DRAFT
FOR REVIEW

DRAFT ENVIRONMENTAL IMPACT STATEMENT

PROPOSED CLOSURE OF LOS ANGELES AFB, CALIFORNIA AND RELOCATION OF SPACE SYSTEMS DIVISION

UNITED STATES AIR FORCE

JULY 1990

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DRAFT ENVIRONMENTAL IMPACT STATEMENT

PROPOSED CLOSURE OF LOS ANGELES AIR FORCE BASE, CALIFORNIA AND RELOCATION OF SPACE SYSTEMS DIVISION

United States Air Force

July 1990

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COVER SHEET
DRAFT ENVIRONMENTAL IMPACT STATEMENT
PROPOSED CLOSURE OF LOS ANGELES AIR FORCE BASE, CALIFORNIA AND RELOCATION OF SPACE SYSTEMS DIVISION

a. **Responsible Agency:** U.S. Air Force

b. **Proposed Action:** Closure of Los Angeles Air Force Base (AFB), California, and Relocation of Headquarters Space Systems Division (SSD) and appropriate supporting units.

c. **Comments on this document directed to:** Lt Col Tom Bartol, Director of Programs and Environmental, AFRCE-BMS/DEP, Norton AFB, California 92409-6448 (714) 382-4891.

d. **Designation:** Draft Environmental Impact Statement (DEIS)

e. **Abstract:** During the late summer of 1989, the Air Force began a thorough review of its force structure, property, and facility requirements needed to support national security policy and future fiscal realities. As a result of this review process, the Secretary of Defense, on 29 January 1990, announced his proposal to close or realign a number of military bases. Los Angeles AFB, California, and the Ballistic Missile Organization (BMO) facilities in San Bernardino, California have been identified as candidates for closure in conjunction with the proposed relocation of SSD and appropriate supporting units to one of four Air Force installations as early as 1993. Proposed relocation sites include Vandenberg AFB, California; March AFB, California; Peterson/Falcon AFBs, Colorado; and Kirtland AFB, New Mexico. In accordance with the National Environmental Policy Act (NEPA), the results of the environmental study are described in this DEIS, which includes analyses of community setting, land use and aesthetics, transportation, utilities, hazardous materials, geology and soils, water resources, air quality, noise, biological resources, and cultural and paleontological resources. Additionally, the DEIS considers the environmental impacts associated with alternative actions including the closure of Los Angeles AFB and relocation of SSD not including BMO; the closure and relocation of a portion of SSD at Los Angeles AFB including BMO; the relocation of BMO alone; and the relocation of an undefined 1,000 presonnel from Los Angeles AFB to one of the four relocation bases. If a decision is made to close Los Angeles AFB and special legislation permits the Air Force to dispose of the properties and apply the proceeds to the cost of relocation, a second EIS will be prepared to cover the final disposition/reuse of the excess property. After base closure, but prior to final decisions on reuse, a caretaker force would be established to provide maintenance of buildings, grounds, and essential utility systems, and to restrict access to the base.

The environmental impacts associated with the proposed action and alternatives include potential impacts to water resources at Vandenberg AFB; impacts to biological resources at Vandenberg AFB and March AFB; and air quality impacts at all four relocation bases.

f. **Comments on this DEIS should be received by TBS.**

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PURPOSE AND NEED

The Air Force began in late summer 1989 a thorough review of its force structure, property, and facility requirements needed to support national security policy and future fiscal realities. As a result of this review process, the Secretary of Defense, on 29 January 1990, announced his proposal to close or realign a number of military bases. Los Angeles Air Force Base (AFB), California, the host base for the Air Force Systems Command's Space Systems Division, and SSD's Ballistic Missile Organization (BMO) facilities in San Bernardino, California have been identified as candidates for closure and relocation (Los Angeles AFB) and realignment (BMO). In addition, the relocation of SSD and appropriate supporting units to selected Air Force installations was also recommended for study. Potential SSD relocation bases include Vandenberg AFB, California; March AFB, California; Peterson AFB/Falcon AFB, Colorado; and Kirtland AFB, New Mexico.

As alternatives, the DEIS also analyzes the impacts of a partial relocation of SSD operations to Vandenberg AFB, March AFB, Peterson AFB/Falcon AFB, and/or Kirtland AFB. Partial relocation of SSD functional units could result in a partial closure of some areas of Los Angeles AFB, and complete or no closure of BMO facilities in San Bernardino.

If a decision is made to close Los Angeles AFB, a second EIS will be prepared to cover the final disposition/reuse of the excess property. After base closure, but prior to final decisions on reuse, a caretaker force would be established to provide maintenance of buildings, grounds, and essential utility systems, and to restrict access to the base.

SCOPE OF STUDY

The Air Force initiated the scoping process on 9 February 1990 with the publication in the *Federal Register* of Notices of Intent (NOI) to prepare an EIS to address impacts of the proposed closure of Los Angeles AFB and relocation of Space Systems Division. Public scoping meetings were held between 14 March 1990 and 24 May 1990 in El Segundo, California; Colorado Springs, Colorado; Lompoc, California; Riverside, California; Albuquerque, New Mexico; and San Bernardino, California. These meetings were conducted to solicit public comments and to identify environmental concerns related to the possible closure actions. Comments were also invited on the environmental issues that should be analyzed in subsequent studies on the final disposition/reuse of base properties. The scope of study for this EIS was based on the results of the public scoping process, discussions with public officials, past experience with programs of a similar nature, and the requirements of the NEPA.

The focus of this EIS is on evaluation of impacts to the environment associated with the proposed action and its alternatives. In order to provide the context in which impacts to the environment may occur, discussions of potential changes to local community settings, land use and aesthetics, transportation, and community and public utility services are included in the EIS. In addition, issues related to current and future management of hazardous materials are discussed. Impacts to the natural or physical environment are evaluated for the following resource categories: geology and soils, water resources, air quality, noise, biological resources, and cultural and paleontological resources. These impacts may occur as a direct result of base closure or relocation actions or as an indirect result of changes to the community or changes in hazardous material management practices.

AFFECTED COMMUNITIES

Base closure and relocation actions would cause changes in the support communities including El Segundo, Hawthorne and San Pedro for Los Angeles AFB, California; San Bernardino, California for BMO, Lompoc and Santa Maria for Vandenberg AFB, California; Riverside, Moreno Valley, and Perris for March AFB, California; Colorado Springs for Peterson and Falcon AFBs, Colorado; and Albuquerque for Kirtland AFB, New Mexico.

LOS ANGELES AFB, CALIFORNIA

Community Setting. For the Proposed Action, it is estimated that the total closure of Los Angeles AFB would result in a reduction of approximately $460 million in personal income and about $1,128 million in total spending. These changes are expected to result in the loss of a total of approximately 15,800 direct and secondary jobs. Total projected population outmigration would be about 14,000.

For the Alternative Actions involving partial closure of Los Angeles AFB, these effects would be proportionally reduced.

Land Use and Aesthetics. Although housing vacancies could increase slightly, the current rate of growth in the area would quickly offset these changes. Local land use patterns and zoning policies would not change. Any land use changes would probably be in the context of reuse and development plans.

Transportation. Vehicle traffic in the vicinity of the base gates would decrease by about 10 percent during peak traffic hours and less than 2 percent overall. This would contribute to slight reductions in noise levels and air pollution emissions on and near the base.

Utilities. Base closure would also decrease demand for potable water, wastewater, natural gas, and electrical utilities. These changes are not expected to have any significant effects of local air or water quality.

BALLISTIC MISSILE ORGANIZATION FACILITIES , SAN BERNARDINO, CALIFORNIA

Community Setting. For the Proposed Action and Alternative 3, it is estimated that the closure of BMO facilities in San Bernardino would result in the loss of a total of approximately 5,060 direct and indirect jobs and a reduction of approximately $48 million in personal income. Total projected population outmigration would be about 7,000.

Land Use and Aesthetics. Although housing vacancies could increase slightly, the current rate of growth in the area would quickly offset these changes. Local land use patterns and zoning policies would not change. Any land use changes would probably be in the context of reuse and development plans.

Transportation. Vehicle traffic in the vicinity of the base gates would decrease by about 5 percent during peak traffic hours and less than 1 percent overall. This would contribute to slight reductions in noise levels and air pollution emissions on and near the base.

Utilities. Base closure would also decrease demand for potable water, wastewater, natural gas, and electrical utilities. These changes are not expected to have any significant effects of local air or water quality.

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VANDENBERG AFB, CALIFORNIA

Community Setting. It is estimated that the total relocation of SSD-LA and SSD-SB functional units to Vandenberg AFB, located in Santa Barbara County, would result in an increase in employment of approximately 14,600, including 7,600 direct and 7,000 secondary jobs for the proposed action. Personal income in the county is projected to increase by approximately $380 million, and total spending by about $970 million. Total projected population inmigration would be approximately 17,100 over the three year period 1993 to 1996. For the alternative action, involving partial relocation of SSD activities, these effects would be proportionally reduced.

For the proposed action, approximately 5,500 offbase housing units would be required to support SSD military and civilian personnel during program operations. This demand represents about four percent of the housing stock in Santa Barbara County. With a current vacancy rate of 3 percent, substantial new residential development would be required in the Lompoc and Santa Maria area.

As a result of the proposed action, public school enrollments in Santa Barbara County would increase by an estimated 3,400 students. This represents an increase of 6 percent over baseline projections, and would require additional facilities.

Land Use and Aesthetics. The proposed action would result in residential development requirements in Lompoc and Santa Maria that are considerably beyond their planned growth rate. Additional developable residential land requirements may necessitate modification of existing general plans.

Transportation. For the proposed action, vehicle traffic in the vicinity of the base gates would increase by about 50 percent during peak traffic hours and about 10 percent overall. This would contribute to considerable increases in noise levels and air pollution emissions in the vicinity of the base.

Utilities. The proposed total relocation to Vandenberg AFB would increase demand for potable water, wastewater, natural gas, and electrical utilities. Existing and planned facility capacities can accommodate these service increases. The current shortage of adequate potable water supplies could affect the rate of development of new residential areas near the base. These changes are not expected to have any significant effects on local air or water quality.

MARCH AFB, CALIFORNIA

Community Setting. It is estimated that the total relocation of SSD-LA and SSD-SB functional units to March AFB, located in Riverside County, would result in an increase in employment of approximately 15,200, including 7,600 direct and 7,600 secondary jobs for the proposed action.

Personal income in the county is projected to increase by approximately $385 million, and total spending by about $977 million. Total projected population inmigration would be approximately 13,900 over the three year period 1993 to 1996. For the alternative action, involving partial relocation of SSD activities, these effects would be proportionally reduced.

For the proposed action, approximately 5,900 offbase housing units would be required to support SSD military and civilian personnel during program operations. This demand could be accommodated by existing vacancies and planned development in Riverside and San Bernardino counties.

As a result of the proposed action, public school enrollments in Riverside County would increase by an estimated 2,000 students. This represents an increase of 0.5 percent over baseline projections, and would be accommodated by existing and planned facilities.

Land Use and Aesthetics. No modifications of current or planned land use would be required for the proposed action.

Transportation. For the proposed action, vehicle traffic in the vicinity of the base gates would increase by about 50 percent during peak traffic hours and about 10 percent overall. This would contribute to considerable increases in noise levels and air pollution emissions in the vicinity of the base.

Utilities. The proposed total relocation to March AFB would increase demand for potable water, wastewater, natural gas, and electrical utilities. Existing and planned facility capacities can accommodate these increases. These changes are not expected to have any significant effects on local air or water quality.

PETERSON AFB/FALCON AFB, COLORADO

Community Setting. It is estimated that the total relocation of SSD-LA and SSD-SB functional units to Peterson AFB/Falcon AFB, located in El Paso County, would result in an increase in employment of approximately 14,200, including 7,600 direct and 6,600 secondary jobs for the proposed action. Personal income in the county is projected to increase by approximately $360 million, and total spending by about $800 million. Total projected population inmigration would be approximately 17,100 over the three year period 1993 to 1996. For the alternative action, involving partial relocation of SSD activities, these effects would be proportionally reduced.

For the proposed action, approximately 6,318 offbase housing units would be required to support SSD military and civilian personnel during program operations. This demand could be accommodated by existing vacancies and planned development in the Colorado Springs area.

As a result of the proposed action, public school enrollments in El Paso County would increase by an estimated 2,400 students. Existing and planned facilities within the school system will be able to accommodate this increase.

Land Use. No modifications of current or planned land use would be required for the proposed action.

Transportation. For the proposed action, vehicle traffic in the vicinity of the base gates would increase by about 50 percent during peak traffic hours and about 10 percent overall. This would contribute to considerable increases in noise levels and air pollution emissions in the vicinity of the base.

Utilities. The proposed total relocation to Peterson AFB/Falcon AFB would increase demand for potable water, wastewater, natural gas, and electrical utilities. Existing and planned facility capacities can accommodate these service increases. These changes are not expected to have any significant effects on local air or water quality.

KIRTLAND AFB, NEW MEXICO

Community Setting. It is estimated that the total relocation of SSD-LA and SSD-SB functional units to Kirtland AFB, located in Bernalillo County, would result in an increase in employment of approximately 14,100, including 7,600 direct and 6,500 secondary jobs for the proposed action. Personal income in the county is projected to increase by approximately $360 million, and total spending by about $600 million. Total projected population inmigration would be approximately 17,100 over the three year period 1993 to 1996. For the alternative action, involving partial relocation of SSD activities, these effects would be proportionally reduced.

For the proposed action, approximately 6,000 permanent housing units would be required offbase to support SSD military and civilian personnel during program operations. This demand can be accommodated by existing vacant units and planned development in the Albuquerque area.

As a result of the proposed action, public school enrollments in Bernalillo County would increase by an estimated 2,400 students. Existing school facilities would be able to accommodate these additional students.

Land Use. No modifications of current or planned land use would be required for the proposed action.

Transportation. For the proposed action, vehicle traffic in the vicinity of the base gates would increase by about 50 percent during peak traffic hours and about 10 percent overall. This would contribute to considerable increases in noise levels and air pollution emissions in the vicinity of the base.

Utilities. The proposed total relocation to Kirtland AFB would increase demand for potable water, wastewater, natural gas, and electrical utilities. Existing and planned facility capacities can accommodate these service increases. These changes are not expected to have any significant effects on local air or water quality.

HAZARDOUS MATERIALS

All hazardous materials and waste used or generated by Los Angeles AFB would be properly disposed of and all residual contamination would be remediated in accordance with an Environmental Protection Agency Resource Conservation and Recovery Act-approved closure plan.

The hazardous waste management plan developed at potential relocation bases would be applied to all hazardous materials and waste used or generated by SSD activities.

IMPACTS TO THE PHYSICAL ENVIRONMENT

Impacts to the physical environment associated with closure of Los Angeles AFB or SSD-San Bernardino are summarized in Table S-1. Impacts to the physical environment associated with relocation actions are summarized in Table S-2. Under the no action alternative, both Los Angeles AFB and SSD-San Bernardino would remain active. This alternative would not alleviate growing fiscal constraints or allow the necessary streamlining of strategic forces. The no action alternative is not expected to result in any significant environmental consequences.

Table S1

Impacts to the Physical Environment Associated with Base Closure Actions

	Impacts of Base Closure	
Resource Category	**Los Angeles AFB**	**Space Systems Division-San Bernardino**
Geology and Soils	• No effect on geology or available mineral resources. • Future soil contamination and erosion would be avoided.	
Water Resources	• Slight decreased demand on local water supply. • Reduced potential for onbase surface water and groundwater contamination from future hazardous waste handling.	
Air Quality	• Reduced emissions from motor vehicles and laboratory operations would result in negligible reductions of various contaminants in Los Angeles County.	
Noise	• Slightly reduced traffic noise.	
Biological Resources	• No effects on vegetation or wildlife. • No threatened or endangered species would be adversely affected.	
Cultural and Paleontological Resources	• The status of historic structures at Fort MacArthur would not be affected by the action. • No prehistoric or paleontological resources would be affected.	

Table S2

Impacts to the Physical Environment Associated with Relocation Actions

Resource Category	Impacts of Relocation: Vandenberg AFB	Impacts of Relocation: Kirtland AFB
Geology and Soils	• No significant geologic hazards are known to occur. • Soil losses from erosion could be significant if appropriate mitigation measures are not taken.	• No significant geologic hazards are known to occur. • Soil losses from erosion could be significant if appropriate mitigation measures are not taken.
Water Resources	• Impacts to groundwater resources would be significant unless the Coastal Canal from the California Aqueduct is constructed. • No surface water features would be affected.	• Groundwater resources would not be significantly affected. • No surface water features would be affected.
Air Quality	• Impacts to air quality are not considered significant.	• Short-term construction-related air quality impacts are not considered significant. • Long-term CO emissions are considered significant because of the nonattainment status of the area.
Noise	• Noise impacts from construction activities and increased vehicular traffic are not considered significant.	• Short-term construction noise impacts are considered significant at Sites 1A and 1B because of the proximity to residential areas, but not significant at Site 2.
Biological Resources	• Impacts to vegetation would not be significant unless housing site 2 is selected. If housing site 2 is selected, 155 acres of Burton Mesa chaparral, a sage plant community, would be disturbed. • No significant impacts to wildlife or wetlands are expected.	• Preliminary studies indicate that impacts to vegetation and wildlife will not be significant; however, additional field studies will be conducted to confirm this conclusion. • No wetlands are known to exist on Sites 1A, 1B, or 1C; some may exist on Site 2.
Cultural and Paleontological Resources	• No significant impacts to cultural or paleontological resources are anticipated.	• Some NRHP-eligible prehistoric sites may be affected at Site 1A. • Cultural resource impacts are not expected to be significant at Sites 1B or 2. • Some important paleontological features occur in the area.

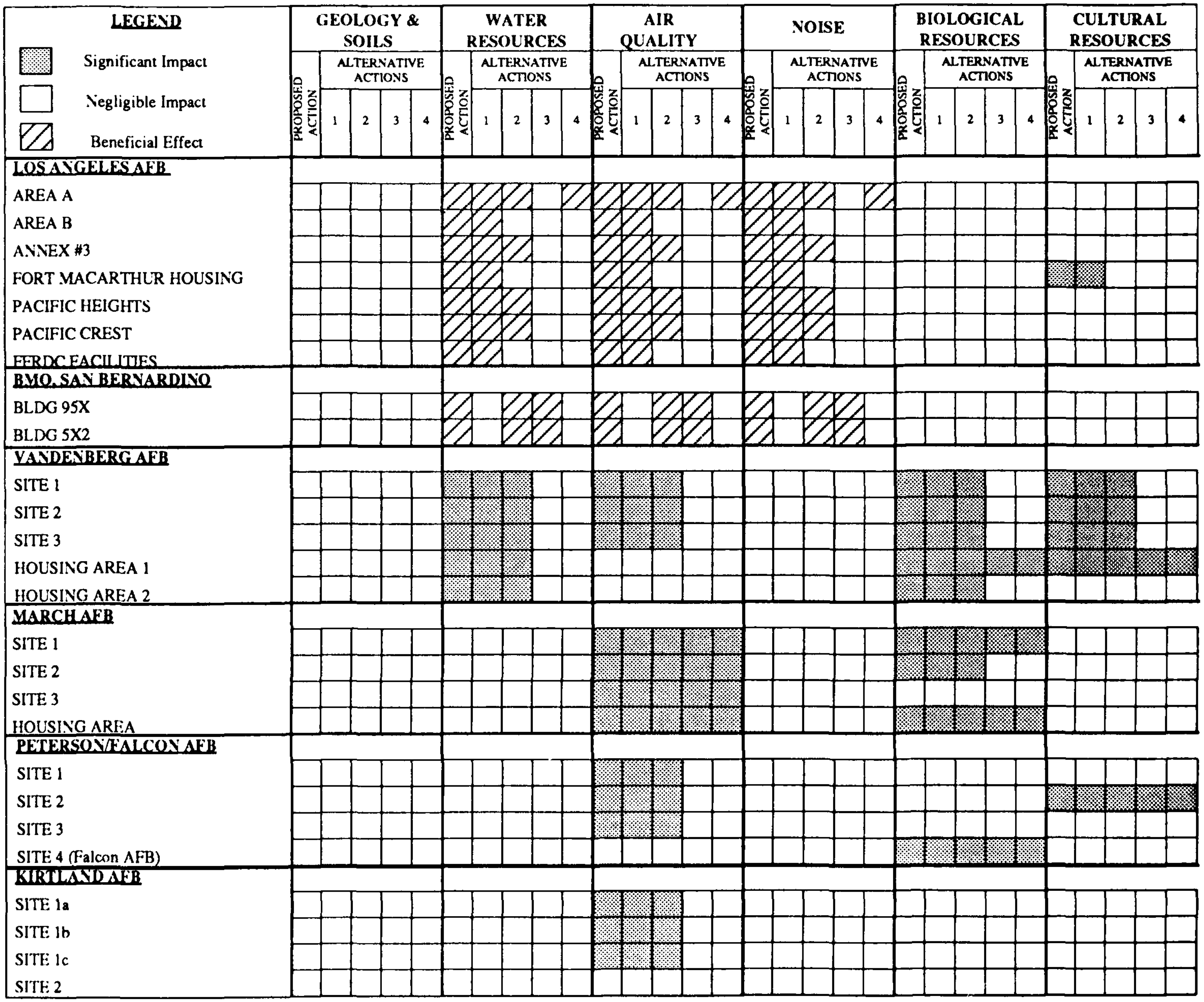
Table S2
(continued)

Impacts to the Physical Environment Associated with Relocation Actions

	Impacts of Relocation	
Resource Category	**March AFB**	**Peterson AFB/ Falcon AFB**
Geology and Soils	• Soil loss from erosion during the construction period could be significant if appropriate mitigation measures are not taken. • No significant geologic hazards are known to occur.	• Soil loss from erosion during the construction period could be significant if appropriate mitigation measures are not taken. • No significant geologic hazards are known to occur.
Water Resources	• No significant impacts to groundwater or surface water are anticipated.	• Some impact to overdraft of groundwater resources is anticipated. • No significant surface water impacts are anticipated.
Air Quality	• Short-term construction-related impacts are not considered significant. • The THC criterion would be exceeded during the operations phase, necessitating additional air quality analyses.	• Air quality impacts from construction are not considered significant. • Long-term CO impacts from vehicular emissions are considered significant at Peterson AFB, but not significant at Falcon AFB.
Noise	• Increased in vehicular noise are not considered significant.	• Increases in vehicular noise are not considered significant.
Biological Resources	• The Steven's kangaroo rat may be significantly affected. • Four sensitive bird species may be affected. • No sensitive plants or wetlands are expected to be affected.	• Biological resources will be surveyed in the spring.
Cultural and Paleontological Resources	• No significant impacts to cultural or paleontological resources are expected.	• Impacts to historic or prehistoric resources are not expected to be significant at either Falcon AFB or Peterson AFB; however, additional surveys will be performed in the spring. • Important paleontological features occur in the area; it is not known if any would be disturbed.

A comparison of environmental impacts by site at each Air Force installation affected by the proposed action and alternatives is presented in Figure S-1.

FIGURE S-1
SUMMARY OF POTENTIAL BIOPHYSICAL ENVIRONMENTAL IMPACTS
CLOSURE OF LOS ANGELES AFB AND REALIGNMENT OF SPACE SYSTEMS DIVISION



1.0 PURPOSE AND NEED FOR ACTION

1.1 INTRODUCTION

In late summer 1989, the Air Force began a comprehensive review of the property, facility, and installation requirements based on its force structure, national security policy, and future fiscal constraints. On January 29, 1990, the Secretary of Defense announced a proposal to close a number of military bases. Among them were bases identified by the Air Force, including Los Angeles Air Force Base (AFB), the host base for Air Force Systems Command's (AFSC) Space Systems Division (SSD).

As a result of the proposed closure of Los Angeles AFB, the Air Force has proposed to relocate SSD and appropriate supporting units to one of the following Air Force bases: Vandenberg AFB, California; March AFB, California; Peterson AFB/Falcon AFB, Colorado; or Kirtland AFB, New Mexico. The closure of Los Angeles AFB and relocation of SSD also includes the closure of facilities and relocation of personnel associated with the Aerospace Corporation, a Federally Funded Research and Development Center closely associated with the day-to-day operations at Los Angeles AFB.

The Air Force has also subsequently reduced manpower through the Defense Management Review (DMR), an initiative to consolidate and streamline Department of Defense (DOD) needs and responsibilities. The DMR resulted in a 10 percent reduction of AFSC personnel. In order to better manage the units within AFSC, the Secretary of the Air Force proposed, among other things, to realign the Ballistic Systems Division (BSD), located at Norton AFB in San Bernardino, California, under SSD. This functional change in command was made on May 5, 1990, and BSD was renamed the Ballistic Missile Organization (BMO). The Air Force has proposed to relocate BMO as part of the proposed action to relocate SSD. The relocation of BMO also includes the relocation of its Systems Engineering/Technical Analysis (SETA) contractor. For convenience, the SSD functions and supporting units at Los Angeles AFB are referred to herein as SSD-LA and the BMO functions and supporting units in San Bernardino are referred to as SSD-SB.

The decision to propose the closure of Los Angeles AFB was based on a number of operational and quality of life issues. Among these are housing costs and commuting times. Currently, many government civilian employees at Los Angeles AFB and most military personnel not in base housing are subjected to inflated housing costs. Government civilian employees cannot presently be compensated adequately to work in the area under existing pay plans. As a result, military and civilian employees suffer financial hardships in comparison to their peers assigned to other locations. This has created difficulty in retaining and filling many civilian positions at Los Angeles AFB, particularly in the lower pay grades such as clerical help, commissary cashiers, and child care providers. The mission capability of SSD is also affected by the lengthy commutes of many civilian and some military employees, which can extend to 4 hours each day, because of the lack of affordable housing in the vicinity of Los Angeles AFB. These factors detract from the goal of producing a professional management team for future space systems development. This situation will continue unless civilian pay is improved through locality or the incentive pay plans, additional military housing is provided, a lower cost location is found, or the current Los Angeles AFB operations are scaled back to fit existing facilities.

In accordance with the National Environmental Policy Act (NEPA), the Air Force has prepared this Environmental Impact Statement (EIS) to assess the potential environmental impacts of the possible closure of Los Angeles AFB and the BMO facilities in San Bernardino and the realignment of SSD-LA and SSD-SB to selected Air Force bases. If a decision is made to close either, further environmental analysis will be completed to cover the final disposition/reuse of the excess property. Local communities would be assisted during the closure process by the DOD's Office of Economic Adjustment.

If a decision is made to close Los Angeles AFB and the BMO facilities, a caretaker force would be provided. The caretaker force, in operation between closure of the base and its ultimate reuse, would provide several services including sufficient maintenance to prevent deterioration of buildings and essential utility systems, minimal maintenance of grounds, and restriction of access.

1.2 SCOPING PROCESS

The President's Council on Environmental Quality (CEQ) regulations which implement NEPA require an early and open process for determining the scope of issues related to the proposed action. The Air Force initiated this process with the publication of two Notices of Intent to prepare an EIS for the closure and relocation actions in the *Federal Register* on 9 February 1990 (see Appendix B). Soon after, written requests were sent to the responsible federal, state, and local agencies to submit their concerns and issues to be analyzed in the EIS to the Air Force. Six public scoping meetings for the EIS addressing the proposed closure of Los Angeles AFB and relocation of SSD were conducted between 14 March and 24 May 1990. These meetings were held in the host communities for each base including El Segundo, California, for Los Angeles AFB; San Bernardino, California, for BMO; Lompoc, California, for Vandenberg AFB; Riverside, California, for March AFB; Colorado Springs, Colorado, for Peterson AFB and Falcon AFB; and Albuquerque, New Mexico, for Kirtland AFB. Table 1.2-1 provides a record of the scoping meetings for each base, including the meeting locations, dates, panel members, number of attendees, and number of persons who made statements.

1.2.1 Summary of Scoping Issues

The scope of study for this EIS was based on the results of the public scoping process, discussions with public officials, past experience with programs of a similar nature, and the requirements of NEPA.

The following issues and concerns are representative of those identified either at scoping meetings or in written statements received before or after the meeting.

Los Angeles AFB. Public statements were made at the Los Angeles AFB meeting by representatives of the City of El Segundo, the El Segundo and San Pedro Chambers of Commerce, the Aerospace Corporation, and members of the general public. These statements were generally in opposition to the move, emphasizing the adverse economic impacts that would result from the proposed base closure. It was suggested that an evaluation of socioeconomic impacts be included in the EIS. One statement was made requesting that additional scoping meetings be held in other towns surrounding the base including Hawthorne, Del-Air, and Hollyglen.

Some of the potential adverse impacts mentioned at the scoping meeting included the direct and secondary impacts on the community from the loss of the military payroll, the loss of contract expenditures made by the Air Force in the South Bay area, and the loss of revenue for goods and services generated annually by the presence of the Air Force. Positive attributes of the base that were mentioned included the contribution to the community made by officers and their families, the strong support for businesses in the South Bay area, and the relationship of Los Angeles AFB to the local aerospace industry including Hughes, TRW, Rockwell, Northrop, and McDonnell Douglas. The new military housing at White Point was noted as a considerable investment. Other comments included the effect of closure on traffic congestion in the area, the high cost of housing in the Los Angeles

Table 1.2-1

Schedule of Scoping Meetings for Proposed Closure of Los Angeles AFB and Relocation of SSD

	Los Angeles AFB	Ballistic Missile Organization	Vandenberg AFB	Kirtland AFB	March AFB	Peterson AFB/ Falcon AFB
Location	El Segundo High School, El Segundo, CA	San Bernardino City Hall, San Bernardino, CA	Cabrillo High School, Lompoc, CA	Eldorado High School, Albuquerque, NM	City Hall, Riverside, CA	Centennial Hall, Colorado Springs, CO
Date	14 March 1990	24 May 1990	27 March 1990	2 April 1990	29 March 1990	26 March 1990
Panel	Col. E. Peura Col. S. TerMaath Maj. M. Vroman	Lt. Col. T. Bartol Col. J. Young Mr. T. Yonkers	Col. O. Robertson Col. S. TerMaath Lt. Col. T. Bartol	Col. E. Franklin Col. J. Skalicky Maj. M. Vroman	Lt. Col. B. Knapp Col. S. TerMaath Maj. M. Vroman	Col. G. Bergeman Col. S. TerMaath Maj. M. Vroman
Number of Registered Attendees	126	100	69	196	26	184
Number of Public Statements	9	39	8	34	9	11

area, and the reluctance of government employees and contract support people to move. The potential uses for Los Angeles AFB after closure were also questioned.

Ballistic Missile Organization. Public statements were made at the BMO scoping meeting in San Bernardino by representatives of U.S. congressmen and state legislators, representatives of the Cities of San Bernardino and Moreno Valley; the University of California, Riverside; the Moreno Valley Chamber of Commerce; and several local organizations and private citizens. These statements were generally in opposition to the move, emphasizing the adverse economic impacts that would result from the proposed relocation of BMO. Comments were generally in support of either leaving BMO at its current location or moving it to March AFB.

Potential reductions in traffic congestion, improvements in air quality, and the availability of infrastructure for water, solid waste, and wastewater systems were suggested issues to be evaluated in the EIS. Several speakers mentioned that California has been hit hard by base closures as well as cutbacks in the aerospace industry and that the potential job loss is a serious problem for the economy. It was noted that the base realignment and closure commission, which ordered Norton AFB closed, specifically said that BMO should stay at its present location adjacent to Norton AFB. The potential effects on the social well-being of the current employees and their families who may be unable to relocate and therefore become unemployed were also mentioned. It was stated that a number of aerospace contractors have located in this area to accommodate the Air Force, specifically BMO.

Some of the arguments presented for leaving BMO at its current location or relocating it to March AFB included: the Inland Empire has water available; the area has an excellent network of highways and is within 20 minutes of Ontario Airport, which handles over four million passengers per year; and military and contract employees have become significant contributors to local communities by serving in civic organizations, supporting theater and art groups, and buying homes.

Vandenberg AFB. At the Vandenberg AFB meeting, statements were made by representatives of the County of Santa Barbara, and several local associations and private citizens. While several speakers spoke in favor of the relocation of SSD to Vandenberg AFB, noting the economic benefits to the area, others identified environmental and other concerns to be considered in the EIS including schools, housing, hospitals, airport capacity, water, traffic, sanitary systems, landfills, prime soils, sensitive habitats, and air quality. Cumulative effects of developments at Bixby Ranch and other programs at Vandenberg AFB such as the Titan-Centaur Launch Complex were also mentioned.

Some of the potential environmental issues that were presented included offbase housing development impacts on agricultural land; the critical water shortage; growth-inducing impacts on the region's limited resources; the Burton-Mesa chaparral on and around Vandenberg AFB; Santa Barbara and Santa Maria Airport capacity; impacts on the roadways in Lompoc and Orcutt, Highway 1, Highway 135, and Bradley Road; sewer capacity in Orcutt and Lompoc; landfill problems in Santa Maria, Lompoc, and Vandenberg AFB; impacts on the area's school, hospital, and dental facilities; and impacts on the central coast of California.

March AFB. Public statements were made at the March AFB scoping meeting by representatives of the City of Moreno Valley; the University of California, Riverside; the Moreno Valley Chamber of Commerce; and several local organizations and private citizens. All comments were in support of the relocation of SSD to March AFB with emphasis on the creation of local jobs and the reduction of commuting distances. It was also noted that the Riverside area has a large quantity of affordable housing.

Most of the issues presented noted positive reasons for relocating SSD to March AFB including: relocation would reduce commuting and freeway traffic; air travel is much easier from Ontario Airport than from Los Angeles International; the Riverside-San Bernardino standard metropolitan statistical area has 231,000 more housing units than employment opportunities; and the Riverside area has a large quantity of affordable housing.

Peterson AFB and Falcon AFB. At the scoping meeting for Peterson AFB and Falcon AFB, statements were made by the Governor of Colorado, representatives of U.S. congressmen, representatives of state legislators, and representatives of the City of Colorado Springs, El Paso County, the University of Colorado, local associations, and private citizens. All but one of the speakers spoke in favor of the relocation of SSD to Peterson and Falcon AFBs, emphasizing the growth capacity of housing and services in the local community. Low housing costs, a highly educated workforce, and a high quality of life were described as beneficial to the proposed program.

Some of the positive factors presented for the relocation of SSD to Peterson/Falcon AFBs included: Colorado Springs did not exceed the pollution standards for carbon monoxide at any time during the past year; the area has good transportation-hub features; the space industry is the largest single factor in the Colorado economy; the average cost of a new home in Colorado is $90,000, and the average monthly rent for a one-bedroom apartment is $268; and of 160,000 dwelling units in Colorado Springs, 22,000 are vacant. One speaker stated that there is a need for balance in the educational, social, church, and cultural environments in Colorado Springs, not a further addition to the imbalance.

Kirtland AFB. Public statements were made at the scoping meeting for Kirtland AFB by state senators and representatives, representatives of U.S. legislators, the Governor's office, the City of Albuquerque, the University of New Mexico, local associations, and private citizens. All speakers spoke in favor of relocating SSD to Kirtland AFB noting that the community could provide all of the housing and services required by the program. A good transportation system, ample utilities, a highly educated workforce, low cost of living, available housing, and a rich cultural diversity were mentioned as positive factors contributing to the SSD relocation.

Some of the positive factors presented for relocating SSD to Kirtland AFB included: Albuquerque has good air quality, with low levels of reactive pollutants, sulfur dioxide, and easily screened particulates; Albuquerque's infrastructure is adequate to handle the demands imposed upon it by the relocation; Albuquerque Airport can handle all growth in air traffic for the next 25 years; there are ample water supplies in New Mexico; Albuquerque has updated its waste and refuse facilities and has constructed a complete solid waste system; the electrical utility service in Albuquerque can accommodate much greater usage; the median price home in New Mexico sells for $83,000; and many homes and apartments are available for sale or rent.

1.2.2 Issues Beyond the Scope of the Environmental Impact Statement

Issues that are beyond the scope of this EIS include:

- Environmental impacts of property disposal and reuse; and
- Potential socioeconomic impacts that are not interrelated to impacts on the physical and natural environment.

1.2.3 Related Studies

Other studies have been recently completed or are being conducted by federal, state, or local agencies that are closely related to the proposed closure of Los Angeles AFB and relocation of SSD. In addition to this EIS, the Air Force is conducting five other studies as required by Title 10 USC 2687. These are:

- A strategic study that will address the changing global military power base and examine the interplay between force structure, national defense policy, and power projection requirements. This study will also address the impact of reducing conventional, strategic, and space systems as the threat to national security is reduced.

- An operational study that will address the operational environment of aircraft and identify special operational characteristics, restricted areas, military operating areas, zoning, range-use rights, and other significant operational issues. It will also include all tenant units and joint service missions supported or needing replacement if the decision is made to close the installation.

- A budgetary study that will determine current-year programmed dollar costs and savings associated with the relocation or retirement of the aircraft and the inactivation or relocation of associated operations and support units.

- A fiscal study that will use the budget evaluation as a springboard, and analyze past, present, and future costs and savings associated with the retirement of aircraft and the inactivation or relocation of associated operational and support units. Costs of closing and savings will be detailed through a life-cycle cost model.

- A local economic consequences study that will address the direct payroll loss to the immediate community and the secondary payroll impact on local businesses caused by the loss of military personnel, dependents, and civilian workforce. In addition, the study will examine the effects on the local real estate market and schools from a loss of personnel. If data are available, the study will address losses to other local industries that depend on the base. The study will also cover projected growth in the community and the potential for reuse, both interim and long term.

1.3 FEDERAL AUTHORIZING ACTIONS AND PERMITS

Table 1.3-1 presents federal authorizing actions and permits that are or may be applicable to the closure of Los Angeles AFB and relocation of SSD to one of four proposed installations.

Table 1.3-1

Federal Authorizing Actions and Permits

Authorizing Action	Typical Activity or Facility That May Require the Action	Authorizing Agency	Authority
<u>Water</u>			
Section 404 (Dredge and Fill) Permit, Consultation	Discharge of dredged or fill material into waters of the United States at specified disposal sites, especially for impoundments, bridge crossing improvements, or where cable or pipe corridors traverse streams and wetlands.	Army Corps of Engineers, in consultation with Environmental Protection Agency and U.S. Fish and Wildlife Service	Federal Water Pollution Control Act of 1972, as amended (FWPCA), §404; 33 USC 1344; 33 CFR 320-330; 40 CFR 230. Executive Orders 11988 and 11990. Fish and Wildlife Coordination Act, 16 USC 661-666c.
Section 10 Permit	Construction of structures in or over any navigable water, the excavation from or depositing of material in such waters or any other work affecting the course, location, condition, or capacity of such waters.	Army Corps of Engineers, in consultation with Environmental Protection Agency and U.S. Fish and Wildlife Service	Rivers and Harbors Act of 1899;
National Pollutant Discharge Elimination System Permit	Most point wastewater discharges require a discharge permit if discharged to any surface water body.	Environmental Protection Agency, or federally designated state agency	Clean Water Act of 1977, §402; 33 USC 466 <u>et seq</u>.
Approval of Spill Prevention Control and Counter-Measure Plan	Storage or transportation of oil (i.e., in the form of gasoline and diesel fuel or in any other form) at construction sites.	Environmental Protection Agency	Federal Water Pollution Control Act, 33 USC 1251, <u>et seq</u>. at §1321(j)(1)(c); 40 CFR 112.

Table 1.3-1, Page 2 of 6

Authorizing Action	Typical Activity or Facility That May Require the Action	Authorizing Agency	Authority
Air/Noise			
Review of Prevention of Significant Deterioration and Nonattainment Area Impacts	Increased highway traffic and other activities with emissions to the atmosphere. Ensure compliance with state and local air quality implementation plans.	Environmental Protection Agency	Clean Air Act, Prevention of Significant Deterioration, and other air quality approvals, 42 USC 7401 et seq.
Consultation	Federal activities resulting in noise that may jeopardize health or safety. Equipment must meet federal noise emission standards.	Environmental Protection Agency	Noise Control Act of 1972, as amended by the Quiet Communities Act of 1978, 42 USC §4901 et seq., particularly 42 USC §4903.
Stationary Source Construction and Operation Permits	Concrete plant, rock crusher, incinerator boiler, generator.	Environmental Protection Agency	Clean Air Act, 42 USC §1701 et seq.
Solid and Hazardous Waste			
Authority for Short-Term Storage of Small Quantities of Hazardous Waste, Hazardous Waste I.D. Number	Generation during construction and temporary storage of small quantities of hazardous waste including expended or unusable oils and lubricants, machining fluids, cleaning agents, and adhesives.	Environmental Protection Agency	Resource Conservation and Recovery Act of 1976, 42 USC 6901 et seq., at §6921; 40 CFR 261.5, 262.34.
Registration, Packaging, and Manifest Requirements	Transportation of hazardous waste generated during construction from generation site to temporary storage site; transportation of propellants.	Federal Highway Administration, Department of Transportation	Hazardous Materials Transportation Act, 49 USC 1801 et seq.; Resource Conservation and Recovery Act of 1976, §3003;42 CFR 170-179; 40 CFR 262.30-262.33;45 Fed. Reg. 51645.

Table 1.3-1, Page 3 of 6

Authorizing Action	Typical Activity or Facility That May Require the Action	Authorizing Agency	Authority
Biological Resources Protection			
Section 7 Consultation on Threatened and Endangered Species	Activities and facilities that may affect threatened or endangered species or their critical habitat.	U.S. Fish and Wildlife Service, Department of the Interior	Endangered Species Act §7; 16 USC 1531 et seq., §1536; 50 CFR 402; Proposed Rules in 48 Fed. Reg. 29990.
Consultation on Effects on Fish and Wildlife	Modification, control, or impoundment of a surface water body over 4 hectares. Must consult with federal and state wildlife agencies.	U.S. Fish and Wildlife Service, Department of the Interior	Fish and Wildlife Coordination Act, 16 USC 661-666.
Wetlands Assessment	Construction in, modification of, or impacts to wetlands is not allowed unless there is no practicable alternative. Must notify federal, state, and local agencies of expected impacts, alternatives considered, and mitigations.	U.S. Fish and Wildlife Service, Department of the Interior, and/or Army Corps of Engineers	Executive Order 11990.
Conservation Program	Military Reservation	Department of Defense in cooperation with the Department of the Interior and appropriate state agencies	Sikes Act, 16 USC, §670a, et seq.

Table 1.3-1, Page 4 of 6

Authorizing Action	Typical Activity or Facility That May Require the Action	Authorizing Agency	Authority
Cultural Resource Protection			
Section 106 Consultation and Comment	Project activities that affect properties with historic, architectural, or cultural value which are listed or eligible for listing in the National Register of Historic Places.	Advisory Council on Historic Preservation	National Historic Preservation Act of 1966, as amended, 16 USC 470 et seq.; Advisory Council on Historic Preservation, 36 CFR 800; National Register of Historic Places, 36 CFR 60; Executive Order 11593 "Protection and Enhancement of the Cultural Environment."
Consultation	Project activities that affect Native American religious practices and sites.	Native American religious leaders	American Indian Religious Freedom Act, 42 USC 1996 et seq.
Permit to Survey, Excavate, Analyze, and Curate Archaeological Resources	Project activities that affect cultural resources.	Interagency Archaeological Services, National Park Service, Department of the Interior	Archaeological Resources Protection Act, PL 96-95.
Transportation			
Highway Access Control Approval	Any construction involving new highway access improvements must be approved by the Secretary of Transportation.	Federal Highway Administration, Department of Transportation	23 USC 111 Federal Air for Highways.

Table 1.3-1, Page 5 of 6

Authorizing Action	Typical Activity or Facility That May Require the Action	Authorizing Agency	Authority
Air Space Permit	Construction of buildings, towers, or other structures greater than 200 ft in height.	Federal Aviation Administration, Department of Transportation	Federal Aviation Act, 49 USC .347 et seq.
Land Use			
Rights-of-Way Consultation	Need to occupy, use, or traverse land for roads or railroads, power and communication distribution systems, and pipelines over wildlife refuges.	U.S. Fish and Wildlife Service, Department of the Interior	Fish and Wildlife Coordination Act, §4CF, 16 USC 661 et seq.; Department of Transportation Act of 1966, 80 Stat 931, PL 890670; National Wildlife Refuge System Administration Act, PL 89-669; Coastal Barrier Resources Act, 16 USC 3501-3510.
Consistency Determination for Coastal Zone Management	Projects that require use of land within the coastal zone.	Implementation through state coastal management programs	Coastal Zone Management Act of 1972, 15 CFR 930, Subpart C.
Right-of-Way Grant (Bureau of Land Management or Forest Service Managed Lands)	Need to occupy, use, or traverse land for roads, railroads, powerlines, storage yards, etc.	Bureau of Land Management, Department of the Interior, U.S. Forest Service, U.S. Department of Agriculture	Federal Land Policy and Management Act, 43 USC 1701-1782.

Table 1.3-1, Page 6 of 6

Authorizing Action	Typical Activity or Facility That May Require the Action	Authorizing Agency	Authority
Withdrawal Land Order	Need to obtain jurisdiction over or occupation of land for system uses other than rights-of-way under certain conditions.	Bureau of Land Management, Department of the Interior/U.S. Forest Service, U.S. Department of Agriculture	Federal Land Policy and Management Act (supra); Engle Act, 43 USC 135-158.
Relocation Benefits Plan	In the event property owners are relocated as a result of the proposed project, a plan for relocation assistance will be developed.	U.S. Air Force	Uniform Relocation Assistance and Real Property Acquisition Act, 42 USC 4601 et seq.
Free-Use Permit	Quarries or borrow pits on public lands.	Department of the Interior, Bureau of Land Management	Materials Act of 1947, 30 USC 601-604.

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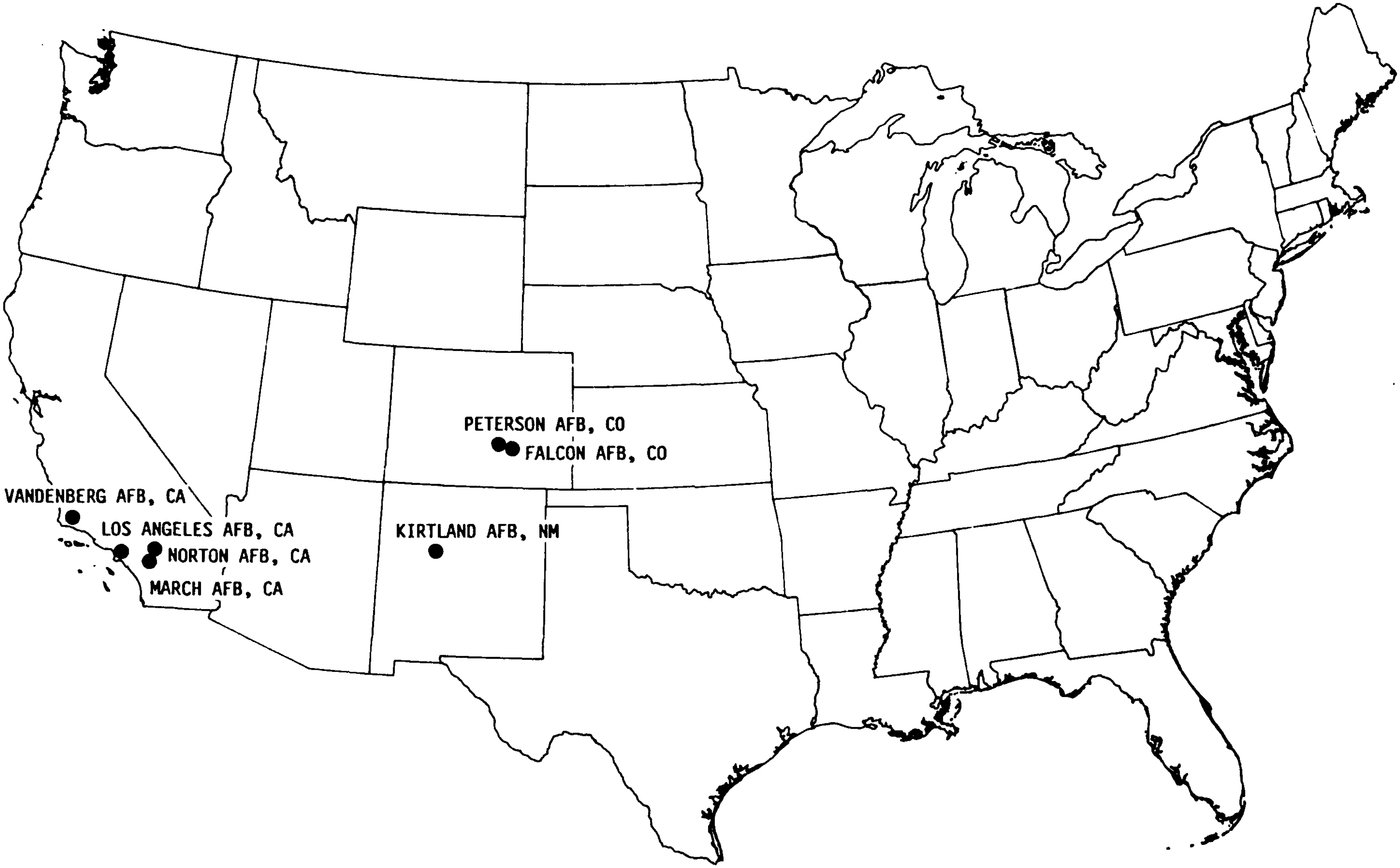

FIGURE 2.2-1 INSTALLATIONS INCLUDED IN THE PROPOSED CLOSURE OF LOS ANGELES AFB AND REALIGNMENT OF SPACE SYSTEMS DIVISION

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These two facility groups include approximately 600,000 square feet of building space. The SETA contractor occupies space within these government facilities. Facilities identified for closure as part of the proposed action are listed in Table 2.2-1.

All of the facilities listed in Table 2.2-1 would be closed under the proposed action. A caretaker team would be established in the event of closure to maintain buildings, grounds, and water supply and utilities, and to provide adequate security until the property is sold or excessed by the Air Force.

Facility Requirements - Relocation Bases. Relocation of SSD-LA and SSD-SB to any one of the four candidate installations would require different levels of military construction for technical facilities, base operating support (BOS) facilities, and expansion of existing utilities and infrastructure. Requirements at each base were determined by the availability of existing structures suitable for SSD program activities, and the capacity of current BOS, infrastructure, and utility systems. Additionally, the construction of military family housing (MFH) would be required at some of the potential relocation bases.

Technical facility space requirements for total relocation of SSD-LA and SSD-SB activities include 1,495,000 square feet of administrative space, 170,000 square feet of laboratory, 530,000 square feet of special compartmentalized information facilities (SCIF), and 380,000 square feet of other space. Construction requirements for these facilities, BOS, and MFH are summarized in Table 2.2-2.

2.2.2 Employment

Employment at Closure Locations. The closure of Los Angeles AFB would involve approximately 8,145 military and civilian employees, and the closure of BMO facilities in San Bernardino would affect an additional 2,530 military and civilian personnel. A majority of these personnel would be relocated to the selected relocation site during the transition period between FY 1993 and FY 1996.

The schedules for the drawdown of personnel at Los Angeles AFB and SSD-SB are presented in Figures 2.2-2 and 2.2-3.

Employment at Relocation Bases. Total relocation of SSD-LA and SSD-SB would require moving 2,410 military personnel, 2,010 DOD civilian employees, 4,180 FFRDC staff, and 1,490 SETA contractor personnel. These personnel would be relocated over the 3-year period between FY 1993 and FY 1996. For potential relocation to either Vandenberg AFB, Peterson/Falcon AFBs, or Kirtland AFB, it is assumed that approximately 80 percent of all employees would relocate with the remaining 20 percent hired locally. At March AFB, it is estimated that about 60 percent of current personnel would relocate, 20 percent would remain in existing residences in the Los Angeles and San Bernardino area, and 20 percent would be hired locally.

2.3 DESCRIPTION OF THE ALTERNATIVE ACTIONS

2.3.1 Alternative 1

Alternative 1, which would begin in FY 1993 and be completed by the end of FY 1996, includes the following actions:

- Total closure of Los Angeles AFB and its facilities including Areas A and B in El Segundo, FFRDC facilities, the Lawndale Annex in Hawthorne, and MFH at Fort MacArthur, Pacific Heights, and Pacific Crest in San Pedro.

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Table 2.2-1

Facility Closures
Proposed Action

Location	Type	Area (ac)	Quantity
Government Facilities			
Los Angeles AFB			
Area A	Office	41.45	860,509 sq ft
Area B	Office/Support	53.70	467,420 sq ft
Lawndale Annex	Office	13.34	30,000 sq ft
Fort MacArthur	Office/Support	93.00	113,235 sq ft
	Housing[1]		404 units
Pacific Crest	Housing	22.09	91 units
Pacific Heights	Housing	12.68	79 units
SSD-SB			
BMO 95X Complex	Office	34.00	252,925 sq ft
BMO 95X Complex Expansion	Office	36.00	341,383 sq ft
Contractor Facilities			
FFRDC	Office-Own[2]	44.45	920,291 sq ft
	Office-Lease	32.51	544,608 sq ft
SETA	Office-Lease	1.3	28,500 sq ft

Notes: [1]Includes 42 housing units under Army control by 1982 agreement.
[2]Includes labs and SCIFs.

Table 2.2-2

SSD Facility Construction Requirements (000 square feet)

Action Facility Type	Vandenberg[1] AFB	March AFB	Peterson AFB/ Falcon AFB	Kirtland AFB[2]
Proposed Action				
Administration	1,372-1,495	1,495	1,495	1,221-1,495
Laboratory	170	170	170	170
SCIF	530	530	530	530
Other	380	380	380	380
BOS	335	320	125/550	74
TOTAL:	2,787-2910	2,895	2,700/3,125	2,375-2,649
MFH (Units)	1,436	1,596	0	24
Alternative 1				
Administration	1,037-1,160	1,160	1,160	886-1,160
Laboratory	170	170	170	170
SCIF	490	490	490	490
Other	310	310	310	310
BOS	250	240	105/492	63
TOTAL:	2,057-2180	2,370	2,235/2,622	1,919-2,193
MFH (Units)	1,074	1,202	0	18
Alternative 2				
Administration	1,172-1,295	1,295	1,295	1,021-1,295
Laboratory	0	0	0	0
SCIF	130	130	130	130
Other	210	210	210	210
BOS	260	285	75/492	30
TOTAL:	1,772-1,895	1,920	1,710/2,622	1,391-1,665
MFH (Units)	1,105	1,252	394	160
Alternative 3				
Administration	212-335	335	335	62-335
Laboratory	0	0	0	0
SCIF	40	40	40	40
Other	70	70	70	70
BOS	130	75	27/140	15
TOTAL:	452-575	520	472/585	187-460
MFH (Units)	362	394	0	6
Alternative 4				
Administration	47-170	170	170	0-170
Laboratory	0	0	0	0
SCIF	20	20	20	20
Other	30	30	30	30
BOS	52	30	11/60	6
TOTAL:	149-272	250	231/280	56-226
MFH (Units)	140	160	0	0

Notes: SCIF = Special Compartmentalized Information Facility
BOS = Base Operating Support
MFH = Military Family Housing
Average MFH = 1,400 square feet
[1]123,000 square feet of existing facilities could be used.
[2]274,000 square feet of existing facilities could be used.

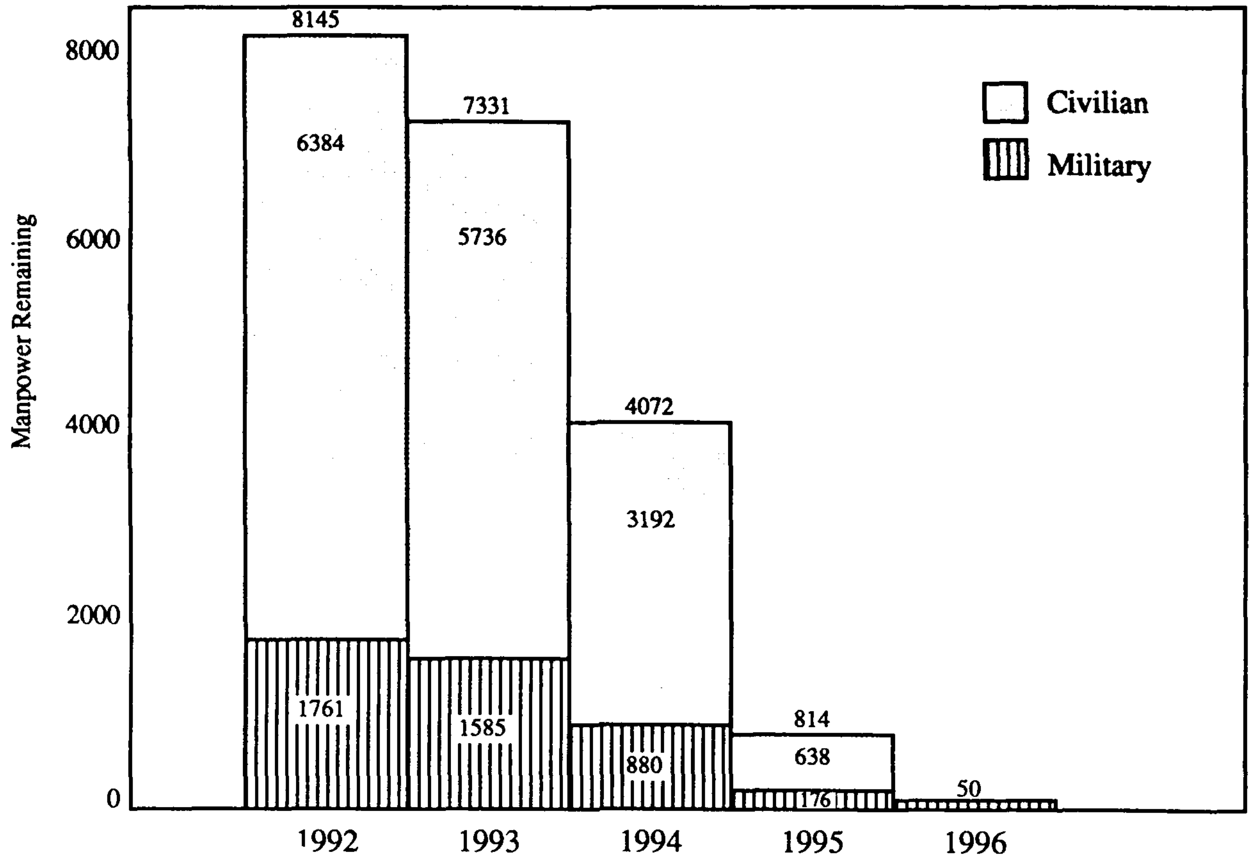

FIGURE 2.2-2 MANPOWER DRAWDOWN SCHEDULE FOR LOS ANGELES AFB - PROPOSED ACTION AND ALTERNATIVE 1

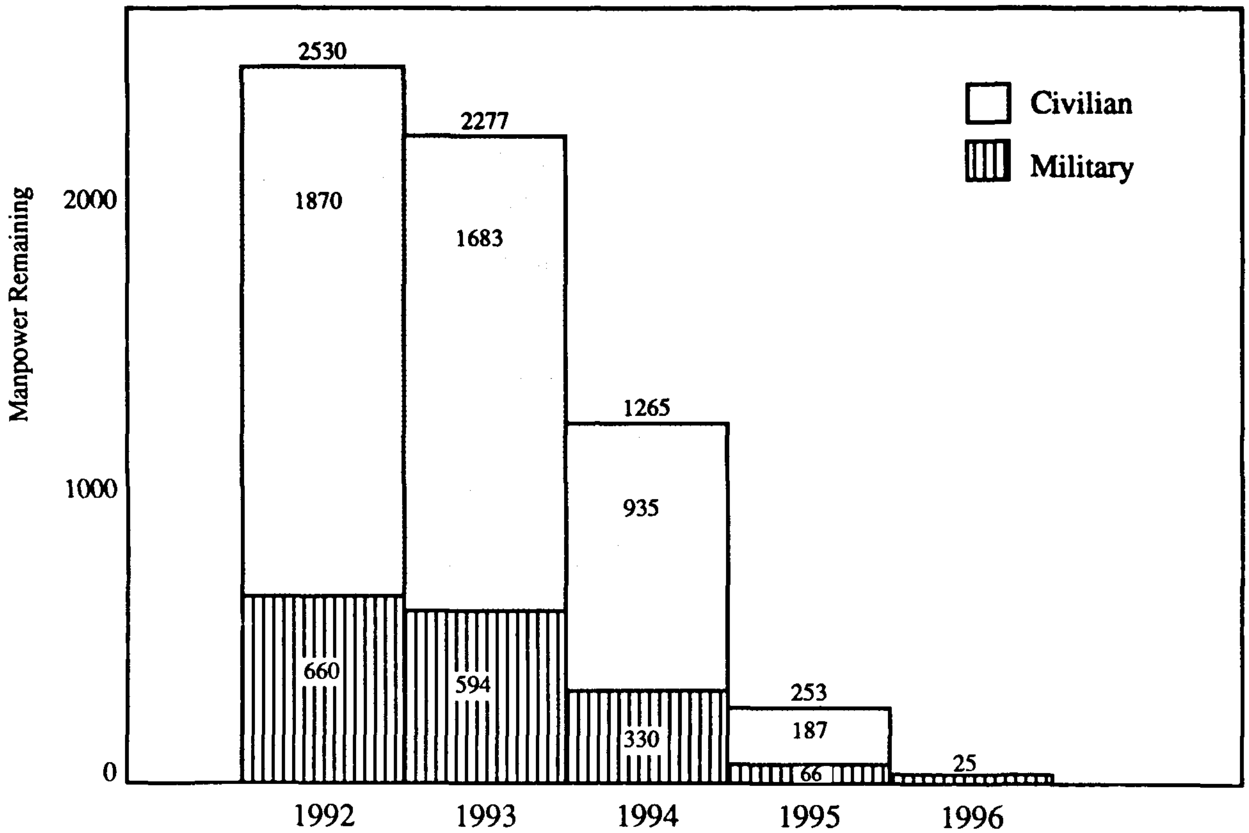

FIGURE 2.2-3 MANPOWER DRAWDOWN SCHEDULE FOR BALLISTIC MISSILE ORGANIZATION, SAN BERNARDINO - PROPOSED ACTION AND ALTERNATIVE 3

- Relocation of SSD-LA including the Space and "Other" SPOs and supporting tenant units to one of the following installations:

  - Vandenberg AFB, California;
  - March AFB, California;
  - Peterson or Falcon AFBs, Colorado; and
  - Kirtland AFB, New Mexico.

- Inactivation of the remainder of SSD support units currently at Los Angeles that duplicate those already in place at the receiving locations, including the 6592nd Air Base Group and ' › AFSC Clinic.

- Continuation of current SSD-SB personnel and facilities in San Bernardino, California, including all ICBM SPOs and appropriate support units.

Alternative 1 is contingent upon special legislation that will allow proceeds from real property sales to partially offset MILCON costs at proposed relocation sites. This special legislation could affect public law provisions in place for disposing of public property.

2.3.1.1 Facilities

Base and Facility Closure. The closure of SSD-LA would involve approximately 315 acres of land in the Los Angeles area. Los Angeles AFB has about 3 million square feet of building space including both government and FFRDC facilities. In addition, 574 units of MFH at Fort MacArthur, Pacific Crest, and Pacific Heights are considered part of the base. Facilities identified for closure as part of Alternative 1 are listed in Table 2.3-1.

All of these facilities would be closed under the proposed action. A caretaker team would be established in the event of closure to maintain buildings, grounds, and water supply and utilities, and to provide adequate security until the property is disposed of or reuse begins.

Facility Requirements - Relocation Bases. Relocation of SSD-LA to any one of the four candidate installations would require different levels of military construction for technical facilities, BOS facilities, and expansion of existing utilities and infrastructure. Requirements at each base were determined by the availability of existing structures suitable for SSD program activities, and the capacity of current BOS, infrastructure, and utility systems. Additionally, the construction of MFH would be required at some of the potential relocation bases.

Technical facility space requirements for total relocation of SSD-LA activities include 1,093,000 square feet of administrative space, 170,000 square feet of laboratory, 497,000 square feet of SCIF, and 380,000 square feet of other space. Construction requirements for these facilities, BOS, and MFH are presented in Table 2.2-2.

2.3.1.2 Employment

Employment at Closure Locations. The closure of SSD-LA would involve approximately 8,145 military and civilian employees located at Los Angeles AFB. A majority of these personnel would be relocated to the selected relocation site during the transition period between FY 1993 and FY 1996.

The schedule for the drawdown of personnel for Alternative 1 is presented in Figure 2.2-2.

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Table 2.3-1

Facility Closures
Alternative 1

Location	Type	Area (ac)	Quantity
Government Facilities			
Los Angeles AFB			
Area A	Office	41.45	860,509 sq ft
Area B	Office/Support	53.70	467,420 sq ft
Lawndale Annex	Office	13.34	30,000 sq ft
Fort MacArthur	Office/Support Housing[1]	93.00	113,235 sq ft 404 units
Pacific Crest	Housing	22.09	91 units
Pacific Heights	Housing	12.68	79 units
Contractor Facilities			
FFRDC	Office-Own[2] Office-Lease	44.45 32.51	920,291 sq ft 544,608 sq ft

Notes: *Includes 42 housing units under Army control by 1982 agreement.
**Includes labs and SCIFs.

Employment at Relocation Bases. Total relocation of SSD-LA would involve 1,750 military personnel, 1,440 DOD civilian employees, 4,180 FFRDC staff, and 190 SETA contractor personnel. These personnel would be relocated over the 3-year period between FY 1993 and FY 1996. For potential relocation to Vandenberg AFB, Peterson/Falcon AFBs, or Kirtland AFB, it is assumed that approximately 80 percent of all employees would relocate with the remaining 20 percent hired locally. At March AFB, it is estimated that about 60 percent of current personnel would relocate, 20 percent would remain in existing residences in the Los Angeles and San Bernardino area, and 20 percent would be hired locally.

2.3.2 Alternative 2

Alternative 2, which would begin in FY 1993 and be completed by the end of FY 1996, includes the following actions:

- Partial Closure of Los Angeles AFB and its facilities including Areas A and B in El Segundo, FFRDC facilities, the Lawndale Annex in Hawthorne, and military family housing at Fort MacArthur, Pacific Heights, and Pacific Crest in San Pedro.

- Total Closure of BMO and SETA at Norton AFB in San Bernardino, California.

- Relocation of the Space SPOs at SSD-LA and the ICBM SPOs at SSD-SB including supporting tenant units to one of the following installations:

  - Vandenberg AFB, California;
  - March AFB, California;
  - Peterson or Falcon AFBs, Colorado; and
  - Kirtland AFB, New Mexico.

- Continuation of current Space SPOs personnel and facilities at Los Angeles AFB including appropriate support units.

Alternative 2 is contingent upon special legislation that will allow proceeds from real property sales to partially offset MILCON costs at proposed relocation sites. This special legislation could affect public law provisions in place for disposing of public property.

2.3.2.1 Facilities

Base and Facility Closure. The partial closure of SSD-LA and total closure SSD-SB would involve approximately 145 acres in the Los Angeles area and nearly 70 acres in San Bernardino. The partial closure of Los Angeles AFB would involve about 1.4 million square feet of government facilities, including the Lawndale Annex and most of Area A. Building 130, located in Area A, would continue in use in support of SSD-LA activities remaining at Los Angeles AFB. MFH including 170 units at Pacific Crest and Pacific Heights would be included in the closure, while the housing at Fort MacArthur would remain part of the active base.

Following the closure of Norton AFB, SSD-SB operations will be located in two facility groups on approximately 70 acres on and adjacent to the existing base. These facility groups include approximately 600,000 square feet of building space.

Facilities that would be closed under Alternative 2 at Los Angeles AFB and BMO in San Bernardino are listed in Table 2.3-2.

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Table 2.3-2

Facility Closures
Alternative 2

Location	Type	Area (ac)	Quantity
Government Facilities			
Los Angeles AFB			
Area A	Office	41.45	860,509 sq ft
Lawndale Annex	Office	13.34	30,000 sq ft
Pacific Crest	Housing	22.09	91 units
Pacific Heights	Housing	12.68	79 units
SSD-SB			
BMO 95X Complex	Office	34.00	252,925 sq ft
BMO 95X Complex Expansion	Office	36.00	341,383 sq ft
Contractor Facilities			
FFRDC	Office-Lease	32.51	544,608 sq ft
SETA	Office-Lease	1.3	28,500 sq ft

All of these facilities would be closed under Alternative 2. A caretaker team would be established in the event of closure to maintain buildings, grounds, and water supply and utilities, and to provide adequate security until the property is sold or excessed by the Air Force.

Facility Requirements - Relocation Bases. Relocation of a portion of SSD-LA and all SSD-SB to any one of the four candidate installations would require different levels of military construction for technical facilities, BOS facilities, and expansion of existing utilities and infrastructure. Requirements at each base were determined by the availability of existing structures suitable for SSD program activities, and the capacity of current BOS, infrastructure, and utility systems. Additionally, the construction of MFH would be required at some of the potential relocation bases.

Technical facility space requirements for partial relocation of SSD-LA and total relocation of SSD-SB activities include 1,395,000 square feet of administrative space, 130,000 square feet of SCIF, and 210,000 square feet of other space. Construction requirements for these facilities, BOS, and MFH are summarized in Table 2.2-2.

2.3.2.2 Employment

Employment at Closure Locations. Alternative 2 would involve approximately 5,240 military and civilian employees located at SSD-LA and additional 2,530 military and civilian personnel at SSD-SB. A majority of these personnel would be relocated to the selected relocation site during the transition period between FY 1993 and FY 1996.

The schedule for the drawdown of personnel at Los Angeles AFB for Alternative 2 is presented in Figure 2.2-4. The drawdown schedule for Alternative 2 at SSD-SB is the same as presented in Figure 2.2-3 for the proposed action.

Employment at Relocation Bases. Alternative 2 would require moving 1,830 military personnel, 1,810 DOD civilian employees, 2,590 FFRDC staff, and 1,390 SETA contractor personnel. These personnel would be relocated over the 3-year period between FY 1993 and FY 1996. For potential relocation to Vandenberg AFB, Peterson/Falcon AFBs, or Kirtland AFB, it is assumed that approximately 80 percent of all employees would relocate with the remaining 20 percent hired locally. At March AFB, it is estimated that about 60 percent of current personnel would relocate, 20 percent would remain in existing residences in the Los Angeles and San Bernardino area, and 20 percent would be hired locally.

2.3.3 Alternative 3

Alternative 3, which would begin in FY 1993 and be completed by the end of FY 1996, includes the following actions:

- Total Closure of Ballistic Missile Organization facilities at Norton AFB in San Bernardino, California.

- Relocation of SSD-SB including supporting tenant units to one of the following installations:

  - Vandenberg AFB, California;
  - March AFB, California;
  - Peterson or Falcon AFBs, Colorado; and
  - Kirtland AFB, New Mexico.

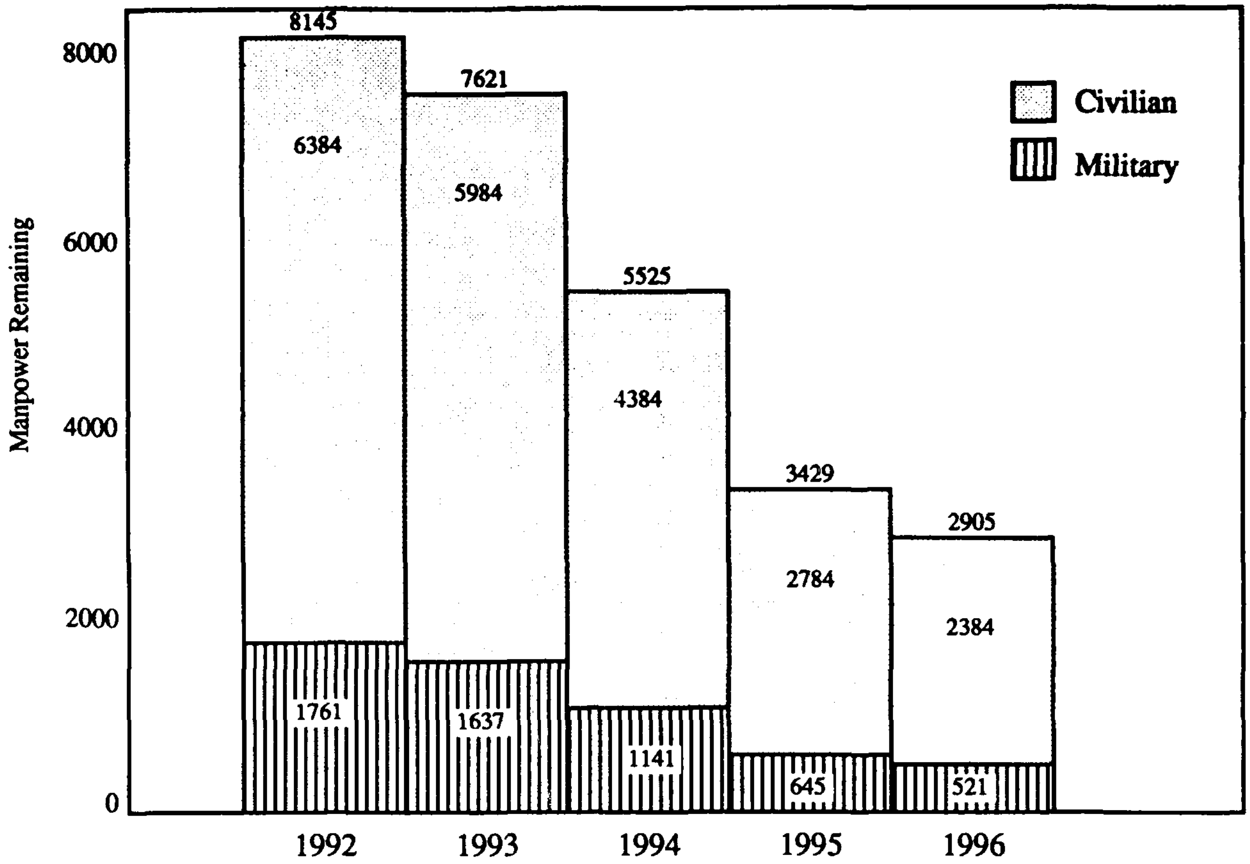

FIGURE 2.2-4 MANPOWER DRAWDOWN SCHEDULE FOR LOS ANGELES AFB - ALTERNATIVE 2

- Continuation of all personnel and facilities at Los Angeles AFB including the Space and "Other" SPOs and appropriate support units.

2.3.3.1 Facilities

Base and Facility Closure. The closure SSD-SB would involve approximately 70 acres in San Bernardino. Following the closure of Norton AFB, SSD-SB would occupy two facility groups for BMO operations located on and adjacent to the existing base. These two facilities include approximately 600,000 square feet of building space.

Current facilities at BMO in San Bernardino included in Alternative 3 are listed in Table 2.3-3.

Table 2.3-3

Facility Closures
Alternative 3

Location	Type	Area (ac)	Quantity
<u>Government Facilities</u>			
SSD-SB			
BMO 95X Complex	Office	34.00	252,925 sq ft
BMO 5X8 Complex	Office	36.00	341,383 sq ft

Both of these facilities would be closed under Alternative 3. A caretaker team would be established in the event of closure to maintain buildings, grounds, and water supply and utilities, and to provide adequate security until the property is sold or excessed by the Air Force.

Facility Requirements - Relocation Bases. Relocation of SSD-SB to any one of the four candidate installations would require different levels of military construction for technical facilities, BOS facilities, and expansion of existing utilities and infrastructure. Requirements at each base were determined by the availability of existing structures suitable for SSD program activities, and the capacity of current BOS, infrastructure, and utility systems. Additionally, the construction of MFH would be required at some of the potential relocation bases.

Technical facility space requirements for relocation of SSD-SB activities include 335,000 square feet of administrative space, 40,000 square feet of SCIF, and 70,000 square feet of other space. Construction requirements for these facilities, BOS, and MFH are presented in Table 2.2-2.

2.3.3.2 Employment

Employment at Closure Locations. Alternative 3 would involve approximately 2,530 military and civilian employees located at SSD-SB. A majority of these personnel would be relocated to the selected relocation site during the transition period between FY 1993 and FY 1996.

The schedule for the drawdown of personnel at SSD-SB for Alternative 3 is the same as presented in Figure 2.2-3 for the proposed action.

Employment at Relocation Bases. **Relocation of SSD-SB would require moving 660 military personnel, 571 DOD civilian employees, and 1,300 SETA contractor personnel. These personnel would be relocated over the 3-year period between FY 1993 and FY 1996. For potential relocation to Vandenberg AFB, Peterson/Falcon AFBs, or Kirtland AFB, it is assumed that approximately 80 percent of all employees would relocate with the remaining 20 percent hired locally. At March AFB, it is estimated that about 15 percent of current personnel would relocate, 65 percent would remain in existing residences in the Los Angeles and San Bernardino area, and 20 percent would be hired locally.**

2.3.4 Alternative 4

Organizational structure and manpower requirements within the Air Force are currently undergoing change as previously discussed in Section 1.1. Consequently, organizational changes may occur within SSD which, at the publication of this Draft EIS, are not yet foreseen. Alternative 4 is provided to give the decision makers the flexibility to respond to these unforeseen changes. Unlike the other alternatives, Alternative 4 does not represent a specific organizational group, but is instead a generalized representation of the current personnel structure SSD at Los Angeles AFB.

Alternative 4, which would begin in FY 1993 and be completed by the end of FY 1996, includes the following actions:

- Relocation of 1,000 personnel from SSD-LA to one of the following installations:

  - Vandenberg AFB, California;
  - March AFB, California;
  - Peterson or Falcon AFBs, Colorado; and
  - Kirtland AFB, New Mexico.

- Continuation of current organizations and facilities at Los Angeles AFB and BMO San Bernardino including appropriate support units.

2.3.4.1 Facilities

Base and Facility Closure. Alternative 4 would not involve the closure of any facilities.

Facility Requirements - Relocation Bases. Relocation of 1,000 personnel from SSD-LA to any one of the four candidate installations would require different levels of military construction for technical facilities, BOS facilities, and expansion of existing utilities and infrastructure. Requirements at each base were determined by the availability of existing structures suitable for SSD program activities, and the capacity of current BOS, infrastructure, and utility systems. Additionally, the construction of MFH would be required at some of the potential relocation bases.

Technical facility space requirements for Alternative 4 include 335,000 square feet of administrative space, 40,000 square feet of SCIF, and 70,000 square feet of other space. Construction requirements for these facilities, BOS, and MFH are presented in Table 2.2-2.

2.3.4.2 Employment

Employment at Closure Locations. Alternative 4 would involve approximately 1,000 military and civilian employees located at SSD-LA. A majority of these personnel would be relocated to the selected relocation site during the transition period between FY 1993 and FY 1996.

The schedule for the drawdown of personnel for Alternative 4 is presented in Figure 2.2-5.

Employment at Relocation Bases. Relocation of 1,000 personnel from SSD-LA would require moving approximately 250 military personnel, 250 DOD civilian employees, and 500 contractor personnel. These personnel would be relocated over the 3-year period between FY 1993 and FY 1996. For potential relocation to Vandenberg AFB, Peterson/Falcon AFBs, or Kirtland AFB, it is assumed that approximately 80 percent of all employees would relocate with the remaining 20 percent hired locally. At March AFB, it is estimated that about 60 percent of current personnel would relocate, 20 percent would remain in existing residences in the Los Angeles and San Bernardino area, and 20 percent would be hired locally.

2.4 FACILITY SITING OPTIONS

To evaluate the potential environmental impacts resulting from the development and operations of HQ SSD activities at each of the candidate bases, a number of specific site options for HQ SSD facilities have been identified at each base including Vandenberg AFB, March AFB, Peterson/Falcon AFBs, and Kirtland AFB. These sites were determined through field investigations which assessed a number of siting criteria including existing facility availability, site conditions, accessibility, environmental constraints, and total capacity. At each candidate base, sufficient land area was identified to accommodate the total relocation of SSD-LA and SSD-SB (10,000 personnel) described by the proposed action, either in a single contiguous area or among several separate sites. These same sites were also considered for partial relocation of SSD operations described by the alternative actions. A description of the sites selected for each candidate base is presented in this section.

2.4.1 Vandenberg Air Force Base, California

Three siting alternatives were evaluated for the relocation of SSD operations to Vandenberg AFB (Figures 2.4.1-1 and 2.4.1-2). Site 1 would accommodate the entire proposed action as well as partial relocation alternatives. Site 2 would also accommodate the entire proposed action as well as alternatives. Site 3 would not be sufficient for the entire proposed action, but could accommodate the partial relocation Alternatives 3 and 4. Two potential siting alternatives for MFH were also identified.

2.4.1.1 Site 1

Site Location and Conditions. Site 1 is bounded by Nebraska and Washington Avenues to the northeast, South Dakota Road to the northwest, and Alaska Way to the southeast. This site consists of approximately 116 acres. The combined acreage in the total site is approximately 116 acres.

The land is generally flat and slopes gently to the southwest. Elevations range from 475 feet mean sea level (MSL) along Nebraska Avenue to 428 feet MSL along Ocean View Avenue. One-third of the site is developed, largely with a series of wooden barracks dating back to World War II. There are a few trees on the site's periphery. In addition, three baseball fields are along the periphery.

Adjacent Land Uses. Building 12000, the Integrated Test Facility, is adjacent to this site. A sizable unaccompanied housing area is northeast across Nebraska Avenue. The Vandenberg Community Center, housing Morale, Welfare, and Recreation (MWR) facilities, is south-southeast across Alaska Way.

Accessibility. The main gate is the Santa Maria Gate and provides easy access via California Boulevard and Oregon Avenue. There is direct access onto the site from both Nebraska and Washington Avenues.

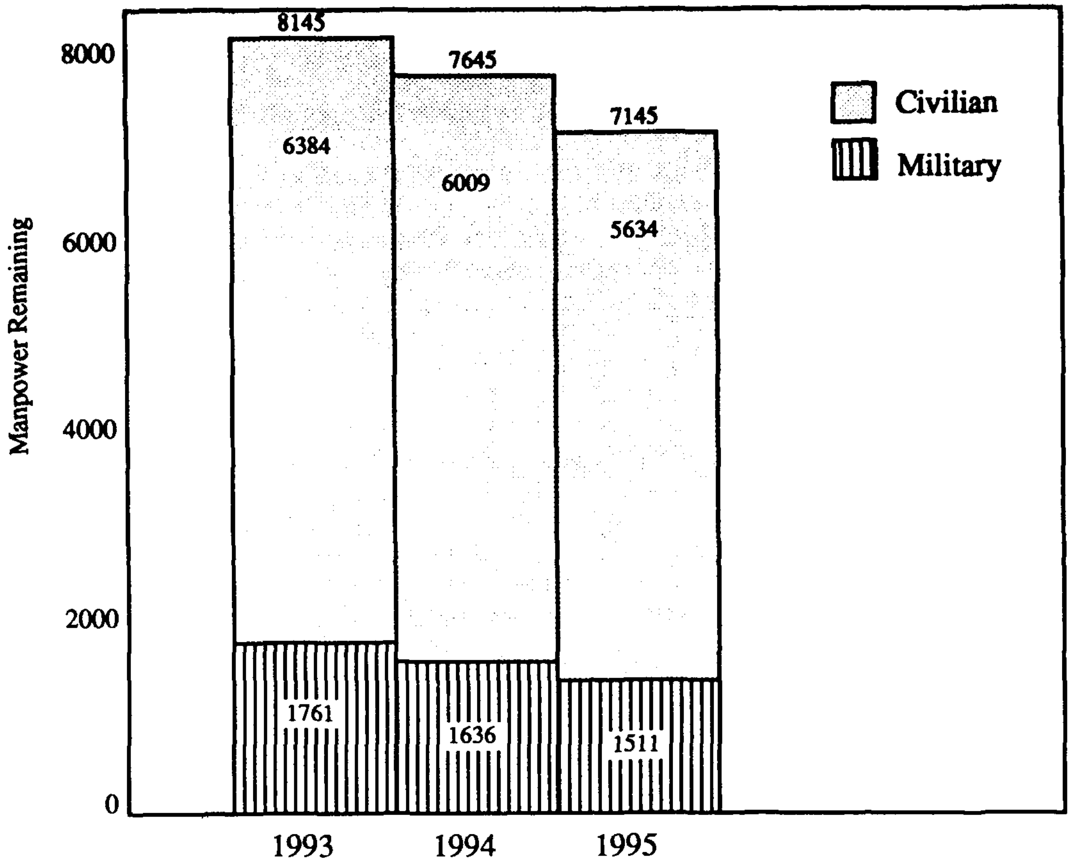

FIGURE 2.2-5 MANPOWER DRAWDOWN SCHEDULE FOR LOS ANGELES AFB - ALTERNATIVE 4

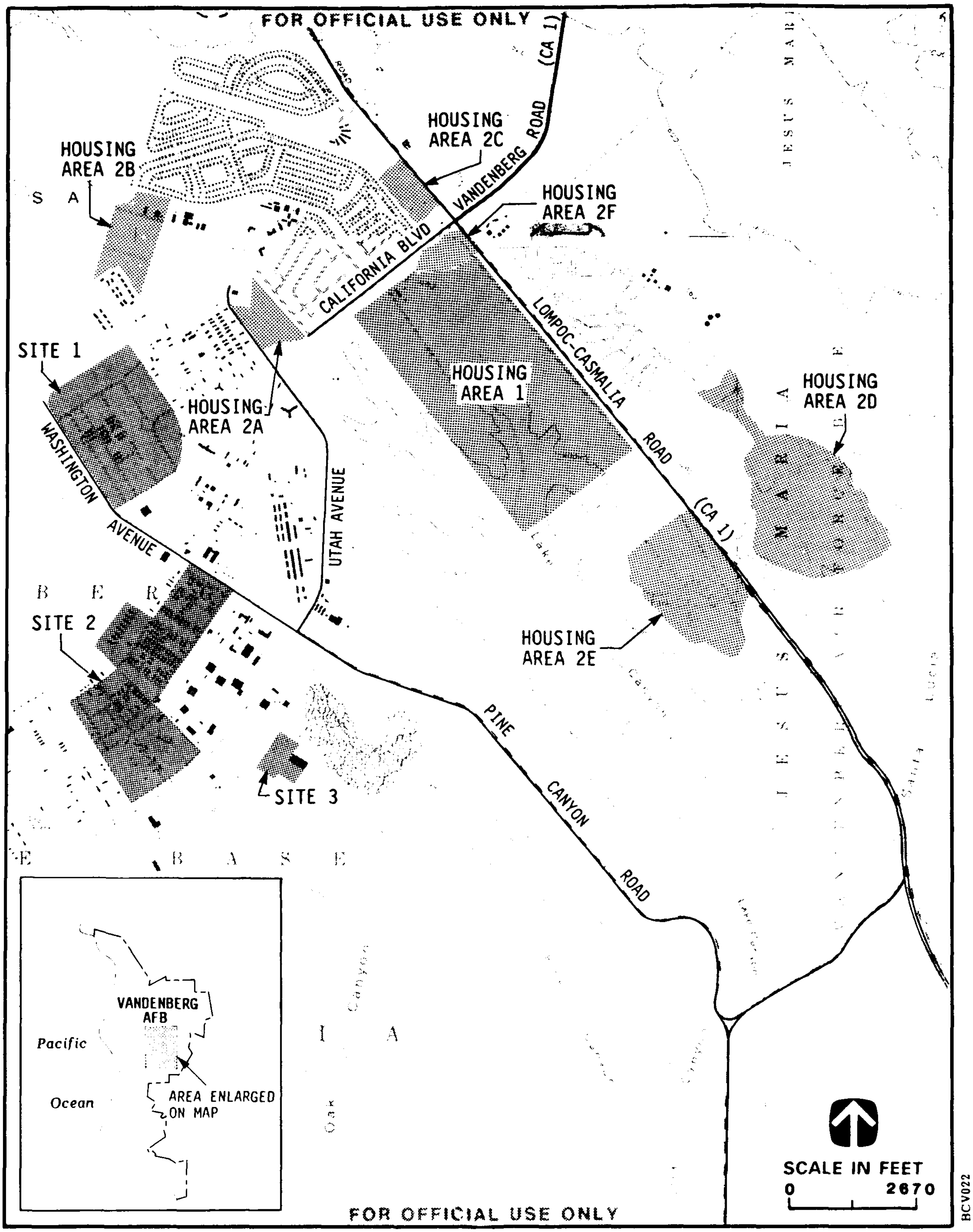

FIGURE 2.4.1-1 PROPOSED SITES AND HOUSING AREAS AT VANDENBERG AFB, CALIFORNIA

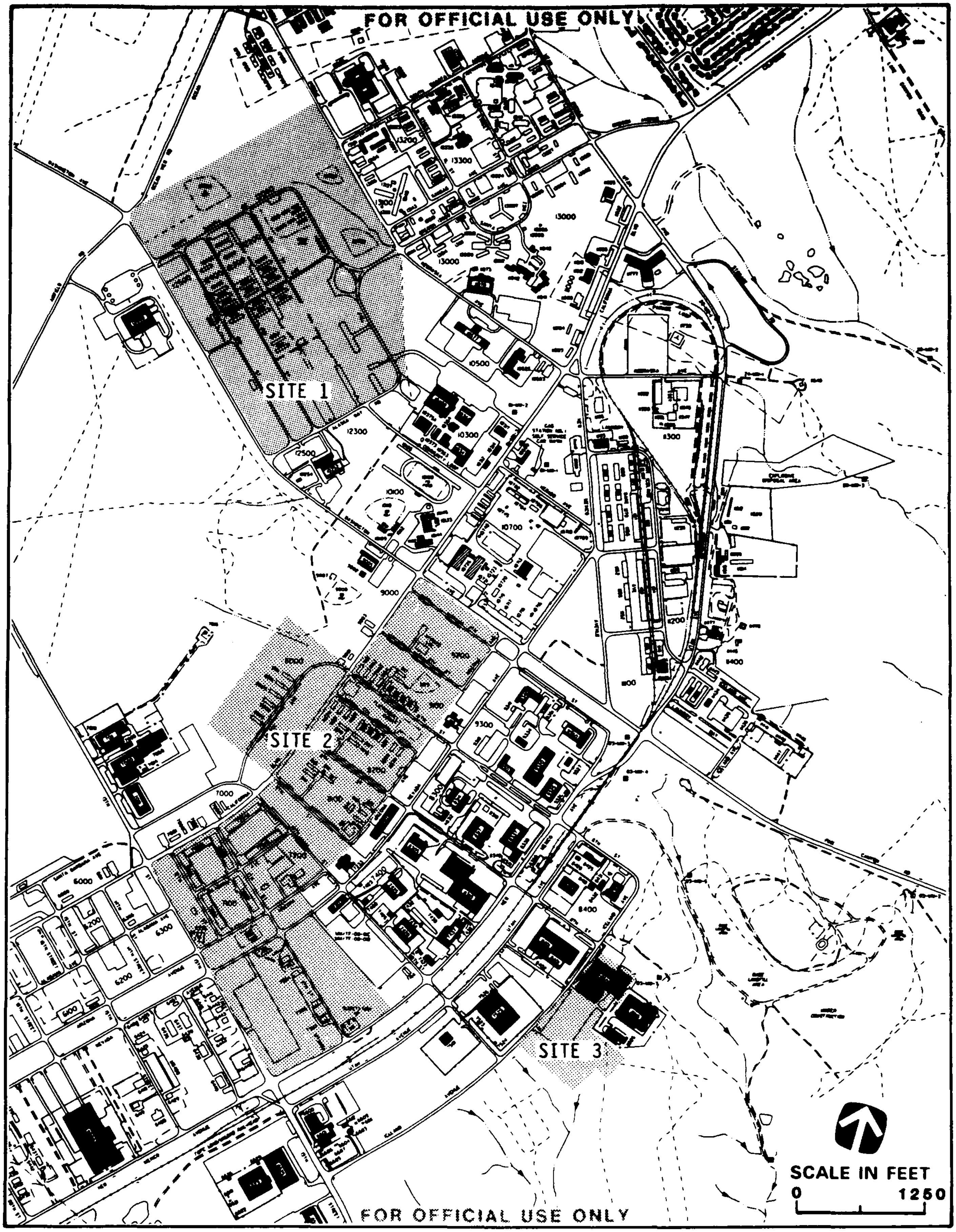

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FIGURE 2.4.1-2 PROPOSED SITES 1, 2, AND 3 AT VANDENBERG AFB, CALIFORNIA

Environmental Constraints. There are no environmental constraints that would preclude the development of this site.

2.4.1.2 Site 2

Site Location and Site Conditions. This site encompasses a total of 152 acres, and is bounded by California Boulevard to the northwest, 13th Street to the southwest, Arizona Avenue to the southeast, and Washington Avenue to the northeast. Currently, this area is largely unoccupied. Several side streets off California Boulevard have been vacated. The Base Comprehensive Plan identifies this as an approved site for administrative offices.

The site terrain is relatively flat, and ground elevations range mostly from 435 to 450 feet MSL. There is little vegetation along California Boulevard.

Adjacent Land Uses. Industrial facilities are to the southwest and northwest. Across California Boulevard is the Western Space and Missile Center. World War II-ear wooden structures front on Lompoc Avenue due west of the site, and the Physical Fitness Center stands at the intersection of California Boulevard and Washington Avenue due north of the site.

Accessibility. The site is bounded by three of Vandenberg AFB's major thoroughfares: California Boulevard, Washington Avenue, and 13th Street, making it accessible from the Main Gate and all parts of the main base. Direct access is primarily from California Boulevard and Arizona Avenue.

Environmental Constraints. There are no environmental constraints that would preclude the development of this site.

2.4.2.3 Site 3

Site Location and Site Conditions. This site includes 20 acres which comprise Building 8500, its offstreet parking lot, and adjacent lands along Iceland Avenue. Buildings 8510 and 8505, immediately southwest of Building 8500, are to remain intact. Building 8500 is available for reuse by HQ SSD. This particular building contains 123,500 square feet and the proposed new building on this site is to contain 86,750 square feet for a combined total of 209,750 square feet.

Adjacent Land Uses. Building 8500 is surrounded by Building 8510 and 8505 to the southeast, and Base Sanitary Landfill No. 5 to the northeast, Building 8401 to the northwest, and its offstreet parking lot to the southwest.

Accessibility. This site is on the western edge of the Vandenberg AFB main base area. Iceland Avenue, a collector road, provides direct access, and Washington Avenue and 13th Street are major arterials that feed into Iceland Avenue.

Environmental Constraints. Most of the land adjacent to Building 8500 has been designated as environmentally constrained in the Base Comprehensive Plan because of the numerous arroyos and Burton Mesa chaparral in this vicinity. This includes the area immediately to the south of Building 8500. The Base Sanitary Landfill, which was used from the 1940s to 1978, and Landfill 2 (Oak Canyon), which was used from 1978 to the present, also restrict development to the west and northwest.

2.4.1.4 Potential Military Family Housing Sites

Site 1

Site Location and Site Conditions. Site 1 is a 345-acre site bounded by Lompoc-Casmalia Road on the east and California Boulevard on the north.

Adjacent Land Uses. Land uses surrounding MFH Site 1 are primarily residential and open space.

Accessibility. Access to Site 1 would be through the Santa Maria Gate on Lompoc Casmalia Road and California Avenue.

Environmental Constraints. The existence of undisturbed areas of Burton Mesa chaparral, including potentially protected species would restrict the use of this site.

Site 2

Site Location and Site Conditions. Site 2 of the proposed action consists of six discontiguous areas surrounding MFH Site 1, which cumulatively equal about 320 acres.

Site 2A consists of an 18-acre vacant parcel which abuts the existing accompanied and unaccompanied housing areas.

Site 2B is a 34-acre parcel with a setting similar to site 2A. The site is occupied by some recreational facilities and is planned for recreation and community (service and commercial) uses. The site also abuts accompanied and unaccompanied housing.

Site 2C is a 22-acre parcel abutting existing accompanied housing. The land is set back from the Santa Maria Gate entrance on land designated for future accompanied housing. The site is adjacent to the Lompoc-Casmalia Road similar to Site 1.

Site 2D is a 115-acre site east of State Highway 1. The site abuts the existing accompanied housing to the north.

Site 2E is a 99-acre site which is an expansion of the Canyon Lake Mobile Home Park and abuts State Highway 1.

Site 2F is a 32-acre site abutting the Santa Maria Gate Entrance and Parade of the Flags along California Boulevard.

Adjacent Land Uses. Land uses surrounding MFH Site 1 are primarily residential and open space.

Accessibility. Access to Site 1 would be through the Santa Maria Gate on Lompoc Casmalia Road and California Avenue

Environmental Constraints. The existence of undisturbed areas of Burton Mesa chaparral, including potentially protected species, would restrict the use of this site.

2.4.2 March Air Force Base, California

Three siting options were evaluated for the relocation of SSD operations to March AFB (Figure 2.4.2-1). Site 1 and Site 2 would accommodate the entire proposed action as well as partial relocation alternatives. Site 3 would be applicable only for Alternatives 3 and 4. In addition, a proposed site for MFH was also identified and evaluated (Figure 2.4.2-1).

2.4.2.1 Site 1

Site Location and Site Conditions. The 636-acre area contains a series of ammunition storage bunkers, many of which are presently inactive. If Site 1 were selected for SSD, this weapons storage area would be removed. A small demolition range is in the vicinity. The site ranges in elevation from 1,600 feet MSL at its northernmost point to 1,777 feet MSL on one of its several knolls. One-half of the total acreage within Site 1 consists of steep slopes greater than 10 percent. Good views exist to the northeast, north, northwest, west, and south. Conversely, this site enjoys high visibility from all surrounding areas, both offbase and onbase.

Adjacent Land Uses. Immediately south of this site is the 1,514-acre Orange Crest development. This planned community is partially developed, and further development is in progress. The plan for this development includes 4,487 residential units, 52 acres of commercial land, 15 acres of offices, and 207 acres of industrial land. The 207 acres planned for light industrial development are immediately south of Site 1. To the northwest and west, at some distance, are a series of single-family residential subdivisions; immediately west is the Alessandro Heights Specific Plan area, which is a planned industrial development. Due north is largely vacant land except for a trailer park, a small number of single-family homes between the base perimeter and Alessandro Avenue, and a water filtration plant of the Metropolitan Water District of Southern California, Due east is vacant base property, including the northern end of the Camp Haan area.

Accessibility. Cactus Avenue is the one paved road providing direct access to this site. This roadway provides a direct link east to Interstate 215 where an upgraded interchange is scheduled to be built. Arnold Avenue, which intersects Cactus Avenue west of Interstate 215, provides access south to the Arnold Heights MFH area, the HQ 5th Air Force, a proposed third-party-financed MFH area, the Air Force Village retirement community, and the base golf course.

Environmental Constraints. A kangaroo rat habitat corridor prevents development of 34 percent of the total site; this leaves some 418 acres potentially available for development.

A 65 (L_{dn}) noise contour traverses the middle of this site, and a 70 L_{dn} noise contour skirts the northeast edge of the site.

2.4.2.2 Site 2

Site Location and Site Conditions. Site 2 includes part of the Camp Haan and all of the Arnold Heights housing areas for a total of 153 acres. The Arnold Heights housing area contains 58 MFH housing units and an elementary school. This housing area is to be vacated as new housing is constructed in a nearby third-party-financed MFH area. Use of this site would require demolition of the vacated housing units. The Camp Haan area is vacant land with numerous foundations remaining from the World War II-era structures that previously were sited there.

Adjacent Land Use. Immediately to the east is the Interstate 215 corridor. Due south is the Riverside National Cemetery and the base golf course. Due west is vacant land along both sides of Plummer Avenue and due north is the vacant Camp Haan area.

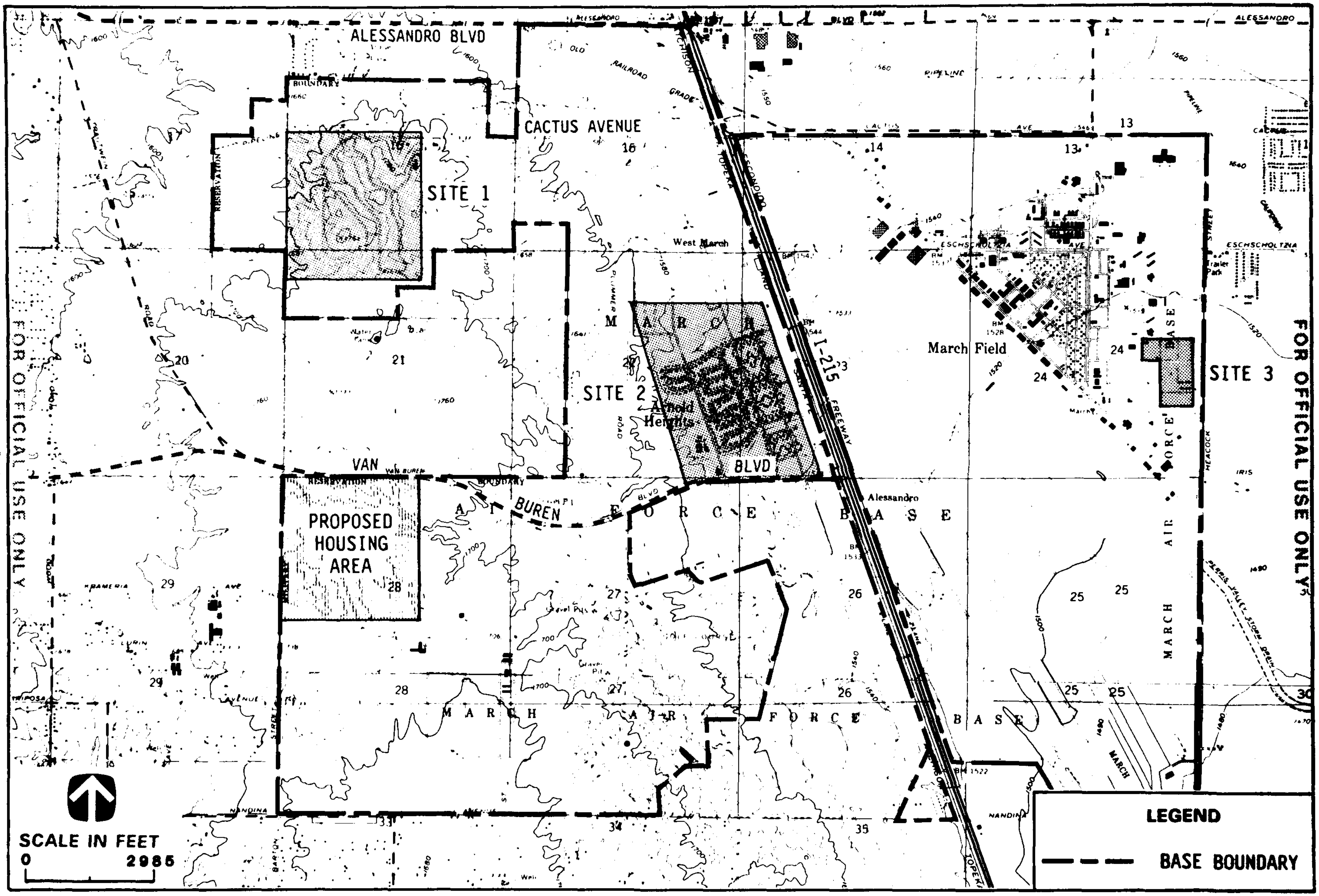

FIGURE 2.4.2-1 PROPOSED SITES AND HOUSING AREA AT MARCH AFB, CALIFORNIA

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Accessibility. Primary access to the site would be via Van Buren Avenue from the south and via Interstate 215, Cactus Avenue, and Arnold Drive from the north.

Environmental Constraints. There are no Installation Restoration Program (IRP) sites within the Arnold Heights MFH area. It is possible that underground storage tanks exist within the Camp Haan area.

All of Site 2 falls between the 70 and 80 L_{dn} noise contours. The kangaroo rat habitat corridor precludes most of the acreage between Plummer Avenue and the western edge of the Arnold Heights housing area from development.

2.4.2.3 Site 3

Site Location and Site Conditions. Site 3 is a 45-acre parcel on the main base area of March AFB east of the flightline (Figure 2.4.2-2). The area is currently developed for recreational uses including softball fields and a riding club. The size of Site 3 would restrict its use to Alternatives 3 and 4.

Adjacent Land Use. Adjacent land uses include the base library, the Air Force Southwest Air Defense Sector Operations Control Center, the KC-10 Training Area, and the U.S. Customs building.

Accessibility. Access to Site 3 would be via Graeber Street from the West Gate, Riverside drive from the Main Gate, and Meyer and Riverside Drives from the East Gate. An unpaved road on the east boundary of the site could be improved to provide more direct access. It would also be possible to provide direct access to the site by opening an additional gate to Heacock Avenue.

Environmental Constraints. The land adjacent to the eastern boundary of Site 3 is an abandoned landfill that may restrict the development of this area. In addition, a 65 L_{dn} contour parallel to the flightline runs diagonally through the center of the site.

2.4.2.4 Military Family Housing Site

The MFH requirement at March AFB is 1,450 units, which will require 180 acres. The land area northwest, west, and south of the HQ 5th Air Force facility has been identified as the best location for this MFH development. The entire southwestern portion of March AFB is emerging as a predominantly residential area. The adjacent uses are either single-family residential or citrus orchards that are likely to be developed for residential use in the future.

2.4.3 Peterson/Falcon Air Force Bases, Colorado

Four siting alternatives were evaluated for the relocation of HQ SSD operations to Peterson/Falcon AFBs. Site 1 (Figure 2.4.3-1) is immediately east of the north-south runway of the Colorado Springs Municipal Airport and could accommodate the entire proposed action. This area is currently part of the lease area available for base development. Partial relocation alternatives could be developed on this site.

Site 2 includes portions of Site 1 and 3 (Figure 2.4.3-1). This area would accommodate the proposed action and all of the alternative actions. Site 2 is especially applicable if government facilities are located onbase, with contractor facilities located on private property.

Site 3 would locate all HQ SSD facilities on offbase property east of Marksheffel Road (Figure 2.4.3-1). This site would accommodate the proposed action and alternatives.

Site 4 (Figure 2.4.3-2) is adjacent Falcon AFB. This site could accommodate the proposed action and alternatives.

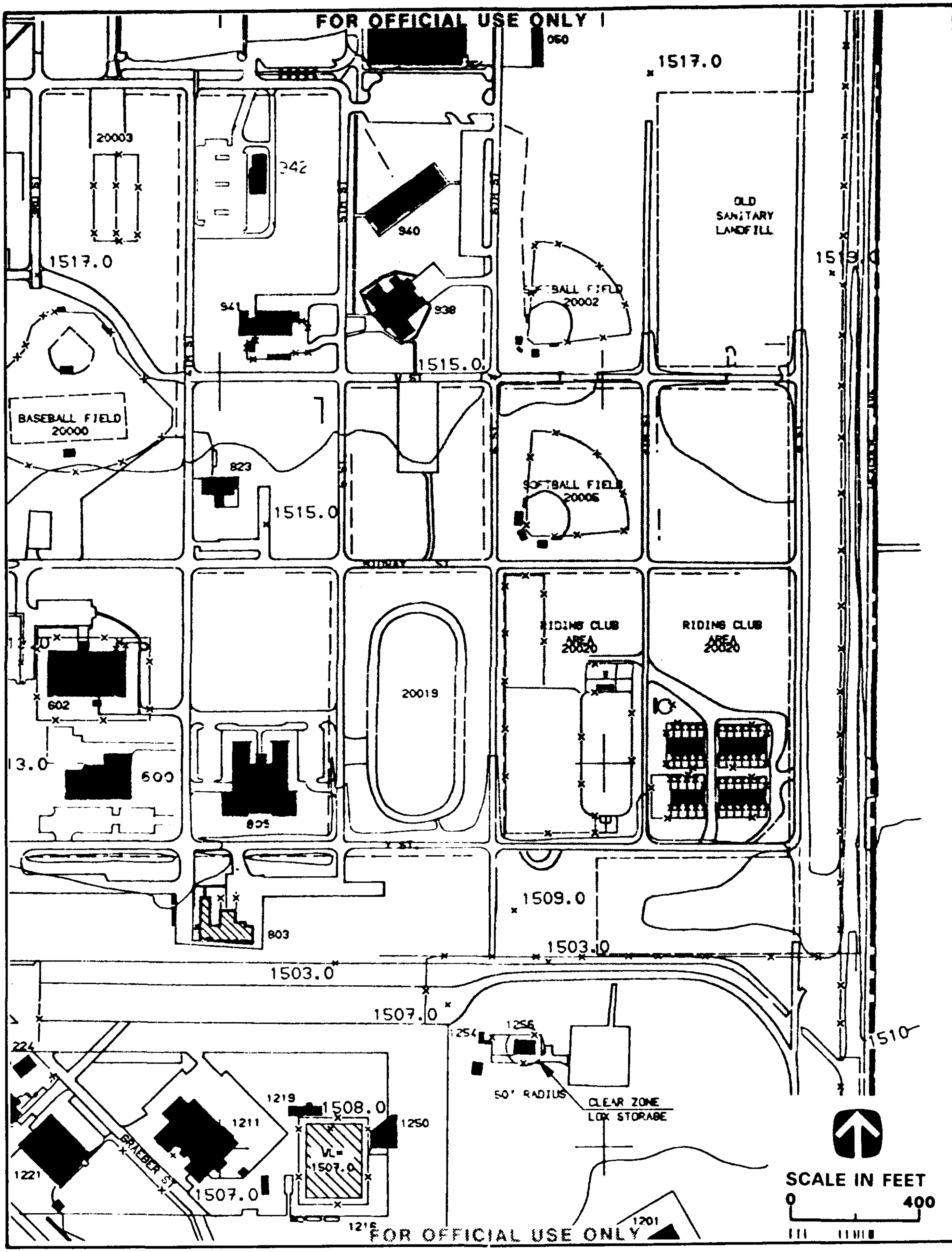

FIGURE 2.4.2-2 PROPOSED SITE 3 AT MARCH AFB, CALIFORNIA

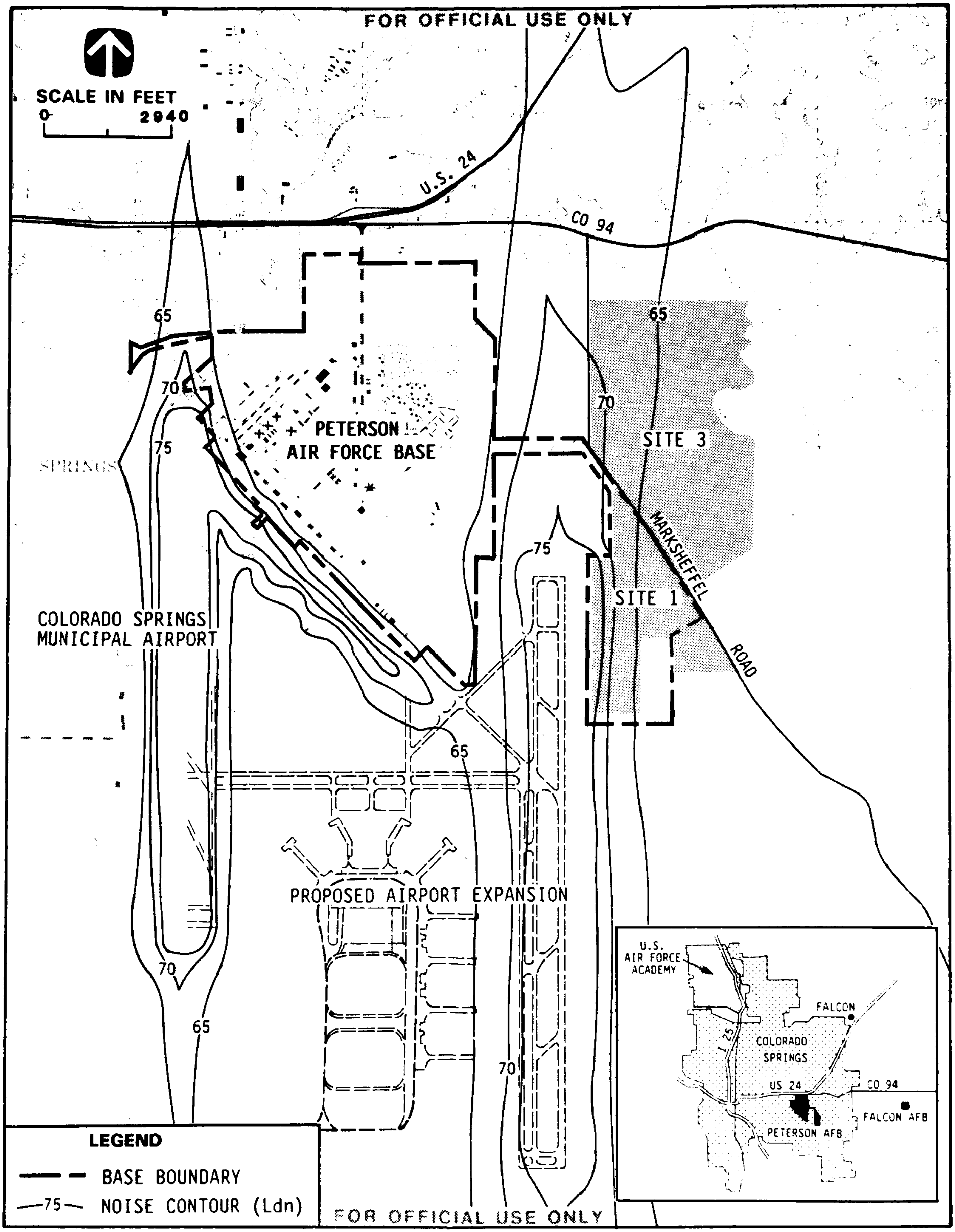

FIGURE 2.4.3-1 PROPOSED SITE 1 AND 3 AT PETERSON AFB, COLORADO

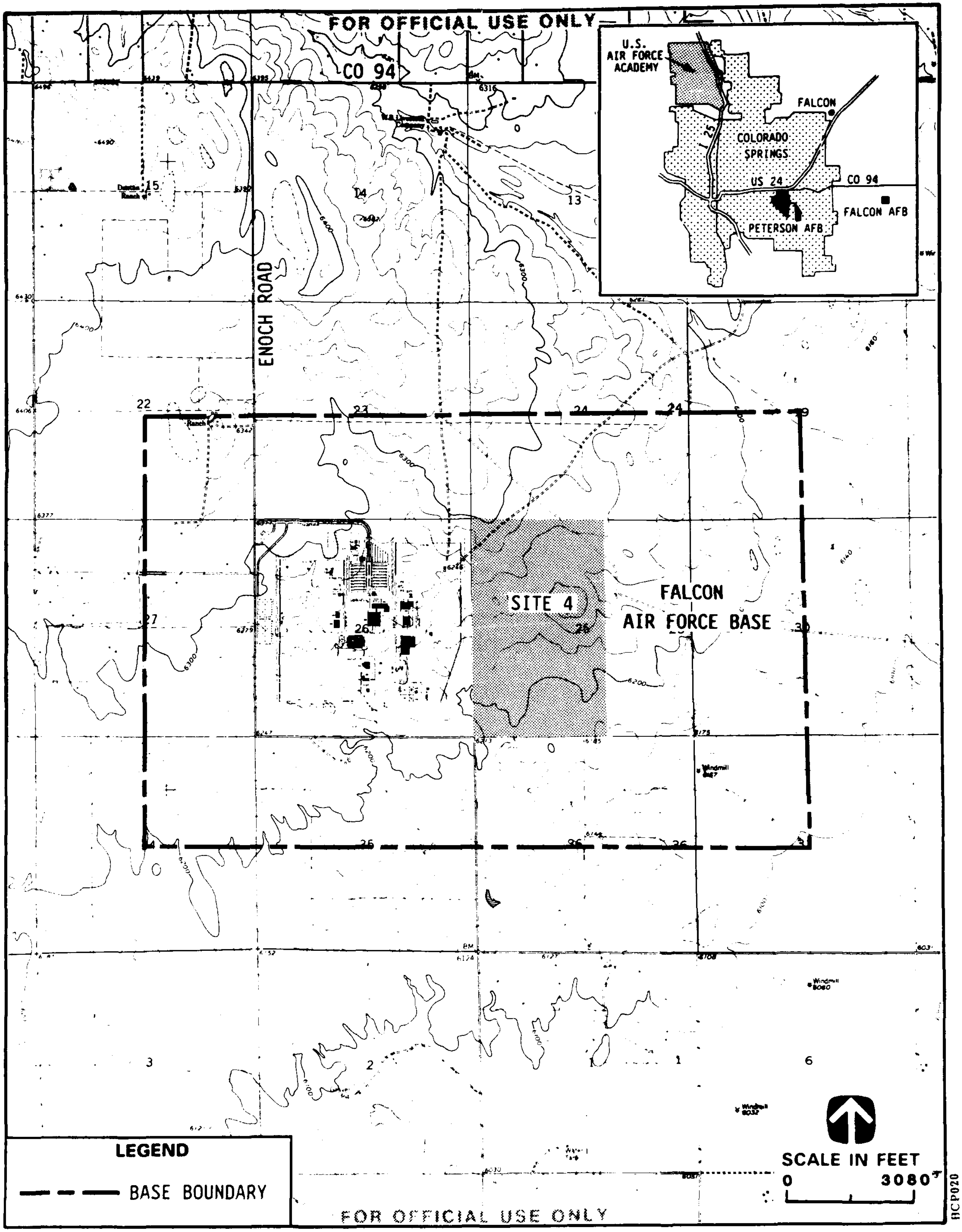

FIGURE 2.4.3-2 PROPOSED SITE 4 AT FALCON AFB, COLORADO

2.4.3.1 Site 1

Site Location and Site Conditions. Site 1 encompasses 122 acres currently held by Peterson AFB under a Lease Amendment and half of the northern portion of a tract held by Peterson AFB under a Lease Option. The terrain is moderate with slopes falling in both the 0 to 4 and 4 to 8 percent categories.

Adjacent Land Uses. Immediately to the west of this site is the north-south runway of the Colorado Springs Municipal Airport. Immediately south of the Lease Option property is the Colorado Center development (a 4,086-acre, mixed-use development which is to contain 1,133 acres of residential development and 1,729 acres of commercial, office, and industrial development). Immediately to the east of this site and Marksheffel Road is the 21,325-acre Banning-Lewis Ranch planned community which extends from Drennan Road on the south to Wooden Road (some 13 miles north) and from Peterson AFB on the west for about 4 miles to the east. Finally, to the north of this site is vacant rangeland, a dairy farm facility, and an abandoned racetrack.

Accessibility. Primary access to the site would be via Colorado Highway 94 and Marksheffel Road. Secondary access to the site would be via Drennan Road once this roadway is improved. Over the long term, Powers Boulevard, Bradley Road/Marksheffel Road, and the Banning-Lewis Parkway will provide access to this site assuming that both the Colorado Center and Banning-Lewis Ranch developments are constructed.

Environmental Constraints. Certain constraints would result from the construction of the north-south runway. First, the Clear Zone preempts certain acreage on the northwest side of the site. Secondly, the 1,000 feet of lateral clearance from the runway centerline preempts the first 50 feet along the western edge of Site 1. The far eastern edge of the Lease Amendment landholding is below the L_{dn} 65 noise contour.

2.4.3.2 Site 2

Site Location and Site Condition. Site 2 encompasses approximately 220 acres and is located on the northeast half of the Lease Amendment landholding and on private land directly across Marksheffel Road to the northeast. This private land is part of the Banning-Lewis Ranch. The terrain is moderate with slopes in both the 0 to 4 and 4 to 8 percent categories.

Adjacent Land Uses. Immediately to the west of this site is the north-south runway of the Colorado Springs Municipal Airport. Immediately south is the 100-acre Peterson AFB Lease Option property and the Colorado Center development. Immediately to the east of this site is the 21,325-acre Banning-Lewis Ranch planned new community.

Accessibility. Primary access to the site would be via State Route 94, Marksheffel Road, and via a new access road linking this site with the southern part of the base. Secondary access to the site will be via Drennan Road once this roadway is improved.

Environmental Constraints. Certain constraints will apply as a result of the construction of the north-south runway. First, the Clear Zone preempts certain acreage on the northwest side of this site. Secondly, the 1,000 feet of lateral clearance from the runway centerline preempts the first 250 feet along the western edge of Site 2.

2.4.3.3 Site 3

Site Location and Site Conditions. This site totals 210 acres and is northeast and east of Marksheffel Road adjacent to the Lease Amendment landholding. The terrain is moderate with slopes falling in both the 0 to 4 and 4 to 8 percent categories. Elevations range from 6,060 feet MSL (southwest edge of site) to 6,150 feet MSL (southeast edge of site).

Adjacent Land Uses. Immediately to the west of this site is the north-south runway of the Colorado Springs Municipal Airport. Immediately south of the Peterson AFB Lease Property Amendment and Lease Option is the 4,086-acre Colorado Center development. Immediately to the east of this site is the 21,325-acre Banning-Lewis Ranch planned community.

Accessibility. Primary access to the site would be via State Route 94, Marksheffel Road, and a new access road which would link this site with the southern part of the base. Secondary access to the site will be via Drennan Road once this road is improved.

Environmental Constraints. Certain constraints would apply as a result of the construction of the north-south runway. A 65 L_{dn} noise contour would restrict development on the western edge of this site.

2.4.3.4 Site 4

Site Location and Site Conditions. This site is on 180 acres immediately east of Falcon AFB, 10 miles east of Peterson AFB, and 2.5 miles south of Colorado State Highway 94.

Adjacent Land Users. The land in the vicinity of Falcon AFB is grassland used for the cattle grazing. A significant amount of the total landholding of Falcon AFB itself has been leased for grazing purposes. The nearest community is Ellicott, approximately 15 miles to the northeast along Colorado State Highway 94.

Site Conditions and Site Constraints. The land in this area is typical grassland and similar to other rangeland in the general vicinity. There is very limited vegetation on the site.

Accessibility. Colorado State Highway 94 and Enoch Road provide access to this site. Secondary access is from the south by way of Drennan Road which, although unpaved, is utilized by a significant number of Falcon AFB employees.

Environmental Constraints. Wetlands located on the eastern boundary of this site could restrict some development in the area.

2.4.3.5 Military Family Housing Site

Housing at Peterson/Falcon AFBs would be offbase.

2.4.4 Kirtland Air Force Base, New Mexico

Two siting alternatives were evaluated for the relocation of HQ SSD operations at Kirtland AFB (Figure 2.4.4-1). Site 1A (Figure 2.4.4-2) would not accommodate the entire proposed action, but could accommodate alternative actions. Alone, this site could accommodate Alternatives 3 and 4 for partial relocation alternatives. Site 1B, the old hospital site and other facilities, could accommodate Alternatives 3 and 4 in modified existing facilities (Figure 2.4.4-3). Sites 1A and 1B in combination would accommodate the proposed action as well as Alternatives 1 and 2.

Site 2 (Figure 2.4.4-4), south of the base golf course, could accommodate all or part of the SSD relocation, but would be justified, due to its separation of existing utilities and support, only if major facilities were established.

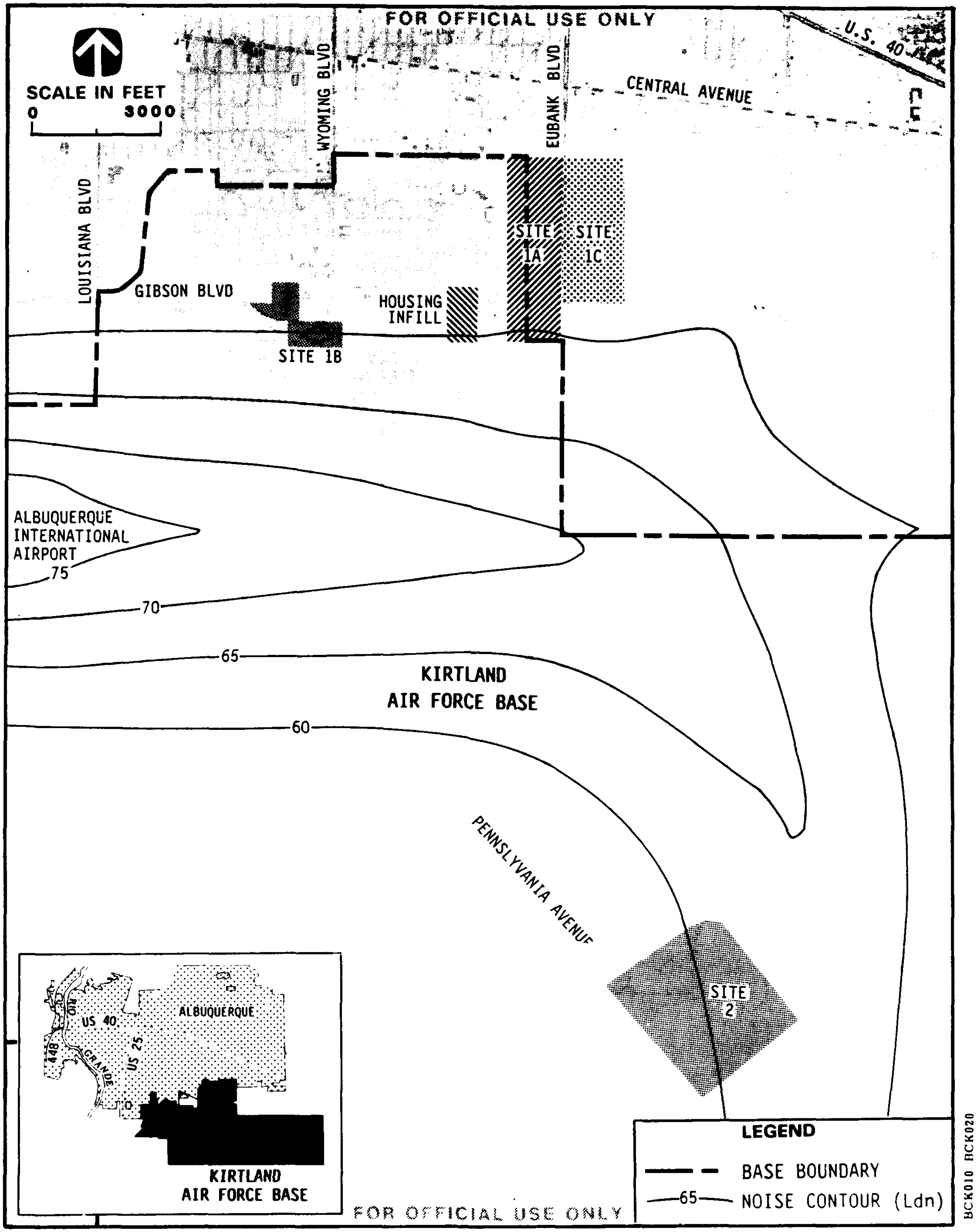

FIGURE 2.4.4-1 PROPOSED SITES AT KIRTLAND AFB, NEW MEXICO

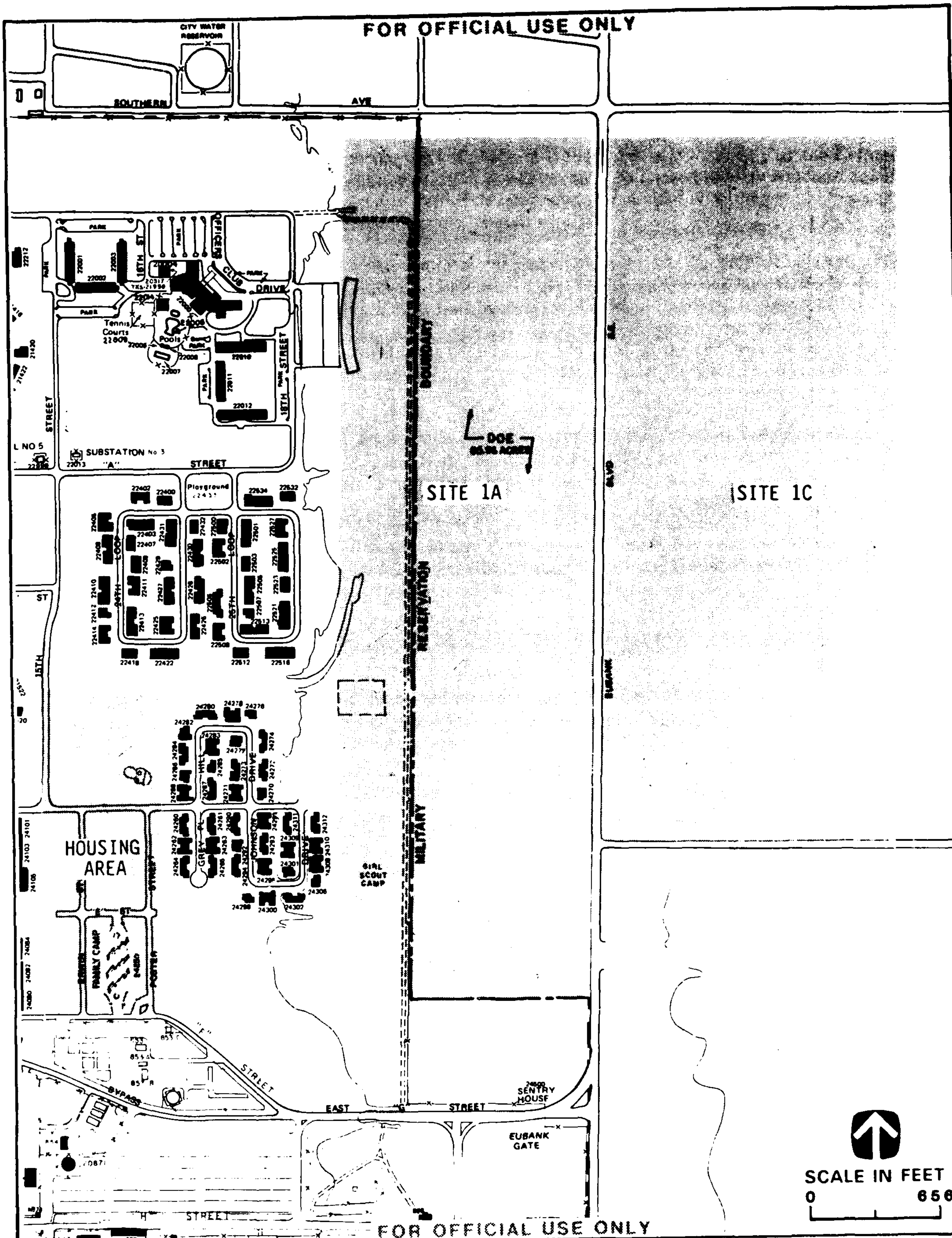

FIGURE 2.4.4-2 PROPOSED SITES 1A AND 1C AND PROPOSED HOUSING AREA AT KIRTLAND AFB, NEW MEXICO

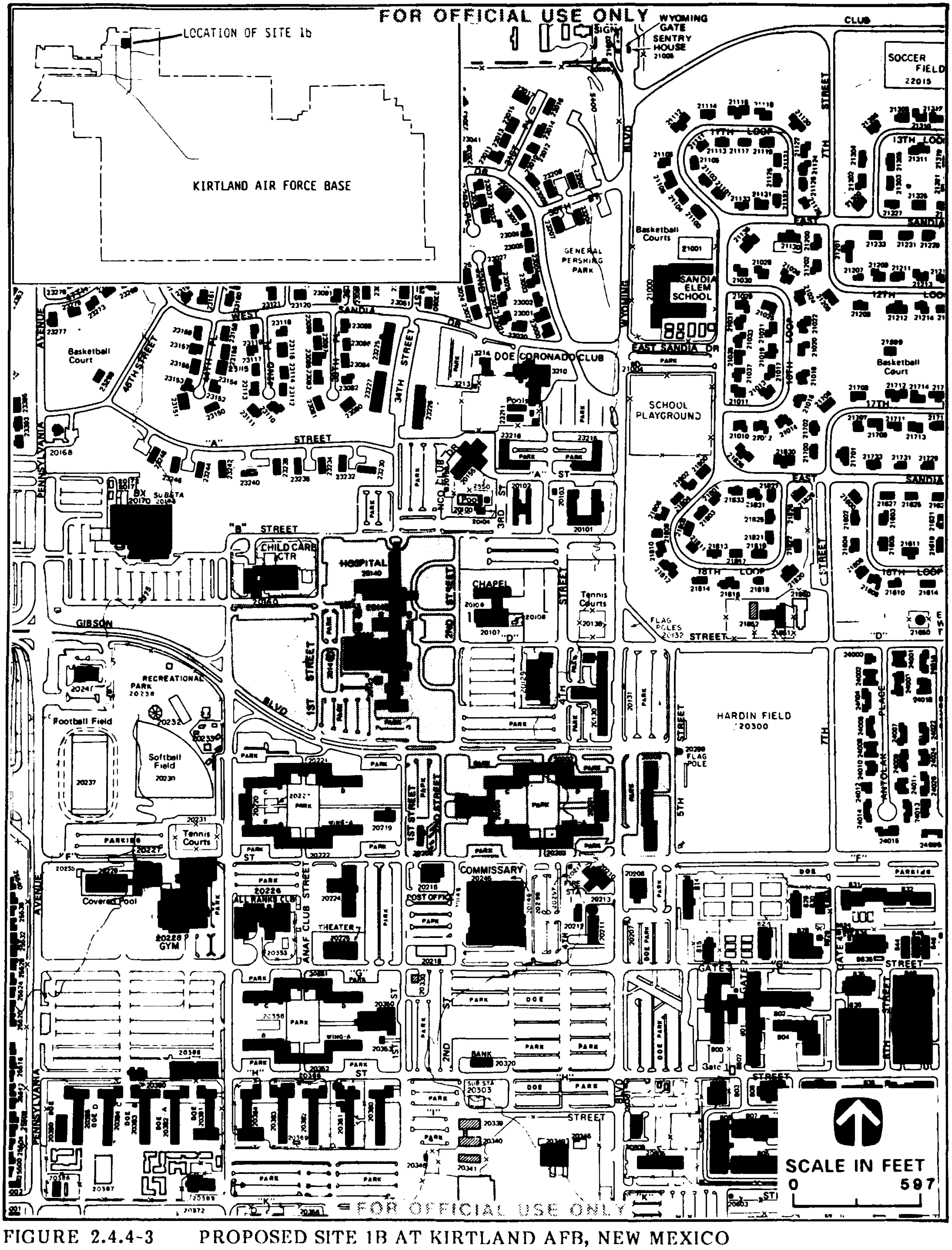

FIGURE 2.4.4-3 PROPOSED SITE 1B AT KIRTLAND AFB, NEW MEXICO

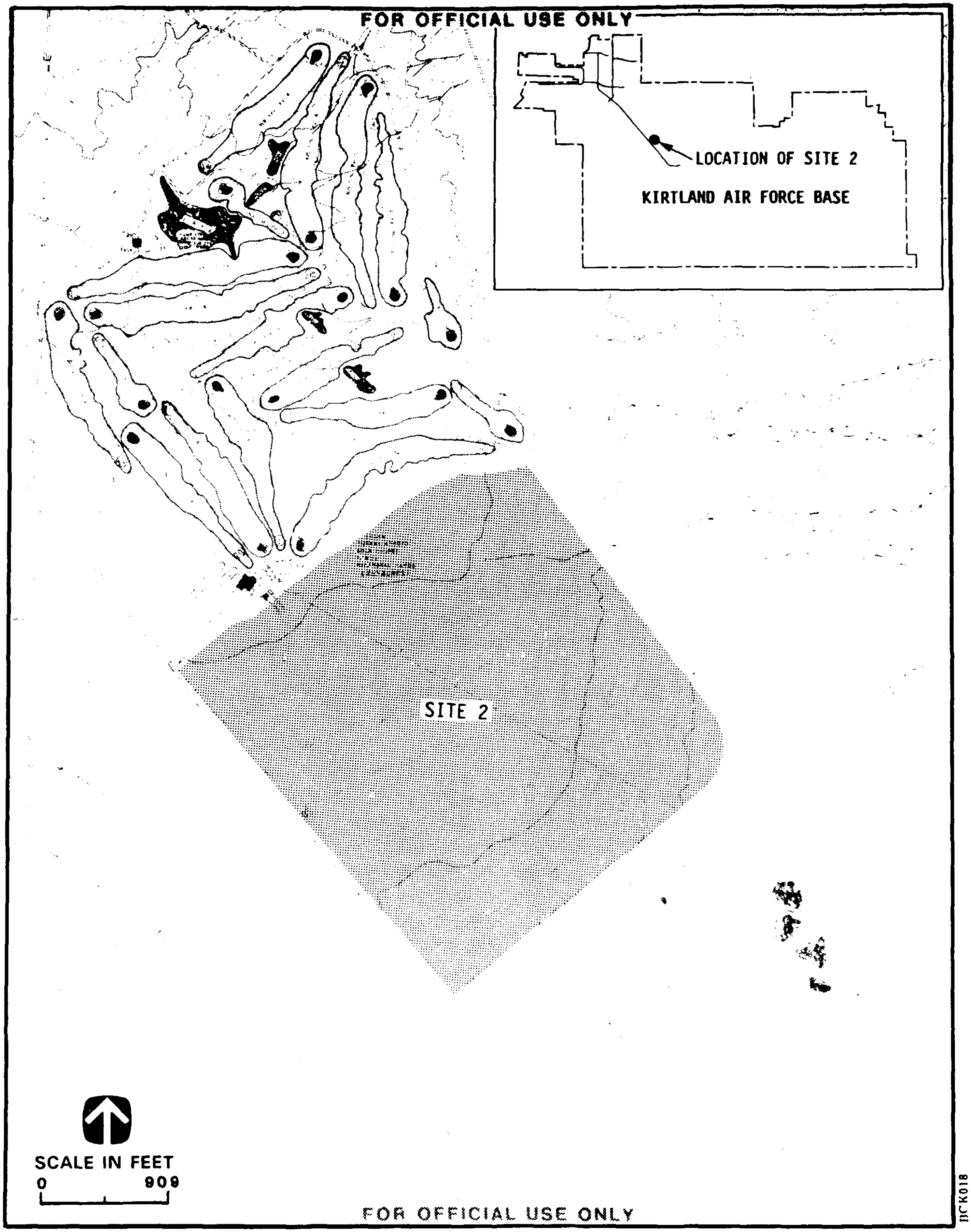

FIGURE 2.4.4-4 PROPOSED SITE 2 AT KIRTLAND AFB, NEW MEXICO

MFH sites could be developed adjacent to existing housing near the Officers' Club or in the golf course vicinity.

2.4.4.1 Site 1A

Site Location and Site Conditions. The site encompasses approximately 130 acres (80 acres are owned by the Department of Energy [DOE]) and is bounded on the north by Southern Avenue, on the east by Eubank Avenue, on the south by proposed DOE administrative office developments along the north side of East G Street, and on the west by the Officers' Club, Temporary Living Facilities/Visiting Officers' Quarters (TLF/VOQ), and the 24th/25th Loop and East Capehart MFH areas.

The terrain is flat throughout the site. Site 1A is typical rangeland, and there is no significant vegetative cover. The proposed HQ SSD/Aerospace Corporation complex, and related off-street parking, will be located on this site.

Adjacent Land Uses. The Officers' Club and various TLF/VOQ facilities are west of the northern portion of this site, and the 24th/25th Loop and East Capehart MFH areas are west of the middle and southern portions of this site. The Sandia Labs and DOE control the area south of East G Street. East of Eubank Avenue is 480 acres of vacant land owned by the Albuquerque School Board.

Accessibility. Site 1A is accessible via Eubank Avenue. The Gibson Avenue realignment will traverse the northern edge of this particular site, which will further enhance this site's accessibility. Primary and direct access onto this site will be from Eubank Avenue. Secondary access will be from D Street, 5th Street, and A Street

Environmental Constraints. This site has no environmental constraints that would preclude development.

2.4.4.2 Site 1B

Site Location and Site Conditions. Site 1B is in the middle of the cantonment area. The cantonment area is all disturbed land. No biota or cultural resource materials are found in this vicinity. The hospital (Building 20140) contains 168,000 square feet. It occupies 17 acres and includes adjacent existing/potential off-street parking areas. Much of this building is available for reuse; only the clinic, occupying the south wing, will remain.

Immediately southwest of the Gibson Boulevard/Wyoming Avenue intersection are three buildings (Buildings 20201, 20202, and 20203) available for reuse by HQ SSD. This site is 13 acres and includes Building 20200, which could potentially be demolished to create an off-street parking site.

Adjacent Land Uses. The chapel is immediately west of the hospital building. Off-street parking lots, an open field, and Building 20160 are located west of the hospital. South of Gibson Boulevard, opposite the hospital, are several low-rise office buildings in two clusters around central courtyards. Southeast of the hospital is the Air Force Operational Testing and Evaluation Center (AFOTEC) and two satellite buildings, one under construction and one planned.

Accessibility. The hospital and Buildings 20201, 20202, and 20203 are highly accessible from the entire installation, being adjacent to the intersection of the base's two major thoroughfares-Gibson Boulevard (east-west) and Wyoming Boulevard (north-south). Direct access to the hospital is from both Gibson Boulevard and D Street. The interior offstreet parking lot for Buildings 20201, 20202, and 20203 can be accessed from both Gibson and F Street.

Environmental Constraints. There are no environmental constraints that would preclude the development of this site.

2.4.4.3 Site 1C

Site Location and Site Conditions. The site encompasses approximately 124 acres of vacant land owned primarily by the Albuquerque Public Schools. Site 1C is bounded on the north by Southern Avenue, on the west by Eubank Avenue, on the south by Opportunity Lane, and on the east by additional vacant land. This site would be used in conjunction with Site 1A for the proposed action and Alternatives 1 and 2. Alternatives 3 and 4 could be located completely on Site 1C.

The terrain is flat throughout the site. Site 1C is typical rangeland, and there is no significant vegetative cover.

Adjacent Land Uses. Most of the land surrounding this site is currently undeveloped. The Officers' Club and various TLF/VOQ facilities are west of the site on the west side of Site 1A. The Sandia Labs and DOE control the area south of East G Street.

Accessibility. Primary access onto this site will be from Eubank Avenue. Secondary access will be from D Street, 5th Street, and A Street

Environmental Constraints. This site has no environmental constraints that would preclude development.

2.4.4.3 Site 2

Site Location and Site Conditions. Site 2 is along Pennsylvania Avenue approximately 2.5 miles southeast of the south edge of the cantonment and approximately 6,000 feet northwest of the Manzano Mountain complex. This site encompasses approximately 175 acres of land immediately adjacent to (southeast of) the base golf course. The terrain slopes toward the golf course, and site elevations range from 5,435 feet MSL in the southwest corner of the site to 5,390 feet MSL. Because this site is typical rangeland, it has no significant vegetation to cover.

Adjacent Land Uses. Site 2 is bounded on the southwest by Pennsylvania Avenue; on the southeast by the riding stable, cobalt testing facility, and the radioactive waste burial facility; and on the northwest by the base golf course. To the northwest lies undeveloped rangeland.

Accessibility. Primary access to this site would be Pennsylvania Avenue which is the southerly extension of Wyoming Boulevard. If this site were developed, consideration would be given to extending Eubank Road from the north to provide a more direct access.

Environmental Constraints. Immediately adjacent the site, to the southeast, is an abandoned sewage lagoon that is designated as an IRP site and is scheduled for cleanup.

The Hubble Springs Sandia Fault bisects Site 2. Another fault (the Tijeras Fault) lies 1.5 to 2 miles southeast of this site.

2.4.4.4 Military Family Housing

The MFH requirement at Kirtland AFB totals 260 units which requires 72 acres of land. A modest amount of vacant land exists within the cantonment area - some 21 acres in the 225th Loop-East Capehart housing area. This would accommodate about 150 MFH units. The DOE property adjacent the Officers' Club includes 80 acres and is the preferred site within the cantonment area for MFH units.

The land adjacent the base golf course (Site 2) has also been proposed as a potential MFH site. While there is ample acreage in this general vicinity for both the SSD complex and the required 260 MFH units (72 acres), this is a remote site for MFH.

2.5 NO ACTION ALTERNATIVE

With the no action alternative, Los Angeles AFB and SSD-SB would remain open at its present size and HQ SSD and Aerospace Corporation remain intact. However, to sustain a viable operation into the 21st century, a continued investment in new office facilities, additional MFH, refurbishment of existing buildings to meet Air Force standards, infrastructure improvements and increased civilian pay will be required.

2.6 COMPARISON OF ALTERNATIVES

A summary of changes to the local community, changes in hazardous materials management practices, and impacts to the natural environment is provided in Figure 2.6-1 for each Air Force installation and site affected by the proposed and alternative actions.

The proposed action and alternatives would result in potential adverse impacts on water resources, air quality, biological resources, and cultural resources at Vandenberg AFB; on air quality and biological resources at March AFB; on biological and cultural resources at Peterson/Falcon AFB; and on air quality at Kirtland AFB.

Beneficial effects on water resources, air quality, and noise would result from the closure of Los Angeles AFB and BMO.

FIGURE 2.6-1
SUMMARY OF POTENTIAL BIOPHYSICAL ENVIRONMENTAL IMPACTS
CLOSURE OF LOS ANGELES AFB AND REALIGNMENT OF SPACE SYSTEMS DIVISION

LEGEND

- S = Significant Impact
- (blank) = Negligible Impact
- B = Beneficial Effect

	GEOLOGY & SOILS					WATER RESOURCES					AIR QUALITY					NOISE					BIOLOGICAL RESOURCES					CULTURAL RESOURCES				
	PROPOSED ACTION	ALTERNATIVE ACTIONS 1	2	3	4	PROPOSED ACTION	ALTERNATIVE ACTIONS 1	2	3	4	PROPOSED ACTION	ALTERNATIVE ACTIONS 1	2	3	4	PROPOSED ACTION	ALTERNATIVE ACTIONS 1	2	3	4	PROPOSED ACTION	ALTERNATIVE ACTIONS 1	2	3	4	PROPOSED ACTION	ALTERNATIVE ACTIONS 1	2	3	4
LOS ANGELES AFB																														
AREA A						B	B	B		B	B	B	B		B	B	B	B		B										
AREA B						B	B				B	B				B	B													
ANNEX #3						B	B	B			B	B	B			B	B	B												
FORT MACARTHUR HOUSING						B	B				B	B				B	B									S	S			
PACIFIC HEIGHTS						B	B	B			B	B	B			B	B	B												
PACIFIC CREST						B	B	B			B	B	B			B	B	B												
FERDC FACILITIES						B	B				B	B				B	B													
BMO, SAN BERNARDINO																														
BLDG 95X						B		B	B		B		B	B		B		B	B											
BLDG 5X2						B		B	B		B		B	B		B		B	B											
VANDENBERG AFB																														
SITE 1						S	S	S			S	S	S								S	S	S			S	S	S		
SITE 2						S	S	S			S	S	S								S	S	S			S	S	S		
SITE 3						S	S	S			S	S	S								S	S	S			S	S	S		
HOUSING AREA 1						S	S	S													S	S	S	S	S	S	S	S	S	S
HOUSING AREA 2						S	S	S													S	S	S							
MARCH AFB																														
SITE 1											S	S	S	S	S						S	S	S	S	S					
SITE 2											S	S	S	S	S						S	S	S							
SITE 3											S	S	S	S	S															
HOUSING AREA											S	S	S	S	S						S	S	S	S	S					
PETERSON/FALCON AFB																														
SITE 1											S	S	S																	
SITE 2											S	S	S													S	S	S	S	S
SITE 3											S	S	S																	
SITE 4 (Falcon AFB)																					S	S	S	S	S					
KIRTLAND AFB																														
SITE 1a											S	S	S																	
SITE 1b											S	S	S																	
SITE 1c											S	S	S																	
SITE 2																														

3.0 AFFECTED ENVIRONMENT

As required by the Council on Environmental Quality regulations for implementing the National Environmental Policy Act (NEPA), the focus of this Environmental Impact Statement (EIS) is on evaluation of potential impacts on the natural environment that may result from the closure of Los Angeles Air Force Base (AFB), California, and the relocation of Space Systems Division (SSD), including the Ballistic Missile Organization (BMO). To provide the context in which impacts to the environment may occur, discussions of installation background and existing baseline conditions in the local communities, including population, land use and aesthetics, transportation, and community and public utility services, are included in this chapter. In addition, current methods of handling and management of hazardous materials and wastes are discussed. Finally, existing conditions in the natural environment are described for geology and soils, water resources, air quality, noise, biological resources, and cultural and paleontological resources.

Section 3.1 includes the environmental setting description for Los Angeles AFB and Aerospace Corporation, a Federally Funded Research and Development Center closely associated with the day-to-day operations of Los Angeles AFB. Section 3.2 provides the environmental setting description for the BMO in San Bernardino, California. Sections 3.3 to 3.6 include the environmental setting descriptions for Vandenberg AFB, California; March AFB, California; Peterson AFB and Falcon AFB, Colorado; and Kirtland AFB, New Mexico, respectively. These bases are being considered as alternative locations for the beddown of HQ SSD and appropriate supporting units, Aerospace Corporation, and BMO.

3.1 LOS ANGELES AIR FORCE BASE, CALIFORNIA

Los Angeles Air Force Base (AFB), with an area of 238 acres (197 acres are fee owned, 40 acres are public domain, and 1 acre is easement), is located in the Los Angeles metropolitan area in Los Angeles County, California (Figure 3.1-1). The host organizations at this Air Force Systems Command (AFSC) base are Headquarters, Space Systems Division (SSD) and the 6592 Air Base Group. The base has 24 tenant units onbase and provides support to approximately 45 offbase units/activities.

The base consists of five noncontiguous sites: Areas A and B in the City of El Segundo; Lawndale Annex No. 3 (Lawndale Annex) in the City of Hawthorne; the Middle Reservation of the Fort MacArthur Military Reservation (Fort MacArthur), and the Pacific Crest and Pacific Heights Housing Areas in the San Pedro area of the City of Los Angeles. The Fort MacArthur area includes both military family housing and some administrative/support facilities (Figures 3.1-2 and 3.1-3). Aerospace Corporation, a Federally Funded Research and Development Center closely associated with the day-to-day operations at Los Angeles AFB, is located adjacent to Areas A and B (Figure 3.1-2).

Areas A and B consist of two separate parcels with a combined area of approximately 95 acres located at the intersection of Aviation and El Segundo Boulevards, approximately 1.5 miles south of Los Angeles International Airport and 2.5 miles east of the Pacific Ocean. Aerospace Corporation is located west of Area A and south of Area B. Aerospace Corporation also leases additional facilities on Aviation Boulevard north of Area A and northwest and west of Area B. The Lawndale Annex is located approximately one mile south of Area A on the east side of Aviation Boulevard, south of Rosecrans Avenue.

The Fort MacArthur, Pacific Crest, and Pacific Heights Housing Areas are located in the southeastern portion of the Palos Verdes Peninsula approximately 14 miles southeast of Areas A and B. The Fort MacArthur Housing Area, consisting of approximately 93 acres, is located west of Los Angeles Harbor, approximately six miles southwest of downtown Long Beach. The Fort MacArthur Housing Area also includes administrative offices, several warehouses, and civil engineering shops. The Pacific Crest (22 acres) and Pacific Heights (13 acres) Housing Areas are located approximately 1.5 miles west of the Fort MacArthur Housing Area and 0.5 miles north of the Pacific Ocean near the intersection of Western Avenue and 25th Street. The two housing areas were created out of the former U.S. Army property at White Point, a part of the original Fort MacArthur Military Reservation.

Los Angeles AFB employed 1,761 permanent party military personnel (1,324 officers and 417 enlisted), 1,430 appropriated fund civilian personnel, 224 other civilian personnel, and 655 contract civilians at the end of fiscal year (FY) 1989. Aerospace Corporation employed 4,075 personnel at the end of FY 1989. Approximately 29 percent of the military personnel live in one of the three housing areas and 71 percent live offbase. Military personnel living offbase and the civilian personnel live in communities throughout Southern California.

History. Los Angeles AFB evolved from the site of the Western Development Division (WDD) of the Air Research and Development Command established in July 1954 in Inglewood, California. WDD was responsible for developing the nation's first intercontinental ballistic missile, the Atlas. In 1955, Space Technology Laboratories (STL) of Ramo-Wooldridge Corporation, the primary contractor at WDD, purchased 41.45 acres at the southeast corner of Aviation and El Segundo Boulevards and constructed a research and development (R&D) center (now Area A). The Air Force purchased the

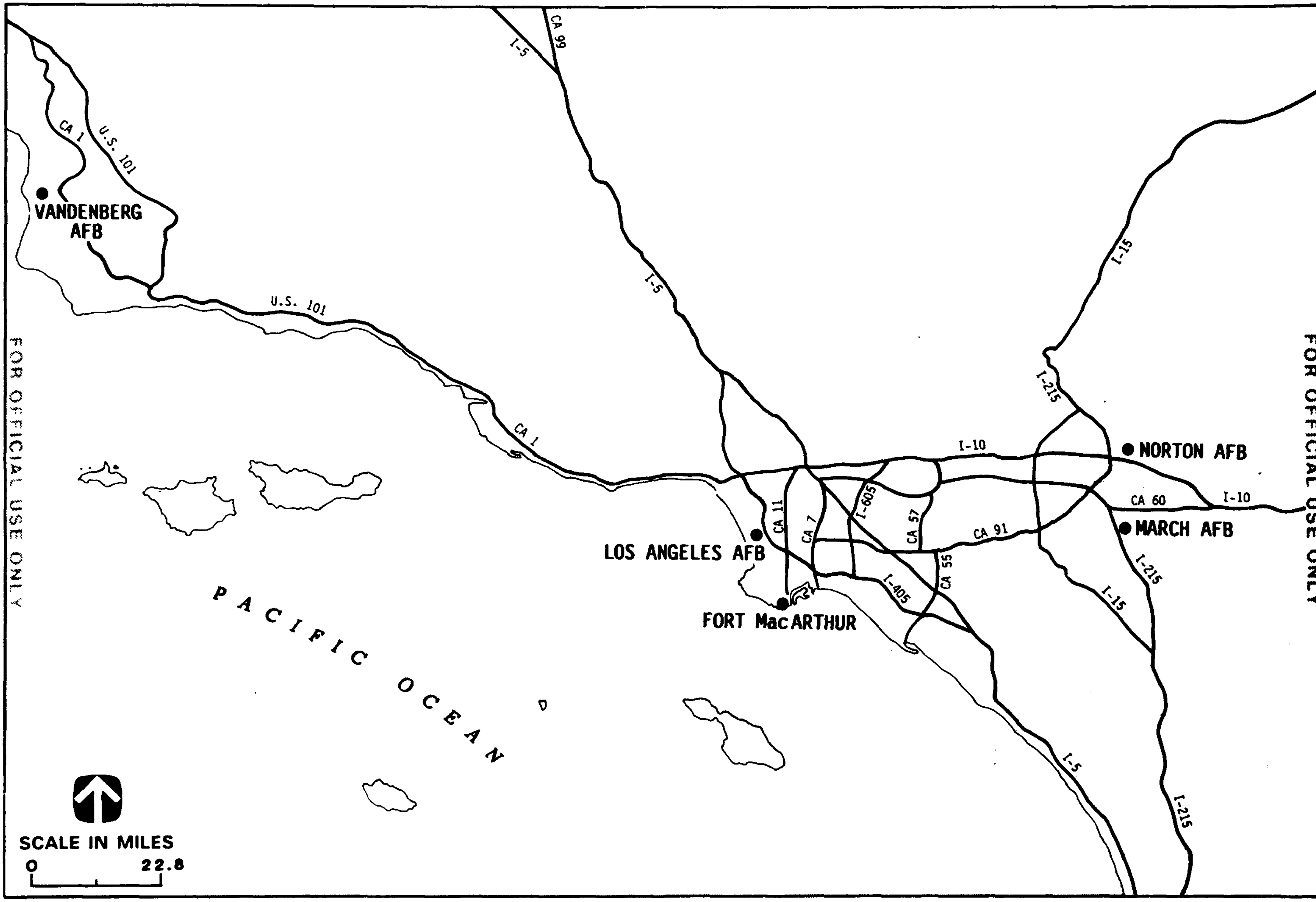

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FIGURE 3.1-1 REGIONAL VICINITY MAP FOR LOS ANGELES AFB, VANDENBERG AFB, MARCH AFB, AND NORTON AFB, CALIFORNIA

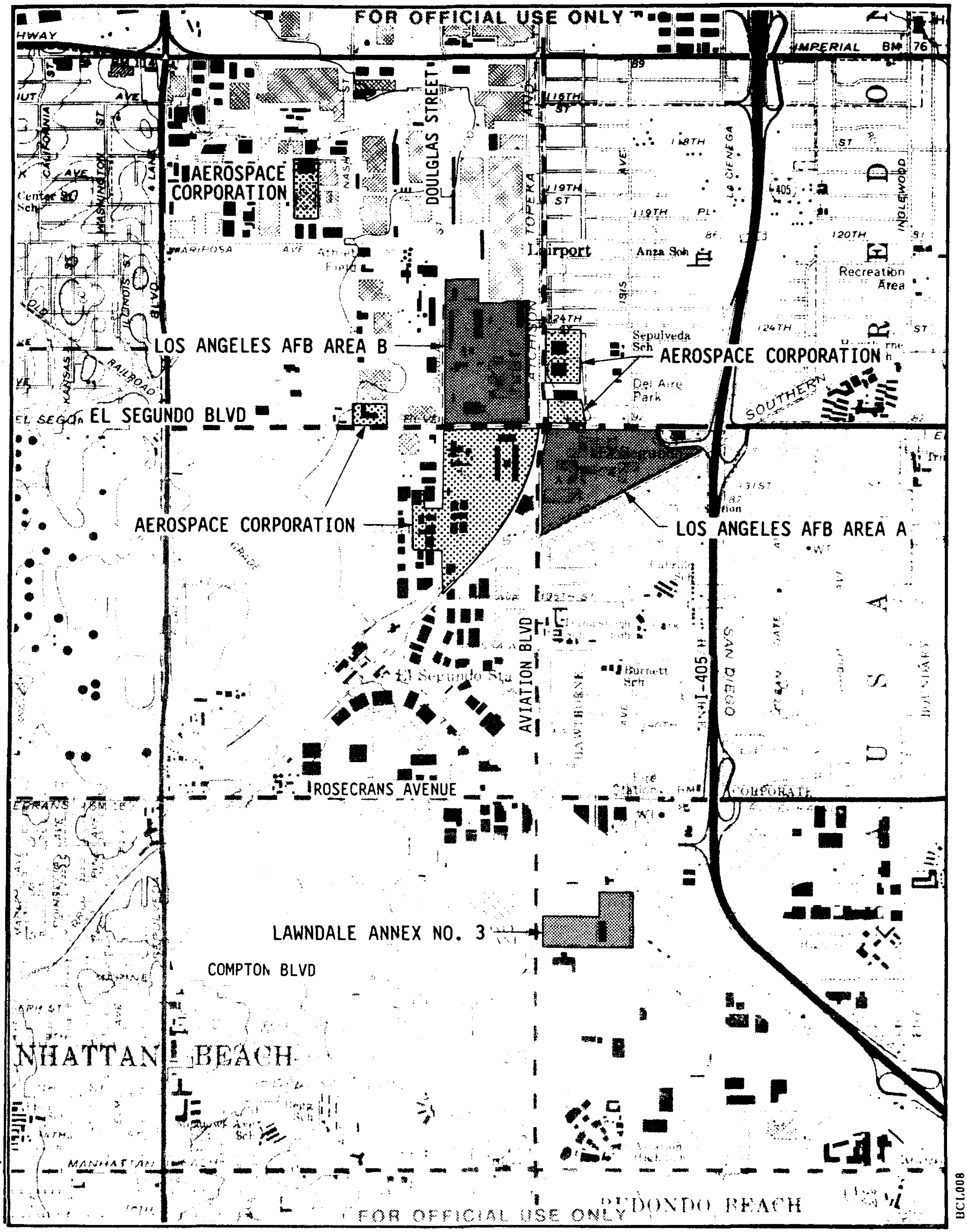

FIGURE 3.1-2 LOCAL VICINITY MAP FOR LOS ANGELES AFB (AREAS A AND B AND LAWNDALE ANNEX NO. 3) AND AEROSPACE CORPORATION, LOS ANGELES COUNTY, CALIFORNIA

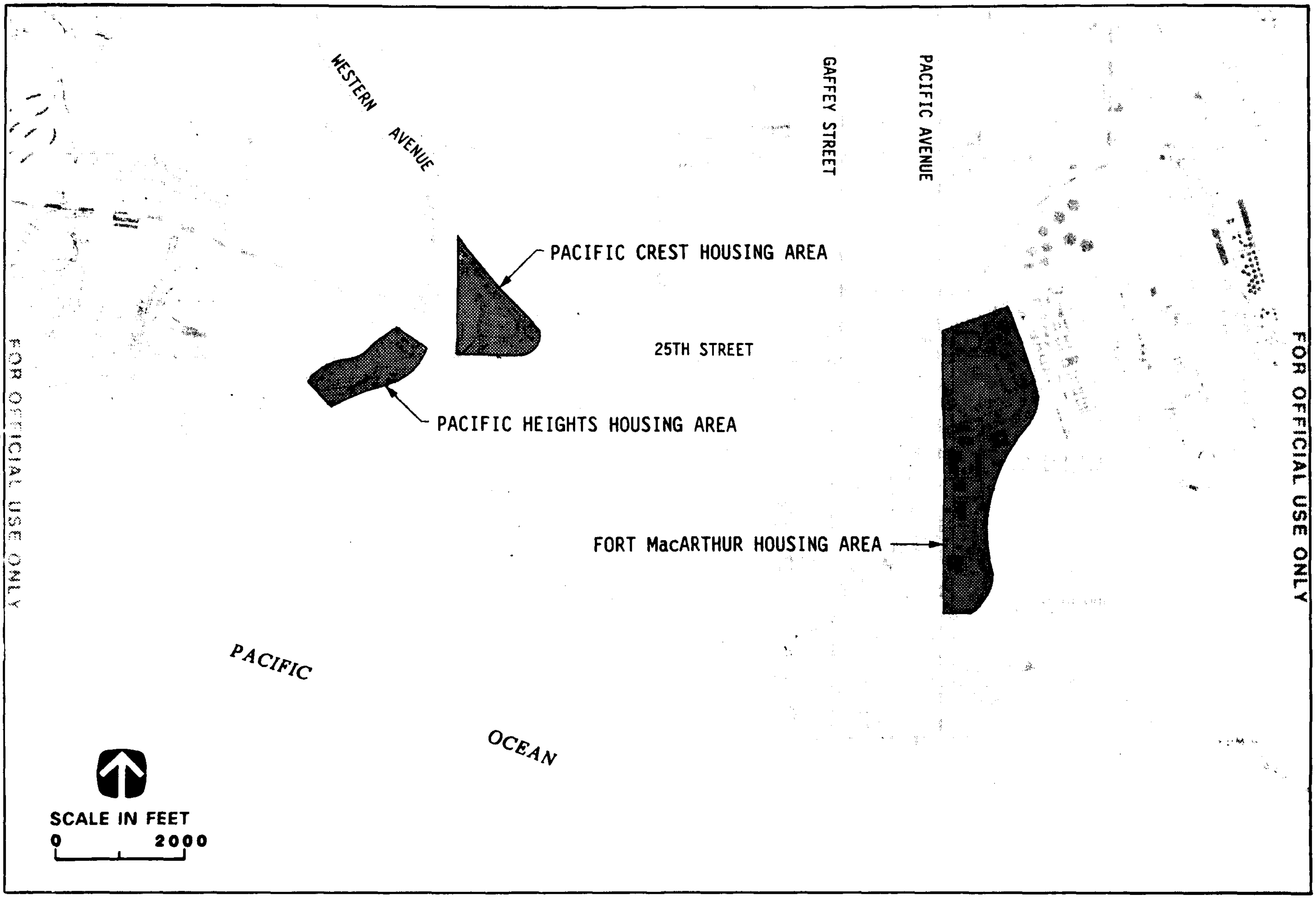

FIGURE 3.1-3 LOCAL VICINITY MAP FOR FORT MacARTHUR, PACIFIC CREST, AND PACIFIC HEIGHTS HOUSING AREAS, LOS ANGELES AFB, LOS ANGELES COUNTY, CALIFORNIA

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R&D center from STL in December 1960 and redesignated it Los Angeles Air Force Station (AFS) in April 1964. In June 1962, the Air Force acquired a permit to use four buildings in the Navy-owned Douglas Street site (now Area B). These facilities and 52.28 acres (Area B) were transferred from the Navy to the Air Force in October 1963. In March 1968, the Navy transferred an additional 1.42 acres in Area B to the Air Force, increasing the property to 53.7 acres. Los Angeles AFS became the headquarters of SSD in October 1979 and was renamed Los Angeles AFB in 1988.

The Lawndale Annex, formerly part of the Lawndale Army Missile Plant, was acquired by the General Services Administration in August 1985. The 13.34-acre property was acquired to provide additional administrative office space for Los Angeles AFB and includes Building 80 and several temporary modular buildings.

The Air Force acquired 96 acres of the Middle Reservation of the Fort MacArthur Military Reservation in October 1982. Fort MacArthur had 43 existing residences, and 252 additional housing units were constructed in 1983. In 1982, the Air Force acquired additional Army property located at the White Point Reservation of Fort MacArthur for the construction of the Pacific Crest (91 residences) and Pacific Heights (79 residences) Housing Areas.

Mission. The mission of SSD includes the following:

- plans, programs, and manages AFSC programs to acquire space systems, subsystems, support equipment, and related hardware and software;
- provides maintenance, construction, alteration, and security of launch, tracking, and support facilities;
- conducts research, exploratory development, and advanced development programs to support future space missions;
- provides and conducts launch and flight test and evaluation support of major Department of Defense (DOD) programs and programs of other federal agencies;
- performs the functions of launch, launch control, deployment checkout prior to turnover, major anomaly resolution not handled by the operating command, and sustaining engineering;
- performs on-orbit test and evaluation of systems, subsystems and components;
- discharges Air Force responsibilities for designated Air Force, DOD and international space programs;
- plans, programs, and acquires test facilities and other test investments required by AFSC space programs at all locations (test centers and contractor facilities);
- plans and provides for security on all systems and information requiring safeguards consistent with Air Force and DOD security directives;
- provides management oversight for commercial expendable launch vehicle activity;
- conducts launch agreement negotiations with commercial space launch operators;

- provides system security engineering management support for selected space systems, subsystems, facilities, support equipment, and related hardware and software; and

- supports other product divisions and federal agencies with technologies derived from its subordinate laboratories.

The 6592 Air Base Group provides various services including administrative; civil engineering; base security police; personnel; disaster preparedness; morale, welfare, and recreation; and headquarters squadron support for organizations and personnel assigned or attached to Los Angeles AFB and Fort MacArthur.

Aerospace Corporation. Aerospace Corporation's central mission is to assist the Air Force in applying the full potential of science and technology to the advancement of space systems vital to national security. Aerospace Corporation engages in space systems architecture, engineering, planning, analysis, and research, predominantly for programs managed by SSD, and is integrally involved in the day-to-day operations at Los Angeles AFB.

Aerospace Corporation is a Federally Funded Research and Development Center (FFRDC) supporting the DOD and operating under government-stipulated procedures and constraints appropriate to its mission. Its principal function, architecture-engineering of space systems, is performed under a single contract with SSD. Aerospace Corporation's corporate general office complex is composed of 17 company-owned and leased office buildings, research facilities, and laboratories located adjacent to Los Angeles AFB in El Segundo.

3.1.1 Community Setting

3.1.1.1 Population and Employment

Population. Based on 1980 U.S. Census data and more recent State of California surveys, the five-city area surrounding Los Angeles AFB (i.e., Hawthorne, Lawndale, Redondo Beach, Manhattan Beach, and El Segundo) has experienced an overall growth rate of 15 percent during the past decade and a population increase from 182,300 to 210,300. These cities, in the South Bay area of Los Angeles County, are expected to experience moderate growth rates over the next ten years. The population of Los Angeles County has increased from 7,477,500 to 8,650,300 since 1980, resulting in a county-wide growth rate of approximately 16 percent. Projections call for a 5 percent growth rate over the next ten years.

Employment. The five communities bordering Los Angeles AFB have a work force of 116,624. Together with workers commuting from other areas, these people filled the 172,877 jobs supported by the cities in the vicinity of the base in 1989. The Los Angeles area has seen steady and significant increases in employment over the past 15 years and is expected to continue this trend into the next century with job openings increasing at a rate of approximately 1 percent per year. These cities depend heavily on the manufacturing sector for their economic well-being, as many of the residents are employed by aerospace and electronics firms in the area. The presence of Los Angeles AFB also influences the area's job-base, as expenditures made by the military create approximately 10,145 jobs in the region surrounding Los Angeles AFB, accounting for 6 percent of employment in the five-city area.

The total civilian workforce in Los Angeles County is currently 4,350,000 with an unemployment rate of 4.9 percent. Total employment is expected to rise as the population grows, but the unemployment rate is expected to remain stable. The growth in total wage and salary employment has fluctuated between 2 and 3 percent over the last five years. The three largest sectors in the local economy, manufacturing, services, and retail trade, are expected to see growth rates of 1.3, 3.0, and 2.1 percent, respectively, in 1990.

3.1.1.2 Housing

The 1980 U.S. Census estimated that there were 2.85 million housing units in Los Angeles County. It is projected that the number of units will exceed 3 million in 1990, and increase to 3.3 million by the year 2000, a 10 percent increase in ten years. In the five-city area surrounding Los Angeles AFB, the total number of units was 78,372 in 1980, and is estimated to be 85,762 in 1990. The number of units in this area is projected to increase to 90,406 by the year 2000, a 5 percent increase. Los Angeles County is a fully-developed area characterized by very little vacant land and low vacancy rates. As a result, home prices and rental costs are very high with costs rising most rapidly in the beach communities.

Los Angeles AFB has 574 units of military housing for its accompanied (married) personnel. Housing consists of two, three, and four bedroom units located at the Fort MacArthur, Pacific Crest, and Pacific Heights housing areas. The base also provides additional housing (e.g., dormitories and temporary living facilities) at Fort MacArthur for unaccompanied permanent and visiting officers and enlisted personnel.

3.1.1.3 Education

The five-city area surrounding Los Angeles AFB has a combined total of 10 high schools and 37 elementary schools with a total enrollment of 23,584 high school students and 17,100 elementary school students. Even with population increases in the area, the trend toward fewer children per household, coupled with an aging population, total enrollment has been gradually declining recently. As a result, many area schools are operating below capacity.

3.1.1.4 Community Services

Police and fire protection for the three housing areas is provided by the Harbor Divisions of the City of Los Angeles police and fire departments. Lawndale Annex No. 3 is provided police and fire protection by the City of Hawthorne. Onsite security at Los Angeles AFB and Aerospace Corporation facilities is maintained by private security firms under contract to the federal government. Los Angeles AFB (Areas A and B) and Aerospace Corporation are provided fire protection by the City of El Segundo.

3.1.2 Land Use

3.1.2.1 Existing Land Use Patterns

Los Angeles AFB and Aerospace Corporation. Los Angeles AFB (Areas A, B, and the Lawndale Annex) and Aerospace Corporation are located within a regional industrial district in southwest portion of the Los Angeles metropolitan area. Areas A and B and Aerospace Corporation are located within the

City of El Segundo and Lawndale Annex No. 3 is within the City of Hawthorne. The three housing areas are located in San Pedro, a community of the City of Los Angeles.

Area A is a highly secure military research and development installation. Area B primarily consists of base operating support facilities, including administrative offices (designated cantonment in Figure 3.1.2-1), recreation facilities, and industrial shops. Industrial uses surround the Los Angeles AFB/Aerospace Corporation complex to the north, west, and south; and residential uses are located to the north and south (Figure 3.1.2-1). Commercial land uses in the area consist of a hotel east of Area A. Railroad right-of-ways, owned and operated by the Southern Pacific Railroad Company, are located west and south of Area A.

The Lawndale Annex is approximately 1 mile south of Areas A and B within an industrial district in the City of Hawthorne. The western portion of the facility includes a fenced dry storage area, an employee parking lot for Building 80, and temporary modular buildings (Figure 3.1.2-1). The eastern part of the property contains recreation facilities including a multipurpose baseball and football/soccer field. Land uses surrounding the Lawndale Annex consist of industrial and public uses. To the north is a utility right-of-way owned by Southern California Edison (SCE) with high voltage transmission lines, and a parcel owned by the State of California and leased for dry storage of boats, recreational vehicles, and vehicles, and self storage. The Los Angeles County Transportation Commission (LACTC) is planning to use the state property as a maintenance and storage yard for rolling stock of the Norwalk-El Segundo Rail Transit Project. To the east is a large Southern California Edison (SCE) substation, vacant open space, and the shared rights-of-way of the Atchison, Topeka and Santa Fe Railroad Company and SCE. A six-story Federal Building is located to the south, and a large industrial complex owned by TRW, Inc. to the west and further south.

Fort MacArthur Military Reservation. Fort MacArthur consists of 404 housing units; administrative offices and group quarters (including the Patton Quadrangle); warehousing and storage facilities; civil engineering shops; an open mess; a communications facility, and recreational facilities (Figure 3.1.2-2). The West Channel/Cabrillo Beach recreational complex, consisting of recreational facilities, a marina, a hotel, a shopping center, and a tidal marsh, is located east of Fort MacArthur. Mixed single-family and multiple-family residences, with some commercial uses, surround the remainder of Fort MacArthur.

The Pacific Crest and Pacific Heights Housing Areas consist of 170 housing units. Land uses surrounding the Pacific Crest Housing Area include the U.S. Navy Whites Point Housing Area, a church, a preschool, and single-family residences to the east and south, and multiple-family residences, a church, a neighborhood shopping center, and a City of Los Angeles fire station to the north and west (Figure 3.1.2-3). Land uses surrounding the Pacific Heights Housing Area include neighborhood shopping centers and the U.S. Navy Whites Point Housing Area to the north and east, respectively. Land uses to the south consist of Whites Point City Park. Whites Point County Park and the state-owned Royal Palms State Beach are located further south of the city park. Single-family residences and some mixed multiple-family housing are located west of the Pacific Heights Housing Area.

3.1.2.2 Land Use Plans and Policies

The land occupied by Areas A and B, and Aerospace Corporation is addressed in the City of El Segundo general plan and zoning ordinance. The development policies and standards of the general

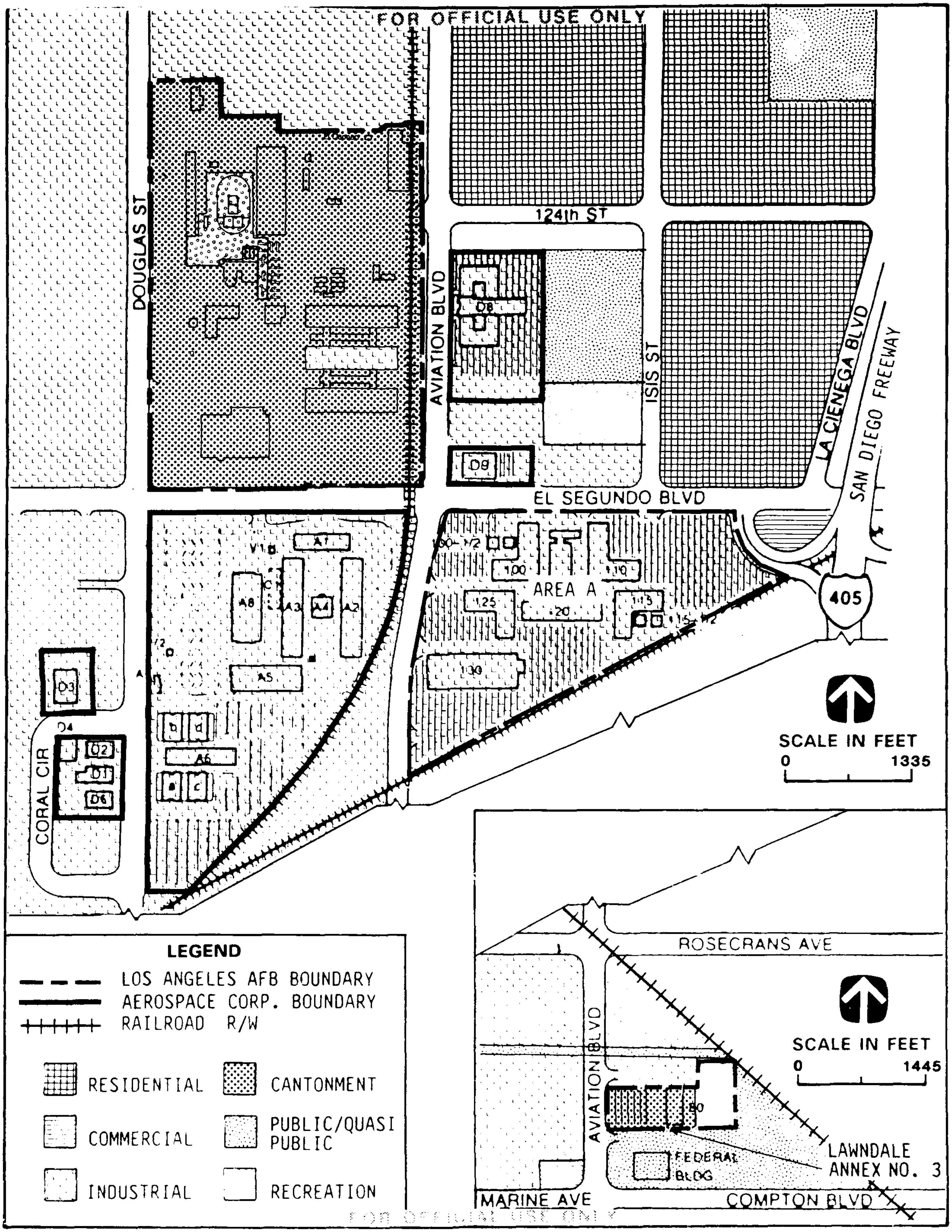

FIGURE 3.1.2-1 LAND USE AT LOS ANGELES AFB (AREAS A AND B AND LAWNDALE ANNEX NO. 3) AND AEROSPACE CORPORATION

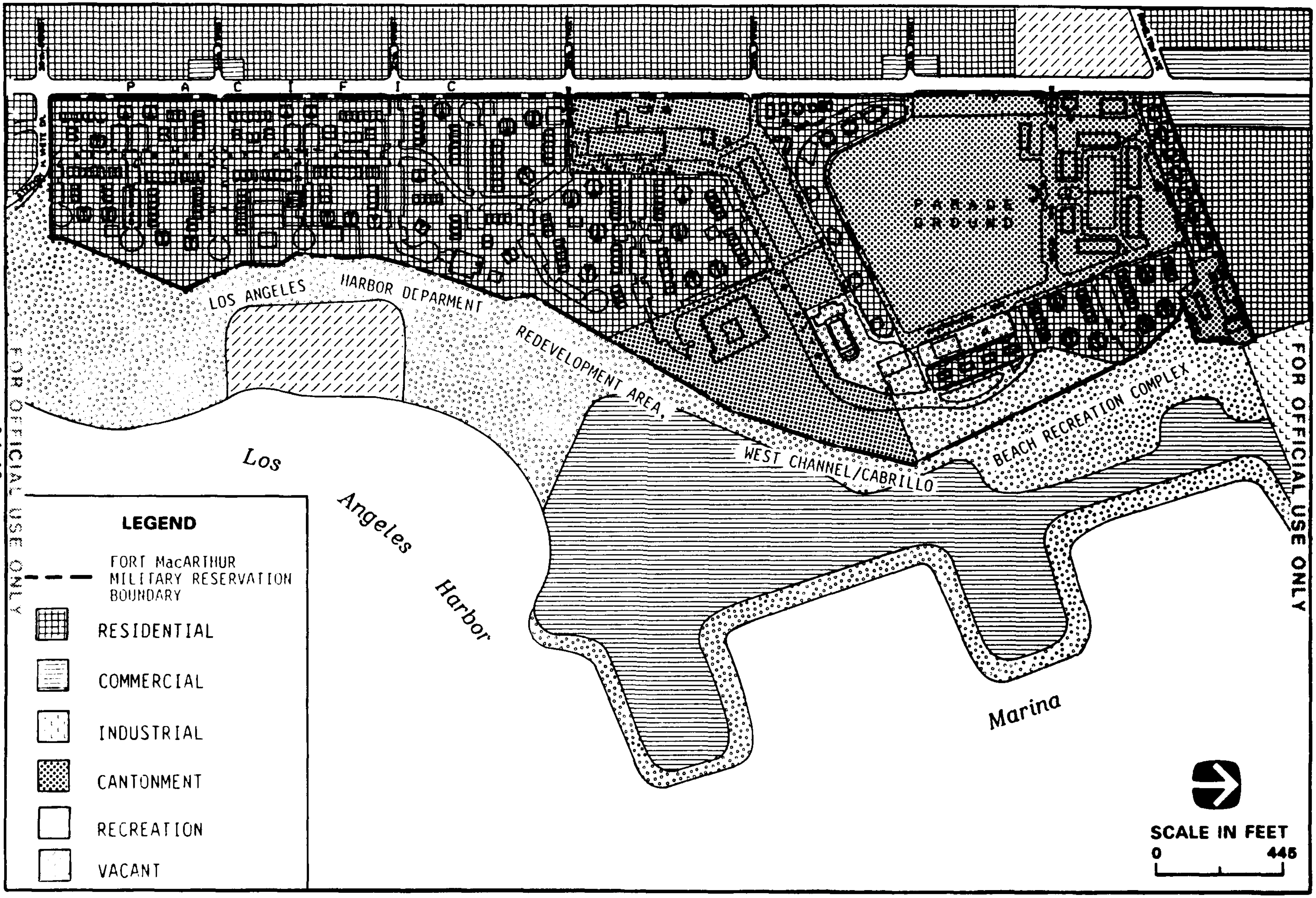

FIGURE 3.1.2-2 LAND USE AT FORT MacARTHUR MILITARY RESERVATION

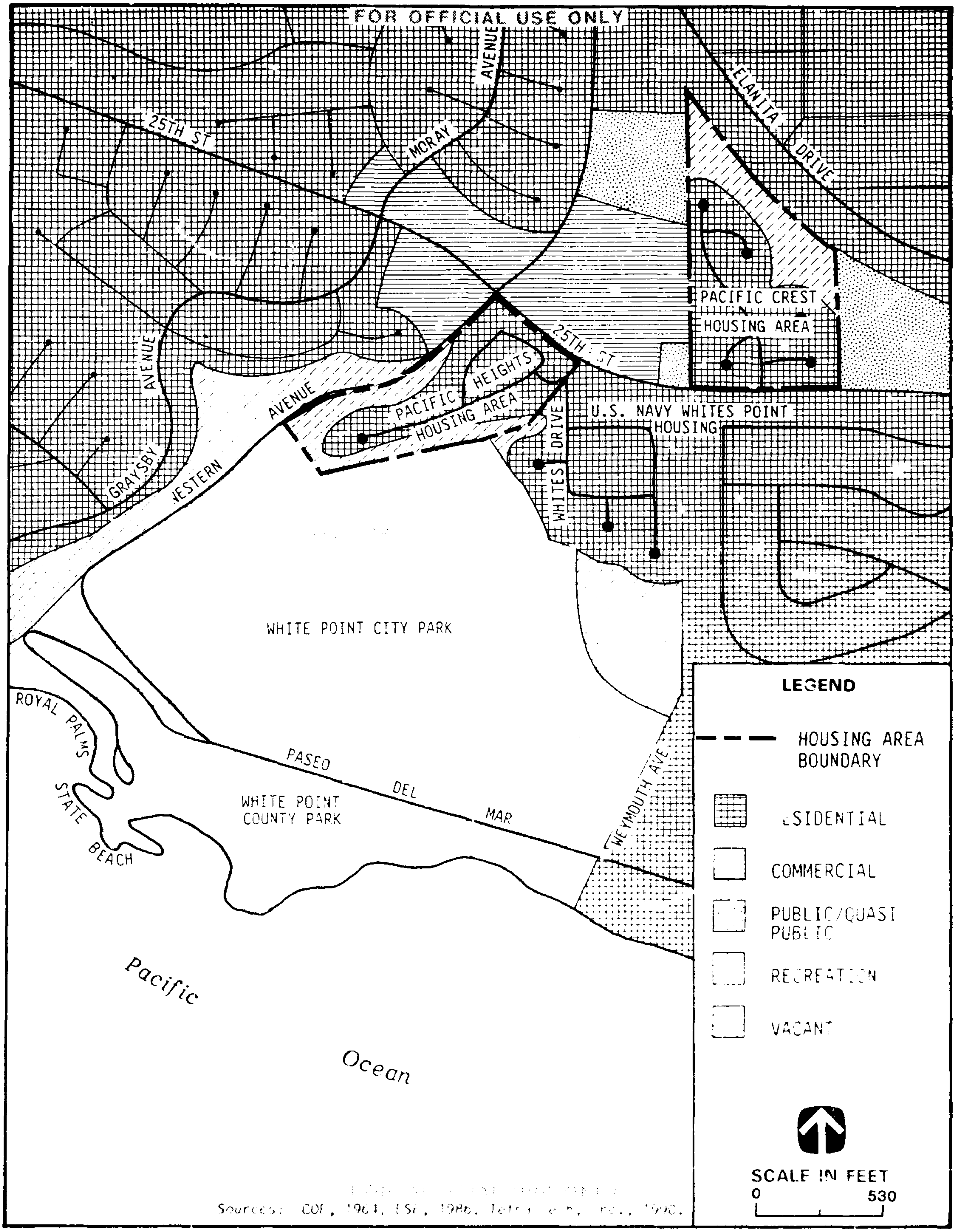

FIGURE 3.1.2-3 LAND USE AT PACIFIC CREST AND PACIFIC HEIGHTS HOUSING AREAS AND VICINITY, LOS ANGELES, CALIFORNIA

plan and zoning ordinance consist of commercial, manufacturing, and industrial designations and zoning districts which encourage and permit various intensive activities including industrial uses. The land occupied by the Lawndale Annex is considered in the City of Hawthorne general plan which designates the area general industrial.

Fort MacArthur Housing Area and associated support facilities and the Pacific Crest and Pacific Heights Housing Areas are considered in the San Pedro Community Plan, adopted by the City of Los Angeles. These areas are designated Open Space-Publicly Owned.

3.1.2.3 Aesthetics

Los Angeles AFB and Aerospace Corporation facilities consist of multi-story office buildings and manufacturing type buildings surrounded by large expanses of paved parking lots. These facilities are surrounded by industrial, manufacturing, or office buildings which comprise the large aerospace industrial district in the City of El Segundo. The adjoining residential neighborhoods were developed many years ago as bedroom communities in response to the growing local aerospace industry. The Lawndale Annex was constructed to serve the Army within a larger industrial district in the City of Hawthorne and surrounding industrial districts in the cities of Manhattan Beach, Redondo Beach and El Segundo. The surrounding property consists of industrial and manufacturing buildings primarily for the aerospace industry and supporting utility facilities. The visual resources of these areas are characteristic of a large urban industrialized area.

Fort MacArthur represents both historic Los Angeles and new development. The historic district of the Fort has preserved the old military buildings of the former Army Post. The Air Force has redeveloped the remainder of Fort MacArthur with new residential housing which blends with the surrounding harbor area and the community of San Pedro.

The Pacific Heights and Pacific Crest Housing Areas consist of detached single-family residences on elevated marine terraces surrounded by an urbanized area consisting of commercial shopping centers, single-family residences, and multiple-family residential apartments. The nearby City, County, and State parks to the south provide open space. The base housing is highly visible at both sites; however, the use of detached single-family residences surrounded by the undeveloped steeper slopes was incorporated into the layout of the housing areas to keep the area in an open space natural state, and to lessen the visual impact on the surrounding properties.

3.1.3 Transportation

3.1.3.1 Traffic

Los Angeles AFB Areas A and B and Aerospace Corporation facilities are primarily located at or near the intersection of Aviation and El Segundo Boulevards (Figure 3.1-2). Aviation Boulevard is a six-lane, north-south arterial and El Segundo Boulevard is a four-lane, east-west arterial. El Segundo Boulevard provides access to Interstate 405 (San Diego Freeway). The El Segundo Boulevard/Aviation Boulevard intersection and surrounding roads operate at a Level of Service (LOS) F (Table 3.1.3-1) during morning and afternoon peak hours.

The Lawndale Annex is located near the intersection of Aviation Boulevard and Compton Boulevard, a four-lane, undivided arterial (Figure 3.1-2). The Aviation Boulevard/Compton Boulevard intersection and surrounding roads operate at LOS F during peak morning and afternoon hours.

Table 3.1.3-1

Comparison of Daily Traffic Volumes to Estimated Roadway Capacities for Road Segments in the Vicinity of Los Angeles AFB

Road Segment	Roadway Capacity	Existing Conditions (1988) ADT[1]	Existing Conditions (1988) V/C Ratio[2]	Existing Conditions (1988) LOS[3]	Projected Conditions (1996) ADT	Projected Conditions (1996) V/C Ratio	Projected Conditions (1996) LOS
El Segundo Boulevard							
West of Douglas Street	54,000	22,700	0.42	A	26,597	0.49	A
Douglas Street to Aviation Boulevard	54,000	23,200	0.43	A	27,182	0.50	A
Aviation Boulevard to I-405	54,000	20,300	0.38	A	23,785	0.44	A
Aviation Boulevard							
North of El Segundo Boulevard	24,000	12,150	0.51	A	14,236	0.59	A
El Segundo Boulevard to Utah Avenue	24,000	11,600	0.48	A	13,591	0.57	A
Utah Avenue to Rosecrans Avenue	24,000	15,600	0.65	B	18,278	0.76	C
North of Compton Boulevard	24,000	18,700	0.78	C	21,910	0.91	E
South of Compton Boulevard	24,000	17,900	0.75	C	20,973	0.87	D
Douglas Street							
North of El Segundo Boulevard	15,000	7,850	0.52	A	9,198	0.61	B
South of El Segundo Boulevard	15,000	9,430	0.63	B	11,049	0.74	C
Interstate 405							
North of El Segundo Boulevard	240,000	262,000	1.09	F	306,975	1.28	F
El Segundo Boulevard to Rosecrans Avenue	240,000	259,000	1.08	F	303,460	1.26	F
Rosecrans Avenue to Compton Boulevard	240,000	260,000	1.08	F	304,631	1.27	F
South of Compton Boulevard	240,000	250,000	1.04	F	292,915	1.22	F
Compton Boulevard							
Aviation Boulevard to I-405	24,000	8,800	0.37	A	10,311	0.43	A
West of Aviation Boulevard	24,000	10,500	0.44	A	12,302	0.51	A
Rosecrans Boulevard							
Aviation Boulevard to I-405	54,000	20,500	0.38	A	22,199	0.41	A
West of Aviation Boulevard	54,000	25,800	0.48	A	27,938	0.52	A
Western Avenue							
North of 25th Street	36,000	2,975	0.08	A	3,221	0.09	A
South of 25th Street	15,000	7,940	0.53	A	8,598	0.57	A

Table 3.1.3-1, page 2 of 2

Road Segment	Roadway Capacity	Existing Conditions (1988)			Projected Conditions (1996)		
		ADT	V/C Ratio	LOS	ADT	V/C Ratio	LOS
25th Street							
West of Western Avenue	36,000	9,411	0.26	A	10,191	0.28	A
Western Avenue to Gaffey Street	36,000	6,688	0.19	A	7,242	0.20	A
Pacific Avenue							
South of 22nd Street	24,000	4,794	0.20	A	5,191	0.22	A
North of 22nd Street	24,000	6,441	0.27	A	6,975	0.29	A
22nd Street							
East of Pacific Avenue	24,000	2,382	0.10	A	2,579	0.11	A
West of Pacific Avenue	24,000	3,898	0.16	A	4,221	0.18	A

Notes: [1]ADT = Average Daily Traffic.
[2]V/C represents the ratio of Average Daily Traffic volume to Roadway Capacity.
[3]LOS = Level of Service (Section 3.1.3, Table 3.1.3-2).

Sources: City of El Segundo 1990; City of Los Angeles 1990; and California Department of Transportation 1989.

Access to Interstate 405 is provided via Rosecrans Avenue, an east-west arterial north of the Lawndale Annex, and Inglewood Avenue, a north-south arterial to the east.

The Fort MacArthur Housing Area is located along Pacific Avenue in the San Pedro area of the City of Los Angeles. Pacific Avenue provides the only access to Fort MacArthur with the main entrance located between Hamilton Avenue and 26th Street. Gaffey Street is a principal access route to the area from Interstate 110 and parallels Pacific Avenue several blocks to the west. A connection between Gaffey Street and Pacific Avenue is provided at 22nd Street. Major Intersections and surrounding roads in the area generally operate at LOS A or B.

The Pacific Crest and Pacific Heights Housing Areas are located on the north side of 25th Street east of the intersection of 25th Street and Western Avenue, and on the south corner of the intersection of 25th Street and Western Avenue, respectively. Western Avenue is a two-lane road adjacent to the western border of the site with a steep grade from Paseo del Mar to 25th Street. North of 25th Street, Western Avenue is a major arterial with two lanes in each direction and a median. A four-lane arterial, 25th Street has turning lanes near the housing areas. The Western Avenue/25th Street intersection and surrounding road generally operate at LOS A or B during peak hours.

3.1.3.2 Airports

Los Angeles International Airport (LAX) is located approximately 1.5 miles northwest of Los Angeles AFB. LAX provides both domestic and international airline service and is used by over 25 major airlines and a number of smaller ones. Passenger traffic at LAX exceeded 44 million in 1988. In addition to LAX, the Southern California region is served by several other major airports including Burbank, Ontario, Long Beach, and John Wayne-Orange County.

Los Angeles AFB and Aerospace Corporation personnel primarily use commercial flights available at LAX, although the other major airports in Southern California are used to some extent. In 1989, travel for Los Angeles AFB and Aerospace Corporation generated approximately 64,500 trips. Approximately 80 percent of the trips were to six destinations: Colorado Springs, Colorado; Washington, D.C.; Orlando, Florida; Seattle, Washington; San Jose, California; and Denver, Colorado.

3.1.4 Utilities

3.1.4.1 Water Supply

Total water consumption for Los Angeles AFB, Aerospace Corporation, and the housing areas is pre-summarized in Table 3.1.4-1. Potable water for Los Angeles AFB is provided by Southern California Water Company, the City of El Segundo, and the Los Angeles Department of Water and Power. Southern California Water Company serves 75 communities throughout California, including Area B. The company served approximately of 225,600 customers in 1989 with total sales of 51.24 billion gallons. Area A is served by the City of El Segundo. The City water department, with 4,500 connections, is a distribution system only. Water is purchased from Los Angeles Department of Water and Power (DWP), which services the three housing areas and Aerospace Corporation. The DWP supplied water to approximately 640,000 customers with sales of 208.11 billion gallons in 1989. Primary water sources for the DWP include the Owens Valley in Inyo County and purchased water from Metropolitan Water District (MWD), whose source is the California Water Project water from Northern California and the Colorado River.

Table 3.1.4-1
Summary of Utility Demands
for Los Angeles AFB and Aerospace Corporation
FY 1989

	Los Angeles AFB[1]	Los Angeles AFB Housing Areas	Aerospace Corporation
Water (gallons)	35,450,000	85,426,200	51,000,000
Wastewater (gallons)	25,390,000	38,084,600	30,350,000
Solid Waste (tons)	3,120	1,615	3,780
Electricity (kw)[2]	33,138,300	3,509,100	53,886,100
Natural Gas (MCF)[3]	66,900	23,900	84,850

Notes: [1]Includes Areas A and B and the Lawndale Annex.
[2]Kilowatt-hours.
[3]Thousand cubic feet.

3.1.4.2 Wastewater

Wastewater treatment for Los Angeles AFB, Aerospace Corporation, and the housing areas is provided by the County Sanitation Districts of Los Angeles. The County Sanitation Districts is a consortium of 27 separate districts which provide sewage collection, treatment, and disposal over a 600-square mile area and serve approximately 4 million persons. The Districts treated more than 500 millions gallons per day (MGD) at 11 treatment facilities. The total wastewater flows presented in Table 3.1.4-1 for Los Angeles AFB, Aerospace Corporation, and the housing areas represent less than 0.05 percent of the County Sanitation District's treatment capacity.

3.1.4.3 Solid Waste

The removal and disposal of solid waste generated at Los Angeles AFB and Aerospace Corporation is provided by local private contractors. Landfill management in Los Angeles County is under the auspices of the County Sanitation Districts of Los Angeles. There are presently 10 major landfill sites utilized by the County. A recent study estimated there were 152 million tons of remaining capacity at these landfills and that beginning in 1992, a daily disposal shortfall of 6,400 tons per day (tpd) would occur. Los Angeles County and many cities in the County have initiated major recycling programs to reduce solid waste generation. Total solid waste generation for Los Angeles AFB and Aerospace Corporation is presented in Table 3.1.4-1.

3.1.4.4 Energy

Electricity for Los Angeles AFB and Aerospace Corporation is provided by the Southern California Edison Company (SCE). SCE serves more than 3.9 million customers in a 50,000 square-mile service area covering much of central and southern California. The company had total retail electric sales of 67.6 billion kilowatt-hours (kWh) in 1989 with 20,136,000 (kW) of total capacity. Peak demand was 15,632,000 kW. Total electrical use for Los Angeles AFB and Aerospace Corporation is presented in Table 3.1.4-1.

Southern California Gas Company provides service to over 4 million customers in southern and central California including Los Angeles AFB and Aerospace Corporation. The company sold 1,032 Billion cubic feet of natural gas in 1989. Total natural gas use for the base and Aerospace Corporation is provided in Table 3.1.4-1.

3.1.5 Hazardous Materials/Waste Management

3.1.5.1 Hazardous Materials Storage and Handling

Los Angeles AFB utilizes and stores hazardous materials as defined by federal and California regulations. These materials include paints, thinners, petroleum products, and other commonly used materials associated with base operations.

There are fifteen active underground storage tanks located on Los Angeles AFB; eight in Area A, six in Area B, and one at Fort MacArthur. Thirteen of the tanks have been integrity tested and all but a recently discovered, 500-gallon underground gasoline storage tank in Area A owned by a private contractor, are registered and permitted. Integrity testing and permitting are currently being completed for this tank. The other seven underground storage tanks in Area A and two in Area B, vary in size from 3,000 to 4,600 gallons, and contain diesel fuel for back-up power generators. The diesel fuel tanks will be replaced with propane tanks to meet proposed South Coast Air Quality Management District rules restricting the use of diesel fuel in emergency generators. Following the conversion to propane, the underground tanks will be removed in compliance with California underground tank regulations. The tanks are scheduled for removal in 1991.

Three underground storage tanks associated with the base gas station in Area B are being replaced with new, technologically-advanced tanks to meet state and federal underground tank regulations. An oil-waste underground storage tank located in the floor of the gas station will also be removed and replaced with an aboveground tank. A 500-gallon gasoline tank at Fort MacArthur cannot be integrity tested because of the design of the tank. Removal is planned in 1990 and soil sampling will be conducted to insure that leakage has not occurred. The tank will be replaced with a vaulted aboveground storage tank. There are no aboveground or underground storage tanks associated with the military housing areas.

Aerospace Corporation uses and stores hazardous and acutely/extremely hazardous materials as defined by federal and California regulations. The materials include poisonous, toxic, pyrophoric, explosive, and corrosive materials. Radioactive materials are also used and stored by the Aerospace Corporation and inventoried quarterly. These materials are licensed by the State of California in accordance with the Nuclear Regulatory Commission (NRC) regulations.

Aerospace Corporation has ten active storage tanks, five aboveground and five underground. The five aboveground tanks consist of a 1,300-gallon argon tank, three 1,500-gallon liquid nitrogen storage tanks, and a 5,000 gallon liquid nitrogen storage tank. Each is permitted by the City of El Segundo. The five underground storage tanks, varying in size from 2,500 to 10,000 gallons, have been integrity tested and permitted. The tanks contain gasoline and diesel fuel and are constructed of double-wall steel with monitoring and back-flow protection to meet the state and federal underground storage tank regulations.

3.1.5.2 Hazardous Waste Management

Hazardous wastes generated at Los Angeles AFB are summarized in Table 3.1.5-1. An estimated 104 tons was generated in FY 1990 with hazardous waste disposal is handled by a private contractor. The wastes are collected onsite and held for less than 90 days in accordance with federal regulations. California-licensed waste haulers are utilized and the wastes are disposed of in accordance with California and federal regulations. A basewide remedial program to remove and replace polychlorinated biphenyl (PCB) transformers, PCB-contaminated transformers, and PCB capacitors has recently been completed. Future hazardous waste streams for the base will not include PCB materials.

Table 3.1.5-1
Summary of Hazardous Wastes Generated at Los Angeles AFB
1989

Hazardous Waste	Amount
Lead Paint	110 gallons
Paint	110 gallons
PCB (oil)	565 gallons
PCB (transformers, capacitors, and oil solids)	119,143 pounds
Asphalt	1.75 yards
Boiler treatment chemicals	30 gallons
Asbestos	11,046 pounds
Freon	120 gallons
Oil/freon mixture	300 pounds
Lithium batteries	30 pounds
Phosphoric acid	5 gallons
Dried asphalt sludge	1,000 pounds
Oil/waste separator sludge	1,310 gallons
Used oil	500 gallons

In the course of conducting daily operations including research and development experiments, Aerospace Corporation generates hazardous and extremely hazardous wastes. In 1989, Aerospace Corporation generated 29 tons of Resource Conservation and Recovery Act (RCRA)-regulated waste, 32 tons of non-RCRA waste, and 0.4 tons of extremely hazardous waste (as defined California hazardous waste regulations). Hazardous wastes and extremely hazardous generated at Aerospace Corporation are summarized in Tables 3.1.5-2 and 3.1.5-3, respectively. In compliance with state regulations, as a producer of extremely hazardous waste, Aerospace Corporation has an extremely hazardous waste disposal permit. Hazardous wastes are stored onsite for no longer than 90 days. The wastes are collected onsite and are transported by a California-licensed waste hauler to licensed hazardous waste disposal facilities in six states (California, Utah, Arkansas, Texas, Idaho, and Oregon) in accordance with California and federal regulations depending on the type of waste to be disposed of.

A remedial program to remove and replace polychlorinated biphenyl (PCB) transformers, PCB-contaminated transformers, and PCB capacitors has been recently completed at Aerospace Corporation. Future waste streams for Aerospace Corporation will not include PCB materials.

3.1.5.3 Installation Restoration Program Sites

The Installation Restoration Program (IRP) was initiated to implement Department of Defense (DOD) policy to comply with RCRA, Sections 6001, 6003, and 3012, and to provide a basis for remedial actions under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986 and Executive Order 12580. The IRP became part of the Defense Environmental Restoration Program (DERP) created under SARA.

The IRP was implemented to identify, report, and correct potential environmental deficiencies that could result in surface water, soil, and/or groundwater contamination, and the migration of contaminants beyond DOD installation boundaries. The IRP was originally developed as a four-phase program:

- Phase I - Problem Identification/Records Search;
- Phase II - Problem Confirmation and Quantification;
- Phase III - Technology Base Development; and
- Phase IV - Corrective Action.

As a result of the SARA amendments, the terminology and procedures were changed and reorganized into phases:

- Phase I - Preliminary Assessment/Site Inspection;
- Phase II - Remedial Investigation/Feasibility Study; and
- Phase III - Remedial Design/Remedial Action.

Table 3.1.5-2

Summary of Hazardous Waste Generated at Aerospace Corporation 1989

Hazardous Waste Type	Yards	Gallons	Pounds
Poison B Solid	1.96	22	165
Poison B Liquid	0.18	50	--
Combustible Liquid, N.O.S.	--	60	--
Flammable Solid, N.O.S.	0.09	--	65
Flammable Liquid, N.O.S.	0.30	2,372	--
Flammable Liquids, Corrosive, N.O.S.	--	160	--
Oxidizer, N.O.S.	0.88	182	--
Corrosive Solid, N.O.S.	0.43	10	30
Corrosive Liquid, N.O.S.	--	1,246	--
Alkaline Liquid, Corrosive Material, N.O.S.	0.21	420	10
Acid Liquid, N.O.S., Corrosive Material	0.18	292	10
Explosive Powder Devile Class C	--	--	5
ORM[2] Category A	0.03	80	--
ORM Category B	0.05	--	15
ORM Category C	--	--	30
ORM Category E - Liquid	--	271	13,439
ORM Category E - Solid	1.61	61	910
Asbestos - ORM Category E, California Regulated	22.00	225	37,685
TOTAL:	27.92	7431	52,424

Notes: [1]N.O.S. = Not otherwise specified.
[2]ORM = Other Regulated Material.

Source: Aerospace Corporation 1990.

Table 3.1.5-3

Summary of Extremely Hazardous Waste[1] Generated at Aerospace Corporation

Chemical[2]	Quantity Disposed of Quarterly/Annually[3,4]
Acetyl chloride	500 gm. /2 kg.
Aluminum chloride	4 lb. /16 lb.
Ammonium bifluoride	50 lb. /200 lb.
Antimony pentachloride	2 lb. /12 lb.
Arsenic and arsenic compounds	2 lb. /8 lb.
Arsenic contaminated trash	2 lb. /12 lb.
Benzidine and salts	200 gm. /2 kg.
Benzoyl chloride	1 lb. /4 lb.
Beryllium & beryllium compounds	8 lb. /42 lb
Biphenyl	1 lb. /6 lb.
Bromine	1 lb. /6 lb.
Cadmium and compounds	15 lb. /60 lb.
Calcium hydride	1 kg. /4 kg.
Calcium hypochlorite (5% in water)	1 gal. /2 gal.
Calcium, metal	2 lb. /12 lb.
Cuprous cyanide	1 lb. /4 lb.
Cyanide and cyanide compounds	15 lb. /60 lb.
Cyanide solid & solution	10 gal. /60 gal.
Dimethyl hydrazine	5 lb. /30 lb.
Dimethyldichlorosilane	2 qt./8 qt.
Ethoxyethyltrichlorosilane	100 ml. /600 ml.
Hydrazine	5 lb./30 lb.
Hydrochloric acid	10 gal./40 gal.
Hydroflouric acid	10 gal. /40 gal.
Lithium battery	25 lb./150 lb.
Magnesium chloride	25 lb. /150 lb.
Mercuric chloride	21 lb./150 lb.
Mercury (amalgamated)	5 lb./30 lb.
Methylhydrazine	5 lb. /15 lb.
Nitrosodimethylamine	100 gm. /400 gm.
Platinum compounds	100 gm. /400 gm.
Potassium cyanide	100 gm. /400 gm.
Sodium amide	100 gm. /400 gm.
Sodium cyanide	5 lb. /20 lb.
Sodium, metal	1 lb. /4 lb.
Stannic chloride	1 pt. /4 pt.
Thallium compounds (30-80%)	50 gm. /400 gm.
Zirconium chloride	1 lb. /4 lb.

Notes: [1]California-listed extremely hazardous as defined by California Administrative Coda Title 22 Section 66685.
[2]Materials are laboratory reagents; concentrations are 100 percent of commercially distributed product unless specified.
[3]Quantities listed are approximations based on quantities disposed of in 1989.
[4]All liquid quantities listed above are solidified in accordance with July 8, 1987 California List landfill ban.

Source: Aerospace Corporation, 1990.

The Preliminary Assessment/Site Inspection phase identified 15 sites on Los Angeles AFB; three in Area A, six in Area B, two at the Lawndale Annex, two at Fort MacArthur, three in Area A, six in Area B, and two at the Pacific Heights Housing Area. The Air Force is also managing a number of IRP sites on formerly government-owned property in the vicinity of the base. The following discussion describes the IRP sites on Los Angeles AFB.

Area A. The three sites in Area A include the pesticide runoff site; the underground fuel spill site; and the plating shop slump site. The pesticide runoff site is located near a former entomology shop. Soil borings taken at the point of discharge showed no contamination. A draft decision document will be submitted to the California Department of Health Services to justify the closing of the site with no further action. The underground fuel spill site is located in the southwest corner of Area A. The storage tank experienced a loss of approximately 25,800 gallons of No. 2 fuel oil in 1977. Because the tank was unsecured, it is not known if the loss was due to theft or tank failure. Soil and water sampling has shown some soil contamination, but no groundwater contamination. Interim remedial action is approved for FY 1991 for tank removal and sampling of the tank pit after excavation. At the third site in Area A, a sump was utilized in a contractor-operated plating shop from 1957 to 1960, when the operation closed. Because of the short duration the shop was open and the nature of the materials, it has been decided to go directly to the remedial action and remove the sump. Upon excavation, soil borings will be completed to check for contamination. This action is planned for FY 1991.

Area B. The six IRP sites at Area B include an Auto Hobby Seepage Pit and five abandoned underground storage tanks. The seepage pit received discharge from the Auto Hobby Shop. It was in use until 1976 when the hobby shop was connected to the sewer system. In 1985, the clarifier pump failed and wastewater was discharged into the seepage pit for a short duration. Waste and compounds that entered the seepage pit include oil, grease, detergents, and carbon-removing compounds. The remedial investigation found soil contamination but no groundwater contamination. Remedial action planned for FY 1991 includes removal of the pit and adjacent soils followed by soil and water resampling. The five abandoned underground storage tanks will be removed and soil sampling completed. Two of the tanks are scheduled for removal in FY 1990 and the other three are scheduled for removal in FY 1991. The Remedial Investigation found no contamination is associated with these five sites.

Lawndale Annex. There are two underground storage tanks at the Lawndale Annex. The two tanks are scheduled for removal in a combined excavation in FY 1991. No contamination associated with these tanks was found; soil samples will be taken after the excavation is completed.

Fort MacArthur. The two IRP sites at Fort MacArthur include a pesticide wastewater soakage pit and an underground storage tank site. The pesticide wastewater soakage pit is located in an area near the tennis courts next to the base housing. The area was used to discharge pesticide-contaminated rinse water to the storm drain or a gravel soakage pit in the early 1970s. The Remedial Investigation found no evidence of pesticide contamination. A draft decision document will be submitted to justify no further action at this site. The underground storage tank site consists of two 20,000-gallon concrete tanks, used as a backup supply of gasoline and diesel fuel. Installed in 1928, the tanks appear to have leaked for a long time and several thousand cubic yards of soil were contaminated with low levels of hydrocarbons and lead. An unconfined aquifer runs through the site and is also contaminated with low concentrations of the same contaminants. The decision-making process for the remedial action is currently ongoing. A notice of violation was issued by the City of Los Angeles Fire Department requiring site characterization. This has been completed and a final report is being prepared for submittal to the City. The site is planned for remediation in FY 1991.

Pacific Heights Housing Area. Two abandoned underground storage tanks at an old gas station and buried drums, were remediated during the construction of the Pacific Heights Housing Area. The remediation was completed as an emergency response with the concurrence of the California Department of Health Services. The Air Force is currently remediating sites on adjacent property (i.e., White Point City Park), that was formerly government-owned. The White Point City Park sites and the two Pacific Heights sites are classified by the state as one site; a final decision document will be submitted when the IRP sites at the park are remediated.

3.1.5.4 Asbestos

A complete asbestos survey in conformance Air Force regulations was conducted Los Angeles AFB. Asbestos is ubiquitous in Area A, Area B, and in some buildings at Fort MacArthur. It is primarily associated with the heating systems and its components, floor tiles, and the ceiling tiles. A management and operations plan is being implemented which stipulates an ongoing process of repairs to the buildings, removal, and quarterly inspections. The asbestos is not considered a health risk in its current state.

Asbestos is also ubiquitous in the buildings of Aerospace Corporation. The asbestos-containing materials in the buildings are similar to Los Angeles AFB buildings. As the buildings are being updated and renovated, the asbestos-containing materials are being removed. The asbestos is not considered a health risk.

3.1.6 Geology and Soils

3.1.6.1 Geology

Physiography and Topography. Los Angeles AFB lies within the Los Angeles Basin, a topographic lowland plain with a northwest trending axis approximately 50 miles in length and 20 miles wide. The stratigraphy of the Basin is characterized by both unconsolidated and indurated sediments ranging from the Jurassic to Recent age.

Regional Geology. Bedrock in the vicinity of Los Angeles AFB consists of metamorphic rocks of the Franciscan and Catalina Schist Formation. These units are impervious and non-water-bearing and are overlain uncomformably by units of Miocene age. The Miocene Monterey Formation consists of massive shale and claystone units.

The youngest deposits underlying the area are recent alluvial deposits. These deposits consists of interbedded fine to coarse sands and silty sands, with lenses of sandy clay. The deposits are up to 200 feet and exhibit thin beds that are relatively densely cemented. The clay lenses are discontinuous and range in thickness from approximately 2 inches to 5 feet.

Seismicity. No faults can be observed at the Los Angeles AFB/Aeropsace Corporation complex or at the three housing areas. The most likely earthquake-generating faults in the Los Angeles area include the Newport-Inglewood, Palos Verde, San Fernando-Sierra Madre, and San Andreas faults (Figure 3.1.6-1). The two major faults considered most likely to rupture and possibly cause strong ground

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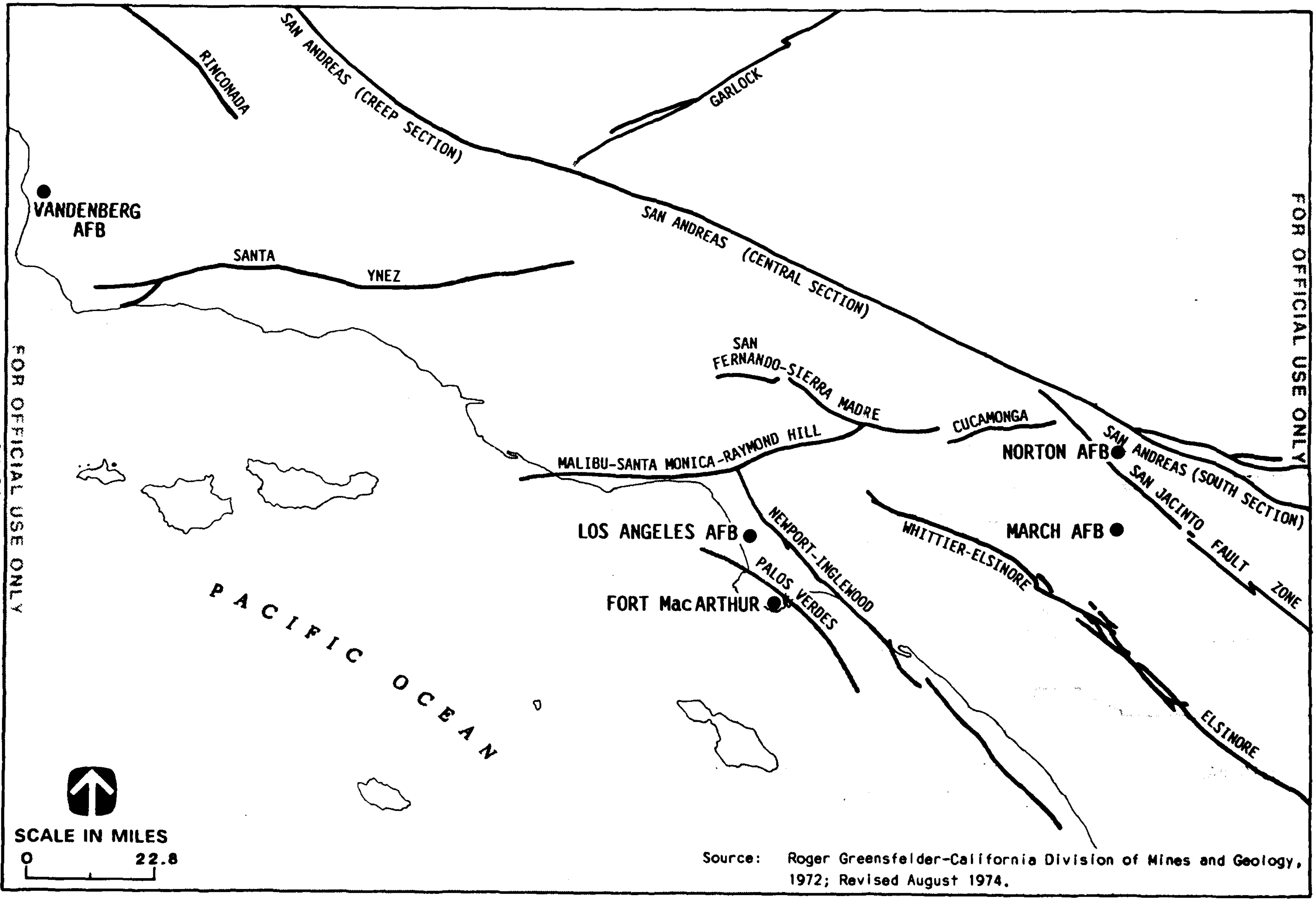

Source: Roger Greensfelder-California Division of Mines and Geology, 1972; Revised August 1974.

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FIGURE 3.1.6-1 PRINCIPAL ACTIVE FAULTS IN SOUTHERN CALIFORNIA shaking are the Palos Verde and Newport-Inglewood faults. Within historic records, the Newport-Inglewood fault had a seismic shift which resulted in an earthquake of a 7.0 magnitude in 1933.

3.1.6.2 Soils

Soil borings at Area B, and the Lawndale Annex indicate that 1 to 3 feet of fill material overlie the natural soil present. The predominant soil is the Oceano Association which has a moderate potential for water erosion and a very high susceptibility to wind erosion. This soil is very permeable to water. The majority of this association is paved over with buildings, parking lots, and streets.

At the Fort MacArthur, Pacific Crest, and Pacific Heights Housing Areas, the predominant soil is the Diablo-Altamont Association. This soil has a moderate potential for water erosion and a high susceptibility to wind erosion. This soil also has a sandy texture which enhances its capability to adsorb water. However, the soils in these areas are largely paved over with buildings, parking lots, and streets.

3.1.7 Water Resources

3.1.7.1 Groundwater

Los Angeles AFB and Aerospace Corporation. Los Angeles AFB lies within the Los Angeles Basin, which is a topographic lowland and plain with a northwest trending axis approximately 50 miles long and 20 miles wide. The stratigraphy of the Los Angeles Basin is characterized by both unconsolidated and indurated sediments of Jurassic to Recent age. There are four geologic formations that contain groundwater aquifers underlying the Basin.

Currently, the Air Force owns the rights to all groundwater resources below Los Angeles AFB. Consequently, the Air Force retains the right to withdraw groundwater. Currently, the only groundwater withdrawals at Los Angeles AFB are to test for possible contamination.

3.1.7.2 Surface Water

The areas surrounding Los Angeles AFB (Areas A and B and the Lawndale Annex) and Aerospace Corporation are well developed industrial/commercial complexes, transportation routes, and residential areas. There are no streams or rivers in this portion of Los Angeles County. All surface water, unless received by the storm drainage system, drain toward the Dominguez Channel to the east which eventually empties into Long Beach Harbor and the Pacific Ocean. The three housing areas are positioned on bluffs, and the topographic gradient decreases to west and south of these areas. Overland run-off would drain to the Pacific Ocean unless collected by the storm drain system.

3.1.8 Air Quality

3.1.8.1 Regulatory Setting

Pollutant emissions from sources and atmospheric interactions determine the quality of air, and the effects on receptors establish the extent to which air quality is degraded. Air quality in a given location is described by the concentration of various pollutants in the atmosphere which are expressed in units of concentration, generally parts per million (ppm) or micrograms per cubic meter ($\mu g/m^3$).

The significance of a pollutant concentration is determined by comparing it with an appropriate federal and/or state ambient air quality standard. These standards represent the allowable atmospheric concentrations at which public health and welfare are protected and include a reasonable margin of safety. National ambient air quality standards (NAAQS) have been established by the EPA for the following pollutants: ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter smaller than 10 micrometers in diameter (PM_{10}), and lead (Table 3.1.8-1).

The federal Clean Air Act, as amended in August 1977, requires that air pollutant emissions from various sources, such as the operations at Los Angeles AFB and Aerospace Corporation facilities, comply with the NAAQS. The Clean Air Act also delegates to each state the responsibility to establish air quality rules, regulations, and standards that are at least as restrictive as the federal requirements. The California Air Resources Board (CARB) has established air quality standards which are more stringent than some of the NAAQS, and has also established standards for pollutants for which there are currently no federal standards (Table 3.1.8-1).

The Clean Air Act gives state and local agencies the authority to establish air quality rules and regulations. Rules adopted by local air pollution control districts and accepted by the CARB are included in the state implementation plan (SIP). When the SIP is approved by the EPA, these rules become federally enforceable. The South Coast Air Quality Management District (SCAQMD) is the local agency responsible for managing air quality, including regulating sources, permitting, and implementing new source review regulations, in the four-county Southern California area (i.e., Los Angeles, Orange, Riverside, and San Bernardino counties). This area is defined as the South Coast Air Basin.

An area is designated as being nonattainment for a particular pollutant if ambient concentrations in that area are above the corresponding standard. The South Coast Air Basin is classified nonattainment for ozone, carbon monoxide, nitrogen dioxide, and particulates. It is classified attainment for sulfur dioxide. The SCAQMD implemented a revised Air Quality Management Plan (AQMP) in March 1989, which is designed to bring the Basin into compliance with the NAAQS for NO_x by 1996, CO by 1997, and ozone and PM_{10} by the year 2007. The AQMP identifies over 125 specific control measures to be implemented in three stages to further reduce emissions in the Basin, including a more stringent new source review regulation.

3.1.8.2 Existing Regional Air Quality

Climate and Meteorology. The climate of the South Coast Air Basin, an approximately 6,600-square-mile area of Southern California, is classified as Mediterranean and characterized by a pattern of cool, wet winters and warm, dry summers. Typical dry summers are caused by a semi-permanent high-pressure cell located over the eastern Pacific Ocean. This system generally blocks storms from moving into the basin during the summer months.

Temperatures in the Los Angeles area range from 29 to 101°F, with a mean temperature of about 63°F. Average annual rainfall in the area is approximately 12 inches. Surface winds in the daytime are typically sea breezes flowing inland at approximately 5 to 8 miles per hour (mph), with the pattern reversed at night. This wind regime is altered greatly during Santa Ana wind conditions when very dry southerly winds can blow in excess of 50 mph.

Table 3.1.8-1

National and California Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards[1] Concentration[3]	National Standards[2] Primary[4]	Secondary[5]
Ozone	1 Hour	0.09 ppm (180 $\mu g/m^3$)	0.12 ppm (235 $\mu g/m^3$)	Same as Primary Standard
Carbon Monoxide	8 Hours	9.0 ppm (10 mg/m^3)	9.0 ppm (10 mg/m^3)	--
	1 Hour	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)	--
Nitrogen Dioxide	Annual Average	--	0.053 ppm (100 $\mu g/m^3$)	Same as Primary Standard
	1 Hour	0.25 ppm (470 $\mu g/m^3$)	--	
Sulfur Dioxide	Annual Average	--	80 $\mu g/m^3$ (0.03 ppm)	--
	24 Hours	0.05 ppm[6] (131 $\mu g/m^3$)	365 $\mu g/m^3$ (0.14 ppm)	--
	3 Hours	--	--	1,300 $\mu g/m^3$ (0.5 ppm)
	1 Hour	0.25 ppm (655 $\mu g/m^3$)	--	--
Suspended Particulate Matter (PM_{10})	Annual Geometric Mean	30 $\mu g/m^3$	--	--
	24 Hours	50 $\mu g/m^3$	150 $\mu g/m^3$	Same as Primary Standards
	Annual Arithmetic Mean	--	50 $\mu g/m^3$	
Sulfates	24 Hours	25 $\mu g/m^3$	--	--
Lead	30-day Average	1.5 $\mu g/m^3$	--	--
	Calendar Quarter	--	1.5 $\mu g/m^3$	Same as Primary Std.
Hydrogen Sulfide	1 Hour	0.03 ppm (42 $\mu g/m^3$)	--	--
Vinyl Chloride (chloroethene)	24 Hour	0.010 ppm ($\mu g/m^3$)	--	--
Visibility Reducing Particles	1 Observation	Insufficient amount to reduce the prevailing visibility[7] to less than 10 miles when the relative humidity is less than 70%.	--	--

Source: California Air Resources Board 1988.

Table 3.1.8-1, Page 2 of 2

Notes: [1]California standards for ozone, carbon monoxide, sulfur dioxide (1 hour), nitrogen dioxide, and particulate matter - PM_{10}, are values that are not to be exceeded. The sulfates, lead, hydrogen sulfide, vinyl chloride, and visibility reducing particles standards are not to be equaled or exceeded.

[2]National standards, other than ozone and those based on annual averages or annual arithmetic means, are not to be exceeded more than once a year. The ozone standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above the standard is equal to or less than one.

[3]Concentration expressed first in units in which it was promulgated. Equivalent units given in parenthesis are bases upon a reference temperature of 25° C and a reference pressure of 760 mm of mercury. All measurements of air quality are to be corrected to a reference temperature of 25°C and a reference of pressure of 760 mm of mercury (1,013.2 millibar); ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

[4]National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect public health. Each state must attain the primary standards no later than three years after that state's implementation plan is approved by the EPA.

[5]National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant. Each state must attain the secondary standards within a "reasonable time" after the implementation plan is approved by the EPA.

[6]At locations where the state standards for ozone and/or suspended particulate matter are violated. National standards apply elsewhere.

[7]Prevailing visibility is defined as the greatest visibility which is attained or surpassed around at least half of the horizon circle, but not necessarily in continuous sectors.

Prevailing winds in the South Coast Air Basin throughout the year are from the northwest with a mean wind speed of approximately 9 miles per hour. Prevailing winds are affected by local and regional weather conditions and topography (mountains). Santa Ana winds occur when northerly or easterly winds flow from Southern California deserts, through the Santa Ana and other river canyons, toward the coast. These dry, strong winds can travel at speeds greater than 35 miles per hour; these winds generally occur between October and March and can last for several days. The area is almost completely enclosed by mountains on the north and east. This geographic configuration and the location relative to the Pacific Ocean allows the wind direction to change daily from offshore at night to onshore during the day.

During the winter, fog from the ocean can move inland or fog can develop locally. Maritime fog develops when temperature inversions occur at elevations less than 1,600 feet. Between May and October, stratus from inversions at greater than 1,600 feet above sea level occur often in the Basin.

Air quality within the basin is affected greatly by climatic variations. The climate of the basin is mild and characterized by cool sea breezes. Occasionally, the mild climate is interrupted by periods of extremely hot weather, winter storms, or Santa Ana winds, which transport hot air into the basin from inland deserts. The characteristics of some weather patterns within the basin serve to disperse air pollutants better than others. The meteorological factors that are most important in the dispersion of air pollutants are wind speed and direction, and atmospheric temperature inversions. During the spring and early summer, pollutants are usually blown out of the basin into the inland desert areas. In the late summer and winter months, wind speeds are typically very light which allows a build-up of air pollutants to occur in the basin. This build-up of air pollutants is further concentrated if a temperature inversion blocks the vertical dispersion of air pollutants. Usually, the temperature of the air decreases with altitude, however an inversion occurs when the temperature of an air mass increases with altitude. When an inversion occurs, the vertical movement of air stops and pollutants are "trapped" below an altitude that is often less than 1,000 feet. Inversion layers and the buildup of air contaminants typically occur in the area in the late summer months.

Existing Air Quality. The air quality in the South Coast Air Basin is very poor. However, it is better in the coastal areas, where Los Angeles AFB is located, then in the interior areas of the Basin. Existing air quality near Los Angeles AFB can be estimated by air monitoring measurements made at the SCAQMD monitoring station in Hawthorne, approximately 1 mile southeast of Los Angeles AFB. The closest monitoring station to the three housing areas located in North Long Beach, approximately 4 miles northeast. A summary of the maximum pollutant concentrations occurring from 1986 to 1988 at the Hawthorne and North Long Beach stations is presented in Table 3.1.8-2. The maximum concentrations and number of days exceeding federal and state regulations for each pollutant at a monitoring station in Los Angeles County and the South Coast Basin are also provided for comparison. The ambient air quality standards were exceeded for ozone and carbon monoxide in all three years at both Hawthorne and North Long Beach. The one-hour average state standard for nitrogen dioxide was exceeded in 1988 at Hawthorne and in all three years at North Long Beach, as was the state standard for PM_{10}. Sulfur dioxide is the only pollutant that did not exceed standards.

3.1.8.3 Air Pollutant Emission Sources

Emissions inventories for Los Angeles County and the South Coast Air Basin are presented in Tables 3.1.8-3 and 3.1.8-4. Emissions data are provided for PM_{10}, SO_x, NO_x, CO, and reactive organic gases,

Table 3.1.8-2

**Summary of Air Quality Monitoring Data for Los Angeles AFB Area
1986-1988**

	Hawthorne			North Long Beach			Los Angeles[1] County			South Coast[1] Air Basin		
	1986	1987	1988	1986	1987	1988	1986	1987	1988	1986	1987	1988
<u>Ozone</u>												
Maximum Concentration (ppm/1 hour)[2]	.19	.20	.22	.18	.17	.16	.35	.33	.34	.35	.33	.35
Days Exceeding Standard												
Federal (>.12 ppm, 1 hour)	8	3	5	10	4	7	159	148	165	164	162	178
State (>.09 ppm, 1 hour)	19	10	11	29	11	18	209	190	205	217	196	216
<u>Carbon Monoxide</u>												
Maximum Concentration												
(ppm/8 hour)	15.0	14.1	15.9	10.3	9.4	10.3	19.7	19.6	27.5	19.7	19.6	27.5
(ppm/1 hour)	21	22	23	13	13	13	27	26	32	27	26	32
Days Exceeding Standard												
Federal (>9.0 ppm, 8 hours)	23	22	30	5	1	2	57	48	64	58	48	65
(>35 ppm, 1 hour)	0	0	0	0	0	0	0	0	0	0	0	0
State (>9.0 ppm, 8 hours)	23	22	30	5	1	2	57	48	64	58	48	65
(>20 ppm, 1 hour)	1	2	4	0	0	0	11	11	21	11	12	21
<u>Nitrogen Dioxide</u>												
Annual Average (ppm)	.042	.035	.036	.053	.043	.047	.05	.045	.048	.046	.042	.045
Maximum Concentration (ppm/1 hour)	.23	.23	.27	.26	.26	.28	.33	.42	.54	.33	.42	.54
Days Exceeding Standard												
Federal (.053 ppm, Annual Average)	0	0	0	0	0	0	0	0	0	0	0	0
State (>.25 ppm, 1 hour)	0	0	1	1	1	1	9	7	10	9	7	11

Table 3.1.8-2, Page 2 of 2

	Hawthorne			North Long Beach			Los Angeles[1] County			South Coast[1] Air Basin		
	1986	1987	1988	1986	1987	1988	1986	1987	1988	1986	1987	1988
<u>Sulfur Dioxide</u>												
Annual Average (ppm)	.005	.004	.005	.008	.006	.007	.004	.003	.004	.003	.003	.003
Maximum Concentration												
(ppm/24 hours)	.019	.014	.024	.029	.023	.024	.039	.025	.036	.039	.025	.036
(ppm/1 hour)	.09	.03	.15	.07	.06	.05	.13	.09	.15	.13	.09	.15
Days Exceeding Standard												
Federal (>.03 ppm, Annual Average)	0	0	0	0	0	0	0	0	0	0	0	0
(>.14 ppm, 24 hours)	0	0	0	0	0	0	0	0	0	0	0	0
State (>.05 ppm, 24 hours)	0	0	0	0	0	0	0	0	0	0	0	0
(>.25 ppm, 1 hour)	0	0	0	0	0	0	0	0	0	0	0	0
<u>Total Suspended Particulates</u>												
Annual Geometric Mean (ppm)	69.5	76.5	79.7	81.1	86.3	85.2	--[3]	--	--	--	--	--
Maximum Concentration												
($\mu g/m^3$/24 hours)[4]	182	150	248	174	174	292	276	263	306	385	648	564
Days Exceeding Standard												
Federal (>260 $\mu g/m^3$, 24 hours)	0	0	0	0	0	2	1	1	2	6	14	11
State (>150 $\mu g/m^3$, 24 hours)	2	0	3	3	5	4	63	119	6	102	166	66
<u>PM_{10}</u>[5]												
Annual Arithmetic Mean (ppm)	--	--	--	55.7	49.0	66.1	--	--	--	--	--	--
Maximum Concentration												
($\mu g/m^3$/24 hours)	--	--	--	136	113	149	211	188	149	294	219	289
Days Exceeding Standard												
Federal (>150 $\mu g/m^3$, 24 hours)	--	--	--	0	0	0	2	3	0	8	9	11
State (>50 $\mu g/m^3$, 24 hours)	--	--	--	21	16	8	48	51	56	60	58	65

Notes: [1]Maximum recorded in Los Angeles County and South Coast Air Basin.
[2]Parts per million.
[3]Not monitored.
[4]Micrograms per cubic meter of air.
[5]Fine particulates with an aerodynamic diameter of 10 micrometers or less.

Source: California Air Resources Board 1986, 1987, and 1988.

LT-3183
07/03/90

Table 3.1.8-3

Emissions Inventory for Los Angeles County, South Coast Air Basin 1985

Source Category	Emissions (Tons/Day) TOG	ROG	CO	NO_x	SO_x	PM
STATIONARY						
Fuel Combustion	34.33	13.18	51.07	194.27	13.77	8.77
Waste Burning	1.34	.93	3.19	.73	.80	.85
Solvent Use	301.42	269.29	.00	.02	.00	.59
Petroleum Process, Storage, & Transfer	246.19	63.36	3.40	9.75	25.32	4.01
Industrial Processes	16.42	14.06	.16	7.63	7.11	10.62
Miscellaneous Processes	246.53	37.94	70.35	7.35	1.65	942.07
Subtotal	846.22	398.76	128.17	219.75	48.64	966.92
MOBILE						
On Road Vehicles	414.71	384.71	3,190.78	408.47	23.08	55.72
Other Mobile	42.40	41.08	287.93	89.03	24.34	7.95
Subtotal	457.10	425.79	3,478.71	497.50	47.43	63.68
TOTAL:	1,303.33	824.56	3,606.88	717.25	96.07	1,030.59

Source: South Coast Air Quality Mangement District, 1989.

Table 3.1.8-4
Stationary Source Emissions for
Los Angeles Air Force Base and Aerospace Corporation

	Tons Per Year				
	HC	CO	NO_x	SO_x	Particulates
Los Angeles AFB	3.7	0.53	3.13	0.02	0.39
Housing areas	0.09	0.24	1.42	0.01	0.18
Aerospace Corporation	17.0	0.42	7.3	0.12	0.58

a measure of reactive hydrocarbons, and total organic gases, a measure of reactive and non-reactive organic gases. Los Angeles County generates more than one-half of the total emissions in the basin.

In the South Coast Air Basin and Los Angeles County, the majority of stationary source emissions for NO_x were from fuel combustion, while the majority of ROG emissions were from solvent use (e.g., surface coating, industrial solvent use, and consumer products). The predominant source of emissions of CO and NO_x in the Basin is from mobile sources. Mobile sources account for approximately 87 percent of the total CO emissions in the Basin, 59 percent of the NO_x emissions, and 46 percent of the ROG emissions.

For comparison, Los Angeles AFB and Aerospace Corporation emissions from stationary sources in 1989 are presented in Table 3.1.8-4.

Los Angeles AFB has 21 permits from the SCAQMD for various stationary sources, including boilers; a paint spray booth and paint spray enclosure; and a gasoline dispensing system. Aerospace Corporation has six permits from the SCAQMD, including permits for degreasers, gasoline fueling equipment, an organic coating dry equipment, a paint booth/enclosure, and several internal combustion engines.

3.1.9 Noise

3.1.9.1 Regulatory Setting

On the federal level, the Noise Control Act of 1972 (PL92-574) as amended by the Quiet Communities Act of 1978 (PL95-609), created an Office of Noise Abatement and Control (ONAC) within the EPA with the mandate to identify major sources of noise; regulate those identified sources of noise; regulate those identified sources; propose aircraft noise standards to the FAA; label noisy products; engage in research, technical assistance, and dissemination of public information; and coordinate all federal noise control activities. Under this act, the EPA provides noise-level guidelines to protect public health and welfare with a sufficient margin of safety. The guidelines provide a basin for assessing the effectiveness of noise regulations and land use policies.

At the state level, the California Office of Noise Control has developed Noise Compatibility Guidelines for evaluating land use compatibility with different noise levels. The guidelines evaluate noise levels for various land uses and determine the acceptability or compatibility of a noise level with a specific land use. These guidelines are consistent with EPA noise-level guidelines.

On the local level, the City of El Segundo Comprehensive Plan Noise Element, identifies noise sources and related impacts and establishes methods for noise abatement. The purpose of the Noise Element is to evaluate noise levels and develop specific policies to reduce or mitigate noise problems. These policies are in compliance with federal and state standards.

3.1.9.2 Existing Noise Sources

The principal source of noise in the vicinity of Los Angeles AFB and Aerospace Corporation is vehicular traffic on Interstate 405 (San Diego Freeway) and major arterial streets adjacent to the facilities, including Aviation Boulevard, El Segundo Boulevard, and Rosecrans Avenue. Vehicular noise consists of the varied sounds of horns, engines, tire squeals, and sirens. Day/night equivalent noise levels (L_{dn}) typically range from 70 to 75 decibels (db) at a distance of 50 feet from the highways. The noise levels decrease with increasing distance from the highways to 65 to 60 db at 150 to 200 feet from the traffic sources. Figure 3.1.9-1 presents maximum A-weighted sound levels of common noise sources.

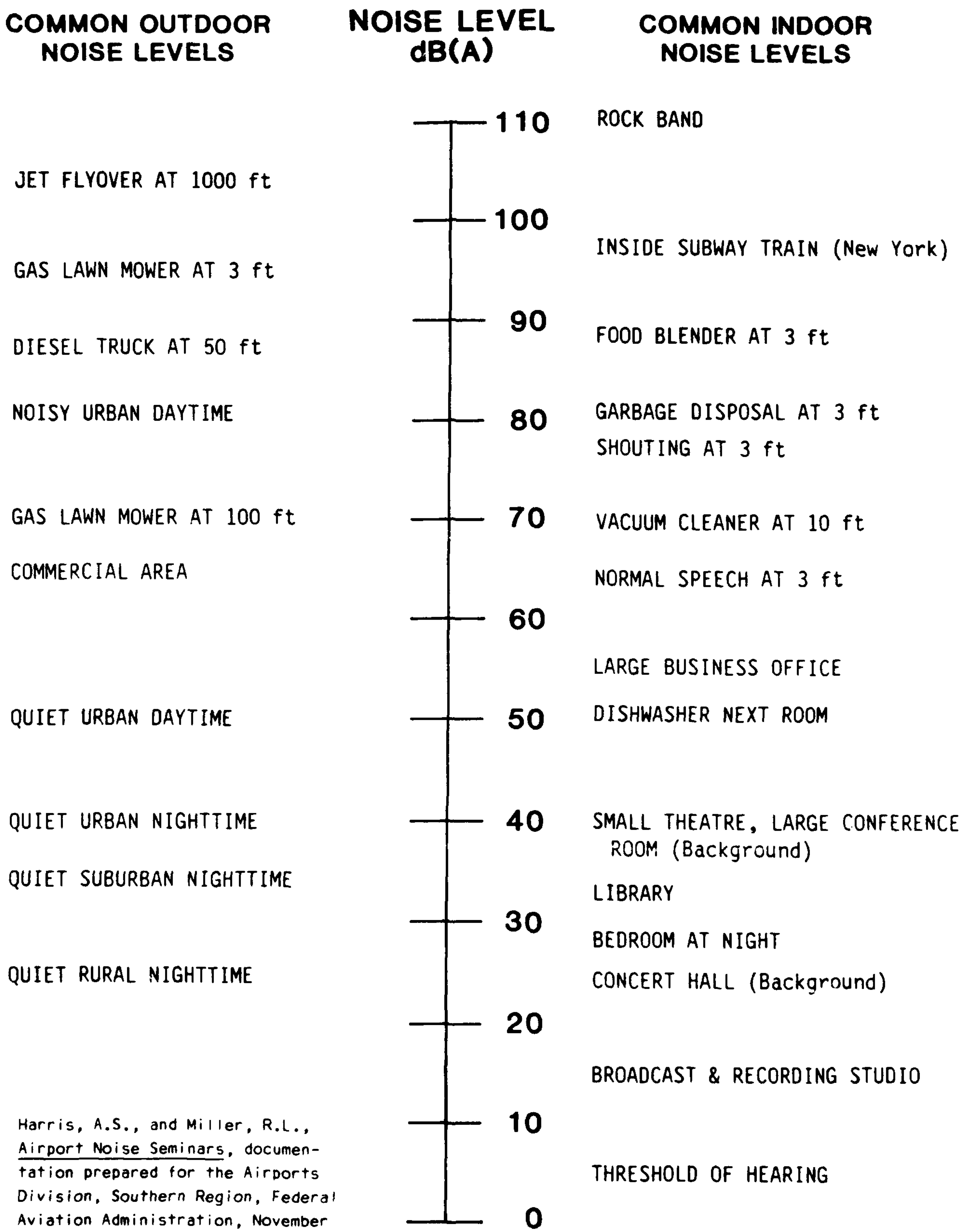
A secondary noise source is the aircraft traffic at the Los Angeles International Airport. The airport is approximately 1.5 miles north of the Los Angeles AFB/Aerospace Corporation complex. L_{dn} noise levels from airport traffic operations in the vicinity of the Los Angeles AFB range from 60 db to 65 db.

3.1.10 Biological Resources

3.1.10.1 Vegetation

Los Angeles AFB and Aerospace Corporation. Los Angeles AFB (Areas A and B and the Lawndale Annex) and Aerospace Corporation are located in an urban environment. No major forms of native vegetation occur at either location as buildings and parking lots cover a majority of the areas. Vegetation primarily consists of landscaping (e.g., lawns, shrubs, and trees) with non-native vegetative species. The areas adjacent to Los Angeles AFB and Aerospace Corporation facilities are a similar urban environment landscaped with non-native species. A highly disturbed area of naturalized weedy species occurs on the right-of-way of the SCE switching station adjacent to the Lawndale Annex.

Housing Areas. The Fort MacArthur, Pacific Heights, and Pacific Crest Housing Areas consist almost entirely of buildings, paved areas, and lawns. The sites do not include any significant forms of native vegetation. Landscape vegetation includes ornamental shrubs adjacent to the residential structures and a large stand (approximately 110 trees) of Washington palms (*Washingtonia robusta*), that surround the parade grounds on Fort MacArthur. The areas surrounding the housing areas contain no major forms of native vegetation. A tidal area below the bluff at Fort MacArthur has been re-created as a nature preserve for the West Channel/Cabrillo Beach project. A small amount of native vegetation has been reestablished in the area. A small, highly disturbed area of weedy species occurs adjacent to the Pacific Heights Housing Area to the south in White Point City Park.



Source: Harris, A.S., and Miller, R.L., Airport Noise Seminars, documentation prepared for the Airports Division, Southern Region, Federal Aviation Administration, November 1977.

BCM014 BC1.012

FIGURE 3.1.9-1 COMMON ENVIRONMENTAL SOUND LEVELS, IN dBA

3.1.10.2 Wildlife

Los Angeles AFB and Aerospace Corporation. Wildlife diversity is low at Los Angeles AFB (Areas A and B and the Lawndale Annex) and Aerospace Corporation because of the limited existing habitat and extensive human activity. Typical urban birds that may occur include the English sparrow (*Passer domesticus*), mourning dove (*Zenaidura macroura*), and raven (*Corvus corox*). Mammalian species are limited to desert cottontail rabbits (*Sylvilagus audobonii*), mice (e.g., *Peromyscus maniculatus*), and possibly moles (e.g., *Scapanus townsendi*). Herpetofauna may include the western garter snake (*Thamnophis sirtalis*), western skink (*Eumeces skilitonianus skilitonianus*), western toad (*Bufo boreas*), and western fence lizard (*Sceloporus occidentalis*). It is assumed the same species also inhabit the urban environment which extends in all directions surrounding the Los Angeles AFB/Aerospace Corporation complex.

Housing Areas. Landscaping at the three housing areas (e.g., shrubs and lawns) provides limited habitat for wildlife with the exception of the large stand of Washington palms at Fort MacArthur, which supports a significant bird population. Human activities and restricted habitat limit wildlife diversity in these areas, and species that have a high tolerance for human activity can be expected to occur. Typical species expected include the house mouse (*Mus musculus*), desert cottontail rabbit, California ground squirrels (*Spermophilus beechevi*), western fence lizards (*Sceloporus occidentalis*), and gopher snakes (*Pituophis melanoleucus*). The areas surrounding the housing areas support similar wildlife. Because of the close proximity of these areas to the Pacific Ocean, there are a number of resident and migratory waterfowl species present.

3.1.10.3 Threatened and Endangered Species

Los Angeles AFB, Aerospace Corporation, and Housing Areas. Listed and proposed endangered and threatened species and candidate species that may occur in the vicinity of Los Angeles AFB and the housing areas are presented in Table 3.1.10-1. None of these species is expected to occur on any of the sites because of the absence of native habitat.

3.1.11 Cultural and Paleontological Resources

3.1.11.1 Prehistoric Resources

Prehistoric site types in the region include villages, camps, shell middens, and hunting and milling locations. Sites range in age from the Millingstone Period (5000 B.C.-1500 B.C.) to the Late Prehistoric Period (A.D. 800-A.D. 1542). Areas A and B were developed in the 1950s, and no surveys have been conducted. Any prehistoric resources which may occur at these locations are presently covered with asphalt. Cultural resource surveys have not been conducted at the Lawndale Annex because the property was previously developed at the time it was acquired by the Air Force. The California SHPO determined that no surveys needed to be conducted, but has recommended cultural monitoring if any ground-disturbing activities occur in the future. Approximately 90 percent of the Whites Point area which includes the Pacific Heights Housing Area, 85 percent of the Pacific Crest Housing Area, and 70 percent of Fort MacArthur have been inventoried for cultural resources.

One prehistoric site was previously identified in the Pacific Heights Housing Area. This site consisted of a shell and lithic scatter and was located on several adjoining terraces. Two sites were recorded in the Pacific Crest Housing Area. A testing and evaluation project for prehistoric resources was

Table 3.1.10-1

Listed and Proposed Endangered and Threatened Species and Candidate Species That May Occur in the Vicinity of Los Angeles AFB, Los Angeles County, California

COMMON NAME	SCIENTIFIC NAME	FEDERAL* STATUS
LISTED SPECIES		
Invertebrates		
El Segundo blue butterfly	*Euphilotes battoides allyni*	(E)
Palos Verdes blue butterfly	*Glaucopsyche lygdamus palosverdesensis*	(E)
CANDIDATE SPECIES		
Birds		
California gnatcatcher	*Polioptila californica*	(2)
Reptiles		
San Diego horned lizard	*Phrynosoma coronatum blainvillei*	(2)
Mammals		
Southern marsh harvest mouse	*Reithrodontomys megalotis limicola*	(2)
Pacific little pocket mouse	*Perognathus longimembris pacificus*	(2)
Invertebrates		
Dorothy's El Segundo dune weevil	*Trigonoscuta dorothea dorothea*	(2)
Lange's El Segundo dune weevil	*Onychobaris langei*	(2)
Globose dune beetle	*Coelus globosus*	(2)
Henne's eucosman moth	*Eucosma hennei*	(2)
Belkin's dune tabanid fly	*Brennania belkini*	(3c)
Plants		
Coastal dunes mil-vetch	*Astragalus tener* var. *titi*	(1)
Beach spectable-pod	*Dithyrea maritima*	(2)
California Orcutt grass	*Orcuttia californica*	(1)
Lyon's pentachaeta	*Pentachaeta lyonii*	(1)
Desert Christmas tree	*Pholisma arenarium*	(3c)

Notes: *(E) -Endangered
(T) -Threatened
(1) -Category 1: Taxa for which the U.S. Fish and Wildlife Service has sufficient biological information to support a proposal to list as endangered or threatened.
(2) -Category 2: Taxa for which existing information may warrant listing, but for which substantial biological information to support a proposed rule is lacking.
(3c) -Category 3(c): Taxa more common than previously thought, no longer being considered for a listing proposal at this time.

Source: U.S. Fish and Wildlife Service, 1990.

implemented in both areas prior to housing construction. Several prehistoric sites were tested and mitigated; these prehistoric sites no longer exist.

The Gabrielino Indians traditionally occupied this area of the Southern California coast. Several historic village locations, some with archaeological materials, have been identified within 10 miles of Whites Point. Rock art, cremation pits, and ceremonial enclosures may be associated with large coastal village sites and would be of concern to Gabrielino groups. The California Native American Heritage Commission has been contacted in order to identify specific groups with concerns in the project areas.

3.1.11.2 Historic Resources

Area A of Los Angeles AFB consists of buildings constructed between 1957 and 1959. None of the buildings meet the 50-year age requirement for historic structures. Area B consists primarily of buildings constructed between 1953 and 1959. Three buildings (Nos. 215, 223, and 229) were constructed in 1942 and are considered historic structures. These buildings are rectangular with hip roofs; the building interiors have been extensively modified for use as offices and shops. None of these three buildings are considered eligible for the National Register of Historic Places (NRHP). Existing structures at the Lawndale Annex were constructed in 1958 and are not considered historic structures because they do not meet the 50-year age requirement.

The Middle Reservation of Fort MacArthur contains a National Register Historic District and the Trona Plant, an NRHP-eligible site. The National Register Historic District consists of 40 acres and includes the 100 Varas tract and Hide House location (1823); the original 500 Varas tract established by the Mexican government in 1846; and Fort MacArthur, established as a military reservation in 1888 and representing military architecture from 1916 to 1919 and 1924 to 1934. The district contains 30 standing structures from the Fort MacArthur period representing Mission Revival, California Craftsman bungalow, and Spanish Colonial Revival architectural styles. The Trona Plant (built 1903-1906) is south of the district and is an example of an industrial process and as unique architecture with its exposed timber construction. No historic structures or archaeological sites occur in the Pacific Crest and Pacific Heights area.

3.1.11.3 Paleontological Resources

Two geological formations occur in the vicinity of Los Angeles AFB and Aerospace Corporation: the Lakewood formation and Older Dune Sand. Both deposits are Late Pleistocene and may contain vertebrate and invertebrate fauna. Several paleontological localities within six mile of these areas have been identified and have produced diverse invertebrate fauna as well as typical Rancholabrean terrestrial vertebrate assemblages.

The geological formation, with surface exposures near Fort MacArthur, is the Miocene Monterey Formation. Two paleontological localities containing Pleistocene marine fauna are located east of the Fort MacArthur near the base of the bluffs.

The geological formations, with surface exposures near the Pacific Crest and Pacific Heights Housing Areas, are the Altamira Member of the Miocene Monterey Formation and Upper Pleistocene deposits. The Altamira Member consists of shales, sandstones, and siltstones containing marine fossils. Fish scales, fish bone, a shark's tooth, and bivalve mollusk were identified in the northern part of the Pacific Heights and Pacific Crest areas. Four paleontological localities have been identified within

1 mile of the two housing areas; three are in the cliff edge south of the Whites Point area. Paleontological materials in the Altamira deposits consists of Miocene marine fauna such as whale, sea lion, porpoise, fish, birds, fossil seaweed, and land plants. Upper Pleistocene deposits similar in age to the Palos Verdes Sand contained intertidal rocky shore fauna such as bivalve molluscs and gastropods.

3.2 BALLISTIC MISSILE ORGANIZATION, SAN BERNARDINO, CALIFORNIA

The Ballistic Missile Organization (BMO) is currently one of the major military tenant units located at Norton Air Force Base (AFB), California. It is responsible for all intercontinental ballistic missile (ICBM) development activities for the Air Force, including the Peacekeeper missile and its Rail Garrison basing mode, the Small ICBM, and the advanced Strategic Missile System programs. BMO and its Systems Engineering and Technical Analysis (SETA) contractor currently occupy approximately 510,000 square feet of facilities in the 95x and 52x Building complexes with over 2,400 personnel.

Norton AFB is scheduled for closure by June 1994 as a result of the recommendations of the Defense Secretary's Commission on Base Realignment and Closure, legislative requirements in the Base Closure and Realignment Act (Public Law 100-526), and Air Force plans to enhance mission readiness and national security. The closure of Norton AFB will involve the inactivation of the 63rd Military Airlift Wing (MAW) and a portion of the 445th MAW. The closure will also involve the relocation of Norton AFB's major assets to March AFB, California; McChord AFB, Washington; and Kirtland AFB, New Mexico. Two of these bases, March AFB and Kirtland AFB, have also been identified as potential relocation installations for Space Systems Division (SSD) activities.

The planned closure action for Norton AFB includes retaining some Air Force activities and facilities including the Ballistic Systems Division (BSD). However, the recent realignment of BSD as the Ballistic Missile Organization (BMO) under the management of Headquarters SSD incorporates this organization into the current evaluation of the proposed closure of Los Angeles AFB and relocation of SSD activities to alternate installations.

The Final Environmental Impact Statement (FEIS) for the closure (withdrawal of units) of Norton AFB, California, prepared by the Department of the Air Force, Headquarters, Military Airlift Command, presents a complete description of the affected environment and environmental consequences resulting from the planned closure actions for this base. The information, analyses, and conclusions presented in the FEIS for the closure of Norton AFB have been incorporated into this document for the environmental evaluation of the subsequent closure and relocation of BMO facilities and activities. Where appropriate, the Norton AFB Closure EIS is summarized or referenced in this document.

History. What is now the Ballistic Missile Organization began with the creation of the Western Development Division (WDD) in Los Angeles, California. The WDD was created in July 1954 as part of the Air Research and Development Command (ARDC) and was given responsibility for the Atlas missile program. By 1957, WDD had accrued responsibility for the Titan and Thor programs as well. These new programs resulted in the enlargement of WDD, and in June 1957 it became the Air Force Ballistic Missile Division (AFBMD) and immediately began work on the Minuteman missile program.

By 1961, the Minuteman system was maturing and the Air Force was increasing its use of satellites. In April 1961, AFBMD was split into the Ballistic Systems Division and the Space Systems Division. At the same time, the ARDC became Air Force Systems Command (AFSC). Space Systems Division remained in Los Angeles and Ballistic Systems Division was transferred to a converted warehouse at Norton AFB near San Bernardino, California.

In July 1967, following the deployment of the Minuteman system, the decision was made to combine BSD and SSD into a single organization, the Space and Missile Systems Organization (SAMSO). SAMSO was headquartered in Los Angeles, and BSD became the ICBM program office, still at Norton AFB.

By 1979, with the MX missile becoming one of the Air Force's most important programs, SAMSO was split into two divisions, reflecting their constituent functions. Space Division remained in Los Angeles, and the Ballistic Missile Office was organized at Norton AFB on 1 October 1979 when the MX program began Full-Scale Engineering Development. The new Ballistic Missile Office also included the Advanced Ballistic Reentry Systems (ABRES) organization, which was developing the Mk 21 reentry vehicles for the MX missile. ABRES was renamed the Advanced Strategic Missile Systems and became one of three major program elements under the Ballistic Missile Office.

Following a decision by AFSC to change all product organizations to divisions, the Ballistic Missile Office became the Ballistic Systems Division in March 1989. However, following the extensive streamlining of the acquisition development community that took place as a result of a Defense Management Review initiative in late 1989, the Ballistic Systems Division was placed under the administrative direction of Space Systems Division and became the Ballistic Missile Organization in May 1990.

3.2.1 Community Setting

BMO is currently located at Norton AFB and occupies the Building 95x and 52x complexes. Norton AFB is in Southern California in San Bernardino County, about 55 miles east of Los Angeles and 60 miles west of Palm Springs. The area surrounding the base is largely urbanized and includes the Cities of San Bernardino, Highland, Redlands, Loma Linda, and Colton. The base comprises 2,003 acres of contiguous property, with the Santa Ana River forming the southern boundary.

Population and Employment. Because Norton AFB is geographically located near the border between San Bernardino and Riverside counties, it is necessary to consider both counties in the following assessment.

The total population in the two-county area was reported at over 2 million in the beginning of 1987: 1,139,100 in San Bernardino and 862,000 in Riverside. Population related to BMO operations in San Bernardino include approximately 6,400 personnel and their dependents.

Data on the growth rates for the major economic sectors in San Bernardino County and the combined counties of San Bernardino and Riverside indicate that construction, manufacturing, and financial services have had the most steady growth in these counties during the 1983 to 1987 period. The only sectors showing continuous decreases in activity are mining and farm production. The federal military jobs sector has experienced a very small amount of growth in recent years, both in San Bernardino County and the two-county area.

3.2.2 Land Use

The land surrounding Norton AFB is zoned for a variety of residential, commercial, and industrial uses. The residential areas primarily consist of single-family detached dwellings in subdivisions with schools (Figure 3.2.2-1) while commercial uses are mainly governmental, business, or professional

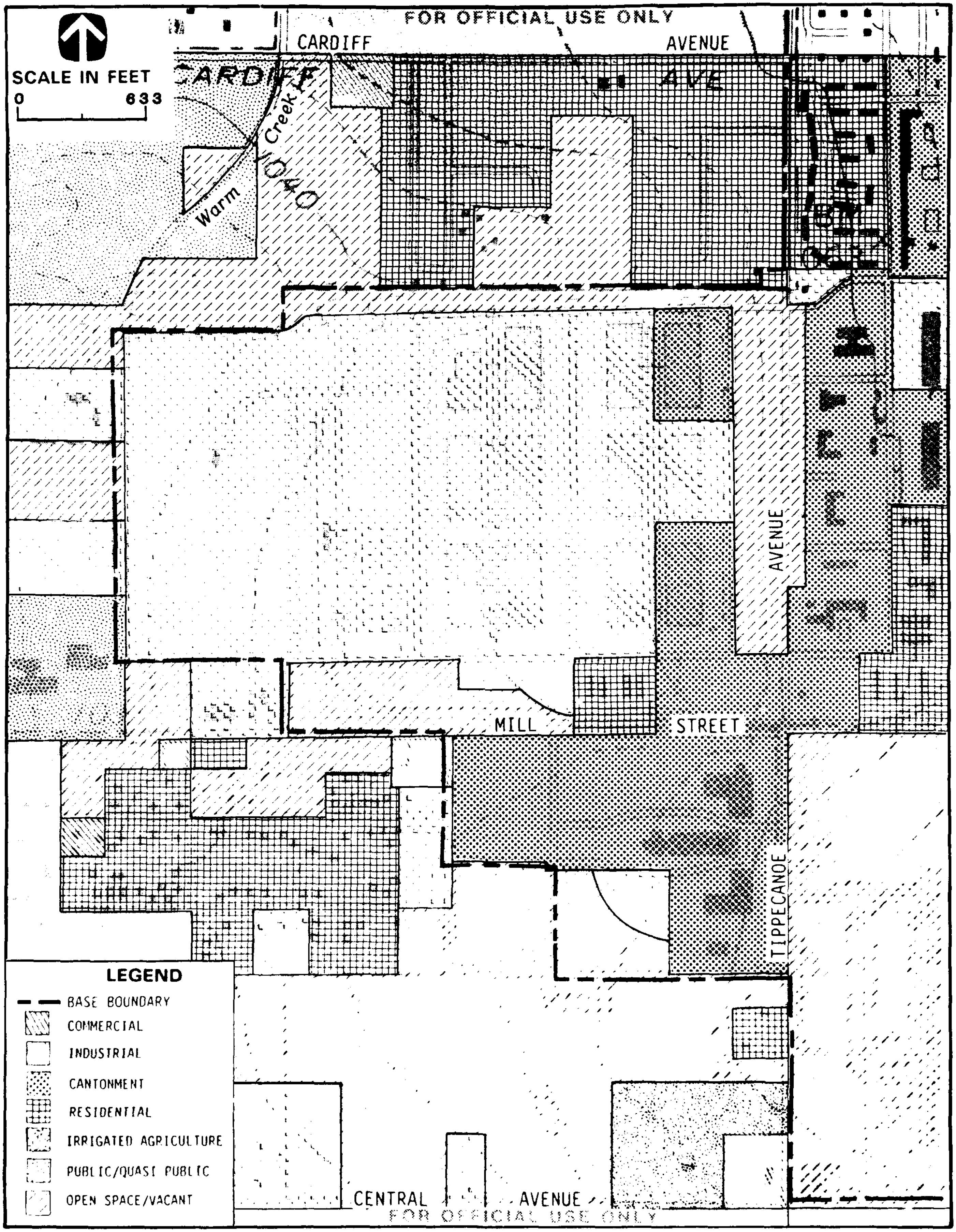


FIGURE 3.2.2-1 LAND USE FOR BMO, NORTON AFB, CALIFORNIA

buildings; medical offices or clinics; hotels; and supermarkets. Industrial uses in the area consist of storage yards, industrial plants, and motor and rail terminals. The principal communities that surround the base are Highland, Loma Linda, Redlands, and San Bernardino.

The Santa Ana River forms the south and southeast perimeter of the base. Otherwise, the base is completely surrounded by residential communities.

3.2.3 Transportation

In Southern California, surface travel is mostly by highway; there is no commuter rail system. The main highways serving Norton AFB are Interstates 10 and 215 and State Routes 30 and 91. Various segments of the roads in San Bernardino County are characterized by traffic volumes that exceed the design volume. Tables 3.2-1 and 3.2-2 list road segments in the vicinity of the BMO facilities on which the volume-to-capacity (V/C) ratio exceeded 1.0 in 1984.

BMO generates approximately 2,500 round trips daily to and from the base including commuter traffic and deliveries.

3.2.4 Utilities

The base and the housing surrounding the base receive electric service from the Southern California Edison Company, a large integrated electric system serving the Southern California area. According to the U.S. Department of Energy, total sales to final customers in 1987 amounted to 63,494,291 megawatt-hours (MWh), with a total disposition of about 74,142,513 MWh. In 1987, Norton AFB used about 74,129.4 MWh, and the onbase housing consumed 2,606.3 MWh.

Natural gas is sold to the base by the Southern California Gas Company. The total output for this company in 1987 was about 1,071.8 trillion British thermal units (Btu). Annually, the base uses 267,854 million Btu and the onbase housing accounts for 185,528 million Btu.

The Norton AFB sanitary sewer discharges into the San Bernardino Water Reclamation Department system for treatment. The Norton AFB discharge permit allows 1.0 million gallons per day (MGD); the actual discharge as metered is 0.85 to 1.0 MGD.

It is estimated that BMO operations represent approximately 15 percent of utility consumption at Norton AFB.

Table 3.2-1

Study Area Highway Facilities With a V/C Ratio Between 1.0 and 1.25

Road	Congested Segment
Highland Avenue	State Street to Muscott Street
Highland Avenue	Golden Avenue to Del Rosa Avenue
I-215 Freeway	Orange Show Road to Washington Street
Mill Street	Vernon Avenue to I-215 Freeway
Mill Street	E Street to Tippecanoe Avenue

Source: Southern California Association of Governments 1987.

Table 3.2-2

Study Area Highway Facilities With a V/C Ratio of 1.25 or Greater

Road	Congested Segment
Church Street	Baseline Street to Railroad Street
Highland Avenue	E Street to Golden Avenue

Source: Southern California Association of Governments 1987.

3.2.5 Hazardous Materials/Waste Management

3.2.5.1 Installation Restoration Program Sites

At Norton AFB, 22 sites have been identified and evaluated in a process equivalent to the Preliminary Assessment/Site Investigation (PA/SI) stage. At the time these studies were completed, the Department of Defense (DOD) Installation Restoration Program (IRP) program was implemented as a four-phase program with the following designations:

- Phase I — Records Search
- Phase II — Confirmation and Quantification
- Phase III — Technology Base Development
- Phase IV — Corrective Action

Investigations at Norton AFB were completed through what was designated as Stage 3 of Phase II.

For Norton AFB, the procedures and schedule for completing the remaining IRP stages have been specified in a formal IAG among the Environmental Protection Agency (EPA), Air Force, and California Department of Health Services.

A full discussion of the IRP sites at Norton AFB is provided in the Norton Closure EIS. However, none of the IRP sites identified are within the vicinity of facilities occupied by BMO. Consequently, the closure of BMO will have no effect on the IRP.

3.2.5.2 Underground Storage Tanks

The current inventory of underground storage tanks (USTs) at Norton AFB includes 77 active tanks and 33 inactive tanks (Tables 3.2.5-1 and 3.2.5-2). The tanks have been used primarily for storage of various petroleum products, both used and unused.

A full discussion of USTs at Norton AFB is included in the EIS for the Closure of Norton AFB. None of the active or inactive tanks are in the Building 95x or 52x complexes currently occupied by BMO. However, five active fuel oil tanks (three 50,000-gallon and two 25,000-gallon), located at the central heat plant (Building 716), support the heating system which supplies the Building 52x complex.

3.2.6 Geology and Soils

Norton AFB is located on a vast apron of Pleistocene and Recent alluvium more than 1,000 feet thick, derived from the igneous and metamorphic complex exposed in the San Bernardino Mountains to the north and east. Granitic and gneissic rocks are the most common types in the alluvium at Norton AFB. The Santa Ana River Wash, which forms the southern boundary of the base, is the largest drainage from the mountains. The channel of City Creek is located along the northern boundary of the base.

The soils at Norton AFB to a depth of 60 inches are classified primarily as belonging to the Tujunga-Soboba Association. Tujunga soils, which comprise the majority of the Norton AFB soils, are somewhat excessively drained and have a surface layer of brown, slightly acidic loamy sand that is gravelly in places. Below this is pale-brown, slightly acidic coarse sand. Soboba soils, which are

Table 3.2.5-1

Inventory of Active USTs (as of October 27, 1988)[1]

Site	Location (Facility No.)	Number of Tanks	Total Capacity (Gallons)	Contents
1	984	1	500	Heating fuel No. 2
2	468	2	10,000	Diesel fuel
3	620	5	10,000	Gasoline
		1	550	Waste oil
4	617	1	1,000	Motor gasoline
5	650	2	25,000	Gasoline
		1	25,000	Diesel fuel
		2	50,000	Fuel oil No. 2
6	757	2	500	Waste oil
7	716	2	25,000	Fuel oil No. 2
		3	50,000	Fuel oil No. 2
8	672	1	4,000	Fuel oil No. 2
9	675	2	12,500	Diesel fuel
		1	5,000	JP-4
		1	10,000	Gasoline
10	680	1	550	Waste oil
11	803	1	2,000	Slop tank (normally empty)
		6	50,000	JP-4

Table 3.2.5-1, Page 2 of 3

Site	Location (Facility No.)	Number of Tanks	Total Capacity (Gallons)	Contents
12	819	1	2,000	Slop tank
13	823	1	5,000	Waste fuel
14	805	1	2,000	Waste fuel
15	697	2	10,000	Fuel oil No. 2
16	804	1	2,000	Waste fuel (normally empty)
		8	50,000	JP-4
17	809	1	2,000	Waste fuel (normally empty)
		8	50,000	JP-4
18	794	1	500	Diesel fuel (new, never used)
19	795	1	750	Diesel fuel
20	1264	1	1,200	Motor gasoline
21	818	1	2,000	Fuel oil No. 2
22	249	3	30,000	Fuel oil No. 2
23	2333	1	10,000	JP-4
24	844	1	1,000	Diesel fuel
25	863	1	300	Diesel fuel
26	333	1	1,000	Fuel oil No. 2
27	341	1	500	Fuel oil No. 2

Table 3.2.5-1, Page 3 of 3

Site	Location (Facility No.)	Number of Tanks	Total Capacity (Gallons)	Contents
28	245	2	1,600	Photoprocessing waste sumps
29	289	1	150	Motor gasoline
30	100	1	550	Fuel oil No. 2
31	820	1	300	Waste fuel
32	726	1	500	JP-4
33	3101	1	550	Diesel fuel
	TOTAL:	77		

Note: [1]Excluded are three tanks at the IWTP (Bldg. 1264): primary clarifier tank, flocculation tank, and ozonator tank.

Source: Norton AFB 1988.

Table 3.2.5-2

Inventory of Inactive USTs
(as of January 25, 1988)

Site	Location (Facility No.)	Number of Tanks	Total Capacity (Gallons)
1i	S-21	1	350
2i	S-38	1	1,000
3i	142	1	500
4i	169	1	550
		3	10,000
5i	222	1	1,000
6i	226	2	10,000
7i	302	1	6,000
8i	335	1	2,000
9i	645	1	750
10i	695	1	1,000
11i	705	1	550
		1	5,000
		1	2,000
12i	749	1	6,000
13i	948	1	3,000
14i	650[1]	3	25,000
15i	514	1	12,000
16i	754	2	30,000
17i	726	2	500
18i	427	1	300
19i	763	1	1,000
20i	477	2	250
21i	245	1	1,600
22i	811	1	350

Note: [1]Tanks 2C, 2E, and 2F.

Source: Norton AFB 1988.

found in the southeast portions of the base along the Santa Ana Wash, are excessively drained and have a surface layer of grayish-brown, slightly acidic, stony or gravelly loamy sand. Below this is brown, slightly acidic, very stony loamy sand and very pale brown, neutral, very stony sand. The soils of this association are used mainly for irrigated crops, dryland crops, and limited grazing. There are no agricultural activities on the base.

The soils of the Tujunga-Soboba Association are also used as a source of sand, gravel, and road fill. Several sand and gravel mining operations are located along the Santa Ana River bed near the base. Sand and gravel are the only mineral resources in the vicinity of the base.

3.2.7 Water Resources

3.2.7.1 Groundwater

Norton AFB is located within the 110-square-mile Bunker Hill groundwater basin. This basin is recharged predominantly by runoff from the San Bernardino Mountains. Recharge also occurs by groundwater inflow from the San Timoteo Basin to the southeast and by penetration of surface water. Discharge from the basin occurs from flow into the Rialto-Colton groundwater basin to the southwest and from extraction by groundwater wells. The basic structure of the basin is three water-bearing zones separated by three confining zones.

In the vicinity of Norton AFB, the combined middle and lower water-bearing zones and lower confining member function as single aquifer beginning at a depth of about 650 feet and extending below that for 500 to 700 feet. This aquifer serves as the source of groundwater extracted for use on the base and in the surrounding communities. The current annual water consumption by Norton AFB is estimated as 840 million gallons per year produced by onsite wells for use by the base units. The BMO portion of this usage is approximately 250,000 gallons annually.

Historically, this area has had ample water supplies. Prior to development in the 1800s, numerous bogs and marshes occurred in the basin, including areas on the eastern portions of the current Norton AFB site. This abundant water supply led to heavy development with resultant sharp declines in groundwater levels. A combination of above-normal rainfall in winter and improved water management over the past 10 years has resulted in a return to somewhat higher groundwater levels. Drinking water derived from deeper aquifer zones is generally of good quality. In base wells, silver in the range of 11 to 29 micrograms per liter (μg/l) has been detected, as has trichloroethylene (TCE) at 1.5 to 6.2 μg/l. In addition, the Gage Canal Company wells, which serve the City of Riverside and are located immediately south of the base, have exhibited TCE concentrations ranging from 0.17 to 2.3 μg/l, according to the California Department of Health Services sampling and analyses conducted in 1980 and 1981. In addition, perchloroethylene was detected in the same wells, with the 1980 to 1981 test results varying from 0.12 to 2.5 μg/l. The State of California drinking water standards are 50 μg/l for silver and 5 μg/l for TCE; no standards are given for perchloroethylene. Therefore, monitoring data from the deep aquifer indicate that the TCE on the base can exceed the water quality standards.

3.2.7.2 Surface Water

Three stream channels are in the vicinity of Norton AFB. The westward-flowing Santa Ana River adjoins the base along its southern boundary. City Creek to the north of the base (diverted to a concrete channel parallel to Third Street), along with a minor unnamed tributary to its west, flows westward into the third stream channel, Warm Creek. The surface streams in this area are normally dry and convey water only during or immediately after heavy regional precipitation.

Controlled stormwater drainage of the land area on Norton AFB generally consists of surface flow to diversion structures and then through collection pipes to local surface streams. There are 11 points for stormwater discharge around the boundary of the base. The point stormwater discharge that also previously included the TBS (IWTP) discharge is regulated under National Pollutant Discharge Elimination System permit CA0002062.

The quality of surface water in the Santa Ana Basin, which drains from the crystalline terrain of the San Gabriel and San Bernardino mountains, is generally excellent. Water from other surface sources--drainage from the Chino Hills, Santa Ana Mountains, and San Timoteo Badlands--contains higher concentrations of dissolved solids but, when available, is still suitable for irrigation and other beneficial uses.

3.2.8 Air Quality

3.2.8.1 Regulatory Setting

The potential for episodes of high air-pollutant concentrations in the San Bernardino Valley is substantially influenced by the meteorological conditions of the area and the emissions of precursor pollutants from the surrounding air basin. Important meteorological parameters include wind speed, wind direction, depth of the mixing layer (determined by the height of the inversion base), and solar intensity (which promotes photochemical smog formation).

Westerly breezes prevail during the summer months when the sun is highest and days longest. With westerly winds, large quantities of precursor emissions from the coastal sections of Southern California are transported into the area and, with strong insulation, maximum amounts of photochemical smog are produced. Conversely, the easterly breezes prevail during winter months when the nights are longest. With easterly winds, the area becomes the source, rather than the receptor, of pollutants in the coastal areas.

The San Bernardino Valley, like most of the areas in coastal Southern California, experiences a low-level temperature inversion during most of the year. The height of the inversion base determines the maximum depth of space available for the mixing and dilution of pollutants. During winter months, early morning inversion bases are initially at the surface on an average of two out of three mornings, but a vertical mixing layer extends to about 4,000 feet by early afternoon, lifting the relatively weak inversion layers or eroding them entirely by convective currents from surface heating. This situation typically allows an accumulation of primary pollutants such as carbon monoxide (CO), nitrogen oxides (NO_x), and lead (Pb) during the early morning hours, with rapid improvement in air quality by early afternoon as the trapped pollutants are allowed to disperse.

During summer months, the height of the early morning inversion base (or mixing layer) averages about 1,400 feet. The afternoon mixing layer extends to only about 2,800 feet, since the summer inversion layers are stronger, more persistent, and less prone to be entirely eroded by surface heating. Consequently, summertime concentrations of most primary pollutants are usually lower than those of winter. Photochemical oxidant concentrations, however, are much higher in summer than in winter. During summer, more solar radiation is available to drive photochemical reactions, and the afternoon vertical mixing layer is far lower than that during winter, which contributes to higher levels of ozone and other pollutants in this season.

3.2.8.2 Air Pollutant Emission Sources

Ambient air quality in the Norton AFB area is primarily influenced by the emissions from Norton AFB and its surrounding area, i.e., the South Coast Air Basin. The basin includes the nondesert portions of Los Angeles, Riverside, and San Bernardino counties and all of Orange County.

The major sources of emissions associated with Norton AFB include aircraft flight and maintenance operations, motor vehicle operations, boilers and furnaces, fire training exercises, painting and metal cleaning operations, aircraft engine testing, and stationary internal combustion engines. All permitted sources (40) are currently in compliance with the district's stack testing and other permit requirements. In addition, 37 permit applications for various existing emission sources are currently pending. Norton AFB does not hold any emission-reduction credits at present.

Emission factors used for estimating vehicular emissions were derived from the projected 1990 vehicular emissions data and other traffic-related data for San Bernardino County obtained from the California Air Resources Board. Vehicular activities (measured in vehicle-miles traveled) for trips to and from Norton AFB were based on (1) the estimated number of vehicles operated by the base employees and military retirees residing in the Norton AFB area, considering car pooling; (2) the estimated frequencies of employee commuting and retiree visits to the commissary at Norton AFB; and (3) the distances estimated from the distribution of employee residences by zip code (see Section 3.4.5.3). Emissions from vehicles assigned to Norton AFB were based on (1) the number of vehicles assigned by vehicle type and (2) annual fuel consumption and vehicle-miles traveled. Truck activities were estimated from the average number of truck deliveries per day and the average distance between Norton AFB and the origins of shipments as supplied by base personnel.

The annual total emissions from all categories of sources associated with Norton AFB during 1987 and 1988 were approximately 8.0 tons per day (T/day) of carbon monoxide (CO); 4.8 T/day of reactive organic gases (ROG); 1.6 T/day of nitrogen oxides (NO_x); 0.25 T/day of total suspended particulates (TSP), which includes 0.21 T/day of particulate matter with aerodynamic diameters equal to or less than 10 μm (PM_{10}); 0.16 T/day of sulfur dioxide (SO_2); and 0.7 lb/day of lead (Pb).

Daily quantities of air pollutants emitted in 1985 from the South Coast Air Basin and the basin portions of San Bernardino and Riverside counties are listed in Table 3.2.8-1 along with those estimated from the sources associated with Norton AFB during 1987 to 1988. The significance of the emissions from the portions of San Bernardino and Riverside counties within the basin is expressed as a percentage of the total basin emissions, and that of the emissions associated with Norton AFB as percentages of the emissions from San Bernardino County (basin portion) and the basin. The emissions from the basin portion of San Bernardino and Riverside counties account for about 8 percent and 6 percent of the basin emissions, respectively. The emissions associated with Norton AFB account for a small fraction of the emissions produced in it surrounding area, that is, about 2.0 percent of the emissions from the basin portion of San Bernardino County and about 0.16 percent of the total South Coast Basin emissions.

Table 3.2.8-1

Emissions of Air Pollutants from the South Coast Air Basin, San Bernardino and Riverside Counties, and Norton AFB

Pollutant	South Coast Basin (T/day)[1]	South Coast Portion of San Bernardino County (SBC)		South Coast Portion of Riverside County		Norton AFB		
		T/day[1]	% of South Coast Basin	T/day[1]	% of South Coast Basin	T/day[2]	% of South Coast Basin	% of SBC
ROG	1,246.4	108.0	8.7	79.5	6.4	4.78	0.38	4.43
NO_x	1,039.8	85.1	8.2	54.2	5.2	1.56	0.15	1.83
CO	5,430.0	409.0	7.5	323.6	6.0	8.00	0.15	1.96
SO_2	121.1	5.8	4.8	3.3	2.7	0.16	0.13	2.76
TSP	1,645.2	141.5	8.6	137.8	8.4	0.25	0.02	0.18

Notes: [1]Data from South Coast Air Quality Management District 1988.
[2]Data from Table 3.4.

3.2.8.3 Air Quality

Ambient air quality has not been monitored within the boundary of Norton AFB. The nearest ambient air quality monitoring stations are in the Cities of San Bernardino (about 3.7 miles northwest), Redlands (about 5.6 miles southeast), and Riverside (about 12.3 miles southwest). Levels of all criteria air pollutants (ozone, CO, NO_2, SO_2, PM_{10}, and Pb) and sulfate (SO_4) are monitored at the San Bernardino and Riverside stations. The Redlands station has measured only ozone levels since 1987.

The greatest air quality problem in the vicinity of SSD-SB, as well as in the entire South Coast Basin, is ozone. The California standard for ozone was exceeded on 173 to 178 days in 1988. The exceedances are far more prevalent during summer, indicating almost continuously excessive ozone levels. During 1988, levels of PM_{10} (measured every 6 days) exceeded the California standard 40 to 51 times, or over 70 percent of the observations, at the two monitoring stations near SSD-SB. In contrast to ozone and PM_{10}, the levels of other air pollutants are relatively low when compared with applicable ambient standards. The California Ambient Air Quality Standards (CAAQS) and the National Ambient Air Quality Standards (NAAQS) for CO, NO_2, SO_2, and Pb have not been exceeded during the last 5 years. The California SO_4 standard was also not exceeded during the same period.

The South Coast portion of San Bernardino County, which includes Norton AFB, is currently designated as in attainment for the NAAQS for SO_2 but nonattainment for ozone, CO, NO_2, and TSP (which includes PM_{10}) (40 CFR 81.305). Although not formally identified as such, this area is in attainment for Pb, but in nonattainment for PM_{10}. The area's designation under the CAAQS has recently been adopted by the California Air Resources Board. The designations are in attainment for CO, SO_2, and Pb; in nonattainment for ozone, NO_2, PM_{10}, and SO_4; and unclassified for hydrogen sulfide (H_2S) and visibility-reducing particles.

The data evaluated (Appendix B) indicate that the ambient levels of ozone, CO, NO_2, SO_2, PM_{10}, and sulfate in the vicinity of Norton AFB did not show any significant increasing or decreasing trends during the last 5 years. The only air pollutant with a definite downward trend during the last 5 years is Pb. In addition, the air quality trends for the three stations discussed, which are on different sides of Norton AFB, are similar, leading to the conclusion that the air quality patterns are similar throughout the Norton AFB area.

3.2.9 Noise

Noise levels resulting from existing aircraft operations at Norton AFB have been estimated as part of the Air Force Air Installation Compatible Use Zone (AICUZ) program. The AICUZ program is designed to provide updated information on the flight operations of the base, as well as land use compatibility guidelines, to assist local community planning efforts in dealing with the impacts of these operations. A full discussion of noise from aircraft operations is included in the EIS for the closure of Norton AFB.

Noise generated as a result of BMO operations is limited to automobile and truck traffic involving approximately 2,500 round trips daily.

3.2.10 Biological Resources

3.2.10.1 Vegetative and Wildlife Resources

Norton AFB lies within the California chaparral complex. The natural vegetation within this complex is typically dominated by foxtail and chamise, intermingled with wild oats, manzanita, ceanothus, and scrub oak. However, the vegetation at Norton AFB and in the vicinity of the BMO buildings has been altered by past and ongoing construction, maintenance, and operational activities. Most of the vegetated areas are mowed and actively landscaped; little or no natural habitat remains. Landscaping onbase includes a variety of shrubs and trees such as oleander, elm, mulberry, eucalyptus, Mexican fan palm, and California oak.

Mammals common to the habitat at Norton AFB include desert cottontailed rabbit, blacktailed rabbit, pocket gopher, ground squirrel, weasel, and deer mouse. Common bird species are meadowlark, gull, raven, crow, and starling. Reptiles that may be found on the base include rattlesnakes and horned lizards.

The Santa Ana River lies along Norton AFB's south and southeastern boundary; therefore, part of the Santa Ana River floodway encroaches onto the southeastern portion of the base. Because the flow of the Santa Ana River is intermittent, fish and amphibians are not found in the area near Norton AFB.

3.2.10.2 Threatened and Endangered Species

The only federally listed threatened or endangered animal species known to occur near Norton AFB is least Bell's vireo (*Vireo bellii*). Bell's vireo is listed as an endangered species by both the U.S. Fish and Wildlife Service (USFWS) and the State of California. This bird typically inhabits thickets, wood margins, and mesquite, and may incidentally occur at the base.

One federally listed endangered plant that is known to occur in the floodplain of the Santa Ana River at Norton AFB is the Santa Ana River wooly-star (*Eriastrum densifolium sanctorum*). In addition, the endangered slender-horned spineflower (*Centrosteqia leptoceras*) may also occur onsite.

Four candidate species (as defined by USFWS Category 2) may also occasionally occur at Norton AFB: the spotted bat (*Euderma maculatum*), San Diego horned lizard (*Phrynosoma coronatum blainvillei*), orange-throated whiptail (*Cnemidophorus hyerythrus*), and greenest tiger beetle (*Cincindela tranquebarica viridissima*). However, exact locations of these species' habitats have not been determined. The Military Airlift Command is arranging for a USFWS survey for the spring and summer of 1990.

3.2.11 Cultural and Paleontological Resources

3.2.11.1 Prehistoric Resources

Approximately 25 percent of Norton AFB has been surveyed for cultural resources, and no prehistoric sites have been recorded. In general, the Norton AFB area is considered to have a low probability of containing prehistoric sites because of the type of environmental setting and the disturbed context of the base.

3.2.11.2 Historic Resources

Eight historic sites have been recorded on the base and include historic trash scatters, a railroad bridge and four water ditches. None of these sites have been formally evaluated to determine potential National Register of Historic Places (NRHP) eligibility. Historic maps of the general area suggest the possibility that 21 additional sites may occur on the base.

Several World War II-era structures, including Morrow Hangar, are also present at Norton AFB. These facilities are being evaluated for NRHP eligibility under the ongoing DOD study.

The BMO facilities are presently located in the 95x and 52x Building complexes. The 95x complex buildings were constructed in the early 1960s and do not meet the 50-year age requirement for historic structures. The 52x complex buildings were constructed in the 1950s and also are not considered old enough to be designated historic structures.

3.2.11.3 Paleontological Resources

The surface geology of Norton AFB consists of Pleistocene and Recent alluvium that is more than 1,000 feet thick. Pleistocene deposits could contain a variety of extinct fauna, and deposits of intact skeletons would be considered scientifically important. However, isolated bone fragments would be more likely to occur and would not be considered important.

3.3 VANDENBERG AIR FORCE BASE, CALIFORNIA

Vandenberg Air Force Base (AFB), with an area of 98,385 acres (98,303 acres are fee-owned and 82 acres are leased), is located in Santa Barbara County along the Pacific Ocean in California (Figures 3.1-1 and 3.3-1). The base is divided into the northern half and southern half by State Highway 246. Vandenberg AFB is one of the largest Air Force bases in the continental United States. The host organization at this Strategic Air Command base is the 1st Strategic Aerospace Division. Major tenants at the base include the Western Space and Missile Center and Detachment (Det) 1, 2nd Satellite Tracking Group.

Vandenberg AFB employed 3,536 permanent party military personnel, 109 military trainees, 1,105 appropriated fund civilian personnel, 4,362 contractor personnel, and 726 other civilians at the end of fiscal year (FY) 1989. Approximately 85 percent of the military personnel live on Vandenberg AFB, and 15 percent live in communities near the base.

The City of Lompoc, approximately five miles southeast of the base, is the host community for Vandenberg AFB. Most of the personnel living offbase reside in Lompoc or the city of Santa Maria, ten miles northeast of the base. In addition, some personnel live in small communities near the base, including Orcutt, Mission Hills, Vandenberg Village, and Tanglewood.

History. Vandenberg AFB, originally known as Camp Cooke, was activated in 1941 as an artillery and tank training area for the Army during World War II. Most of the camp's 92,000 acres were used for tank maneuvers and artillery firing. Camp Cooke was deactivated in June 1946 and remained idle until August 1950 when it was reactivated in its previous role for the Korean War. Camp Cooke was again deactivated in February 1953. The Air Force acquired the northern half of the idle camp in 1957 for use as a missile launching and training site, and renamed it Cooke AFB. In 1958, the base was renamed in honor of the late Gen. Hoyt S. Vandenberg.

Over the years, the Air Force gained more of what had been Camp Cooke, and acquired the Navy's Point Arguello Launch Complex (the northern half of South Vandenberg AFB). In the early 1960s, the Sudden Ranch property (the south-facing coastal land extending to Jalama Beach) was acquired for development of Space Launch Complex (SLC)-6 for the Manned Orbiting Lab Program.

Over 1,600 launches have occurred since the first launch in December 1958. Most prominent are Minuteman ICBMs that are sent to Vandenberg AFB from distant operational sites to be launched unarmed to a target over 4,000 miles away in the Kwajalein Islands area. Space boosters of all sizes have orbited more than 500 unmanned satellites since the first polar-orbit satellite in history was launched from Vandenberg AFB in February 1959.

Mission. Vandenberg AFB facilities are also used by more than 40 DOD and non-DOD government organizations and over 70 civilian contractors, that are involved with space and missile launch programs. Vandenberg AFB is the only site in the free world from which ICBMs and polar-orbiting satellites are launched. It is the pioneer missile base of SAC and headquarters of the 1st Strategic Aerospace Division (1STRAD). 1STRAD is the largest missile unit in SAC. Its primary mission is to train SAC missile crew members; test and evaluate ICBM operations; and provide host support for the many tenant organizations and contractors located at Vandenberg AFB. 1STRAD is also responsible for all base facilities and serves units from other Major Commands, nonmilitary

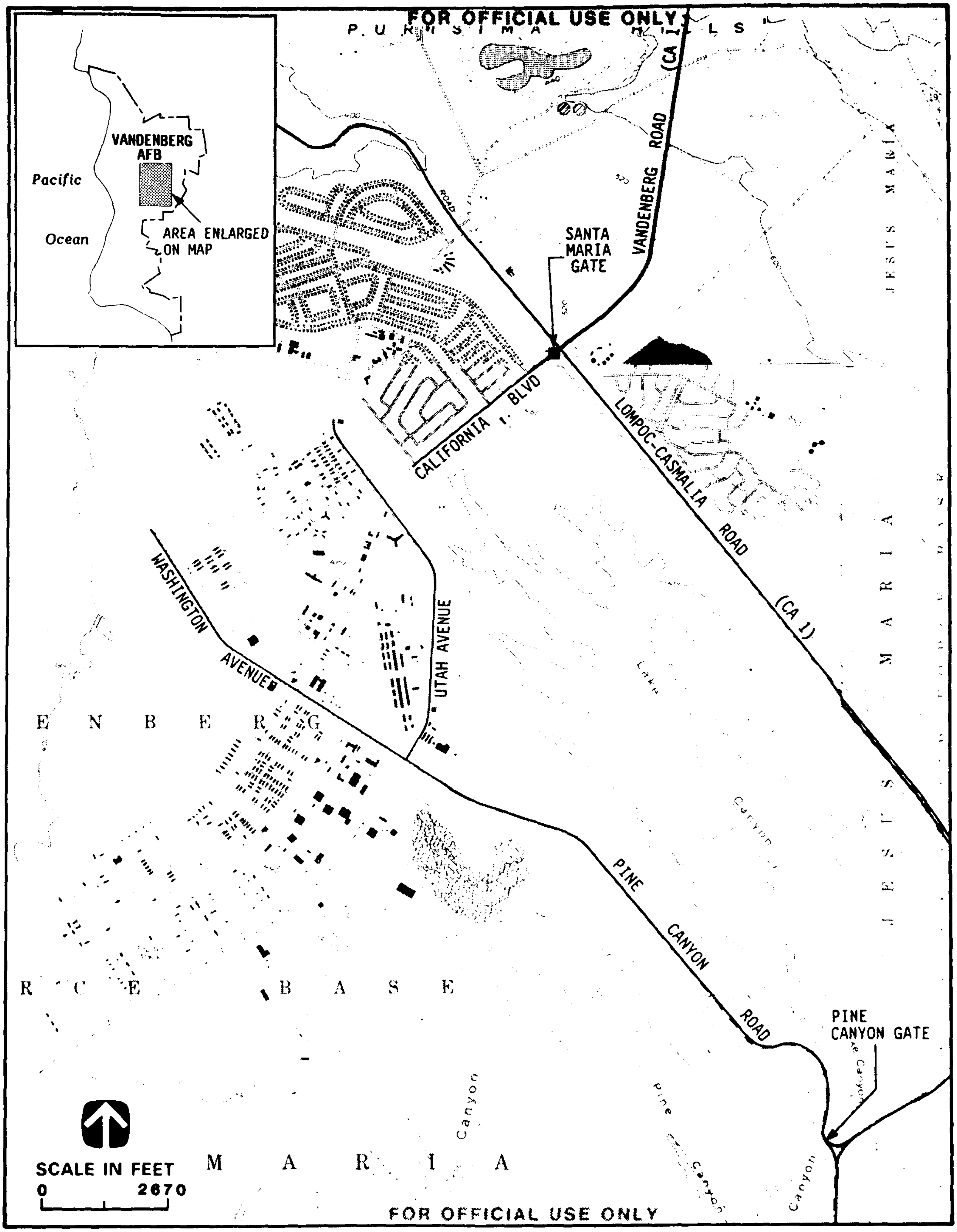


FIGURE 3.3-1 LOCAL VICINITY MAP FOR BASE SUPPORT AREA, VANDENBERG AFB, SANTA BARBARA COUNTY, CALIFORNIA

government agencies, and about 70 contractors. In addition to 1STRAD, the following major units are located at Vandenberg AFB.

4392nd Aerospace Support Wing (ASW). The 4392nd ASW provides various services at Vandenberg AFB, including administration; civil engineering; contracting; transportation; comptroller; security and law enforcement; personnel; public affairs; airfield operations; and morale, welfare and recreation.

Western Space and Missile Center (WSMC). An Air Force Systems Command (AFSC) unit, the WSMC provides support for the launching, testing, and evaluation of missile and space systems; support to DOD and other aeronautical and guided missile and space programs; and management and operations of the Western Test Range.

Detachment (Det) 1, 2nd Satellite Tracking Group. This AFSC unit is responsible for commanding, tracking, and receiving telemetry from orbiting DOD satellites.

1369th Audiovisual Squadron (AVS). This Military Airlift Command (MAC) unit provides audiovisual support to various space and missile organizations including audiovisual documentation, high-speed photo instrumentation, and laboratory processing and television production.

Det. 8, 37th Aerospace Rescue & Recovery Squadron (AARS). This MAC unit provides search and rescue operations for the Central Coast and helicopter support for Vandenberg AFB space and missile programs.

392nd Communications Group (CG). This Air Force Communications Command (AFCC) unit provides common user information systems and air traffic services and instrumentation support.

Det. 41, Headquarters, Ogden Air Logistics Center. This Air Force Logistics Command unit is responsible for onsite logistics, engineering, depot maintenance, and technical data tasks in support of base space and missile programs.

3.3.1 Community Setting

3.3.1.1 Population and Employment

Population. The north Santa Barbara County (North County) area has a population of approximately 266,000. The largest cities are Santa Maria and Lompoc with populations of 53,000 and 32,000, respectively. Approximately 80 percent of base personnel live onbase, but the remainder live in the north county area, primarily in the cities of Santa Maria and Lompoc. Population in north Santa Barbara County increased by 20 percent between 1980 and 1988, primarily due to increased activity at Vandenberg AFB, more tourism, and greater development of offshore oil and gas.

Approximately 73 percent of the growth in Santa Barbara County between 1985 and 2005 is expected to occur in the North County area. The population of Santa Maria is expected to increase by 61 percent, the Santa Ynez Valley by 55 percent, and Lompoc by 27 percent. These increases will be caused primarily by a steady immigration, a declining mortality rate at all age levels, and continued economic expansion.

Employment. The largest employers in the North County area are services, retail trade, government, and manufacturing. In 1985, the area's employment level was 101,600, an increase of approximately 50 percent in 10 years with most of the growth occurring in the manufacturing sector. Projections are for employment in the North County area to increase to 145,800 by 2005, a 43 percent increase from the employment level in 1985. The unemployment rate is currently 5 percent and is projected to remain between 5 and 5.5 percent through the year 2005. The primary growth constraints on the North County area will be water and residential land shortages in some areas.

The number of persons employed at Vandenberg AFB has declined from approximately 16,000 in 1985 to less than 10,000, currently. Of these, approximately 65 percent are civilian employees. The base generates about 4,300 jobs for the local economy, and has an overall monetary impact of more than $506,200,000 on the surrounding region. Vandenberg employs approximately 40 percent of Lompoc's labor force and 9 percent of Santa Maria's.

3.3.1.2 Housing

In northern Santa Barbara County, there are currently about 90,000 housing units, a 20 percent increase from 1980. Water shortages have caused a moratorium on new residential construction in the southern portion of the county, which has increased the demand for housing in the northern area. The Northern County area is expected to have the greatest increase in home construction.

At Vandenberg AFB, there are 2,078 housing units: 1,804 single-family homes, 84 duplexes, 25 fourplexes, and 1 sixplex. The base also has 172 mobile home spaces, 29 guest housing units, and 1,618 dormitory spaces. Construction plans call for expanding housing units in the Capehart housing and east housing areas and trailer park.

3.3.1.3 Education

Vandenberg AFB operates two elementary schools, a middle school, and a handicapped school for military dependents. Lompoc School District has a current enrollment of 9,813 and projects an enrollment of 10,235 in 1991. Lompoc's elementary and junior high schools are near capacity, while its high schools are well below capacity. In Santa Maria, there is a total current enrollment of approximately 12,800 students. Overall, only moderate growth is expected in the near future. However, new construction is underway at the elementary level.

3.3.1.4 Community Services

Lompoc, Santa Maria, and Guadalupe are responsible for basic services such as police and fire protection for their respective communities. The Santa Barbara County Sheriff and Fire Departments also provide service to the Vandenberg AFB area. In Lompoc and Santa Maria, the number of city employees per 1,000 residents is 10 and 14.6, respectively.

3.3.2 Land Use

3.3.2.1 Existing Land Use Patterns

Cities in the vicinity of Vandenberg AFB include Lompoc, Santa Maria, and Guadalupe, and the unincorporated communities of Mission Hills, Orcutt, Vandenberg Village, Buellton, and Los Alamos.

The Base Support Area is located in the center of the northern half of Vandenberg AFB (Figure 3.3-1). Vandenberg Village is located approximately 3.7 miles and Mission Hills 5.1 miles southeast of the Base Support Area. The existing facilities of the Base Support Area are located on approximately 1,500 developed acres (Figure 3.3.2-1).

Residential. Vandenberg AFB has accompanied and unaccompanied residential housing. Accompanied housing consists of Capehart Increment Nos. 1 through No. 5 and the mobile home park. Capehart Increment No. 3 consists of 399 units located outside the Santa Maria Gate on the northern side of the Lompoc-Casmalia Road segment of State Route 1. Capehart Increment No. 4 consists of 150 units, and Capehart Increment No. 5 consists of 124 units, and are adjacent to Capehart Increment No. 3. They collectively form the northern extension of the Base Support Area (Figure 3.3.2-1).

Capehart Increment No. 1, with 880 dwelling units, is the oldest accompanied housing on Vandenberg AFB. This housing area is located inside the Santa Maria Gate. The Lake Canyon Mobile Home Park consists of approximately 170 spaces south of the Lompoc-Casmalia Road, approximately 0.5 miles southwest of the Capehart Increment Nos. 3 through 5 complex. This mobile home park is located outside the Santa Maria Gate and is separate from the Base Support Area.

Unaccompanied housing consists of 60 dwelling units with a capacity of 1,555 personnel. This housing is located on 65 acres south of the Capehart Increment Nos. 1 and 2 housing areas in the west-central part of the Base Support Area.

Public/Quasi Public. Public/quasi public facilities at Vandenberg AFB are the Lompoc Adult School, Vandenberg Middle School, and Los Padres Elementary School, adjacent to the Capehart Increment Nos. 3 through 5 housing complex, and Crest View Elementary, which is adjacent to Capehart Increment No. 1 housing area (Figure 3.3.2-1).

Cantonment. The facilities designated administrative, community (commercial), community (service [with exception of public schools]), and medical, in the Vandenberg AFB Comprehensive Plan, have been combined into the cantonment designation for this land use analysis. The cantonment designation generally is concentrated in the central portion of the Base Support Area from the Capehart Housing Areas south to 13th Street.

Industrial. This designation consists of those facilities designated industrial in the Vandenberg AFB Comprehensive Plan, except those facilities that are designated "ordnance related". The industrial designation area is generally concentrated in the central and southern portions of the Base Support Area (Figure 3.3.2-1).

Flightline. The flightline is located within the southernmost section of the Base Support Area, with the exception of two helicopter pads and approach zones, located in the central Base Support Area. Figure 3.3.2-1 shows only a portion of the total flightline area of Vandenberg AFB. The flightline includes the runways, taxiways, and the nonpaved areas within the runway clear/approach zones. The Aircraft Operations and Maintenance areas are generally undeveloped and contribute to the rural appearance of Vandenberg AFB.

Ordnance Related. The ordnance-related areas consist of the Explosive Ordnance Disposal (EOD) area in the east-central portion of the Base Support Area, the Weapons Storage Area (WSA), and three adjacent facilities south of the Base Support Area (Figure 3.3.2-1).

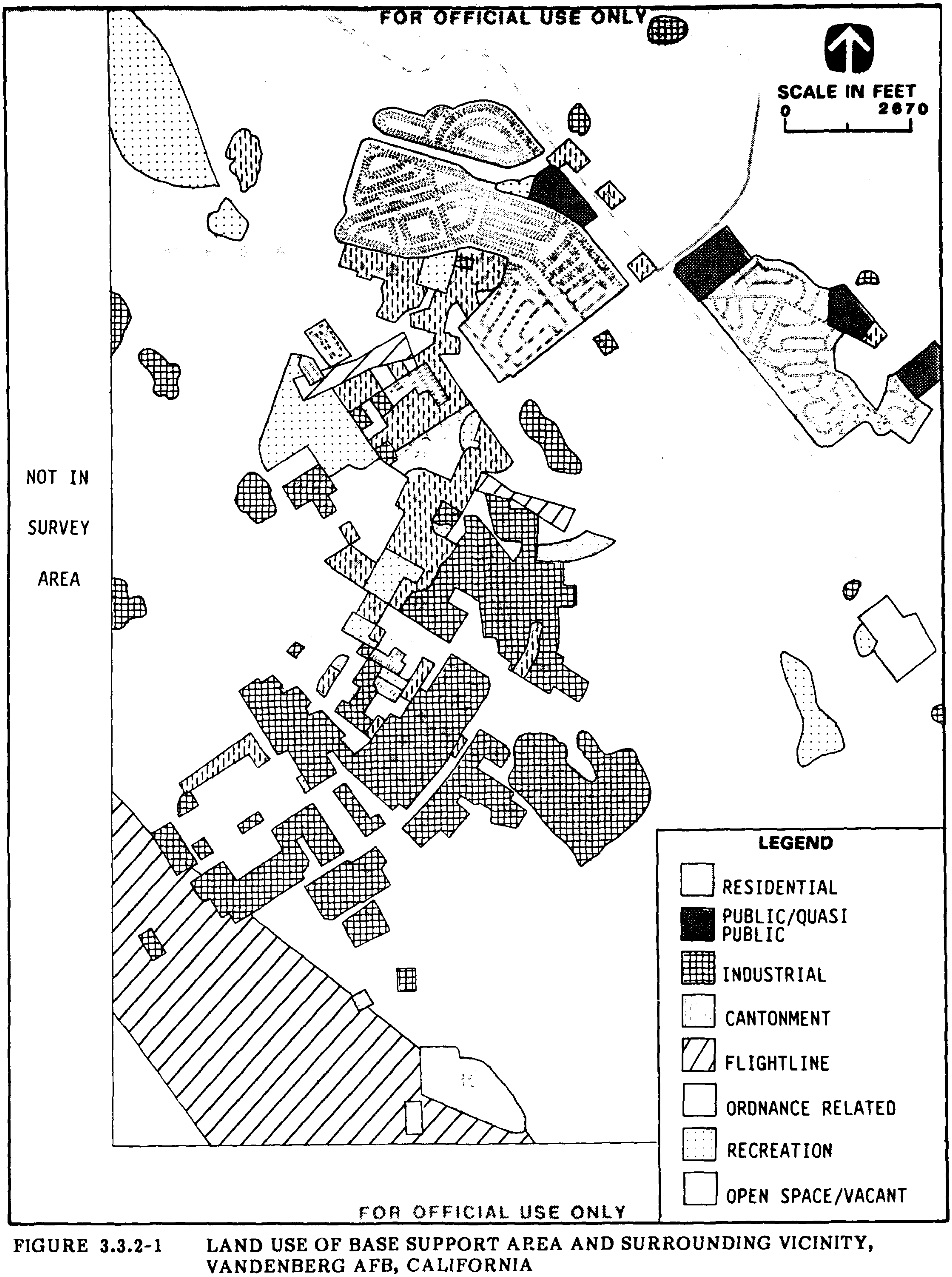


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FIGURE 3.3.2-1 LAND USE OF BASE SUPPORT AREA AND SURROUNDING VICINITY, VANDENBERG AFB, CALIFORNIA

Recreation. Recreation areas consist of scattered in holdings as shown in Figure 3.3.2-1. The facilities include baseball diamonds, football/soccer fields, basketball and tennis courts, a running track, fishing lakes, a model airplane field, and an off-road vehicle (ORV) area.

Open Space. Open space generally surrounds the Base Support Area with some scattered vacant lots within the developed area. Open space includes the undisturbed vacant land of Burton Mesa, the explosive safety zones, lands reserved for environmental protection, and future development sites. Much of the open space area permits outdoor activities such as hunting and equestrian activity.

3.3.2.2 Land Use Plans and Policies

Vandenberg AFB. The adopted Vandenberg AFB Comprehensive Plan is the planning document for future base physical facilities planning and the protection of environmental and cultural resources. The plan is designed to eliminate inefficient land use, reduce future siting conflicts, avoid incompatible future development, reduce or eliminate unnecessary project expenditures, and protect the environmental resources of Vandenberg AFB. The Military Family Housing Community plan, adopted in March 1990, is designed to address the future upgrading of existing onbase housing units and community surroundings from FY 1991 to 2002. This plan recognizes the possible need for constructing housing units if new missions are moved to Vandenberg AFB from bases that are now being studied for closure. The plan is flexible and comprehensive, and can be amended to meet future needs. The Vandenberg AFB Comprehensive Plan has designated three residential reserves adjacent to Capehart Increments Nos. 1 through 5 and located north of Utah Avenue within the Base Support Area.

Offbase. The cities of Lompoc, Santa Maria, and Guadalupe, and the County of Santa Barbara, have each adopted general plans. These plans consider the impacts and needs of Vandenberg AFB upon their jurisdictions.

The City of Santa Maria general plan is designed to promote growth in a controlled and orderly manner to avoid leapfrog development. It promotes infill and is protective toward the surrounding prime farmlands. The policies for protecting prime farmland are designed to prevent premature or unnecessary conversion to nonagricultural uses. The city currently has space for 5,000 additional dwelling units. A land use element currently being prepared will provide for more dwelling units in the future. The city has historically had a growth rate of 350 to 650 housing units per year. The land use element will be designed to accommodate phased growth to a planned future population of 80,000 to 85,000 from a current population of approximately 53,000.

The City of Guadalupe is characterized as a small agricultural community bounded by the Santa Maria River floodplain to the north and surrounded elsewhere by prime farmland. The adopted general plan would allow the ultimate development of approximately 2,060 dwelling units on 271 acres. Within the city, all but 23 parcels have been developed for residential use. The city is in the process of preparing a new general plan. The new plan recommends the expansion of designated residential use to 630 acres, which could accommodate approximately 4,500 dwelling units. The City of Lompoc is characterized by a tight development pattern with an absence of leapfrog development. The policies of the Land Use Element restrict residential development to the urbanized area. The urbanized area, as of 1989, contained approximately 98 acres of vacant developable residential land. The Local Agency Formation Commission (LAFCO) recently decided to limit the northward residential expansion of Lompoc to Purisima Road. LAFCO determined that 148 acres of future developable residential area, with a potential density of approximately 840 dwelling units, be subject to the jurisdiction of the County of Santa Barbara for land planning and be served by the Mission Hills Community Service District. As a result, the acreage will be developed under the policies of the Santa Barbara County general plan. As with Lompoc, the County general plan has designated Mission Hills and Vandenberg Village as urbanized areas; the surrounding private land is designated low rural densities ranging from 40- to 100-acre minimum lot sizes. The County has adopted policies in the general plan to protect the environmental and agricultural resources. Therefore, as with Lompoc, there is a possibility that the unincorporated areas would also develop the present vacant land designated for future residential development. The County of Santa Barbara administers land use in Orcutt, Tanglewood, and other unincorporated areas under the County general plan.

3.3.2.3 Visual Resources

The Base Support Area is sited on Burton Mesa, an uplifted marine terrace adjacent to the coastal plain of the Pacific Ocean. This area takes the form of an "S," an inherited form of the former cantonment area of Camp Cooke. The surrounding landscape is composed of open space lands with pristine stands of Burton Mesa chaparral and varying degrees of man-made disturbance, including the former developed areas of Camp Cooke that are now vacant. The Base Support Area has residential and public school areas to the north; administrative, industrial and support facilities in the middle; and flight operations to the south. The area is characterized by pockets of intensive development separated by windbreaks, vacant areas, and recreational and natural areas, and is surrounded by vast areas of open space which give the installation a park-like quality. The highly intensive industrial and flight operations areas are effectively screened from sensitive residential and community service areas.

3.3.3 Transportation

3.3.3.1 Traffic

Existing Conditions. Regional access to Vandenberg AFB is provided by State Routes 1, 20 and 246; Lompoc-Casmalia Road, and Santa Lucia Canyon Road. State Route 246 divides the base (North Half and South Half). Four entrance/exit gates provide primary access to the base. The Santa Maria Gate is located near the intersection of California Avenue and Lompoc-Casmalia Road and provides access from the Orcutt and Santa Maria north of the base. The Utah Gate, located on Utah Avenue east of Lompoc-Casmalia Road, also provides access from Orcutt and Santa Maria. The Pine Canyon Gate is located on Pine Canyon Road north of Santa Lucia Canyon Road and provides access from the Lompoc area to the south and east. The Solvang Gate, located on 15th Street north of California Route 246, provides access from the south and west. The transportation network in the Vandenberg AFB area is shown in Figure 3.3.3-1.

The principal routes into Vandenberg AFB from Lompoc and areas to the south are via H Street to Lompoc-Casmalia Road (State Route 1) and then north to the Santa Maria Gate; via Floradale Avenue, which continues as Santa Lucia Canyon Road outside of Lompoc, north to Pine Canyon Road and the Pine Canyon Gate; or west on California Route 246 (Ocean Avenue) to 15th Street and the Solvang Gate. The principal routes into Vandenberg AFB from Santa Maria and Orcutt are via State Route 1 (known locally as Vandenberg Road) to the Santa Maria Gate, or via the circuitous Black Road to Lompoc-Casmalia Road and the Utah Gate.

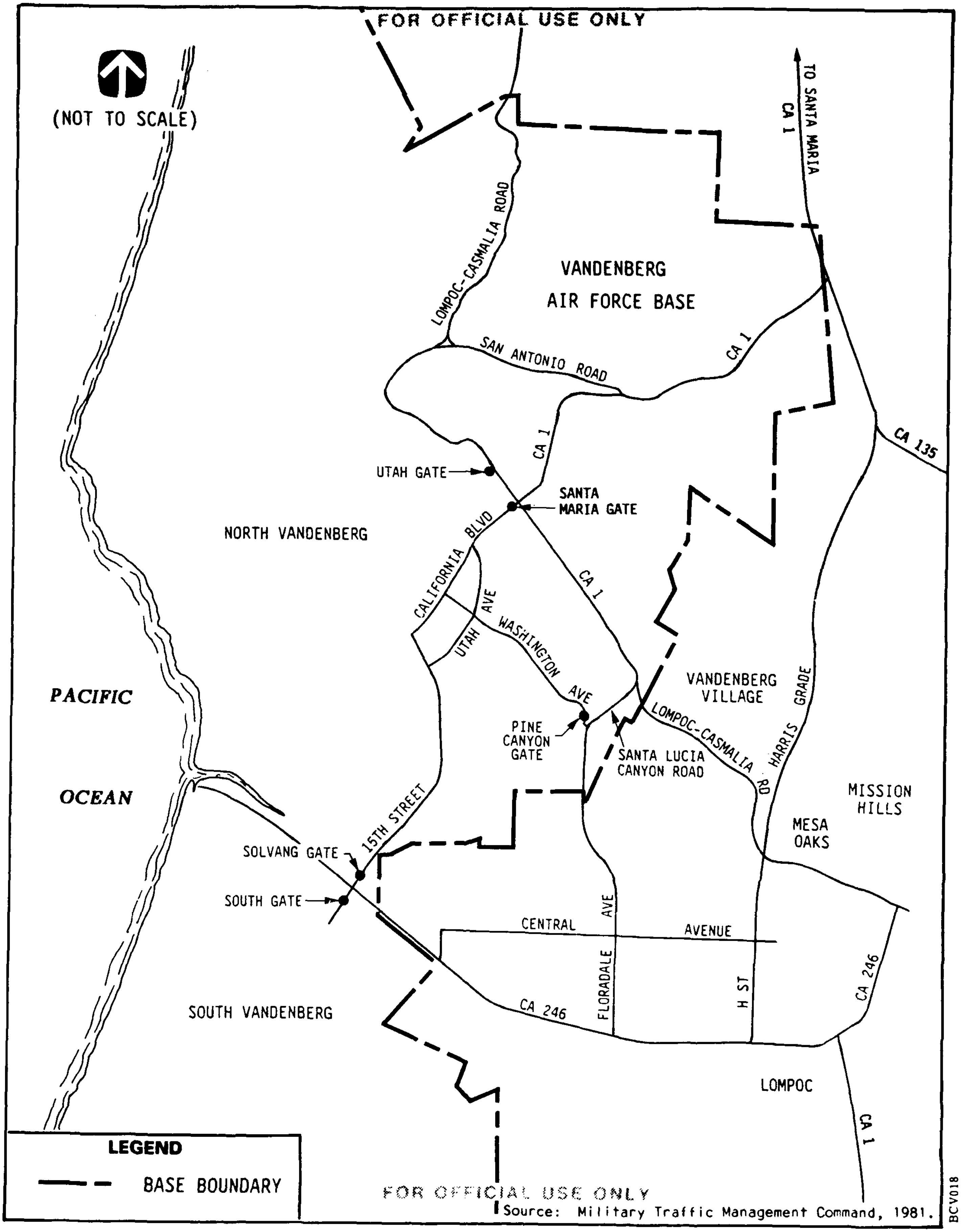

FIGURE 3.3.3-1 GENERAL ROAD SYSTEM VANDENBERG AFB, CALIFORNIA

Roadway Characteristics. H Street (State Route 1) is a four-lane divided roadway extending from Olive Avenue north through the City of Lompoc. H Street becomes Harris Grade Road outside of the city. Ocean Avenue (California Route 246) is a four-lane divided roadway between 7th Street and V Street in the city. East of 7th Street, Ocean Avenue is a three-lane divided roadway and west of V Street, it is a two-lane divided roadway.

Existing and Projected Traffic Volumes. Current and projected traffic volumes for roads in the vicinity of Vandenberg AFB are presented in Table 3.3.3-1. Daily operating conditions on the roadways in the Vandenberg AFB area were analyzed. Existing daily traffic volumes were compared to Level of Service (LOS) E roadway capacities to arrive at a volume-to-capacity ratio and corresponding level of service of operation. A comparison of daily traffic volumes and volume-to-capacity ratios for selected roadway segments is provided in Table 3.3.3-1. All road segments analyzed operate at LOS C or better.

3.3.3.2 Airports

Santa Maria Airport is a small regional airport located approximately 30 minutes driving time from Vandenberg AFB. The airport is only served by commuter airlines. Currently two scheduled airlines provide Santa Maria and the surrounding region with flights to Los Angeles and San Francisco. Passenger traffic at Santa Maria Airport exceeded 75,000 passengers (36,500 enplanements and 39,300 deplanements) in 1989. The airport served 125,180 passengers in 1984, and a 1986 Master Plan projected total annual passenger traffic of 250,000 in 1995. Limited major carrier service is available at Santa Barbara Airport with direct flights to Dallas-Fort Worth, Los Angeles, San Francisco, and San Jose.

3.3.4 Utilities

Northern Santa Barbara County is identified as the area where community and public utility services may be directly or indirectly affected by the proposed action. Santa Maria, the largest city in the area, is expected to receive significant immigration. Because of its proximity to Vandenberg AFB, Lompoc is also expected to have some increased migration.

3.3.4.1 Water Supply

The City of Santa Maria provides potable water to its residents from groundwater sources. The groundwater quality underlying the Santa Maria groundwater basin generally exceeds federal and state standards, although three wells have been closed because of high nitrate content and the presence of trichlorethylene (TCE). The groundwater is slowly becoming "harder", as it now contains 840 parts per million (ppm) of total dissolved solids (TDS). TDS levels are increasing at an estimated rate of 7.8 ppm per year. Treatment is required when TDS levels reach 1,000 ppm. Approximately, 11,300 acre-feet per year (3.684 billion gallons) of water from the State Water Project has been entitled to the city. Plans to extend a 5 foot-diameter pipeline to the northern Santa Barbara County boundary would allow Santa Maria to supplement its water supply and improve water quality. This project is anticipated to begin construction in the 1990s. An additional 3 million-gallon pumping plant is also planned for completion prior to 1996 to meet additional water demand. The present system has a treatment capability of 18 million gallons per day (MGD). A summary of existing and projected water demand is provided in Table 3.3.4-1. Present average daily demand is 61 percent of the capacity of

Table 3.3.3-1

Comparison of Daily Traffic Volumes to Estimated Roadway Capacities for Road Segments in the Vicinity of Vandenberg AFB

Road Segment	Roadway Capacity	Existing Conditions (1988) ADT[1]	Existing Conditions (1988) V/C Ratio[2]	Existing Conditions (1988) LOS[3]	Projected Conditions (1996) ADT	Projected Conditions (1996) V/C Ratio	Projected Conditions (1996) LOS
Lompoc-Casmalia Road							
Santa Lucia Canyon Road to California Blvd.	36,000	17,300	0.48	A	19,488	0.54	A
Harris Grade Rd. to Santa Lucia Canyon Road	36,000	18,745	0.52	A	21,116	0.59	A
North of California Blvd./Vandenberg Road	18,000	2,000	0.12	A	2,253	0.12	A
California Boulevard/CA 1							
Lompoc-Casmalia Rd. to San Antonio Road	36,000	13,600	0.38	A	15,320	0.43	A
San Antonio Road to CA 1	36,000	12,900	0.36	A	14,532	0.40	A
West of Santa Maria Gate	36,000	13,570	0.38	A	15,287	0.42	A
Pine Canyon Road							
At Pine Canyon Gate	24,000	2,800	0.12	A	3,154	0.13	A
Santa Lucia Canyon Road/Floradale Road							
Lompoc-Casmalia Road to Pine Canyon Road	24,000	4,800	0.20	A	5,407	0.23	A
Pine Canyon Road to Ocean Avenue/CA 246	24,000	6,500	0.27	A	7,322	0.31	A
H Street							
Ocean Avenue to Central Avenue	36,000	27,878	0.77	C			
Central Avenue to Lompoc-Casmalia Road	36,000	23,600	0.66	B	31,429	0.87	D
					26,585	0.74	C
Harris Grade Road							
Lompoc-Casmalia Road to Route 135	15,000	4,300	0.29	A	4,844	0.32	A
Purisima Road							
Harris Grade Road to CA 246	36,000	24,200	0.67	A	27,261	0.76	C
Ocean Avenue/CA 246							
CA 246 to H Street	36,000	15,800	0.44	A	17,799	0.49	A
H Street V Street	36,000	14,400	0.40	A	16,221	0.45	A
V Street to Floradale Avenue	36,000	6,200	0.17	A	6,984	0.19	A
West of Floradale Avenue	15,000	5,200	0.35	A	5,858	0.39	A

Table 3.3.3-1, Page 2 of 2

Road Segment	Roadway Capacity	Existing Conditions (1988)			Projected Conditions (1996)		
		ADT	V/C Ratio	LOS	ADT	V/C Ratio	LOS
CA 1/CA 135							
Vandenberg Road to Orcutt Road	36,000	12,500	0.35	A	14,081	0.39	A
Orcutt Road to Black Road	36,000	15,200	0.42	A	17,123	0.48	A
Orcutt Road/Broadway Street							
CA 1/ CA 135 to Lakeview Road	36,000	26,000	0.72	C	31,678	0.88	D
Lakeview Road to Betteravia Road	36,000	37,500	1.04	F	45,690	1.27	F
Betteravia Road to Main Street	54,000	39,500	0.73	C	48,127	0.89	D

Notes: [1]ADT = Average Daily Traffic.
[2]V/C Ratio represents the ratio of Average Daily Traffic volume to roadway capacity.
[3]LOS = Level of Service (Section 3.1.3, Table 3.1.3-1).

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Table 3.3.4-1

Summary of Current and Projected Average Daily Water Demand and Wastewater Flows (million gallons per day)

Year	Santa Maria	Lompoc	Vandenberg AFB
Water Demand			
1989	11.0	5.76	4.1
1996	13.2	6.38	4.1
1997	13.6	6.49	4.1
Wastewater Flows			
1989	5.6	3.56	0.9
1996	7.0	3.91	0.9
1997	7.2	3.96	0.9

the treatment systems. Future demand will increase to 77 and 81 percent in 1996 and 1997, respectively. Per capita demand is based on estimates of 200 gallons per day per capita (gpdc).

The City of Lompoc provides potable water to its residents and areas surrounding the city from groundwater sources. The quality of the groundwater within the Lompoc Basin are similar to that of the Santa Maria Basin in that it is slowly becoming harder and contains high TDS levels. In some areas the TDS level is 3,000 ppm. Lompoc must treat pumped water to reduce salts before distributing it for domestic use. The present system has a treatment capacity of 7.0 MGD. Existing and projected average daily demand is summarized in Table 3.3.4-1. Present average daily demand is 82 percent of the treatment system's capacity. Future demand will increase to 91 percent and 93 percent in 1996 and 1997, respectively. Per capita demand is based on city estimates of 180 gpdc. Upgrades to the facility to increase the treatment capacity to 10 MGD are planned to meet future demand. The City's State Water Project entitlement is 4,000 acre-feet (1.304 billion gallons) per year. The issue of use of this entitlement is presently unresolved.

Vandenberg AFB provides its own water from groundwater sources with an operating capacity of 11 MGD. Present demand (Table 3.3.4-1) is 37 percent of the treatment system's capacity and is expected to remain constant. The State Water Project allocation for the base is 8,000 acre-feet (2,608 billion gallons) per year.

3.3.4.2 Wastewater

Wastewater treatment for the City of Santa Maria occurs at a city-owned activated sludge treatment plant. Effluent discharge does not presently meet regional water quality standards because of its high sodium concentration. The system capacity is 7.8 MGD. Future expansion is planned to increase the treatment capacity to 8.7 MGD in 1990 and 9.7 MGD by 2000. Existing and projected average daily flows are provided in Table 3.3.4-1. Average daily flow in 1989 was 72 percent of the treatment system's capacity and projected flows are 91 and 93 percent of capacity in 1996 and 1997, respectively. With the planned increase to 8.7 MGD, the projected increase in flows in 1996 would be 73 percent of the system's capacity and 75 percent in 1997. Per capita flow is based on 100 gpcd.

The 5.0 MGD treatment facility owned by the City of Lompoc services the city residents and areas surrounding the city, including Vandenberg AFB. Existing and projected average daily flows are presented in Table 3.3.4-1. Average daily demand in 1989 was 82 percent of the capacity of the treatment system. Projected flows in 1996 and 1997 will increase the wastewater flow to 95 percent and 93 percent of capacity, respectively. Per capita flow is based on city estimates of 85 gpcd. The treatment facility can be expanded to 12 MGD for future projected demands. The present contract with Vandenberg AFB allows for the treatment of a daily flow of 1.53 MGD and a peak demand of 3.4 MGD. Currently, Vandenberg AFB is utilizing 59 percent of their contractual amount.

3.3.4.2 Solid Waste

Solid waste is collected by the City of Santa Maria and disposed of in a city-owned landfill. The city generated 535 tons per day (T/day) of solid waste in 1989. Santa Maria, like all California jurisdictions, is required to implement California Assembly Bill (AB) 939. This statute requires implementation of a recycling program which will reduce solid waste generation 25 percent by 1995 and 50 percent by 2005 based on 1988 solid waste generation figures. Santa Maria's program is anticipated to be promulgated through the implementation of a Solid Waste Management Element, which is anticipated to occur in 1991. Without the recycling program, solid waste generation is expected to increase to 589 T/day by 1995. At this rate, the Santa Maria landfill would have a lifespan of 20 years. The recycling program would extend the lifespan from 3 to 25 years depending on when the program implementation occurs and the rate of compliance. The Santa Maria landfill accepts both Class II and Class III wastes.

The City of Lompoc Solid Waste Division collected an average of 170 tons per day of solid waste in 1989. The city operates a Class III sanitary landfill. The landfill has sufficient capacity to handle wastes for additional 20 to 30 years at the present expected generation. To comply with AB 939, the city is presently preparing an interim Source Reduction and Recycling Study, to be completed by July 1, 1991. The lifespan of the current landfill would be extended with implementation of such a program.

A private contractor collects solid waste on Vandenberg AFB and disposes of it in a landfill on base. Approximately 35 tons per day (TPD) were generated in FY 1989. The landfill has a projected lifespan of 35 years at present rates of generation. The lifespan would be extended with conformance to AB939.

3.3.4.4 Energy

Pacific Gas and Electric Company (PG&E) provides electrical service to Vandenberg AFB and most of the surrounding area, including the City of Santa Maria. The company serviced 11.5 million customers in northern and central California in 1989. Peak electrical demand reached 17,000 megawatts (MW) in 1989. Peak demand is expected to increase to 22,800 MW by the year 2009, with an annual growth rate of 1.5 percent. The company's present capacity is 23,244 MW; no new projects are currently planned to provide additional electrical supply. Any increased demand can be met with power purchased from sources outside the region. The City of Santa Maria consumed an estimated 108,900 kilowatt-hours (kWh) in 1989. Projected demand is based upon an expected annual growth rate of 2.5 to 3.0 percent.

Vandenberg AFB has ten substations onbase to provide electricity to facilities throughout the installation. These substations are capable of supplying 92.0 MVA. Total consumption in 1989 was 183,000 kWh, with an estimated peak demand of 46,000 kW.

The City of Lompoc is a member of Northern California Power Association (NCPA). NCPA is a nonprofit joint agency comprised of 11 cities, 1 rural electric cooperative, and 1 irrigation district formed to purchase, generate, transmit, interchange, and pool electrical energy and capacity for its members. A peak demand of 1,352 MW was met with resources from a system with a capacity of approximately 1,500 MW. NCPA projects a 2.5 percent annual increase in peak demand. To meet projected peak demands, the company will rely on purchased power and a new hydroelectric project presently under construction. The system capacity for the City of Lompoc is 75 megavolt-amperes (MVA), and a third transformer substation is presently under construction. Consumption for 1989 for the city was 21,900 kWh. Projected demand is based upon an expected annual growth rate of 1.5 percent.

3.3.5 Hazardous Materials/Waste Management

3.3.5.1 Hazardous Materials Management

Hazardous materials are used and temporarily stored at various industrial facilities throughout Vandenberg AFB. Most of the hazardous materials associated with base operations consist of solvents, paint strippers, and paints. Other hazardous materials used and stored at the base include fuels, oils, batteries, herbicides and pesticides, and a variety of chemicals and munitions. Because of the space launch mission of the base, hazardous materials such as hypergolic fuels (e.g. hydrazine) are used in large quantities.

Procedures for hazardous material storage, use, and spill prevention and control at Vandenberg AFB are outlined in various plans including the Underground Storage Tank Management Plan, the Solvent Management Plan, and the Spill Prevention Control and Countermeasures/Oil and Hazardous Substance Contingency (Spill Prevention Response) Plan.

3.3.5.2 Hazardous Waste Management

Vandenberg AFB manages all hazardous waste in accordance with a Hazardous Waste Management Plan. The management plan describes how the base will store, handle, and manage hazardous waste products generated at the installation. Hazardous waste routinely generated by the base include oils, paints, thinners, solvents, and other regulated materials. In addition to the management plan, the base has also developed a Waste Minimization Plan to provide information and procedures to reduce and minimize the generation of hazardous wastes at the base.

The Defense Reutilization and Marketing Office (DRMO) is responsible for shipping hazardous waste offbase. Hazardous wastes are stored in an onbase conforming storage area for no more than 90 days and then transported to licensed treatment and disposal facilities.

3.3.5.3 Installation Restoration Program Sites

No Installation Restoration Program (IRP) sites are located on any of the proposed project sites. Nine IRP sites have been identified in proximity of the proposed project areas. The following is a general discussion and status of each of these sites.

Base Exchange Service Station. The Base Exchange Service Station has been in operation as the primary automobile service station on Vandenberg AFB since 1963. Indications of gasoline leakage at the station were investigated in August 1985, and a number of samples containing petroleum hydrocarbons were obtained from soils at relatively shallow depth. Some of the contaminated soil has been excavated and stockpiled at the site, but the bulk of the contaminated material is still in the ground. The site is presently in the Remedial Investigation/Feasibility Study phase.

Old Service Station. The Old Service Station was the primary automobile service station for the base until 1963. It is currently used as a petroleum dispensing facility. The underground storage tanks were removed from the site, but base personnel have reported observations of gasoline at the surface of the site. It was suggested that the source may have been in piping that had been disconnected from the tanks, but not removed from the site. The site is presently in the Remedial Investigation/Feasibility Study phase.

Landfill No. 2 and Laundry Site. These two sites are located on the southeastern edge of the Burton Mesa. The Remedial Investigation/Feasibility Study phase is being completed on both sites together because of their close proximity. The landfill is approximately 40 acres in size. The site has been used continuously for disposal since 1941 and is currently the sanitary landfill for the base. Materials disposed of include sanitary trash; miscellaneous waste petroleum, oils and lubricants; waste solvents; pesticides; transformer oil; ordnance; paint; scrap missile material; scrap metal; PCB-contaminated soil; and construction debris. The laundry site is located north of the landfill and operated until 1967. Monitoring wells installed in the area have shown TCE values as high as 88 ppm.

Landfill No. 1/Drum Disposal Site No. 1 and Entomology Wash Rack. These sites are being investigated together in the Remedial Investigation/Feasibility Study phase because of their proximity. Landfill No. 1 is located in the central section of the installation, about one mile directly north of Landfill No. 2. The landfill was used from 1942 to 1957. Fill material consisted of incinerator ash; unbearable slag; scrap metal; pesticides; unexploded ordnance; and waste petroleum, oils, and lubricants (POL). Currently the landfill is closed. The Drum Disposal Site is in the area immediately south of Landfill No. 1. Approximately 50 drums of waste POL and solvents were buried in a trench at this site in 1957. Although the buried drums may still be intact, the soils in the area are permeable, and migration could occur if the drums deteriorate. The Entomology Wash Rack is located on the west side of Utah Avenue. The area was used from 1965 to 1985 for mixing pesticides and washing and rinsing pesticide-spraying equipment during cleanup operations. Rinse waters and excess pesticide formulations were disposed of on the soil adjacent to the wash rack pad and also down the wash rack drain to the stormwater drainage system. Until 1974, large quantities of DDT were reportedly used at Vandenberg AFB. DDT residues, in addition to residues from other persistent pesticides (e.g., chlordane toxaphenes) may still remain in the soils around the wash rack.

Fuel Decon Facility. This site was used for disposal of neutralized fuel samples brought to the laboratory for testing. The site investigation was completed and a No Further Action Decision Document is being prepared for submittal to the U.S. Environmental Protection Agency (EPA).

Fuel Tank Farm Site. This site consists of five aboveground and four underground fuel storage tanks at the fuel tank farm. Possible leakage of the storage tanks and pipelines and accidental spills at the unloading and loading facilities were a concern at the site. A Phase II IRP investigation was completed and a No Further Action Decision Document is being prepared for submittal to EPA.

3.3.6 Geology and Soils

3.3.6.1 Geology

Regional Geology. Vandenberg AFB lies in the western portion of the Transverse Ranges Physiographic Province of California. This region of west-trending mountains is divided by a series of valleys oriented by subsurface faulting. The west-central part of the base is characterized by an extensively uplifted marine terrace which is dissected into three erosion surfaces. The terraces are bounded by the Casmalia Hills to the north and Cypress Ridge of the Santa Ynez Mountain Range to the south. San Antonio Terrace (north) and Burton Mesa (center) are both uplifted marine terraces separated by San Antonio Creek. The Santa Ynez River, to the south, separates Burton Mesa from Lompoc Terrace (Figure 3.3.6-1). The surfaces of the Mesa have been altered by eolian or wind transported deposits. A dendritic pattern of incised ephemeral streams, tributaries to either the Santa Ynez River, San Antonio Creek, or independent streams which drain to the west into the Pacific Ocean, have also

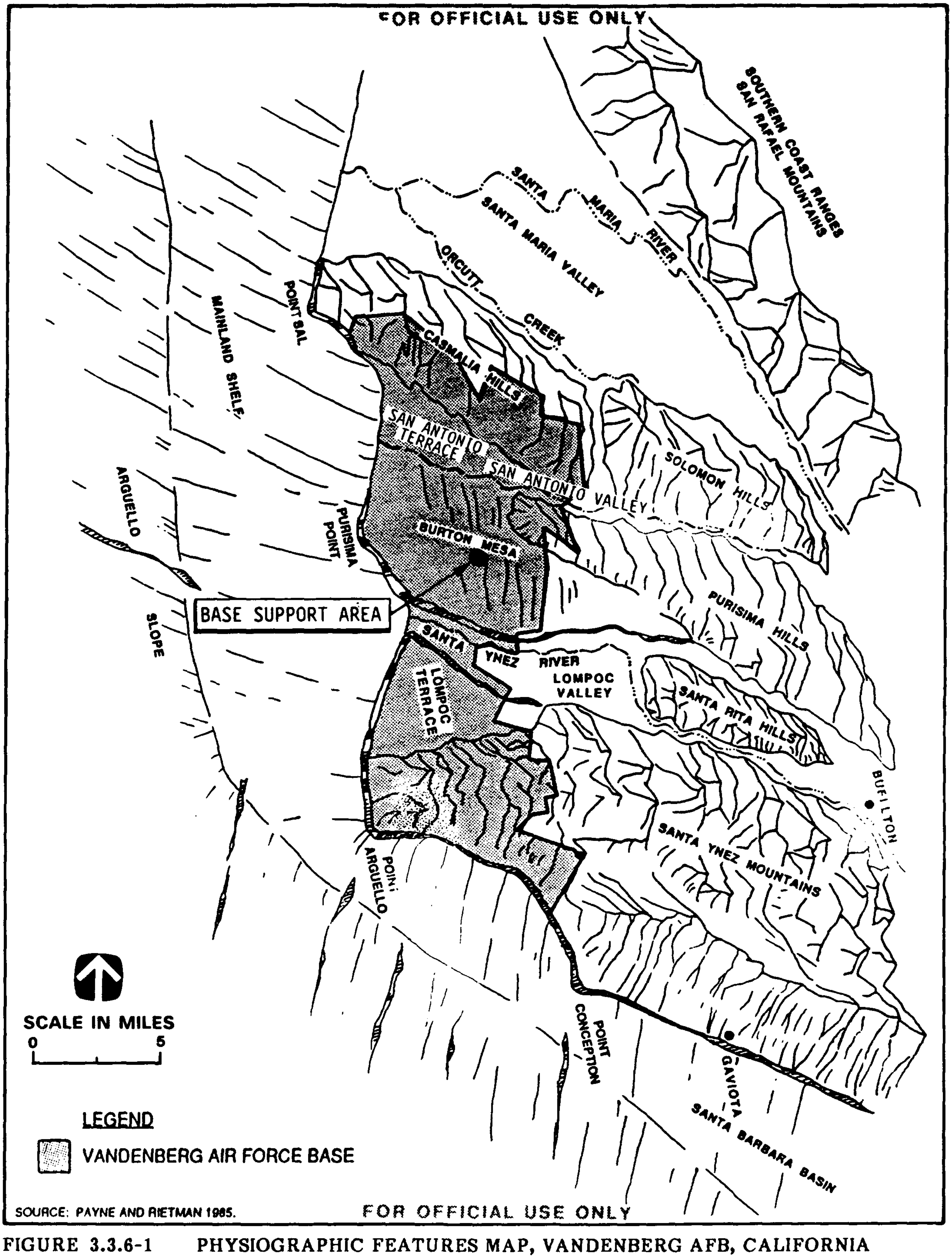


FIGURE 3.3.6-1 PHYSIOGRAPHIC FEATURES MAP, VANDENBERG AFB, CALIFORNIA

altered the topography. The Base Support Area is sited on a broad plain of Burton Mesa with surface drainage flowing into the surrounding dendritic drainage basins.

Geologic Hazards. Potential geologic hazards at Vandenberg AFB include landslides, surface fault ruptures, seismicity liquefaction, tsunamis, and seiche. The physical location of the Base Support Area limits the potential effects of these geologic hazards on the base.

Fault Rupture. Vandenberg AFB is located in a region of highly complex geologic compositions. The base is located in the Hosgri Fault System, which is located on and offshore. Burton Mesa is situated between the Lion's Head Fault to the north and Hosgri Fault and Santa Ynez River Fault to the south (Figure 3.3.6-2). The Hosgri Fault is considered to be an active fault, evidenced by seismicity or displacement in the last 11,000 years (Holocene Epoch). The Santa Ynez River Fault has been classified as potentially active because evidence shows displacement 11,000 to 500,000 years old. The Lion's Head Fault shows no evidence of displacement in the last 500,000 years; however, fault evidence may be masked by erosion or vegetation. There is no evidence of faults present in the vicinity of the Base Support Area.

Seismicity or Strong Ground Motion. Seismicity or strong ground motion is associated with the effects of fault rupture, both subsurface and surface. The Vandenberg AFB area has experienced 90 minor earthquakes in the past 65 years with magnitudes ranging from 3.0 to 7.3 (Richter scale), including a 7.3 magnitude event in 1927 located offshore near Point Arguello.

Other hazards associated with surface rupture and ground motion are liquefaction, tsunamis, and seiche. Liquefaction and tsunami hazards can be discounted because the liquefaction prone areas at Vandenberg AFB are located in the high groundwater areas associated with San Antonio Creek and the Santa Ynez River. The tsunami hazard to the Base Support Area can be considered minimal as the area is over two miles from and over 300 feet higher than the ocean. Seiche is an induced wave setup by a force, such as ground motion from an earthquake, in an enclosed fluid body such as a lake, pond, or storage tank. The hazard is posed by the overtopping of water behind a dam or through the rupture of a tank. Potential seiche hazard to the Base Support Area is limited to small areas located downhill from petroleum, oil, and lubricant (POL) storage tanks and large water tanks. The three Pine Canyon lakes are located below the Base Support Area and, therefore, do not present a potential hazard.

3.3.6.2 Soils

Within the Base Support Area, two soil series describe the majority of the soil resources: the Narlon Loamy Sand and the Tangair Sand. The two soil series vary in particle size classification and slope throughout the Base Support Area. Within the northwestern portion of the area identified for the realignment, the Tangair sand is the representative soil series. This soil is found in the Tangair-Narlon Association and ranges from nearly level to strongly sloping. The Tangair Sand ranges from being poorly drained to moderately well drained soil and is located on the terraces commonly found at Vandenberg AFB. The Narlon Loamy Sand is the representative soil for the southern and eastern portions of the proposed project areas. This soil is also identified with the Tangair-Narlon Association and shares common physical properties with the Tangair Sand.

The potential for water erosion to the Tangair Sand ranges from none to slight because of the rapid permeability of this soil. The potential for windblown erosion is high because of the coarse texture of this soil. The Narlon Loamy Sand's potential for water erosion ranges from none to slight because

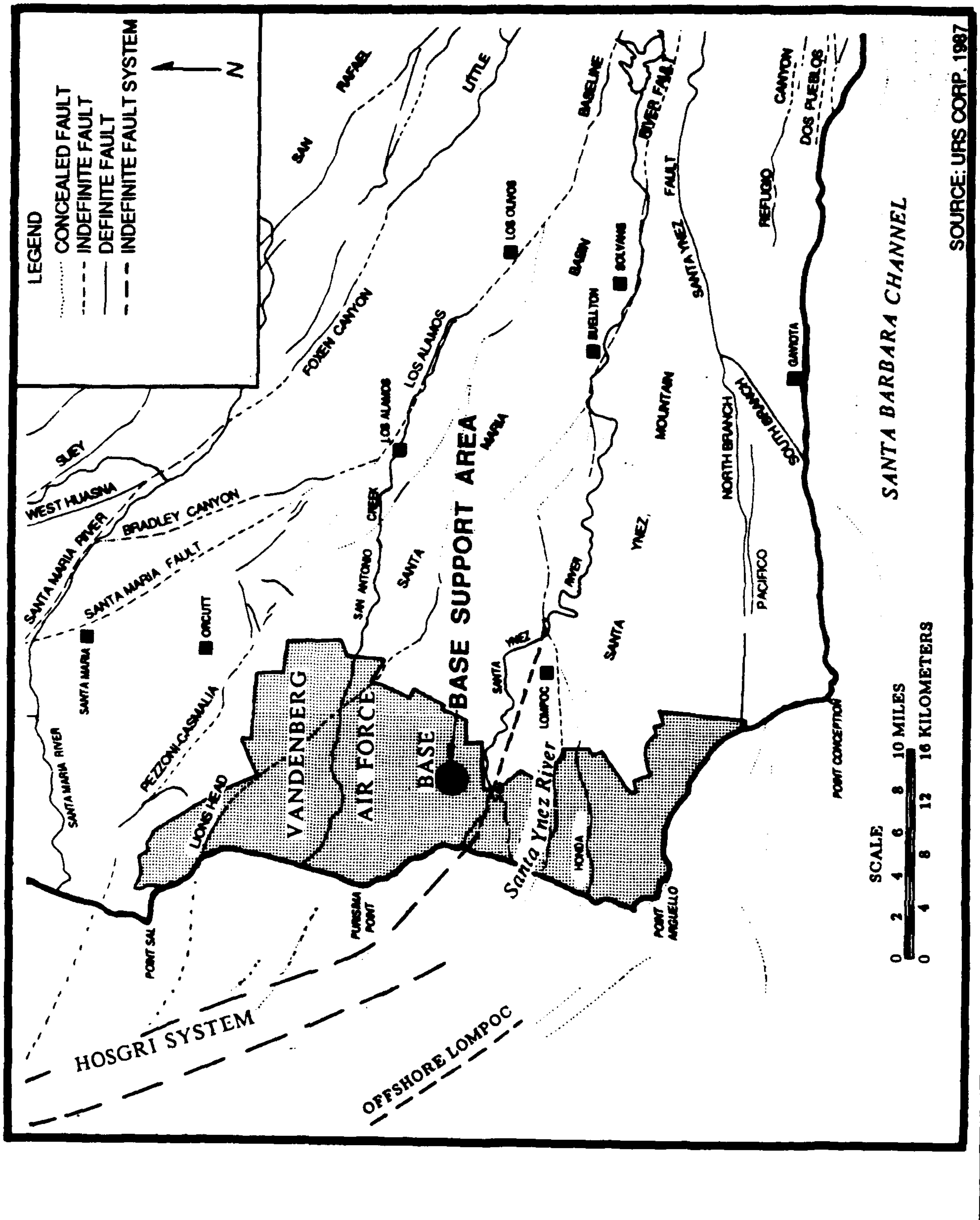


FIGURE 3.3.6-2 LOCATION OF FAULTS IN THE VANDENBERG AFB, CALIFORNIA AREA

of the rapid permeability of this soil. As this soil is slightly less coarse in texture, the potential for windblown erosion is moderate.

No prime farmland is located within the proposed project areas. All the soils in this area have severe limitations that make them unsuitable for cultivation and limit their use to pasture, range, woodland, or wildlife habitat.

3.3.7 Water Resources

3.3.7.1 Groundwater

There are three watersheds in hydrologically-linked groundwater basins that supply groundwater to the south Vandenberg AFB/Lompoc ares (Figure 3.3.7-1). The three basins, the Lompoc Plain, Lompoc Upland, and Lompoc Terrace basins, are located in the Santa Ynez watershed. The City of Lompoc and surrounding unincorporated communities withdraw water from the Lompoc Plain and Lompoc Upland groundwater basins. North Vandenberg AFB obtains 30 percent of its water requirements (1,700 acre-feet/year) from the Lompoc Plain basin. Annual recharge of these two basins is 33,000 acre-feet/year with a withdrawal rate of 38,000 acre-feet/year. These two basins are overdrafted by 5,000 acre-feet/year (Table 3.3.7-1). South Vandenberg AFB obtains its water (approximately 260 acre-feet/year) from the Lompoc Terrace basin. With a recharge rate of 250 acre-feet/year, this basin is currently overdrafted by 10 acre-feet/year and is not a long-term reliable water source.

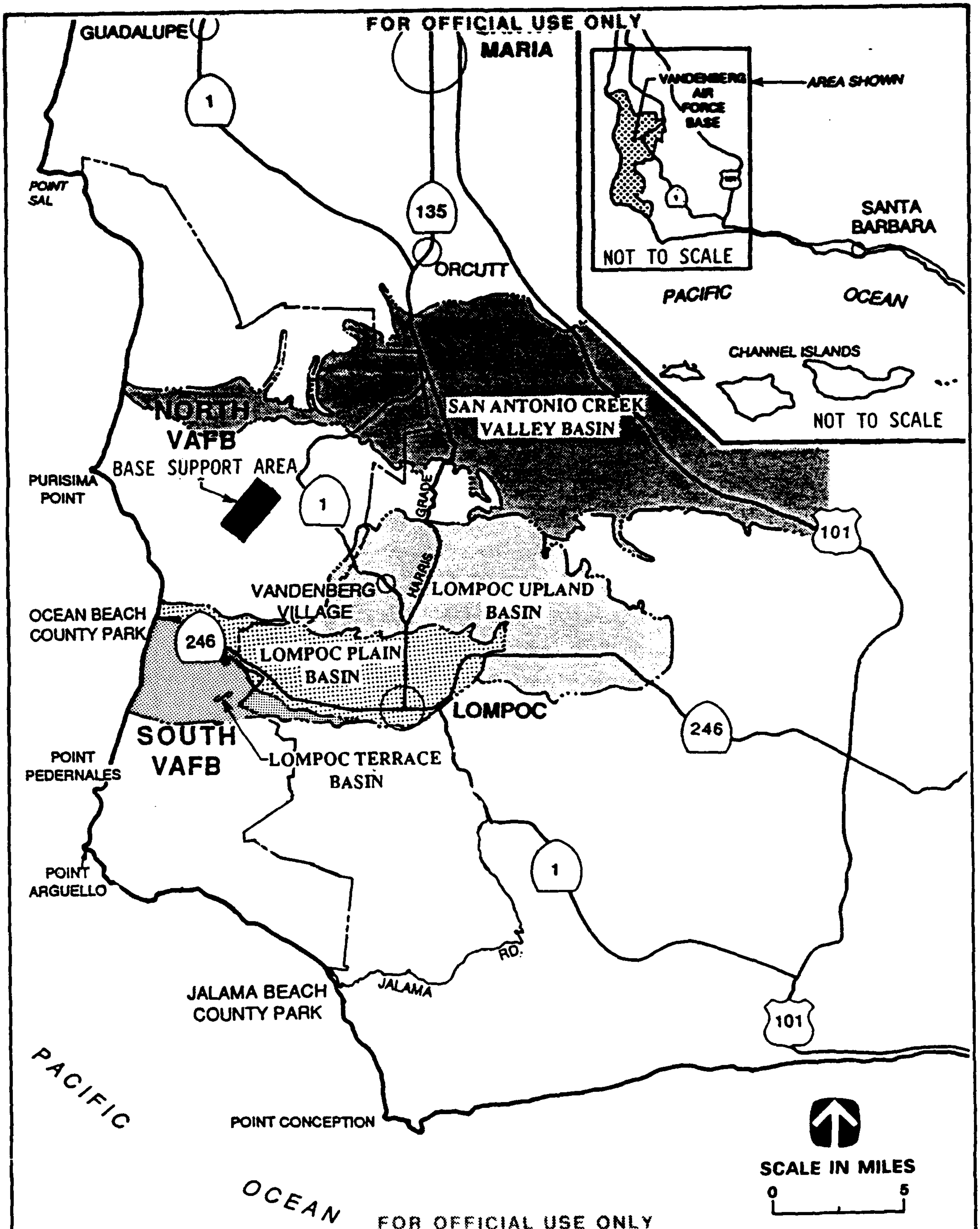
North Vandenberg AFB obtains the remaining 70 percent (3,600 acre-feet/year) of its water from the San Antonio Creek watershed. Total demand on the San Antonio Creek watershed is 20,000 acre-feet/year. With a recharge rate of about 8,000 acre-feet/year, the San Antonio watershed is overdrafted by 12,000 acre-feet/year (Figure 3.3.7-1).

The City of Santa Maria obtains its water from the Santa Maria watershed basin. Present demand on this basin is about 112,000 acre-feet/year with 78 percent of it for agricultural uses. Currently this groundwater source is overdrafted by 21,000 acre-feet/year (Table 3.3.7-1).

Groundwater quality within this region meets all National Interim Primary Drinking Water Regulations Standards. Continued overdraft of the groundwater basins could lead to a decrease in the watertable levels and a compaction of the basins. Water quality has decreased slightly as saline agricultural drainage percolates back into the groundwater.

3.3.7.2 Surface Water

The Base Support Area is sited upon an uplifted marine terrace called Burton Mesa. Burton Mesa is drained by a dendritic pattern of minor ephemeral stream courses (water flows in a stream channel only during and shortly after a rainstorm) which radiate in a circular pattern around the Base Support Area and drain away from the installation. There are three major ephemeral stream systems: the tributaries of San Antonio Creek which drain to the north; the Santa Ynez River which drains to the south; and four small streams which drain to the west. San Antonio Creek and the Santa Ynez River allow surface water to infiltrate through the sand into the ocean. Occasionally, during periods of high stream flow, the sand deposits are temporarily breached, and surface water flows directly into the ocean, but these breaches are soon closed by the migrating action of sand deposits. Some sections of



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Source: USAF 1987a and adapted from Environmental Solutions Inc., 1989.

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FIGURE 3.3.7-1 GROUNDWATER BASINS IN THE VANDENBERG AFB, CALIFORNIA AREA

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Table 3.3.7-1

Groundwater Use of Aquifers in the Vandenberg AFB Area

Watershed (Aquifer)	Total Withdrawal	Recharge Rate	Overdraft
	Acre-Feet/Year		
San Antonio Creek	20,000	8,000	12,000
Santa Ynez Valley			
Lompoc Upland Basin/ Lompoc Plain Basin	38,000	33,000	5,000
Lompoc Terrace Basin	350	250	100
Santa Maria	133,000	112,000	21,000
TOTAL:	191,350	153,250	38,100

these streams are perennial, but generally remain dry for the majority of the year. These stream systems are not sources of drinking water, but may provide aquifer recharge.

The San Antonio Creek Drainage Basin is approximately 154 square miles in area. The creek is characterized by perennial flows with intermittent flows upstream of Barka Slough. Water quality in San Antonio Creek has been classified as poor with total dissolved solids (TDS) levels ranging from 1,400 to 3,600 parts per million (ppm).

The Santa Ynez River has a drainage area of approximately 900 square miles. The natural flow has been severely altered by several dams, the largest being Cachuma Dam which impounds Lake Cachuma Reservoir. The waters of Lake Cachuma are exported out of the Santa Ynez River Basin to the City of Santa Barbara.

3.3.8 Air Quality

3.3.8.1 Regulatory Setting

National Ambient Air Quality Standards (NAAQS) have been established by EPA for the following pollutants: ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter smaller than 10 micrometers in diameter (PM_{10}), and lead (Section 3.1.8, Table 3.1.8-1). The federal Clean Air Act delegates to states and local agencies the authority to establish air quality rules and regulations which must be at least as restrictive as the federal requirements. The California Air Resource Board (CARB) has established air quality standards which are more stringent than some of the NAAQS and has also established air quality standards for pollutants for which there are currently no federal standards. The Clean Air Act also delegates to each state the authority to establish air quality standards, regulations, and rules. Rules adopted by local air pollution control districts, and accepted by the CARB, are included in the state implementation plan (SIP). When the SIP is approved by the EPA, these rules become federally enforceable.

Santa Barbara County is within the Central Coast Air Quality Control Region (AQCR Number 32) (CFR,1989) and the California South Central Coast Air Basin, which includes San Luis Obispo, Ventura, and Santa Barbara counties. Air quality in the northern part of Santa Barbara County is generally quite good.

The Santa Barbara County Air Pollution Control District (SBAPCD) is the local agency responsible for managing air quality including regulating sources, permitting, and implementing new source review regulations in Santa Barbara County. SBAPCD has the authority for granting permits to stationary sources in the county, including Vandenberg AFB. However, the CARB reviews most stationary source permit applications in Santa Barbara County to ensure that the APCD rules and regulations are implemented.

An area is designated as being nonattainment for a particular pollutant if ambient concentrations in that area are above the corresponding standard. The South County portion of Santa Barbara County (i.e., area south of the Santa Ynez Mountains) has been formally designated a nonattainment area for the federal ozone standard. The rest of the county is currently classified by the EPA as attainment for the ozone standard, although violations of the state and federal standards do occur in the North County area and formal redesignation to nonattainment status is under consideration.

The SBAPCD implemented a revised Air Quality Attainment Plan (AQAP) in May 1990, which is designed to bring the South County into compliance with the NAAQS for ozone. The AQMP identifies specific control measures for reactive organic gases (ROG) and NO_x emission sources, the two key precursors in the formation of ozone. Although the North County area, which includes Vandenberg AFB, is not currently a nonattainment area for ozone, many of the control measures will be extended to this area, because the North County area does not violate the state standard for ozone. The SBAPCD is required to prepare an attainment plan for the North County area under the California Clean Air Act. This plan is scheduled to be implemented in 1991.

3.3.8.2 Regional Air Quality

Meteorology and Climate. Vandenberg AFB is characterized by a coastal Mediterranean climate which experiences an unusual amount of fog, especially during the summer. Rainfall varies from as little as 6 inches per year in the dry inland valleys to about 30 inches per year along some mountain ridges. Temperatures along the coast are moderated by the ocean's influence. September and October are the warmest months of the year with an average high of 69°F. The average maximum temperatures for December through August range from 60 to 65°F; lows range from 40 to 50°F.

Existing Air Quality. Existing air quality near Vandenberg AFB can be estimated by air monitoring measurements made at the SBAPCD monitoring station in Lompoc, approximately 5 miles southeast of the base. Vandenberg AFB maintained a monitoring station near the Base Support Area until 1989. A summary of the maximum pollutant concentrations occurring from 1986 to 1988 at the Lompoc and Vandenberg AFB stations is presented in Table 3.3.8-1. Existing air quality in the Santa Maria area is also presented. The maximum concentrations and number of days exceeding federal and state for each pollutant at a monitoring station in Santa Barbara County is also provided for comparison. The state ambient quality standards were exceeded for ozone in all 3 years at the Lompoc monitoring station. The 24-hour average state standard for PM_{10} was exceeded in all 3 years at the Lompoc monitoring station.

3.4.8.2 Air Pollutant Emission Sources

An emissions inventory for Santa Barbara County is presented in Table 3.3.8-2. Emissions data are presented for PM_{10}; SO_x; NO_x; CO; and reactive organic gases, a measure of reactive hydrocarbons; and total organic gases, a measure of reactive and non-reactive organic gases.

In Santa Barbara County, the majority of stationary source emissions for NO_x were from fuel combustion, while the majority of ROG emissions was from solvent use (e.g., surface coating, degreasing, and consumer products) and petroleum processing, storage, and transfer. The predominant source of emissions of CO and NO_x in the county is from mobile sources. In the North County area, mobile sources account for approximately 47 percent of the total CO emissions, 56 percent of the NO_x emissions, and 20 percent of the ROG emissions.

For comparison, estimated emissions from stationary sources at Vandenberg AFB are presented in Table 3.3.8-3. Table 3.3.8-4 provides a summary of the emissions inventory prepared by Vandenberg AFB in 1986 for all emission sources onbase including area and mobile sources.

Table 3.3.8-1

Summary of Air Quality Monitoring Data for Vandenberg AFB Area 1986-1988

	Vandenberg AFB			Lompoc (128 H Street)			Santa Maria (Broadway)			Santa Barbara[1] County		
	1986	1987	1988	1986	1987	1988	1986	1987	1988	1986	1987	1988
Ozone												
Maximum Concentration (ppm/1 hour)[2]	.10	.15	.08	.11	.11	.10	--[3]	.10	.08	.16	.17	.12
Days Exceeding Standard												
Federal (>.12 ppm, 1 hour)	0	1	0	0	0	0	--	0	0	1	2	0
State (>.09 ppm, 1 hour)	3	4	0	1	2	1	--	1	0	20	14	8
Carbon Monoxide												
Maximum Concentration												
(ppm/8 hour)	1.0	1.0	1.0	3.3	2.3	2.4	--	--	--	8.6	7.5	7.4
(ppm/1 hour)	1	1	1	6	7	6	--	--	--	18	14	15
Days Exceeding Standard												
Federal (>9.0 ppm, 8 hours)	0	0	0	0	0	0	--	--	--	0	0	0
(>35 ppm, 1 hour)	0	0	0	0	0	0	--	--	--	0	0	0
State (>9.0 ppm, 8 hours)	0	0	0	0	0	0	--	--	--	0	0	0
(>20 ppm, 1 hour)	0	0	0	0	0	0	--	--	--	0	0	0
Nitrogen Dioxide												
Annual Average (ppm)	.002	.002	.003	.011	.009	.012	--	--	--	.011	.011	.015
Maximum Concentration (ppm/1 hour)	.04	.03	.03	.05	.04	.06	--	--	--	.13	.13	.16
Days Exceeding Standard												
Federal (.053 ppm, Annual Average)	0	0	0	0	0	0	--	--	--	0	0	0
State (>.25 ppm, 1 hour)	0	0	0	0	0	0	--	--	--	0	0	0

Table 3.1.8-1, page 2 of 2

	Vandenberg AFB			Lompoc (128 H Street)			Santa Maria (Broadway)			Santa Barbara[1] County		
	1986	1987	1988	1986	1987	1988	1986	1987	1988	1986	1987	1988
Sulfur Dioxide												
Annual Average (ppm)	.000	.000	.00	.000	.000	.00	--	.000	.000	.001	.000	.001
Maximum Concentration												
(ppm/24 hours)	.010	.001	.001	.007	.002	.003	--	.006	.008	.025	.015	.016
(ppm/1 hour)	.01	.01	.01	.06	.02	.02	--	.03	.04	.19	.07	.07
Days Exceeding Standard												
Federal (>.03 ppm, Annual Average)	0	0	0	0	0	0	--	0	0	0	0	0
(>.14 ppm, 24 hours)	0	0	0	0	0	0	--	0	0	0	0	0
State (>.05 ppm, 24 hours)	0	0	0	0	0	0	--	0	0	0	0	0
(>.25 ppm, 1 hour)	0	0	0	0	0	0	--	0	0	0	0	0
Total Suspended Particulates												
Annual Geometric Mean (ppm)	29.9	36.5	44.2	45.8	46.9	47.9	64.8	62.4	83.0	--	--	--
Maximum Concentration												
($\mu g/m^3$/24 hours)[4]	69	131	99	94	126	120	172	152	216	512	263	388
Days Exceeding Standard												
Federal (>260 $\mu g/m^3$, 24 hours)	0	0	0	0	0	0	0	0	0	1	1	1
State (>150 $\mu g/m^3$, 24 hours)	0	0	0	0	0	0	2	1	3	4	16	11
PM_{10}[5]												
Annual Arithmetic Mean (ppm)	--	--	--	--	--	--	31.9	29.7	34.7	--	--	--
Maximum Concentration												
($\mu g/m^3$/24 hours)	--	--	--	--	--	--	73	61	60	73	61	72
Days Exceeding Standard												
Federal (>150 $\mu g/m^3$, 24 hours)	--	--	--	--	--	--	0	0	0	0	0	0
State (>50 $\mu g/m^3$, 24 hours)	--	--	--	--	--	--	6	4	4	6	4	9

Notes: [1]Maximum recorded in Santa Barbara County.
[2]Parts per million.
[3]Not monitored.
[4]Micrograms per cubic meter of air.
[5]Fine particulates with an aerodynamic diameter of 10 micrometers or less.

Source: California Air Resources Board 1986, 1987, and 1988.

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Table 3.3.8-2

Emission Inventory for Santa Barbara County, 1987 South Central Coast Air Basin

Source Category	TOG	ROG	CO	NO_x	SO_x	PM	PM_{10}
STATIONARY							
Fuel Combustion	4.63	1.03	2.85	12.72	.59	.28	.24
Waste Burning	2.42	1.75	13.11	.02	.01	6.27	6.08
Solvent Use	12.94	11.12	.00	.00	.00	.00	.00
Petroleum Process, Storage, & Transfer	53.58	24.26	.01	.00	.03	.01	.01
Industrial Processes	.14	.12	.26	.01	.00	1.66	.89
Miscellaneous Processes	93.39	11.61	10.64	.16	.00	98.95	46.14
Miscellaneous	.94	.43	.17	.89	.38	.22	.13
Subtotal	168.04	50.33	27.04	13.80	1.01	107.39	53.48
MOBILE							
Onroad Vehicle	16.81	15.30	123.15	19.74	1.08	2.88	1.74
Other Mobile	4.85	4.56	32.63	6.44	.64	.64	.61
Subtotal	21.86	19.89	155.78	26.18	1.72	3.51	2.35
OUTER CONTINENTAL SHELF	14.19	6.7	14.3	11.71	6.13	.49	.46
Subtotal	14.19	6.7	14.3	11.71	6.13	.49	.46
TOTAL:	218.09	83.60	191.41	63.40	14.99	111.88	56.75

Notes: [1]Includes Vandenberg AFB Draft Emissions Inventory

Source: Santa Barbara Air Pollution Control District 1987.

Table 3.3.8-3
Stationary Source Emissions for Vandenberg Air Force Base[1]
(tons per day)

	Particulates	SO_x	NO_x	HC	CO
Vandenberg AFB	0.028	0.031	0.248	0.032	N/A[2]

Notes: [1]Estimated by SBAPCD.
[2]Data not available.

Vandenberg AFB has over 100 permits from the SBAPCD for various stationary sources, including boilers, incinerators, paint spray booths, underground storage tanks, degreasers, abrasive blasting system, and for equipment associated with the space launch mission of the base, particularly for the storage, transfer, and purging of hydrazine and nitrogentetroxide, and a gasoline fueling equipment system. Increased stationary source emissions from new or modified sources at the base are subject to SBAPCD's new source review regulations, which require use of best available control technology if the emission increase is 2.5 pounds per hour or greater. Sources with emission increases greater than 10 pounds per hour, 240 pounds per day, or 25 tons per year or greater are required to mitigate emission increases with emission offsets from existing sources at minimum ratio of 1.2:1. The ratio increases as the distance between the offset source and the proposed source increases.

3.3.9 Noise

3.3.9.1 Regulatory Setting

The principal document that prescribes guidelines for developing compatible land use planning and zoning on Vandenberg AFB is the Air Installation Compatible Use Zone (AICUZ) study. It incorporates federal and California state noise standards and addresses issues related to hazards caused by aircraft accidents, and noise from aircraft and airfield operations. The study contains specific noise policy and implementation guidelines, as well as methods for assessing noise impacts associated with air installation land uses. The document describes compatible use zones which are a function of noise and accident potential.

The Noise Control Act of 1972 (PL 92-574) created within the EPA an Office of Noise Abatement and Control (ONAC) with the mandate to identify major sources of noise; regulate those identified sources; propose aircraft noise standards to the FAA; label noisy products; engage in research, technical assistance, and dissemination of public information; and coordinate all federal noise control activities. The Quiet Communication Act of 1978 (PL 95-609) amended the Noise Control Act of 1972. The 1978 Act required the EPA to administer a national Quiet Communities Program which included but was never limited to developing an abatement plan for areas around major transportation facilities (including airports, highways, and railroads) and other major stationary sources of noise and, where appropriate, for the facility or source itself.

Table 3.3.8-4

Emission Inventory For Vandenberg AFB, California 1986

EMISSION SOURCE	TOTAL EMISSIONS (TONS)				
	TSP	SOx	NOx	CO	TOG
Adhesive Paint and Solvent Usage					
- Base Supply	----	----	----	----	39.96
- COCESS	----	----	----	----	35.12
- CE Contracts	----	----	----	----	6.13
Household Organic Compounds Usage	----	----	----	----	16.50
Asphalt Paving	----	----	----	----	4.97
Asphalt Roofing	----	----	----	----	23.52
Bulk Fuels Storage Area	----	----	----	----	7.52
POL Loading Rack	----	----	----	----	1.06
Generator Emissions					
- Natural Gas	0.00	0.00	0.01	0.24	0.01
- Diesel	0.23	0.21	3.17	0.69	0.25
Power Plants	21.33	19.87	298.62	64.95	23.88
Service Stations	----	----	----	----	32.30
Aircraft Operations	2.88	3.45	21.79	152.40	58.50
Aircraft Servicing	0.01	0.01	0.20	6.91	0.23
Vandenberg Aeroclub	----	----	----	----	0.36
Pesticides	----	----	----	----	0.41
Sandblasting	6.56	----	----	----	----
Building Heating Units (boilers)					
- Propane	0.05	----	1.07	0.22	0.09
- Natural Gas	1.77	0.21	35.37	7.07	2.83
- Oil	3.52	125.18	34.62	8.69	1.12
Family Housing Space Heating	0.84	0.10	16.89	0.46	1.35
Fire Training Area	2.50	0.00	0.10	3.12	1.05
Missile Launches (including HCl)	61.35	----	0.67	74.29	----
Well Water Degasification (H2S)	----	----	----	----	----
Component Cleaning Facility	----	----	----	----	20.46
Base Dry Cleaning	----	----	----	----	0.84
Paint Spray Booths	----	----	----	----	3.38
Rocket Engine Flushing (SLC-3)	----	----	----	----	15.60
Incinerators	0.03	----	0.01	----	----
Mobile Sources (Traffic)	----	----	98.63	1225.99	171.05
Hypergolic Propellant Handling					
- Fuel (Hydrazines)	----	----	----	----	----
- Oxidizer	----	----	----	----	----
Wildland Fires (not included in totals)	306.00	----	72.00	2520.00	432.00
Total 1986 Emissions (tons)	101.06	149.03	511.15	1545.03	468.47

BCV025

The Santa Barbara County noise element of the comprehensive plan identifies noise sources and related impacts and establishes methods for noise abatement. The purpose is to evaluate noise levels and develop specific policies to reduce or mitigate noise problems. These policies are in compliance with federal and state standards.

3.3.9.2 Existing Noise Sources

The principal noise sources on Vandenberg AFB include missile launch activities; aircraft operations, railroad traffic on the Southern Pacific Railroad that crosses Vandenberg AFB; and vehicular traffic on roads in the Base Support Area and on traffic arteries carrying base operations traffic, both onbase and offbase.

Missile launches register the highest noise levels and can range from 60 decibels on the A-weighted scale (dBA) to 100 dBA in the vicinity of the launches including areas near Lompoc and Santa Maria. However, because the missile launches occur infrequently, the resulting noise has little impact on the day/night equivalent noise levels (L_{dn}) or Community Noise Equivalent Levels (CNEL) in these areas.

Aircraft operations at Vandenberg AFB produces the next highest noise levels. The AICUZ noise contour map for Vandenberg AFB indicates an L_{dn} noise level of 80 dBA near the airfield runway, with a noise level of 65 dB extending 5 miles southeast of the runway. An average of ten trains (two Amtrack passenger trains and eight freight trains) pass through the base every 24 hours on the Southern Pacific Railroad. Railroad noise on Vandenberg AFB has not been measured. However, the results from a railroad noise prediction model indicate the L_{dn} noise levels for the Southern Pacific Railroad traffic would range from about 66 to 72 dBA at 100 feet from the track and from about 57 to 63 dBA at 400 feet from the track.

Vehicular traffic noise impacts residential areas located along the highways. L_{dn} noise levels measured in the residential area of the Base Support Area range from 46 to 85 dB. Other sensitive residential areas lie along State Route 1 in Vandenberg Village and along State Route 1/135 in Orcutt. Noise measurements have not been made in these areas. However, utilizing traffic information along these routes and the Federal Highway Administration STAMINA 2.0 noise model, L_{dn} noise levels are estimated to range from 56 to 62 dB at a distance of 100 feet from the highway.

3.3.10 Biological Resources

3.3.10.1 Vegetation

The Vandenberg AFB area sustains many different vegetation types. Several of these once flourished in Santa Barbara County, but now occupy only a portion of their original range because of development. Natural vegetation communities which exist onbase, but outside proposed project areas include oak woodlands (moist valleys and north slopes), oak savanna (upland areas), Bishop pine forest (clusters around chaparral areas that receive an ample amount of precipitation or fog condensation to supplement soil moisture and in areas with relatively infertile soil), tanbark oak forest (steep canyons and peaks where more moisture or better soil conditions are present than in the Bishop pine areas), coastal strand (beaches and fore dunes), and coastal dune scrub (firmly established back dunes). The California Department of Fish and Game (CDFG) nongame Natural Heritage Program has identified Bishop pine forest, coastal strand, and coastal dune scrub as rare natural communities.

Most of the areas in the proposed project areas are either developed or dominated by highly disturbed grasslands. Common species in the grasslands include wildoats (*Avena* spp.), bromes (*Bromus* spp.), and fescues (*Festuca* spp.). Many of these areas are mowed regularly and are dominated by filaree (*Erodium* spp.). Introduced trees, such as pines (*Pinus* spp.) and Eucalyptus (*Eucalyptus* spp.) have been planted throughout these areas. Other important vegetation types in the affected areas include coastal sage scrub, Burton Mesa chaparral, and riparian woodlands.

Coastal sage scrub is a diversified community that thrives on steep, dry slopes from the coast to the inland foothills of southern California. It borders grassland, chaparral, dunes, and wooded areas. The dominant species include California sage brush (*Artemisia californica*), black sage (*Salvia mellifera*), purple sage (*Salvia leucophylla*), deerweed (*Lotus scoparius*), and poison oak (*Toxicodendron diversilobum*), which are all partially or completely drought-deciduous during the summer. Coyote bush (*Baccharis pilularis*), coffee berry (*Rhamnus californica*), and the giant rye (*Elymus condensatus*) are the evergreen associates.

Burton Mesa chaparral is a rare form of coastal chaparral existing on sandy and shaley soils of moderately flat upland sites on and around the Burton Mesa. The soil is substantially more moist than in the coastal sage scrub and thus provides a habitat for dense evergreen shrubs. Dune areas may also contain this chaparral. Two endemic manzanitas, Purisima manzanita (*Arctostaphylos purissima*) and Shagbark manzanita (*Artostaphylos rudis*), typify the community along with Santa Barbara ceanothus (*Ceanothus impressus* var. *impressus*). A multistemmed variant of (*Quercus agrifolia*) is also unique to the area. Burton Mesa chaparral contains a number of U.S. Fish and Wildlife Service (USFWS) candidate species (see Threatened and Endangered Species discussion below) and has been classified G1, S1 by the CDFG nongame Natural Heritage Program. This classification is reserved for the rarest plant communities.

Riparian woodlands thrive along streams and lakes and in areas where the soil moisture is higher than in the surrounding uplands. The woodlands are predominantly comprised of willow (*Salix* spp.), Pacific wax myrtle (*Myrica californica*), and cottonwood (*Populus* spp.). A variety of shrubs and smaller plants, including mule fat (*Baccharis glutinosa*), cattails (*Typha latifolia*), wild raspberry (*Rubus ursinus*), and poison oak (*Toxicodendron diversilobum*), contribute to this biologically diverse zone for plants and wildlife.

A brief description of the vegetation of each of the proposed project areas follows.

Site 1. This site is regularly mowed and is dominated by filaree (*Erodium cicutarium*) and non-native grasses including bromes, wild oats (*Avena barbata*), and veldt grass (*Ehrharta calycina*). Introduced trees, principally *Pinus radiata* and *Eucalyptus globulus*, line the roads.

Site 2. The portion of this site south of California Boulevard is very similar to Site 1, but has fewer trees. The area west of the intersection of California Boulevard and Washington Avenue is not mowed as frequently, resulting in a species composition in which bromes, wildoats, and fescues are more prevalent than filaree. Small patches of Burton Mesa chaparral occur throughout this area, becoming more contiguous west of the site.

Site 3. This area is presently developed. The land southeast of the site is highly erodible sand supporting iceplant, filaree, and veldt grass (*Erharta* sp.) with vestiges of Burton Mesa chaparral adjacent to the landfill to the east.

Proposed Housing Area 1. This is a large stand of relatively undisturbed Burton Mesa chaparral. Several USFWS category 2 candidate species and other sensitive plants (see discussion above) occur here. Willow-dominated riparian woodlands cut across the southern and northern regions of the site.

Proposed Housing Areas 2a, b, and c. These areas are regularly mowed but not irrigated and contain most of the non-native species mentioned for Site 1. In addition, *Carpobrotus* sp. is common in these areas, there are a number of oaks (*Quercus* spp.) scattered throughout the area, and ephemeral drainages containing saltgrass (*Distichlis spicata*), spike-rush (*Eleocharis* sp.), bentgrass (*Agrostis semiverticillata*), and rush (*Juncus phaecephalus*) cut across areas a and b.

Proposed Housing Area 2d. The Burton Mesa chaparral, comprising the northern region of this site, is more heavily disturbed than that in Proposed Housing Area 1 and is dominated by chamise (*Adenostoma fasiculatum*). Most of the larger, southern portion is heavily grazed non-native grassland containing most of the species mentioned above for Site 1. Oaks are scattered throughout the area and the remainder is disturbed chaparral dominated by Baccharis and california sagebrush (*Artemesia californica*).

Proposed Housing Area 2e. This site is comprised of a mobile home park and the area immediately surrounding it. No significant native vegetation occurs within the park. The area surrounding the park is mostly non-native grassland, as described above. This area is adjacent to a large stand of relatively undisturbed Burton Mesa chaparral, and vestiges of that plant community are scattered along the edges of the site. In addition, oak groves occur both east and south of the mobile home park.

Proposed Housing Area 2f. This area along California Avenue is lined with pines and largely dominated by *Carpobrotus* sp. To the south lies the relatively undisturbed Burton Mesa chaparral area mentioned above. Willow-dominated riparian areas run along the south side of the site both east and west of Lake Canyon Road, and a similar riparian area begins along the westernmost boundary of the site.

3.3.10.2 Wildlife

The plant communities on and near Vandenberg AFB support a wide variety of wildlife species. Those which occur in the proposed project areas that may be affected are discussed below.

Grasslands on and offbase support a large population of California ground squirrels (*Spermophilus beechevi*). Other small mammals which can be expected include black-tailed jackrabbits (*Lepus californicus*), agile kangaroo rats (*Dipodomys agilis*), and deer mice (*Peromyscus maniculatus*). These and other small animals provide forage for a number of raptors. These include the red-tailed hawk (*Buteo jamaicensis*), red-shouldered hawk (*Buteo lineatus*), black-shouldered kite (*Elans caeruleus*) and American kestrel (*Falco sparverius*). Other avian species expected in and around the grasslands include California quail (*Lophortyx caliofrnicus*), mourning dove (*Zenaida macroura*), and a variety of songbirds.

Reptiles expected in the grasslands include the western fence lizard (*Sceloporus occidentalis*), pacific rattlesnake (*Crotalus viridis* var. *helleri*), southern alligator lizard (*Cerrhonotus multicarinatus* var. *multicarinatus*), and gopher snake (*Pituophis melanoleucus* var. *annectens*).

Burton Mesa chaparral provides excellent forage and dense cover and can be expected to support a variety of small mammals including the California vole (*Microtus californicus*), deer mouse (*Peromyscus maniculatus*), western harvest mouse (*Reithrodontomys megalotis*), and brush rabbit (*Sylvilagus bachmani*). Larger mammals in the Burton Mesa chaparral include coyote (*Canis latrans*), mule deer (*Odocoileus hemionus*), bobcat (*Lynx rufus*), and badger (*Taxidea taxus*). Mountain lion (*Felis concolor californica*), opossum (*Deidelphis virginiana virginiana*), and long-tailed weasels (*Mustela frenata*) are probably also present.

The dense cover of this shrubland probably allows fewer foraging opportunities for raptors, but those occurring in neighboring grasslands can be expected in the area occasionally. Other avian species would be expected to occur in greater numbers and variety than in the grasslands.

In addition to the reptiles occurring in the grassland habitats, the California striped racer (*Masticophis lateralis* var. *lateralis*), western terrestrial garter snake (*Thamnophis elegans* var. *terrestris*) and possibly the western skink (*Eumeces skiltonianus* var. *skiltonianus*) occur in Burton Mesa chaparral (USAF 1989).

Riparian Woodlands support most of the same mammalian species found in Burton Mesa chaparral. In addition to many of those occurring in the grasslands and shrublands, the dusky-footed woodrat (*Neotoma fescipes*), racoon (*Procyon lotor*), California mole (*Scapanus latimanus*), and Feral pigs (*Sus scrofa*) occur in these areas.

A number of wetland-associated birds occur in the riparian woodlands, either as residents or during migration. The more common of these include the great blue heron (*Ardea herodias*), red-winged blackbird (*Agelaius phoeniceus*), common flicker (*Colaptes auratus*), Allen's hummingbird (*Selasphorus sasin*), great horned owl (*Bubo virginianus*), Hutton's vireo (*Vireo huttoni*), and Nuttall's woodpecker (*Picoides nuttallii*).

Most of the reptile species discussed in the above communities also occur in and around the riparian woodlands. In addition, a number of amphibians are associated with these areas, including the western toad (*Bufo boreas* var. *halophilus*), pacific tree frog (*Hyla regilla*) and western spadefoot toad (*Scaphiopus hammondi*). The arboreal salamander (*Aneides lugubrus*) may also occur in riparian woodland in the area.

3.3.10.3 Threatened and Endangered Species

Listed and proposed endangered, threatened, and candidate species which occur or may occur in the area of Vandenberg AFB are listed in Table 3.3.10-1. Six federally-listed endangered species occur or may occur in the Vandenberg AFB area. The California brown pelican (*Pelecanus occidentalis*) is known to frequent the coastal areas of the base. The California least tern (*Sterna antillarum browni*) is known to occur in the coastal strand. Bald eagles (*Haliaeetus leucocephalus*) have been known to forage onbase but are not expected to nest in the vicinity of the proposed project areas. American peregrine falcons (*Falco peregrinus anatum*) also forage onbase, and a pair may be nesting nearby. This nest is not believed to be within the proposed project areas. Least Bell's vireo (*Vireo bellii pusillus*) is expected to occur in the riparian woodlands onbase. The unarmored threespine stickleback (*Gasterosteus aculeatus williamsoni*) is known to occur in San Antonio Creek. The bay checkerspot butterfly (*Euphydryas editha bayensis*), a federally-listed threatened species, may occur in the less disturbed grasslands onbase.

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Table 3.3.10-1

Listed and Proposed Endangered and Threatened Species and Candidate Species That May Occur in the Vicinity of Vandenberg AFB, Santa Barbara County, California

COMMON NAME	SCIENTIFIC NAME	FEDERAL STATUS*
LISTED SPECIES		
Birds		
California brown pelican	*Pelecanus occidentalis*	(E)
California least tern	*Sterna antillarum browni*	(E)
American bald eagle	*Haliaeetus leucocephalus*	(E)
American peregrine falcon	*Falco peregrinus anatum*	(E)
Least Bell's vireo	*Vireo bellii pusillus*	(E)
Fish		
Unarmored threespine stickleback	*Gasterosteus aculeatus williamsoni*	(E)
Invertebrate		
Bay Checkerspot Butterfly	*Euphydryas editha bayensis*	(T)
CANDIDATE SPECIES		
Mammals		
Spotted bat	*Euderma maculata*	(2)
Pacific western mastiff bat	*Plecotus townsendii townsendii*	(2)
Greater western mastiff bat	*Eumops perotis californicus*	(2)
Birds		
California black rail	*Laterallus jamaicensis coturniculus*	(2)
Western snowy plover	*Charadrius alexandrinus nivosus*	(2)
Long-billed curlew	*Numenius americanus*	(2)
White-faced ibis	*Plegades chihi*	(2)
Ferruginous hawk	*Buteo regalis*	(2)
Tricolored blackbird	*Agelaius tricolor*	(2)
Elegant tern	*Sterna elegans*	(2)
Swainson's Hawk	*Buted swainsoni*	(2)
California Yellow-Billed Cuckoo	*Coccyzus americanus occidentalis*	(2)
Reptiles		
Western pond turtle	*Clemmys marmorata*	(2)
San Diego Coast Horned Lizard	*Phrynosoma coronatum blainvillei*	(2)
Amphibians		
California red-legged frog	*Rana arurora draytoni*	(2)
Arroyo southwestern toad	*Bufo microscaphus californicus*	(2)

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Amphibians		
California red-legged frog	*Rana aurora draytoni*	(2)
Arroyo southwestern toad	*Bufo microscaphus californicus*	(2)
Fish		
Tidewater goby	*Eucyclogobius newberryi*	(2)
Invertebrates		
Salt marsh skipper	*Panoquina errans*	(2)
Plants		
Marsh sandwort	*Arenaria paludicola*	(1)
South coast range Morning glory	*Calysteqia collina venusta*	(2)
Soft-leaved Indian paintbrush	*Castilleja mollis*	(2)
La Graciosa thistle	*Cirsium loncholepis*	(1)
Surf thistle	*Cirsium rhothophilum*	(1)
Beach spectable-pod	*Dithyrea maritima*	(2)
Lompoc yerba santa	*Eriodictyon capitatum*	(1)
Roderick's fritillary	*Fritillaria grayana*	(2)
Crisp monardella	*Monardella crispa*	(2)
San Luis Obispo monardell	*Monardella undulata var. frutescens*	(2)
Black flowered figwort	*Scrophularia atrata*	(2)
Shgbark manzanita	*Arctostaphylos ruidis*	(2)
Hoover's baccharis	*Baccharis plummerae glabrata*	(2)
Nipomo cleanothus	*Ceanothus imperssus v. nipomoensis*	(3b) (3b)
Montery spine flower	*Chorizanthe pungens v. pungens*	(2)

Notes:*(E) -Endangered

(T) -Threatened

(1) -Category 1: Taxa for which the U.S. Fish and Wildlife Service has sufficient biological information to support a proposal to list as endangered or threatened.

(2) -Category 2: Taxa which existing information may warrant listing, but for which substantial biological information to support a proposed rule is lacking.

(3b) -Taxa no longer being considered for listing due to a taxonomic problem.

Source: U.S. Fish and Wildlife Service, 1990.

Thirty-three federal candidate species occur, or may occur in the Vandenberg AFB area (Table 3.3.10-1). Six of these, shagbark manzanita (*Arctostaphylos rudis*), Hoover's baccharis (*Baccharis plummerae glabrata*), Nipomo ceanothus (*Ceanothus impressus* v. *nipomoensis*), Monterey spine flower (*Chorizanthe pungens* v. *pungens*), Crisp monardella (*Monardella crispa*), and the San Diego coast horned lizard (*Phyrnosoma coronatum blainvillei*) occur or may occur in the Burton Mesa chaparral listed as Proposed Housing Site 1. The CDFG Nongame Natural Heritage Program has classified Burton Mesa chaparral areas GI, SI--their rarest plant community designation. The Burton Mesa chaparral areas on Vandenberg AFB may be among the largest still in existence.

3.3.10.4 Wetlands

Wetlands occur within or border several of the proposed sites (see Vegetation section above). These drainages are fed primarily by lawn watering and road runoff from the adjacent administrative and family housing areas and support willow- and wax myrtle-dominated riparian woodlands.

3.3.11 Cultural and Paleontological Resources

3.3.11.1 Prehistoric Resources

There are more than 700 known archaeological sites on Vandenberg AFB ranging in age from 9,000 years old to less than 100 years old. Identified prehistoric site types of Vandenberg are seasonal residential bases which contain evidence of food processing, tool maintenance, and the final stages of tool manufacture; overnight hunting camps which contain tool manufacturing debris, shell, and evidence of fire; day-use hunting locations indicated by small scatters of lithic flakes and occasional tools; villages; general camps; and rock quarry sites.

An estimated 20 to 30 percent of the base area has been intensively surveyed in accordance with the current standards of cultural resource management. However, because of low visibility due to vegetation and shifting sediments, it is estimated that less than two percent of the base has been surveyed with sufficient intensity such that all extant surface sites have been discovered. A cultural resources survey is currently being conducted in the proposed project areas.

A National Register of Historic Places (NRHP) Archaeological District was established on the San Antonio Terrace and an Historic Preservation Plan was prepared to guide ICBM-related and other future projects affecting cultural resources within the district. No comparable National Register District or specific planning document covers the proposed SSD beddown areas on Burton Mesa.

Most of the proposed beddown areas on Burton Mesa have recently been inventoried for cultural resources. Six prehistoric sites and several isolates have been recorded. All six prehistoric sites are located in Proposed Housing Site 1 and consist of three quarry locations and three lithic scatters or day-use hunting locations. Quarry locations are relatively rare, and these three sites may be considered NRHP eligible. The three small day-use hunting locations or lithic scatters have limited research potential and may not be considered eligible.

The Chumash culture, one of the most socially and economically complex hunting-gathering cultures in North America, attained its full development 800 to 150 years ago. The Chumash occupied the south-central coastal region of California from Malibu Canyon to San Luis Obispo and inland as far as the western edge of the San Joaquin Valley. The tribe was divided into several dialect groups which corresponded with lands around the various Spanish missions. The people who occupied the Vandenberg area were Purismeno Chumash named for the La Purisima Concepcion Mission founded in 1788.

The modern Chumash of the Santa Ynez Band of Mission Indians have direct concerns regarding land use on Vandenberg AFB. The Chumash regard all prehistoric sites as important but have identified special concerns regarding burials, sacred areas, and traditional resource procurement areas, especially wetlands. A consultation and monitoring agreement with the band is already in effect. A Native American monitor has been present during cultural resource surveys in the proposed program areas.

3.3.11.2 Historic Resources

The 1769 expedition of Gaspar de Portola marked the beginning of Spanish influence in the Vandenberg AFB area. Mission La Purisima Concepcion was founded in 1787 and dominated the area's economy for many years. By 1834, the mission played a small role, and land holdings were granted in the form of ranchos. In the Vandenberg area, Ranchos Jesus Maria, Todos Santas, and San Antonio were granted to the Olivera family in the 1830s, and ruins of the Olivera abode are protected on Vandenberg AFB. Many of the ranchos were subdivided and sold in the 1860s to Americans who continued to use the lands for ranching. Marshallia Ranch and Sudden Ranch date to this period.

Gradually farming increased, and the regional economy diversified. In 1896, the Southern Pacific rail line was extended through the area. The Union Sugar Company operated in the San Antonio Valley from 1910 to 1940 for the processing of sugar beets. Oil was discovered in the Santa Maria area in 1901, and the Vandenberg area was explored during the early part of the century. Oil drilling pads still exist on the base today, but not near the proposed project areas. Military use of the region began in 1941 when the federal government condemned 90,000 acres of ranch land and established Camp Cooke as an Army post. The camp was used for training and maneuvers and as a prisoner-of-war camp. In 1957, the Air Force took over Camp Cooke and renamed it Vandenberg AFB.

Many of the original wooden buildings from Camp Cooke are in current use at Vandenberg AFB. These buildings are World War II-era temporary structures. In the past, some of these structures have been scheduled for removal. Evaluation of each building status was conducted on a case-by-case basis. Recommendations were made, and the State Historic Preservation Office was consulted prior to removing those structures. Fifty-seven of the World War II buildings occur in the proposed project areas. It is likely that some of these buildings may be considered eligible for the NRHP, and additional evaluation may be required. However, it is assumed that the majority of structures will not be considered eligible.

3.3.11.3 Paleontological Resources

The proposed project areas are located within the Surf Quadrangle (U.S. Geologic Survey, 7.5 minute series). The surficial geology of this quad has been mapped by Dibblee (1988). Most of the proposed project areas are located on the aeolian Orcutt Sand of late Pleistocene age. The upper shale unit of the Miocene Monterey Shale outcrops just south of the Base Support Area. This unit of chert siliceous shale contains marine microfossils. Fossil evidence of marine diatoms is found in the late Miocene Sisquoc formation as diatomite and diatomaceous mudstone. The Pliocene Foxen claystone, late Pliocene Carenga Sand, late Pliocene to Pleistocene Paso Robles formation sands and conglomerates are not noted as being fossiliferous. Late Pleistocene and Holocene sands are similarly nonfossiliferous.

3.4 MARCH AIR FORCE BASE, CALIFORNIA

March Air Force Base (AFB), with an area of approximately 6,806 acres (6,594 acres are fee-owned and 212 acres are easement), is located in Riverside County, California (Figures 3.1-1 and 3.4-1). The base is divided by Interstate 215, with the area east of the Interstate known as the Main Base and the area to the west as West March. The base is approximately 65 miles east of Los Angeles AFB.

The Main Base contains the flightline and related facilities, administrative and operational support facilities, unaccompanied and family housing, recreation facilities, and the base hospital. Facilities located on West March include Headquarters (HQ) 15th Air Force, the Non-Commissioned Officers (NCO) Professional Military Education Center, 15th Air Force band center, Weapons Storage Area (WSA), wastewater treatment plant, base golf course, and the military family housing area known as Arnold Heights. A Veterans Administration National Cemetery and Air Force Village West, a retirement community, are located in the West March area on land that was formerly part of the base.

The host organization at this Strategic Air Command (SAC) base is the 22nd Air Refueling Wing (AREFW) with KC-10A tanker aircraft. Major tenants at March AFB include HQ, 15th Air Force; the Air Force Reserve (AFRES) 452nd AREFW; and the California Air National Guard (ANG) 163rd Tactical Fighter Group (TFG). Several additional units are scheduled for addition to March AFB in fiscal year (FY) 1994. These units will be relocated to the base as a result of the closure of Norton AFB in San Bernardino, California.

March AFB employed 9,712 personnel at the end of FY 1989, including 3,851 permanent party military personnel (697 officers and 3154 enlisted), 2,068 Air Force Reserve personnel, 1,703 California ANG personnel, 1,394 appropriated fund civilian personnel, and 696 other civilian personnel. The relocation of various units from Norton AFB will increase the number of personnel at the base by approximately 1,200. Approximately 45 percent of the permanent party military personnel live onbase, and 55 percent live in communities surrounding the base. The cities of Riverside, Moreno Valley, and Perris, surrounding the base, are the host communities for March AFB. Most of the personnel living offbase reside in these three communities, but some personnel live in other communities near the base including some communities in nearby San Bernardino County.

History. As the oldest Air Force base in the west, March has had a long history of progressive and steady growth. Through the efforts of the Riverside community, Alessandro Aviation Field was officially opened in March 1918 as part of the War Department's national buildup of aviation training facilities. March Field was initially used to train World War I "Jenny" pilots.

Following World War I, the base was closed for approximately 4 years and was reactivated in 1927 as a primary flying school. In 1938, March Field became the central base for West Coast bombing and gunnery training. In the 1940s, anti-aircraft protection training and the testing of new ideas and equipment, such as jet-assisted and liquid rocket takeoffs, occurred at March Field.

West March was the location of Camp Haan from 1941 to 1946. Camp Haan served as an anti-aircraft artillery replacement training center, an Army Service Forces Depot, a prisoner-of-war camp, and a separation center during World War II. As many as 80,000 personnel were reportedly stationed there at one time and many of the building foundations still remain near the Arnold Heights housing area, HQ 15th Air Force, and other areas of West March.

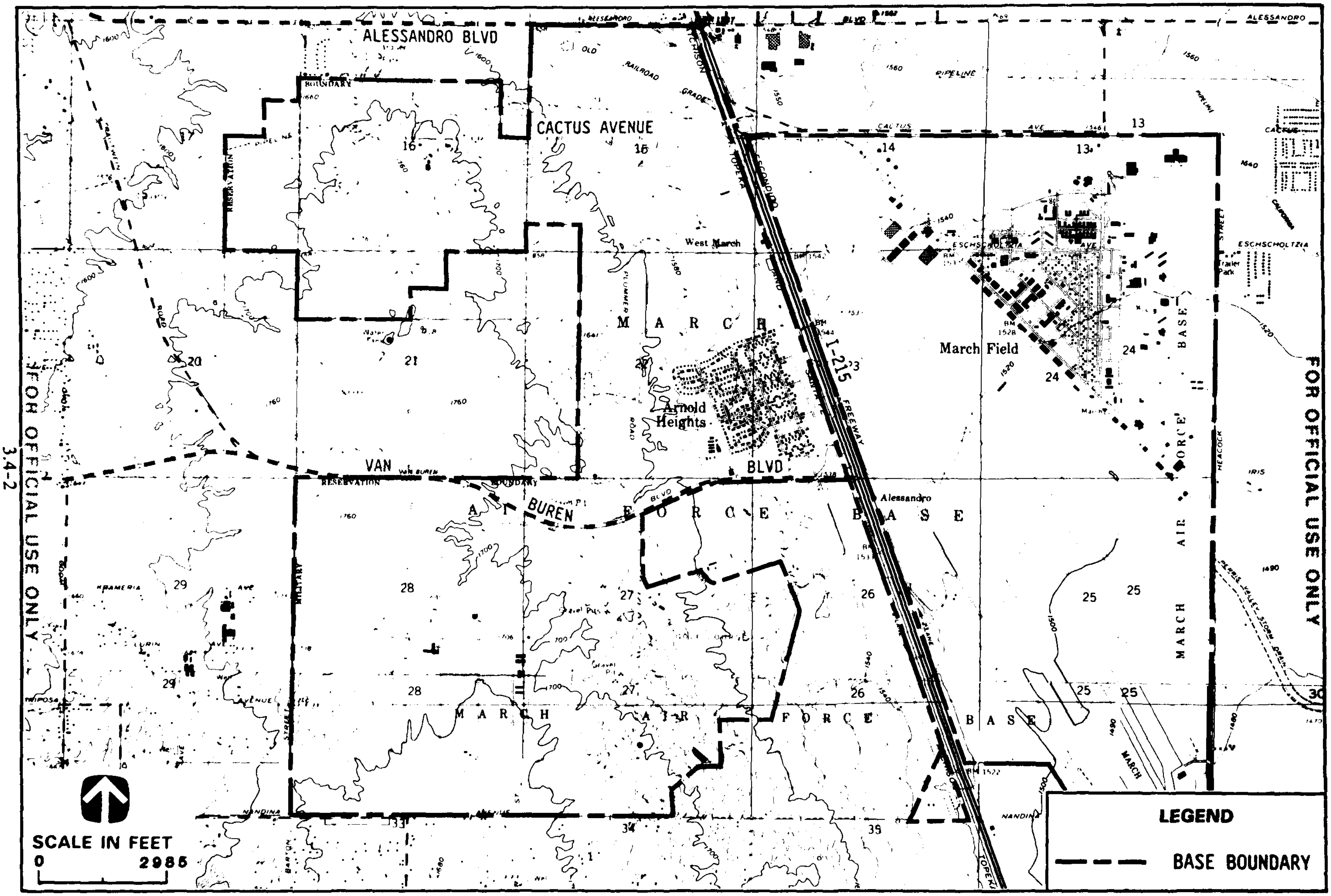

FIGURE 3.4-1 LOCAL VICINITY MAP FOR MARCH AFB, RIVERSIDE COUNTY, CALIFORNIA

Following World War II, March AFB retained its role as an operational fighter base until SAC took over control in 1949. The 22nd Bombardment Wing was assigned as the senior host tactical unit and HQ 15th Air Force was transferred to March AFB at about the same time. After a 42-year history of service, the 22nd Bombardment Wing was redesignated the 22nd AREFW in October 1982.

Mission. The mission of the 22nd AREFW is to develop and maintain the capability to conduct air refueling operations in support of Air Force operations in any part of the world. It operates in that role as part of the SAC commitment to world peace through readiness and the deterrence of armed aggression including the support of the Department of Defense (DOD) in many contingency situations, such as strategic force projection and strategic force mobility.

HQ 15th Air Force is responsible for SAC operations in the western United States, Alaska, and the Pacific. This includes responsibility for more than 85 percent of the intercontinental ballistic missile (ICBM) force, approximately 40 percent of SAC's bomber and tanker forces, and most of SAC's strategic reconnaissance resources.

The 452 AREFW was the first AFRES organization assigned a mission to provide air refueling tankers and crews to support SAC's global air refueling commitment. The 452nd became the first reserve unit to stand continuous alert with SAC active Air Force personnel in October 1977.

The 163rd TFG, which flies F-4 fighter aircraft, is a tenant unit assigned to the Tactical Air Command (TAC) and the California ANG. Its primary mission is to provide air support as necessary utilizing conventional weapons.

The 943rd Tactical Airlift Group (TAG) consists of the headquarters section and several missions. One unique mission is that of supporting the U.S. Forest Service in airdropping Phos-Chek fire retardant over active forest fires. C-130B aircraft are used in accomplishing the mission of the 943rd TAG.

Other missions at March AFB include the SAC NCO Professional Military Education Center; the Southwest Air Defense Sector; 15th Air Force Band; the 33rd Communications Group; Field Training Detachment (Det.) 507; Det. 7, 9th Weather Squadron; Det. 24, 3904th Management Engineering Squadron; HQ 9th Weather Squadron; and the U.S. Customs Aviation Operations Center West.

Proposed Missions. As a result of the closure of Norton AFB, the Air Force has proposed to relocate several tenant units currently at Norton AFB to March AFB beginning in FY 1992. The realignment is expected to be completed by the fourth quarter of FY 1994. However, some smaller units may begin moving as early as the second quarter of FY 1991 if required space becomes available. Units to be transferred include the Defense Reutilization and Marketing Office (DRMO), the HQ Aerospace Audio Visual Squadron (AAVS), Army and Air Force Exchange Service (AAFES) Regional Distribution Center, 1400th Military Airlift Squadron, 445th Military Airlift Wing/AFRES, and several smaller tenant units.

The realignment of these units at March AFB will add approximately 1,100 military and civilian personnel to the base and 1,700 AFRES personnel. In addition to the personnel, 16 C-141B, 4 C-12, and 4 C-21 transport aircraft will be added. The addition of the 445th MAW/AFRES will result in the deactivation of the 943rd TAG and the retirement of 8 C-130 aircraft. Approximately $157.3 million of construction will be required to support the realignment. Facilities for the DRMO and AAFES will be constructed in the West March area north of the Arnold Heights Housing Area.

3.4.1 Community Setting

3.4.1.1 Population and Employment

Population. The population of Riverside County in 1989 was 1,014,800, a 52.8 percent increase from a 1980 population of 663,900. The cities of Moreno Valley, Perris, and Riverside, all in the vicinity of the March AFB, made up approximately one-third of the population of Riverside County in 1989. Moreno Valley and Perris have both experienced much greater annual growth rates in recent years than Riverside. The City of Perris had an annual average growth rate of 6 percent between 1980 and 1986 and a 22.2 percent increase between 1988 and 1989. Moreno Valley had an average annual growth rate of 17.8 percent between 1980 and 1987 and 11.6 percent between 1988 and 1989. The City of Riverside has had a steady increase over the last 10 years of approximately 3 percent per year.

Employment. Wage and salary employment in Riverside and San Bernardino counties increased at an annual rate of 4 percent in 1988. Total employment was approximately 648,200 with an unemployment rate of approximately 5.9 percent. The growth rates for the resident civilian workforce for 1985, 1986, and 1987 were 8.6 percent, 6.8 percent, and 6.6 percent, respectively, with 1988 recording a 39.4 percent decline from the prior year to a 4 percent growth. New jobs were created in all major industrial groups except mining, with most new employment opportunities occurring in services, government, construction, and retail trade sectors.

Government payrolls increased by 4.7 percent in 1988 with a total of 125,900 employed in the government sector (20,000 by the federal government and 105,900 by state and local governments). The California Development Department forecasted an increase to 134,900 government jobs by 1990 (21,600 federal and 113,300 state and local). Employment is expected to increase in all areas, except mining. The growth fueled by the rapid population expansion in the area is expected to be somewhat slower than recent years. This decline is primarily due to the contraction of the business cycle which has been expanding for the last 6 years.

3.4.1.2 Housing

The housing stock in Riverside County has increased substantially to accommodate the population growth over the past three decades. The Demographic Research Unit of the California Department of Finance estimated a total of 475,534 units for Riverside County in January 1989, with a 5.98 percent vacancy rate. The three cities in the vicinity of March AFB, Moreno Valley, Perris, and Riverside, had 32,173, 5,896, and 76,611 units, respectively. The vacancy rate is 2.96 percent for Moreno Valley, 12.43 percent for Perris, and 4.11 percent for Riverside. The Southern California Association of Governments (1989) growth forecast estimated a slight increase in the number of jobs relative to housing, which may have the effect of lowering vacancy rates as housing demand increases relative to supply.

Riverside has approximately 77,000 housing units and has an additional 2,900 acres designated for residential use in its 1990 general plan update. Moreno Valley has approximately 33,000 housing units and has approximately 10,000 acres of vacant developable land designated for residential use, with a capacity for 40,000 dwellings. City approval of submitted residential developments would provide for approximately 25,000 additional dwellings. Perris has approximately 7,200 dwelling units and has approved five residential developments that would add approximately 13,000 dwelling units; additional residential development projects are currently being processed by the city.

March AFB has military family housing located in three areas: Green Acres on the Main Base with 129 units, Arnold Heights (Wherry Housing) in West March with 582 units, and Sunnybrook, a 200-unit apartment complex approximately 10 miles south of the base in the City of Perris. Green Acres has housing for all officer ranks and junior NCOs. Arnold Heights has two, three, and four bedroom units available for company grade officers and all enlisted ranks. Sunnybrook has two bedroom units for families of junior enlisted personnel. A private-sector financed housing project is proposed for development on a 130-acre parcel in West March south of Van Buren Boulevard. This housing area will consist of between 550 and 1,100 housing units.

3.4.1.3 Education

Four school districts serve the areas surrounding March AFB: Moreno Valley Unified School District, Riverside Unified School District, Val Verde Elementary School District, and Perris Union High School District.

Moreno Valley Unified School District has 19 elementary schools, 7 junior high schools, and 3 high schools. Enrollment in the 1989-1990 school year was 26,841 and projected to increase to 45,592 in the 1994-1995 school year. Arnold Heights Elementary School is located within the Moreno Valley Unified School District boundaries.

Riverside Unified School District has 25 elementary schools, 5 middle schools, 4 high schools, a continuation school, and an adult school. The total enrollment for the 1988-89 school year was approximately 27,000. Four new elementary schools are planned for construction in the 1990s. The system is currently operating beyond capacity with approximately 40 relocatable classrooms being utilized.

Val Verde School District is one of five elementary school districts within the Perris Union High School District. Because of rapid growth in recent years, temporary classrooms have been used to supplement the school's facilities. Enrollment in the 1989-1990 school year was 2,891. California State Office of Local Assistance projects an increased enrollment to 3,342 pupils by the 1991-1992 school year.

Perris Union High School District school year 1989-1990 enrollment totaled approximately 4,000 pupils. The high school is currently beyond capacity with 2,400 students. The facility has added over 16 relocatable classrooms. Construction has begun on a second high school and construction for a third middle school is planned for 1992.

3.4.1.4 Community Services

The County of Riverside provides a variety of services for the unincorporated areas surrounding March AFB, including fire and police protection. The Cities of Riverside, Perris, and Moreno Valley provide a variety of services such as police and fire protection, recreation, public works, and libraries for the residents of each respective community.

3.4.2 Land Use

3.4.2.1 Existing Land Use

The Main Base area is bordered by the City of Moreno Valley on the north and east and the City of Perris on the south. West March is bordered by the City of Riverside on the north and west and includes an enclave into West March (Figure 3.4-1). This area, known as Orangecrest, is currently being developed into residential housing with some commercial and industrial land uses. The remaining land surrounding West March consists of unincorporated county land, including a small inholding north of the WSA and a large area bordering the southern portion of West March. Land uses in the West March area and the area near Site 3 are shown in Figure 3.4.2-1.

Residential. Residential housing on West March consists of accompanied (i.e., married) and unaccompanied units and Air Force Village West. Accompanied housing consists of the Arnold Heights Housing Area. Arnold Heights, constructed in 1953, consists of 582 Wherry-type units. The unaccompanied housing consists of the NCO Professional Military Education Center (PME Center). Air Force Village West, a planned retirement community for retired military officers, spouses, widows, or widowers, consists of 942 units and includes apartments, duplexes, and single-family residences built on 153 acres in the south part of West March.

Public/Quasi-Public. Facilities classified public/quasi-public on West March included the Arnold Heights Elementary School, west of the Arnold Heights Family Housing Area; the Veterans Administration Riverside National Cemetery; a Boy Scout Hut north of Arnold Heights Family Housing Area; and a large water storage tank owned by the Eastern Municipal Water District (EMWD) north of the WSA. An area between the main runway and Interstate 215 is planned as the site for the new March Field Museum, which will be relocated from its present location along the flightline on the Main Base.

Cantonment. Cantonment land uses consist of administrative, community (excluding public schools), medical, and mission-related facilities. Cantonment land uses on West March include the Security Police Dog Kennels adjacent to the WSA; two "Combat Engineer Mobility Area (Prime Beef)" encampment sites north of Arnold Heights; a chapel in Arnold Heights; non-housing/recreational uses in the Arnold Heights Housing Area; HQ 15th Air Force; the NCO Professional Military Education Center; the 33rd Communications Group facilities; and a Security Police Mobility Area.

Industrial. The primary industrial land use on West March is the March AFB wastewater treatment plant. Other industrial activity in West March is scattered in small areas within the Arnold Heights Family Housing Area, near HQ 15th Air Force, and other areas in the southern section of West March. Facilities for the AAFES (i.e., base exchange) and DRMO, which are being relocated to March AFB from Norton AFB, are planned for construction in the area north of Arnold Heights and south of Cactus Avenue.

Ordnance-Related. The WSA, Explosive Ordnance Disposal (EOD) Area, and Small Arms Range are ordnance-related uses on West March. The explosives safety zones surrounding the WSA and EOD area are designated open space. The Small Arms Range, operated by the Security Police, is adjacent to the Security Police Mobility Area.

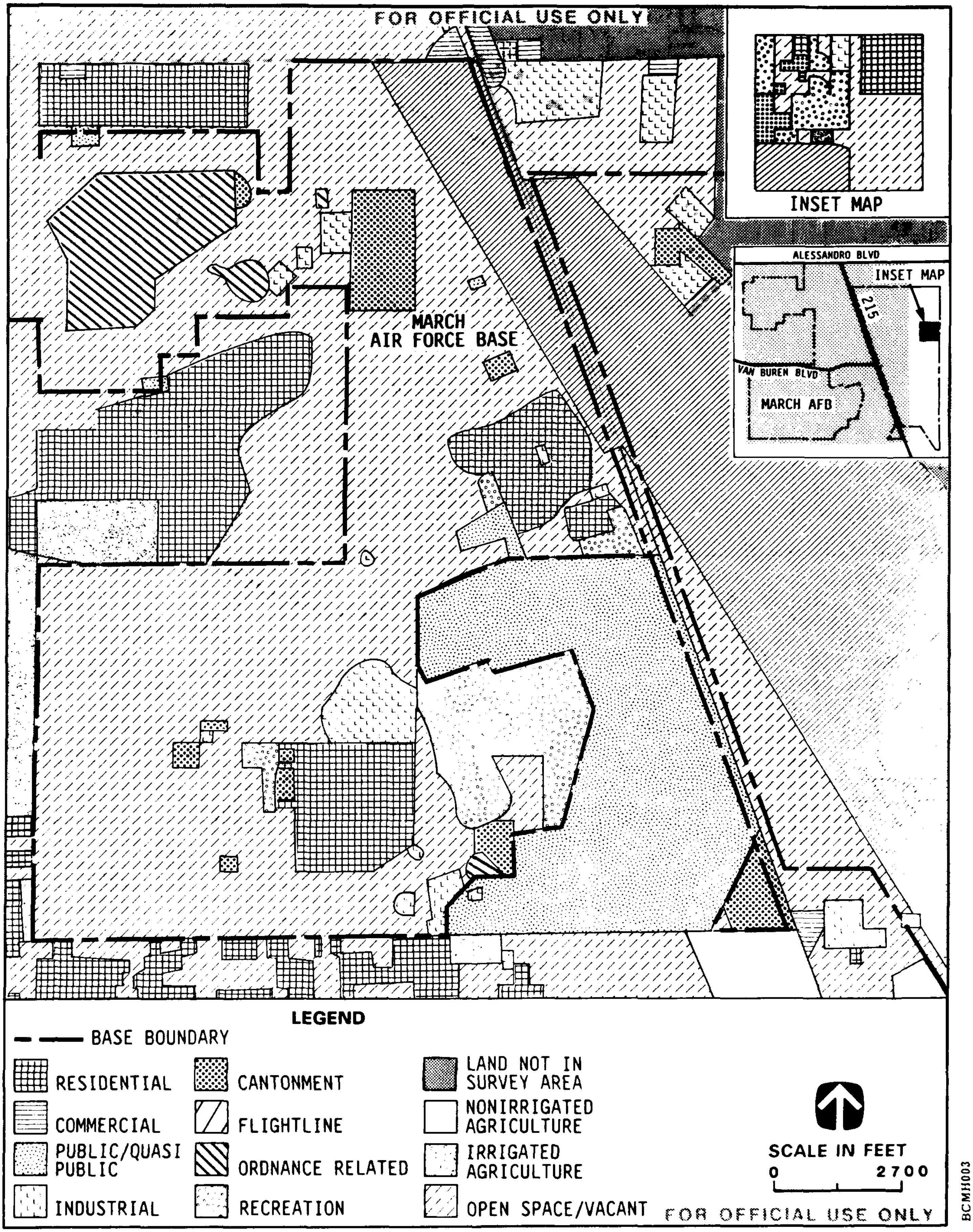

FIGURE 3.4.2-1 LAND USE OF WEST MARCH AFB, CALIFORNIA AND VICINITY

Flightline. The flightline designation includes the runway and surrounding aircraft operations area, including the Approach Zone, Clear Zone, and Accident Potential Zones (APZ) 1 and 2.

Open Space. West March has a large amount of open space including areas west of Arnold Heights, near HQ 15th Air Force, surrounding the WSA, and between the flightline area and Interstate 215.

Recreation. Recreation facilities on West March include the base golf course and recreation facilities at the NCO Professional Military Education and in the Arnold Heights Housing Area.

Site 3 Land Use. Land uses in Site 3 are shown in Figure 3.4.2-1 (inset map). Unaccompanied base housing is located in the north of the site. Community uses, both commercial and service, are located south and west of the unaccompanied housing (cantonment designation). Other cantonment land uses are southwest of Site 3 and include administrative and mission-related land uses. Industrial land uses include a closed landfill. Recreational uses consist of a baseball diamond and a soccer field northwest of Site 3. A riding club with stables, an arena, and pasture areas occupy the southeast corner of Site 3. Two additional baseball fields are north of the riding club with a running track/par course west of the riding club. An outdoor recreation building and a dry storage area for recreational vehicles and boats is southwest of Site 3.

OffBase Land Use. Offbase land uses in the West March area include commercial and industrial uses at the intersection of Interstate 215 and Alessandro Boulevard. A small residential area consisting of single-family residences and a mobile home subdivision is north of Site 1. A 1,200-acre multi-use development with residential (approximately 4,500 dwelling units), commercial, and light industrial uses is south of Site 1 and west of Site 2. Lands west of Site 1 are currently open space but planned for light industrial and commercial development. The area south of West March includes a mix of commercial citrus groves, low-density residential development, and some nonirrigated grainland farming activities in the unincorporated community of Mead Valley. Offbase land uses, east of Site 3 in Moreno Valley, have been rapidly converted from agricultural uses to residential uses.

3.4.2.2 Land Use Plans and Policies

Onbase. The March AFB Comprehensive Plan, adopted in 1985, is the document that guides future base physical facilities planning and the protection of environmental and cultural resources. The plan aims to eliminate inefficient land use, reduce future siting conflicts, avoid incompatible future development, reduce or eliminate unnecessary project expenditures, and protect the environmental resources of March AFB.

The comprehensive plan has been amended for the relocation of the AAFES and DRMO facilities from Norton AFB to the West March area. The area south of Van Buren Boulevard has been designated for replacement military family housing on a 130-acre parcel. A 110-acre addition to the base golf course is also proposed. The comprehensive plan has designated much of the area near Site 3 for outdoor recreation or open space. Lands to the west and south of Site 3 are designated mission-related, administrative, or industrial uses.

The Air Installation Compatible Use (AICUZ) Plan for March AFB provides for land use decisions within the flight operations area of the base as well as a guide for land use planning by the County of Riverside and the cities of Moreno Valley, Perris, and Riverside with regard to flying activities at the base.

Offbase. The cities of Moreno Valley, Perris, and Riverside, and the County of Riverside, have adopted their respective general plan elements. The City of Riverside has adopted the Orangecrest Specific Plan and Alessandro Heights Specific Plan for the areas west of Arnold Heights and the WSA, respectively. The City of Moreno Valley has adopted the Gateway Specific Plan, which includes the area north of Cactus Avenue and east of Interstate 215. This area is planned for commercial and single-family residential uses.

3.4.2.3 Visual Resources

The land east of Interstate 215, where flightline operations are centered, is a flat landscape. Lands to the north, west, and south have remained an open space landscape barren of all but facilities that support base operations. The West March area, a flat plain that gradually rises to the Canyon Crest divide, includes some steep hills composed of grasslands. The portion of the base presents a rural setting surrounded by a rapidly urbanizing area. HQ 15th Air Force and the WSA, on the upper elevations of the Canyon Crest look toward the east and the urbanized communities of Moreno Valley and Perris. The main base area is generally developed. The area near Site 3 consists of lightly developed recreational facilities and more intensively developed flightline and cantonment areas to the south and west. The area east of Site 3 and outside the base boundaries consists of developing residential areas to the north and industrial areas to the extreme south.

3.4.3 Transportation

3.4.3.1 Traffic

Existing Conditions. Regional access to March AFB is provided by Interstate 215, the north-south highway that divides the base in half (Figure 3.4.3-1). The California Department of Transportation plans to upgrade Interstate 215, between State Route 60 and the base, to freeway status. These improvements will include an interchange and new ramps at Cactus Avenue to provide access to the West and Main gates of March AFB. The contract for the segment between State Route 60 and Van Buren Boulevard will be let in April 1990; a contract to improve the segment between Van Buren and Nuevo Road will be let in September 1990. Both segments are expected to be completed by 1993. The environmental impacts of each segment were considered in the Final Route 215 Environmental Impact Statement (October 1984) and in the Finding of No Significant Impact (FONSI): Van Buren Boulevard to Nuevo Road in Perris, Negative Declaration and Environmental Assessment.

Local access to the Main Base is provided by three primary arterial roadways: Cactus Avenue, Graham Street, and John F. Kennedy Drive in the City of Moreno Valley. Access to West March is provided from the north by Alessandro Boulevard and from the south by Van Buren Boulevard.

Roadway Characteristics. Cactus Avenue, running east and west along the northern boundary of the Main Base, provides access from the west, including the Arnold Heights Housing Area on West March. Cactus Avenue terminates in West March at the WSA. To the east, Cactus Avenue extends approximately one-quarter mile past Graham Street and terminates. Cactus Avenue resumes again at Heacock Avenue and continues through the City of Moreno Valley.

Graham Street provides access to the Main Base from the north, and intersects Cactus Avenue near the March AFB Main Gate. Within the base boundaries, Graham Street continues as Riverside Drive. John F. Kennedy Drive intersects the eastern boundary of the Main Base at the East Gate and connects

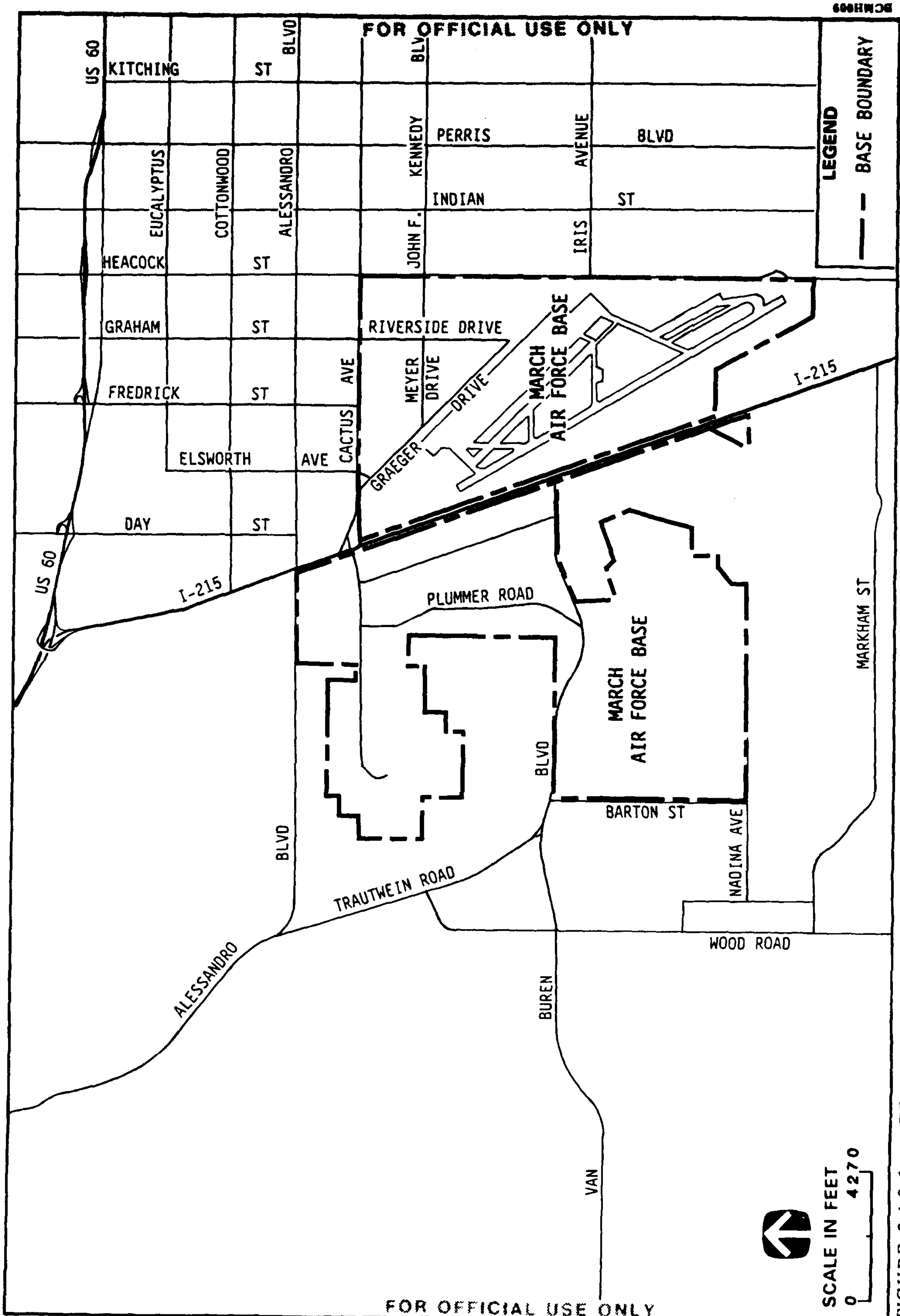

FIGURE 3.4.3-1 TRANSPORTATION NETWORK IN THE VICINITY OF MARCH AFB, CALIFORNIA

the base with residential developments to the east. Within the base, John F. Kennedy Drive continues as Meyer Drive.

Alessandro Boulevard is a primary arterial extending from the City of Riverside through the City of Moreno Valley to Gilman Springs Road in an unincorporated area of Riverside County. Alessandro Boulevard provides access to West March from the west. Van Buren Boulevard is a four-lane highway which extends from north of the State Route 91 (Riverside Freeway), southeast through the West March area to Interstate 215, west of the Main Base. Van Buren Boulevard also provides access to West March from the west.

Three gates provide access to the Main Base. The Main Gate is located on Riverside Drive, south of Cactus Avenue, and currently accommodates an average of 62 percent of the total daily gate traffic. The West Gate is located on Graeber Street, south of Cactus Avenue at its intersection with Elsworth Street, and provides access for approximately 20 percent of the daily traffic. The East Gate is located on Meyer Drive, west of Heacock Street, and provides access for approximately 18 percent of daily traffic.

3.4.3.2 Airports

The primary airport serving the March AFB area is Ontario International Airport, approximately 30 miles west of the base. Ontario International Airport is served by 11 major airlines and several smaller airlines. Passenger traffic has steadily increased each year and exceeded 5.2 million passengers (2,633,800 enplanements and 2,665,450 deplanements) in 1989. As a result, the number of flights available has also increased. The airport is served by both major and regional airlines and provides non-stop service to the major hubs in the United States including Denver, San Francisco, Atlanta, Chicago, and Salt Lake City. Other airports in the region included Palm Springs International Airport, John Wayne Orange County Airport, and Los Angeles International (Section 3.1.3.2).

3.4.4 Utilities

Riverside and San Bernardino counties are identified as the area where community and public utilities would be directly or indirectly affected by the proposed action. The cities of Riverside, Moreno Valley, and Perris are expected to receive the majority of the population inmigration.

3.4.4.1 Water Supply

Riverside Public Utility (RPU), a municipal corporation, provides potable water to residents of the City of Riverside, primarily from groundwater sources located under the City of San Bernardino. The present system has a treatment capacity of 100 million gallons per day (MGD). A summary of existing and projected demand is provided in Table 3.4.4-1. Average daily demand for 1989 was 58 percent of system capacity. Future demand will increase to 62 percent in 1996 and 1997. Per capita demand estimates are based on city estimates of 225 gallons per capita per day (gpcd). Riverside currently purchases 5 percent of its water from the Metropolitan Water District (MWD) of Southern California, the principal water purveyor in the Southern California region, to meet peak demands.

EMWD supplies Moreno Valley, Perris, and March AFB with potable water. EMWD purchases its water from MWD and obtains it from the MWD H. J. Mills Filtration Plant in Riverside. The water is a blend obtained from California State Water Project and the Colorado River. EMWD has an operating capacity of 71 MGD. Existing average daily demand and projected demand is shown on

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Table 3.4.4-1

Summary of Current and Projected Average Daily Water Demand and Wastewater Flows (MGD)

Year	Riverside	Moreno Valley/Perris		March AFB
Water Demand				
1989	58.2	66.0		1.60
1996	61.6	75.3		1.80
1997	62.1	76.6		1.80
Wastewater Flows				
1989	29.0	8.0	1.7	0.50
1996	30.5	14.0	2.2	0.75
1997	30.7	14.6	2.3	0.75

Table 3.4.4-1. Current demand is 93 percent of system capacity and projected demand in 1996 and 1997 will extend beyond the system capacity to 106 and 108 percent, respectively. EMWD has requested a larger connection from MWD. Per capita demand estimates are based on 200 gpcd.

March AFB is supplied potable water by EMWD through an 18-inch connection at the West Gate and a second connection at East Gate. The connections have delivery capacities of 2,700 gallons per minute (gpm), and 1,800 gpm, respectively. Average daily demand for March AFB is presented in Table 3.4.4-1. Increased demand in 1996 includes the increased base population expected as a result of the realignment of units at Norton AFB.

3.4.4.2 Wastewater

The City of Riverside operates a tertiary wastewater treatment plant with an operating capacity of 32 MGD. The facility is presently being upgraded to the increased treatment capacity of 40 MGD. The 1989 average daily wastewater flow and projected average daily wastewater flow for 1996 and 1997 are presented in Table 3.4.4-1. Present flows are 91 percent of the system capacity. Projected flows in 1996 and 1997 are an estimated 75 and 76 percent, respectively, of the increased system capacity. Projected flow is based on 100 gpcd.

EMWD operates secondary treatment facilities for both Moreno Valley and Perris. The Moreno Valley treatment facility is being expanded to increase the operating capacity from 10 to 16 MGD and upgrade the facility to tertiary treatment. Wastewater flows for 1989 were 80 percent of the present treatment system capacity and projected to be 88 percent in 1996 and 91 percent in 1997 of the increased capacity treatment facility (Table 3.4.4-1). The Perris treatment facility has a present operating capacity of 2 MGD. Expansion plans for the facility are currently being designed for incremental increases in capacities of 3, 6, 12, and 18 MGD with upgrading to tertiary treatment. Wastewater flows for 1989 and projected flows for 1996 and 1997 are presented in Table 3.4.4-1. Wastewater flows in 1989 were 85 percent of the system treatment capacity. The facility will need to be expanded prior to 1996 to meet projected demand. Projected flow is based on 100 gpcd.

March AFB operates a biofiltration secondary treatment facility with a capacity of 1.0 MGD. The plant is presently not meeting the biological oxygen demand (BOD) standards on its National Pollutant Discharge Elimination System (NPDES) permit. Upgrading of the facility is planned to meet the standards. The facility is currently operating at 60 percent of its capacity, and the realignment of units and personnel from Norton AFB is projected to increase operations to 80 percent of treatment capacity. The facility will be able to meet the increased demand. Planned demolition of the Arnold Heights Housing Area will allow an additional 0.25 MGD of flow after demolition. The replacement housing will not use the March AFB treatment facility.

3.4.4.3 Solid Waste

The County of Riverside Waste Management Department owns and operates the three sanitary landfills that serve the cities of Riverside, Moreno Valley, and Perris, and March AFB. The City of Riverside generates approximately 910 tons per day (T/day) of solid waste and utilizes the Hydro landfill which is scheduled for closure in 1996. Collection of solid waste for March AFB and Moreno Valley is done by contract haulers which use the Badlands landfill. This landfill received 334 T/day of solid waste in 1988. March AFB generated 36.5 T/day in 1989. The County Solid Waste Management Plan estimates the Badlands landfill will receive an increase of 440 tons per day over the next few years, with anticipated closure in the year 2042. Collection in the City of Perris is performed by contract waste haulers and the refuse is disposed of at the Mead Valley landfill. The landfill is utilized by four other small communities in the area. Currently, 375 T/day of solid waste is disposed of, and the amount is expected to increase to 460 T/day over the next 5 years. Residential per capita generation is estimated at 3.5 pounds/day/person. Riverside County will be required to implement the provisions of the recently passed California Assembly Bill (AB) 939. This statute requires implementation of recycling programs to reduce solid waste generation (i.e., disposal at landfills) 25 percent by 1995 and 50 percent by 2005 based on 1988 solid waste generation figures. Implementation of recycling programs would extend lifespans of the county's landfills by an undetermined amount depending on when programs are implemented and their effectiveness.

3.4.4.4 Energy

Electricity. RPU also provides electricity to the residents of the City of Riverside. RPU had a power supply of 1,460 megawatt-hours (MWh) in 1989 with a peak demand of 367.2 megawatts (MW). The number of electric customers increased by 2.5 percent in 1989; a 2 percent average annual growth is projected over the next five years. The utility anticipates that additional seasonal and peaking capacity supply contracts will be required by 1995 and 1997, and negotiations are in progress to increase contractual commitments. Energy consumption for 1989 was 1,413 MWh.

Southern California Edison (SCE) provides electrical power to the Moreno Valley, Perris, March AFB. SCE serves more than 3.9 million customers in a 50,000 square-mile service area covering much of central and southern California. The company had total retail electric sales of 67.6 billion MWh in 1989 with 20,136 MW of total capacity. Peak demand was 15,632 MW. Additional demands will be met by increasing power purchases for outside the region and maintaining current generating facilities. Estimated energy consumption in Moreno Valley was 356,133 MWh and 53,803 MWh for Perris.

SCE provides March AFB with electrical service delivered at 34.5 megavolt-amperes (MVA) to a main substation located on the base. Approximately 53,803 MWh were consumed in FY 1989, with a peak demand of 12.84 MW. The relocation of units and personnel from Norton AFB is expected to increase the peak demand to 35 MVA.

Natural Gas. Southern California Gas Company, the utility division of Pacific Enterprises, provides natural gas to over four million customers in central and southern California including March AFB and the areas surrounding the base. The company sold 1,032 billion cubic feet in 1989; sales are expected to slow to less than the 5 percent increase experienced in 1989. Pacific Enterprises Oil Company, the Oil and Gas Division of Pacific Enterprises, will be able to accommodate future increased demands. Estimated consumption in 1989 in Riverside was 5,100,000 thousand cubic feet (mcf), 2,126,500 mcf in Moreno Valley; and 397,017 in Perris.

Southern California Gas Company supplies natural gas to March AFB at a metering point in the West March area. The gas is delivered at 65 pounds per square inch (psi) and is reduced to 15 psi for distribution. Consumption for the base in 1989 was 130,800 mcf.

3.4.5 Hazardous Materials and Waste Management

3.4.5.1 Hazardous Materials Management

Hazardous materials are used and temporarily stored at various industrial facilities throughout March AFB. Most of the hazardous materials associated with base operations consist of solvents, paint strippers, and paints. Other hazardous materials used and stored at the base include fuels (both aircraft and motor vehicles), oils, herbicides and pesticides, and a variety of chemicals and munitions. Procedures for hazardous material storage, use, and spill prevention and control at March AFB are outlined in various plans including an Underground Storage Tank Management Plan, a Solvent Management Plan, and a Spill Prevention Management Plan.

3.4.5.2 Hazardous Waste Management

March AFB manages all hazardous waste in accordance with a Hazardous Waste Management Plan. The management plan describes how the base will store, handle, and manage hazardous waste products generated at the installation. Hazardous waste routinely generated by the base include oils, paints, thinners, solvents, and other regulated materials. In addition to the management plan, the base has also developed a Waste Minimization Plan to provide information and procedures to reduce and minimize the generation of hazardous wastes at the base. No hazardous waste is stored onbase for more than 90 days. Twenty-nine sites around March AFB accumulate wastes, and the Norton AFB DRMO is responsible for the proper handling of waste and arranging for transport to licensed treatment and disposal facilities in accordance with federal and California regulations. The DRMO facility will be relocated to March AFB as a part of the Norton AFB closure. Appropriate permits will be applied for to meet federal regulations.

The March AFB Installation Restoration Program (IRP) identified no sites on the proposed project areas (Sites 1, 2, and 3) or the proposed housing area. However, there are two identified sites in the vicinity of Site 1 and one near Site 3 (Figure 2.4.2-1). The three sites are described below.

Landfill No. 5. This 53-acres site is located in the northwest portion of the base, south of Cactus Avenue and west of Interstate 215. The landfill was used between 1954 and 1974 for disposal of garbage, rubbish, demolition debris, and possibly small quantities of waste oils, spent solvents, thinners, sludge in drums, and PCB oils. In addition, approximately 300 gallons of acetone were reportedly dumped at Landfill No. 5 in 1981. The landfill has been closed.

Munition Residue Burial Site. This site is also located in the northwest part of the base, south of Cactus Avenue. Small-scale munitions disposal has been conducted at this site beginning in the late 1950s. The site consists of a detonation pit and burial trenches. Outdated small arms ammunition, egress items, smoke grenades, starter cartridges, and other pyrotechnics were deactivated in the detonation pit. The residues and shell casings were buried in shallow (less than five feet) trenches. The residues could be hazardous if the munitions were not completely deactivated.

Results of the Phase II - Stage I Field Investigation program judged these two sites to pose minimal potential threats to the environment or public health. A No Further Action Decision Document (NFADD) was prepared for both sites and submitted to the Environmental Protection Agency (EPA). EPA recommended that a lysimeter and monitoring well be installed at the site.

Landfill Site No. 6. This 22-acre landfill is located along the eastern boundary of the base south of the East Gate, and operated from 1955 to 1968. Reportedly, the depth of the landfill is 12 to 25 feet. Wastes disposed of at the landfill included garbage, refuse, rubble, and possible waste oils, spent solvents, paints, thinners, and sludges. Tetrachloroethylene, trichloroethylene, vinyl chloride, toluene, and petroleum hydrocarbon levels were found to be above applicable criteria during the Phase II-Stage 2 Field Investigation program. The ongoing Phase II-Stage 4 investigation will include soil and water monitoring investigations.

March AFB is listed on the federal facility sites section of the EPA National Priorities List (NPL).

3.4.6 Geology and Soils

3.4.6.1 Geology

Physiography and Topography. March AFB, located in the northern portion of the Perris Valley and in the Peninsular Ranges physiographic province, is characterized by flat to gently sloping topography. Bedrock surface outcrops include the Perris Block, Gavilan Hills, Lakeview Mountains, and Box Springs Mountains. To the east lie the San Jacinto Mountains and the Colorado Desert; to the west, the Pacific Coastal Plain; and to the north are the Transverse Ranges. The elevation of the valley floor ranges from 1,400 to 1,800 feet above sea level. As with surface topography on most of the Perris Valley alluvium, relief on the March AFB is slight. There is a gentle grade from an elevation of 1,547 feet in the northwest to 1,501 feet in the southeast.

Regional Geology. The regional geology of the March AFB area is characterized by igneous and metamorphic crystalline rocks overlain by or protruding through (i.e. bedrock surface outcrops) alluvial sediments of the Perris Valley. Mountains and escarpments in the region date from the Mesozoic era. The Main Base is located on recent alluvium deposited in the Quaternary period. This alluvium constitutes the floor of the Perris Valley, and generally is composed of unconsolidated stream, river channel, and alluvial fan deposits that reach thicknesses of up to 2,000 feet. West March is located on the Perris Block, and consists of granitic bedrock. Both the alluvium and the Perris Block are bounded on the southwest by the Chino and Elsinore fault zones and on the north by the Cucamonga fault zone (Section 3.1.6, Figure 3.1.6-1). West March lies closer than the Main Base to the Chino-Elsinore fault zone, which is not as active as the San Andreas and San Jacinto fault systems.

Geologic Hazards. Earthquakes, originating as shock waves generated by movement along active faults, are the main seismic hazard of the March AFB area. Primary seismic hazards which result from earthquakes are groundshaking and the potential for rupture along surface traces of faults. Secondary seismic hazards result from the effects of groundshaking on soils and bedrock, and include liquefaction, landslides, seiches (damaging standing waves in small bodies of water), and dam collapse.

The San Jacinto and San Andreas faults are the most significant for potential groundshaking. Each of these faults lies within 20 miles of the Main Base. The San Jacinto and San Andreas faults are the most significant for potential groundshaking. The San Jacinto fault, approximately 7 miles from the base, is the most active fault in Southern California and regularly produces earthquakes with Richter scale magnitudes of 6.0 to 7.0. The San Andreas fault, 15 miles from the site, although less active, has the potential for producing earthquakes of Richter magnitude 8.0. No faults are known to be present on the base.

3.4.6.2 Soils

Two major soil series describe the soil resources in the proposed project areas (Sites 1, 2, and 3): Fallbrook Sandy Loam and Monserate Sandy Loam. These two soil series vary in particle size classification and slope throughout the March AFB area. On the Main Base and in the Arnold Heights Housing Area, the primary soil series is the Monserate Sandy Loam. This series is located within the Monserate-Arlington-Exeter association and is well drained with nearly level to moderately steep slopes. The surface layer of this association has a sandy loam to loam texture and the entire section can be shallow to deep to a hard pan. The potential for erosion due to water is slight as these soils are well advanced. The coarse texture of this soil indicates a susceptibility toward erosion. Within the West March area, the Fallbrook Sandy Loam is the representative soil. This soil series is located within the Cieneba-Rockland-Fallbrook association and is a well-drained to somewhat excessively drained soil with undulating to steep slopes. This soil can be shallow to moderately deep with a surface layer of sandy loam and fine sandy loam texture derived from granitic rock. The potential for erosion due to water is slight as these soils are well drained. The coarse texture of this soil indicates a susceptibility to wind erosion.

The Monserate sandy loam has a capability classification that indicates severe limitations reducing the choice of plants due to the potential for erosion. This soil can be managed to support citrus or avocados, but is not commonly used for this purpose. The Fallbrook Sandy Loam has the same limitations but requires more management than the Montersate Sandy Loam. If irrigated and managed properly, the Fallbrook Sandy Loam can support citrus or avocados. If unirrigated, this soil can support crops or plants adapted to the area.

3.4.7 Water Resources

3.4.7.1 Groundwater

The principal water aquifer in the March AFB area : the San Jacinto Basin. Groundwater in the San Jacinto Basin is contained within a closed aquifer. The San Jacinto Basin aquifer is recharged by precipitation and infiltration. Runoff from the surrounding mountains of non-waterbearing rocks, percolation from irrigation, and wastewater effluent disposal contribute to recharge. Groundwater occurs in the alluvial materials that underlie the Main Base area. These waterbearing sediments are found from approximately 35 to 100 feet. Recharge to this portion of the aquifer is due to groundwater flow from the western part of the base.

Under the West March area, groundwater occurs in limited quantities in the shallow weathered rock zone and possibly in fractures and joint systems of the bedrock. Water table depths are generally 15 to 25 feet below the ground surface in the weathered rock zones. Groundwater quality in this area of the base is generally good. Total dissolved solids range from 250 to 1,000 milligrams/liter (mg/l), with 400 to 500 mg/l being the most common levels. The potential for groundwater contamination is currently being investigated through the March AFB IRP program.

3.4.7.2 Surface Water

March AFB and the Perris Valley lie within the San Jacinto River Basin, which feeds into the Santa Ana River Basin during years of heavy precipitation. The Santa Ana River Basin drains into the Pacific Ocean. Annual rainfall at Riverside averages between 10 and 13 inches and peaks seasonally with 90 percent falling between November and May.

Surface drainage at March AFB flows into the San Jacinto River and to tributaries of the upper Santa Ana River. Although runoff is heavy on the base due to the extent of development, flooding is controlled by an extensive system of open drainage channels, including the Perris Valley Storm Drain which circumscribes the northern and eastern boundaries of the Main Base.

3.4.8 Air Quality

3.4.8.1 Regulatory Setting

The regulatory setting for March AFB is the same as described for Los Angeles AFB in Section 3.1.8.

3.4.8.2 Regional Air Quality

Meteorology and Climate. A general description of the meteorology and climate of the South Coast Air Basin is described in Section 3.1.8. The climate in the March AFB area is considered Mediterranean to semiarid with hot, dry summers and cool, moist winters. It is not uncommon for the temperature to vary from 50 to 60 degrees in a 24-hour period. Daily recorded high temperatures in the summer months are very often in excess of 100°F; daily minimum temperatures in the winter have been as low as 32°F. The average annual temperature is 62°F. Killing frosts are generally experienced only in the months of December and January and many years are frost-free.

Existing Air Quality. The South Coast Air Quality Management District (SCAQMD) monitors air quality at 37 locations in the South Coast Air Basin, including two locations in the City of Riverside and one in the City of Perris. March AFB is located approximately 8 miles south of Riverside and approximately 8 miles north of Perris, so the air quality at March AFB is assumed to be similar to the air quality at these monitoring stations. The results of the air quality monitoring from 1986 to 1988 by the SCAQMD are presented in Table 3.4.8-1. The federal air quality standards for ozone and particulate matter and the state standards for carbon monoxide, ozone, and particulate matter were exceeded at the monitoring stations during in each year. State and federal standards for ozone and the state standard for suspended particulates were exceeded at the Perris monitoring station. These pollutants were not monitored in 1987 at the Riverside (Magnolia) station. Additionally, monitoring of visibility at March AFB indicated that the state visibility standard of 10 miles (Section 3.1.8, Table 3.1.8-1), on days when the relative humidity is less than 70 percent, was not met during 168 days in 1986, 198 days in 1987, and 215 days in 1988.

3.4.8.3 Emission Sources

An emissions inventory for the Riverside County portion of the South Coast Air Basin is presented in Table 3.4.8-2. Riverside County's contribution to overall emissions in the basin (Section 3.1.8, Table 3.1.8-4) is less than either Los Angeles or Orange counties' contributions, but overall emissions in the county have been increasing because of the rapid growth that has taken place. Solvent use is the predominant reactive organic gas emission source in Riverside County. Because of the absence of major industrial developments and electrical generating facilities (i.e., fuel combustion facilities), Riverside County has very low emissions of oxides of nitrogen (NO_x) and carbon monoxide, compared to the western portion of the basin (i.e., Los Angeles and Orange counties). However, because Riverside County is downwind of these areas, the area suffers from high ozone concentrations, resulting from the photochemical reaction of NO_x and ROG from stationary and mobile sources.

Table 3.4.8-1

Summary of Air Quality Monitoring Data for the March AFB Area 1986-1988

	Riverside (Rubidoux)			Riverside (Magnolia)			Perris			Riverside[1] County		
	1986	1987	1988	1986	1987	1988	1986	1987	1988	1986	1987	1988
Ozone												
Maximum Concentration (ppm/1 hour)[2]	.25	.29	.28	--[3]	--	--	.22	.20	.23	.27	.29	.28
Days Exceeding Standard												
Federal (>.12 ppm, 1 hour)	106	113	123	--	--	--	79	82	82	117	122	131
State (>.09 ppm, 1 hour)	161	168	178	--	--	--	133	136	137	174	175	189
Carbon Monoxide												
Maximum Concentration												
(ppm/8 hours)	6.0	6.1	6.8	8.3	7.6	10.0	--	--	--	8.30	7.60	10.0
(ppm/1 hour)	9	9	9	18	13	17	--	--	--	18	13	17
Days Exceeding Standard												
Federal (>9.0 ppm, 8 hours)	0	0	0	0	0	1	--	--	--	0	0	1
(>35 ppm, 1 hour)	0	0	0	0	0	0	--	--	--	0	0	0
State (>9.0 ppm, 8 hours)	0	0	0	0	0	1	--	--	--	0	0	1
(>20 ppm, 1 hour)	0	0	0	0	0	0	--	--	--	0	0	0
Nitrogen Dioxide												
Annual Average (ppm)	.032	.027	.037	--	--	--	--	--	--	.032	.027	.036
Maximum Concentration (ppm/1 hour)	.16	.19	.19	--	--	--	--	--	--	.16	.21	.19
Days Exceeding Standard												
Federal (.053 ppm, Annual Average)	0	0	0	--	--	--	--	--	--	0	0	0
State (>.25 ppm, 1 hour)	0	0	0	--	--	--	--	--	--	0	0	0

Table 3.4.8-1, Page 2 of 2

	Riverside (Rubidoux)			Riverside (Magnolia)			Perris			Riverside[1] County		
	1986	1987	1988	1986	1987	1988	1986	1987	1988	1986	1987	1988
Sulfur Dioxide												
Annual Average (ppm)	.001	.001	.001	--	--	--	--	--	--	.001	.001	.001
Maximum Concentration												
(ppm/24 hours)	.008	.009	.012	--	--	--	--	--	--	.008	.009	.012
(ppm/1 hour)	.02	.02	.02	--	--	--	--	--	--	.02	.02	.02
Days Exceeding Standard												
Federal (>.03 ppm, Annual Average)	0	0	0	--	--	--	--	--	--	0	0	0
(>.14 ppm, 24 hours)	0	0	0	--	--	--	--	--	--	0	0	0
State (>.05 ppm, 24 hours)	0	0	0	--	--	--	--	--	--	0	0	0
(>.25 ppm, 1 hour)	0	0	0	--	--	--	--	--	--	0	0	0
Total Suspended Particulates												
Annual Geometric Mean (ppm)	120.5	116.9	126.8	96.5	106.5	119.6	89.2	88.2	91.4	--	--	--
Maximum Concentration												
($\mu g/m^3$/24 hours)[4]	347	305	313	326	234	307	215	255	260	347	305	313
Days Exceeding Standard												
Federal (>260 $\mu g/m^3$, 24 hours)	1	3	3	1	0	3	0	0	0	4	12	4
State (>150 $\mu g/m^3$, 24 hours)	24	25	26	8	21	22	8	13	7	80	127	51
PM_{10}[5]												
Annual Geometric Mean (ppm)	86.0	89.6	104.6	--	--	--	--	49.2	62.7	--	--	--
Maximum Concentration												
($\mu g/m^3$/24 hours)	294	219	252	--	--	--	--	137	164	294	219	252
Days Exceeding Standard												
Federal (>150 mg/m^3, 24 hours)	5	7	7	--	--	--	--	0	1	5	7	7
State (>50 $\mu g/m^3$, 24 hours)	48	46	38	--	--	--	--	5	35	48	46	52

Notes: [1]Maximum recorded in Riverside County.
[2]Parts per million.
[3]Not monitored.
[4]Micrograms per cubic meter of air.
[5]Fine particulates with an aerodynamic diameter of 10 micrometers or less.

Source: California Air Resources Board 1986, 1987, and 1988.

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Table 3.4.8-2

Emissions Inventory for Riverside County, South Coast Air Basin 1985

Source Category	**Emissions (Tons/Day)**					
	TOG	**ROG**	**CO**	**NO_x**	**SO_x**	**PM**
STATIONARY						
Fuel Combustion	.71	.32	2.96	5.69	.35	.32
Waste Burning	.11	.04	.67	.00	.00	.09
Solvent Use	17.54	16.29	.00	.00	.00	.01
Petroleum Process, Storage, & Tranfer	5.60	1.21	.00	.00	.00	.05
Industrial Processes	1.98	1.49	1.39	.00	.00	1.71
Miscellaneous Processes	78.39	18.12	27.37	.94	.02	129.42
Subtotal	104.34	37.48	32.39	6.63	.36	131.60
MOBILE						
On Road Vehicles	32.47	30.16	239.94	39.33	2.26	5.39
Other Mobile	12.17	11.83	51.25	8.19	.69	.85
Subtotal	44.64	41.99	291.19	47.52	2.95	6.25
TOTAL:	148.98	79.47	323.58	54.15	3.31	137.84

Source: South Coast Air Quality Management District, 1989.

March AFB currently has 84 permits from the SCAQMD to operate various sources of pollutants such as generators, fuel tanks, and boilers. The emissions data for March AFB were obtained from a summary of emissions prepared by March AFB for the SCAQMD. The factors used in compiling the emission summary were taken from EPA Publication AP-42, Compilation of Air Pollutant Emission Factors, or were provided by the SCAQMD. Total 1989 emissions from permitted and nonpermitted sources (i.e., area sources) were 462 tons per year of reactive organic gases (ROG), 77 tons of NO_x, 4 tons of SO_x, 509 tons of CO, and 6 tons of particulate matter. March AFB currently has 1,973,100 square feet in industrial building floor area. These buildings require natural gas for heating and electrical energy which result in the production of criteria air pollutants.

3.4.9 Noise

3.4.9.1 Regulatory Setting

Noise at March AFB resulting from flying operations is considered in the AICUZ report for the base. The Air Force AICUZ concept is designed to promote land development near its airfields in a manner that not only protects adjacent communities from the noise and safety hazards associated with aircraft operations but also preserves the operational integrity of the airfields. The AICUZ report specifies a wide variety of types and intensities of land usage by a series of districts that consider noise exposure and accident potential near an airfield.

The current AICUZ report for March AFB was prepared in 1984, but is being updated to include the changes in aircraft operations that will result from the realignment activities at the base, including the addition of C-141 aircraft from Norton AFB.

3.4.9.2 Existing Noise Sources

Noise contours are the mapped expression of average noise levels surrounding a single source of noise, such as a highway or airport. In this case the noise contours are measured in terms of Day/Night Average Sound Level (L_{dn}), an index based on a 24-hour average of noise levels, with nighttime sound levels weighted. According to the California Office of Noise Control (CONC), residential uses should be discouraged and considered normally unacceptable uses in areas with average noise exposure levels greater than 65 decibels (dB). The Arnold Heights Housing Area (Site 2), constructed prior to use of modern jet aircraft, lies within the 70 to 80 dB range of noise generated from the base airfield. Within the residential areas in the vicinity of the base, there were an estimated 32,778 housing units containing about 88,500 persons who are affected by the 65 dB noise level or greater. Approximately 74 percent of this population is within the 65 dB to 70 dB noise zone. An undetermined number of persons located within the commercial, industrial, or open land use categories are also affected by 65 dB or greater generated by aircraft operations.

Approximately 69 percent of the land area within the 65 dB or greater zones is classified as "open," which is either agricultural, vacant, park, or undevelopable land. It also includes the open space of the March AFB runway and land adjacent to it. Residential land use accounts for 27 percent of the total area, with the remaining 4 percent containing commercial and industrial activities. Table 3.4.9-1 provides, by noise zone, the affected population for residential areas, land use categories in acres, and total acres.

Table 3.4.9-1

Existing Development With Baseline Ldn Noise Contours (Population and Acres)

Noise Zone	Estimated Population	Land Use Category (in acres) Residential	Commercial	Industrial	Agricultural/Vacant	Total Acres
65	65,078	8,773	216	382	14,236	23,607
70	18,400	2,903	425	190	10,481	13,999
75	3,352	801	194	290	3,671	4,956
80	1,710	343	60	234	3,882	4,519
TOTAL:	88,540	12,820	895	1,096	32,270	47,081

Source: U.S. Air Force 1984

3.4.10 Biological Resources

3.4.10.1 Vegetation

Historically, much of the West March area supported grasslands and coastal sage scrub. Discing and other disturbances have resulted in replacement of native communities with grasslands of mostly ruderal species and small remnant areas of degraded coastal sage scrub. The non-native grassland community at Sites 1 and 2, and the proposed housing area is primarily colonized by introduced species such as filaree (*Erodium cicutarium*), slender wild oats (*Avena barbata*), red brome (*Bromus rubens*), mustard (*Brassica geniculata*), and barley (*Hordeum leporinum*). Washes, which occur in several areas on the sites, contain California sage brush (*Artemisia californica*), mulefat (*Baccharis glutinosa*), and San Joaquin matchweed (*Gutierrezia bracteata*).

Woody riparian vegetation occurs in the intermittent stream drainages in limited areas around Site 1 and in the northwest corner of the proposed housing area. Common species include willows (*salix goodingii and s. laevicata laevicata*) and mulefat. Site 2 is now occupied by base housing, and habitat is limited to cultivated species associated with residential areas. To the west of this site are areas which support vegetation similar to that described for Site 1 and are dominated by ruderal species with scattered rock outcroppings. Site 3 has been previously developed. Vacant lots in this area are dominated by filaree, red brome, and mustard.

3.4.10.2 Wildlife

Wildlife diversity in the areas near Site 1 and the proposed housing area is low because of the homogeneous nature and disturbed condition of the vegetation. Mammals commonly found in these areas include the California ground squirrels (*Spermophilus beecheyi*), desert cottontails (*Sylvilagus auduboni*), black-tailed jackrabbits (*Lepus californicus*), deer mice (*Peromyscus maniculatus*), and little pocket mice (*Perognathus longimembris*). Predatory mammals include coyotes (*Canis latrans*), long-tailed weasels (*Mustela frenata*), and striped skunks (*Mephitis mephitis*).

Reptile species commonly found in the area include western fence lizards (*Sceloporus occidentalis*), side-blotched lizards (*Uta stansburiana*), granite spiny lizards (*Sceloporus orcutti*), gopher snakes (*Pituophis melanoleucus*), Southern Pacific rattlesnake (*Crotalus viridis helleri*), and coachwhips (*Masticophis flagellum*). Amphibian species, generally limited to the riparian areas, may include the western toad (*Bufo boreas*), the Pacific tree frog (*Hyla regilla*), and true frogs (*Rana* sp.).

Because of the abundance of rodents, the area is frequently used as a foraging area for raptors. In previous field studies, red-tail hawks (*Buteo jamaicensis*), Cooper's hawks (*Accipter cooperi*), red-shouldered hawks (*Buteo lineatus*), golden eagles (*Aquila chrysaetos*), American kestrels (*Falco sparverius*), common barn owls (*Tyto alba*), and turkey vultures (*Cathartes aura*) have been found foraging in the area. Other avian species commonly found in the area include rock dove (*Columbia livia*), mourning dove (*Zenaida macroura*), horned lark (*Eremophilia alpestris*), American crow (*Corvus brachyrhynchos*), common raven (*Corvus corax*), house finch (*Carpodacus mexicanus*), and western meadowlark (*Sturnella neclecta*).

Because of the limited habitat available and the high degree of human activity, wildlife diversity at Site 2 is low. The grasslands to the west can be expected to support the same type of wildlife species as described for Site 1.

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Table 3.4.10-1

Listed and Proposed Endangered and Threatened Species and Candidate Species That May Occur in the Vicinity of March Air Force Base, Riverside County, California

COMMON NAME	SCIENTIFIC NAME	FEDERAL STATUS*
LISTED SPECIES		
Mammals		
Stephen's kangaroo rat	*Dipodomys stephensi*	(E)
CANDIDATE SPECIES		
Mammals		
Greater mastiff bat	*Eumops perotis Californicus*	(2)
Los Angeles pocket mouse	*Perognathus longimembris brevinasus*	
Birds		
Swainson's hawk	*Buteo swainsoni*	(2)
Ferruginous hawk	*Buteo regalis*	(2)
Prairie Falcon	*Falco Mexicanus*	(2)
Reptiles		
Orange-throated whiptail	*Cnemidophorus hyperythrus*	(2)
San Diego horned lizard	*Phrynosoma coronatum blainvillei*	(2)
Plants		
Munz's onion	*Allium fimbriatum var. munzii*	(2)
Thread-leaved brodiaea	*Broadiaea filifolia*	(2)
No Common Name	*Caulanthus simulans*	
Many-stemmed live-forever	*Dudleya multicaulis*	(2)
Moreno Currant	*Ribes canthariforme*	(2)

Notes: *(E) -Endangered.
(1) -Category 1: Taxa for which the Fish and Wildlife Service has sufficient biological information to support a proposal to list as endangered or threatened.
(2) -Category 2: Taxa which existing information indicates may warrant listing, but for which substantial biological information to support a proposed rule is lacking.

Source: U.S. Fish and Wildlife Service, 1990.

3.4.10.3 Threatened and Endangered Species

Listed and proposed endangered, threatened, and candidate species which could be present at March AFB are listed in Table 3.4.10-1. The slender-horned spine flower is a federally-listed endangered species. Because of the highly disturbed nature of the proposed sites, none of the sensitive species are expected to occur.

Ten sensitive animal species occur or may occur in the area. These species have been given special recognition by federal, state, and local conservation agencies and organizations because of their declining, limited, and threatened populations. In most cases, the primary reason for their decline is loss of habitat.

The two reptiles are listed by the U.S. Fish and Wildlife Service (USFWS) as Category 2 candidate species. These lizards usually remain in relatively open, sandy spaces near rock outcroppings in the coastal sage scrub plant community.

The Stephen's kangaroo rat is listed as a federally endangered species and as threatened by the California Department of Fish and Game. It is found in the open, grassland areas at the edge of the degraded coastal sage scrub plant community. The species occurs in the disturbed grassland areas of Site 1 and the proposed housing site as well as adjacent to Site 2 in trace abundance (1 to 2 burrows per hectare). In addition, a number of small and two large areas of concentrated populations are located near the proposed sites. One of the large areas is bisected by the access road (Cactus Avenue) to the WSA. The other is southwest of Site 2.

The USFWS, March AFB, the County of Riverside, and other agencies are currently designing a habitat conservation plan (HCP) for the Stephen's kangaroo rat. This HCP will provide for the establishment of a preserve/corridor to connect the scattered populations on and off March AFB and prevent the genetic isolation which could drive this species to extinction.

The Los Angeles pocket mouse (*Perognathus longimembris brevinasus*), a USFWS Catagory 2 candidate species, is also known to occur in the area's non-native grasslands. The greater mastiff bat (*Eumops perotis californicus*) occurs in the area but is not expect on the proposed sites.

The ferruginous hawk, Swainson's hawk, and prairie falcon are federal Category 2 candidate species, and the northern harrier is on the California Department of Fish and Game list of "Species of Special Concern." All of these raptors forage in and around the proposed sites. They are supported by the area's large population of small mammals, which also provide forage for a colony of burrowing owls dwelling in the building foundations remaining from Camp Haan in the southwest section of the proposed housing area. The burrowing owl is currently a California Department of Fish and Game "Species of Special Concern," but its decline throughout its range is expected to lead to a rapid elevation to protected status. The colony on March AFB may be one of the largest remaining in Southern California.

3.4.10.4 Wetlands

Several small riparian areas occur in the proposed sites. However, these areas are not part of drainages large enough to be considered jurisdictional wetlands.

3.4.11 Cultural and Paleontological Resources

3.4.11.1 Prehistoric Resources

Research conducted at the nearby Perris Reservoir documents that the San Jacinto Plain was occupied by 2,300 BP (before present). Evidence of earlier occupation has not yet been recovered. A significant prehistoric population influx appears to have occurred approximately 500 BP. This may have been related to the desiccation of Lake Cahuilla in the Salton Basin to the southeast.

Prehistoric site types that occur in the March AFB area include camps, and hunting and milling locations. Approximately 24 percent of the base has been previously inventoried for cultural resources; 1 historic site and 18 prehistoric sites were identified. No prehistoric sites were recommended as eligible for listing on the National Register of Historic Places (NRHP). A cultural resources inventory is currently being conducted on proposed project areas at March AFB.

Four cultural resource inventories have been conducted on West March AFB; approximately 30 percent of West March has been previously surveyed. Thirty-one prehistoric sites and three isolated finds were recorded. All of the sites consisted of bedrock mortars or grinding slicks. The grinding slicks or bedrock mortars are portions of natural rock with shallow basins used by prehistoric populations to grind seeds and plants. The grinding slicks on West March are not done and are not associated with villages or camps. Because the grinding slicks represent limited activity locations and are not associated with other materials, they are not considered eligible for the NRHP. However, it has been recommended that the boulders containing the grinding slicks should be preserved in place.

Ethnographically, the March AFB area was associated with the Luiseno and Cahuilla Indians. Historic villages have generally been identified along the Whitewater River 70 miles southeast of March AFB. Petroglyphs, pictographs, ceremonial houses, sweatlodges, shrines, cremation locations, and historic cemeteries may be considered sensitive sites or features and will be of concern to local Cahuilla groups. The California Native American Commission has been contacted in order to identify specific groups with concerns in the project areas.

3.4.11.2 Historic Resources

A preliminary historical inventory of the Main Base was conducted in 1985. A 1-square-mile area of the Main Base is considered a National Register Historic District even though it has not been officially nominated. This area represents the original Army flying field established in 1918 and contains a complex of buildings, site features, and landscaping constructed from 1928 to 1934 and a series of 1939 to 1942 modifications. Only one building from the original flying field remains; it was originally used as a bakery or servant's quarters.

Portions of Camp Haan have been recorded during several cultural resource surveys on West March. Camp Haan was a World War II anti-aircraft artillery replacement training center, an Army Service Force depot, and prisoner-of-war camp. Numerous foundations and one standing structure are all that remain from Camp Haan. Because Camp Haan lacks integrity, it is not a good example of World War II era activities nor is it representative of a particular architectural style. Camp Haan is considered not eligible for the NRHP and, presently, some of the building foundations are being removed.

3.4.11.3 Paleontological Resources

The eastern portion of March AFB is situated on Quaternary alluvium; the western part of the base contains outcrops of Cretaceous period granitic bedrock (tonalite and diorite). Pleistocene vertebrate fossils could occur in the Quaternary deposits; however, no known localities have been previously identified. The granitic bedrock on West March does not contain any paleontological materials.

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3.5 PETERSON AIR FORCE BASE/FALCON AIR FORCE BASE, COLORADO

Peterson Air Force Base (AFB), with an area of approximately 1,286 acres (184 acres are fee-owned and 1,102 acres are leased from the City of Colorado Springs), is located 4 miles east of Colorado Springs in El Paso County, Colorado (Figures 3.5-1 and 3.5-2). The host organization at this Air Force Space Command base is the 3rd Space Support Wing. Peterson AFB is the headquarters for the North American Aerospace Defense Command (NORAD), U.S. Space Command, and Air Force Space Command. Other major units include the 1st Space Wing and the Air Force Reserve 302nd Tactical Airlift Wing (TAW). The base is part of the Peterson Complex which includes Peterson AFB, Falcon AFB, and Cheyenne Mountain AFB, as well as offices in the Federal Building and other leased space in downtown Colorado Springs.

Peterson AFB employed 5,675 permanent party military personnel, 1,374 Air Force Reserve personnel, 2,421 appropriated fund civilian personnel, 639 other civilian personnel, and 2,801 contractor personnel at the end of fiscal year (FY) 1989. Approximately 20 percent of the permanent party military personnel live on Peterson AFB, and 80 percent live in communities near the base. The City of Colorado Springs is the host community for the base, and most of the personnel living offbase reside in the city or nearby smaller communities.

Falcon AFB, approximately 10 miles east of Colorado Springs and Peterson AFB, covers approximately 3,840 acres of fee-owned land (Figure 3.5-3). Presently, facilities at Falcon AFB are confined to a 640-acre portion of the base, east of Enoch Road. The host organization at this Air Force Space Command base is the 2nd Space Wing. The major tenant at Falcon AFB is the Strategic Defense Initiative Organization (SDIO) National Test Facility (NTF). The NTF, currently under construction, is expected to become fully operational in late 1990.

Falcon AFB employed 1,369 permanent party military personnel, 300 appropriated fund personnel, and 2,198 contract civilians at the end of FY 1989. When the NTF becomes fully operational, the total workforce is expected to be approximately 6,000. Falcon AFB has no base housing; most of the personnel who work at Falcon AFB live in the Colorado Springs metropolitan area.

History. Peterson AFB, originally established as a civilian airport for Colorado Springs in 1925, came under federal control during World War II, and a large portion of the facility was used as a fighter training base. In 1945, the field was returned to the control of the City of Colorado Springs, and many of the military buildings were razed. The federal government and the City in 1948 reached an agreement that guaranteed a flying facility for the 15th Air Force, which was then headquartered at Ent AFB in Colorado Springs. A year later, 15th Air Force relocated to March AFB, California, and both Ent Air Force Base and the Air Force portion of Peterson Field were placed on inactive status until January 1951, when the Air Force established the Aerospace Defense Command at Peterson Field and Air Force personnel were reassigned to support the new command.

In 1976, Peterson Field was renamed Peterson AFB. In October 1979, control of the base was transferred to the Strategic Air Command. Air Force Space Command was activated at Peterson AFB in September 1982. The 1st Space Wing was constituted and activated in January 1983 and assumed control of the base in April of the same year. The 2nd Space Wing was activated at Falcon AFB, approximately ten miles east of Peterson AFB, in July 1985. The 3rd Space Support Wing was activated

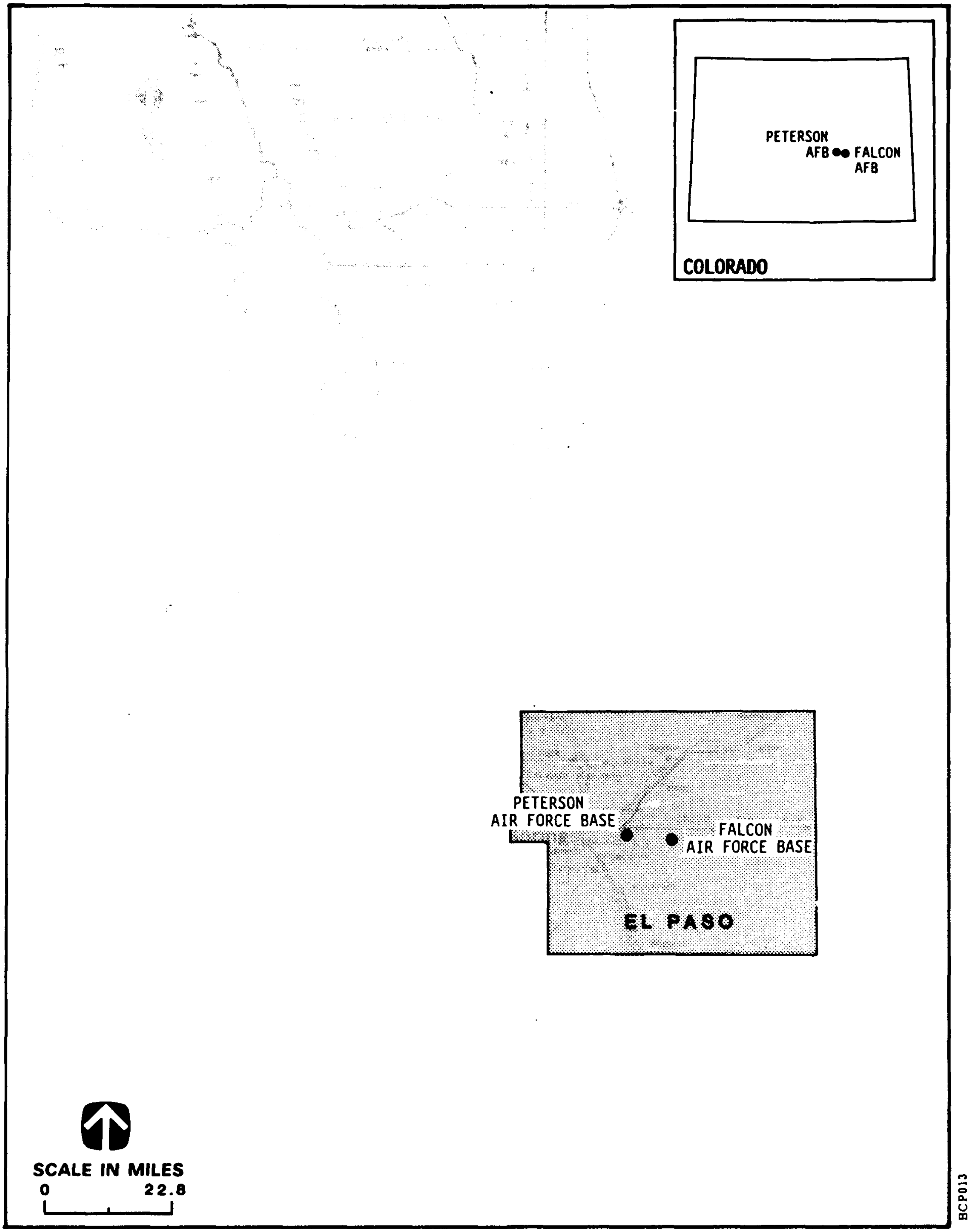

FIGURE 3.5-1 REGIONAL VICINITY MAP FOR PETERSON AFB AND FALCON AFB, COLORADO

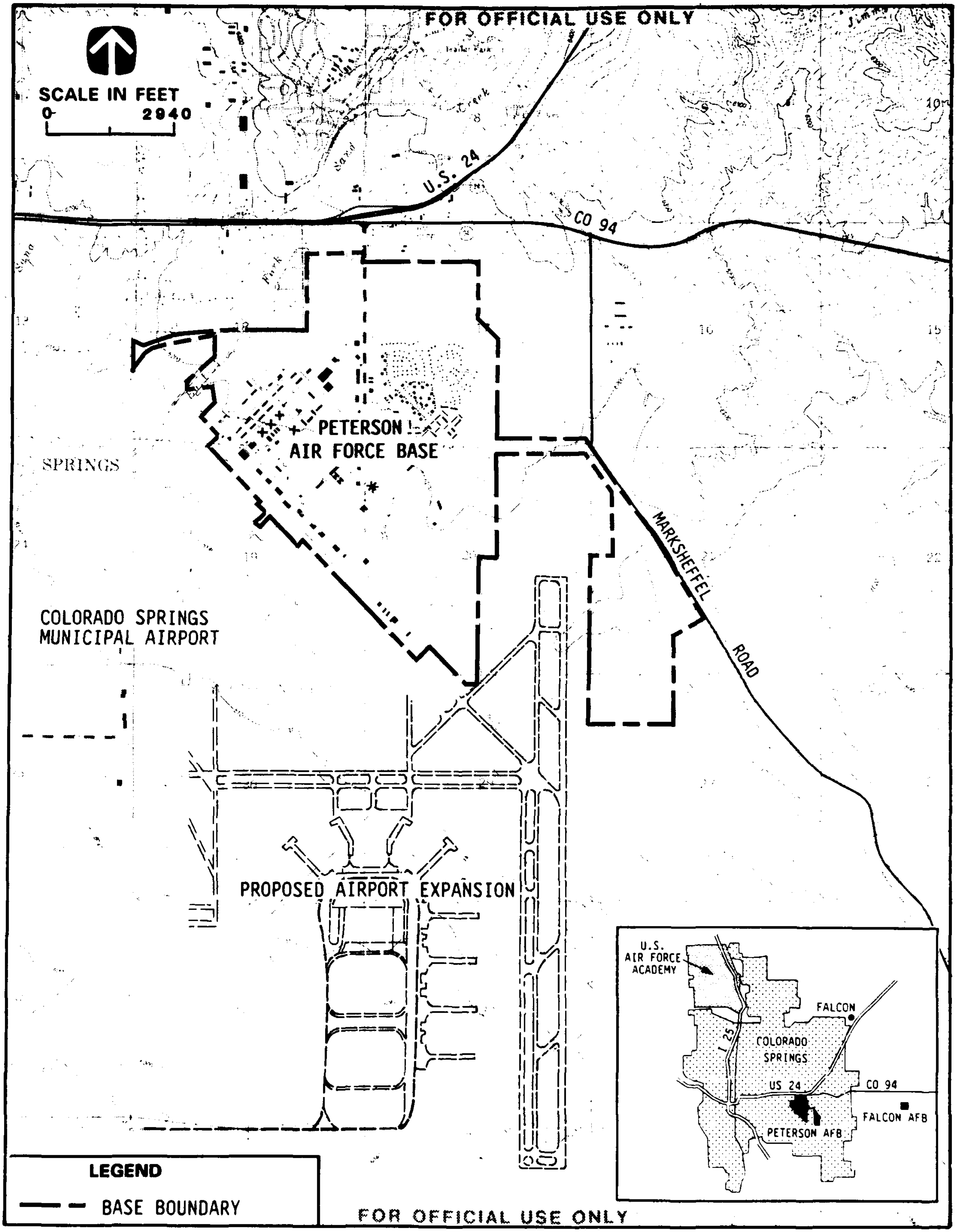

FIGURE 3.5-2 LOCAL VICINITY MAP FOR PETERSON AFB, EL PASO COUNTY, COLORADO

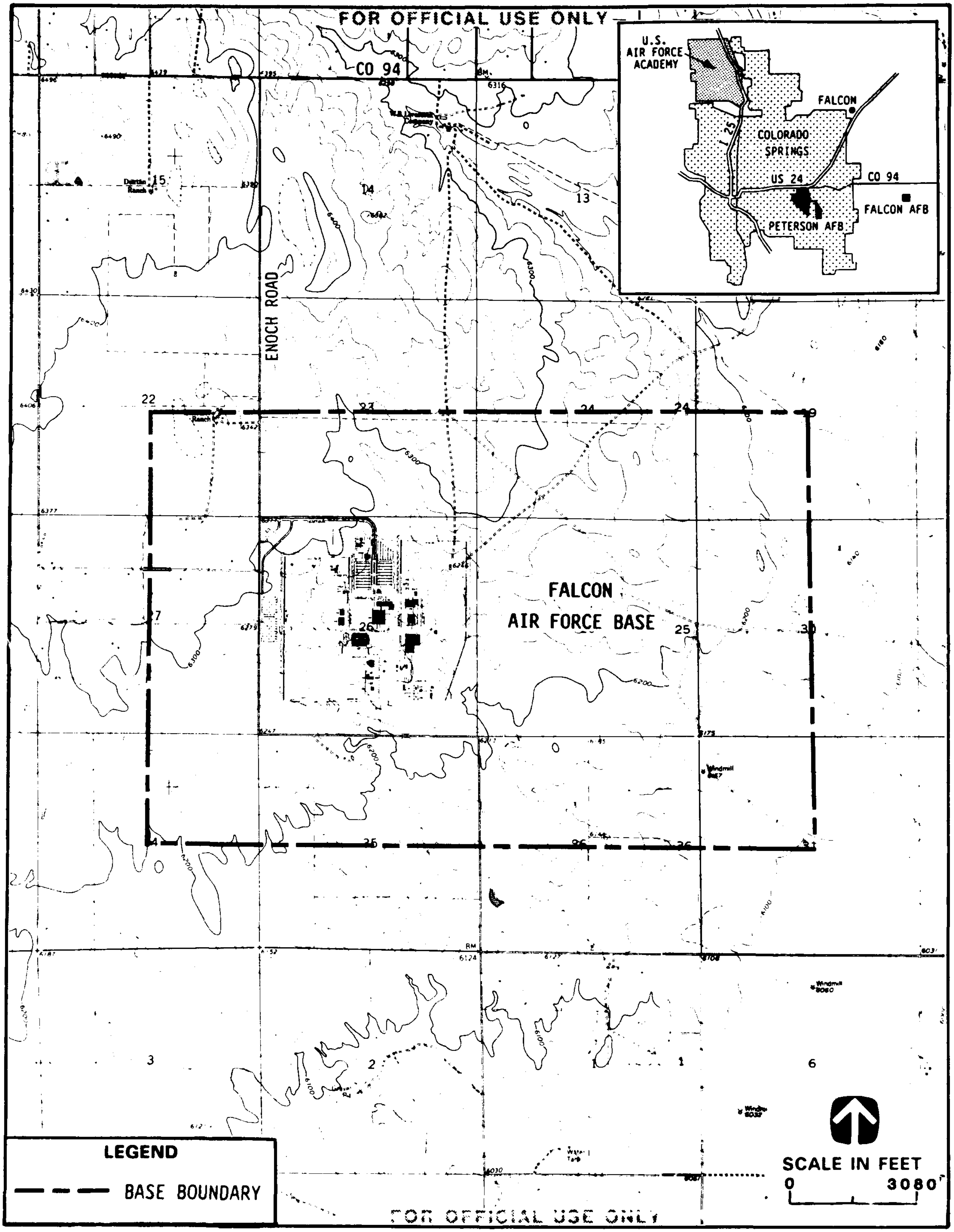

FIGURE 3.5-3 LOCAL VICINITY MAP FOR FALCON AFB, EL PASO COUNTY, COLORADO

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in October 1986 to provide base operating support for the Peterson Complex and all Air Force Space Command bases and sites worldwide.

Mission. The major commands and units at Peterson AFB and Falcon AFB are described below.

The North American Aerospace Defense (NORAD) Command is responsible to the U.S. Joint Chiefs of Staff and the Canadian Chief of Defense Staff for the warning and assessment of, and providing an appropriate response to, an air attack on North America, and providing surveillance and control of the airspace of Canada and the United States.

The United States Space Command (USSPACECOM) commands, plans, coordinates and employs forces to conduct those activities in space that support national objectives. USSPACECOM also prepares operational plans for the conduct of military space operations, assigns tasks and directs coordination among the subordinate component commands (i.e., Air Force Space Command, Naval Space Command and Army Space Command) to ensure unity of effort in accomplishment of command assigned missions.

Air Force Space Command operates forces to provide support from space to terrestrial forces; ground control support for Department of Defense (DOD) satellites in peacetime and through all required levels of conflict; warning of a space or missile attack; and the ability to negate enemy space systems during conflict.

The 1st Space Wing provides ongoing management, training, and evaluation for missile warning, space surveillance, intelligence, and communications sites that are assigned to the wing. The 1st Space Wing operationally commands and supports sensor units located in the United States and throughout the world.

The 2nd Space Wing, headquartered at Falcon AFB, provides command and control of operational DOD satellite systems, and operates and manages the Air Force Satellite Control Network (AFSCN).

The 3rd Support Wing is the host wing for both Peterson AFB and Cheyenne Mountain AFB and provides overall operating support. The Wing also provides certain support functions such as personnel, finance, supply, and transportation for the 2nd Space Wing and 4th Weather Wing at Falcon AFB.

As a part of the Space Command's mission, Falcon AFB was created in 1985 to be the National Test Facility for the Strategic Defense Initiative Organization (SDIO).

3.5.1 Community Setting

3.5.1.1 Population and Employment

Population. El Paso County experienced rapid growth throughout the first half of the 1980s. From 1980 to 1986, Colorado Springs was the fastest growing city in the state and the 12th fastest growing population in the nation. During 1980 to 1988 El Paso County grew from 309,424 to 388,686, a rate of 25.6 percent. The impetus for this growth was a culmination of developments generated by three sectors of the economy: military, high-tech, and construction.

Employment. Regional employment growth was equally as strong during that time period, with annual average growth rates of 6 percent, led by growth in the services and manufacturing sectors. Total employment in El Paso County increased from 155,470 in 1980 to 210,184 in 1988. Based on 1988 estimates of the Colorado Department of Labor and Employment, the labor force, including both those working and those seeking work, numbered 189,150 civilians and 35,049 active-duty military personnel. The unemployment rate peaked with the rest of the country in 1987 at 8.1 percent, returned to absolute job growth in 1988, and in 1989 the unemployment ratio was 7.3 percent. Table 3.5.1-1 identifies employment by sector.

Military facilities in the Colorado Springs area employ 37,800 military and military-connected civilian personnel or about 18 percent of total employment in the area. This excludes all civilian non-appropriated funded (NAF) and contract personnel, which are estimated to number between 4,000 and 5,000 employees. Also excluded are over 21,000 military retirees living in the area. In terms of impact on the area, approximately 24,000 military and military-connected households (excluding NAF, contract, and retiree households) account for over 16 percent of all households.

3.5.1.2 Housing

A summary of the housing inventory in the Colorado Springs area is presented in Table 3.5.1-1. The housing inventory in the city increased dramatically during the 1970s. Over 43,000 units, approximately 37 percent of the housing inventory in 1980, were constructed during this decade. Since 1980, the inventory has grown by over 47,000 units, approximately 30 percent of the estimated housing stock in 1990. Most of these units was constructed from 1983 to 1985. The two decades combined account for well over 50 percent of the current housing stock.

In 1986 and 1987, household growth was not sufficient to absorb the units built during the boom years of 1983 and 1984. Low interest rates in 1986 caused high levels of single-family construction which also contributed to an overbuilt market. The existing home supply exceeds the demand and, until the market balances, production of new units should be considerably slower than the average in the area during the 1980s. A surplus of single-family homes exists in and around Colorado Springs, a situation that has existed since the mid-1980s.

The vacancy rate for rental units is currently estimated at 16 percent and has not been below 10 percent since 1983. The southeast area of Colorado Springs, adjacent to the base, has the highest concentration of apartments and generally has the highest vacancy rates. It is estimated that military personnel represent between 50 and 70 percent of the tenants in apartment complexes near Peterson AFB.

Peterson AFB has 640 unaccompanied personnel quarters (exclusive of visiting and temporary quarters) and 491 family housing units. Demand for family housing onbase is considerable because of the financial advantage; waiting lists are currently lengthy. However, the soft housing market in Colorado Springs has not justified the construction of new onbase housing. Falcon AFB has no onbase housing.

3.5.1.3 Education

The public school system in the Colorado Springs area consists of 147 elementary, 24 middle and junior high schools, and 16 high schools, and enrolled approximately 67,886 in 1990. Design capacity of these schools is approximately 79,510 students, a 17 percent excess capacity in terms of facilities. In

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Table 3.5.1-1

Housing Inventory and Vacancy Trends in Colorado Springs, Colorado January 1990

	April 1970	April 1980	January 1990
Total Housing Inventory	73,710	117,571	164,500
Total Occupied Units	67,581	107,791	145,800
Owner Occupied Units	39,745	65,440	97,450
Percent of Total	58.8	60.7	66.8
Renter Occupied Units	27,836	42,351	48,330
Percent of Total	41.2	39.3	33.1
Total Vacant	6,129	9,780	18,700
Available Vacant	3,714	6,439	13,260
For Sale	863	1,936	4,060
Sales Vacancy Rate Percent	2.1	2.9	4.0
For Rent	2,851	4,503	9,200
Rental Vacancy Rate Percent	9.3	9.6	16.0
Other Vacant Units	2,415	3,341	5,500

Notes: Subtotals may not add to totals because of rounding.

These vacancy rate estimates are designed to be compatible with the vacancy rates in the 1970 and 1980 Census.

Source: U.S. Department of Housing and Urban Development 1990.

addition, the Colorado Springs area has one Catholic high school, four Catholic elementary schools, and two Lutheran elementary schools. The Colorado Springs Christian School is composed of one elementary, one junior high, and one senior high school. The Colorado School for the Deaf and Blind is also located in the area.

3.5.1.4 Community Services

The City of Colorado Springs and El Paso County provide a variety of community services including police and fire protection and recreation. Nine hospitals are located in El Paso County and specialize in general care, psychiatry, osteopathy, and cancer research and treatment. Primary medical facilities include Cedar Springs Psychiatric Hospital, Penrose Hospital, Penrose Community Hospital, Memorial Hospital, and St. Frances Hospital.

3.5.2 Land Use

3.5.2.1 Existing Land Use

Peterson AFB. Peterson AFB consists of two areas linked by a narrow strip of land (Figure 3.5-2). The main portion of the base is located adjacent to the Colorado Springs Municipal Airport. The Air Force and the City jointly use the airport runways. Existing land use patterns in this portion of the base include major command headquarters and space mission-related facilities in the north and north-central areas of the base near the Main Gate; community (commercial) center, medical, and unaccompanied housing in the central area; family housing in the east-central area; recreational uses in the southeast area; industrial uses in the northwest area; and aircraft operations and maintenance facilities along the flightline in the southwest area. To the east of the main base is a 222-acre area that was recently leased from the City of Colorado Springs. The area is currently undeveloped, but is planned for space mission-related, community (commercial), administrative, and open space land uses (Figure 3.5.2-1).

Existing land uses in the area surrounding Peterson AFB consist of the Colorado Springs Municipal Airport and commercial and industrial uses to the west, and residential developments and scattered residences and commercial land uses to the north along the U.S. 24/State Highway 94 corridors. Lands to the south and east of the base are largely undeveloped open space and/or rangeland. The City of Colorado Springs plans to expand the airport in the near future, including the construction of a new north-south runway east of the main portion of the base and a new passenger terminal south of the main base (Figure 3.5-2). A 24,312-acre area east and northeast of Peterson AFB and adjacent to the 222-acre leased area is master planned as the Banning-Lewis Ranch. The entire area was annexed by the City of Colorado Springs in 1987. Most of the land is currently under the control of the Resolution Trust Agency, the federal agency responsible for managing assets defaulted to the federal government as a result of savings and loan failures. The area remains largely undeveloped and predominately supports agricultural uses including a small dairy located with proposed Site 3. The area is master planned for an integrated community with a variety of land uses including residential, light industrial, commercial/office, and open space.

Falcon AFB. Falcon AFB is located in a largely undeveloped area of eastern El Paso County. The only developed areas within Falcon AFB are located in Section 26 on approximately 500 acres (Figure 3.5-3). Land uses within the developed portion of the base include administrative and space

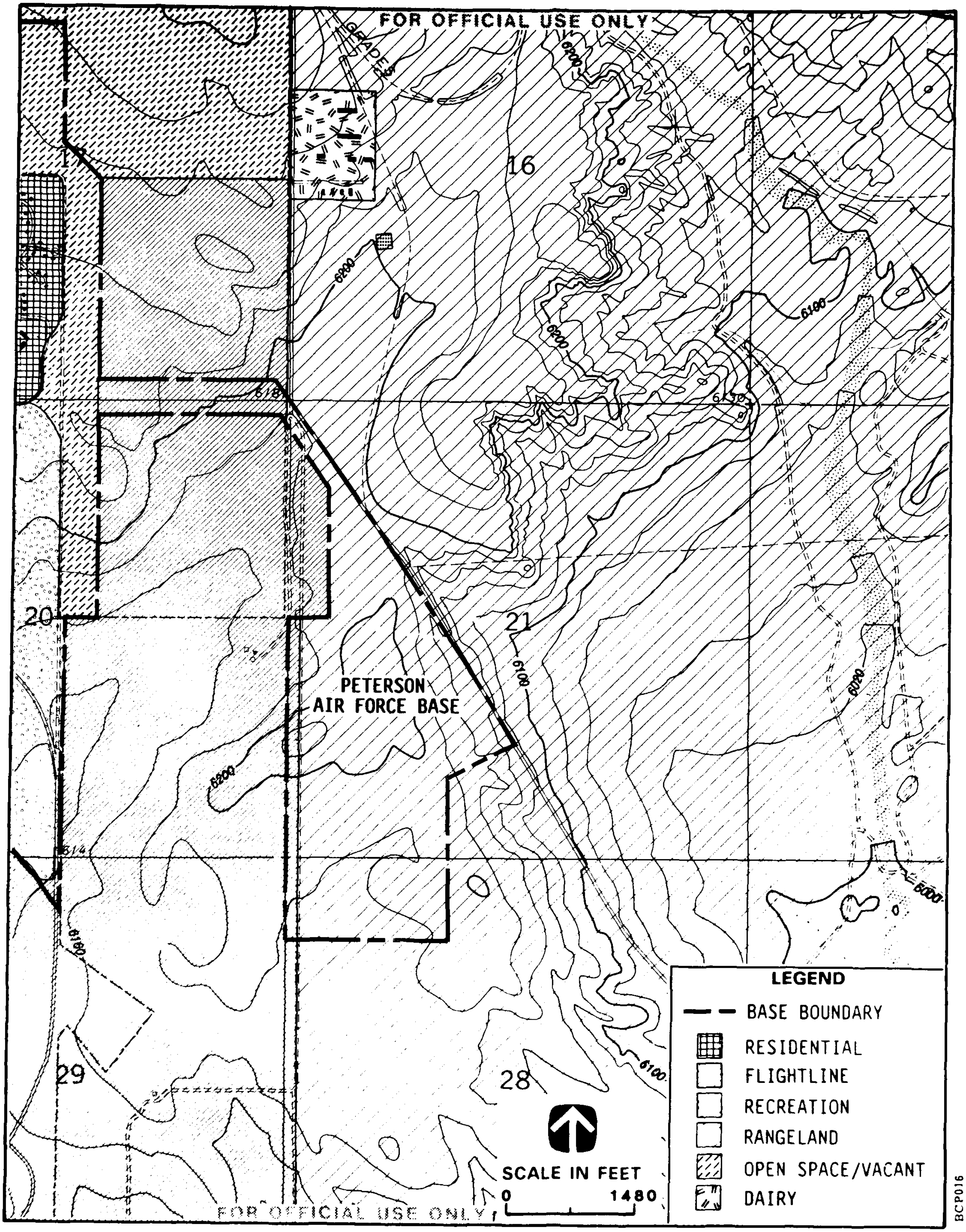

FIGURE 3.5.2-1 LAND USE OF SOUTHEAST PETERSON AFB, COLORADO AND VICINITY

mission-related land uses in the central area; industrial uses (i.e., wastewater treatment facility, electrical substation, central plant, and fuel storage areas) in the southeast and eastern areas; recreational facilities in the northeast area; and parking and contractor (construction) support in the northern area (Figure 3.5.2-2). The main entry road to Falcon AFB is located along the northern edge of Section 26.

Land surrounding the developed portion of the base is primarily used for agricultural-related uses including grazing. A small farm is located approximately one-third mile west of the developed portion of the base and Enoch Road. With the exception of this farm, the areas surrounding the base are open space including the proposed project area. Many of these areas are used for cattle grazing. Little urban-level development occurs along State Highway 94 between Peterson AFB and Falcon AFB. Land uses consist of rangeland and low density residences.

3.5.2.2 Land Use Plans and Policies

Peterson AFB. Peterson AFB controls land use within the base boundaries through its Base Comprehensive Plan. The City of Colorado Springs exercises land use control for areas within its corporate limits, including a portion of the proposed Site 2 and all of Site 3. Lands to the north and west of the proposed project areas are designated Airport Planned Development and south Airport Industrial. The land immediately east of proposed Site 1 is within the Banning-Lewis Ranch planned development and designated Research and Development and Office/Low Density. Lands to the south of the proposed project areas within the Banning-Lewis Ranch are designated School, Park, and Residential/Medium Density; lands to the north are designated Industrial Park, Retail, and Research and Development. Further east within the Banning-Lewis Ranch, the land is designated Residential/Medium Density and Residential/High Density.

Falcon AFB. Both the city and county governments, under the umbrella organization of the Pikes Peak Area Council of Governments, participate in land use planning for the region. Land use jurisdiction for most of the area around Falcon AFB is, however, the ultimate responsibility of El Paso County. Offbase lands in the Falcon AFB area are designated for agricultural use by the County. This designation applies to the areas within a one-mile radius of Falcon AFB and requires a minimum lot size of 5 acres. The county has adopted an 8-square-mile compatible use zone (i.e., buffer zone) which surrounds the base. Areas north and west of the buffer zone are master planned for research and development, office, and industrial uses.

3.5.3 Transportation

3.5.3.1 Traffic

Existing Conditions. Regional access to Peterson AFB and Falcon AFB is provided by U.S. 24 and State Highway 94. Local access to Peterson AFB is provided by Peterson Boulevard and Powers Boulevard via Stewart Avenue. Two entrance/exit gates provide access to the base (Figure 3.5.3-1). The North Gate is located approximately 700 feet south of State Highway 94 on Peterson Boulevard. The west gate is at the intersection of Powers Boulevard and Stewart Avenue. A third gate is proposed in the eastern portion of the base along Marksheffel Road. Local access to Falcon AFB is provided by Enoch Road, which intersects State Highway 94 approximately two miles north of the base. Blue Road, to the west of Falcon AFB, is proposed to be extended to link the two bases.

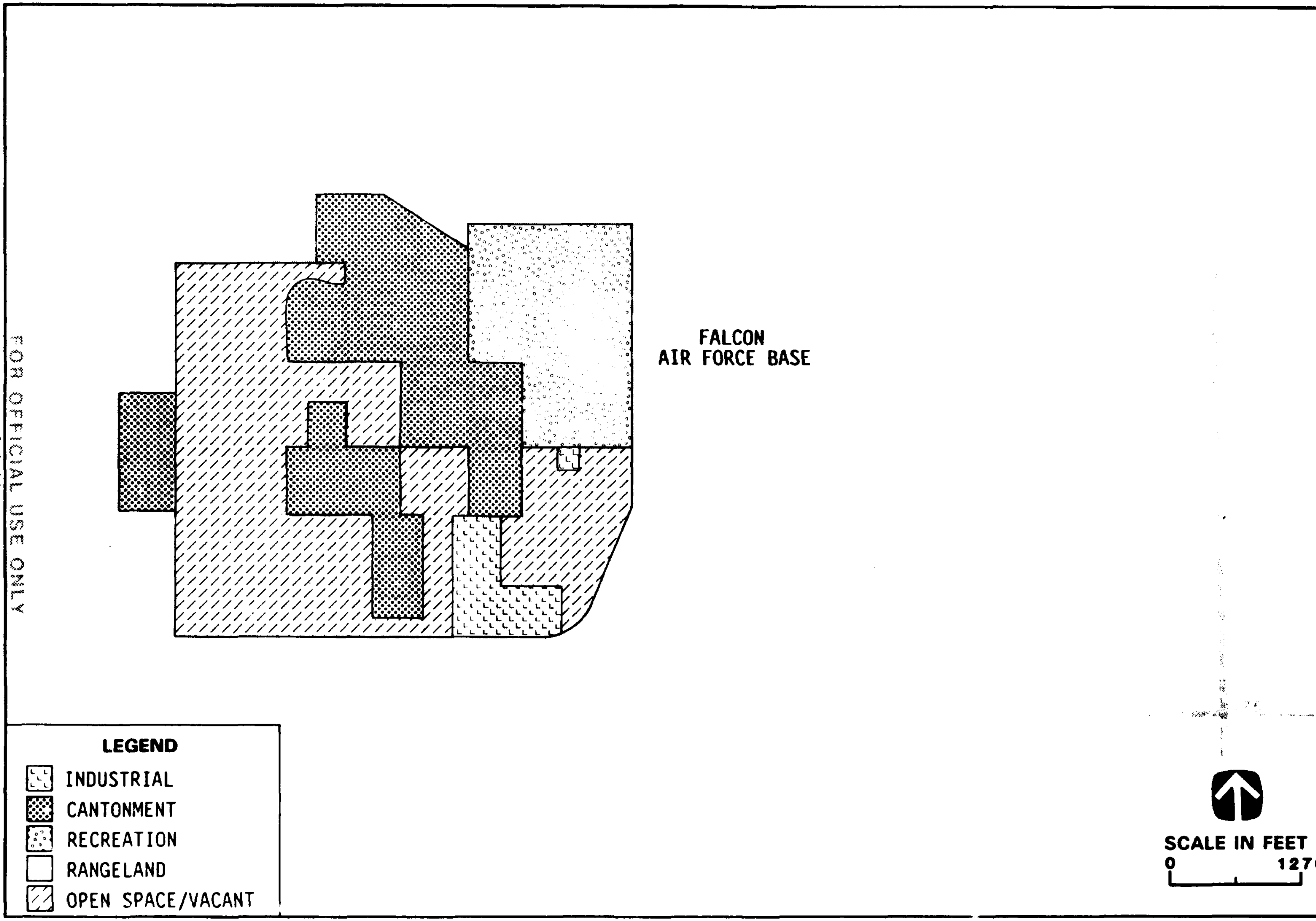

FIGURE 3.5.2-2 LAND USE OF FALCON AFB, COLORADO AND VICINITY

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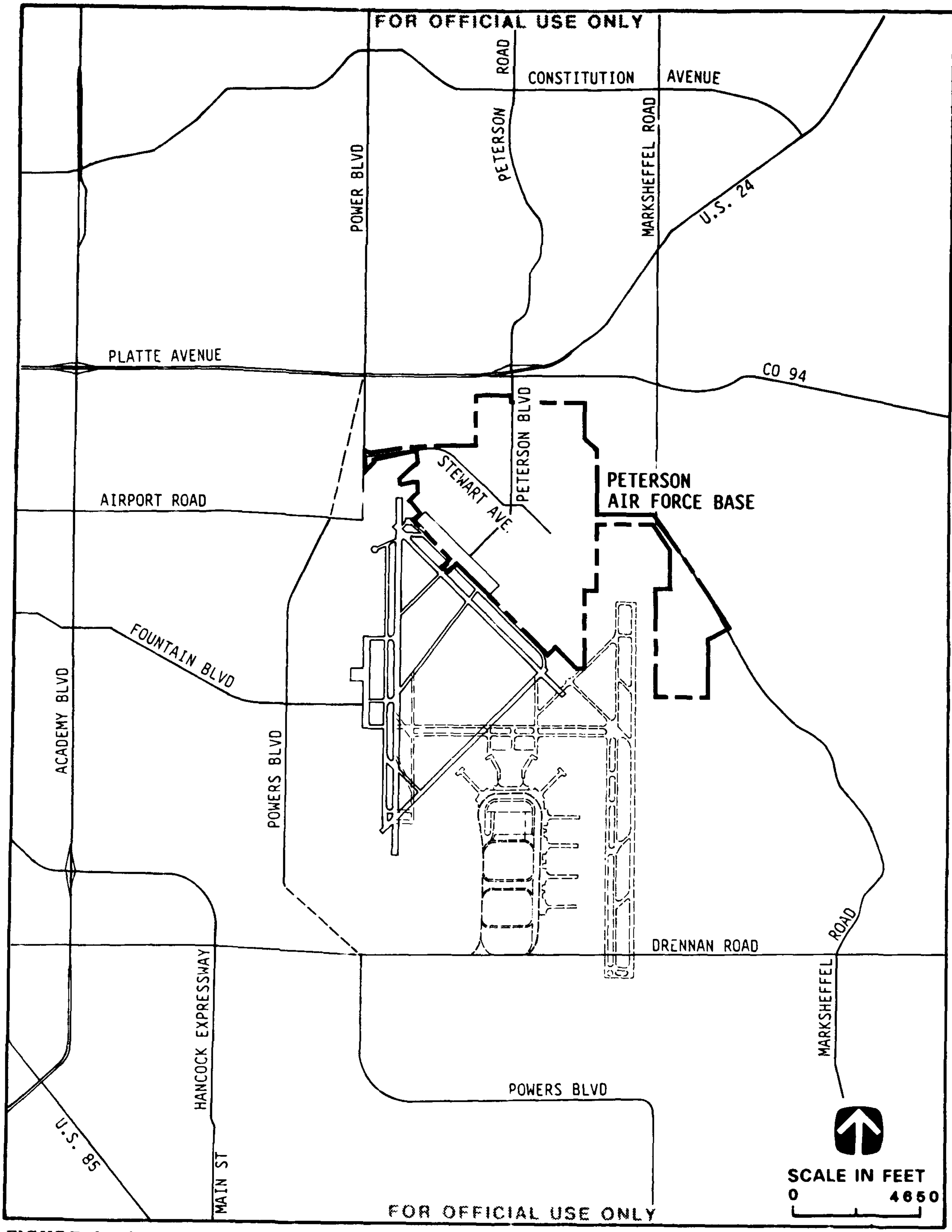

FIGURE 3.5.3-1 TRANSPORTATION NETWORK IN THE VICINITY OF PETERSON AFB, COLORADO SPRINGS, COLORADO

Roadway Characteristics. Peterson Boulevard is a four-lane divided roadway extending from inside Peterson AFB, north to Galley Road. U.S. 24 links Colorado Springs with Interstate 70 at Limon and, through the connection with Peterson Boulevard provides access to the base from the east and west. Powers Boulevard is currently a rural two-lane road extending south from U.S. 24 (Platte Avenue) to south of Fountain Avenue. Improvement of Powers Boulevard to six lanes in the vicinity of Peterson AFB is planned to provide better access to the Colorado Springs Municipal Airport and the surrounding area. Improvement of Powers Boulevard to six lanes north of U.S. 24 has been completed.

State Highway 94 is a two-lane roadway with unrestricted access and at grade intersections. Long term plans call for the conversion of State Highway 94 to a six-lane freeway with grade-separated interchanges. Construction of Falcon AFB in the early 1980s resulted in improvements to State Highway 94 from its junction with U.S. Highway 24 east to Enoch Road, including the addition of 10-foot paved shoulders and the replacement of substandard bridges. Enoch Road is a two-lane roadway from its intersection with State Highway 94 to approximately one-half mile south of the base entry road.

Existing Traffic Volumes. Existing daily traffic volumes and estimated roadway capacities for roadways in the immediate vicinity of the base are presented in Table 3.5.3-1. Traffic along State Highway 94 is relatively low, with approximately 3,500 vehicles per day west of Enoch Road and approximately 1,800 east of Enoch Road. Rural truck traffic comprises approximately 10 percent of this traffic. Along Enoch Road, average daily traffic is approximately 1,500 vehicles and is primarily associated with the operations at Falcon AFB.

Operating Conditions on Roadways. The traffic volumes were compared to Level of Service (LOS) E daily roadway capacities to arrive at a volume-to-capacity ratio and corresponding level of service of operation. Table 3.5.3-1 presents a comparison of daily traffic volumes and volume-to-capacity ratios for selected roadway segments. All roadway segments analyzed are currently operating at LOS B or better with the exception of U.S. 24/State Highway 94 west of Peterson Boulevard which is currently operating at LOS F. Peak hour traffic congestion typically occurs at the U.S. 24/State Highway 91/Peterson Boulevard intersection north of the main gate with afternoon traffic leaving Peterson AFB.

Future Traffic Conditions. Average daily traffic volumes for the year 1996 for the roadways in the immediate vicinity of the Peterson AFB and Falcon AFB are presented in Table 3.5.3-1. The year 1996 daily traffic volumes were compared to estimated year 1996 daily capacities to arrive at a volume-to-capacity ratio and corresponding level of service of operation. Table 3.5.3-1 presents a comparison of daily traffic volumes and volume-to-capacity ratios for selected roadway segments. All roadway segments analyzed are expected to operate at LOS D or better.

The existing roadway system is expected to change as a result of the continued urbanization of the Colorado Springs area, and planning for the future roadway network is ongoing. The Pikes Peak Area Council of Governments coordinates planning activities for growth to the year 1996 and has prepared a long-range plan for transportation improvements in the Colorado Springs urban area. This plan is expected to meet the transportation needs of the community and analyzes the highway and mass transit network alternatives over the next 20 years.

The 2.1 miles of State Highway 94 between Enoch Road and Ellicott were repaved in 1989. This was the only roadway improvement project near Falcon AFB that the Colorado Department of Highways

Table 3.5.3-1

Comparison of Daily Traffic Volumes to Estimated Daily Roadway Capacities for Road Segments in the Vicinity of Peterson AFB and Falcon AFB

Road Segment	Roadway Capacity	Existing Conditions (1988) ADT[1]	Existing Conditions (1988) V/C Ratio[2]	Existing Conditions (1988) LOS[3]	Projected Conditions (1996) ADT	Projected Conditions (1996) V/C Ratio	Projected Conditions (1996) LOS
Peterson Boulevard							
U.S. 24 to Main Gate	26,000	8,700	0.33	A	9,800	0.38	A
U.S. 24 to Constitution Avenue	26,000	9,600	0.37	A	10,814	0.42	A
U.S. 24/Platte Avenue							
Peterson Boulevard to Marksheffel Road	57,000	5,400	0.09	A	6,093	0.11	A
Peterson Boulevard to Powers Blvd.	57,000	16,500	0.29	A	18,587	0.33	A
Powers Blvd. to Acadamy Blvd.	57,000	21,300	0.37	A	41,300	0.48	A
State Highway 94							
Peterson Blvd. to Marksheffel Road	16,200	5,550	0.34	A	6,252	0.39	A
Marksheffel Road to Enoch Road	16,200	4,500	0.28	A	5,126	0.32	A
East of Enoch Road	16,200	1,800	0.11	A	2,028	0.13	A
Powers Boulevard							
U.S. 24 to Constitution Avenue	57,000	13,900	0.24	A	15,658	0.27	A
U.S. 24 to Airport Road	57,000	14,000	0.28	A	15,771	0.28	A
Marksheffel Road							
State Highway 94 to U.S. 24	16,200	2,300	0.14	A	2,591	0.16	A
State Highway 94 to Drennan Road	16,200	2,300	0.14	A	2,591	0.16	A
Academy Road							
U.S. 24 to Constitution Avenue	33,000	41,000	1.24	F	46,186	1.40	F
U.S. 24 to Airport Road	66,000	40,000	0.61	B	45,060	0.68	B
Enoch Road							
South of State Highway 94	28,900	1,500	0.05	A	1,690	0.06	A
Stewart Avenue	28,900	10,300	0.36	A	11,603	0.40	A

Notes: [1]ADT = Average Daily Traffic.
[2]V/C represents the ratio of Average Daily Traffic volume to Roadway Capacity.
[3]LOS = Level of Service (Section 3.1.3, Table 3.1.3-2).

Source: Pikes Peak Area Council of Governments 1988.

identified in its 1985-1990 improvement plan. Improvements to the interchange between State Highway 94 and Peterson Boulevard are proposed, and if implemented, would improve both morning and afternoon peak traffic flow to LOS B. Long-term plans call for the conversion of State Highway 94 freeway status with grade-separated interchanges (at one mile intervals for the 13-mile segment from Peterson Boulevard to Peyton Highway) in order to accommodate a projected 60,000 vehicles per day with build-out of this area.

3.5.3.2 Airports

Colorado Springs Municipal Airport is served by seven major airlines and several smaller ones. The runways are maintained in joint use with Peterson AFB. The Colorado Springs Airport is served by several major and regional airlines which provide direct flights to several major airport hubs including Denver, Salt Lake City, Dallas-Fort Worth, Chicago, and St. Louis. Passenger traffic exceeded 1.23 million (616,345 enplanements and 620,185 deplanements) in 1989. The airport will be expanded in FY 1993 to 12 gates with the potential for future expansion to 160 gates. Stapleton International Airport, approximately 80 miles north of Colorado Springs in northeastern Denver, is served by 15 major airlines and several secondary carriers.

3.5.4 Utilities

The City of Colorado Springs is the principal area where community and public utility services may be directly or indirectly affected by the proposed action. Most personnel living offbase are expected to reside in the City of Colorado Springs.

3.5.4.1 Water Supply

The City of Colorado Springs provides potable water to its residents and Peterson AFB primarily from surface water flows. Fifty-three percent of the water supply is imported through the transbasin diversions from the western slope of the Rocky Mountains. The remaining supply is from within El Paso County; 38 percent surface water sources and 9 percent from groundwater sources. The present system has a treatment capacity of 151 million gallons per day (MGD). Existing and projected average daily demand is presented in Table 3.5.4-1. Average daily demand in 1989 was 43 percent of the system's capacity, but the system is presently at a 100 percent capacity during summer peak demand. Construction of an upgraded facility to handle the increased demand is planned. Population growth estimates project average daily demand will increase to 66 percent in 1996 and 68 percent in 1997 of the system's treatment capacity. Estimates of per capita demand is based on 200 gallons per day per capita (GPCD).

Peterson AFB is supplied potable water through a 30-inch water main. The base consumed 1.07 MGD in fiscal year (FY) 1989. Onbase potable water use its expected to remain constant. Present per capita demand is 95.5 gpcd.

The Cherokee Water District provides service to Falcon AFB utilizing groundwater as the supply source. Cherokee Water District has the capacity to deliver 6.25 MGD. Total daily average demand in 1989 was 3.5 MGD. The district's contractual limit on delivery to Falcon AFB is 0.48 MGD. The average daily demand at the base was 0.002 MGD in FY 1989. Projected demands of 0.63 MGD, when the National Test Facility (NTF) is fully operational, would increase the total daily water requirements

Table 3.5.4-1

**Summary of Current and Projected
Average Daily Water Demand and Wastewater Flows
(million gallons per day)**

	Colorado Springs	Peterson AFB	Falcon AFB
Water Demand			
1989	65.0	1.00	.002
1996	66.2	1.10	.632
1997	67.5	1.10	.632
Wastewater Flows			
1989	30.0	0.67	0.055
1996	33.2	0.67	0.055
1997	33.9	0.67	0.055

to 0.632 MGD. Present plans include increased storage capacity and water reclamation and conservation to meet the increased future demand.

Water service to Falcon AFB is through a 10-inch water supply line and 4-inch water meter capable of delivering 500 gallons per minute (gpm) at 10 pounds per square inch. Water storage for peak demands, such as fire fighting requirements, is currently provided onsite by two 1.8 million gallon storage tanks.

3.5.4.2 Wastewater

Wastewater treatment for the City of Colorado Springs and Peterson AFB occurs at a recently upgraded municipal activated sludge treatment plant. The facility is presently operating at 58 percent of its 52 MGD treatment capacity. Table 3.5.4-1 presents existing and projected average daily flows. Projected population growth will increase wastewater flows to 66 percent by 1996 and 68 percent by 1997 of the treatment system's capacity. Per capita flow estimates are based on 100 gpcd. Peterson AFB discharged 0.67 MGD to the city facility in FY 1989. Future flows are expected to remain constant. Current per capita flows are 59.8 gpcd.

Falcon AFB has an onsite sewage treatment plant. The Falcon AFB wastewater treatment facility has, for a number of years, not met state or federal standards. The base has plans to remedy and upgrade the facility. The current system has an extended aeration activated sludge treatment process capable of treating 0.075 MGD. Present demand is 73 percent of the system's operating capacity. The wastewater flows onbase are expected to increase by 0.18 MGD because of the increased number of personnel associated with NTF when it is fully operational. The planned expansion of the existing facility will accommodate the increased flows.

3.5.4.3 Solid Waste

The metropolitan area of Colorado Springs generates approximately 890.4 tons per day (T/day) of solid waste which is disposed of at two public landfill sites. The landfills have a lifespan of 10 to 12 years each. Refuse collection is accomplished by contract at both Peterson and Falcon AFBs and disposed of in the public landfills. Peterson AFB generated approximately 17,760 tons of solid waste in 1989. Information on the amount of solid waste generation of Falcon AFB is not available.

3.5.4.4 Energy

Electricity. The Western Area Power Administration (WAPA) markets and transmits federally-produced power to 15 central and western states, including Colorado. The Fryingpan-Arkansas Project, which supplies electrical power to Colorado, has the capacity of 600,000 kilowatts (kW) during the winter and 729,000 kW during the summer; the total energy available is 2 billion kilowatt-hours (kWh) per year. The City of Colorado Springs purchases power from WAPA and also operates several coal-fired power plants with a generating capacity of 652,000 kW. The utility has approximately 383,000 customers and consumption in 1989 was 525,000 kWh. Current forecasts indicate a need for increased supplies in 1994; a major expansion project is currently being planned to handle the increased needs. The city also supplies electricity to Peterson AFB. The transformer substation at Peterson AFB is capable of handling a 10,000 kW peak daily demand, although it is designed to provide up to 15,000 kW if it was cooled by forced air. The 1989 peak daily demand for the base was 6,000 kW.

Falcon AFB is within the service area of the Mountain View Electrical Association. Presently, a 115-kW line ties into a substation onbase. The system is capable of providing 15,000 kW. With the addition of air-cooling equipment, the system is designed to provide up to 25,000 kW. Peak daily demand in 1989 was 6,301 kW. The NTF, when fully operational, will increase peak demand to 19,411 kW.

Natural Gas. The City of Colorado Springs Department of Utilities supplies Peterson AFB and the area with natural gas purchased from the Colorado Interstate Gas Company. Natural gas supplies available to the area are extensive, and average demand is less than 60 percent of the existing system's capacity. In 1989, the city had 117,713 customers and projects 136,353 by 1997. The average residential consumption is 90 thousand cubic feet (Mcf) per year. Peterson AFB consumed 203,231 Mcf in FY 1989; demand is expected to stay constant.

Falcon AFB currently uses diesel fuel and propane in the place of natural gas. A natural gas pipeline is scheduled to be installed by Peoples Natural Gas south along Enoch Road from a mainline along State Highway 94 by September 1990. The City of Colorado Springs will supply Peoples Natural Gas. The new gas line will be connected to the existing infrastructure at the base. The base also uses diesel fuel for backup electrical generators. In FY 1989, Falcon AFB consumed 3,185 million BTUs of propane and 41,366 million BTUs of diesel fuel.

3.5.5 Hazardous Materials/Waste Management

3.5.5.1 Hazardous Materials Management

Hazardous materials are used and temporarily stored at various industrial facilities throughout both Peterson AFB and Falcon AFB. Most of the hazardous materials associated are associated with base operations and include paints, strippers, solvents, petroleum fuel, oil and lubricants, herbicides and pesticides, and a variety of chemicals and munitions.

Procedures for hazardous material storage, use, and spill prevention and control are outlined in various plans including the Underground Storage Tank Management Plan, Solvent Management Plan, and Spill Prevention and Response Plan.

3.5.5.2 Hazardous Waste Management

Falcon AFB and Peterson AFB manage all hazardous waste in accordance with a Hazardous Waste Management Plan specific to each base. The management plan describes how the base will store, handle, and manage hazardous waste products generated at the installations. Hazardous waste routinely generated by the bases include oils, paints, thinners, solvents, and other regulated materials. In addition to the management plan, both bases have developed a Waste Minimization Plan to provide information and procedures to reduce and minimize the generation of hazardous wastes. Hazardous wastes are stored in conforming storage areas on each base for not more than 90 days. Hazardous wastes are transported from each base to the Defense Reutilization and Marketing Office (DRMO), located at Fort Carson Military Reservation, for shipment to licensed treatment and disposal facilities.

No Installation Restoration Program (IRP) sites have been identified on any of the proposed sites at Peterson AFB. Because Falcon AFB is a relatively new base, no IRP studies have been conducted. The base was formerly rangeland and no hazardous waste problems were uncovered during construction of the base. In addition, operations at the base do not require the use of large quantities of hazardous materials.

3.5.6 Geology and Soils

3.5.6.1 Geology

Physiography and Topography. Both Peterson AFB and Falcon AFB are situated on the high plains of the Colorado Piedmont along the western margin of the Great Plains physiographic province. This is a region of rolling grasslands dotted with scattered buttes and mesas that terminate abruptly against the southern Rocky Mountains. The Front Range is the easternmost range that rises from the Great Plains.

The terrain of Colorado Springs, which is situated on a semiarid plateau of the eastern slope of the Rocky Mountains, is relatively flat. The mountains to the west rise abruptly above the plateau to average heights of 11,000 feet. Gently rolling prairie lies to the east of the city while, to the north, the land slopes upward toward the Palmer Lake Divide. The mean elevation is 6,145 feet. The greater metropolitan area extends north into Douglas County and west into Teller County.

Peterson AFB is located on the western edge of the Denver Basin at an elevation of 6,200 feet above sea level. The area adjacent to the base is composed of low, sandy foothills and flat plains. Topography within the base slopes very gently to the south and east, and the east fork of Sand Creek passes through the western portion of the base. Falcon AFB is also at an elevation of 6,200 feet and located on the western edge of the Denver Basin. The area around the base is composed of sandy foothills and plains of low relief. Topography onsite is a broad, gentle slope to the south and east.

Regional Geology. The plains in the region around Colorado Springs are underlain by several large tectonic features, of which the Denver Basin is most prominent. The basin is asymmetric and filled with 11,000 feet of sediment. The eastern margin of the basin dips gently to the west, but the western margin is very steep where it borders the Front Range. All of the surface sediments that occur in this region are continental in origin.

Geologic Hazards. No known geologic hazards, such as geothermal hot springs, landslides, or potentially active faults, occur on either Falcon AFB or Peterson AFB. Colorado, in general, has a low seismic risk potential and is located in Seismic Zone 1, designated for areas where only minor damage could occur. Eastern Colorado, including the Colorado Springs area, has a particularly low seismic risk as no known potentially active faults have been identified in the region. Three recorded moderate intensity earthquakes (intensity VII, Modified Mercalli Index) have occurred in the region; all were located over 50 miles north of the two installations.

3.5.6.2 Soils

At Peterson AFB, Blakeland Loamy Sand is the representative soil resource. The slope of this soil varies from 1 to 9 percent. This soil is located in the Truckton-Blakeland-Bresser Association and consists of deep and somewhat excessively drained sandy soil formation alluvial and eolian deposits.

Permeability of the Blackland Loamy Sand is rapid, reducing the potential for erosion to a moderate level. As the texture is coarse, the potential for wind erosion is severe.

At Falcon AFB, the Bresser Sandy Loam and the Ascalon Sandy Loam are the representative soil types. Soils in the Truckton-Blakeland-Bresser Association are deep and well drained and have been formed on terraces and upland areas. The permeability of the Ascalon and Bresser Sandy Loams is moderate, and the hazard of water and wind erosion is also moderate. All three series are soil types conductive for the growth of range grasses. If well managed, these soils can be used for agricultural purposes. None of the soils are designated as prime farmland.

3.5.7 Water Resources

3.5.7.1 Groundwater

The principal aquifers in the Colorado Springs region are the Arkansas, the Dawson, and the Black Squirrel Creek. Alluvial aquifers, underlying Fountain Valley and the Black Squirrel Creek drainage, extend the alluvial basin toward Colorado Springs from the mainstream of the Arkansas River. Aquifers associated with the Arkansas River basin are generally shallow and consist of unconsolidated material with good water quality. The groundwater level varies from 25 to 100 feet, and yields vary from 100 to 1,200 gallons per minute. In general, the groundwater moves toward and discharges into the principal streams. Water withdrawal from wells has reduced the flow of groundwater to some streams and, in some areas, has induced flows from streams to the aquifer.

The Dawson aquifer underlies the majority of El Paso County at an average depth of 100 feet and is estimated to contain 38 million acre-feet of water in the upper 500 feet of its saturated thickness. Alluvial aquifers underlying major drainage areas, such as the Arkansas River, Fountain Creek, Jimmy Camp Creek, and Black Squirrel Creek Valleys, are important sources of water for municipal and agricultural purposes. Colorado's water regulations protect groundwater basins from withdrawal rates that would exceed the dependable supply. The Colorado Groundwater Commission has established a threshold withdrawal rate for the state of one percent annually of the estimated reserves from designated groundwater basins, including the Black Squirrel Creek aquifer. However, state regulations exempt wells that were in operation prior to the effective date of the legislation. Recently adopted groundwater regulations in El Paso County are more restrictive and limit withdrawals from an aquifer to 0.33 percent of the estimated reserves each year.

Falcon AFB. In the Falcon AFB area, the Dawson aquifer underlies to a depth of 100 to 150 feet, but has not been extensively developed as a source of water. The Black Squirrel Creek alluvial aquifer lies approximately three to six miles east of the base and is the primary water source for agricultural and municipal uses in unincorporated areas of El Paso County east of Colorado Springs. The quality of groundwater in the Dawson aquifer is good and is suitable for most uses. The quality of groundwater in the central portion of the Black Squirrel Creek aquifer is suitable for all uses. Currently the Black Squirrel Aquifer has an annual withdrawal of 13,000 to 15,000 acre-ft. The recharge rate is estimated at 8,000 to 10,000 acre-ft/year. Hence, at the present usage rate, the Black Squairrek Creek Aquifer is overdrafted by 5,000 acre-ft/year.

Peterson AFB. At Peterson AFB, groundwater is not developed as a water supply source and would not constitute a potential resource.

3.5.7.2 Surface Water

Both installations are located in the Colorado Front Range of the Arkansas River basin. Precipitation in the area averages 13.5 inches annually which results primarily from thunderstorms occurring from March to September. Relatively dry conditions prevail during winter. El Paso County has an annual precipitation of approximately 15 inches.

Ephemeral or intermittent streams characterize most of the smaller drainage within the area. Only those streams with headwaters in the mountains flow continuously, including the Arkansas River with its headwaters near the Continental Divide, and Fountain Creek that originates near Pikes Peak. Smaller drainage in the area generally originate near the Monument Divide and Black Forest areas in northern El Paso County and flow southward to their confluence with the Arkansas River. Water quality in the Arkansas River basin is generally adequate to support most designated uses except in the central portion of Fountain Creek, below Colorado Springs, where high fecal coliform counts and metals impair the designated uses.

To minimize the potential for water quality damage caused by storm drainage and erosion, an Areawide Water Quality Management Plan (208 Plan) establishes various programs. Discharge of treated domestic wastewater often constitutes the entire streamflow in many of the tributary streams in the area. Surface water flows, or wastewater discharges to many of the tributary streams, often contribute to the recharge of shallow alluvial aquifers. Because of extremely low minimum streamflows, the lack of sustained aquatic life, and the use of surface water for stock watering and other agricultural uses, many of the water quality classifications for tributary streams are not set at a level to protect a full range of uses.

Peterson AFB. At Peterson AFB, the East Fork of Sand Creek, an intermittent drainage channel, crosses the western portion of the base.

Falcon AFB. At Falcon AFB, two drainage channels originate approximately two miles north of the site. One of the stream channels has been rerouted around the perimeter of the base and the channel has been lined with rock.

3.5.8 Air Quality

3.5.8.1 Regulatory Setting

Pollutant emissions from sources and atmospheric interactions determine the quality of air, and the effects on receptors establish the extent to which air quality is degraded. Air quality in a given location is described by the concentration of various pollutants in the atmosphere which are expressed in units of concentration, generally parts per million (ppm) or micrograms per cubic meter ($\mu g/m^3$). The significance of a pollutant concentration is determined by comparing it with an appropriate federal and/or state ambient air quality standard. These standards represent the allowable atmospheric concentrations at which public health and welfare are protected and include a reasonable margin of safety. National Ambient Air Quality Standards (NAAQS) have been established by the U.S. Environmental Protection Agency for the following pollutants: ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particular matter smaller than 10 micrometers in diameter (PM_{10}), lead, and sulfates (Table 3.5.8-1).

Table 3.5.8-1

National and Colorado Ambient Air Quality Standards

Pollutant	Federal Primary Standards	Federal Secondary Standards	Colorado Adopted Standards
Ozone			
1-Hour Average	.12 ppm*	.12 ppm	.12 ppm
Carbon Monoxide			
8-Hour Average	9 ppm	9 ppm	9 ppm
1-Hour Average	35 ppm	35 ppm	35 ppm
Nitrogen Dioxide			
Annual Arithmetic Average	.053 ppm	.053 ppm	.053 ppm
Sulfur Dioxide			
Annual Arithmetic Average	.03 ppm	- - - -	- - - -
24-Hour Average	.14 ppm	- - - -	- - - -
3-Hour Average	- - - -	.5 ppm	700 $\mu g/m^3$**
Total Suspended Particulates			
Annual Geometric Mean	75 $\mu g/m^3$	60 $\mu g/m^3$	75 $\mu g/m^3$
24-Hour Average	260 $\mu g/m^3$	150 $\mu g/m^3$	260 $\mu g/m^3$
Suspended Particulate Matter (PM_{10})			
Annual Arithmetic Mean	50 $\mu g/m^3$	50 $\mu g/m^3$	50 $\mu g/m^3$
24-Hour Average	150 $\mu g/m^3$	150 $\mu g/m^3$	150 $\mu g/m^3$

Notes: *ppm - parts per million
**$\mu g/m^3$ - micrograms per cubic meter

Source: Colorado Department of Health, 1989.

The federal Clean Air Act requires air pollutant emissions from various sources, such as the operations at Peterson AFB and Falcon AFB facilities, comply with the NAAQS. The Clean Air Act also delegates to each state the responsibility to establish air quality rules, regulations, and standards. These rules, regulations, and standards must be at least as restrictive as the federal requirements. The State of Colorado has adopted the NAAQS.

An area is designated as being nonattainment for a particular pollutant if ambient concentrations in that area are above the corresponding standard. The Colorado Springs area is classified nonattainment for carbon monoxide. While the nonattainment area includes Peterson AFB, violations of the NAAQS for CO occur in the Interstate 25 corridor, several miles west of the base. The remainder of El Paso County is in compliance with the NAAQS.

Because the Colorado Springs metropolitan area is a nonattainment area for CO, the state is required to adopt a State Implementation Plan (SIP) outlining a policy to reduce emissions, improve air quality, and regain attainment status. This responsibility has been delegated to the Pikes Peak Area Council of Governments (PPACG), a consortium of municipal and county governments responsible for planning decisions related to development projects in El Paso and neighboring counties. Any future development within the designated nonattainment areas must comply with the adopted SIP policies.

In order to demonstrate compliance with the SIP, a proposed project must obtain all necessary permits and show consistency with the traffic and population projections contained in the SIP. Additionally, pollutant increases must be within federal Prevention of Significant Deterioration (PSD) increments, must not contribute to violations of the National Ambient Air Quality Standards (NAAQS) or delay attainment, and must be consistent with the control measures adopted in the SIP. Air Quality Maintenance Plans outlining options to control CO have been incorporated into the SIP.

Falcon AFB is located outside the Colorado Springs nonattainment areas for CO; however, Peterson AFB is within the EPA-designated nonattainment area and all projects would be required to comply with the SIP.

3.5.8.2 Regional Air Quality

Meteorology and Climate. In the Colorado Springs region, the climate is continental and influenced by the high elevation of Front Range, which protects the area from temperature extremes and results in cool, sunny summers and dry, low-humidity winters. The average annual temperature of 48.3° F ranges from a January mean of 29° F to a July mean of 70.8° F. Approximately 80 percent of the average annual 15 inches of rainfall occurs from April to September and primarily during thunderstorms. The average annual snowfall is 40 inches.

The ambient air quality within the Colorado Springs metropolitan area varies with local meteorological conditions. During the winter months, when inversion and limited dispersion conditions prevail, the air quality is often poor. These conditions are recognized as the primary factor contributing to higher CO concentrations in the Colorado Springs area. The potential is also high for TSP impacts in the winter months when soil moisture and ground cover are at a minimum and wind speeds are high. Air quality generally improves during the spring months because of fewer temperature inversions and an increase in rainfall.

Existing Air Quality. The air quality in El Paso County is very good. Existing air quality near Peterson AFB can be estimated by air monitoring measurements made at monitoring stations in Colorado Springs in the vicinity of the base. There are seven monitoring stations in Colorado Springs; two monitor CO, two monitor O_3, three monitor PM_{10}, and two monitor TSP. The closest monitoring station to the base, Station 4A, is located approximately 4 miles west, but only monitors P_{10}. The closest station which monitors O_3 and CO is Station 4A, located in downtown Colorado Springs, approximately 6 miles west of the base. A summary of the maximum pollutant concentrations occurring from 1986 to 1988 at these stations is presented in Table 3.5.8-2. The maximum concentration of a station in the county and the number of exceedances of the NAAQS for each pollutant is also provided for comparison. The 8-hour ambient quality standard for CO was exceeded in 1987 and 1988 at Station 4A. Station 4B, located 2 miles north of Station 4A, also exceeded the standard twice in 1988. The 24-hour average standard for PM_{10} was exceeded in 1988 at Station 4B, located 5 miles northwest of the base. Colorado Springs was in compliance for all other NAAQS.

3.5.8.3 Air Pollutant Emissions Source

An emissions inventory for El Paso County is presented in Table 3.5.8-3. Emissions data were available for PM_{10}, SO_x, NO_x, CO, and volatile organic gas (VOC), a measure of reactive hydrocarbons. In El Paso County, the majority of stationary source (point) emissions for NO_x are from fuel combustion, while the majority of VOC emissions were from solvent use (e.g., surface coating, industrial solvent use, and consumer products) in industrial processes. Solid waste disposal including incineration and open burning are large area sources of HC and emissions. The predominant source of emissions of CO, VOC, and NO_x in the county is from mobile sources. Mobile sources account for approximately 88 percent of the total CO emissions in the county, 50 percent of the NO_x emissions, and 57 percent of the VOC emissions.

Outside the Colorado Springs urban area, the most significant sources of air pollutants are from agricultural activities to the east, military training operations at Fort Carson to the south, and naturally-occurring dust from the semiarid plains east of the Rocky Mountains. Fugitive dust from unpaved roads accounts for 46 percent of the total suspended particulates in the Air Quality Management Area (AQMA) and the county as well. Pollutant concentrations are predicted to substantially increase as a result of more intensive and widespread urban activities in the AQMA.

3.5.9 Noise

3.5.9.1 Regulatory Setting

Peterson AFB. Because Peterson AFB operates as a tenant of, and under joint use with, the Colorado Springs Municipal Airport, an AICUZ (Air Installation Compatible Use Zone) study is not required, and the base operates under the jurisdiction of the Part 150 program, a Federal Aviation Administration (FAA) program designed to assist in noise control and planning around civilian airports. The FAR Part 150 guidelines require an Airport Noise Compatibility Planning Program to be established, including determining existing noise conditions around the airport; identifying noise problem areas; reviewing and selecting both land use and operational noise control alternatives; coordinating and interacting among operators, users, neighbors, local government, and the FAA; and developing an implementation plan for the program.

Table 3.5.8-2

Summary of Air Quality Monitoring Data for Peterson AFB/Falcon AFB Area
1986-1988

	Site 4A			Site 4C			Site 4H			El Paso County[1]		
	1986	1987	1988	1986	1987	1988	1986	1987	1988	1986	1987	1988
Ozone												
Maximum Concentration (ppm/1 hour)[2]	.078	.08	.09	.085	.11	.10	--[3]	--	--	.085	.11	.10
No. of Exceedences Federal (>.12 ppm, 1 hour)	0	0	0	0	0	0	--	--	--	0	0	0
Carbon Monoxide												
Maximum Concentration (ppm/8 hours)	8.1	10.7	12.8	--	--	--	--	--	--	9.5	10.7	12.9
(ppm/1 hour)	24.2	17.4	20.3	--	--	--	--	--	--	25.0	18.5	20.3
No. of Exceedences Federal (>9.0 ppm, 8 hours)	0	1	2	--	--	--	--	--	--	2	1	2
(>35 ppm, 1 hour)	0	0	0	--	--	--	--	--	--	0	0	0
Nitrogen Dioxide												
Annual Average ($\mu g/m^3$)[4]	--	--	--	--	--	--	--	--	--	--	--	6.9
Maximum Concentration ($\mu g/m^3$/24 hours)	--	--	--	--	--	--	--	--	--	--	--	2.82
Federal ($100\mu g/m^3$ Annual Average)	--	--	--	--	--	--	--	--	--	--	--	0

Table 3.5.8-2, Page 2 of 2

	Site 4A			Site 4C			Site 4H			El Paso County[1]		
	1986	1987	1988	1986	1987	1988	1986	1987	1988	1986	1987	1988
Sulfur Dioxide												
Annual Average ($\mu g/m^3$)	--	--	--	--	--	--	--	--	--	--	--	4.23
Maximum Concentration ($\mu g/m^3$/24 hours)	--	--	--	--	--	--	--	--	--	--	--	8.6
No. of Exceedences												
Federal (>365 $\mu g/m^3$, 24 hours	--	--	--	--	--	--	--	--	--	--	--	0
State (>700 $\mu g/m^3$, 3 hours)	--	--	--	--	--	--	--	--	--	--	--	0
Total Suspended Particulates												
Annual Geometric Mean ($\mu g/m^3$)	--	--	--	--	--	--	--	--	--	61	70	65
Maximum Concentration ($\mu g/m^3$/24 hours)	--	--	--	--	--	--	--	--	--	185	296	195
No. of Exceedences												
Federal (>260 $\mu g/m^3$, 24 hours)	--	--	--	--	--	--	--	--	--	0	1	0
PM_{10}[5]												
Annual Arithmetic Mean ($\mu g/m^3$)	--	--	--	--	--	--	--	--	26	--	32	34
Maximum Concentration ($\mu g/m^3$/24 hours)	--	--	--	--	--	--	--	--	60	--	71	160
No. of Exceedences												
Federal (>150 $\mu g/m^3$, 24 hours)	--	--	--	--	--	--	--	--	0	--	0	1.3

Notes: [1]Maximum recorded in El Paso County.
[2]Parts per million.
[3]Not monitored.
[4]Micrograms per cubic meter of air.
[5]Fine particulates with an aerodynamic diameter of 10 micrometers or less.

Source: Colorado Department of Health 1986, 1987, and 1988.

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Table 3.5.8-3

Emission Inventory for El Paso County, Colorado 1987 (Tons Per Year)

Source Category	Particulates	SO_x	NO_x	VOC	CO
Fuel Combustion					
Area Sources	990	326	2,506	2,058	6,060
Point Sources	286	9,082	9,464	48	419
Industrial Process (Point)	12	0	0	436	0
Solid Waste Disposal (Area)	549	17	88	1,090	3,337
Transportation (Area)	7,333	937	11,753	15,077	87,050
Miscellaneous (Area)	99,532	2	60	7,608	1,800
Subtotal: Area Sources	108,404	1,282	14,407	25,833	98,247
Subtotal: Point Sources	298	9,082	9,464	484	419
Total:	108,702	10,364	23,871	26,317	98,666

Source: Environmental Protection Agency, 1988.

3.5.9.2 Existing Noise Sources

Peterson AFB. In the Peterson AFB area, flying operations associated with the base and the Colorado Springs Municipal Airport constitute the primary source of noise. An additional runway is presently under construction southeast of the site, and its use is expected to produce noise contours at the proposed site of at least 65 L_{dn} by the year 2000.

The FAR Part 150 Program for Colorado Springs Municipal Airport was updated in March 1990. The projected noise contours for the airport are shown in Figure 2.4.3-1. While the new runway and operations will significantly reduce noise impacts in areas west of the base, some areas would still be adversely influenced by noise without implementation of further mitigation measures.

Falcon AFB. Falcon AFB is located in a rural, sparsely populated area in which there are few sensitive receptors located near the base. Open range borders the base on three sides, and several scattered residences are located approximately one-third mile to the west. The primary source of existing noise at and near Falcon AFB is vehicular traffic. Current ambient noise levels are estimated at 40 L_{dn}.

3.5.10 Biological Resources

3.5.10.1 Vegetation

Proposed Site 1 at Peterson AFB is predominantly a needle and thread (*Stipa comata*) - blue gGrama (*Bouteloua gracilis*) - prairie sandreed (*Calamovilfa longifolia*) community with a few small rock outcrops on the east side. Areas southwest of Marksheffel Road are dominated by needle and thread and the area east of this road is dominated by blue grama, primarily the result of different grazing practices, although the southwest side tends to be somewhat more sandy. Dominant forbs and subshrubs include three-tooth groundsel (*Senecio tridenticulatus*), plains wild buckwheat (*Eriogonum microthecum* var. *effusum*), white beardtongue (*Penstemon albidus*), narrowleaf beardtongue (*Penstemon angustifolius*), hairy golden aster (*Heterotheca villosa*), and lambert locoweed (*Oxytropis lambertii*). One outcrop of sandstone on the eastern boundary terminates in a cliff about 6 to 12 meters high with mountain mahogany (*Cercocarpus montanus*) on the top of the outcrop and scattered ponderosa pine (*Pinus ponderosa*), Rocky Mountain juniper (*Juniperus scopulorum*), skunkbush sumac (*Rhus trilobata*), and chokecherry (*Prunus virginiana*) along the cliff. Several of the smaller outcrops have small patches of skunkbush sumac and some waxy currant (*Ribes cereum*) but are mostly dominated by forbs including James wild buckwheat (*Eriogonum jamesii*) and long-pod milkvetch (*Astragalus lonchocarpus*).

The Falcon AFB proposed site (Site 4) is dominated by blue grama and three-awn (*Aristida purpurea*) with one large shallow pond in the southern portion and several small (less than 16 meters diameter) ponds toward the middle. The ponds contain water spike rush (*Eleocharis palustris*), prairie sedge (*Carex stenophylla*), and pepperwork (*Marsilea vestita*), a species related to ferns. Dominant forbs on the Falcon site include white beardtongue, three-tooth groundsel, stemless cymopterus (*Cymopterus acaulis*), and slender milkvetch (*Astragalus gracilis*). No shrubs or trees were found on this site.

Livestock grazing and farming are the predominant land uses in the region east of Peterson AFB. Because of the arid climate, vegetation is slow to recover from removal or disturbance, resulting in widespread soil erosion in the region.

3.5.10.2 Wildlife

Habitats in the vicinity of Peterson AFB and Falcon AFB support both small and large mammals, a variety of songbirds and raptors, and many reptiles and amphibians. The proposed project areas at both locations are comprised mainly of the short-grass prairie habitat. The species listed below are those that occur most commonly in the short-grass prairie habitat in this region.

Big game species found occasionally in the short-grass prairie habitats are pronghorn (*Antilocapra americana*), mule deer (*Odocoileus hemionous*), and white-tailed deer (*O. virginianus*). During a survey in June 1990, pronghorn were sited daily at both sites. Common large predatory mammals include bobcat (*Felis rufus*), badger (*Taxidea taxus*), coyote (*Canis latrans*), and gray fox (*Urocyon cinereoargenteus*). Smaller predators include striped skunk (*Mephitus mephitus*), racoon (*Procyon lotor*), long-tailed weasel (*Mustela frenata*) and red fox (*Vulpes vulpes*).

Supporting the predatory species populations are many species of small mammals including small-footed myotis (*Myotis leibii*), western pocket mouse (*Reithrodontomys megalotis*), deer mouse (*Peromyscus maniculatus*), silky pocket mouse (*Perognathus flavus*), northern pocket gopher (*Thomomys talpoides*), black-tailed jackrabbit (*Lepus californicus*), desert cottontail (*Sylvilagus audubonii*), white-tailed jackrabbit (*Lepus townsendii*), and thirteen-lined ground squirrel (*Spermophilus tridecemlineatus*). Although the sites are within the historic range of the black-tailed prairie dog (*Cynomys ludovicianus*), the June 1990 survey found no evidence of habitation by this species on the sites.

Common avian species at both sites include western meadowlarks (*Sturnella neglecta*), horned larks (*Eremophila alpestris*), lark buntings (*Calamospiza melanocorys*), lark sparrows (*Chondestes grammacus*), and mourning doves (*Zenaiada macroura*). Grasshopper sparrows (*Ammodramus savannarum*) are also common in the less heavily grazed area southwest of Marksheffel Road at the Peterson site and a mourning dove nest with two eggs was discovered in this area during the June 1990 survey. Several game birds are known to occur in the area though none were found during the survey. These include scaled quail (*Callipepla squamata*) and ring-necked pheasants (*Pasianus colchicus*). During the survey, a number of birds were seen in the area around the cliff at the eastern boundary of the Peterson site. These included mocking birds (*Mimus polyglottos*), cliff swallows (*Petrochelidon pyrrhonota*), rough-winged swallows (*Stelgidopteryx ruficollis*), an American kestrel (*Falco sparverius*), and a Short-Eared owl (*Asio flammeus*) with its two young. Other raptor species observed on the sites during the June 1990 survey include red-tailed hawks (*Buteo iamaicensis*) and Swainson's hawks (*Buteo swainsoni*). Northern harriers (*Circus cyaneus*) and turkey vultures (*Cathartes aura*) are also expected in the areas but were not observed during the survey. A number of wetland-associated birds were observed on and around the largest of the ponds on the Falcon site. These are described in the wetlands section below.

Two toad species are expected to occur in short-grass prairie habitats in both of the project areas, the plains spadefoot (*Scaphiopus bombifrons*) and Woodhouse's toad (*Bufo woodhousii woodhousii*), through none were observed during the June 1990 survey. Otherwise, amphibian species are mostly restricted to the aquatic habitats on Peterson AFB and Falcon AFB. No aquatic habitats occur on the proposed project areas at Peterson AFB, but several natural temporary pools occur in the proposed project area at Falcon AFB. Amphibian species expected to occur in these ponds include the tiger salamander (*Ambystoma tigrinum*) and plains leopard frog (*Rana blairi*).

Reptiles are fairly abundant in short-grass prairie habitats in the vicinity of the bases. Common snakes include the prairie rattlesnake (*Crotalus viridis viridis*), bullsnake (*Pituophis melanoleucus sayi*), and western plains garter snake (*Thamnonphis radix haydeni*). The northern earless lizard (*Holbrokia maculata maculata*), the eastern red-lipped prairie lizard (*Sceloporus undulatus erythrocheilus*) and the prairie sixlined racerunner (*Cnemidophorus sexlineatus viridis*) are the most common lizard species.

3.5.10.3 Threatened and Endangered Species

Several sensitive plant species and communities occur in El Paso County, but none are expected to occur in the vicinity of the proposed project areas. The black-footed ferret (Mustela nigripes), a specialized predator of prairie dogs, has been nearly extirpated from the shortgrass prairie as a consequence of prairie dog control programs and is a federally-listed endangered species. Although no ferrets have been recently sighted in El Paso County, the predominant short-grass prairie habitat could support this species. The U.S. Fish and Wildlife Service (USFWS) indicates that actions detrimental to prairie dogs, or their habitat, could adversely affect black-footed ferrets. The June 1990 survey found no evidence of recent prairie dog habitation on the sites at Peterson AFB or Falcon AFB.

The proposed sites are within the historic range of the bald eagle (*Haliaeetus leucocephalus*) and the whooping crane (*Grus americana*) (both federally listed endangered species), but were not observed during the survey and are not expected to occur due to the lack of appropriate habitat. The cliff at the Peterson site provides potential nesting habitat for the federally endangered peregrine falcon (*Falco peregrinus*), but there is no documentation of recent peregrine falcon nesting in the area and no nests were found during the survey. Bald eagles and peregrine falcons may occur as infrequent visitors during migration.

Because of the lack of perennial streams in the proposed project areas, the greenback cutthroat trout and the Arkansas darter (*Etheostoma cragini*) are not expected to occur. The greenback cutthroat trout is listed as endangered by both the federal government and the State of Colorado. The Arkansas darter is listed as endangered by the State. Critical habitats designated by federal agencies do not occur within 50 miles of the Peterson AFB.

3.5.10.4 Wetlands

Wetland habitats including riparian systems of arid and semiarid regions like east-central Colorado, are valuable wildlife habitats that have been designated by the USFWS for preservation, and where possible, rehabilitation. Wetland habitats in the region of Peterson AFB and Falcon AFB include intermittent and perennial streams, artificial pools and hydrological impoundments, and temporary surface pools in the prairie. Wildlife using these water sources includes large and small mammals, songbirds and waterfowl, as well as reptiles and amphibians.

Although wetland habitats occur on Peterson AFB, none are located near the proposed project areas. The wetlands occurring onbase are artificial recreational ponds located within the base golf course.

Several natural temporary pools occur in the proposed project area east of Falcon AFB in the short-grass prairie habitat. These pools are slight depressions in the grassland which catch and hold rainwater during the spring season. The June 1990 survey indicated that these pools support plant species adapted to flooded conditions. These included water spike rush, prairie sedge, and pepperwort.

A number of water-associated bird species were observed in and around the largest of the ponds. These included northern shoveler (*Anas clypeata*), mallards (*Anas platyrhynchos*), pintails (*Anas acuta*), blue-winged teal (*Anas discors*), green-winged teal (*Anas crecca*), American avocets (*Recurvirostra* *americana*), killdeer (*Charadrius vociferus*), red-winged blackbirds (*Agelaius phoeniceus*), and barn swallows (*Hirundo rustica*).

3.5.11 Cultural and Paleontological Resources

3.5.11.1 Prehistoric Resources

Prehistoric site types that occur in the area include habitation sites, camps, hunting stations, plant processing sites, buffalo kills and butchering sites ranging from the Paleoindian period (10,000-5,000 B.C.) to the Late Ceramic or Protohistoric period (A.D.1550-A.D.1750). Most of the sites in the region represent the Ceramic stage (A.D. 200-A.D.1750).

Approximately 84 percent of Peterson AFB has been inventoried for cultural resources. No prehistoric sites were identified and only two isolated finds have been recorded on the base.

The proposed project sites (Sites 1, 2, and 3) occur in the eastern portion of Peterson AFB in Sections 16, 21 and 28 (Township 14 South, Range 65 West) (Figure 3.5-2). Several cultural resources surveys have been conducted in this area. A literature search and reconnaissance study was completed for the Banning-Lewis Ranch planned development. Field reconnaissance was conducted on small selected parcels in the Banning-Lewis Ranch project area; however, none of the reconnaissance areas are located in the current proposed program areas. Only one prehistoric site, a small Early Ceramic period lithic scatter was recorded on a terrace of Jimmy Camp Creek near the proposed program areas. A cultural resources inventory is presently being conducted on selected offbase parcels adjacent to Peterson AFB.

One square mile or about 16 percent of Falcon AFB (i.e., Section 26) has been inventoried for cultural resources. A survey was conducted prior to establishment of the base. No prehistoric sites were identified; however, six isolated finds were recorded. A cultural resource survey is presently being conducted on selected parcels in Section 25, east of the previously surveyed area.

Several Native American groups including Plains Apache, Shoshone, Comanche, Ute, Arapaho, Kiowa and Cheyenne, historically occupied or traversed the general area around Colorado Springs. Some archaeological sites or features such as burials or vision quest locations may be encountered during inventory and may be of concern to Native American groups. The Colorado Commission on Indian Affairs has been contacted in order to identify specific Native American groups with concerns in the area.

3.5.11.2 Historic Resources and Structures

The earliest use of the area around Colorado Springs was by Spanish, French and American fur traders and explorers beginning in the early 1800s. Several historic trails used by the fur traders converge in the general area including the north-south trending Divide Trail along Jimmy Camp Creek. Coal mines and small mining communities such as McFerran (1888-1896) were established in the region in the 1860s to exploit the coal seams in the Upper Cretaceous Laramie Formation. In the 1880s, several railroads and numerous rail spurs connecting the coal mines and mining communities to Colorado Springs were built in the area. Sheep and cattle ranches were established in the general area in the late 1880s. These ranches were later divided into homesteads but eventually became large ranch holdings after the 1930s.

Most of the historic resources in the area are archaeological sites or standing structures associated with the early transportation routes, coal mining, frontier settlement and the sheep or cattle industry. Sites include historic trails, gravesites, coal mines, mining communities, railroad grades, homesteads, schools, cattle camps, line shacks, lambing pens ranch complexes and windmills.

Five standing structures from the original Colorado Springs Municipal Airport (1926-1941) have been recorded at Peterson AFB. The buildings represent a combination Art Deco/Art Modern architectural style and have been recommended as eligible for listing on the National Register of Historic Places (NRHP). Military use at Peterson AFB began in 1942 and continued through World War II. In 1945, the air field was returned to the City and most of the World War II-era buildings were razed at that time. Peterson Air Field was used for military activities from 1948 to 1949 and 1951 to the present. Most of the buildings on the base were built within the last 50 years and are not considered historic resources.

A historic railroad grade was recorded during a small survey conducted in 1984 at Peterson AFB. The railroad grade represents the remnants of connecting spur built by the Denver and New Orleans Railroad Company in 1882. The railroad spur was abandoned in 1917. The railroad grade lacks physical integrity and was recommended as not eligible for the NRHP.

Numerous historic resources have been identified in the Banning-Lewis Ranch project area east of Peterson AFB. These sites include portions of the Divide Trail, several coal mines, old railroad grades, mining communities and camps, homesteads and ranches. Several historic sites have been identified through archival research in proposed program areas in Sections 16, 21 and 28. The Jimmy Camp coal mine in operation from 1929 to 1941, consisted of four adits located in Section 16. All four adits were backfilled and reclaimed before 1984 during the Colorado Inactive Mine Program. Portions of the Denver and New Orleans Railroad (1882-1917) also occur in Sections 16 and 21.

Only one historic site has been previously identified at Falcon AFB. The site is a livestock watering complex consisting of a windmill, pumphouse, modern well, and stock tanks. This complex may have been built as early as the 1920s; however, it is considered not eligible for the NRHP. Falcon AFB was established in 1982; none of the onbase structures are considered historic resources because they do not meet the 50-year age requirement.

3.5.11.3 Paleontological Resources

A paleontology study was conducted for the Banning-Lewis Ranch project. Four formations from the Upper Cretaceous and Lower Tertiary have surface exposures along Jimmy Camp Creek and all are fossiliferous. Pierre Shale consists of silty shales, siltstones, and sandstones and contains plant remains, pelecypods, ammonites and baculites. The Fox Hills sandstone has mostly shale in the lower portions and sandstone in the upper portion. The Fox Hills contains pelecypods, dinosaur bone, fish and plant remains. The Laramie Formation consists of sandstones, shales and coal beds; paleontological materials include plant and marine animal remains and dinosaur bone.

The Denver Formation is a series sandstones, siltstones, shales and conglomerates and contains plant remains, early mammals, turtles, crocodiles, and dinosaur bone. The Denver Formation represents the contact between the Mesozoic and Cenozoic eras and is important because it provides a diverse floral and faunal assemblage including both dinosaurs and early mammals.

Four paleontological localities have been identified in the proposed program areas in Sections 16 and 21. The Fox Hills sandstone exposures in these localities have yielded trace fossils, burrows of near-shore crustaceans, molluscs, gastropods, a pleisosaur tooth, and fish vertebrae. The Laramie Formation exposures contain petrified wood, leaf fragments, an unidentified dinosaur bone fragment. The Denver Formation exposures in these localities contain unidentified dinosaur bone fragments.

Geological formations with surface exposures near Falcon AFB includes the Denver Formation which represents the contact between the Mesozoic and Cenozoic eras and contains both dinosaur and early mammal remains.

3.6 KIRTLAND AIR FORCE BASE, NEW MEXICO

Kirtland Air Force Base (AFB) is located in Bernalillo County in north-central New Mexico, adjacent to the City of Albuquerque (Figures 3.6-1 and 3.6-2). The host organization at this Military Airlift Command (MAC) base is the 1606th Air Base Wing (ABW). Major tenants at Kirtland AFB include the 1550th Combat Crew Training Wing, the Department of Energy (DOE), Sandia National Laboratories, and the Air Force Systems Command (AFSC) Space Technology Center.

The base is located adjacent to the Albuquerque International Airport, and the runway facilities are jointly used by the base and the airport. Kirtland AFB covers an area of approximately 52,681 acres; the Air Force controls 44,017 acres (25,497 acres are fee-owned, 18,439 acres are public domain lands, and 82 acres are easement); the DOE controls 7,522 acres (2,927 acres are fee-owned, and 4,595 acres are public domain); and the City of Albuquerque owns 1,141, acres including 1,110 acres of runways/taxiways.

Kirtland AFB and the non-Department of Defense (DOD) tenant units employed 4,847 military personnel, 1,249 National Guard and Air Force Reserve personnel, 3,128 appropriated fund civilian personnel, 2,826 other civilian personnel, and 8,664 contractor personnel at the end of fiscal year (FY) 1989. Approximately 52 percent of the military personnel live on the base, and 48 percent live in communities near the base. The City of Albuquerque, located adjacent to the base on the north and west, is the host community for Kirtland AFB. Most of the personnel living offbase reside in Albuquerque, but some personnel live in other smaller communities in the area.

History. Kirtland AFB was named after Colonel Roy C. Kirtland, a military aviation pioneer who learned to fly with the Wright Brothers. Kirtland AFB began as a private airfield built in the 1920s. In the late 1930s and early 1940s, the municipal airport for Albuquerque was converted into two military complexes: Kirtland Air Field was established in 1939 and the Sandia facility in 1942. The Sandia Corporation (now Sandia National Laboratories) was placed on Sandia Base, now on the eastern side of Kirtland Air Field. Manazano Base was constructed in 1947 as an annex to Sandia Base. In 1948, Kirtland Air Field became Kirtland AFB and in 1971, Sandia Base, Manazano Base, and Kirtland AFB merged and became known as Kirtland AFB.

Mission. Kirtland AFB is the fifth largest Air Force Base and the largest base in MAC. The basic mission of Kirtland AFB is to support research and development and the training of pararescue medics. The support function for the base is performed by the 1606th ABW. The 1606th ABW mission is to supply medical care, housing, civil engineering, fire protection, administrative support, personnel services, legal assistance, transportation, security, law enforcement, pay, accounting, and funds management.

The 1550th Combat Crew Training Wing operates the consolidated Air Force helicopter training school for all Air Force helicopter crew members in conjunction with a specialized training school. The wing also provides basic and advanced pararescue qualification training.

Other organizations located at Kirtland AFB include the Contract Management Division, the Air Force's acquisition contract management agency, and the Space Technology Center under the command of Space Systems Division. The Space Technology Center directs three laboratories: the Weapons Laboratory at Kirtland AFB; the Rocket Laboratory at Edwards AFB, California; and the Geophysics Laboratory at Hanscom AFB, Massachusetts. The Weapons Laboratory is responsible for non-conventional weapons research, development of high energy laser technology and nuclear weapon technology.

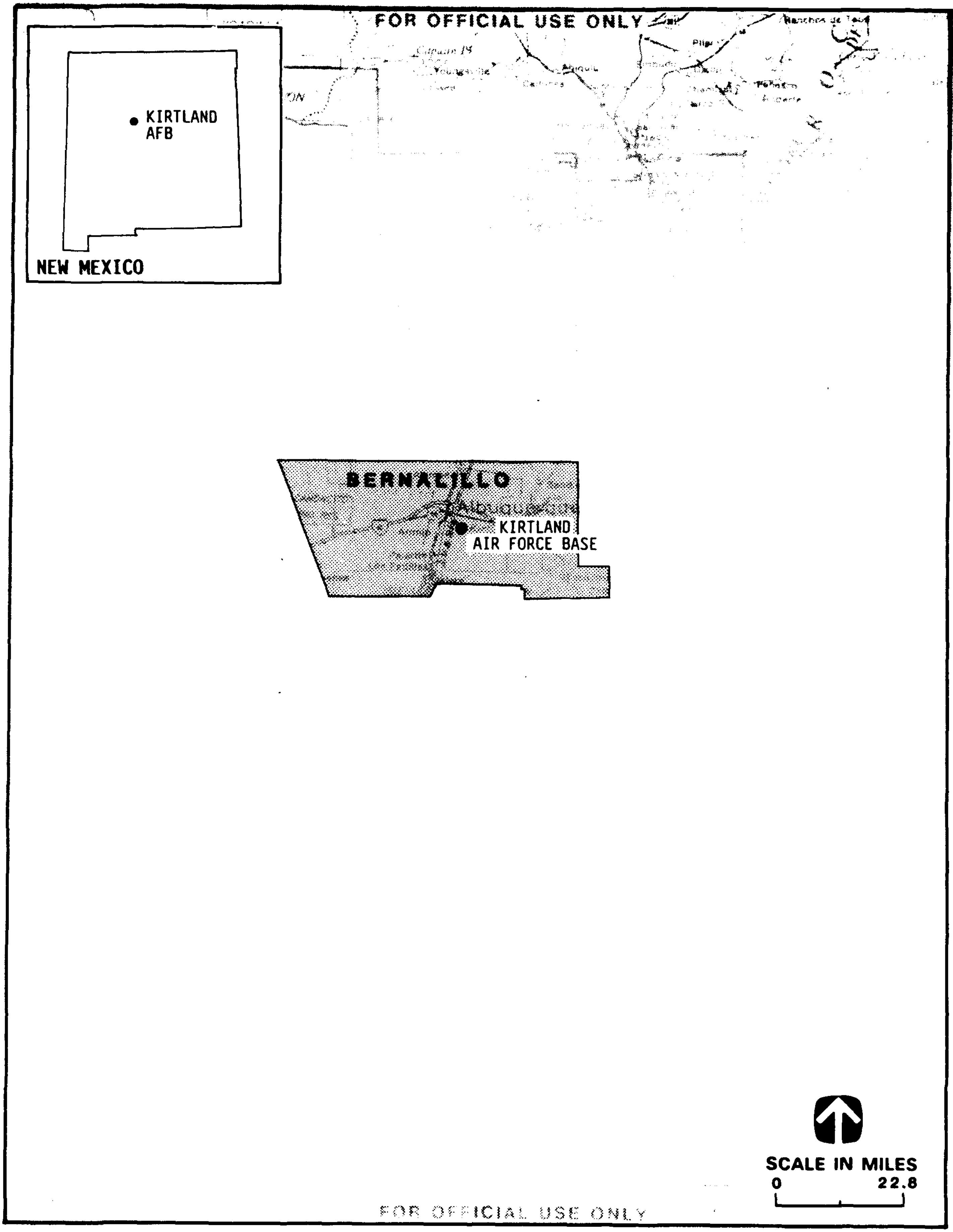

FIGURE 3.6-1 REGIONAL VICINITY MAP FOR KIRTLAND AFB, NEW MEXICO

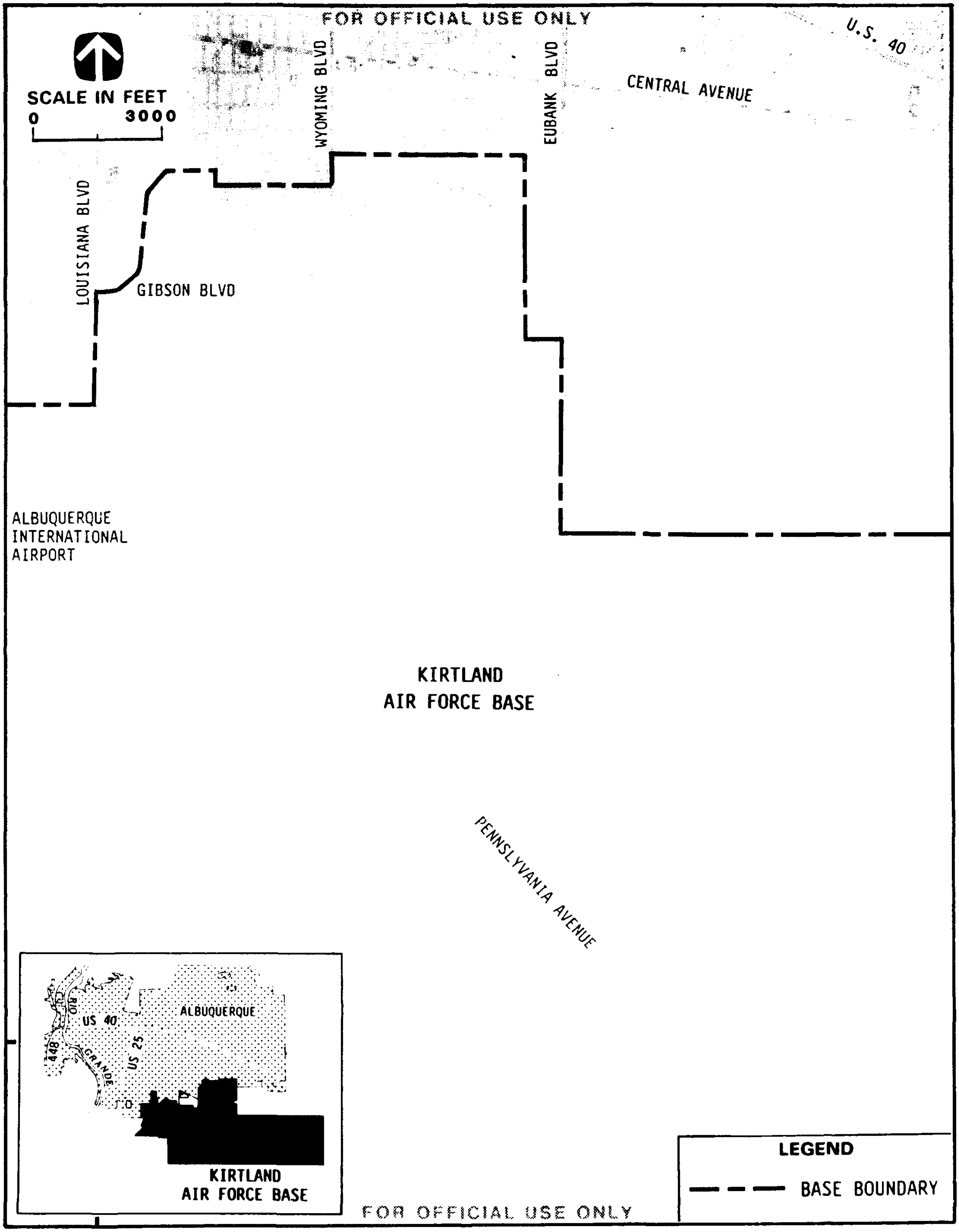

FIGURE 3.6-2 LOCAL VICINITY MAP FOR KIRTLAND AFB, BERNALILLO COUNTY, NEW MEXICO

The Department of Energy's Albuquerque Operations Office and the Sandia National Laboratories conducts research and development, testing, stockpile surveillance, and the transportation of nuclear materials.

3.6.1 Community Setting

3.6.1.1 Population and Employment

Population. The population of Bernalillo County accounts for 32 percent of the people living in New Mexico. In 1990, the population in the Albuquerque Metropolitan Statistical Area (MSA) was estimated at 538,970. The area's population has grown by 26.2 percent since 1980 when it totalled 427,100. During the past decade, the area has grown at an annual rate of 2.4 percent, after having grown at 3.1 percent a year during the 1970s.

Employment. In 1990, employment in the Albuquerque MSA was estimated at 253,920. With a labor force of 268,900, the unemployment rate is 5.9 percent. The largest employment sectors are services (27.9%), wholesale/retail (25.7%) and government (19.7%). The manufacturing sector accounts for only 8.6 percent of the area's employment. The largest individual employers in Bernalillo County are the Albuquerque Public School System, the Sandia National Laboratory, and Kirtland AFB.

3.6.1.2 Housing

Kirtland AFB maintains 2,122 family quarters and 1,883 enlisted quarters. The base also has 486 transient quarters and 64 guesthouses.

The average price of a home has risen by 45 percent since 1980, and average rental costs have gone up by 18 percent over the same period. Housing costs in Albuquerque are very close to the national average. The average vacancy rate has risen from 4.2 percent in 1980 to 7.8 percent, largely because of the housing surplus which has resulted from the construction boom of the mid 1980s. During this time, 47,242 units were added to the housing stock. Single-family homes make up the majority of the city's housing units.

3.6.1.3 Education

The Albuquerque Public School District has a total enrollment of 84,700 students, attending 11 high schools, 23 junior high schools, 75 elementary schools, and 6 alternative schools. It is the twenty-seventh largest school district in the United States.

3.6.1.4 Community Services

Fire and police department services are provided to area residents by both the City of Albuquerque and Bernalillo County. The city fire department handled over 30,000 emergency calls last year, and total expenditures on fire and police protection in 1989 represented over 33 percent of the City's operating budget. Within the Albuquerque MSA, the number of public service personnel per 1,000 residents is 42 local government employees per 1,000 residents; 24 state government employees per 1,000; 2.5 federal government employees per 1,000.

3.6.2 Land Use

3.6.2.1 Existing Land Use

The land use area at Kirtland AFB discussed here consists of the northwest area of the base including the eastern half of the main cantonment area (referred to as the Base Support Area). This area contains both existing facilities and designated growth areas. The southern and western portions of the base are primarily used for testing, research, and training. The land use study area considers nine classifications which are identified on Figures 3.6.2-1 and 3.6.2-2.

Residential. The east half of the Base Support Area consists of accompanied and unaccompanied residential base housing in the northwest corner. The Base Comprehensive Plan designates a housing area for general officers' quarters on a site bounded by the existing Officer's Club and the current base boundary near Eubank Boulevard.

Public/Quasi Public. Public/quasi public use onbase is limited to the Wherry and Sandia Elementary Schools and the DOE National Atomic Museum. The Base Comprehensive Plan designates expansion of the base by approximately 86 acres on vacant DOE-owned land adjacent to Eubank Boulevard (Site 1A). The planned uses of this area include the relocation of the DOE National Atomic and USAF Air Rescue Museums, the construction of a conference center, the siting of a commuter light rail station and right-of-way; and the construction of a DOE Technology Transfer Center.

Cantonment. Existing base facilities designated administration, community (excluding public schools), and medical in the Base Comprehensive Plan have been combined for study purposes into the cantonment designation of the land use analysis. The majority of the areas designated as cantonment are concentrated within the Base Support Area.

The Base Comprehensive Plan designates sites for a new headquarters building for the Air Force Inspection and Safety Center (AFISC). AFISC is being relocated from Norton AFB in San Bernardino, California to a site north of the Eubank Gate and DOE Area I and south of proposed Site 1A. AFISC would also require a 30-acre site for a crash-site laboratory. One site under consideration is located between the base golf course and riding club. A contractors complex and a new Eubank Gate visitors center would be located on a base expansion area currently owned by DOE, north of the existing Eubank Gate.

Industrial. Industrial type uses within the Base Support Area are located within an industrial district shared by the Air Force and Sandia National Laboratories. The Sandia National Laboratories facilities are located within DOE Area I, and occupy most of the industrial district, with Air Force uses to the west and south. The Sandia National Laboratories also administers several DOE facilities designated industrial at the DOE Areas III, IV and V, located south of the Base Support Area. DOE Technical Area V contains four nuclear reactors within a 3-kilometer Exclusion Radius Area. The defined exclusion area is located wholly within Air Force or DOE owned lands over which there is direct control. No housing is located within this radius with the exception of a caretakers residence located at the base riding club. The reactors are also sited within a 6-kilometer low-population zone.

Air Force industrial land uses vary greatly. Outside the Base Support Area, developed industrial facilities consist of the trestle facility, and its associated support facilities, training areas; burial sites; developed industrial buildings; and a sewer plant scheduled for future abandonment.

The Interservice Nuclear Weapons School (INWS), administered by the Air Force, consists of eight nuclear accident training sites (numbered TS-1 to TS-8). The sites are located in a crescent-shaped band located 600 to 3,500 feet from the base golf course. The INWS has placed training sites 5, 6, 7

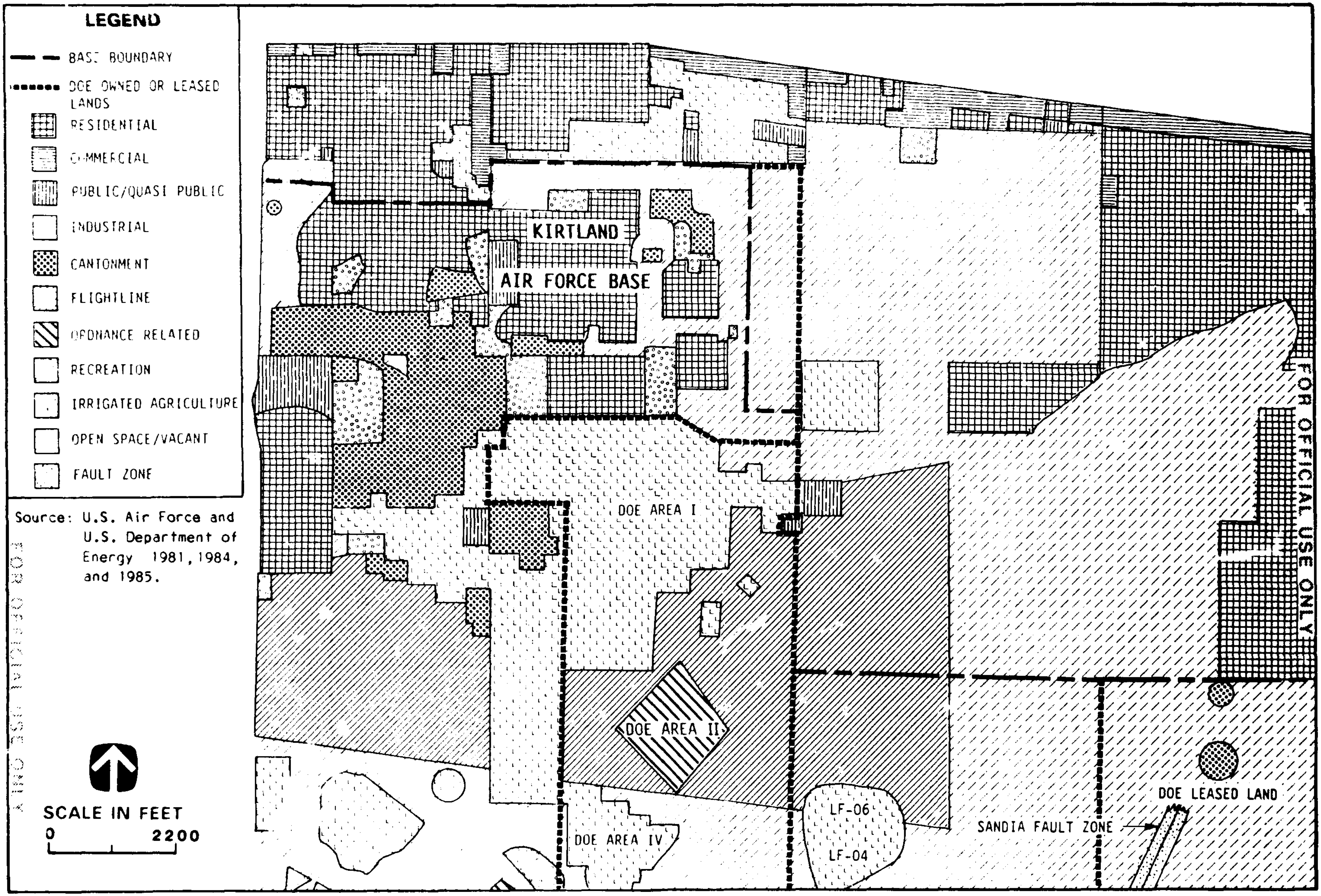

FIGURE 3.6.2-1 LAND USE OF SITE 1 AREA, KIRTLAND AFB AND VICINITY

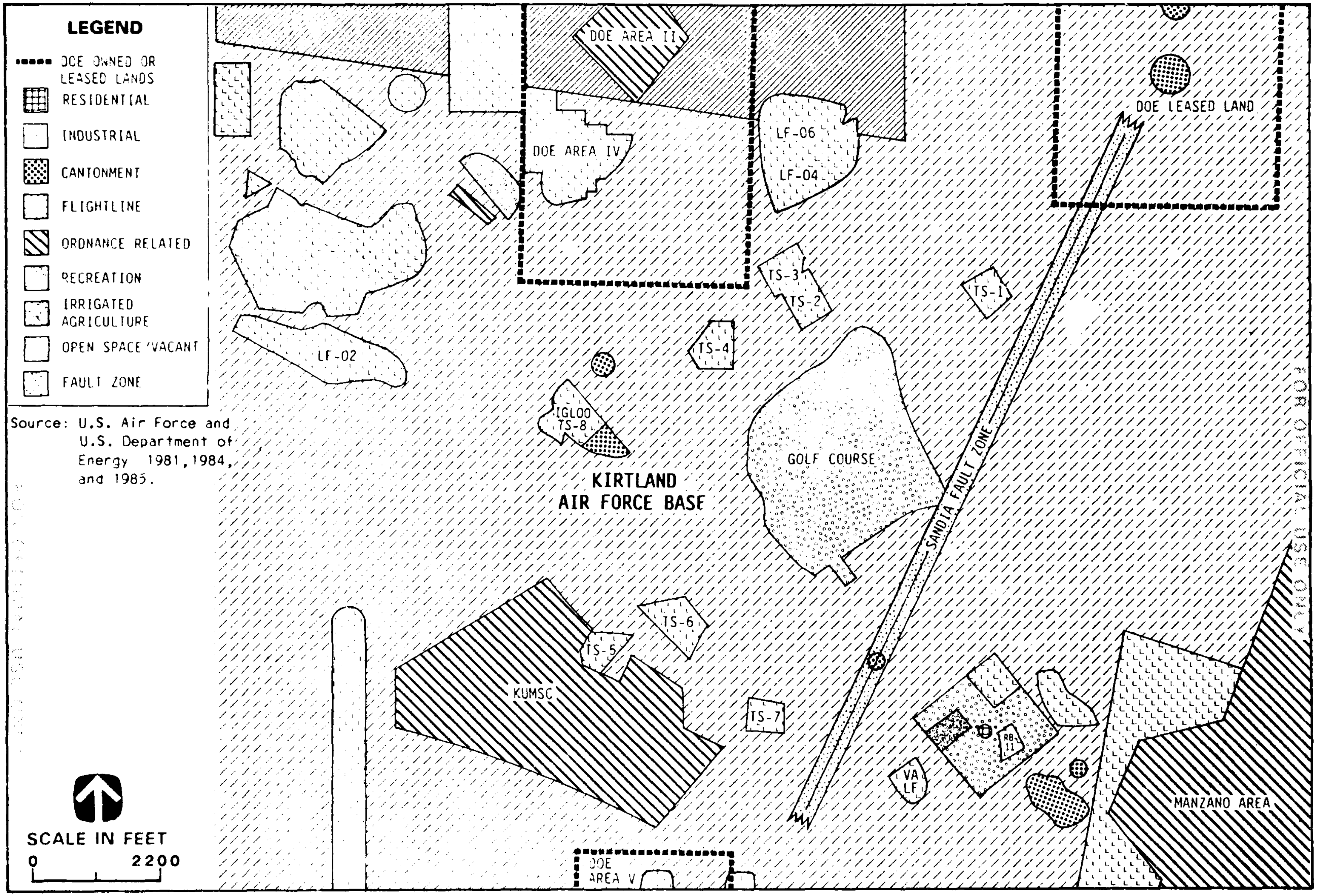

FIGURE 3.6.2-2 LAND USE OF SITE 2 AREA, KIRTLAND AFB AND VICINITY

and 8 (located south of Pennsylvania Avenue) on inactive status. The training sites are used for the training of personnel for alpha radiation monitoring and decontamination of simulated nuclear weapons accidents.

The Air Force manages an inactive radioactive waste burial (RB No. 11) site located within the defined area of the base riding club. The site is marked with radiation warning signs within an unfenced site.

The Air Force manages four nonradioactive sanitary landfills (LF) within the study area. LF-02 and LF-03 are located on the western end of the study area, west of Pennsylvania Avenue. The sites contain general refuse and are closed. LF-04 was formerly operated jointly by the City of Albuquerque and the Air Force for disposal and burial of general refuse. The adjoining site, LF-06, is an active site operated by the Air Force for disposal of general refuse. The Veterans Administration Hospital formerly operated a temporary landfill in order to dispose of hardfill from the demolition of old hospital facilities. The site is closed and the Air Force has posted the area prohibiting further dumping.

The Air Force also operates a hazardous waste storage facility (Building 28009) located south of Pennsylvania Avenue between training site 8 and a Sandia Laboratories facility. The facility is used to store hazardous wastes prior to disposal. A cobalt-60 test facility with surrounding berms is located on the northern corner of the fenced quadrangle of the base riding club.

Ordnance Related. Ordnance-related facilities consist of the Manzano Area, DOE Area II, the railroad facilities, and the recently constructed Kirtland Underground Munition Storage Complex (KUMSC). The explosives safety zones for these facilities vary.

Flightline. The flightline designation within the study area would include the clear zone and Approach Zone No.1 (APZ-1) as designated in the Base Comprehensive Plan. The flight line designation overlays across the southern part of the Base Support Area on the north and DOE Areas 1 and 11 in the south. Most of the land within the clear zone and APZ-1 is undeveloped open space.

Recreation. Most of the Kirtland AFB recreational facilities are scattered within the Base Support Area. Outside the Base Support Area, recreational facilities include of a skeet range, the base golf course, and the base riding club.

Open Space. Open space lands are generally located south and west of the Base Support Area (both within and outside the base). Within the Base Support Area, open space land is primarily located within the base housing areas.

Fault Zones. A fault zone of the Sandia Fault (as defined by Grant), is located between the golf course and riding club. This fault has been delineated for planning purposes.

Off Base Land Use. The City of Albuquerque abuts the northern boundary of the base. The land uses are composed of residential, commercial, and industrial districts together with an assortment of supporting public uses. Residential neighborhoods consist of multifamily, single family, and mobile homes. A Public Service Company of New Mexico's switching station, several water storage tanks, and an Albuquerque Public Schools District bus maintenance and storage yard are public uses located near the northern boundary of the base. Albuquerque Public Schools District also owns a large parcel of vacant land adjacent to the base and the 86-acre DOE land holding and east of Eubank Boulevard. Proposed Site 1C includes a portion of this parcel.

Offbase industrial uses are located in an existing industrial district north of the base and south of Central Avenue. Another new industrial park is currently being developed immediately east of Eubank Gate. Commercial use is generally located on a highway strip along Central Avenue.

3.6.2.2 Land Use Policies and Plans

The land occupied by Kirtland AFB is addressed under the Kirtland AFB Base Comprehensive Plan. The private land located north and east of the base is administrated by the city of Albuquerque and County of Bernalillo through their adopted Zoning Ordinances. The City of Albuquerque has planned for approximately 9,900 acres of vacant developable land for future single family residences. An infill study conducted by the city indicates there are approximately 18,000 acres of developable land available for all types of future residential uses including multifamily residential.

The land located north of the base from San Pablo Street east of Wyoming Boulevard is generally zoned R-2 Residential or RT Residential Zone which permits houses, town houses, and low density apartments. The land located between Wyoming Boulevard and Eubank Boulevard is generally zoned C-2, Community Commercial Zone; C-3, Heavy Commercial Zone; and SU-1, Special Use Zone. The C-2 zone provides for suitable sites for commercial activities and certain types of outside storage. The C-3 zone provides for C-2 uses, wholesale commercial uses, and some light industrial uses. The SU-1 zone provides for uses which are special because of infrequent occurrence, effect on surrounding property, safety, hazard, or other reason.

The land east of Eubank Boulevard to Juan Tabo Boulevard and north of Southern Avenue, is composed of a mixture of C-2, C-3, and O-1, office and institutional zone. The O-1 zone provides for office, service, institutional, and dwelling uses. The land south of Southern Avenue is essentially undeveloped with the exception of a developing industrial park near the Eubank Gate at Kirtland AFB. The Industrial Park is zoned SI-1 for industrial purposes. The Sandia Research Park is being developed at this location.

The surrounding land is zoned SU-1 and is planned for residential, public parks and recreational uses, and several school sites. The Albuquerque Public School District is preparing a specific plan for this 480-acre parcel. The remaining land in this area is zoned SU-1 for the mobile home park and R-D in Tijeras Canyon developed under the Four Hills West Specific Plan 81-5 which permits a mixture of dwelling unit types and incidental-related commercial activities. The R-P zone continues east from Juan Tabo Boulevard to the Four Hills Village consisting of existing single family homes and the Four Hills Country Club Golf Course (zoned SU for golf course). The Four Hills Village is located high on an alluvial fan and overlooks the base, including the Manzano Area.

3.6.2.3 Visual Resources

Albuquerque is surrounded by the high desert to the north and south, volcano escarpments to the west, and the Sandia Mountains to the east. The Manzano Mountains, Jemez Mountains, and Mount Taylor are visible in the distance. The city is located at an altitude of 5,300 feet above sea level.

Kirtland AFB and Albuquerque International Airport are surrounded by relatively flat terrain to the north, south, and west, and foothills to the east. The onbase facilities consist of low-level structures with well controlled and irrigated landscaping. The area surrounding the base consist of old residential housing and businesses in a well-preserved state.

3.6.3 Transportation

3.6.3.1 Traffic

Existing Conditions. The transportation network in the Kirtland AFB area is shown on Figure 3.6.3-1. Regional access to the base is provided by Interstates 25 and 40. Local access to the base is provided by Gibson Boulevard and five entrance/exit gates. The Eubank Boulevard gate provides access to the base from the east; the Wyoming Boulevard gate provides access from the north; and the Carlisle Boulevard gate, Truman gate (at San Mateo Boulevard), and Gibson Boulevard gate (at Louisiana Boulevard) provide access from the north along Gibson Boulevard.

The Albuquerque area is served by two major interstate highways, Interstate 40 and Interstate 25. These two highways intersect in the central area of the city and provide access to all major streets. Local transportation is primarily dependent on surface systems, with the automobile being the dominant mode. A public bus system provides service throughout the city. Local governmental agencies and commissions have studied two potential transportation corridors that would serve the southeastern part of Albuquerque. The Gibson Corridor route was jointly established by Kirtland AFB and local and state governments in 1980. This arterial will reduce onbase congestion and city traffic volumes generated by the base.

Gibson Boulevard is a six-lane principal arterial with limited access extending from Broadway Boulevard (west of the base) to Louisiana Boulevard. Three of the five gates to the base are off of Gibson Boulevard. It is expected that Gibson Boulevard extension will be constructed to Juan Tabo Road east of the base by the year 2010.

Carlisle Boulevard is a four-lane minor arterial extending from south of Gibson Boulevard north to Montgomery Boulevard. North of Gibson Boulevard, Carlisle Boulevard primarily serve residential areas. San Mateo Boulevard is a four-lane road just north of Gibson Boulevard, widening to a six-lane principal arterial with limited access from just south of Central Avenue north to Interstate 25.

Louisiana Boulevard is a six-lane principal arterial extending from south of Gibson Boulevard north to Spain Road. Wyoming Boulevard is a six-lane principal arterial extending from inside Kirtland AFB to the north. Eubank Boulevard is a four-lane principal arterial south of Central Avenue, widening to six lanes north of Central Avenue. Eubank Boulevard extends from Pennsylvania Avenue inside the base north to Academy Road.

Pennsylvania Avenue connects the Manzano Area to the main part of the base where the traffic is dispersed during peak periods to various entry gates. Traffic on Pennsylvania Avenue in the vicinity of the Manzano Area is minimal; however, Pennsylvania Avenue is a convoy route leading to the munitions storage area at Manzano and, as such, is subject to periodic traffic disruption. Offroad parking areas are provided for vehicles that are on Pennsylvania Avenue during the convoy maneuver.

Existing Traffic Volumes. The 1988 average daily traffic for offbase roads in the vicinity of the base is presented in Table 3.6.3-1. Traffic counts conducted in March 1988 showed a total of 24,800 and 21,800 vehicles per day at the Wyoming and Gibson gates, respectively. Traffic problems on the base are generally confined to the peak hour situations where major streets, including Gibson Boulevard, Wyoming Boulevard and Pennsylvania Avenue north of "O" Street) become congested. The base has implemented staggered work schedules and one-way street systems in certain areas of the base to minimize congestion, particularly during the peak hour periods. Traffic rapidly diffuses throughout the major streets and highways in the Albuquerque area outside the base.

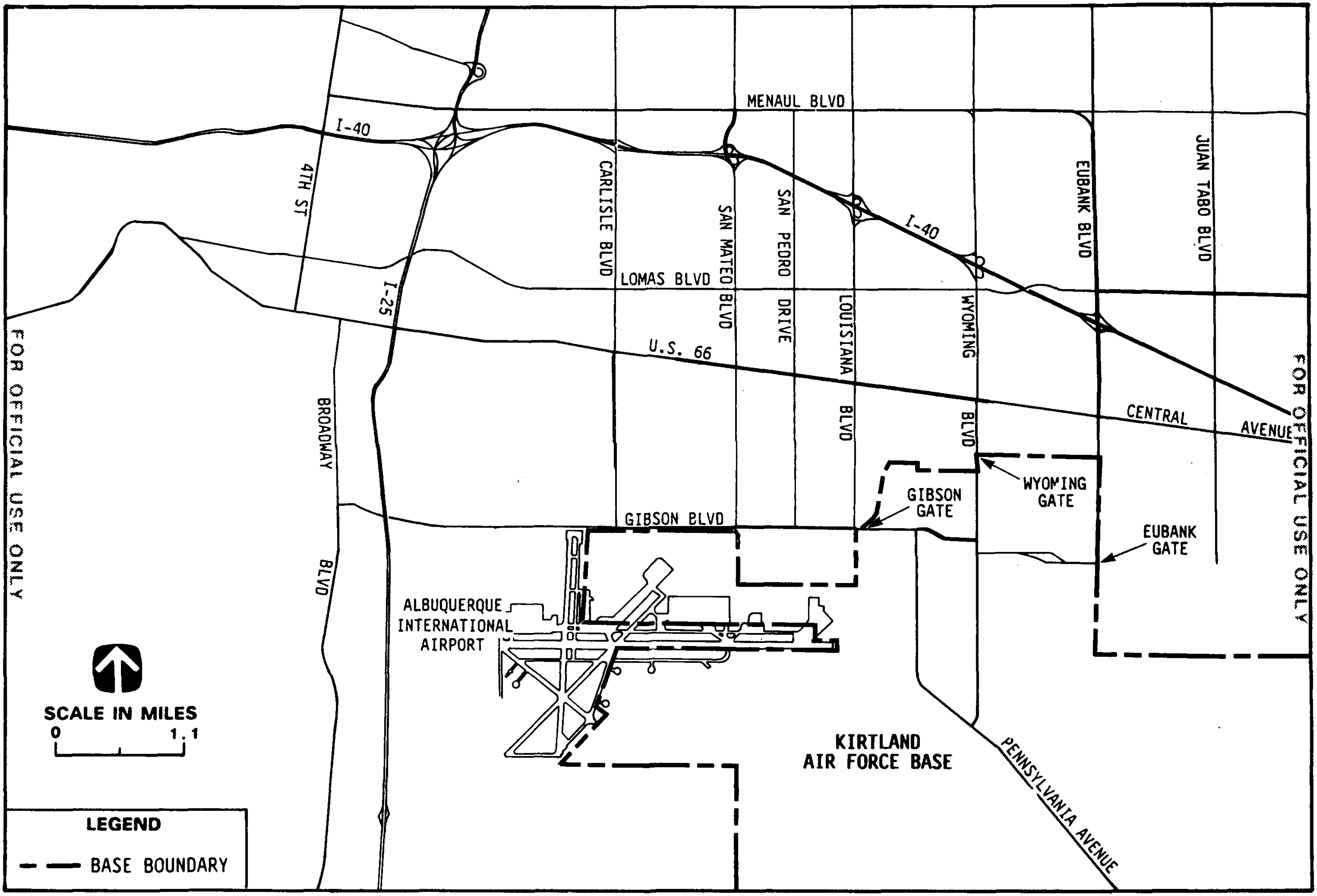

FIGURE 3.6.3-1 TRANSPORTATION NETWORK IN THE VICINITY OF ALBUQUERQUE, NEW MEXICO

Table 3.6.3-1

Comparison of Daily Traffic Volumes to Estimated Roadway Capacities for Road Segments in the Vicinity of Kirtland AFB

Road Segment	Roadway Capacity	Existing Conditions (1988) ADT[1]	Existing Conditions (1988) V/C Ratio[2]	Existing Conditions (1988) LOS[3]	Projected Conditions (1996) ADT	Projected Conditions (1996) V/C Ratio	Projected Conditions (1996) LOS
Gibson Boulevard							
I-25 to Carlisle Boulevard	50,400	37,400	0.74	C	42,131	0.78	C
Carlisle Boulevard to San Mateo Blvd.	50,400	36,200	0.72	C	40,779	0.76	C
San Mateo Boulevard to Louisiana Blvd.	50,400	32,800	0.65	B	36,949	0.68	B
Carlisle Boulevard							
Gibson Boulevard to Central Avenue	26,400	9,800	0.37	A	11,040	0.42	A
Central Avenue to Lomas Boulevard	12,000	8,500	0.71	B	9,575	0.80	D
San Mateo Boulevard							
Gibson Boulevard to Central Avenue	28,800	29,700	1.03	F	33,457	1.16	F
Central Avenue to I-40	43,200	47,700	1.10	F	53,734	1.24	F
Louisiana Boulevard							
Gibson Boulevard to Central Avenue	36,000	23,700	0.66	B	26,698	0.74	C
Central Avenue to I-40	36,000	34,000	0.94	E	38,301	1.06	F
Wyoming Boulevard							
Central Avenue to I-40	43,200	40,300	0.93	E	45,398	1.05	F
Central Avenue to Wyoming Gate	43,200	24,800	0.57	A	27,937	0.65	B
Eubank Boulevard							
South of Central Avenue	28,000	13,700	0.48	A	15,433	0.54	A
Central Avenue to I-40	43,200	30,300	0.70	B	34,133	0.79	C
I-40 to Menaul Boulevard	43,200	33,100	0.77	C	37,287	0.86	D
Central Avenue							
Carlisle Boulevard to San Mateo Blvd.	43,200	37,300	0.86	D	42,018	0.97	E
San Mateo Boulevard to San Pedro Blvd.	43,200	36,400	0.84	D	41,004	0.95	E
San Pedro Boulevard to Louisiana Blvd.	36,000	34,900	0.97	E	39,315	1.09	F
Louisiana Boulevard to Wyoming Blvd.	43,200	36,300	0.84	D	40,892	0.95	E
Wyoming Boulevard to Eubank Blvd.	43,200	35,000	0.81	D	39,427	0.91	E
Eubank Boulevard to I-40	43,200	31,900	0.74	C	35,935	0.83	D

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Road Segment	Roadway Capacity	Existing Conditions (1988)			Projected Conditions (1996)		
		ADT	V/C Ratio	LOS	ADT	V/C Ratio	LOS
Interstate 40							
I-25 to Louisiana Boulevard	84,000	133,000	1.58	F	149,824	1.78	F
San Mateo to Louisiana Boulevard	126,000	124,000	0.98	E	139,685	1.11	F
Louisiana Boulevard to Wyoming Blvd.	126,000	101,600	0.81	D	114,452	0.91	E
Wyoming Blvd. to Eubank Boulevard	126,000	79,800	0.63	B	89,894	0.71	C
Eubank Boulevard to Central Avenue	126,000	61,000	0.48	A	68,716	0.55	A

Notes: [1]ADT = Average Daily Traffic.
[2]V/C represents the ratio of Average Daily Traffic volume to Roadway Capacity.
[3]LOS = Level of Service (Section 3.1.3, Table 3.1.3-2).

Source: Middle Rio Grande Council of Governments 1990.

Operating Conditions on Roadways. A comparison of daily traffic volumes and volume-to-capacity ratios for selected roadway segments in the vicinity of the base is presented in Table 3.6.3-1. Existing daily traffic volumes were compared to Level of Service (LOS) E roadway capacities to arrive at a volume-to-capacity ratio and corresponding level of service of operation. Estimated roadway capacities were obtained from the Middle Rio Grande Council of Governments and are considered to be very conservative. The capacities are based on the Highway Capacity Manual theory of calculating capacities and actual capacities may be quite higher. Most roadway segments analyzed currently operate at LOS D or better. Two roadway segments operate at LOS E: San Mateo Boulevard north of Gibson Boulevard and San Mateo Boulevard south of Central Avenue.

Projected daily traffic volumes for 1996 for roadways in the immediate vicinity of the base are presented in Table 3.6.3-1. These projections do not assume any major increase in activity at Kirtland AFB. The 1996 daily traffic volumes were compared to LOS E roadway capacities to arrive at a volume-to capacity ratio and corresponding level of service of operation. Several roadway segments are anticipated to operate at LOS E in 1996, including segments of Central Avenue, San Mateo Boulevard, Wyoming Boulevard, and Louisiana Boulevard.

3.6.3.2 Airports

Albuquerque International Airport is served by several major and regional airlines. The runways are used jointly with Kirtland AFB. Direct air service is available to several major hubs, including Denver, Houston, Los Angeles, Chicago, Salt Lake City and St. Louis. Passenger traffic in 1989 exceeded 5.4 million (2,362,570 enplanements and 2,358,900 deplanements).

3.6.4 Utilities

The City of Albuquerque is identified as the area where municipal and public utility services may be directly or indirectly affected by the proposed action.

3.6.4.1 Water Supply

The City of Albuquerque provides potable water to its residents and Kirtland AFB from groundwater sources. The City's water supply is pumped from an aquifer contained in the Rio Grande Basin. Once the water is pumped out, it is stored in enclosed reservoirs for distribution. The City's system presently has a capacity of 267 million gallons per day (MGD). A summary of existing and projected demand is provided in Table 3.6.4-1. Average daily demand in 1989 was an estimated 47 percent of the system's capacity. Future demand will increase to 55 percent and 56 percent of the system's capacity in 1996 and 1997, respectively. Estimates are based on a per capita demand of 247 gallons per day per capita (gpcd).

Potable water for Kirtland AFB is primarily from groundwater wells located on the base. The aquifer is a part of the Rio Grande Basin. The base has a contractual allocation of 2,085 million gallons annually from the aquifer. Approximately 3.98 MGD was pumped in FY 1989 or approximately 70 percent of their allocation. The city supplied an additional 0.8 MGD for peak demands. Average daily demand is presented in Table 3.6.4-1 for 1989 and the projected increase anticipated with approximately 325 additional personnel onbase resulting from the transfer of the AFISC headquarters from Norton AFB. Per capita demand is approximately 160 gpcd.

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Table 3.6.4-1

Summary of Current and Projected Average Daily Water Demand and Wastewater Flows (million gallons per day)

Year	Albuquerque	Kirtland AFB
Water Demand		
1989	124.4	4.78
1996	135.8	5.28
1997	137.5	5.28
Wastewater Flows		
1989	55.0	2.27
1996	62.8	2.30
1997	63.6	2.30

3.6.4.2 Wastewater

Wastewater generated by the City of Albuquerque and Kirtland AFB is processed by the City at a combined trickling filter and activated-sludge treatment plant with an operating capacity of 60 MGD. Average daily wastewater flows are presented in Table 3.6.4-1. Average daily flow in 1989 was 92 percent of the system's operating capacity. A planned upgrade will increase the system's operating capabilities to 72 MGD. Projected average daily flow in 1996 and 1997 is an estimated 87 and 88 percent of the increased capacity system, respectively. Per capita flow is estimated to be 110 gpcd. Kirtland AFB presently contributes an average daily wastewater flow of 2.27 MGD to the city's treatment facility. The addition of approximately 325 AFISC personnel will increase the average daily wastewater flow to 2.30. Per capita flow is estimated to be 90 gpcd.

3.6.4.3 Solid Waste

The Albuquerque Solid Waste Management Department is responsible for solid waste collection and disposal. The city currently generates 1,100 tons per day (T/day) of solid waste and disposes of it in a city-owned sanitary landfill. The landfill has a current projected life span of 10 to 12 years, with expansion to a 50-year capacity. Per capita residential generation is estimated to be 3.5 pounds per day. Kirtland AFB produces 40 T/day of solid waste and disposes of it at an onbase sanitary landfill with a projected lifespan of ten years. Solid waste generation for the City is projected to increase by 1.5 to 2 percent per year. Solid waste generation is expected to increase by approximately 0.35 tons per day with the addition of the AFISC personnel.

3.6.4.4 Energy

Electricity. Electrical energy is supplied to the City and Kirtland AFB by the Public Service Company (PSC) of New Mexico. The electricity is transmitted from the Four Corners area (in northwest New Mexico) and generated by coal-fired plants. The company has 287,000 retail customers. The net generation capacity in 1989 was 1,591,000 kilowatts (kW), with a peak demand of 1,006,000 kW. Because sales have been less than expected, PSC has a surplus generating capacity capable of accommodating projected growth in the service area. The City of Albuquerque represented 43.7 percent of the company's sales in 1989. The average residential annual consumption is approximately 6000 kilowatt-hours (kWh). A 2 percent average annual increase in electricity demand is expected for the Albuquerque area.

Electrical service is delivered to Kirtland AFB at 125 megavolt-amperes (MVA) through a substation with three transformers. The base peak usage was 59.3 MW and total consumption was 323,449,000 kWh in FY 1989.

Natural Gas. Natural gas is also provided to the City of Albuquerque and Kirtland AFB by PSC. PSC served 339,000 customers with total sales of 4.69 billion cubic feet in 1989. Long term contracts assure extensive supplies for future peak demands. The City of Albuquerque consumed 2,038,710 thousand cubic feet (Mcf) and expects a 2 percent average annual increase in gas consumption. Average residential consumption is 82 Mcf per year.

A 14-inch-high pressure main at 45 pounds per square inch (psi) supplies natural gas to Kirtland AFB. It is then metered, reduced, and distributed for heating purposes. The base consumed 1,585,589 Mcf in FY 1989. Demand is expected to remain constant. There is no natural gas supply to the Manzano Area; diesel fuel oil and propane are used for heating in this area of the base.

3.6.5 Hazardous Materials/Waste Management

3.6.5.1 Hazardous Materials Management

Hazardous materials are used and temporarily stored at various industrial facilities throughout Kirtland AFB. Most of the hazardous materials are associated with the base operations. The materials include paints, solvents, paint strippers, fuels, oils, herbicides and pesticides, and a variety of chemicals and munitions. In addition to the above materials, Kirtland AFB, the DOE, and Sandia Laboratories store and use radioactive materials in conformance with federal regulations. A radiological permit has been issued to each by the Nuclear Regulatory Commission (NRC).

Procedures for hazardous material storage, use, and spill prevention and control at Kirtland AFB are outlined in various plans including the Underground Storage Tank Management Plan, the Solvent Management Plan, and the Spill Prevention and Response Plan.

3.6.5.2 Hazardous Waste Management

Kirtland AFB operates as a generator of hazardous waste and a Treatment, Storage, and Disposal Facility (TSDF). Hazardous waste routinely generated by the base include oils, paints, thinners, solvents, and other regulated materials, including radioactive wastes. A Hazardous Waste Management Plan has been developed and implemented to ensure compliance with Resource Conservation and Recovery Act (RCRA) requirements. The base presently has a Part A RCRA permit and is expecting issuance of the Part B RCRA permit in July 1990. In addition to the Hazardous Waste Management Plan the base has also developed a Waste Minimization Guide to provide information and procedures to reduce and minimize the generation of hazardous wastes on the base.

The Defense Reutilization and Marketing Office (DRMO) is responsible for shipping hazardous waste offbase. The hazardous wastes are stored in an onbase conforming storage area, and then transported to licensed treatment and disposal facilities by DRMO-contracted transporters.

No Installation Restoration Program (IRP) sites have been identified on any of the proposed sites at Kirtland AFB. Seven sites are in the vicinity of the proposed project areas (Figure 3.6.5-1). The sites and their present status are described below.

Radioactive Burial Site No. 11 (RB-11). This disposal site was used from 1960 to 1971 and is located near the riding stables in the southwestern quadrant of the base, approximately one-half mile from proposed Site 2. The radioactive wastes consisted primarily of animal carcasses which received doses of radioactivity, animal excreta, and contaminated solid wastes. Most of the radioactivity is in the form of induced activity and short half-lived elements, but it is likely that several millicuries of elements with longer half-lives may be present. An undetermined amount of liquid waste was also disposed of, along with small amounts of hazardous and toxic chemicals, including acids, mercury, cyanides, and silver. Monitoring of the site is currently being conducted as part of the Remedial Investigation/Feasibility Study. In addition, a magnetometer survey is being conducted in order to locate a reportedly buried drum of mercury.

Radioactive Training Facilities (TS-2, TS-3, TS-4, and TS-6). These sites are located along the proposed future extension of Eubank Road between proposed Site 2 and Sites 1A and 1C. These areas are maintained for the purpose of training military personnel in alpha radiation monitoring and decontamination of simulated nuclear weapon accidents. Each site is fenced and marked with radiation warning signs and patrolled by security police. The areas are monitored on a periodic basis to ensure radiation levels are within acceptable ranges.

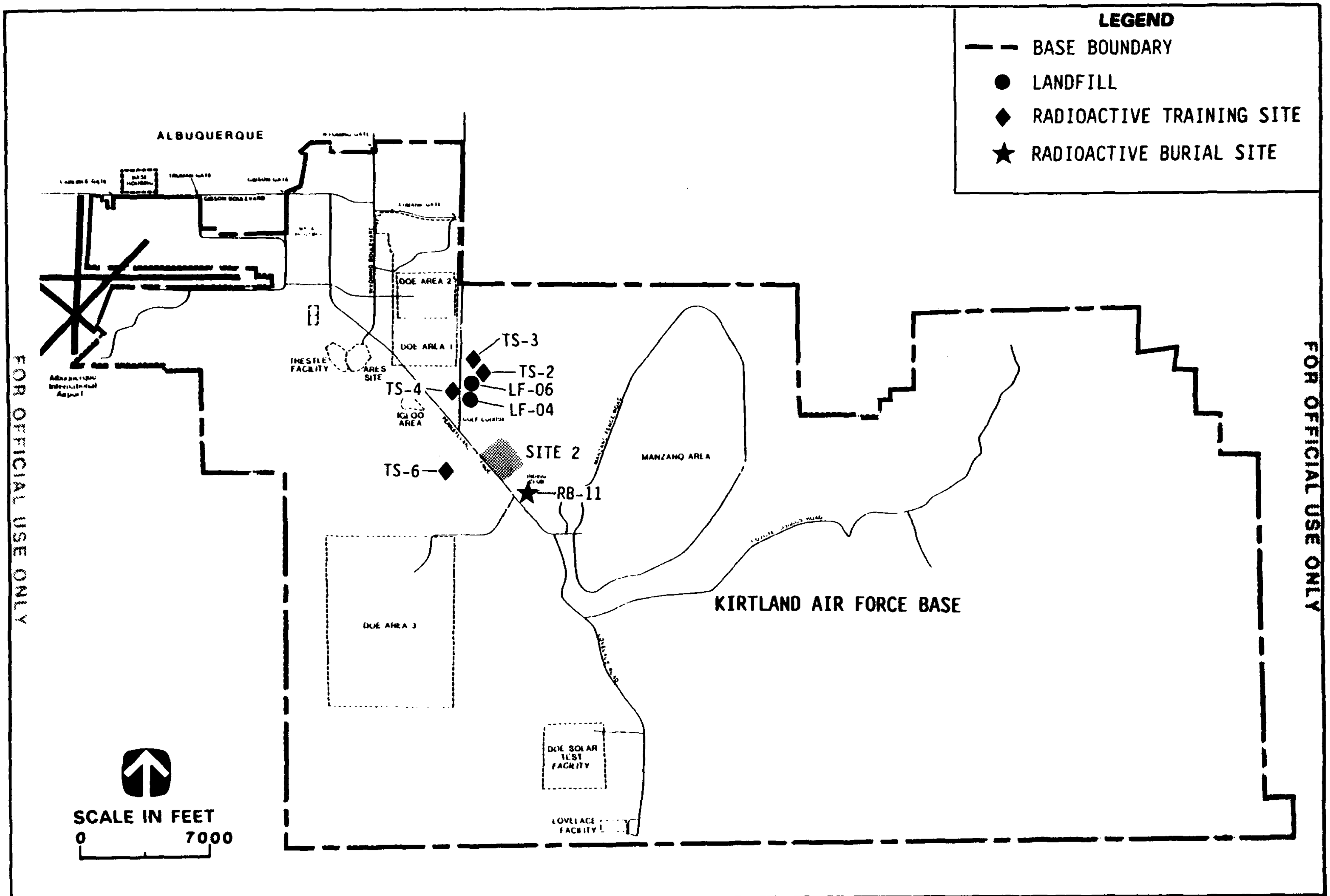

FIGURE 3.6.5-1 LOCATION OF IRP SITES NEAR PROPOSED PROJECT SITES AT KIRTLAND AFB, NEW MEXICO

Landfill Sites (LF-4 and LF-6). These sites are adjacent to each other in the north central portion of the base. Landfill No. 6 is presently used for refuse disposal. Landfill No. 4 was operated from 1965 to 1969 and used for co-disposal of solid waste with the City of Albuquerque. The site is well covered and no waste is exposed to the surface. Neither site is expected to result in potential contamination problems. A Remedial Investigation/Feasibility Study is currently in progress at both of these sites.

3.6.6 Geology and Soils

3.6.6.1 Geology

Physiology and Topography. The topography of the Albuquerque area is a flat, semiarid valley. Desert grasslands are to the west where a mesa rises abruptly to the base of a lava escarpment from a row of five small, extinct volcanoes. The Sandia and Manzano Mountains to the east of Albuquerque have a maximum elevation of 10,682 feet at Sandia Peak. The elevation of the city is 5,314 feet. Kirtland AFB and the City of Albuquerque are located in the Rio Grande Valley of the Mexican Highland Subdivision of the Basin and Range Physiographic Province. The base is located on the East Mesa of the Rio Grande Valley. The Rio Grande River, a perennial stream, receives runoff from Kirtland AFB via overland flow from arroyos and canals.

Regional Geology. Geologic units associated with Kirtland AFB range in age from pre-Cambrian to Quaternary. The lithologies of these units include unconsolidated materials, sedimentary, metamorphic and igneous materials. The geology of the north and western portions of Kirtland AFB is composed of unconsolidated units while the eastern portion of the base is underlaid by consolidated units. The north and western portions of the base are located with the Albuquerque basin while the eastern section of the base is located within an area dominated by block faulted mountains. The Albuquerque Basin to the west is a part of the Rio Grande rift which is a connected series of structural basins and grabens. The eastern boundary of the basin is defined by a complex fault system plus the Manzano-Sandia mountains. The highland and mountainous areas were formed by the accumulation of sediments. The sediment thickness varies from a few feet up to 21,000 feet in depth.

Geologic Hazards. Four major fault systems exist within the boundaries of Kirtland AFB. The Tijeras Fault and the Hubbell Springs Fault intersect on the base and are currently active. The Hubbell Springs Fault appears to control groundwater movement. The other two faults are the Sandia and Manzano faults. The Manzano Fault is believed to be responsible for raising the Manzanita and Manzano Mountains to their present height. The Sandia Fault may be a northward portion of the Hubbell Springs Fault and may represent the point where the Sandia Mountains separated from rocks underlying the Rio Grande Rift.

3.6.6.2 Soils

Within the Kirtland AFB area, there are eight different soils, complexes or associations. The soils located on flood plains and or dissected terraces include the Wink-Embudo Complex, the Wink Fine Sandy Loam, and the Bluepoint-Kokan Association. The Wink-Embudo Complex has a 0 to 5 percent slope as does the Wink Fine Sandy Loam, while the Bluepoint-Kokan Association is listed as hilly. These soils are located in landscapes that are steep in aspect with somewhat excessively drained sandy and gravelly soils within dissected terraces and alluvial fans. The soils within this association are a potential source of sand and gravel for construction activities. The hazard for water erosion is moderate or severe.

The remaining five soil types are deep soils that can be located on alluvial fans, mesas or piedmonts. They are the Latene Sandy Loam, the Embudo Gravelly Fine Sandy Loam, Madurez-Wink Association, Tijeras Gravelly Fine Sandy Loam, and Embudo-Tijeras Complex. The Latene Sandy

Loam has a 1 to 5 percent slope and the Embudo Gravelly Fine Sandy Loam a 0 to 5 percent slope. The Madurez-Wink Association has been identified as gently sloping. The Tijeras Gravelly Fine Sandy Loam has a 1 to 5 percent slope; the Embudo-Tijeras Complex has a 0 to 9 percent slope. Soils located on alluvial fans, mesas, or piedmonts generally have well-drained loamy textures and may be used for range, watershed, wildlife habitats, and community development. Erosion potentials for these soils tend to range from slight to moderate.

There are no prime or unique farmland soils located on Kirtland AFB. All of the soils located within the base have a dryland capability that indicates unsuitability for cultivation or severe limitations because of the risk of erosion.

3.6.7 Water Resources

3.6.7.1 Groundwater

Kirtland AFB lies within the limits of the Rio Grande underground water basin. The principal aquifer of the Rio Grande Basin supporting the city of Albuquerque and Kirtland AFB is contained within the Santa Fe formation. This formation is valley fill and is composed of unconsolidated and semi-consolidated sands, gravels, silts and clays of the Pliocene Santa Fe formation plus alluvial fan deposits resulting from upland erosion. The Rio Grande basin is 27 miles wide and 90 miles long (Albuquerque economic development 1988). The valley fill varies from a few feet thick nearer to the Sandia and Manzano Mountains to over 21,000 feet thick at a point five miles southwest of the airfield on Kirtland AFB.

Ground water exists in the valley fill under water table (unconfined) conditions (Engineering-Science 1981). The water table of the Albuquerque area is known to be an irregular surface probably due to changes in local permeability, variations in saturated thickness and local withdrawal and recharge of ground water. Water level fluctuations may be brief, seasonal or long term. This will depend whether the recharge to the system occurs from precipitation, underflow of groundwater from adjacent areas and seepage from streams, canals drains, surface reservoirs and applied crop irrigation water. Recharge is most likely to occur at the base of mountains where permeability is enhanced due to the coarse-grained soils.

The impact of local faulting on Kirtland AFB ground water flow in not known, but well data suggests that the area east of the Hubbell Springs Fault may have significantly shallower ground water level than that portion of the base west of the fault. The regional water table slopes at a shallow gradient diagonally down valley from the upland areas in the south westward direction moving to the Rio Grande area.

The City of Albuquerque obtains its water from approximately 89 wells that have been drilled throughout the metropolitan area. The water is pumped from the wells to local enclosed reservoirs and then the water is gravity-fed to the consumers through a waterline distribution system. Annual production of water in 1988 was 36,864 million gallons with a daily peak of 203 million gallons.

Regional groundwater monitoring is a component of the comprehensive plan to identify sources of nitrate, volatile organics, and gasoline contamination, as all three have been found as contaminates in the groundwater. Septic tanks, agricultural activities, solid waste disposal sites, petroleum handling facilities, solid waste disposal sites, and illegal discharges are other sources of contamination which threaten groundwater quality.

3.6.7.2 Surface Water

Kirtland AFB is drained primarily by the Rio Grande River, located about 4 miles west of the base boundary. Runoff from the base either drains into the river via overland flow to arroyos (Tijeras Arroyo and Arroyo del Coyote occur on the base), canals, and man-made drainages, or infiltrates into surface soils. The only permanent surface waters near the proposed project areas are five ponds at the base golf course. Man-made drainages occur mostly in the northern, developed portion of the base. Natural drainages include the two arroyos mentioned above and an unnamed drainage between them. Localized flooding on the base occurs only for brief periods when surface drainage flow is restricted within the arroyos.

3.6.8 Air Quality

3.6.8.1 Regulatory Setting

Pollutant emissions from sources and atmospheric interactions determine the quality of air, and the effects on receptors establish the extent to which air quality is degraded. Air quality in a given location is described by the concentration of various pollutants in the atmosphere which are expressed in units of concentration, generally parts per million (ppm) or micrograms per cubic meter ($\mu g/m^3$). The significance of a pollutant concentration is determined by comparing it with an appropriate federal and/or state ambient air quality standard. These standards represent the allowable atmospheric concentrations at which public health and welfare are protected and include a reasonable margin of safety. National ambient air quality standards (NAAQS) have been established by the U.S. Environmental Protection Agency for the following pollutants: ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter smaller than 10 micrometers in diameter (PM_{10}), lead, and sulfates (Table 3.6.8-1).

The federal Clean Air Act requires air pollutant emissions from various sources, such as the operations at Kirtland AFB to comply with the NAAQS. The Clear Air Act also delegates to each state the responsibility to establish air quality rules, regulations, and standards. These rules, regulations, and standards must be at least as restrictive as the federal requirements. The State of New Mexico has adopted the federal standards, but has also established some standards which are more stringent than some of the NAAQS (Table 3.6.8-1).

The Clean Air Act gives state and local agencies the authority to establish air quality rules and regulations. Rules and regulations adopted by local air pollution control districts and accepted by the State are included in the state implementation plan (SIP). When approved by the EPA, these rules become federally enforceable. Kirtland AFB and the City of Albuquerque are within Air Quality Control Region No. 2, one of eight AQCRs in the state. Region 2 is located in the northwestern portion of New Mexico and is entirely contained within the state. Air quality control functions for all of Bernalillo County have been delegated to the Albuquerque-Bernalillo County Air Quality Control Board. Air quality management is carried out by the Albuquerque Department of Environmental Health Air Pollution Control Division.

An area is designated as being nonattainment for a particular pollutant if ambient concentrations in that area are above the corresponding standard. The Albuquerque Air Quality Control Region is classified nonattainment for carbon monoxide.

3.6.8.2 Regional Air Quality

Meteorology and Climate. The climate of the Albuquerque and Kirtland AFB region is dry and continental. Monthly mean temperature ranges from 32.7° F in January to 78.7° F in July with an annual average of 56.8° F. Annual precipitation averages 8.3 inches and primarily occurs between

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Table 3.6.8-1

National and New Mexico Ambient Air Quality Standards

Pollutant	Federal Primary Standards	Federal Secondary Standards	New Mexico Standards
Ozone			
1-Hour Average	.12 ppm*	.12 ppm	.06 ppm
Carbon Monoxide			
8-Hour Average	9 ppm	9 ppm	8.7 ppm
1-Hour Average	35 ppm	35 ppm	13.1 ppm
Nitrogen Dioxide			
Annual Arithmetic Average	.053 ppm	.053 ppm	.05 ppm
24-Hour Average	- - - -	- - - -	.10 ppm
Sulfur Dioxide			
Annual Arithmetic Average	.03 ppm	- - - -	.02 ppm
24-Hour Average	.14 ppm	- - - -	.10 ppm
3-Hour Average	- - - -	.50 ppm	- - - -
Total Suspended Particulates			
Annual Geometric Mean	75 $\mu g/m^3$**	60 $\mu g/m^3$	60 $\mu g/m^3$
24-Hour Average	260 $\mu g/m^3$	150 $\mu g/m^3$	150 $\mu g/m^3$
Suspended Particulate Matter (PM_{10})			
Annual Arithmetic Mean	50 $\mu g/m^3$	50 $\mu g/m^3$	50 $\mu g/m^3$
24-Hour Average	150 $\mu g/m^3$	150 $\mu g/m^3$	150 $\mu g/m^3$

Notes: *ppm - parts per million
**$\mu g/m^3$ - micrograms per cubic meter

June and September as brief and sometimes heavy thunderstorms. Snowfall occurs between December and March and averages approximately 10.3 inches annually. During the winter, the Sandia Mountains shelter the Albuquerque area from frigid winds that sweep down the plains from the East. The relative humidity ranges from 16 to 69 percent.

Existing Air Quality. The air quality in the Albuquerque area is generally very good. Existing air quality near Kirtland AFB can be estimated by air monitoring measurements made at monitoring stations located near the base. There are 14 ambient air monitoring stations located within the city. Thirteen sites monitor total suspended particulates (TSP), 8 sites monitor PM_{10}, 5 sites monitor O_3, 6 sites monitor CO, 1 site monitors NO_x, and 7 sites record wind speed and direction. The closest monitoring station to the base, Site 2ZN, is located approximately 2 miles west of proposed project Sites 1a and 1/c. This station monitors CO, TSP, and PM_{10}. A summary of the maximum pollutant concentrations occurring from 1986 to 1988 at three monitoring stations near the base is presented in Table 3.6.8-2. Sites 2R and 2ZE are located approximately 5 miles west and 2.5 miles northwest of proposed project Sites1a and 1c. The maximum concentration recorded at a station in the County and number of samples taken in which the federal and state standards were exceeded for each pollutant for which information was available is also provided for comparison. The 8-hour ambient quality standard for carbon monoxide was exceeded in all three years at Site ZE. The one-hour average state standard for ozone was exceeded in all three years at Site 2R and in 1987 and 1988 at Site 2ZE.

The worst air quality problems occur in areas of high traffic density, such as major shopping centers, and in downtown Albuquerque. Carbon monoxide violations are generally found in the downtown area of Albuquerque because of the large volume of automobile emissions there. Control strategies have been implemented to reduce NO_x, HC, and CO emissions. These include improvement of vehicle exhaust controls, a vehicle inspection program, less reliance on cars for travel, and improved traffic flows. The city has also implemented a fireplace ordinance which restricts the use of fireplaces during certain meteorological conditions.

3.6.8.3 Emission Sources

An emissions inventory for Bernalillo County is presented in Tables 3.6.8-3. Emissions data were available for PM_{10}, SO_x, NO_x, CO, and hydrocarbons (HC). In Bernalillo County, the majority of stationary source emissions for NO_x was from fuel combustion, while the majority of HC emissions were from solvent use (e.g., surface coating, industrial solvent use, and consumer products) in industrial processes. The predominant source of emissions of CO and NO_x in the county is from mobile sources. Mobile sources account for approximately 95 percent of the total CO emissions, 80 percent of the NO_x emissions, and 87 percent of the HC emissions.

Primary sources of air pollutants in the City of Albuquerque include vehicular emissions, residential wood burning, dust from unpaved roads and construction sites, and to a lesser degree some industrial operations. The geographic location of Albuquerque at a mile high altitude plus the Sandia Mountains to the east, tend to aggravate any air pollution problems, especially in the winter months when residential wood burning is increased.

3.6.9 Noise

3.6.9.1 Regulatory Setting

As a result of Kirtland AFB operating as a tenant of, and under joint use with, Albuquerque International Airport, an Air Installation Compatible Use Zone (AICUZ) study is not required. Kirtland AFB operates under the jurisdiction of the Federal Aviation Administration (FAA) program for airport noise control planning called the Federal Aviation Regulation (FAR) Part 150. This Table

Table 3.6.8-2

Summary of Air Quality Monitoring Data for the Kirtland AFB Area
1986-1988

	Site 2R			Site 2ZE			Site 2ZN			Bernalillo[1] County		
	1986	1987	1988	1986	1987	1988	1986	1987	1988	1986	1987	1988
Ozone												
Maximum Concentration (ppm/1 hour)[2]	.088	.093	.088	.050	.103	.107	--[3]	--	--	.11	.12	.109
Samples > Standard												
Federal (>.12 ppm, 1 hour)	0	0	0	0	0	0	--	--	--	0	0	0
State (>.06 ppm, 1 hour)	179	165	220	1	209	212	--	--	--	220	245	273
Carbon Monoxide												
Maximum Concentration												
(ppm/1 hour)	--	--	9.0	20.0	24.0	16.0	--	14.0	13.0	20.0	16.4	21.0
(ppm/8 hours)	--	--	3.9	14.0	12.4	11.0	--	7.0	7.1	15.1	24.0	14.2
Samples > Standard												
Federal (>9.0 ppm, 8 hours)	--	--	0	N/A[4]	N/A	N/A	--	1	N/A	N/A	N/A	N/A
(>35 ppm, 1 hour)	--	--	0	0	0	0	--	0	0	0	0	0
State (>8.7 ppm, 8 hours)	--	--	N/A	N/A	N/A	N/A	--	N/A	N/A	N/A	N/A	N/A
(>13.1 ppm, 1 hour)	--	--	N/A	N/A	0	N/A	--	0	0	N/A	N/A	N/A
Nitrogen Dioxide												
Annual Average (ppm)	--	--	--	--	--	--	--	--	--	.017	.018	.018
Maximum Concentration (ppm/24 hours)	--	--	--	--	--	--	--	--	--	--	--	--
Samples > Standard												
Federal (.053 ppm, Annual Average)	--	--	--	--	--	--	--	--	--	0	0	0
State (>.10 ppm, 24 hours)	--	--	--	--	--	--	--	--	--	--	2	1

Table 3.6.8-2, Page 2 of 2

	Site 2R			Site 2ZE			Site 2ZN			Bernalillo[1] County		
	1986	1987	1988	1986	1987	1988	1986	1987	1988	1986	1987	1988
<u>Sulfur Dioxide</u>												
Annual Average (ppm)	--	--	--	--	--	--	--	--	--	.006	--	--
Maximum Concentration (ppm/24 hours)	--	--	--	--	--	--	--	--	--	.02	--	--
Samples > Standard												
Federal (>.03 ppm, Annual Average)	--	--	--	--	--	--	--	--	--	0	--	--
(>.14 ppm, 24 hours)	--	--	--	--	--	--	--	--	--	0	--	--
State (>.02 ppm, Annual Average)	--	--	--	--	--	--	--	--	--	--	--	--
(>.10 ppm, 24 hours)	--	--	--	--	--	--	--	--	--	--	--	--
<u>Total Suspended Particulates</u>												
Annual Geometric Mean ($\mu g/m^3$)[5]	75	75	93	49	50	51	--	49	--	102	88	105
Maximum Concentration ($\mu g/m^3$/24 hours)	174	165	233	148	139	112	--	71	--	277	262	311
Samples > Standard												
Federal (>260 $\mu g/m^3$, 24 hours)	0	0	0	0	0	0	--	0	--	1	1	1
State (>150 $\mu g/m^3$, 24 hours)	4	2	10	0	0	0	--	0	--	8	6	10
<u>PM_{10}</u>[6]												
Annual Arithmetic Mean ($\mu g/m^3$)	--	--	--	33	33	29	--	30	28	33	51	49
Maximum Concentration ($\mu g/m^3$/24 hours)	--	--	--	125	107	67	--	60	77	125	107	95
Samples > Standard												
Federal (>150 $\mu g/m^3$, 24 hours)	--	--	--	0	0	0	--	0	0	0	0	0

Notes: [1]Maximum recorded in Bernalillo County.
[2]Parts per million.
[3]Not monitored.
[4]N/A = Not available.
[5]Micrograms per cubic meter of air.
[6]Fine particulates with an aerodynamic diameter of 10 micrometers or less.

Source: New Mexico Health and Environment Department 1989.

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Table 3.6.8-3

**Emissions Inventory for
City of Albuquerque and Bernalillo County
1986**

	Emissions (tons/year)				
Source Category	**HC**	**CO**	**NO_x**	**SO_x**	**PM**
Transportation	19,258	174,608	12,860	245	2,564
Residential	1,151	8,180	747	20	1,120
Public Roadway (Dust)	--	--	--	--	38,315
Industrial	1,640	139	2,007	10	1,475
Commercial	--	65	327	2	16
Agriculture	--	--	--	--	13
Construction/Development	--	--	--	--	17,281
Solid Waste Disposal	6	104	7	--	<1
Miscellaneous	99	328	19	3	63
TOTAL:	22,154	183,424	15,967	280	60,847

Source: Albuquerque Environmental Health Department, Air Pollution Control Division, 1988.

program includes provisions for the development and submission of noise exposure maps and noise compatibility programs to the FAA by airport proprietors. The basic objectives of the program are to determine the existing noise condition around the airport; identify the noise problem areas; review and select both land use and operational noise control alternatives; and coordinate and interact with operators, users, neighbors, local governments, and the FAA. The most recent FAR 150 study for the Albuquerque International Airport was prepared in 1989. This study incorporates baseline data from Kirtland AFB aircraft as a portion of the flight operations at Albuquerque International Airport.

3.6.9.2 Existing Noise Sources

Aircraft take-offs and landings constitute the primary source of noise at Kirtland AFB. The runway at Albuquerque International Airport is less than 3 miles from the proposed project areas. All three proposed project areas lie for the most part outside the 65 day-night equivalent noise level (L_{dn}) contour for projected noise exposure in 1993 (Figure 2.4.4-1). Portions of proposed project Sites 1B and 2 are within the 65 L_{dn} contour. Based on the daily operations in 1988, the majority of the noise results from civilian aircraft arrivals and departures as air carrier and commuter aircraft comprise the majority of take-offs and landings at the airport.

3.6.10 Biological Resources

3.6.10.1 Vegetation

Site 1b is a developed area containing no significant native plants. Vegetation in this area is limited to landscaping plants (i.e., lawns and planted bushes and trees). Sites 1a and 1c are located on a nearly level area along both sides of Eubank Boulevard north of the Kirtland AFB Eubank gate. Large portions of this area to the northeast and east have been disturbed by fire human activity, and by the past and present activity of black-tailed prairie dogs (*Cynomys ludovicianus*). Human disturbance has been relatively greater on the offbase portions of these sites with the exception of a recreational vehicle area onbase which is regularly mowed. Sites 1a and 1c can be classified as disturbed grasslands dominated by black grama (*Bouteloua eriopoda*), tobasa (*Hilaria mutica*), dropseed and sacoton (*Sporobolus* spp.), and ring muhly (*Muhlenbergia torreyi*). The most heavily disturbed areas contain high numbers of ephemeral annual plant species such as hiddenflower (*Cryptantha mexicana*) and spectacle-pod (*Dithyrea wislizenii*).

Site 2 is somewhat more varied in topography and is relatively less disturbed than Sites 1a and 1c. There is a greater diversity of plant species on site 2, but the dominant species are the same as those listed above for Sites 1a and 1c. Site 2 contains several depressions and ephemeral washes which support Louisiana wormwood (*Artemesia ludoviciana*) and Rio Grande valley cottonwood (*Populus fremontii* v. *wislizenii*). In addition, a rather wide shrubby area, dominated by fourwing saltbush (*Atriplex canescens*) and indian hemp (*Apocynum cannabinum*).

3.6.7.2 Wildlife

There are no fishing streams or lakes on Kirtland AFB and no hunting is allowed onbase. Because of the lack of competition from livestock, animals that feed on grasses are abundant. Muledeer (*Odocoileus hemionus*) are often sited in winter months. During a field survey in June 1990, a coyote (*Canis latrans*) was sighted daily on Site 2. Common small mammals include black-tailed jack rabbit (*Lepus californicus*), desert cottontail (*Sylvilaqus audubonii*), rock squirrel (*Spermophilus variegatus*), ground squirrels (*Spermophilus* spp.) and black-tailed prairie dogs (*Cynomys ludovicianus*).

Common reptile species on the proposed sites include little striped whiptail (*Cnemidophorus inornatus*), desert short-horned lizard (*Phrynosoma douglassi ornatissimum*), leopard lizard (*Gambelia wislizenii*), and prairie rattlesnake (*Crotalus viridis viridis*).

Raptor species expected in the area include Swainson's hawk (*Buteo swainsoni*), red-tailed hawk (*Buteo jamaicensis*), golden eagle (*Aquila chrysaetos*), burrowing owl (*Athene cunicularia*), and turkey vulture (*Cathartes aura*). During the survey in June 1990, a red-tailed hawk was sighted over Site 2 and a large colony of burrowing owls was seen for aging at Site 1a east of the existing housing area. Other avian species common on the sites include horned lark (*Eremophila alpestris*), western meadowlark (*Sturnella neglecta*), lark bunting (*Calamospiza melanocorys*), starling (*Sturnus vulgaris*), scaled quail (*Callipepla squamata*), mourning dove (*Zenaida macroura*), and rock dove (*Columba livia*).

3.6.10.3 Threatened and Endangered Species

Gramma grass cactus (*Toumeya papyracanthus*) is a USFWS Category 2 candidate species and Wright's pincushion cactus (*Mammillaria wrightii*) is listed by the State of New Mexico as a sensitive species. Both plants are known to occur within the proposed project sites. During the June 1990 survey, gramma grass cactus was found in relative abundance at Site 1a and one specimen was found at Site 2. One specimen of Wright's pincushion cactus was discovered at Site 2.

The American bald eagle (*Haliaeetus leucocephalus*), American peregrine falcon (*Falco peregrinus anatum*), and whooping crane (*Grus americana*) are all federally-listed endangered species which occur in Bernalillo County. The Mexican spotted owl (*Strix occidentalis lucida*) is a USFWS Category 2 candidate species which also occurs in the area. None of there species is known to occur within the proposed project areas.

3.6.10.4 Wetlands

No wetlands exist on sites 1a, 1b, or 1c. The northeast portion of site 2 contains several ephemeral streams. These are not expected to be large enough or persistent enough to constitute jurisdictional wetlands.

3.6.11 Cultural and Paleontological Resources

3.6.11.1 Prehistoric Resources

Prehistoric site types identified on Kirtland AFB include pueblos, pithouse villages, rockshelters, hunting blinds, agricultural terraces, quarries, lithic and ceramic scatters, and lithic scatters. Approximately 71 percent of the base has been inventoried for cultural resources; however, survey techniques and procedures vary greatly between projects. Sixty prehistoric sites have been recorded onbase and most represent the Anasazi period (A.D. 1 to 1540). Previous cultural resource surveys identified no prehistoric sites at proposed Site 2. A cultural resources survey is presently being conducted for Sites 1A and 1C.

Native Americans with concerns in this area include Sandia Pueblo, located north of Albuquerque, and Isleta Pueblo, south of the base. Archaeological sites may contain ceremonial features such as kivas, village shrines, petroglyphs, or burials; all of these site types or features would be of concern to local groups. The New Mexico State Office of Indian Affairs and the All Indian Pueblo Council have been contacted in order to identify specific native American groups with concerns in the project areas.

3.6.11.2 Historic Resources

Forty-two historic sites have been identified during previous cultural resource surveys onbase. These sites represent early mining, ranching, sheepherding, commercial ventures, and transportation routes. Historic sites associated with mining activities include shafts, prospects, tunnels, tailing dumps, claim cairns, trash scatters, and habitation sites. Ranching and sheepherding sites consist of corrals, ditches, stone foundations, camps, and trash scatters. The remnants of a bottling plant in operation from 1900 to 1930 also occurs onbase.

Kirtland AFB was established in 1942 at the location of the original Albuquerque Airport. Only four standing structures onbase are older than 50 years. Three buildings are aviation-related facilities (i.e., hangars and a depot) and the fourth is the Kirtland AFB West Officer's Club. The three aviation facilities have been recommended as not eligible for the National Register of Historic Places (NRHP), the Officers Club was built in 1936 in the Spanish Colonial style and is considered NRHP-eligible.

Previous cultural resource surveys located only one historic site at proposed Site 2. This site consists of a sparse scatter of historic debris mixed with modern trash and debris from the golf course. This historic site lacks integrity and is not considered NRHP-eligible.

3.6.11.3 Paleontological Resources

Five major geologic formations have surface exposures on Kirtland AFB: Pleistocene pediments and gravels, Miocene Santa Fe Group (undivided), Pennsylvanian-Mississippian Madera limestone and Sandia Formation (undivided), Permian Abo Sandstone, and PreCambrian rock. The majority of the base consists of Pleistocene pediments, terrace deposits, gravel, sand, and caliche. The Miocene Santa Fe Group occurs along Tijeras Canyon in the center of the base. The Madera limestone and Sandia formation occurs along with the PreCambrian rock along the mountain front on the east edge of the base. The Permian Abo Sandstone, a red sandstone, is located along the Manzano Mountains in the southern portion of the base.

Only three formations may contain paleontological materials: the Pleistocene deposits, the Santa Fe Group, and the Madera limestone/ Sandia formation. Pleistocene sediments contain mastodon, mammoth, horse, camel, antelope, musk ox, caribou, ground sloths, bison, cave bear, dire wolf, lion, saber-toothed cat, and other types of extinct and modern fauna, including birds and freshwater pelecypods and gastropods. Pleistocene fauna have been found in cave locations and river gravels around Albuquerque.

The Santa Fe Group represents a diverse deposit of early mammal forms, reptiles, birds, and plants from the middle Miocene to the early Pliocene. Extinct and modern mammals, and precursors of modern forms found in this deposit include deer, antelope, gazelle, horse, pig, camel, elephant, rhinoceros, hippopotamus, rabbit, beaver, mole, shrew, ground sloth, hedgehog, peccary, dog, fox, cat, raccoon, badger, skunk, and weasel. Other fossil forms found in association are a vulture-like bird, tortoise, lizard, frog, petrified wood, and palm frond. Because of the diversity of the Santa Fe Group deposits, environmental reconstruction of the Miocene/Pliocene is possible. However, fossiliferous deposits of the Santa Fe Group to the extent mentioned above, are discretely clustered north of Santa Fe. The Santa Fe Group outcrops around Albuquerque may contain a few small skeletal fragments of mammal forms, but are not as diverse or well-preserved.

Insects, crustaceans, eurypterids, amphibians, and fish have been preserved in swamp sediments in the Madera limestone/Sandia formation in the Manzanita Mountains east of Albuquerque. According to Kues (1982), Pennsylvanian paleontological fossils are abundant, diverse, and widely distributed.

4.0 ENVIRONMENTAL IMPACTS

According to the Council on Environmental Quality regulations for implementing the National Environmental Policy Act (NEPA), "The NEPA process is intended to help public officials make decisions that are based on understanding environmental consequences, and take actions that protect, restore, and enhance the environment" (40 CFR 1500.1). The focus of the discussion in this chapter is, therefore, on evaluation of potential impacts to the natural environment. In order to provide the context in which impacts to the environment may occur, discussions of potential changes to local population, land use and aesthetics, transportation, and community utility services are included. In addition, issues related to current and future management of hazardous waste/materials are discussed. Potential impacts to the natural environment are evaluated for the following resource categories: geology and soils, water resources, air quality, noise, biological resources, and cultural and paleontological resources. These impacts may occur as a direct result of base closure or as an indirect result of changes to the community or changes in handling of hazardous waste/materials. Potential mitigation measures for all significant environmental impacts are discussed following the resource sections. In addition, the relationship between short-term uses and long-term productivity of the environment and irreversible and irretrievable commitment of resources are discussed.

4.1 LOS ANGELES AIR FORCE BASE, CALIFORNIA

This section presents the environmental impacts associated with the proposed closure of Los Angeles AFB. In this context, the base is considered to be inclusive of Areas A and B at Aviation and El Segundo Boulevards within the City of El Segundo; the Aerospace Corporation in the City of El Segundo; Lawndale Annex in the City of Hawthorne; and the Fort MacArthur, Pacific Crest, and Pacific Heights military family housing areas within the San Pedro community of Los Angeles. The no action alternative is also discussed.

4.1.1 Community Setting

The Air Force is sensitive to the community upheaval that may be caused by closing a major employer like Los Angeles Air Force Base (AFB). Therefore, the Air Force has advised the local communities that help is available from the Office of Economic Adjustment (OEA) upon their request. The OEA, located in the Office of the Assistant Secretary of Defense, is the chief staff arm for the President's Economic Adjustment Committee (EAC). The EAC consists of federal department and agency heads and was established under Executive Order 12049 on March 27, 1978, to provide resources to various federal agencies in assisting communities affected by base closures. One of the OEA's activities is to assist support communities in the development and implementation of comprehensive economic recovery programs. The EAC then affords priority assistance to community requests for federal technical assistance, financial resources, excess or surplus property, or other requirements that are part of this program.

4.1.1.1 Proposed Action

The proposed action to close Los Angeles AFB and relocate Space Systems Division (SSD) to another installation would result in an initial reduction in employment in the South Bay area of approximately 1,700 jobs beginning in 1993, reaching a total of approximately 17,000 jobs by 1997. Of this total, about 8,150 would be direct military and civilian positions at Los Angeles AFB, while about 8,850 would be indirect workers.

The proposed action would result in reduction of $48 million in personal income to the area in 1993, reaching $480 million by 1997 and each year thereafter. Los Angeles County would experience the greatest majority of this loss in income.

The proposed action would reduce population by about 23,200 people who would relocate to the new location. Of this total, 26 percent would be military personnel and dependents; 60 percent would be civilian government workers, support contractor personnel, and their dependents; and 14 percent would be indirect workers and retirees with their families. The loss of 23,200 population in Los Angeles County would have no discernible effect on the nature of its population base and would be offset by projected growth within 1 year.

4.1.1.2 Alternative Actions

Three of the four alternative actions under evaluation would affect Los Angeles AFB including Alternative 1, the total closure of Los Angeles AFB and relocation of SSD-LA without the inclusion of SSD-SB; Alternative 2, the partial closure of Los Angeles AFB and relocation of a portion of SSD-LA including SSD-SB; and, Alternative 4, the relocation of 1,000 personnel from SSD-LA. The total employment, personal income, and population effects of these alternatives is summarized in Table 4.1.1-1.

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Table 4.1.1-1

Projected Reductions in Employment, Personal Income, and Population
Proposed Action and Alternatives
Los Angeles AFB
1997

	Proposed Action	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Employment	16,975	16,975	10,899	-	2,080
Direct	8,145	8,145	5,240	-	1,000
Indirect	8,830	8,830	5,659	-	1,080
Personal Income (millions 1990 $)	482	482	309	-	48
Population	23,173	23,173	14,878	-	2,812

4.1.1.3 No Action Alternative

Under the no action alternative, socioeconomic activity in the region surrounding Los Angeles AFB will be characterized by the baseline descriptions found in Chapter 3.0.

4.1.2 Land Use and Aesthetics

4.1.2.1 Proposed Action

Existing Land Use Patterns. Closure of Los Angeles AFB would have no effect on land ownership because the Air Force would retain the property until an appropriate reuse has been determined. Facilities would be vacated and a caretaker program would provide maintenance to prevent deterioration and retain a positive appearance until the reuse of the property is determined.

Land Use Plans and Policies. Land use plans and policies in the areas surrounding Los Angeles AFB facilities would undergo revisions to accommodate the type of development that base closure would allow.

Aesthetics and Visual Resources. No construction or demolition activities are planned as part of the proposed closure action. The installation would be under Air Force control within a secured boundary. Buildings and grounds would be minimally maintained until final disposition is decided. Therefore, some change in aesthetics and visual resources is anticipated.

4.1.2.2 Alternative Actions

Alternative 1. This alternative action would be identical to that of the proposed action for Los Angeles AFB.

Alternative 2. This action would reduce the number of facilities that would be closed.

4.1.2.3 No Action Alternative

Los Angeles AFB and the Aerospace Corporation would continue their present mission, Area A facilities would be refurbished, Area B facilities would be demolished, and new facilities would be constructed. The present military housing would continue. The Lawndale Annex No. 3 facility would be sold. The land use and aesthetic effects would not be significant.

4.1.3 Transportation

4.1.3.1 Proposed Action

Closure of Los Angeles AFB and its ancillary facilities would require the transport of material, supplies, and personnel to another military facility (to be determined). Several transport methods, including truck, freight train, and airplane, could be used to transport personnel and equipment to the receiving base.

Transportation Systems. Los Angeles AFB is adjacent to two major railroads. The Southern Pacific Railroad line parallels the southern portion of Area A, perpendicular to Aviation Boulevard. The Atchison Topeka and Santa Fe Railroad line runs parallel to Aviation Boulevard, along the western and eastern portion of Area A and Area B, respectively. However, Los Angeles AFB has not, to date, utilized these facilities and it is not anticipated that the base would do so during drawdown.

Ground Traffic. Traffic volume would increase on Aviation, El Segundo, and Compton boulevards during closure activities; however, the proposed phased drawdown would mean that not all relocations and equipment transport would occur simultaneously. Even though the traffic volume would increase, in general, this effect would be offset by the decrease in traffic after the base is closed. Approximately 3,700 vehicles enter or exit the base daily. After closure, the number of vehicles would be reduced, resulting in a 10 percent decrease in daily traffic on Aviation Boulevard, a 10 percent decrease on El Segundo Boulevard, and a 5 percent decrease on Compton Boulevard.

Air Traffic. Closure of Los Angeles AFB would have a slight beneficial impact on air traffic at nearby Los Angeles International Airport in that the approximately 64,000 commercial flights per year taken by military and civilian personnel would be eliminated. It is reasonable to assume, however, that commercial carriers would be adversely affected by this reduction. No military aircraft are assigned to Los Angeles AFB.

4.1.3.2 Alternative Action

Under the alternative action, use of the existing transportation system, traffic volumes, and air travel would be proportionately less than the existing levels of impact.

4.1.3.3 No Action Alternative

Auto traffic volume and flow would be the same as present conditions. Air traffic would also continue as presently defined.

4.1.4 Utilities

4.1.4.1 Proposed Action

Water Supply. The relocation of Los Angeles AFB and its related facilities would result in a reduction in demand of potable water of approximately 0.47 million gallons per day (MGD). This would represent a 0.03 percent reduction to the Southern California Water Company and a 0.07 percent reduction to the Los Angeles Department of Water and Power. Closure of the base would not eliminate the total need for water; some usage would be required for caretaker activities in the interim period until final disposition of the base is determined. Base closure would also result in civilian and military personnel living offbase vacating their residences. Assuming 200 gallons per capita per day, this represents a reduction of 3.0 MGD of the average daily usage for the metropolitan area. The combined reduction of water demand would have no adverse impact on the water purveyors.

Wastewater Treatment. The relocation of Los Angeles AFB would result in the reduction of approximately 0.26 MGD of base- and military family housing-generated wastewater flow, or a 0.05 percent of the annual average flow of wastewater to the Los Angeles County Sanitation District. The vacating of offbase residences, which are inhabited by either base-related military or civilian employees, would result in an estimated decrease of 1.5 MGD of wastewater flow to the metropolitan area. These combined wastewater flow reductions would have no adverse impact on the capacity or operation of the numerous treatment facilities involved.

Solid Waste. Base closure would result in a short-term increase in the amount of solid waste generated by the base from closure and removal activities and disposal to the Los Angeles County Sanitation District. The reduction in the solid waste normally generated by the base of 6,901 tons per year would offset this short-term increase. Solid waste generation from offbase military and civilian personnel would result in an additional decrease of 6,700 tons per year. This combined decrease would have no adverse impact on those involved with solid waste removal or disposal operations.

Energy. The relocation of Los Angeles AFB and Aerospace Corporation would result in an annual reduction of approximately 90,500,000 kilowatt-hours (kWh) or 0.01 percent of the amount of electric power provided by the Southern California Edison Company in 1989. Relocation, however, would not eliminate all power consumption at the base because some electrical usage would be required for caretaker activities until final disposition of the base is determined. Residential units occupied by military and civilians which have been vacated due to relocation would also reduce electric power consumption by an average of 370 kWh per month per unit. No significant effect on the Southern California Edison Company is expected due to the closure of Los Angeles AFB.

Base closure would also reduce the natural gas consumption of approximately 175,600 million cubic feet annually. This represents 0.00005 percent of the amount of natural gas provided by Southern California Gas Company in 1989. Relocation would not eliminate all natural gas consumption at the base because some natural gas usage would be required for caretaker activities until final disposition of the base is determined. Residential units occupied by military and civilians which have been vacated due to base closure would reduce natural gas consumption by an average of 5,000 cubic feet annually. No significant impacts to Southern California Gas Company are expected.

4.1.4.2 Alternative Actions

Alternative 1. The impacts of this alternative are the same as those of the proposed action.

Alternative 2. Partial closure of Los Angeles AFB would occur under this alternative. Approximately 13,000 personnel would relocate if Alternative 2 were selected. There would be a major decrease in use of all the utility systems on the base. Military personnel associated with the Special Program Office would primarily utilize Aerospace Corporation facilities and Building 130 in Area A of Los Angeles AFB. Fort MacArthur would continue to be used for military family housing needs. The following is an estimation of decreased demand to the utility systems for Alternative 2:

	Los Angeles AFB	MFH	Offbase
Water (GA)	63,360,000	41,086,000	955,205,000
Wastewater (GA)	30,046,500	19,150,000	477,602,000
Solid Waste (Tons)	2,811	649	6,000
Electricity (kWh)	59,886,144	517,630	28,358,000
Natural Gas (MCF)	93,324	17,548	31,930

The decreased use of the various utility systems in Alternative 2 would not have a significant effect.

Alternative 3. Current demands on the various utility systems would continue if Alternative 3 were selected.

Alternative 4. The use of the various utility systems in Alternative 4 is estimated to decrease 10 percent. This decrease is not expected to have a significant effect.

4.1.4.3 No Action Alternative

Present demands on the various utility systems would continue if the no action alternative were selected.

4.1.5 Hazardous Materials/Waste Management

4.1.5.1 Proposed Action

Hazardous Materials Management. With base closure, hazardous materials used and stored at the various industrial locations utilized in base operations would be shipped and used elsewhere or sold as excess in accordance with applicable federal and state regulations. A small amount of hazardous materials such as gasoline, oils, herbicides, and pesticides would continue to be stored and used onbase for maintenance of the base facilities during caretaker activities. A minor beneficial impact to public health, water resources, soils, and biological resources would result due to the inventory reduction and related reduced potential for spills, and limited used of hazardous materials on the base after closure.

At the time of closure all underground storage tanks containing diesel fuel oil would have already been removed and replaced with aboveground storage tanks containing propane to meet South Coast Air Quality Management District rules. The aboveground storage tanks would be taken out of service and emptied in accordance with the City of El Segundo Fire Department regulations. All other underground storage tanks would be taken temporarily out of service and drained. Tank vent lines would remain open and functioning; all other lines, pumps, manways, and ancillary equipment would be capped and secured. Prior to closure, all tanks onbase would meet the upgraded underground storage tank standards and would remain temporarily closed during caretaker status until the disposition of the base was completed. Compliance with the regulatory requirements would avoid any adverse impacts associated with hazardous materials leaking from underground storage tanks, thus reducing the potential for contamination to soil or water resources.

Aerospace Corporation would manage the disposition of their inventory of hazardous materials. The major portion of the inventory would be shipped in accordance with state and federal regulations to the selected installation. Surplus or materials no longer utilized would be sold as excess or disposed of in conformance with federal and state regulations. Any necessary permits for the relocation would be handled by Aerospace Corporation. A minor beneficial impact to public health, water resources, soils, and biological resources would result due to the inventory reduction and related reduced potential for spills with the relocation of Aerospace Corporation.

The underground storage tanks at Aerospace Corporation containing diesel fuel would have already been removed to meet South Coast Air Quality Management District rules. The underground storage tanks containing gasoline would be taken temporarily out of service and drained. Tank vent lines would remain open and functioning; all other lines, pumps, manways, and ancillary equipment would be capped and secured. Compliance with the regulatory requirements would avoid any adverse impacts associated with hazardous materials leaking from underground storage tanks and contaminating soil or water resources.

All aboveground storage tanks would be taken out of service and emptied in compliance with requirements of the El Segundo Fire Department.

Hazardous Waste Management. The relocation of Los Angeles AFB would eliminate approximately 104 tons of hazardous waste currently generated by the base per year. Any waste collected during the relocation would be handled and disposed of in accordance with state and federal regulations. Reduction of current hazardous waste disposal activities and the potential for spills would result in a minor beneficial impact on public health, water and biological resources, and soils.

The relocation of Aerospace Corporation would eliminate approximately 61.4 tons of hazardous waste currently generated by the company per year. Any waste collected during the relocation would be handled and disposed of in accordance with state and federal regulations. Reduction of current hazardous waste disposal activities and the potential for spills would result in a minor beneficial impact on public health, water and biological resources, and soils.

Installation Restoration Program Sites. Activities to cleanup past hazardous waste sites identified in the IRP would continue at Los Angeles AFB. IRP remedial investigation/feasibility studies and subsequent remedial action is independent of the base closure process and would continue until remediation was completed.

Asbestos. An asbestos survey was completed for Los Angeles AFB and the military housing areas. No asbestos-containing materials were located in the Pacific Heights or Pacific Crest housing units. A survey of asbestos-containing materials at Aerospace Corporation would be completed prior to disposition of the facilities. During caretaker status the management and operations plan would be followed and surveys would continue to ensure no problems occur. No impact is expected.

4.1.5.2 Alternative Actions

Alternative 1. The impacts of Alternative 1 are the same as those stated above for the proposed action.

Alternative 2.

Hazardous Materials Management. The hazardous material used and stored by Los Angeles AFB under this alternative would decrease significantly. Only a small amount of materials associated with building maintenance would be necessary. A minor beneficial impact to public health, water resources, soils, and biological resources would result due to the inventory reduction and related reduced potential for spills, and limited use of hazardous materials onbase if this alternative is selected.

All aboveground and underground storage tanks would be drained and rendered temporarily out of service in accordance with state and federal regulations. Aboveground ground tanks associated with Building 130 would remain in service. The removal from operation or permanent closure of most of the aboveground and underground storage tanks at Los Angeles AFB is expected to have a minor beneficial impact on the environment because the hazardous materials which they contain would be removed, thus reducing the potential for future spills to contaminate soil and water resources.

No change in the utilization and storage of hazardous materials would occur under this alternative at Aerospace Corporation. All materials would continue to be handled in compliance with state and federal regulations. The adverse impact associated with spills of hazardous materials on public health, water and biological resources, and soils would continue.

All aboveground and underground storage tanks would continue to be used in accordance with state and federal regulations and permits.

Hazardous Waste Management. The hazardous waste stream would decrease significantly under Alternative 2. A small amount of hazardous waste associated with the operation of Building 130 would occur. The waste would be managed and disposed of in accordance with state and federal regulations by a private contractor. The reduction of hazardous waste disposal activities under Alternative 2 would result in a minor beneficial impact on public health, water and biological resources, and soils.

Under Alternative 2, the current generation of 61.4 tons of hazardous waste per year would continue at Aerospace Corporation. Adverse impacts associated with the potential for spills from current hazardous waste disposal activities would continue with Alternative 2.

Installation Restoration Program Sites. Activities to cleanup past hazardous waste sites identified in the IRP would continue at Los Angeles AFB. IRP remedial investigation/feasibility studies and subsequent remedial action is independent of the relocation process and will continue until remediation is completed.

Asbestos. Under Alternative 2, the management and operation plan would be followed and surveys would continue in Building 130 and Aerospace Corporation to ensure no problems occur from asbestos-containing materials in the buildings.

Alternative 3.

Hazardous Materials Management. Current hazardous materials management practices would continue at Los Angeles AFB and Aerospace Corporation if Alternative 3 were selected. Adverse impacts associated with the potential for spills of hazardous materials would continue under this alternative.

Hazardous Waste Management. The current hazardous waste generation and management would continue at Los Angeles AFB and Aerospace Corporation if Alternative 3 were selected. Adverse impacts associated with the potential for spills from current hazardous waste disposal activities would continue under this alternative.

Alternative 4.

Hazardous Materials Management. The current hazardous materials management would continue at Los Angeles AFB and Aerospace Corporation if Alternative 4 were selected. The estimated decrease in use of hazardous materials would be very small. Adverse impacts associated with the potential for spills of hazardous materials would continue under this alternative.

Hazardous Waste Management. The current hazardous waste generation and management would continue at Los Angeles AFB and Aerospace Corporation if Alternative 4 were selected. An estimated decrease in hazardous waste generation would be very small. Adverse impacts associated with the potential for spills of hazardous materials would continue under this alternative.

4.1.5.3 No Action Alternative

Hazardous material and waste management would continue in the current manner if the no action alternative were selected. The possible adverse impacts associated with the storage and use of hazardous materials and the generation and disposal of hazardous waste would continue.

4.1.6 Geology and Soils

4.1.6.1 Proposed Action

Geology. Closure of Los Angeles AFB would have no effect on the geology or the availability of mineral resources because the federal government would retain ownership and mineral rights until final disposition of the base.

Soils. Positive effects would occur for local topography as new construction and other activities for military missions would no longer be a concern. The elimination of new construction would prevent grading or excavating for base needs, thereby reducing the amount of soil erosion. Risks associated with new soil contamination by spills or inadvertent releases of hazardous materials caused by military operations would be eliminated.

4.1.6.2 Alternative Action

Under the alternative action, the impacts on geology and soils would be proportionately less than the full closure of the base facilities.

4.1.6.3 No Action Alternative

General base activities and new construction would contribute to some soil erosion. The potential for soil contamination through accidental releases of hazardous materials would remain. However, the base has implemented mitigation programs to manage hazardous wastes and to prevent or minimize additional contamination.

4.1.7 Water Resources

4.1.7.1 Proposed Action

Groundwater. Base closure would have a positive impact on the water quality in the area by diminishing potential and ongoing impacts to groundwater quality. Fuel and other hazardous chemical storage tanks would be emptied, and spills from corroded tanks would be avoided. Currently, no groundwater is drawn from underlying aquifers for use onbase. Base closure would not reduce permeable surfaces, thereby increasing the recharge rate of the aquifer. However, it would preclude continued development that would reduce the recharge rate.

Surface Water. Base closure would have a positive impact on the water quality in the area by diminishing potential and ongoing impacts to surface water quality. The cessation of operations would also significantly reduce the introduction of contaminants to stormwater runoff. Plans for removing existing fuel and chemical storage tanks and replacing them with double-walled tanks are under development, thereby reducing the potential for spills from corroded tanks.

The overall demand for water for drinking, sanitation, irrigation, and industrial uses would be significantly reduced. In addition, the demand on the area's water facilities, which supply all of the base's water, would be significantly reduced. The reduced demand would have little actual impact. Stormwater would still be routed to the streams that drain the base so that the current hydrology of these streams would be maintained.

4.1.7.2 Alternative Action

Under the alternative action, the impacts on ground and surface water would be proportionately less than those experienced from full closure of the base.

4.1.7.3 No Action Alternative

No additional effect on existing groundwater conditions is anticipated. The potential for groundwater contamination through accidental release of hazardous materials would remain; however, the base has implemented mitigation programs to manage hazardous wastes and to prevent or minimize additional contamination.

No additional effect on existing surface water conditions is anticipated. The potential for surface water contamination through accidental release of hazardous materials would remain; however, the base has implemented mitigation programs to manage hazardous wastes and prevent or minimize additional contamination.

4.1.8 Air Quality

The closure of Los Angeles AFB and Aerospace Corporation would result in the reduction of air pollutant emissions in the area. Because the emissions from these facilities contribute only a very small fraction of the pollutant burden in the area, the improvement in air quality would not be measurable.

4.1.8.1 Proposed Action

When the base is fully demobilized and closure is complete, air emissions from base operations would be eliminated. Base closure would reduce the number of motor vehicles in the affected Los Angeles communities, which would thereby result in lower automobile emissions. In addition, the base incinerator would be deactivated. However, the reductions of air pollutant emissions are not expected to result in significant changes in local air quality. As shown in Section 3.1.8.3, the estimated emissions from the base are only a small portion of the total emissions for the Los Angeles County and the South Coast Air Basin. Therefore, the air quality impact would be insignificant. However, even though the emission reduction is relatively small, it would still have some beneficial effect on the local air quality.

4.1.8.2 Alternative Action

The alternative action would cause proportionately more air pollution than that experienced from the full closure of the base.

4.1.8.3 No Action Alternative

Present air emissions from Los Angeles AFB represent a small portion of the total emissions for the county. With the no action alternative, air emissions would remain at present levels.

4.1.9 Noise

The closure of Los Angeles AFB and Aerospace Corporation would reduce traffic and the associated noise in the local area. Day-night (L_{dn}) noise levels would be reduced approximately 1 decibel on the A-weighted scale (dBA) to 2 dBA. This reduction would hardly be detectable in the high background noise levels that currently exist in the area.

4.1.9.1 Proposed Action

No military flights are associated with current activities at Los Angeles AFB. Noise generated from ground transportation associated with the base would be reduced significantly because of the reduction in military, supplier, contractor, and dependent traffic. During drawdown and closure, the movement of equipment, supplies, and personnel could cause traffic noise to increase slightly; however, this short-term effect would be offset by the overall reduction of noise after base closure. Therefore, the proposed action would have insignificant impacts on the noise levels in the area.

4.1.9.2 Alternative Action

Noise generated from ground transportation would be proportionately greater than that experienced by the full closure of the base.

4.1.9.3 No Action Alternative

Current noise levels would continue under this alternative.

4.1.10 Biological Resources

4.1.10.1 Impacts of the Proposed Action

Vegetation. Under the proposed action, all existing facilities (e.g., buildings, parking lots, roads, landscaping) would be maintained in their present condition. Therefore, the proposed action would not have a significant impact on the plant resources of the area.

Wildlife. The most important effects of the proposed action on the wildlife of the area would result from an overall decrease in human activity. However, this decreased activity would not have a significant impact on the wildlife of the area because of the lack of suitable habitats.

Threatened and Endangered Species. No threatened or endangered species are expected to occur in the proposed project areas. Therefore, the proposed action would not have a significant impact on threatened or endangered species.

4.1.10.2 Alternative Actions

Studies indicate that the alternative actions would not have a significant impact on vegetation, wildlife, or threatened or endangered species in Los Angeles AFB area.

4.1.10.3 No Action Alternative

Studies indicate that the no action alternative would not have a significant impact on the area's vegetation, wildlife, or threatened or endangered species.

4.1.11 Cultural and Paleontological Resources

4.1.11.1 Proposed Action

No prehistoric or historic resources have been identified at Area A or the Lawndale Annex. Subsurface paleontological materials may occur in this area. However, base closure would not affect buried paleontological materials.

Three buildings, built in 1942, are located in Area B; however these historic resources are not considered eligible for the National Register of Historic Places (NRHP). No prehistoric material has been identified in this area. Subsurface paleontological materials may occur. Base closure activities would not affect cultural resources or buried paleontological materials in Area B.

Fort MacArthur contains an NRHP Historic District and an NRHP eligible site, the Trona Plant. The district and the Trona Plant would not be affected by base closure because they would be maintained in their present condition during caretaker status.

No prehistoric or historic resources presently exist in the Pacific Crest and Pacific Heights housing areas. Paleontological materials do occur in the area; however, these deposits would not be affected by closure activities.

4.1.11.2 **Alternative Action**

Impacts under the alternative action would be similar to those of the proposed action for Area A, Lawndale Annex, and the Pacific Crest and Pacific Heights Housing Areas.

4.1.11.3 **No Action Alternative**

Present levels of security would be maintained, and vandalism to the existing and eligible NRHP sites would remain at a minimum.

4.1.11.4 **Mitigation Measures**

One NRHP eligible site, the Trona Plant, and the Fort MacArthur National Register Historic District, are located in the Fort MacArthur portion of Los Angeles AFB. If the base is selected for closure under the proposed action, a Memorandum of Agreement between the base, State Historic Preservation Officer, and Advisory Council on Historic Preservation should be prepared along with a mitigation plan indicating how the Fort MacArthur National Register Historic District and the Trona Plant will be taken into account during reuse planning and development. Specific treatments are negotiable and depend largely on local and regional issues, guidelines and precedents.

4.2 BALLISTIC MISSILE ORGANIZATION, SAN BERNARDINO, CALIFORNIA

This section presents the environmental impacts associated with the proposed closure and relocation of the Ballistic Missile Organization (BMO) located in San Bernardino, California. In considering the proposed action and alternatives, the involvement of SSD-SB is limited to either a total closure and relocation or no action, with SSD-SB remaining in San Bernardino. SSD-SB is included in the proposed action and Alternative 2 in combination with SSD-LA, and singly for Alternative 3.

4.2.1 Community Setting

The Air Force is sensitive to the community disruption that may be caused by closing a major employer like BMO in San Bernardino. Therefore, the Air Force has advised the local communities that planning assistance is available from the Office of Economic Adjustment (OEA), upon their request. The OEA, located in the Office of the Assistant Secretary of Defense, is the chief staff arm for the President's Economic Adjustment Committee (EAC). The EAC consists of federal department and agency heads and was established under Executive Order 12049 on March 27, 1978, to provide resources to various federal agencies in assisting communities affected by base closures. One of the OEA's activities is to assist support communities in the development and implementation of comprehensive economic recovery programs. The EAC then affords priority assistance to community requests for federal technical assistance, financial resources, excess or surplus property, or other requirements that are part of this program. The OEA is currently working with the communities affected by the closure of Norton AFB. This effort is expected to continue or expand if BMO is relocated.

4.2.1.1 Proposed Action

The proposed action to close SSD-SB and relocate the activities to another installation would result in an initial reduction in employment in the San Bernardino area of approximately 500 jobs in 1993, reaching a total reduction of about 5,060 jobs by 1997. This total would be about equally split between direct and indirect jobs.

The proposed action would result in a reduction of approximately $48,251,000 in income for Riverside and San Bernardino counties in 1997 and each year thereafter.

The proposed action would reduce population in San Bernardino and Riverside counties by approximately 7,000 workers and their dependents who would relocate to the new location. This reduction would be offset by current growth with the area with 1 year.

4.2.1.2 No Action Alternative

With the no action alternative, socioeconomic activity in the area surrounding San Bernardino, California, would be the same as that characterized by the baseline descriptions in Chapter 3.0.

4.2.2 Land Use and Aesthetics

4.2.2.1 Proposed Action

The caretaker team established for the Norton AFB closure would be tasked to provide building, ground, and water supply system maintenance, and to provide adequate security for the vacated BMO facilities. Consequently, base land use would experience some change as a result of the closure action. This condition would continue until the disposition of excess property is completed.

4.2.2.1 No Action Alternative

Under the no action alternative, land use and aesthetics in the area surrounding San Bernardino, California, are as characterized by the baseline descriptions in Chapter 3.0.

4.2.3 Transportation

4.2.3.1 Proposed Action

The closure of BMO will reduce the number of trips to and from the base by approximately 2,200, including 2,100 commuter and 100 delivery trips. Reduced volume would affect peak-hour traffic on local streets in the Norton AFB area. The average daily traffic immediately surrounding Norton AFB would fall by more than 90 percent of the current 1990 traffic. Transferred Norton AFB employees living in Redlands, Colton, Loma Linda, and other places west and south of the base need not approach Norton AFB to commute to March AFB. The commuters who avoid the delay and congestion of highways might cause deterioration in the level of service on north-south local streets, such as Waterman Avenue, Tippecanoe Avenue, Alabama Street, Reche Canyon Road, Pigeon Pass Road, and San Timoteo Road.

Traffic volume on affected local streets is well below capacity, with the exception of Waterman Avenue, which is near capacity. In addition to the lower traffic density on the north-south Highland Avenue, peak-hour traffic will decrease on west-bound Baseline Avenue, 5th Street, 3rd Street, and Mill Street. The incremental decrease in local-street traffic volume does not change the existing level of service.

The military personnel occupying the 264 units of family housing to be retained at Norton AFB would continue to contribute to local road traffic loads.

4.2.3.1 No Action Alternative

Under the no action alternative, traffic in the area surrounding San Bernardino, California, is characterized by the baseline descriptions in Chapter 3.0.

4.2.4 Utilities

4.2.4.1 Proposed Action

The closure of BMO facilities would reduce demand for electric power by an estimated 13,480 megawatt-hours, about 0.01 percent of the total power distributed by Southern California Edison in that year. Demand for natural gas would decrease by about 12,330 million British thermal units, accounting for less than 0.001 percent of the output of Southern California Gas Company.

The closure of SSD-SB and decrease in population of about 5,000 people would reduce potable water consumption by an estimated 370 million gallons per year. This reduction would not affect the existing water treatment and delivery systems in the San Bernardino area.

Discharge into the San Bernardino wastewater system would be reduced by 0.35 million gallons per day as a result of the proposed relocation of BMO. This reduction in discharge (less than 0.01% of total wastewater treated) would not affect the overall operation of the sewer collection and treatment system.

4.2.4.1 No Action Alternative

Under the no action alternative, utility usage for BMO facilities in San Bernardino, California, is the same as that described for the baseline in Chapter 3.0.

4.2.5 Hazardous Materials/Waste Management

4.2.5.1 Proposed Action

Installation Restoration Program. No Installation Restoration Program (IRP) sites are located within the Building 52X or 95x complexes occupied by SSD-SB. Therefore, the closure of BMO would not affect current IRP plans or activities. A full discussion of the IRP at Norton AFB is included in the Norton AFB Closure EIS.

Underground Storage Tanks. Underground storage tanks (UST) that become inactive as the result of withdrawal of units from Norton AFB present the possibility for leaks to the soil and groundwater if adequate precautions are not implemented. New federal UST regulations, which became effective in December 1988, are designed to minimize this possibility. These regulations require the following actions to be taken with tanks that are no longer used:

- Tanks that are not used can be "temporarily" closed for 3 to 12 months. During the temporary closure, any leak detection or corrosion protection devices must be kept operational. (If the tank is empty, leak detection is not necessary.)
- All lines connecting to the UST, except the vent line, must be capped during temporary closure.
- Tanks that are not protected from corrosion must be permanently closed after 12 months using the following procedures:
    - Notify the regulatory authority 30 days before closure.
    - Determine if leaks have occurred and if so initiate appropriate cleanup procedures.
    - Remove all liquids, dangerous vapors, and accumulated sludge.
    - Either remove the UST or fill it with a chemically inactive solid, such as sand.
- Tanks that have corrosion protection and meet other standards for upgraded USTs can remain "temporarily" closed indefinitely.
- The regulatory authority can grant an extension beyond the 12-month limit on temporary closure for USTs unprotected from corrosion.

- **The UST need not be permanently closed if it is filled with an unregulated substance (e.g., water) after it is emptied, cleaned, and checked for previous leaks.**

These federal regulations, and other county regulations, would be following to minimize any negative impacts of UST inactivity related to the relocation of SSD-SB.

4.2.5.2 No Action Alternative

Under the no action alternative, the treatment of hazardous materials would be the same as characterized by the baseline descriptions in Chapter 3.0.

4.2.6 Geology and Soils

4.2.6.1 Proposed Action

The closure of BMO would have not result in adverse environmental impacts on the geology or soils of the area.

4.2.6.2 No Action Alternative

Under the no action alternative, the geology and soils of the area would remain as described in Chapter 3.0.

4.2.7 Water Resources

4.2.7.1 Proposed Action

The closure of SSD-SB and relocation of about 5,000 people, including employees and their families, would reduce groundwater consumption the base and the surrounding communities. This would be a beneficial effect, increasing the groundwater availability for other users.

4.2.7.2 No Action Alternative

Under the no action alternative, the water resources of the area would remain as described in Chapter 3.0.

4.2.8 Air Quality

4.2.8.1 Proposed Action

The closure of SSD-SB would result in a reduction in emissions of air pollutants at Norton AFB base and vicinity. Emissions to be eliminated include some boiler and furnace emissions and vehicular emissions associated with vehicles assigned to the base, military and civilian employee commuting, and truck traffic associated with BMO operation.

The air pollutant emission changes in the SSD-SB area that would result from the relocation of BMO are listed in Table 4.2.8-1. Improvements in the levels of primary air pollutants are expected in the immediate vicinity of SSD-SB. However, the net emission reduction are still a small fraction of the total emissions from the San Bernardino County portion of the Southern California Air Basin, and these emission reductions would result in relatively minor improvements in ambient air quality of the county.

Table 4.2.8-1

Estimated Emission Changes at SSD-SB Resulting From the Relocation of BMO

Source	ROG	NO_x	CO	SO_2	TSP	PM_{10}
San Bernardino County Total	108.0	85.1	409.0	5.8	141.5	70.9
Reduction	0.03	0.07	0.28	0.002	0.017	0.012

4.2.8.1 No Action Alternative

Under the no action alternative, air quality in the area surrounding SSD-SB would remain as described in Chapter 3.0.

4.2.9 Noise

4.2.9.1 Proposed Action

The relocation of SSD-SB would have the positive impact of eliminating some traffic noise associated with vehicular traffic. Because reuse of the base as an airport is possible, noise levels due to aircraft operations could conceivably increase in the future.

Some temporary increase in noise levels would be associated with the truck transportation used to move the units from the base. This truck traffic has been estimated at an average of 9.2 trucks per day during the move operations. This would be offset by the decrease in current ground transportation in and surrounding the base, which includes an estimated average of 250 trucks entering and leaving the base each weekday.

4.2.9.2 No Action Alternative

Under the no action alternative, ambient noise levels in the area surrounding SSD-SB would remain as described in Chapter 3.0.

4.2.10 Biological Resources

4.2.10.1 Proposed Action

Vegetation. Most of the native plant community located near SSD-SB on the base is already altered and maintained as fields or lawns. The native plants that exist are primarily found along the Santa Ana River, and this area is not expected to be disturbed by the relocation.

Wildlife. Animal species that are found at SSD-SB are mostly indigenous and common to the area. Wildlife species may become temporarily displaced because of the short-term increase in activity, noise, and vegetative disturbance that may result from relocation activities. However, this disruption would not threaten the existence of any species.

Threatened and Endangered Species. Based on informal discussions to date between the U.S. Fish and Wildlife Service (USFWS) and Air Force representatives, relocation of SSD-SB is not expected to have adverse effects on any endangered species that may be in the vicinity of BMO facilities. Only the Santa Ana wooly-star is known to occur within the floodway of the Santa Ana River near Norton AFB. The other federally listed endangered species, slender-horned spineflower and least Bell's vireo, may also exist on the base in association with the Santa Ana River floodway. A survey to determine if protected species are present on Norton AFB will be conducted next spring/summer by the USFWS; in the interim, there is no expectation that harm would occur to protected species because closure should not alter or disturb the area associated with the Santa Ana floodway and its environs.

As for the four candidate species that may occur, the action is not expected to cause a significantly adverse impact. However, several of these species may experience temporary displacement because of the increase in activity, noise, and vegetative disturbance that may result from relocation activities.

4.2.10.2 No Action Alternative

Under the no action alternative, biological resources in the area surrounding SSD-SB would remain as described in Chapter 3.0.

4.2.11 Cultural and Paleontological Resources

4.2.11.1 Proposed Action

Closure of BMO facilities Norton AFB is not expected to have any adverse effect on archaeological sites or historical structures listed or eligible for inclusion in the National Register of Historic Places. Removal of military units from Norton AFB would entail negligible disturbance to the ground surface or subsurface. Maintenance of existing structures would continue with the presence of the caretaker force.

4.2.11.1 No Action Alternative

Under the no action alternative, cultural resources in the area surrounding SSD-SB would remain as described in Chapter 3.0.

4.2.12 Mitigation Measures

No mitigations are required for the Proposed or Alternative Actions at SSD-SB.

4.2.13 Cumulative Impacts

The cumulative impacts associated with the planned closure of Norton AFB and the proposed relocation involve three major issues: the cleanup of hazardous wastes, groundwater contamination, and socioeconomic impacts related to the reduction of employment and population. Although the contribution of the relocation of SSD-SB to these issues is relatively small as described in the above section, the study of these issues as they relate to the closure of Norton AFB have not been completed. Each of these issues will be specifically addressed in a separate EIS which is being prepared to evaluate the environmental consequences of the reuse of Norton AFB.

4.3 VANDENBERG AIR FORCE BASE, CALIFORNIA

4.3.1 Community Setting

4.3.1.1 Proposed Action

The proposed action would generate approximately 2,800 jobs beginning in 1992, increasing to a peak of 23,600 jobs in 1996, then declining to 14,800 in 1997. During the peak year for construction (1996), 16,100 of total employment would be direct jobs while another 7,500 would be indirect.

The proposed action would represent 4.5 percent of the total employment in the north county during the peak year of the project. This would result in an unemployment rate for the north county nearly 1 percent lower in 1997 than if the project had not been undertaken.

The proposed action would produce $148,709,000 of personal income in 1993, $403,471,000 in the peak construction year of 1996, then fall to $380,316,000 in 1997 and every year thereafter in the north county.

Population inmigration resulting from the project would begin at 2,900 in 1993 and increase to about 36,000 by 1996. The permanent population increase would be approximately 26,500 with 5,100 people onbase and 21,400 would live offbase. It is assumed that about 80 percent would locate in Santa Maria, 10 percent in Lompoc, and 10 percent in other communities in the north county.

It is estimated that this increase in population could require the development of nearly 1,400 acres of land in the vicinity of Vandenberg AFB for residential, commercial, industrial and public uses. Although the specific areas in which this development would occur cannot be specifically identified, the conversion of this amount of land for community use could result in some adverse impacts to the natural environment.

4.3.1.2 Alternative Actions

Alternative Action for the relocation of SSD activities located at Los Angeles AFB and San Bernardino, California involve personnel requirements that are smaller than those for the Proposed Action. The effects of these Alternative Actions on communities serving Vandenberg AFB are summarized in Table 4.3.1-1.

4.3.1.3 No Action Alternative

Under the no action alternative, socioeconomic activity in the region surrounding Vandenberg AFB would be characterized by the baseline descriptions found in Chapter 3.0.

4.3.2 Land Use and Aesthetics

4.3.2.1 Proposed Action

Site 1. Site 1 consists of 137 acres. The site is within the base support area of the Vandenberg AFB Comprehensive Plan. The proposed action would utilize 116 acres and displace an existing morale,

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Table 4.3.1-1

Projected Increases in Employment, Personal Income, and Population
Proposed Action and Alternatives
Vandenberg AFB
1997

	Proposed Action	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Employment	14,750	11,110	11,380	3,730	1,500
Direct	10,090	7,560	7,740	2,530	1,000
Indirect	4,750	3,550	3,640	1,200	500
Personal Income (millions 1990 $)	420	316	323	106	43
Population	25,902	19,800	20,450	6,730	2,650

welfare and recreational complex (MWR) consisting of baseball diamonds, day use picnic area and RV dump station, child care facility and personnel vehicle display area. The site is planned for future unaccompanied housing and outdoor recreation in the Base Comprehensive Plan. The surrounding use consists of existing MWR facilities, the base hospital, and unaccompanied housing. The proposed action would also require 21 acres of vacant land, currently planned Administrative, adjacent to an existing industrial area consisting of Building 12000 at the intersection of Airfield Road (extension of Ocean View Avenue) and Washington Avenue, and the Space and Missile Administrative offices.

Site 1 does abut certain land uses such as the base hospital and MWR facilities which may be incompatible with certain industrial functions of the proposed action. As a result the proposed action has anticipated this land use issue, and incompatible uses of the proposed action would be sited on the industrial designated lands within sites 2 or 3 to avoid any significant land use effects at Site 1.

Site 2. Site 2 consists of a total of 152 acres. The site currently is occupied by the AFROTC LRC consisting of turfed training fields, athletic fields and buildings of Camp Cooke vintage. To the south is the 7100 complex of portable buildings and the generally vacant 7300 industrial area. Site 2 is designated Administrative and Industrial in the Base Comprehensive Plan, a use consistent with the proposed action with no adverse land use or aesthetic effects.

Site 3. Site 3 is approximately 20 acres and consists of Building 8500 and surrounding lands. Site 3 is located within the Vandenberg AFB industrial area. The proposed action would reuse this industrial area with no resulting effects to land use or aesthetics.

Military Housing.

Site 1. Site 1 of the proposed action consists of a 345-acre area located within a planned accompanied housing area of the Base Comprehensive Plan. The proposed action is consistent with the plan and is set back from the Santa Maria Gate Entrance and Parade of State Flags along California Boulevard. The site is sited along State Highway 1 similar to the existing Capehart Increment Housing Area on the other side of the highway. The proposed action would not result in any land use effects and the aesthetic effects would not be significant.

Site 2. Site 2 of the proposed action consists of six areas which total 320 acres.

Site 2A. Site 2A consists of an 18-acre vacant parcel which abuts the existing accompanied and unaccompanied housing areas. The comprehensive plan has designated the land suitable for community (service); however, the site lends itself well for residential infill. The land use and aesthetic effects are not significant.

Site 2B. Site 2B is a 34-acre parcel with a setting similar to site 2A. The site is occupied by some recreational facilities and is planned for recreation and community (service and commercial). The site also abuts accompanied and unaccompanied housing. The use of this land for housing is also a logical residential infill with the same land use and aesthetic effects as site 2A; not significant.

Site 2C. Site 2C is a 22-acre parcel abutting existing accompanied housing. The land is set back from the Santa Maria Gate entrance on land designated for future accompanied housing. The site is adjacent to the Lompoc Casmalia Road similar to Site 1. The land use and aesthetic effects are the same as Site 1; no land use effects and no significant aesthetic effects.

Site D. Site 2D is a 115-acre site located east of State Highway 1. The site does abut the existing accompanied housing to the north. The site is located outside the designated Base Support Area on land designated reserve in the comprehensive plan. The plan also would reroute State Highway 1 through the site - a condition already planned for in the delineation of the site boundaries. The use of this site would result in an expansion of the Base Support Area. The expansion, however, is in a pattern which would incorporate the Lake Canyon Mobile Home Park. As a result, the development pattern would be a logical expansion. Site 2D would result in land use and aesthetic effects which would not be significant.

Site 2E. Site 2E is a 99-acre site which is an expansion of the Canyon Lake Mobile Home Park and abuts State Highway 1. Site 2E is similar to site 2D in that both sites are located outside the designated Base Support Area and designated reserve. The site, however, is a logical expansion of an alternate type of affordable housing. The land use and aesthetic effects are not significant.

Site 2F. Site 2F is a 32-acre site abutting the Santa Maria Gate Entrance and Parade of the Flags along California Boulevard. The site is designated accompanied housing in the comprehensive plan. There would be no land use effects associated with this site. The site does have the potential to encroach upon the Santa Maria Gate entrance and possibly effect the aesthetics of the setting of the Base entrance. However, at this time it is not possible to evaluate the aesthetic impacts since detailed plans of the housing area are not available. As a result it must be stated that there is the potential to have adverse effects; however, careful architectural design and planning would result in no aesthetic effects.

Offbase Host Communities.

Lompoc and Unincorporated Communities in the Vicinity. The City of Lompoc and the surrounding unincorporated communities of Mission Hills (including Mesa Oaks) and Vandenberg Village have historically been host to approximately 55 percent of Vandenberg AFB employees choosing to reside offbase (i.e., military, civil service, and civilian contractors). The lack of developable residential land and the policies of the adopted city and county general plans have essentially frozen the designated urban areas to existing boundaries and have protected prime farmland and environmentally sensitive areas from future conversion to urbanized uses. Furthermore, the Vandenberg AFB comprehensive plan warns that the westward expansion of Lompoc across these prime farmlands could create a conflicting situation in which the land would lie close to or under the Vandenberg AFB flight paths.

The proposed action may also increase the rate of development upon available vacant developable whereby there is the potential to create extreme development pressures on the City of Lompoc and County of Santa Barbara to convert prime agricultural land and/or environmentally sensitive land to new residential use. The proposed action may result in significant land use and aesthetic effects.

Santa Maria and Unincorporated Communities in the Vicinity. Santa Maria and the unincorporated communities, of Orcutt and Tanglewood have historically been host to approximately 40 percent of Vandenberg AFB employees who reside offbase (i.e., military, civil service, and civilian contractors).

Santa Maria, through its proposed land use element of the general plan (currently not adopted), would recommend the expansion of potential residential use to increase the city's housing by 5,927 dwelling units and adjust the county line and city boundary, which would add 375 more dwelling units. The adopted land use element mentions that there is adequate vacant land designated Residential for moderate population growth. In instances of extended periods of growth, the city may find it necessary to develop an active annexation policy, redevelop older residential neighborhoods, and expand selectively into prime agricultural lands. The new general plan emphasizes phasing growth to keep it manageable. The unincorporated area around Santa Maria could accommodate development at a faster rate by annexation as opposed to new development away from the city on lands managed by the County of Santa Barbara, as general plan policies direct growth to existing urban areas and prevent leap-frog development and protection of environmental and prime agricultural resources. The City of Santa Maria Planning Department has indicated that the city can accommodate the employees of the proposed action choosing to live off base. The city has recommended there be some phasing to avoid any possible effects.

Guadalupe. Guadalupe has indicated it expects the proposed action would result in some of the offbase employees choosing to reside in the city. The city has indicated it can accommodate its fair share of residential growth from the proposed action without any adverse land use or aesthetic effects.

Other Areas. Communities located elsewhere have historically provided residences for 5 percent of Vandenberg AFB personnel living offbase. It is anticipated these levels would essentially remain the same, with the exception of those communities that have reached total buildout or have moratoria on new development based on water hook-ups or growth control measures. The low level of residential settlement in the other areas would result in no significant effects.

4.3.2.2 Alternative Actions

Land use and aesthetic effects resulting from the alternative actions 1 and 2 at Vandenberg AFB would be about the same as in the proposed action (not significant), except there would be proportionally fewer acres of Vandenberg AFB land within and adjacent to the base support area that would be developed. The effects to the host communities of Lompoc, Santa Maria, Guadalupe and surrounding unincorporated communities would essentially be the same as in the proposed action. The effects of Alternatives 3 and 4 to the host communities of Lompoc and Santa Maria and Guadalupe probably would not be significant.

4.3.2.3 No Action Alternative

Vandenberg AFB would continue with its existing missions and future missions as described in the base comprehensive plan, plus accommodate new growth.

The City of Lompoc and the unincorporated communities of Mission Hills and Vandenberg Village have few vacant parcels for residential development. Total development of vacant developable land is anticipated to occur within 5 years even if no new missions were added to Vandenberg AFB.

The Cities of Santa Maria and Guadalupe have has planned for future growth and has expressed their willingness to accommodate their fair share of future offbase needs of Vandenberg AFB.

The no action alternative would not effect other communities in the vicinity of the base.

4.3.3 Transportation

Roadway Traffic. Traffic associated with the proposed action would increase daily round-trips to Vandenberg AFB by over 15,000 vehicles during the peak construction year and approximately 9,200 vehicles during the operations phase. These vehicle trips would occur on most of the roadway network presented in Figure 3.3.3-1.

Because of the preliminary status of program planning, traffic analyses were based on changes to projected baseline conditions as a result of operations phase trip generation. It is recognized that ADT could increase by up to 60 percent during the peak construction year, resulting in temporary and adverse reductions in LOS.

Table 4.3.3-1 presents a comparison of daily traffic volumes to estimated roadway capacities in the vicinity of Vandenberg AFB resulting from the proposed action. This comparison is generally the same for Sites 1, 2 and 3. Changes in LOS occur for six road segments.

The proposed action would result in changes in peak-hour traffic, ADT, and LOS, causing an increase in automotive air emissions that exacerbate nonattainment air quality conditions.

Air Traffic. The addition of up to 80,000 enplanements and deplanements to Santa Maria, the commercial facility nearest Vandenberg AFB, would increase current levels by over 200 percent in 1997. This increase could be accommodated by the facility but could result in increase noise impacts.

4.3.4 Utilities

4.3.4.1 Proposed Action

Water Supply. Program-related potable water demand is shown on Table 4.3.4-1 for the cities of Santa Maria and Lompoc and Vandenberg AFB. The potable water demand for Santa Maria would increase 39 percent above the projected baseline in 1996, the peak construction year, and 25 percent during operations (beginning in 1997). Peak project demand would be 2 percent above the operating capacity of the plant in 1996. If the surface water supplies from the proposed State Water Project were available the increased demand would be met. Otherwise, increased groundwater pumping would be necessary and the system would be significantly affected.

Program-related increases to the water treatment system for the City of Lompoc would increase 9 percent in 1996 and 6 percent in 1997. The system would be operating at 70 percent in 1996 and 69 percent in 1997 of the planned 10 MGD system. The expanded system would be able to handle the increased average daily demand of the proposed action.

Potable water demand at Vandenberg AFB would increase from 4.1 MGD to 5.3 MGD in 1996 and 1997 due to a combination of onbase housing and facilities demands. With an estimated pumping capacity of 11 MGD, the base has the capacity to pump and treat the potable water demand for the proposed action. Water requirements associated with the preparation of construction materials, dust

Table 4.3.3-1
Comparison of Daily Traffic Volumes to Estimated Roadway Capacities for Road Segments in the Vicinity of Vandenberg AFB

Road Segment	Road Capacity	Projected Conditions (1996)			Projected Conditions (Proposed Action)				
		ADT[1]	V/C Ratio	LOS	Peak Hour Traffic	Total Daily Traffic	ADT	V/C Ratio	LOS
Lompoc-Casmalia Road									
Santa Lucia Canyon Road to California Blvd.	36,000	19,488	0.54	A	185	925	20,415	0.57	A
Harris Grade Rd. to Santa Lucia Canyon Road	36,000	21,116	0.59	A	185	925	22,050	0.61	B
North of California Blvd./Vandenberg	18,000	2,253	0.12	A	75	370	2,625	0.07	A
California Boulevard/CA 1									
Lompoc-Casmalia Rd. to San Antonio	36,000	15,320	0.43	A	2,910	14,400	29,740	0.83	D
San Antonio Road to CA 1	36,000	14,532	0.40	A	2,910	14,400	28,955	0.80	C
West of Santa Maria Gate	36,000	15,287	0.42	A	3,760	18,630	33,920	0.94	E
Pine Canyon Road									
At Pine Canyon Gate	24,000	3,154	0.13	A	335	1,665	4,820	0.20	A
Santa Lucia Canyon Road/Floradale Road									
Pine Canyon Road to Ocean Avenue/CA 246	24,000	7,322	0.31	A	335	1,665	9,000	0.37	A
H Street									
Ocean Avenue to Central Avenue	36,000	31,429	0.87	D	35	185	31,615	0.88	D
Central Avenue to Lompos-Casmalia Road	36,000	26,585	0.74	C	35	185	26,770	0.74	C

Table 4.3.3-1, Page 2 of 2

Road Segment	Road Capacity	Projected Conditions (1996) ADT[1]	Projected Conditions (1996) V/C Ratio	Projected Conditions (1996) LOS	Projected Conditions (Proposed Action) Peak Hour Traffic	Projected Conditions (Proposed Action) Total Daily Traffic	Projected Conditions (Proposed Action) ADT	Projected Conditions (Proposed Action) V/C Ratio	Projected Conditions (Proposed Action) LOS
Purisima Road									
Harris Grade Road to CA 246	36,000	27,261	0.76	C	35	185	27,450	0.76	C
Ocean Aveanue/CA 246									
CA 246 to H Street	36,000	17,799	0.49	A	110	555	18,350	0.51	A
H Street V Street	36,000	16,221	0.45	A	300	1,480	17,700	0.49	A
V Street to Floradale Avenue	36,000	6,984	0.19	A	375	1,850	8,830	0.25	A
West of Floradale Avenue	15,000	5,858	0.39	A	375	1,850	7,710	0.51	A
CA 1/CA 135									
Vandenberg Road to Orcutt Road	36,000	14,081	0.39	A	2,900	14,420	28,500	0.79	C
Orcutt Road to Black Road	36,000	17,123	0.48	A	300	1,480	18,600	0.52	A
Orcutt Road/Broadway Street									
CA 1/CA 135 to Lakeview Road	36,000	31,678	0.88	D	2,600	12,950	44,620	1.24	F
Lakeview Road to Betteravia Road	36,000	45,690	1.27	F	1,860	9,245	54,935	1.53	F
Betteravia Road to Main Street	54,000	48,127	0.89	D	1,490	7,400	55,525	1.03	F

Notes: [1]ADT = average daily traffic.
[2]V/C ratio represents the ratio of average daily traffic volume to roadway capacity.
[3]LOS = level of service (Section 3.1.3, Table 3.1.3-2).

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Table 4.3.4-1

Potable Water Requirements for Vandenberg AFB

	Baseline (MGD)	Proposed Action Demand[1] (MGD)	Proposed Action %[2]	Alternative 1 Demand (MGD)	Alternative 1 %	Alternative 2 Demand (MGD)	Alternative 2 %	Alternative 3 Demand (MGD)	Alternative 3 %	Alternative 4 Demand (MGD)	Alternative 4 %
Santa Maria											
1996	13.2	5.1	39	3.6	27	3.5	27	1.0	7	0.2	2
1997	13.6	3.4	25	2.6	19	2.6	19	.84	6	0.1	1
Lompoc											
1996	6.4	0.6	9	0.4	6	0.4	6	0.4	6	0.3	5
1997	6.5	0.4	6	0.3	5	0.3	5	0.3	5	0.2	3
Vandenberg AFB											
1996	11.0	1.2	11	5.4	49	5.2	47	1.6	15	0.6	5
1997	11.0	1.2	11	0.9	8	1.0	9	0.3	3	0.1	1

Notes: [1]Potable water demand is based on 200 gallons per capita per day (gpcd) for Santa Maria and Lompoc. Potable water demand for Vandenberg AFB is based on 150 gpcd for military housing residents and 50 gpcd for personnel.
[2]Percent increase over baseline demand.

control, and revegetation would be 5.8 MGD in 1996, the peak construction year, and could be met with water from the storage system onbase.

Wastewater Treatment. Program-related wastewater flow is shown on Table 4.3.4-2. Average daily wastewater flow for the City of Santa Maria would increase 30 percent over the projected baseline in 1996 and then decrease to 20 percent in beginning in 1997 during operations. The proposed upgraded facility to 8.7 MGD would not meet the increased demands of the proposed action. The operating capacity of the system would be exceeded by 2 percent in 1996 and 3 percent in 1997. The system would be significantly affected by the proposed action and would need to be expanded to meet the projected demand.

Average daily wastewater flow for the City of Lompoc would increase by 4 percent over the projected baseline in 1996 and 3 percent in 1997. This flow would include the increased 1.0 MGD flow from Vandenberg AFB. The system would be operating at 74 percent capacity in 1996 and 1997 and would be able to meet the demands of the proposed action. The increased wastewater flow from the base to the Lompoc treatment facility would be within the parameters of the contractual treatment agreement with the City of Lompoc.

Solid Waste. Program-related solid waste generation is shown on Table 4.3.4-3. The proposed action would increase the solid waste generation for the City of Santa Maria an estimated 7 percent in 1996 over the projected baseline (tons per day [T/day]) in 1996 and 5 percent in 1997. The city's current automated collection system would be able to meet the increased generation.

The proposed action would increase the solid waste generation for the City of Lompoc an estimated 3 percent in 1996 and 2 percent in 1997. The city's current automated collection system would be able meet the increased generation.

The increased amount of solid waste generation would affect both Santa Maria's and Lompoc's ability to implement AB939 and meet the 25 percent reduction of solid waste generation in 1995 and 50 percent reduction in 2005 of the 1988 generation statistics. The Solid Waste Management Element would need to incorporate the projected increased solid waste generation of the proposed action.

The solid waste generation on Vandenberg AFB associated with the military family housing and the facilities would increase approximately 18.5 T/day from the proposed action. The presently permitted landfill onbase must also meet the state-mandated reductions. The recycling and abatement program would need to include the estimated increases from the proposed action. Much of the construction wastes would be recycled. Each of the proposed sites has buildings that would be demolished. Prior to demolition the asbestos-containing materials in the buildings would be removed in accordance with 29 CFR 1926.58 and disposed of in the onbase landfill. The wood and concrete from the buildings would be recycled, minimizing the total amount of solid waste generated.

Energy. Increased electrical energy generation for the City of Santa Maria and the base would be met by Pacific Gas and Electric Company (PG&E). Estimated increased residential demand from the proposed action for the City of Santa Maria would be 46,656,000 kWh in 1996, decreasing to 26,707,200 kWh in 1997. Residential demand onbase would increase approximately 6,892,000 kWh. PG&E would have adequate power supplies to meet this increase.

Table 4.3.4-2

Project-Related Wastewater Flows for Vandenberg AFB

	Baseline (MGD)	Proposed Action		Alternative 1		Alternative 2		Alternative 3		Alternative 4	
		Flow[1]	%	Flow	%	Flow	%	Flow	%	Flow	%
Santa Maria											
1996	6.99	2.6	30	1.8	20	1.8	20	0.5	6	0.1	1
1997	7.22	1.7	20	1.3	15	1.3	15	0.4	5	0.1	1
Lompoc											
1996	3.91	0.29		0.2		0.3		0.2		0.1	
1997	3.96	0.19		0.2		0.2		0.2		0.1	
Vandenberg											
1996	0.76	1.0		0.7		0.8		0.3		0.1	
1997	0.76	1.0		0.7		0.8		0.3		0.1	

Note: [1]Wastewater flows for Santa Maria and Lompoc based on 100 gpcd.
Wastewater flows for Vandenberg AFB based on 120 gallons gpcd for military family housing residents and 40 gallons gpcd for personnel.

Table 4.3.4-3
Project-Related Solid Waste Generation at Vandenberg AFB
(tons per day)

Residential and Facilities

	Proposed Action		Alternative 1		Alternative 2		Alternative 3		Alternative 4	
	1996	1997	1996	1997	1996	1997	1996	1997	1996	1997
Santa Maria	44	30	31	23	31	23	9.0	7.3	1.4	1.0
Lompoc	5.5	3.8	4.0	2.8	4.0	2.8	3.9	2.9	2.7	2.2
Vandenberg AFB:										
Military Family Housing	8.7	8.7	6.5	6.5	6.5	6.5	2.2	2.2	0.8	0.8
Project Facilities	9.8	9.8	7.6	7.6	7.6	7.6	4.2	4.2	1.0	1.0

Construction

	1992	1993	1994	1995	1996
Proposed Action	105	437	437	437	332
Alternative 1	74	310	310	310	235
Alternative 2	66	254	254	245	209
Alternative 3	14	59	59	59	59
Alternative 4	5.7	24	24	24	24

Notes: Demolition and Recycling estimates not included

Increased program-related residential electrical demand for the City of Lompoc would be approximately 5,832,000 kWh in 1996, decreasing to 3,956,000 kWh in 1997. The Northern California Power Agency has adequate supplies to meet the projected demand.

Currently, Vandenberg AFB has ten substations onbase to provide electricity to facilities throughout the installation. The 92 megavolt-ampere (MVA) system had an estimated 52 MVA peak demand in 1989. The estimated peak demand of 30 MVA for the proposed action would be met by the present system.

Total residential demand for the proposed action is an estimated 1,629,600 million cubic feet (Mcf) in 1996, decreasing to 1,038,000 Mcf in 1997. The facilities demand onbase for the proposed action is an estimated 342,000 Mcf annually. Southern California Gas Company has the infrastructure and reserves to meet the increased project-related natural gas demands.

4.3.4.2 Alternative Actions

4.3.4.2.1 Alternative 1

Water Supply. The potable water demand for Alternative 1 would increase average daily demand 27 percent in 1996 and 19 percent in 1997 over the projected baseline for the Santa Maria treatment system. Because of this increase, the system would be operating at 93 percent of capacity in 1996 and 90 percent in 1997. The system would be affected by Alternative 1. The increase would exacerbate the need to increase the capacity of the system, particularly to meet peak demands in the summer.

The water demand associated with Alternative 1 on the City of Lompoc and Vandenberg AFB would be met by their respective systems and would not be significantly affected by Alternative 1.

Wastewater Treatment. Average daily wastewater flow for the City of Santa Maria would increase 27 percent over the projected baseline in 1996 and 19 percent in 1997. The proposed expanded capacity facility of 8.7 MGD would not meet the increased demands of Alternative 1. The treatment capacity of the system would be operating at 100 percent of the treatment capacity in 1996, decreasing to 97 percent in 1997. The system would be significantly affected by Alternative 1 and would need to be expanded to meet the projected demand.

The City of Lompoc's wastewater treatment system would meet the increased demand to their facility and would not be significantly affected by increased wastewater flow from Alternative 1.

Solid Waste. Alternative 1 would increase the solid waste generation for the City of Santa Maria 5 percent over the projected baseline in 1996 and 4 percent in 1997. Alternative 1 would increase the solid waste generation for the City of Lompoc an estimated 2 percent over the projected baseline in 1996 and 1997. The collection system in both cities would be able to meet the increased generation.

The increased amount of solid waste generation would significantly affect Santa Maria's, Lompoc's, and the base's ability to implement AB939. The cities' Solid Waste Management Element would need to incorporate the estimated increases from Alternative 1.

Energy. Residential electrical energy demands would decrease approximately 25 percent from the proposed action demand if Alternative 1 were selected. Pacific Gas and Electric Company and Northern California Power Agency would have adequate supplies to meet the electrical demand of Alternative 1.

Vandenberg AFB would have the infrastructure and electrical capacity to meet the facility peak demand of 26 MVA. The system would not be affected by the increased demand of Alternative 1.

Residential and facilities natural gas demands would decrease approximately 25 percent from the proposed action demand if Alternative 1 were selected. Southern California Gas Company would have adequate supplies to meet the energy demands of Alternative 1.

4.3.4.2.2 Alternative 2

The impacts of Alternative 2 are the same as those stated above for the proposed action and Alternative 1.

4.3.4.2.3 Alternative 3

If Alternative 3 were selected, there would be no adverse impacts to the existing potable water systems, wastewater treatment facilities, solid waste disposal infrastructure, or energy systems for Vandenberg AFB or the surrounding area.

4.3.4.2.4 Alternative 4

If Alternative 4 were selected, there would be no adverse impacts to the existing potable water systems, wastewater treatment facilities, solid waste disposal infrastructure, or the energy systems for Vandenberg AFB or the surrounding area.

4.3.4.3 No Action Alternative

There would be no adverse impacts to the existing potable water systems, wastewater treatment facilities, solid waste disposal infrastructure, or increased energy requirements for Vandenberg AFB or the surrounding area if the No Action Alternative were selected.

4.3.5 Hazardous Materials/Waste Management

4.3.5.1 Proposed Action

Hazardous Materials Management. The volume and composition of hazardous materials used and stored on Vandenberg AFB would increase with the proposed action. Any needed state or federal permits associated with these materials would be obtained. Aerospace Corporation would be responsible for the permits associated with their use of hazardous materials. These would be obtained in accordance with state and federal regulations. The increased inventory of hazardous materials and related potential for increased spills would pose adverse impacts on public health, water resources, soils, and biological resources.

Utilization of present management plans for the handling and storage of hazardous materials would decrease the adverse impacts associated with the increased inventory.

Hazardous Waste Management. The volume and composition of hazardous waste would increase at Vandenberg AFB. The current volume of 104 tons at Los Angeles AFB would not be directly transferable. The elimination of the duplication of base operation functions would decrease the waste stream. The current composition would also change. The asbestos-containing and PCB wastes would not be transferred. The current volume and composition of the waste stream from Aerospace Corporation would be transferred, with the exception of the asbestos-containing and PCB wastes. The increase in the current hazardous waste disposal activities and the potential for spills would pose adverse impacts on the public health, water resources, soils, and biological resources. Utilization of present management plans for the handling and disposal of hazardous waste would mitigate the adverse impacts of the increased generation of hazardous waste onbase.

Installation Restoration Program Sites. No IRP sites are located on Sites 1, 2, or 3 at Vandenberg AFB. No adverse impacts are associated with the location of any IRP sites on the base.

4.3.5.2 Alternative Actions

4.3.5.2.1 Alternative 1

The impacts of Alternative 1 are the same as those stated above for the proposed action because the Ballistic Missile Organization does not maintain hazardous materials inventories or directly generate hazardous wastes.

4.3.5.2.2 Alternative 2

Hazardous Materials Management. If Alternative 2 were selected, Aerospace Corporation and the Special Program Office would not relocate. Under this alternative, the composition of hazardous materials at Vandenberg AFB would be similar to its current inventory. There would be an expected increase in inventory of materials associated with base operations, but the hazardous materials associated with Aerospace Corporation would not be transferred. Any adverse impacts posed to public health or the environment by the increased inventory would be mitigated by the continued implementation of current management plans.

Hazardous Waste Management. If Alternative 2 were selected, the composition of the waste stream at Vandenberg AFB would be similar to its current waste stream. There would be an expected increase in the volume of the waste stream. Any adverse impacts posed to public health or the environment by the increased hazardous waste disposal activities and potential for spills would be mitigated by the continued implementation of current management plans.

4.3.5.2.3 Alternative 3

If Alternative 3 were selected, the Ballistic Missile Organization would relocate. The volume and composition of both the hazardous materials inventory and hazardous waste generation would continue at present levels at Vandenberg AFB. The possible adverse impacts associated with the storage and use of hazardous materials and the generation and disposal of hazardous waste would continue.

4.3.5.2.4 Alternative 4

If this alternative were selected the volume and composition of both the hazardous materials inventory and hazardous waste generation would continue at present levels at Vandenberg AFB. The possible adverse impacts associated with the storage and use of hazardous materials and the generation and disposal of hazardous waste would continue.

4.3.5.6 No Action Alternative

If the no action alternative were selected, the volume and composition of both the hazardous materials inventory and hazardous waste generation would continue at present levels at Vandenberg AFB. The possible adverse impacts associated with the storage and use of hazardous materials and the generation and disposal of hazardous waste would continue.

4.3.6 Geology and Soils

4.3.6.1 Proposed Action

Geologic Hazards. Vandenberg AFB is in the western portion of the Transverse Ranges Physiographic Province and is within the Hosgri Fault System (Figure 3.3.6-1). Three faults traverse Vandenberg AFB: the Hosgri Fault, the Honda Fault, and the Lion's Head/Lompoc-Solvang (Santa Ynez River) Fault. Epicenters of several seismic events have occurred within the Vandenberg AFB area and seismicities have ranged from 3.0 to 7.3 in magnitude on the Richter Scale (Figure 3.3.6-1).

As a result of an earthquake, liquefaction of the underlying geologic structures, or tsunami or seiche wave action may be generated. The proposed location for the Space Systems Division (SSD) mission is over 2 miles from and 300 feet higher than sea level. This might preclude any damage from tsunami or seiche wave action. Damage to structures may occur as a result of liquefaction if the structures are in areas with high water tables. As the sites for the realigned mission are located far enough from the Santa Ynez River and the San Antonio Creek, liquefaction does not appear to pose a hazard.

Soils.

Construction Phase. Some impacts may occur to soil resources in the proposed alternative areas as a result of construction activities. Construction of the necessary facilities has the potential to increase the potential for erosion unless proper mitigation measures are taken.

Erosion is the wearing away of land surfaces by geological processes such as water and wind. Standard measures would be employed during the construction phase to minimize wind and water erosion. The amount of soil loss caused by water erosion is dependent on rainfall intensity and erodibility of the soil. It is also dependent on the texture of the soil, location within the landscape, and plant cover. Without erosion control measures, the maximum soil loss caused by water erosion would be 7 tons per acre per year (Table 4.3.6-1). Proper construction practices could reduce this loss by 50 percent (Table 4.3.6-1). These practices could include construction of retaining walls, berms to guide overland flow, and contouring steep grades.

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Table 4.3.6-1

Soil Loss Due to Wind and Water Erosion for the Proposed Action and Alternatives Vandenberg AFB (tons/acre/year)

	Proposed Action	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Total Disturbed Acres	312	242	228	70	27
Mitigation:					
Water Erosion[1]	1,092	847	798	245	95
Wind Erosion[2]	5,148	3,993	3,762	1,155	446
No Mitigation:					
Water Erosion[1]	2,184	1,694	1,596	490	189
Wind Erosion[2]	10,296	7,986	7,524	2,310	892
Soil Formation Rate[3]	1,560	1,210	1,140	350	135

Notes: [1]Maximum soil loss due to water erosion for the Tanguir Sand is 7 tons/acre/year.
[2]Maximum soil loss due to wind erosion for the Tanguir Sand is 33 tons/acre/year.
[3]Average soil formation rate is 5 tons/acre/year (Soil Conservation Service [SCS], 1982).

The wind can also be a significant force to reduce soil resources. Determining how much soil that is lost to wind is dependent on soil texture, speed and duration of the wind, location within the landscape, and plant cover. Without erosion control measures, the maximum soil loss caused by wind erosion would be 7 tons per acre per year (Table 4.3.6-1). Proper construction practices could reduce this loss by 50 percent (Table 4.3.6-1). These practices would include spraying down the construction sites with water.

Operational Phase. As buildings and landscapes would be installed, and pavement established for parking lost and roads, no impact to soil resources due to erosion is anticipated.

4.3.6.2 Alternative Actions

If only a portion of the SSD mission was relocated to Vandenberg AFB, impacts on soil resources would decrease proportionally with the amount of construction required.

4.3.6.3 No Action Alternative

There would be no adverse impact to the existing geology and soil resources of Vandenberg AFB if the no action alternative was selected.

4.3.6.4 Mitigation Measures

Geologic Hazards. No significant faults are known to cross within the base support area which contains the proposed sites under study at Vandenberg AFB. The Hosgri Fault System is to the south of the Base Support Area. Movement along the Hosgri Fault System would occur with unpredictable frequency and would expose any option of the relocated mission to the same risk as the surrounding community.

Soil. During the construction phase, soil loss due to wind would be a significant impact. This can be mitigated in various ways. Through the months of October to March, the Santa Ana-like winds can be a dominate influence in increasing erosional activities. Awareness of these windy months and application of mitigation measures would reduce the amount of soil loss. The application of water to the exposed soil surface can allow a crust to form. This crust reduces the amount of unconsolidated soil particles that can be dispersed due to winds.

Standard construction practices would be employed to prevent water erosion due to overland flow of storm water or as a result of the impact of rainfall. These practices would include the construction of berms and channels to direct flowing water from the construction site.

4.3.7 Water Resources

4.3.7.1 Proposed Action

Groundwater Resources.

Construction Phase. Vandenberg AFB currently uses groundwater derived from the San Antonio Creek Valley Basin and the Lompoc Plain Basin (Table 3.3.7-1). Currently, both basins are overdrafted.

During the construction of the facilities required by the SSD mission, 12,500 gallons of water per acre disturbed would be used to spray down exposed soil surfaces to reduce wind-blown sediments and mitigate the erosion potential of this resource plus construction activities and revegetation. Based on the acres disturbed during construction, 5.8 million gallons of water would be used to control windblown soil for the proposed action (Table 4.3.7-1). This amount of water would be used to control windblown sediments when appropriate. Construction companies commonly spray down the site once a day to control windblown dust.

Surface Water.

Construction Phase. As surface water is not affected by Alternatives 1 through 4, no mitigation is necessary.

The perennial stream channels within the Vandenberg AFB region support surface water that is not used as a potable water source. These streams contributed to the recharge of the aquifers with which they are associated. Generally, the quality of the water is poor as these streams receive effluent from various sewage treatment facilities.

Operational Phase. The existing drainage patterns do not support potable water. Therefore, future operational activities would have no effect.

4.3.7.2 Alternative Actions

If one of the remaining options (II through V) were to be realigned at Vandenberg AFB, impacts to water resources would decrease corresponding to how much construction would be required. The areas designated for the various components of the realigned mission would require water but as only a portion of the facilities would be required, only a relational fraction of groundwater would be needed.

4.3.7.3 No Action Alternative

There would be no adverse impact to the existing water resources of Vandenberg AFB if the no action alternative was selected.

Table 4.3.7-1

Water Requirements During Construction and Operations Phases for the Proposed Action and Alternatives Vandenberg AFB [million gallons per day]

	Proposed Action	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Construction Phase[1]	5.8	4.5	4.3	1.3	0.5
Operations Phase[2]					
Household	5.0	3.75	3.8	1.25	0.5
Facility/Industrial	0.5	0.4	0.38	0.125	0.05

[1]Water used to spray down exposed soil is estimated at 12,500 gallons per acre including water for revegetation efforts.

[2]Requirements are based on 200 gallons/day per person for household use (base housing) and 50 gallons/day per person for industrial use.

4.3.7.4 Mitigation Measures

Groundwater Resources.

Construction Phase (Alternatives 1 through 4). Further drawdown of the water table must be avoided and purchasing water from another source would be necessary. It has been estimated that the construction of the State Water Project pipeline, the Coastal Branch, Phase II, will allow water from the California Aqueduct to flow to Santa Barbara and San Luis Obispo Counties. Vandenberg AFB will be allowed 8,000 acre-feet per year of water from the State Water Project. This water would help mitigate further water demand during a portion of the construction activity. The use of alternative technologies to reduce windblown dust other than by spraying water may be appropriate.

Operational Phase (Alternatives 1 through 4). To offset any water shortages, more water would have to be purchased. Further drawdown of the water table must be avoided and purchasing water from another source would be necessary. The future use of water furnished from the State Water Project would serve the needs of the realigned mission.

Surface Water.

Construction Phase. As surface water is not affected by Alternatives 1 through 4, no mitigation is necessary.

Operational Phase. As surface water is not affected by Alternatives 1 through 4, no mitigation is necessary.

4.3.8 Air Quality

4.3.8.1 Proposed Action

In the short term, construction of the proposed facilities would affect air quality primarily through soil disturbance (fugitive dust) and construction vehicle emissions. Long-term effects of the project would be caused by emissions from the additional vehicles used by project personnel and their families. Short-term impacts were determined by comparing project emissions with the estimated Santa Barbara County emissions inventory. The long-term impacts from related increases in motor vehicle traffic were estimated using the California CALINE 4 line source dispersion model.

The primary sources of particulates during construction would be from clearing and grading activities which generate wind-blown dust, and exhaust emissions from heavy-duty construction equipment. Emission factors for fugitive dust and combustive emissions from heavy-duty diesel equipment were obtained from the Environmental Protection Agency's (EPA's) "Compilation of Air Pollution Emission Factors (AP-42) (EPA, 1985). Particulate emissions were assumed to be reduced by 50 percent through the application of water on disturbed soil during and after grading activities. Construction activities were assumed to occur over a 3-year period. The assumed distribution of equipment categories and annual operation hours (AP-42) are shown in Table 4.3.8-1. Exhaust emissions were calculated by estimating annual usage of the equipment. A comparison of total annual construction emissions, with Santa Barbara County emissions is presented on Table 4.3.8-2. As shown in the table,

Table 4.3.8-1

Assumed Distribution of Construction Equipment and Annual Usage

Quantity	Construction Equipment Category	Annual Usage (hours/year)
3	Bulldozers (track)	3,150
1	Front loaders (track)	1,100
2	Front loaders (wheel)	2,280
3	Scrapers	6,000
2	Rollers	1,480
3	Off-highway trucks	12,000
2	Motor graders	1,660
2	Cranes	2,000

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Table 4.3.8-2

Comparison of Project Construction Emissions with Santa Barbara County Emissions (Tons Per Year)

Source	CO	HC	NO_x	SO_x	Part
Construction Emissions	16.9	2.8	44.0	4.8	12.6
Santa Barbara County	69,864	30,514	23,141	5,471	40,836
% County Emissions	0.024	0.009	0.19	0.09	0.03

the project emissions for all pollutants are less than 1 percent of the county emissions. Therefore, the air quality impacts from project construction activities would not be significant.

The primary short- and long-term air quality impacts, resulting from operations of the proposed project, would be due to carbon monoxide (CO) emissions from project-related increases in motor vehicle traffic. Based on the transportation analysis for both Sites 1 and 3, the greatest increase in CO emissions would occur at the intersection outside of the Santa Maria Gate where a traffic light controls the flow of vehicles. Traffic congestion in the morning and afternoon peak hours may occur based on the current design of the intersection. Assuming a worst-case situation in which the peak hourly traffic would increase by approximately 3,800 vehicles at this intersection, the maximum hourly CO concentrations would increase by 10 parts per million (ppm). Based on ambient maximum concentrations recorded in the area, a background CO concentration of 7 ppm was assumed. However, operational emissions from added vehicular traffic would not cause violations of the California or federal ambient air quality standards for CO. Therefore, the overall long-term impact of project emissions on local and regional air quality would not be significant.

The emissions of criteria pollutants from project stationary sources would be expected to be similar to current emissions for similar facilities at the SSD and Aerospace Corporation facilities in Los Angeles (Section 3.2.8). Although not a major stationary source, the emissions would be greater than the New Source Review thresholds established by Santa Barbara Air Pollution Control District regulations. Best Available Control Technology and emissions offsets would be required as part of the permitting process.

4.4.8.2 Alternative Actions

Air quality impacts for Alternatives 1 to 4 would similar to the proposed action, although the increased concentrations of CO would be smaller. The federal and state standards would not be exceeded.

4.4.8.3 No Action Alternative

Air quality impacts for the no action alternative would not be significant.

4.3.9 Noise

Construction of project facilities would take approximately 3 years and would comprise the main source of noise associated with the project, along with noise from vehicular traffic.

The residential area of the cantonment contains the closest sensitive receptors to the potential construction sites. It was determined that none of the proposed construction sites were sufficiently close to the residential area to constitute a significant impact. The construction of new housing adjacent to the existing residential area could result in noise levels of about 60 decibels on the A-weighted scale (dBA) at nearby residences. However, since current day-night (L_{dn}) noise levels in this area range from 46 dB to 85 dB (Section 3.3.6.2), the noise from construction activities would not be significant.

The only long-term noise impacts would result from the increase in vehicular traffic. Assuming a doubling of traffic along the major arteries that access the main gate, the Federal Highway

Administration traffic noise models (STAMINA) predicted an emission of about 3 dBA in L_{dn} noise levels at 100 feet from the highway. This increase would be barely detectable and would not be considered a significant impact.

4.3.10 Biological Resources

4.3.10.1 Proposed Action

Vegetation. Most of the development planned in the proposed action for Sites 1, 2, 3, and housing Sites 2a, b, c, d, e, and f would be in areas of Vandenberg AFB which have been previously developed or disturbed. Studies indicate that the proposed development of these areas will not have a significant impact on the vegetation of the region. The loss of small "islands" of Burton Mesa chaparral at Site 2 and proposed housing Site 2d will not have a significant impact on Burton Mesa chaparral as a whole.

The construction of housing at proposed housing Site 1 would result in the loss of approximately 155 acres of relatively undisturbed Burton Mesa chaparral. This would have a significant impact on this rare plant community. (See Threatened and Endangered Species discussion).

Wildlife. The proposed action would include development of previously undeveloped but highly disturbed land at Sites 1, 2, and proposed housing Sites 2a through f. This will result in the temporary and permanent disturbance of habitat for small mammals, reptiles, and raptors. Studies indicate that, because of the habitat alternatives available, the proposed action would not have a significant impact on the wildlife resources of these areas.

A variety of wildlife occurs in the Burton Mesa chaparral at proposed housing Site 1. However, habitat alternatives do exist in the area, and the loss of some individuals and displacement of others is not expected to have a significant impact on the wildlife of this area.

Threatened and Endangered Species. Previous development of areas of Burton Mesa chaparral has eradicated a large portion of this vegetation type. Potential mitigation measures include reestablishing chaparral communities in other suitable areas.

Currently, the groundwater basins supplying Vandenberg AFB are overdrafted. One of these, the San Antonio Creek Valley Basin, is recharged in part by San Antonio Creek, which is known to be inhabited by unarmored threespine stickleback (*Gasterosteus aculeatus williamsoni*), a federally listed endangered species. Further overdrafting of the aquifer may lead to a decrease in flow in San Antonio Creek. This would have a significant adverse impact on the stickleback. Mitigation measures include purchasing water for construction and operational phases of the proposed action in order to prevent drawdown of San Antonio Creek.

The federally endangered California brown pelican (*Pelecanus occidentalis*), California least tern (*Sterna antillarum browni*), and the USFWS category 2 candidate tidewater goby (*Eucycloglobius newberryi*) are all species which occur in the coastal areas of Vandenberg AFB. The increase in population at the base which would result from the implementation of the proposed action may lead to an increase in human activity at coastal areas on and offbase. However, these increases are expected to be slight and the impacts on the above-mentioned sensitive species would not be significant.

The American bald eagle (*Haliaeetus leucocephalus*) and American peregrine falcon (*Falco peregrinus anatum*), both federally listed endangered species, have been known to occur in the area but are not known to nest in the proposed areas. These species would not be significantly affected by the proposed action.

Least Bell's vireo (*Vireo belli pusillus*), another federally listed endangered species, is expected in the riparian woodlands onbase. If proper erosion control and drainage measures are employed in these areas, this species should not suffer significant adverse impacts as a result of the proposed action.

The bay checkerspot butterfly (*Euphydryas editha bayensis*), a federally listed threatened species, may occur in the less disturbed grasslands onbase. Since the grasslands in the proposed project areas are very disturbed, this species would not suffer significant adverse impacts as a result of the proposed action.

Wetlands. The wetlands at the boundaries of both proposed housing sites would be affected by changes in the drainages feeding them. These impacts will not be significant.

4.3.10.2 Alternative Actions

The impacts of the alternative actions on the biological resources of the Vandenberg AFB area would decrease in direct proportion to decreases in the acreage disturbed and elevation in human activity.

4.3.10.3 No Action Alternative

The no action alternative would not have a significant impact on the biological resources of the Vandenberg AFB area. However, if there is future development on or around the sites, significant impacts may occur. These impacts would be discussed in a separate EA.

4.3.11 Cultural and Paleontological Resources

4.3.11.1 Proposed Action

Site 1 contains no prehistoric sites. Sixteen World War II-era temporary structures are located within this site and some may be considered National Register of Historic Places (NRHP)-eligible. No fossiliferous outcrops occur in this area. Impacts of the proposed action on Site 1 may have an adverse affect on cultural resources if any of the historic buildings are evaluated as NRHP-eligible.

Site 2 also contains no prehistoric sites. Forty-one wooden World War II-era temporary structures are located within this site and some may be considered NRHP-eligible. No fossiliferous outcrops occur in this area. If any of the historic buildings are evaluated as NRHP-eligible, the proposed action at Site 2 would have an adverse affect on cultural resources.

Site 3 also contains no prehistoric sites or World War II temporary structures. Paleontological materials in the form of marine diatoms are found in the Monterey shale formation, which outcrops south of this area. These fossils are relatively abundant onbase. The proposed action at Site 3 would not affect cultural resources or important paleontological materials.

Housing Site 1 contains six prehistoric sites, three of which may be considered NRHP-eligible. No historic resources have been identified in the area. Paleontological materials in the form of marine diatoms are present in the local outcrops of Monterey shale; however, these fossils are abundant in the area. The proposed action at Housing Site 1 would have an adverse affect on cultural resources.

Housing Sites 2A through 2F do not contain any prehistoric or historic sites. Housing Site 2D contained only one isolated flake. Monterey shale with marine diatoms may have surface outcrops in Housing Site 2D. The proposed action in Housing Site Areas 2A through 2F would not have an affect on cultural or paleontological resources.

4.3.11.2 Alternative Actions

Alternative Actions 1 and 2. Impacts of Alternative Actions 1 and 2 would be the same as for the proposed action for each area.

Alternative Actions 3 and 4. Impacts of Alternative Actions 3 and 4 would be the same as the proposed action for Site 3, Housing Site 1, and Housing Site Areas 2A through 2F.

4.3.11.4 Mitigation Measures

Potentially eligible prehistoric and historic sites have been identified in proposed program areas. Test excavations will be needed to formally evaluate the prehistoric sites for eligibility to the NRHP. Additional documentation and archival research will be required for the historic structures. If the State Historic Preservation Officer concurs with recommendations of eligibility, a mitigation plan should be prepared, approved, and implemented for all NRHP eligible sites prior to construction.

4.4 MARCH AIR FORCE BASE, CALIFORNIA

4.4.1 Community Setting

4.4.1.1 Proposed Action

The Proposed action would generate approximately 2,700 jobs beginning in 1992, increasing to a peak of 24,900 jobs in 1996, then declining to 15,140 in 1997. During the peak year for construction (1969), 16,600 of total employment would be direct jobs while another 8,300 would be indirect.

The Proposed Action would produce $77 million of personal income in 1992, $708 million in the peak construction year of 1996, then fall to $#430 million in 1997 and every year thereafter.

Population inmigration resulting from the project would begin at 2,650 in 1992 and increase to about 30,550 by 1996. The permanent population increase in the area is projected at 22,000. Of this total, approximately 5,700 people would live onbase while 16,300 would live offbase. It is assumed that these offbase households would locate to communities in Riverside County.

It is estimated that this increase in population could require the development of nearly 1,500 acres of land in the vicinity of MARCH AFB for residential, commercial, industrial and public uses. Although the specific areas in which this development would occur cannot be specifically identified, the conversion of this amount of land for community use could result in some adverse impacts to the natural environment. However current land development in Riverside and San Bernardino counties should accommodate this growth without additional land requirements.

4.4.1.2 Alternative Actions

Alternative Action for the relocation of SSD activities located at Los Angeles AFB and San Bernardino, California involve personnel requirements that are smaller than those for the Proposed Action. The effects of these Alternative Actions on communities serving March AFB summarized in Table 4.4.1-1.

4.4.1.3 No Action Alternative

Under the No Action Alternative, socioeconomic activity in the region surrounding March AFB will be characterized by the baseline descriptions found in Chapter 3.

4.4.2 Land Use and Aesthetics

4.4.2.1 Proposed Action

Site 1. Site 1 would be located in an area currently occupied by the conventional Weapons Storage Area (WSA); resulting in the displacement and relocation of the WSA to a new site. Site 1 also borders the conventional Explosive Ordnance Disposal (EOD) area, but is outside its explosives safety zone. Site 1 is located on the summit of a hill of a divide known locally as "Canyon Crest" with views of March AFB, Moreno Valley and Riverside. The surrounding area is in a state of transition from a rural landscape to an urban one. The Orangecrest area of the City of Riverside is rapidly being developed. Project facilities of Site 1, while visible to the urban area of Riverside and Moreno Valley, are anticipated to blend in with the surrounding urbanized pattern. Site 1, furthermore, is consistent with the March AFB comprehensive plan and the adopted city of Moreno Valley and Riverside and County of Riverside general plans. The effects of the proposed action upon land use and aesthetics at Site 1 would not be significant.

Site 2. Site 2 would be located in an area currently occupied by the Arnold Heights Family Housing Area. The housing area is projected for demolition and will be replaced by a private sector financed housing project being developed on a 130-acre parcel west of Arnold Heights. Site 2 is on essentially flat land located west of the U.S. Interstate 215 and East March and north of the U.S. Riverside National Cemetery and east of the Arnold Height, Elementary School. The facilities of Site 2 would be surrounded by March AFB and the cemetery and would be compatible with surrounding uses including the school. The facilities of the proposed action, while visible to Van Buren Boulevard and U.S. Interstate 215, would blend in with the urban and military views present along both corridors. The effects of the proposed action upon land use and aesthetics at Site 2 would not be significant.

Table 4.4.1-1

Projected Increases in Employment, Personal Income, and Population
Proposed Action and Alternatives
March AFB
1997

	Proposed Action	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Employment	15,135	11,360	11,640	3,830	1,500
Direct	10,090	7,560	7,740	2,530	1,000
Indirect	5,045	3,800	3,900	1,300	500
Personal Income ($000) (million 1990 $)	430	323	330	110	43
Population	21,700	16,200	16,700	5,500	2,200

Military Housing. The military housing area would consist of 1,450 units to be placed on a 180-acre site within West March. The site is located on an elevated area of Canyon Crest south of Van Buren Boulevard. The site is currently vacant, located between the developing residential areas of Orange Crest (offbase) and Air Force Village west (onbase). The proposed action would place the military housing area within a rapidly developing area of western Riverside County. Land use and aesthetics would not be significantly affected by the proposed action.

Offbase Host Communities. Most employees of SSD-SB would not move from their present residences. The Inland Empire, containing 47 cities in Riverside and San Bernardino counties, is one of the most rapidly urbanizing areas of the United States. It is anticipated the March AFB host communities of Moreno Valley, Perris, Riverside and the other communities of the Inland Empire would easily assimilate the employees of the proposed action who choose to live offbase without any adverse impacts. The land use and aesthetic effects on the host communities resulting from March AFB SSD-LA, SSD-SB, and Aerospace Corporation employees living offbase are anticipated not to be significant.

4.4.2.2 Alternative Actions

Land use changes associated with Alternatives 1 and 2 would be about the same as in the proposed action; however, the acreage used would be less in each alternative. The number of people seeking residences offbase in the host communities would be smaller per option, but the land use and aesthetic effects would all not be significant.

Alternatives 3 or 4 would be located on approximately 45-acre site on the main base area of East March AFB. The Alternative 3 or 4 action would result in the displacement of the library parking area; Field No. 1; a lighted baseball diamond with bleachers; the base riding club including stables, riding arena, pastures and animal quarantine area; and a hobby garden area. This action would redevelop this area of the base for more intensive uses. This action is consistent with the recent historic development pattern of the base as evidenced by the construction of the Air Force Southwest Air Defense Sector Operations Control Center, the KC-10 Training Area, and the U.S. Customs building. The action would not result in any significant effects on land use or aesthetics.

4.4.2.3 No Action Alternative

March AFB would continue with its existing missions and future missions. The Arnold Heights Family Housing Area would still be demolished, and the housing area would be relocated to its new site at West March. The site of Arnold Heights would await a new mission to be sited on the planned vacant land. There would be no effects associated with land use and aesthetics.

4.4.3 Transportation

4.4.3.1 Proposed Action

Roadway Traffic. Traffic associated with the Proposed Action would increase daily round-trips to March AFB by over 15,000 vehicles during the peak construction year and approximately 9,200 vehicles during the operations phase. These vehicle trips would occur on most of the roadway network presented in Figure 3.4.3-1 (Section 3.4.3).

Due to the preliminary status of program planning, traffic analyses were based on changes to projected baseline conditions as a result of operations phase trip generation. It is recognized that ADT could increase by up to 60 percent during the peak construction year, resulting in temporary and adverse reduction in LOS.

Tables 4.4.3-1 and 4.4.3-2 present a Comparison of Daily Traffic Volumes to Estimated Roadway Capacities in the Vicinity of March AFB resulting from the Proposed Action. This comparison is generally the same for Sites 1 and 2 except for traffic on Cactus Avenue which would not occur if Site 2 were selected. Site 3 would only be selected for the considerably smaller Alternatives 3 and 4 which would not result in changes to projected LOS ratings. Changes in LOS occur for six road segments.

The Proposed Action would result in changes in peak-hour traffic, ADT, and LOS causing an increase in automotive air emissions that exacerbate non-attainment air quality conditions.

Air Traffic. The addition of up to 80,000 emplacement and deplacements to Ontario Airport, the commercial facility nearest March AFB, would increase current levels by about 2 percent in 1990. This increase would not affect environmental conditions.

4.4.4 Utilities

4.4.4.1 Proposed Action

Water Supply. Program-related potable water demand is shown on Table 4.4.4-1 for the Cities of Riverside, Moreno Valley, Perris, and March AFB. The potable water demand for the proposed action would increase the average daily demand 1.2 percent over the projected baseline in 1996, the peak construction year, and 0.68 percent during operations (beginning in 1997) for the City of Riverside. With the additional project demand the system would be operating at 62 percent of its treatment capacity in 1996 and 1997. The system would not be significantly affected by the proposed action.

Program-related increases to the water treatment system for the Cities of Moreno Valley, Perris, and March AFB would increase 3.5 percent over the projected baseline in 1996, the peak construction year, and 2.5 percent during operations (beginning in 1997). The system presently cannot meet the projected growth in the communities it services. Eastern Municipal Water District (EMWD) is currently negotiating increased supply from the Metropolitan Water District. The additional demands from the proposed action would need to be included in the projected demand by EMWD.

Water requirements associated with the preparation of construction materials, dust control, and revegetation would be 6.9 MGD in the construction peak year of 1996. This demand could be met with the present storage system onbase and utilizing reclaimed water from the wastewater treatment plant onbase.

Table 4.4.3-1

Comparison of Daily Traffic Volumes to Estimated Roadway Capacities for Road Segments in the Vicinity of March AFB Proposed Action - Site 1

Road Segment	Road Capacity	Projected Conditions (1996)			Projected Conditions (Proposed Action)				
		ADT[1]	V/C Ratio[2]	LOS[3]	Peak Hour Traffic	Total Daily Traffic	ADT	V/C Ratio	LOS
Interstate 215									
Alessandro Boulevard to CA 60	86,000	67,744	0.85	D	1,130	7,070	74,815	0.87	D
Alessandro Boulevard to Van Buren Blvd.	86,000	67,060	0.84	D	2,470	15,460	82,520	0.95	E
South of Van Buren Boulevard	86,000	71,166	0.89	D	675	4,230	75,400	0.88	D
Alessandro Boulevard									
West of Trautwein Road	38,000	31,354	0.83	D	600	3,740	35,090	0.92	E
Trautwein Road to Interstate 215	38,000	26,003	0.68	B	600	3,740	29,740	0.78	C
Interstate 215 to Graham Street	38,000	46,531	1.22	F	650	4,050	50,580	1.33	F
Van Buren Boulevard									
West of Trautwein Road	30,000	29,424	0.98	E	325	2,040	31,460	1.05	F
Trautwein Road to Interstate 215	30,000	31,477	1.05	F	1,370	8,565	40,040	1.33	F
Cactus Avenue									
Interstate 215 to Graham Street	30,000	18,681	0.62	B	260	1,615	20,300	0.68	B
West of Interstate 215 to Plummer Road	18,000	137	0.01	A	2,160	13,500	13,645	0.76	C
Plummer Road to WSA	---	---	---	---	4,600	28,780	28,920	1.61	F
Graham Street/Riverside Drive									
Alessandro Boulevard to Main Gate	30,000	17,039	0.57	A	260	1,615	18,650	0.62	B

Table 4.4.3-1, Page 2 of 2

Road Segment	Road Capacity	Projected Conditions (1996)			Projected Conditions (Proposed Action)				
		ADT[1]	V/C Ratio[2]	LOS[3]	Peak Hour Traffic	Total Daily Traffic	ADT	V/C Ratio	LOS
Plummer Road									
South of Van Buren Boulevard	18, 000	2,327	0.13	A	480	3,025	5,350	0.30	A
North of Van Buren Boulevard (currently closed)	18,000	---	---	---	970	4,590	4,590	0.26	A

Notes: [1]ADT = average daily traffic.
[2]V/C ratio represents the ratio of average daily traffic volume to roadway capacity.
[3]LOS = level of service (Section 3.1.3, Table 3.1.3-2).

Table 4.4.3-2

Comparison of Daily Traffic Volumes to Estimated Roadway Capacities for Road Segments in the Vicinity of March AFB Proposed Action - Site 2

Road Segment	Road Capacity	Projected Conditions (1996) ADT[1]	Projected Conditions (1996) V/C Ratio[2]	Projected Conditions (1996) LOS[3]	Proposed Action Conditions (1996) Peak Hour Traffic	Proposed Action Conditions (1996) Total Daily Traffic	Proposed Action Conditions (1996) ADT	Proposed Action Conditions (1996) V/C Ratio	Proposed Action Conditions (1996) LOS
Interstate 215									
Allessandro Boulevard to CA 60	86,000	67,744	0.85	D	1,130	7,070	74,815	0.87	D
Alessandro Blvd. to Van Buren Blvd.	86,000	67,060	0.84	D	2,000	12,515	79,575	0.92	E
South of Van Buren Buolevard	86,000	71,166	0.89	D	675	4,230	75,400	0.88	D
Alessandro Boulevard									
West of Trautwein Road	38,000	31,354	0.83	D	600	3,740	35,090	0.92	E
Interstate 215 to Graham Street	38,000	46,531	1.22	F	650	4,050	50,580	1.33	F
Trautwein Avenue									
Alessandro Blvd. to Van Buren Blvd.	18,000	13,686	0.76	C	600	3,740	17,420	0.97	E
Van Buren Boulevard									
West of Trautwein Road	30,000	29,424	0.98	E	325	2,040	31,460	1.05	F
Trautwein Road to Interstate 215	30,000	31,477	1.05	F	1,460	9,110	40,590	1.35	F
Cactus Avenue									
Interstate 215 to Graham Street	30,000	18,681	0.62	B	260	1,615	20,300	0.68	B
Graham Street/Riverside Drive									
Alessandro Boulevard to Main Gate	30,000	17,039	0.57	A	260	1,615	17,040	0.62	B
Plummer Road									
South of Van Buren Boulevard	18,000	2,327	0.13	A	483	3,020	18,650	0.30	A

Notes: [1]ADT = average daily traffic.
[2]V/C Ratio represents the ratio of average daily traffic volume to roadway capacity.
[3]LOS = level of service (Section 3.1.3, Table 3.1.3-2).

Table 4.4.4-1

Potable Water Requirements at March AFB

	Baseline (MGD)	Proposed Action Demand[1] (MGD)	Proposed Action %[2]	Alternative 1 Demand (MGD)	Alternative 1 %	Alternative 2 Demand (MGD)	Alternative 2 %	Alternative 3 Demand (MGD)	Alternative 3 %	Alternative 4 Demand (MGD)	Alternative 4 %
Riverside											
1996	61.58	.75	1.2	0.77	1.25	0.46	0.75	0.10	0.16	0.08	0.13
1997	62.07	.42	0.68	0.48		0.26	0.77	0.13	0.21	0.07	0.11
Moreno Valley/ Perris											
1996	75.3	3.5	5	3.4	5	2.38	3	0.58	1	0.37	0.5
1997	76.6	2.54	3	2.44	3	1.78	2	0.46	1	0.28	0.4
March AFB											
1996	--	1.3		1.0		1.0		0.32		0.13	
1997	--	1.3		1.0		1.0		0.32		0.13	

Notes: [1]Potable water demand is based on 200 gallons per capita per day (gpcd) for Riverside & Moreno Valley/Perris. Potable water demand for March AFB is based on 150 gpcd for military housing residents and 50 gpcd for personnel.
[2]Percent increase over baseline demand.

Wastewater Treatment. Program-related wastewater flow is shown on Table 4.4.4-2. Average daily wastewater flow to the Riverside city facility would increase 1.25 percent over the projected baseline in 1996, the peak construction year, and 0.68 percent during operations (beginning in 1997). With the additional project demands, the system would be operating at 77 percent of its treatment capacity in 1996 and 78 percent in 1997. The system would not be affected by the proposed action.

Average daily wastewater flow to the treatment facility in Moreno Valley would increase above the projected baseline 4 percent in 1996 and 2.1 percent in 1997. With the additional demand from the proposed action, the system would be operating at 91 percent of its capacity in 1996. The treatment capacity of the system would be exceeded 7 percent in 1997. The proposed action would exacerbate the need to increase the treatment capacity of the facility. Projected growth in the community presently indicates the system would be operating at 91 percent in 1997 without the demands of the proposed action. Unless the wastewater treatment system is expanded, the proposed action would significantly affect the system.

Average daily wastewater flow to the treatment facility in the City of Perris would increase 25 percent above the projected baseline in 1996 and 13 percent in 1997. Without the increased demands from the project, the system would be operating above its treatment capacity in 1996 and 1997. Prior to the proposed action the treatment capacity of the system would need to be expanded. The additional demand from the proposed action could be met with the first planned incremental expansion of the treatment facility, 3 MGD. Including the additional demand from the proposed action the increased capacity system would be operating at 85 percent and 87 percent in 1996 and 1997, respectively. The wastewater treatment facility would not be significantly affected by the proposed action.

The wastewater treatment facility on March AFB would be affected by the proposed action. The system is projected to be operating at 80 percent of its treatment capacity. The planned demolition of the Arnold Heights housing area would provide an additional 0.25 MGD treatment capacity. With this decrease and the projected wastewater flow from the proposed action, the system would be operating at 95 percent. The additional flow from the proposed action would be an increase of 40 percent above the projected baseline and would exacerbate the need to increase the treatment capacity of the facility. Military family housing would not utilize the treatment system onbase.

Solid Waste. Program-related solid waste generation is shown on Table 4.4.4-3. Each of the municipalities' collection and disposal systems would be able to handle the increased generation. The increased amount of solid waste would significantly affect each of the municipalities' ability to implement AB939 and meet the 25 percent reduction of solid waste generation in 1995 and 50 percent in 2005 of the 1988 generation statistics. The Solid Waste Management Element would need to incorporate the projected increased solid waste generation of the proposed action emphasizing reusable materials and recycling.

Construction waste generation is shown on Table 4.4.4-3. Demolition and recycling estimates are not included in the projected numbers. The Weapons Storage Area on March AFB would be demolished and relocated if the proposed action were located on Site 1. Concrete from the area would be recycled, minimizing the total amount of solid waste generated. If Site 2 or 3 were selected the Weapons Storage Area would not be demolished and the associated construction waste would not be generated.

Table 4.4.4-2

Projec-Related Wastewater Flows at March AFB

		Proposed Action		Alternative 1		Alternative 2		Alternative 3		Alternative 4	
	Baseline (MGD)	Flow[1]	%	Flow	%	Flow	%	Flow	%	Flow	%
Riverside											
1996	30.5	0.38	1.25	0.39	1.25	0.23	0.75	0.05	0.16	0.04	0.13
1997	30.7	0.21	0.68	0.24	1.06	0.13	0.42	0.03	0.10	0.03	0.10
Moreno Valley											
1996	14.0	0.55	4	0.60	4.2	0.35	3	0.07	3	0.06	0.43
1997	14.6	0.31	2.1	0.36	2	0.20	1	0.04	2	0.04	0.27
Perris											
1996	2.2	0.55	25	0.60	27	0.35	15	0.07	3	0.06	3
1997	2.3	0.31	13	0.36	16	0.20	18.7	0.04	2	0.04	2
March AFB Facilities											
1996	0.8	0.39	49	0.30	38	0.30	38	0.10	125	0.04	5
1997	0.8	0.39	49	0.30	38	0.30	38	0.10	125	0.04	5
Military Family Housing											
1996	--	0.66	--	0.50	--	0.52	--	0.16	--	0.06	--
1997	--	0.66	--	0.50	--	0.52	--	0.16	--	0.06	--

Note: [1]Wastewater flows for Riverside, Moreno Valley, and Perris based on 100 gpcd.
Wastewater flows for March AFB based on 120 gpcd for military family housing residents and 40 gpcd for personnel.

Table 4.4.4-3
Project-Related Solid Waste Generation at March AFB
(tons per day)

Residential and Facilities

	Proposed Action		Alternative 1		Alternative 2		Alternative 3		Alternative 4	
	1996	1997	1996	1997	1996	1997	1996	1997	1996	1997
Riverside	6.53	3.6	6.7	4.2	4.0	2.3	0.78	0.43	0.7	0.57
Moreno Valley	9.78	5.4	10.7	6.3	6.0	3.4	1.2	0.6	1.0	0.69
Perris	9.78	5.4	10.7	6.3	6.0	3.4	1.2	0.6	1.0	0.69
March AFB										
Military Family Housing	9.6	9.6	7.2	7.2	7.4	7.4	2.4	2.4	2.4	2.4
Project Facilities	9.8	9.8	7.6	7.6	7.6	7.6	4.2	4.2	4.2	4.2

Construction

Project Facilities[1]	1992	1993	1994	1995	1996
Proposed Action	100	417	417	417	317
Alternative 1	85	356	356	356	270
Alternative 2	59	246	246	246	187
Alternative 3	11.9	49.8	49.8	49.8	37.8
Alternative 4	4.8	19.9	19.9	19.9	15.13

Note: [1]Demolition and Recycling estimates are not included

Energy. Riverside Public Utility would meet the residential demands of the proposed action. Increased residential demand from the proposed action would be approximately 8,820,000 kWh in 1996 and 4,885,000 in 1997.

Residential electrical demand for the rest of the area would be met by Southern California Edison Company. Increased residential demand from the proposed action would be an estimated 35,157,000 kWh for 1996, the peak construction year, and 18,432,000 kWh during operations (beginning in 1997). Residential demand onbase would increase approximately 10,534,000 kWh. Southern California Edison Company would have adequate power supplies to meet the increased demand of the proposed action.

The electrical system on March AFB would be expanded to meet the peak demand of 29.0 MVA for the proposed action.

Energy demand for natural gas for the area would be met by Southern California Gas Company. Total residential demand for the proposed action is an estimated 493,750 Mcf for 1996, the peak construction year, and 222,000 Mcf during operations (beginning in 1997). Facilities demand onbase for the proposed action is an estimated 200,000 Mcf. Southern California Gas Company has the infrastructure and reserves to meet the increased project-related natural gas demands.

4.4.4.2 Alternative Actions

Alternative 1.

Water Supply. The potable water demand from Alternative 1 to the City of Riverside would be met by the present system and would not be affected by Alternative 1.

Program-related demand to the EMWD for the potable water supply to the Cities of Perris and Moreno Valley for Alternative 1 is the same as the proposed action. The projected baseline demand would not be met by the present system and would need to be increased. The project-related increases would need to be considered in the projected total demand by the utility.

Wastewater Treatment. Alternative 1 would not significantly affect the wastewater treatment systems for the Cities of Riverside and Perris.

The wastewater treatment facility for the City of Moreno Valley would be significantly affected by Alternative 1. The project-related demand above the projected baseline is the same as the proposed action.

The wastewater treatment facility for March AFB would be able to treat the projected wastewater flow for Alternative 1. With the decreased flow from the Arnold Heights housing area the system would be operating at 0.55 MGD, or 55 percent of its capacity. The additional demand from Alternative 1 would increase the system to 85 percent of its treatment capacity. Alternative 1 would not significantly affect the wastewater treatment system on March AFB.

Solid Waste. If Alternative 2 were selected the generation of solid waste would be similar to that of the proposed action. There would be significant impact to the base and municipalities to meet the required reduction in the generation of solid waste. The generation of construction wastes would be similar to that of the proposed action.

Energy. The energy demands for Alternative 1 are similar to those stated for the proposed action.

Alternative 2.

Water Supply. The water demand from Alternative 2 to the City of Riverside would be met by the present system. There would be no significant impacts.

If Alternative 2 were selected, program-related demand to the water supply system for the Cities of Moreno Valley and Perris would increase average daily demand 3 percent above the projected baseline in 1996, the peak construction year, and 2 percent during operations (beginning in 1997). The projected baseline demand is 6 and 8 percent above the operating capacity in 1996 and 1997, respectively. The addition program-related demand would need to be considered for the total projected demand by the utility and would not be a significant impact.

Wastewater Treatment. The Cities of Riverside and Perris and the bases wastewater treatment systems would meet the increased demand of Alternative 2. There would be no significant impacts to their respective systems.

Program-related wastewater flow from Alternative 2 to the Moreno Valley treatment facility would increase flows 3 percent in 1996 and 1 percent in 1997. The system would be operating 90 and 93 percent of treatment capacity in 1996 and 1997. The program-related demands would exacerbate the need to expand the facility, but would not significantly affect treatment plant.

Solid Waste. The collection and disposal systems of the cities and March AFB would be able to meet the increased generation of Alternative 2. The increased amount of solid waste generation would significantly affect the cities' and the base's ability to meet the required source reduction of AB939. Construction wastes are similar to that of the proposed action and Alternative 1.

Energy. If Alternative 2 were selected, the electrical and natural gas demands would be met by the utility companies. No significant impacts would occur.

Alternative 3.

Water Supply. The water demand from Alternative 3 to the City of Riverside would be met by the present system. There would be no significant impacts.

The impact to the water supply system for the Cities of Moreno Valley and Perris would be minimal for this alternative. Alternative 3 would increase average daily demand 1 percent over the projected baseline in both 1996 and 1997. The system would need to be expanded to meet the projected baseline as well as the program-related demands. Alternative 3 would not significantly affect the system.

Wastewater Treatment. The program-related wastewater flow from Alternative 3 to the Cities of Riverside and Perris and March AFB would be met by their respective systems and would not be significantly affected by Alternative 3.

The impact to the treatment system for the City of Moreno Valley would be very minimal from Alternative 3. Program-related wastewater flow would increase 0.5 percent over the baseline projection in 1996, the peak construction year, and 0.3 percent during operation (beginning in 1997). The projected operating capacity of the system in 1991 is 91 percent without project-related demands and 92 percent with. The increase from Alternative 3 would not significantly affect the wastewater treatment facility of Moreno Valley.

Solid Waste. If Alternative 3 were selected, the impact on the local municipalities would be much less. Solid waste generation from the project would not significantly affect the ability of the cities and the base to incorporate the increased generation from Alternative 3 into their source reduction and recycling plan. Construction waste generation would be less for this alternative. Site 3 would be utilized, negating the need for demolition of the Weapons Storage Area located on Site 1.

Energy. If Alternative 3 were selected the utility systems servicing the electricity and natural gas demands to the base and the surrounding area would be able to meet the energy demands of this alternative. No significant impacts would occur.

Alternative 4. If Alternative 4 were selected, no significant impacts to the potable water systems, wastewater treatment facilities, solid waste disposal infrastructure, or energy systems would occur.

4.4.4.3 No Action Alternative

There would be no adverse impact to the existing potable water systems, wastewater treatment facilities, solid waste infrastructure, or increased energy requirements for March AFB or the surrounding area.

4.4.5 Hazardous Materials/Waste Management

4.4.5.1 Proposed Action

Hazardous Materials Management. The volume and composition of hazardous materials used and stored on March AFB would increase with the proposed action. Any needed state or federal permits associated with these materials would be obtained. Aerospace Corporation would be responsible for the permits associated with their use of hazardous materials. These would be obtained in accordance with state and federal regulations. The increased inventory of hazardous materials and related potential for increased spills would pose adverse impacts on the public health, water resources, soils, and biological resources. Utilization of present management plans for the handling and storage of hazardous materials would decrease the adverse impacts associated with the increased inventory.

Hazardous Waste Management. The volume and composition of hazardous waste would increase at March AFB. The current volume of 104 tons of hazardous waste annually at Los Angeles AFB would not be directly transferable. The elimination of the duplication of base operation functions would decrease the waste stream. The current composition would also change. The asbestos-containing and

PCB wastes would not be transferred. The current volume and composition of the waste stream from Aerospace Corporation would be transferred, with the exception of the asbestos-containing and PCB wastes. The increase in the current hazardous waste disposal activities and the potential for spills would pose adverse impacts on public health, water resources, soils, and biological resources. Utilization of present management plans for the handling and disposal of hazardous waste would mitigate the adverse impacts of the increased generation of hazardous waste onbase.

Installation Restoration Program Sites. No IRP sites are located on the sites for the proposed action. No adverse impacts are associated with the location of any IRP sites on March AFB.

4.4.5.2 Alternative Actions

Alternative 1. The impacts of Alternative 1 are the same as those stated above for the proposed action since the Ballistic Missile Organization does not maintain hazardous materials inventories or generate a hazardous waste stream.

Alternative 2.

Hazardous Materials Management. If Alternative 2 were selected, Aerospace Corporation and the Special Program Office would not relocate. Under this alternative the composition of hazardous materials at March AFB would be similar to its current inventory. There would be an expected increase in inventory of materials associated with base operations, but the hazardous materials associated with Aerospace Corporation would not be transferred. Any adverse impacts posed to public health or the environment by the increased inventory would be mitigated by the continued implementation of current management plans.

Hazardous Waste Management. If Alternative 2 were selected, the composition of the waste stream at March AFB would be similar to its current waste stream. There would be an expected increase in the volume of the waste stream. Any adverse impacts posed to public health or the environment by the increased hazardous waste disposal activities and potential for spills would be mitigated by the continued implementation of current management plans.

Alternative 3. If Alternative 3 were selected, the Ballistic Missile Organization would solely relocate. The volume and composition of both the hazardous materials inventory and hazardous waste generation would probably increase very slightly above present levels at March AFB. The possible adverse impacts associated with the storage and use of hazardous materials and the generation and disposal of hazardous waste would continue.

Alternative 4. If this alternative were selected, the volume and composition of both the hazardous materials inventory and hazardous waste generation would continue at present levels at March AFB. The possible adverse impacts associated with the storage and use of hazardous materials and the generation and disposal of hazardous waste would continue.

4.4.5.6 No Action Alternative

Hazardous materials and waste management would continue in the current manner if the no action alternative were selected. The possible adverse impacts associated with the storage and use of hazardous materials and the generation and disposal of hazardous waste would continue.

4.4.6 Geology and Soils

4.4.6.1 Proposed Action

Geologic Hazards. March Air Force Base is located on the Perris Plain Block which is a portion of the Peninsular Ranges Physiographic Province located between the San Jacinto Fault Zone and the Elsinore Fault Zone. The San Jacinto Fault Zone is located to the east of March AFB and is an active seismic area. Epicenters of several seismic events have occurred in the March AFB area. Seismicity of reported earthquakes have ranged from 4.0 to 5.9 in magnitude on the Richter Scale for the period of 1932 through 1987.

No significant faults are known to cross within Site 1, Site 2, Site 3, or the Housing Area. Movement along the San Jacinto Fault to the east will occur with unpredictable frequency and will expose the relocated mission to the same risk as the surrounding community.

Soils.

Construction Phase. Some impacts may occur to the soil resources in the proposed alternative areas as a result of construction activity. Construction of the necessary facilities has the potential to increase erosion unless proper mitigation measures are taken.

Standard measures would be employed during the construction phase to minimize wind and water erosion. The amount of soil loss due to water erosion is dependent on rainfall intensity and erodibility of the soil. It is also dependent on the texture of the soil, location within the landscape, and plant cover. Without erosion control measures, the maximum soil loss due to water erosion would be 3 tons/acre/year (Table 4.4.6-1). Proper construction practices could reduce soil loss by 50 percent (Table 4.4.6-1). These practices could include construction of retaining walls, berms to guide overland flow, and contouring steep grades.

Without erosion control measures, the maximum soil loss due to wind erosion would be 13 tons/acre/year (Table 4.4.6-1). Proper construction practices could reduce this loss by 50 percent (Table 4.4.6-1), resulting in minimal impacts.

Operational Phase. As buildings and landscapes will be installed, pavement established for parking lots and roads, no impact to the soil resources due to erosion is anticipated.

4.4.6.2 Alternative Actions

If only part of the SSD mission was relocated to March AFB, impact on soil resources would decrease correspondingly.

Table 4.4.6-1

Soil Loss Due to Wind and Water Erosion for the Proposed Action and Alternatives March AFB (tons/acre/year)

	Proposed Action	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Total Disturbed Acres	554	443	455	161	50
Mitigation:					
Water Erosion[1]	831	664	682	242	75
Wind Erosion[2]	3,601	2,879	2,956	1,047	325
No Mitigation:					
Water Erosion[1]	1,662	1,329	1,365	483	150
Wind Erosion[2]	7,202	5,759	5,915	2,093	650
Soil Formation Rate[3]	2,770	2,215	2,275	805	250

Notes: [1]Maximum soil loss due to water erosion for the Fallbrook Sandy Loam is 3 tons/acre/year.
[2]Maximum soil loss due to wind erosion for the Fallbrook Sandy Loam is 13 tons/acre/year.
[3]Average soil formation rate is 5 tons/acre/year (Soil Conservation Service [SCS], 1982).

4.4.6.3 No Action

There would be no adverse impact to the existing geology and soil resources if no action were taken.

4.4.6.4 Mitigations

During the construction phase, soil loss caused by wind might be a significant impact. This can be mitigated in various ways. Through the months of October to March, the Santa Ana Winds can exert a dominant influence to increase erosional activities. Awareness of these windy months and application of mitigation measures will reduce the amount of soil loss. The application of water to the exposed soil surface can allow a crust to form. This crust reduces the amount of unconsolidated soil particles dispersed by wind. Standard construction practices would be employed to prevent water erosion due to overland flow of storm water as a result of the impact of rainfall. These practices would include the construction of berms and channels to direct flowing water from the construction site.

4.4.7 Water Resources

4.4.7.1 Proposed Action

Groundwater Resources. March AFB currently uses water purchased from the Eastside Municipal Water District. Groundwater resources around March AFB have not been developed. Hence, there is no withdrawal of local groundwater, and the proposed action or the alternatives at March AFB would not affect this resource.

Surface Water.

Construction Phase. During the construction of the facilities would require 12,500 gallons of water per acre would be used to spray down exposed soil surfaces to reduce wind-blown sediments and mitigate the erosion potential of this resource (Table 4.4.7-1). The proposed action would require 6.9 million gallons of water to control airborne dust and to mitigate potential wind erosion. This amount of water would be used to control sediments when appropriate. Alternatives 1 through 4 would require less acres for construction activities and subsequently less water to mitigate flowing dust (Table 4.4.7-1). This water is expected to percolate into the soil or evaporate. Consequently no degradation of surface waters is expected.

Operational Phase. Runoff from paved surfaces and facilities will increase with the addition of new facilities. However, the drainage from these sources is not expected to have any measurable impact on surface water in the area.

4.4.7.2 Alternative Actions

If one of the remaining Alternatives (1 through 4) were to be realigned at March AFB, impact to water resources would decrease correspondingly based on how much construction would be required (Table 4.4.7-1). The areas designated for the various components of the realigned mission would require water; but, as only a portion of the facilities would be required, only a relational fraction of the water would be needed.

Table 4.4.7-1

Water Requirements During Construction and Operations Phases for the Proposed Action and Alternatives March AFB [million gallons per day]

	Proposed Action	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Construction Phase[1]	6.9	5.5	5.2	1.5	0.6
Operations Phase:[2]					
Household	5.0	3.7	3.8	1.25	0.5
Facility/Industrial	0.5	0.4	0.39	0.125	0.05

[1]Water used to spray down exposed soil is estimated at 12,500 gallons per acre, including water for revegetation efforts.

[2]Requirements are based on 200 gallons/day per person for household use (base housing) and 50 gallons/day per person for facility and industrial use.

4.4.7.3 No Action Alternative

There would be no adverse impact to the existing water resources at March AFB if the No Action Alternative was selected.

4.4.7.4 Mitigations

To offset any water shortages, more water would be required to be purchased. It may be feasible to use alternative technologies for reducing the amount of wind-blown sediments such as hydromulching or the use of organic polymers.

4.4.8 Air Quality

4.4.8.1 Proposed Action

In the short term, construction of the proposed facilities would affect air quality primarily through soil disturbance (fugitive dust) and construction vehicle emissions. Long-term effects of the project would be caused by emissions from the additional vehicles used by project personnel and their families. Short-term impacts were determined by comparing project emissions with the estimated Riverside County emissions inventory. The long-term impacts from related increases in motor vehicle traffic were estimated using the California CALINE 4 line source dispersion model.

The primary sources of particulates during construction would be from clearing and grading activities which generate wind-blown dust, and exhaust emissions from heavy-duty construction equipment. Emission factors for fugitive dust and combustive emissions from heavy-duty diesel equipment were obtained from the Environmental Protection Agency's (EPA's) "Compilation of Air Pollution Emission Factors (AP-42) (EPA, 1985). Particulate emissions were assumed to be reduced by 50 percent through the application of water on disturbed soil during and after grading activities. Construction activities were assumed to occur over a 3-year period. The assumed distribution of equipment categories and annual operation hours (AP-42) are shown in Table 4.3.8-1 (Section 4.3.8). Exhaust emissions were calculated by estimating annual usage of the equipment. A comparison of total annual construction emissions, with Riverside County emissions is presented on Table 4.4.8-1. As shown in the table, the project emissions for all pollutants are less than 1 percent of the county emissions. Therefore, the air quality impacts from project construction activities would not be significant.

The primary short- and long-term air quality impacts, resulting from operations of the proposed project, would be due to carbon monoxide (CO) emissions from project-related increases in motor vehicle traffic. Based on the transportation analysis, the greatest increase in CO emissions would occur at the intersection along Cactus Avenue at the proposed entrance to Site 1 where a traffic light would control the flow of vehicles into the site. Traffic congestion in the morning nd afternoon peak hours may occur. Assuming a worst-case situation in which the peak hourly traffic would increase by approximately 4,600 vehicles, the maximum hourly CO concentrations would increase by 16.3 parts per million (ppm). Based on ambient maximum concentrations recorded in the area, a background CO concentration of 13 ppm was assumed. Operational emissions from added vehicular traffic at Site 1 would not cause violations of the federal ambient air quality standards for CO, but would exceed

Table 4.4.8-1

Comparison of Project Construction Emissions with Riverside County Emissions Proposed Action (Tons Per Year)

Source	CO	HC	NO_x	SO_x	Part
Construction Emissions	16.9	2.8	44.0	4.8	12.6
Riverside County	118,107	29,006	19,764	1208	50,312
% County Emissions	0.014	0.01	0.22	0.4	0.025

the state standard. Impacts would be similar for proposed Site 2, although the CO concentration would only increase by 12.2 ppm. The resulting CO concentration would still exceed the state standard.

However, even though the South Coast Air Basin including Riverside County is nonattainment area for CO, the overall long-term impact of project emissions on local and regional air quality would not be significant. The relocation of SSD-LA and Aerospace Corporation is consistent with the South Coast Air Basin Air Quality Management Plan policies of encouraging stationary sources to relocate to the eastern portions of the Basin and provide job opportunities in areas where the balance of jobs and housing is poor.

The emissions of criteria pollutants from project stationary sources would be expected to be similar to current emissions for similar facilities at the SSD and Aerospace Corporation operation in Los Angeles (Section 3.2.8). Although not a major stationary source, at current emission levels, emissions from proposed project facilities would exceed the New Source Review thresholds established by South Coast Air Quality Management District regulations. Best Available Control Technology and emission offsets would be required as part of the permitting process.

4.4.8.2 Alternative Actions

Air quality impacts for Alternatives 1 to 4 would similar to the proposed action. The state standard for CO would be exceeded for Alternatives 1 and 2 at both Sites 1 and 2, but would not be exceeded for Alternatives 3 and 4.

4.4.8.3 No Action Alternative

Air quality impacts for the no action alternative would not be significant.

4.4.9 Noise

Neither construction nor operation of the proposed facilities at March AFB would produce significant noise impacts. Construction of the facilities would take approximately 3 years and would comprise the main source of noise associated with the project. The nearest sensitive receptors are in a trailer park located about 1,200 feet north of proposed Site 1. L_{dn} noise levels in the area are presently about 70 dBA to 72 dBA. These high levels are the result of aircraft traffic at March AFB. Noise levels in the trailer park from construction activity would range 60 dBA to 65 dBA. The combined noise levels would range from 70 dBA to 73 dBA, or an increase of about 1 dB. This increase could not be detected by the human ear, and therefore the noise impacts would be insignificant.

Long-term noise impacts that would result from increased vehicular traffic would be negligible because of the current high background noise levels, discussed previously.

4.4.10 Biological Resources

4.4.10.1 Proposed Action

Vegetation. Most of the land which would be developed at Site 1 and for housing under the proposed action is previously disturbed grassland. Small areas of woody, riparian vegetation occur in drainages around Site 1 and in the proposed housing site, just south of Van Buren Boulevard. While large areas of disturbed grassland and some small sections of riparian vegetation would be destroyed or disturbed, studies indicate that the proposed action would not result in any significant impact to the area's plant resources. Sites 2 and 3 are previously disturbed and contain primarily landscaped areas.

Wildlife. The proposed action would result in the destruction or disturbance of a considerable amount of habitat for small mammals, reptiles, and birds. Some amphibians, in the riparian areas of the proposed housing site, may be destroyed or displaced. However, studies indicate that sufficient alternative habitats exist in the region, and the proposed action would not significantly affect the wildlife resources of the area.

Threatened and Endangered Species. Studies do not indicate the presence of any of the sensitive plant species listed on Table 3.4.10-1 (Section 3.4.10) within the area affected by the proposed action. Therefore, the proposed action is not expected to have any significant impact on these species.

Habitat, burrow, and animal destruction, and the potential for genetic isolation which would result from the implementation of the proposed action, would have a significant impact on the Stephen's kangaroo rat (SKR). The SKR is listed as an endangered species. The County of Riverside, March AFB, and nearby city agencies are currently working with the USFWS to establish an SKR Habitat Conservation Program (HCP). This HCP is expected to include the delineation of an ecological corridor/preserve to connect the scattered populations of SKRs. Officials of the county and the USFWS should be consulted (formally and informally) through all phases of development in order to minimize any impacts on this species.

The Los Angeles pocket mouse (*Perognathus longimembris brevinasus*) is a USFWS category 2 candidate species which is known to occur in the area of the proposed sites on west March AFB. The HCP being developed for SKR is likely to also benefit the Los Angeles pocket mouse population in the area. Additional mitigation for this species would probably not be necessary unless it is elevated to listed status.

The greater mastiff bat (*Eumops perotis californicus*), a USFWS category 2 candidate species, is expected in the area but is not known to occur on the proposed sites. The proposed action would, therefore, not have a significant impact on this species.

Five sensitive bird species are believed to occur within the area affected by the proposed action. The ferruginous hawk, Swainson's hawk, and prairie falcon, which are USFWS category 2 candidate species, and the northern harrier, which is a California Department of Fish and Game (CDFG) species of special concern, may forage in the grasslands on the western portion of March AFB. Studies indicate that the loss of habitat resulting from the proposed action would not, by itself, be a significant impact on these species, because alternative habitats exist in the area. The proposed action in combination with other development in the area may have a cumulative impact on these species.

Surveys indicate the presence of the burrowing owl, a CDFG species of concern, in the area of the proposed housing site. The loss of habitat and decline of this species throughout its range may lead to a rapid elevation in its federal status. Mitigation for the loss of this colony's habitat might include relocation of the proposed housing site or relocation of the individuals in the colony. Studies indicate that this species may be relocated with relative ease through trapping and the use of artificial burrows.

The orange-throated whiptail and San Diego Coast horned lizard are both USFWS category 2 candidate species which occur in the coastal sage scrub plant community. This plant community is not expected to be disturbed by the proposed action. Studies indicate that these reptiles would not suffer significant impacts from the proposed action.

Wetlands. Studies indicate that the proposed action would not have a significant impact on any wetlands. Future development offbase west of Site 1 may significantly affect the drainages supplying the riparian woodlands in that area.

4.4.10.2 Alternative Actions

The impacts of the alternative actions on the biological resources of the March AFB area would decrease in direct proportion to decreases in the acreage disturbed and elevation of human activity.

4.4.10.3 No Action Alternative

The no action alternative would not have a significant impact on the biological resources of the March AFB area.

4.4.11 Cultural and Paleontological Resources

4.4.11.1 Proposed Action

Site 1 may contain prehistoric milling slicks or bedrock mortars used by prehistoric populations to grind plants and seeds. Nineteen bedrock mortars have been identified on west March; although, none are associated with campsites or other features or artifacts. Bedrock mortars are expected to occur in Option Site 1 but are not likely to be eligible because they may represent limited-activity locations. Historic sites may be identified during survey; however, these sites may be small and lack physical integrity. Historic sites found in this area may not be considered NRHP eligible. The granitic bedrock in this portion of the base does not contain any paleontological materials. The proposed action for Site 1 would not have an adverse effect on cultural resources.

Site 2 may contain prehistoric milling slicks or bedrock mortars; however, these sites may not be considered NRHP because they have limited research potential. Portions of Camp Haan, a World War II training center, are located in the northern part of this area and consist of concrete foundations and several standing structures. However, Camp Haan has been determined not eligible for the NRHP. No paleontological materials are associated with the granitic bedrock in this area. The proposed action for Site 2 would not have an adverse effect on cultural resources.

The proposed housing area may contain prehistoric milling slicks or bedrock mortars; however, these sites have limited research potential and may not be considered NRHP eligible. Concrete foundations associated with Camp Haan may occur in the southern part of the housing area; however, Camp Haan has been determined to be not eligible for the NRHP. No paleontological materials are associated with the granitic bedrock in this area. The proposed action for the housing area would not have an adverse effect on cultural resources.

4.4.11.2 Alternative Actions

Alternative Actions 1 and 2. Impacts associated with Alternatives actions 1 and 2 would be the same as the proposed action for each siting option.

Alternative Actions 3 and 4. Site 3 may not contain any prehistoric sites. Bedrock used for mortars does not occur in this portion of the base. There are no historic structures located in this area. It is also unlikely that any important paleontological materials be encountered. Alternative actions 3 and 4 may not have an adverse effect on cultural resources.

4.4.11.3 No Action Alternative

Cultural and paleontological resources remain in their present condition.

4.4.11.4 Mitigation Measures

If potentially eligible cultural resources are identified during the present survey, test excavations be needed to formally evaluate these sites for eligibility to the NRHP. If the SHPO concurs with recommendations of eligibility, a mitigation plan should be prepared, approved, and implemented for all NRHP eligible sites prior to construction.

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4.5 PETERSON AND FALCON AIR FORCE BASES, COLORADO

4.5.1 Community Setting

4.5.1.1 Proposed Action

The proposed action would generate approximately 2,100 jobs beginning in 1992, increasing to a peak of 22,000 jobs in 1996, then declining to 14,800 in 1997. During the peak year for construction (1996), 14,900 of total employment would be direct jobs while another 7,000 would be indirect.

The proposed action would produce $148,709,000 of personal income in 1993, $403,471,000 in the peak construction year of 1996, then fall to $380,316,000 in 1997 and every year thereafter in the north county.

Population inmigration resulting from the project would begin at 2,100 in 1993 and increase to about 33,330 by 1996. The permanent population would increase by about 25,900 people who would live offbase in the Colorado Springs area.

It is estimated that this increase in population could require the development of nearly 1,400 acres of land in the vicinity of Peterson/Falcon AFBs for residential, commercial, industrial, and public uses. Although the specific areas in which this development would occur cannot be specifically identified, the conversion of this amount of land for community use could result in some adverse impacts to the natural environment.

4.5.1.2 Alternative Actions

Alternative action for the relocation of SSD activities located at Los Angeles AFB and San Bernardino, California involve personnel requirements that are smaller than those for the proposed action. The effects of these alternative actions on communities serving Peterson/Falcon AFB are summarized in Table 4.5.1-1.

Table 4.5.1-1

**Projected Increases in employment, Personal Income, and Population
Proposed Action and Alternatives
1997**

	Proposed Action	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Employment	14,850	11,110	11,340	3,720	1,470
Direct	10,090	7,560	7,740	2,530	1,000
Indirect	4,750	3,550	3,600	1,190	470
Personal Income (million 1990 $)	421	316	322	106	48
Population	25,900	19,300	19,900	6,560	2,580

4.5.1.3 No Action Alternative

Under the No Action Alternative, socioeconomic activity in the region surrounding Peterson AFB will be characterized by the baseline descriptions found in Section 3.4.5.1.

4.5.2 Land Use and Aesthetics

4.5.2.1 Proposed Action

Site 1. The Site 1 alternative at Peterson concerns 122 acres of Lease Amendment property and the northern half of the lease option property. The land abuts land owned by the City of Colorado Springs and currently is being developed as a runway for the new municipal airport expansion. The remaining land surrounding the land as well as Site 1 consists of rangeland devoted to cattle grazing. The conversion of the land from open rangeland to military use would be a logical expansion of the existing Peterson AFB and Colorado Springs Municipal Airport area and would not result in any significant land use or aesthetic effects.

Site 2. Site 2 is bisected by Marksheffel Road. Approximately 75 acres would be located in the "Lease Amendment/Option Area" (Site 1) and 145 acres would be acquired from private land, a portion of the approved Banning-Lewis Ranch, a 24,312-acre approved master planned community. The approved specific plan would allow a mixture of future uses including residential, commercial/office, research and development, a middle school, elementary school, and a park. The site is currently undeveloped rangeland and used to graze cattle. The conversion of rangeland to military use would occur within land designated for urban purposes by the City of Colorado Springs. The city is encouraging the conversior of rangeland to urban uses as per the Banning Lewis Master Plan. The use of Site 2 would not result in significant land use or aesthetic effects.

Site 3. Site 3 is located entirely within the Banning-Lewis Ranch and would require the acquisition of 220 acres of private land. The use of Site 3 would result in the displacement of a dairy feedlot and the conversion of rangeland to urban use. The Banning-Lewis Master Plan already plans for the displacement of the dairy and conversion of rangeland to urban uses. The selection of Site 3 would result in no significant land use or aesthetics effects.

Site 4. Site 4 consists of a vacant, undeveloped 180-acre site within Falcon AFB. The site is located east of the developed area of the base. The site consists of Air Force owned lands currently outleased for cattle grazing. The base is being expanded in an orderly and logical manner. The selection of Site 4 would not result in any significant land use or aesthetic effects.

Offbase Host Community. The City of Colorado Springs is the community anticipated to be host to those Peterson/Falcon AFB and Aerospace Corporation employees living offbase. The City of Colorado Springs has historically been host to most of the Peterson AFB and Falcon AFB employees choosing to reside offbase (including military, civil service, and civilian contractors). The city has indicated that it can accommodate the new offbase employees of the Proposed Action with existing housing. As a result, no significant land use or aesthetic effects are anticipated.

4.5.2.2 Alternative Actions

Land use and aesthetic effects from Alternatives 1 through 4 at Peterson/Falcon AFBs would not be significant. The land use and aesthetic effects in the host community of Colorado Springs would be the same as the proposed action, but proportionally less.

4.5.2.3 No Action Alternative

Peterson AFB and Falcon AFB would continue with their existing missions. The acquisition of private lands offbase (Peterson AFB) would not occur. The no action alternative would produce no land use and/or aesthetic effects.

4.5.3 Transportation

Roadway Traffic. Traffic associated with the proposed action would increase daily round-trips to Peterson and Falcon AFBs by over 15,000 vehicles during the peak construction year and approximately 9,200 vehicles during the operations phase. These vehicle trips would occur on most of the roadway network presented in Figure 3.6.3-1.

Because of the preliminary status of program planning, traffic analyses were based on changes to projected baseline conditions as a result of operations phase trip generation. It is recognized that ADT could increase by up to 60 percent during the peak construction year, resulting in temporary and adverse reductions in LOS.

Tables 4.5.3-1 and 4.5.3-2 presents a comparison of daily traffic volumes to estimated roadway capacities in the vicinity of Peterson and Falcon AFBs resulting from the proposed action. This comparison is generally the same for all sites. Changes in LOS occur for six road segments.

The proposed action would result in changes in peak-hour traffic, ADT, and LOS, causing an increase in automotive air emissions that exacerbate nonattainment air quality conditions.

Air Traffic. The addition of up to 80,000 enplanements and deplanements to Colorado Springs Airport, the commercial facility nearest Peterson and Falcon AFBs, would increase current levels by about 20 percent in 1997. This increase would not affect environmental conditions.

4.5.4 Utilities

4.5.4.1 Proposed Action

Water Supply. Program-related potable water demand is shown on Table 4.5.4-1 for the City of Colorado Springs, Peterson AFB, and Falcon AFB. The City of Colorado Springs provides potable water to its residents and Peterson AFB. The potable water demand for the proposed action would increase average daily demand 9.5 percent in 1996, the peak construction year, and 8 percent during operations (beginning in 1997). With the additional project-related increases the system would be operating at 48 percent in 1996, the peak construction year, and during the operations (beginning in 1997). There would be no significant impacts to the water supply system.

Table 4.5.3-1

Comparison of Daily Traffic Volumes to Estimated Daily Roadway Capacities for Road Segments in the Vicinity of Peterson AFB Proposed Action - Sites 1, 2, and 3

Road Segment	Road Capacity	Projected Conditions (1996)			Projected Conditions (Proposed Action)				
		ADT[1]	V/C Ratio[2]	LOS[3]	Peak Hour Traffic	Total Daily Traffic	ADT	V/C Ratio	LOS
Peterson Boulevard									
U.S. 24 to Constitution Avenue	26,000	10,814	0.42	A	175	870	11,680	0.45	A
U.S. 24/Platte Avenue									
Peterson Boulevard to Powers Blvd.	57,000	18,587	0.33	A	2,590	13,050	31,640	0.56	A
Powers Blvd. to Academy Blvd.	57,000	41,300	0.49	A	860	4,350	28,345	0.50	A
State Highway 94									
Peterson Blvd. to Marksheffel Road	16,200	6,252	0.39	A	2,760	13,920	20,170	1.25	F
Powers Boulevard									
U.S. 24 to Constitution Avenue	57,000	15,658	0.27	A	1,210	6,090	21,750	0.38	A
U.S. 24 to Airport Road	57,000	15,771	0.28	A	520	2,610	18,380	0.32	A
Marksheffel Road									
State Highway 94 to U.S. 24	16,200	2,591	0.16	A	520	2,610	5,200	0.32	A
State Highway 94 to Drennan Road	16,200	2,591	0.16	A	3,275	16,530	19,120	1.18	A
Academy Road									
U.S. 24 to Constitution Avenue	33,000	46,186	1.40	F	345	1,740	47,925	1.45	F
U.S. 24 to Airport Road	66,000	45,090	0.68	B	175	870	45,930	0.70	B

Notes: [1]ADT = average daily traffic.
[2]V/C Ratio represents the ratio of average daily traffic volume to roadway capacity.
[3]LOS = level of service (Section 3.1.3, Table 3.1.3-2).

Table 4.5.3-2
Comparison of Daily Traffic Volumes to Estimated Daily Roadway Capacities for Road Segments in the Vicinity of Peterson AFB
Proposed Action - Site 4

Road Segment	Road Capacity	Projected Conditions (1996)			Projected Conditions (Proposed Action)				
		ADT[1]	V/C Ratio[2]	LOS[3]	Peak Hour Traffic	Total Daily Traffic	ADT	V/C Ratio	LOS
Peterson Boulevard									
U.S. 24 to Constitution Avenue	26,000	10,814	0.42	A	345	1,240	12,054	0.46	A
U.S. 24/Platte Avenue									
Peterson Boulevard to Powers Blvd.	57,000	18,587	0.33	A	2,590	9,300	27,890	0.49	A
Powers Blvd. to Acadamy Blvd.	57,000	41,300	0.48	A	860	3,100	27,090	0.48	A
State Highway 94									
Peterson Blvd. to Marksheffel Road	16,200	6,252	0.39	A	2,930	10,540	16,800	1.04	F
Marksheffel Road to Enoch	16,200	5,126	0.32	A	3,450	12,400	17,470	1.08	F
Powers Boulevard									
U.S. 24 to Constitution Avenue	57,000	15,658	0.27	A	1,210	4,340	20,000	0.35	A
U.S. 24 to Airport Road	57,000	15,771	0.28	A	520	1,860	17,630	0.31	A
Marksheffel Road									
State Highway 94 to U.S. 24	16,200	2,591	0.16	A	520	1,860	4,450	0.27	A
Academy Road									
U.S. 24 to Constitution Avenue	33,000	46,186	1.40	F	345	1,240	47,425	1.44	F
U.S. 24 to Airport Road	66,000	45,090	0.68	B	175	620	45,680	0.69	B
Enoch Road									
South of State Highway 94	28,900	1,690	0.06	A	3,450	12,400	14,090	0.49	A

Notes: [1]ADT = average daily traffic.
[2]V/C Ratio represents the ratio of average daily traffic volume to roadway capacity.
[3]LOS = level of service (Section 3.1.3, Table 3.1.3-2).

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Table 4.5.4-1

Potable Water Requirements for Peterson AFB and Falcon AFB

	Baseline (MGD)	Proposed Action Demand[1] (MGD)	Proposed Action %[2]	Alternative 1 Demand (MGD)	Alternative 1 %	Alternative 2 Demand (MGD)	Alternative 2 %	Alternative 3 Demand (MGD)	Alternative 3 %	Alternative 4 Demand (MGD)	Alternative 4 %
Colorado Springs											
1996	66.16	7.0	9.5	5.4	8	5.4	8	1.62	2	0.65	1
1997	67.47	5.7	8.0	4.25	6	4.4	6	1.42	2	0.55	1
Peterson AFB											
1996	--	0.49	--	0.38	--	0.38	--	0.12	--	0.05	--
1997	--	0.49	--	0.38	--	0.38	--	0.12	--	0.05	--
Falcon AFB											
1996	0.63	0.49	--	0.38	--	0.38	--	0.12	--	0.05	
1997	0.63	0.49	--	0.38	--	0.38	--	0.12	--	0.05	

Notes: [1]Potable water demand is based on 200 gallons per capita per day (gpcd) for Colorado Springs. Potable water demand for Peterson AFB and Falcon AFB is based on 150 gpcd for military housing residents and 50 gpcd for nonresidents.
[2]Percent increase over baseline demand.

The projected baseline increases for the potable water system on Falcon AFB are above their contractual amount with the Cherokee Water District. The present contractual agreement of 0.48 MGD annually would not meet the future baseline projected for Falcon AFB or the projected potable water demand of the proposed action. As part of the proposed action, the contract would need to be renegotiated with Cherokee Water District.

Wastewater Treatment. Program-related wastewater treatment demand is shown on Table 4.5.4-2. The City of Colorado Springs provides wastewater treatment to its residents and Peterson AFB. Average daily wastewater flow would increase 11 percent over the projected baseline in 1996 and 9 percent in 1997. With the additional project-related increased the system would be operating at 71 percent in 1996, the peak construction year, and during operations (beginning in 1997). There would be no significant impacts to the wastewater treatment system.

The wastewater treatment system on Falcon AFB is being redesigned to meet the parameters of its NPDES permit, but is not being expanded to treat additional flow. The operating capacity of the system would either need to be expanded or an alternative treatment facility would need to be utilized as a part of the proposed action.

Solid Waste. Program-related solid waste generation is shown on Table 4.5.4-3. The proposed action would increase the solid waste generation over the projected baseline for the City of Colorado Springs an estimated 6 percent in 1996 and 5 percent in 1997. The city's current collection and disposal system would be able to meet the increased generation. The proposed action would increase the solid waste generation on Peterson AFB approximately 5 percent. The private contractor would be able to handle the increased generation. It is estimated that the increase for Falcon AFB would increase over 50 percent of the current baseline. The present contract with the private contractor may need to be renegotiated for the collection and disposal of the increased amount. No significant impacts would occur.

The total residential and facilities solid waste generation increase to the two public landfills would be 70.6 tons per day (T/day) in 1996 and decreasing to 64.6 T/day in 1997, not including the construction wastes shown on Table 4.5.4-3. The public landfills have the expansion capacity to meet the increased solid waste generation of the proposed action. No significant impacts would occur.

Energy. Project-related electrical demand for Colorado Springs and Peterson AFB would be met by the City of Colorado Springs. Estimated increased residential demand from the proposed action would be 76,330,000 kWh for 1996, the peak construction year, and 61,100,000 kWh during operations (beginning in 1997). Colorado Springs would have adequate power supplies to meet this increase. No significant impacts would occur.

Falcon AFB is supplied electrical energy through the Mountain View Electric Association, purchased from Western Area Power Administration (WAPA). Reserves to meet the increased facilities demand would be available. No significant impacts would occur.

The present electrical systems on both Peterson AFB and Falcon AFB would not meet the facilities peak demand of 29 MVA. The system would need to be increased as a part of the proposed action.

The City of Colorado Springs Department of Utilities supplies its residents and Peterson AFB with natural gas for heating purposes. Natural gas supplies to the area are extensive and would be able to

Table 4.5.4-2

Project-Related Wastewater Flows for Peterson AFB and Falcon AFB

	Baseline	Proposed Action		Alternative 1		Alternative 2		Alternative 3		Alternative 4	
	(MGD)	Flow[1]	%	Flow	%	Flow	%	Flow	%	Flow	%
Colorado Springs											
1996	33.2	3.69	11	2.90	9	2.80	9	0.85	3	0.34	1
1997	33.8	2.99	9	2.20	6	2.30	6	0.90	2	0.34	1
Peterson AFB											
1996	-	0.39	-	0.30	-	0.30	-	0.10	-	0.04	-
1997	-	0.39	-	0.30	-	0.30	-	0.10	-	0.04	-
Falcon AFB											
1996	0.075	0.39	-	0.30	-	0.30	-	0.10	-	0.04	-
1997	0.075	0.39	-	0.30	-	0.30	-	0.10	-	0.04	-

Note: [1]Wastewater flows for Colorado Springs is based on 100 gpcd.
Wastewater flows for Peterson AFB and Falcon AFB based on 40 gpcd.

Table 4.5.4-3

meet the estimated residential demand of 1,041,000 Mcf in 1996 and decreasing to 832,564 Mcf in 1997. The facilities demand on Peterson AFB of 376,000 Mcf would also be met by the utility. There would be no significant impacts.

The facilities demand on Falcon AFB of approximately 376,000 Mcf would be supplied by People's Natural Gas. There would be no significant impacts.

4.5.4.2 Alternative Actions

There would be no significant impacts on the existing potable water systems, wastewater treatment facilities, solid waste infrastructure, or increased energy requirements for Peterson AFB or the surrounding area if Alternatives 1 through 4 were selected.

There would be no significant impacts on the solid waste infrastructure or energy requirements for Falcon AFB if Alternatives 1 through 4 were selected. However, for each of the alternative actions, the potable water system and wastewater system at Falcon AFB would need to be increased as a part of the action.

For Alternatives 1 and 2, the capacity of the electrical system at each of the bases would need to be increased as a part of the alternative action. The present electrical systems at Peterson and Falcon AFB would meet the increased peak demand for Alternatives 3 and 4.

4.5.4.3 No Action Alternative

There would be no adverse impacts to the existing potable water systems, wastewater treatment facilities, solid waste disposal infrastructure, or increased energy requirements for Peterson AFB, Falcon AFB, or the surrounding area if the no action alternative were selected.

4.5.5 Hazardous Materials/Waste Management

4.5.5.1 Proposed Action

Hazardous Materials Management. The volume and composition of hazardous materials used and stored on Peterson or Falcon AFBs would increase with the proposed action. Any needed state or federal permits associated with these materials would be obtained. Aerospace Corporation would be responsible for the permits associated with their use of hazardous materials. These would be obtained in accordance with state and federal regulations. The increased inventory of hazardous materials and related potential for increased spills would pose adverse impacts on public health, water resources, soils, and biological resources. Utilization of present management plans would decrease the adverse impacts associated with the increased inventory.

Hazardous Waste Management. The volume and composition of hazardous waste would increase at Peterson AFB or Falcon AFB. The current volume of 204 tons annually at Los Angeles AFB would not be directly transferable. The elimination of the duplication of base operation functions would decrease the waste stream. The current composition would also change. The asbestos-containing and PCB-containing wastes would not be transferred. The current volume and composition of the waste stream for Aerospace Corporation would be transferred, with the exception of the asbestos-containing and the PCB wastes. The increase in the current hazardous waste disposal activities and the associated potential for spills would pose adverse impacts to public health, water resources, soils, and biological resources. Utilization of present management plans for the handling and disposal of hazardous wastes would mitigate the adverse impacts of the increased generation of hazardous wastes on either of the bases.

Installation Restoration Program Sites. No IRP sites are located on the proposed sites on either of the bases.

4.5.5.2 Alternative Actions

Alternative 1. The impacts of Alternative 1 are the same as those for the proposed action because the Ballistic Missile Organization does not maintain a hazardous materials inventory or directly generate a hazardous waste stream.

Alternative 2.

Hazardous Materials Management. If Alternative 2 were selected Aerospace Corporation and the Special Program Office would not relocate. Under this alternative the composition of hazardous materials inventory at Peterson AFB or Falcon AFBs would be similar to their current inventory. There would be an expected increase in the inventory of hazardous materials associated with base operations.

Any adverse impacts posed to the public health or the environment by the increased inventory would be mitigated by the continued implementation of the current management plans.

Hazardous Waste Management. If Alternative 2 were selected the composition of the waste stream at Peterson AFB or Falcon AFBs would be similar to its current waste stream. There would be an expected increase in the volume of the waste stream associated with the base operation activities. Any adverse impacts posed to public health or the environment by the increased hazardous wastes disposal activities and the potential for spills would be mitigated by the continued implementation of current management plans.

Alternative 3. If Alternative 3 were selected the Ballistic Missile Organization would relocate. The volume and composition of both the hazardous materials inventory and hazardous waste generation would continue at present levels at Peterson AFB or Falcon AFB. The possible adverse impacts associated with the storage and use of hazardous materials and the generation and disposal of hazardous wastes would continue.

Alternative 4. If Alternative 4 were selected the volume and composition of both the hazardous materials inventory and hazardous waste generation would continue at present levels at Peterson and Falcon AFBs. The possible adverse impacts associated with the storage and use of hazardous materials and the generation and disposal of hazardous waste would continue.

4.5.5.3 No Action Alternative

Hazardous material and waste management would continue in the current manner if the no action alternative were selected. The possible adverse impacts associated with the storage and use of hazardous materials and the generation and disposal of hazardous waste would continue.

4.5.6 Geology and Soils

4.5.6.1 Proposed Action

Geologic Hazards. Peterson and Falcon AFBs are in the Colorado Piedmont along the western margin of the Great Plains Physiographic Province. Colorado has a low seismicity potential, and within the Colorado Springs area, only three recorded earthquakes have occurred.

Soils.

Construction Phase. Some impacts may occur to soil resources in the proposed alternative areas as a result of construction activity. Construction of the necessary facilities has the potential to increase erosion unless proper mitigation measures are taken.

Standard measures would be employed during the construction phase to minimize wind and water erosion. The amount of soil loss due to water erosion is dependent on rainfall intensity and erodibility of the soil. It is also dependent on texture, location within the landscape, and plant cover. Without erosion control measures, the maximum soil loss due to water erosion would be 3 tons/acre/year (Table 4.5.6-1). Proper construction practices could reduce this loss by 50 percent (Table 4.5.6-1). These practices include construction of retaining walls, berms to guide overland flow, and contouring steep grades.

The wind can also be a significant force to reduce soil resources. Determining how much soil can be lost due to wind is dependent on soil texture, speed and direction of the wind, location within the landscape, and plant cover. Without erosion control measures, the maximum soil loss due to wind erosion would be 92 tons/acre/year. Proper construction practices could reduce this loss by 50 percent (Table 4.5.6-1). These practices could include spraying down the construction site with water.

Operational Phase. As buildings and landscapes would be installed, and pavement established for parking lots and roads, no impact to soil resources due to erosion is anticipated.

4.5.6.2 Alternative Actions

If one of the remaining Alternatives 1 through 4 were to be realigned to Peterson or Falcon AFB, impacts on soil resources would decrease correspondingly to how much construction would be required. The areas designated for the various components of the realigned mission would still be set aside, but because only a portion of the facilities would be required, only a relational fraction of the land might be exposed to the erosional forces of wind and water.

4.5.6.3 No Action Alternative

There would be no adverse impact to the existing geology and soil resources of the proposed alternative area at Peterson or Falcon AFB if the alternative no action alternative was selected.

Table 4.5.6-1

Soil Loss Due to Wind and Water Erosion for the Proposed Action and Alternatives Peterson and Falcon AFBs (tons/acre/year)

	Proposed Action	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Total Disturbed Acres:					
Peterson AFB	186	155	127	32	13
Falcon AFB	227	186	155	39	16
Mitigation - Water Erosion:					
Peterson AFB[1]	279	233	191	48	20
Falcon AFB[1]	341	279	233	59	24
Mitigation - Wind Erosion:					
Peterson AFB[2]	8,556	7,130	5,842	1,472	598
Falcon AFB[2]	10,442	8,556	7,130	1,794	736
No Mitigation - Water Erosion:					
Peterson AFB[1]	558	465	381	96	39
Falcon AFB[1]	681	558	465	117	48
No Mitigation - Wind Erosion:					
Peterson AFB[2]	17,112	14,260	11,684	2,994	1,196
Falcon AFB[2]	20,884	17,112	14,260	3,588	1,472
Soil Formation Rate:					
Peterson AFB[3]	930	775	635	160	65
Falcon AFB[3]	1,135	930	775	195	80

Notes: [1]Maximum soil loss due to water erosion for the soils found at Peterson and Falcon AFB is 3 tons/acre/year.
[2]Maximum soil loss due to wind erosion for the soils found at Peterson and Falcon AFB is 92 tons/acre/year.
[3]Average soil formation rate is 5 tons/acre/year (Soil Conservation Service [SCS], 1982).

4.5.6.4 Mitigation Measures

Geologic Hazards. No significant faults are known to occur within the Peterson or Falcon AFB area. Therefore, no mitigation is required for geologic hazards.

Soils. During the construction phase, soil loss caused by wind would be a significant impact. This can be mitigated in various ways. During August through December, the prevailing winds can exert a dominate influence in increasing erosional activities. Awareness of these windy months and application of mitigation measures would reduce the amount of soil loss. The application of water to the exposed soil surface can allow a crust to form. This crust reduces the amount of unconsolidated soil particles dispersed by winds. Standard construction practices would be employed to prevent water erosion due to overland flow of storm water or as a result of the impact of rainfall. These practices would include the construction of berms and channels to direct flowing water from the construction site.

4.5.7 Water Resources

4.5.7.1 Proposed Action

Groundwater Resources.

Construction Phase. Peterson AFB purchases water from the Transbasin Water Project and also water withdrawn from the Arkansas and Dawson aquifer. No groundwater wells are established on either Peterson or Falcon AFBs. All water required for construction would be purchased from the local water municipality (Table 4.5.7-1). Water required for construction at Falcon AFB would further affect the overdrafted Black Squirrel Creek aquifer (Table 4.5.7-2). Although the water requirement for construction represents less than a 0.1 percent increase in demand to the Black Squirrel Creek aquifer for the proposed action, this need would contribute to further overdraft of that aquifer.

Operational Phase. The use of this resource during the operational phase of this mission would necessitate an increase in water to the base (Table 4.5.7-1). This could be accomplished by purchasing more water from the public utility company of Colorado Springs for Peterson AFB. Colorado Springs currently purchases the bulk of its water from the Transbasin Water Project. Approximately 9 percent of the water use by Colorado Springs is obtained from the Arkansas and Dawson aquifers. These aquifers are not overdrawn and, at the current usage rate, represent a reliable water source. Falcon AFB would have to purchase water from the Cherokee Water District. Operational water use would also add to overdraft of the Black Squirrel Creek aquifer.

Surface Water.

Construction Phase. During construction of the facilities at Peterson AFB or Falcon AFB, 12,500 gallons of water per acre would be used to spray down exposed soil surfaces to reduce wind-blown sediments and mitigate the erosion potential of this resource. The proposed action would require 2.8 million gallons to control airborne dust and to mitigate potential wind erosion. This amount of water would be used to control sediments when appropriate. Alternatives 1 through 4 would require less acres for construction activities and subsequently less water to mitigate blowing dust. This water is

Table 4.5.7-1

Water Requirements During Construction and Operations Phases for the Proposed Action and Alternatives Peterson AFB [million gallons per day]

	Proposed Action	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Construction Phase[1]	2.3	1.9	1.6	0.4	0.16
Operations Phase[2]	0.5	3.7	3.8	1.25	0.5

[1]Water used to spray down exposed soil is estimated at 12,500 gallons per acre, including water for revegetation efforts.

[2]Requirements are based on 50 gallons/day per person for facility and industrial use.

Table 4.5.7-2

Water Requirements During Construction and Operations Phases for the Proposed Action and Alternatives Falcon AFB [million gallons per day]

	Proposed Action	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Construction Phase[1]	2.8	2.4	1.9	0.5	0.2
Operations Phase[2]	0.5	3.75	3.8	1.25	0.5
Percentage of Regional Water Use:					
Construction Phase	.06%	0.05%	0.04%	0.01%	.004%
Operations Phase	0.01%	0.08%	0.081%	0.02%	0.01%

[1]Water used to spray down exposed soil is estimated at 12,500 gallons per acre, including water for revegetation efforts.

[2]Requirements are based on 50 gallons/day per person for facility and industrial use.

expected to percolate into the soil or evaporate. Consequently, no degradation of surface waters is expected.

Operational Phase. Runoff from paved surfaces and facilities will increase with the addition of new facilities. However, the drainage from these sources is not expected to have any measurable impact on surface water in the area.

4.5.7.2 Alternative Actions

If one of the remaining Alternatives 1 through 4 were to be realigned at Peterson or Falcon AFBs, impacts to water resources would decrease correspondingly based on how much construction would be required. The areas designated for the various components of the realigned mission would require water, but, because only a portion of the facilities would be required, only a relational fraction of the water would be needed.

4.5.7.3 No Action Alternative

There would be no adverse impact to the existing water resources of the proposed alternative area at Peterson or Falcon AFBs if the no action alternative was selected.

4.5.7.4 Mitigation Measures

Surface Water.

Construction Phase. To offset any water shortages, more water would need to be purchased. It may be feasible to use alternative technologies for reducing the amount of wind blown sediments, such as hydromulching or the use of organic polymers.

Operational Phase. If the daily operations of the realigned mission results in water usage that exceeds the current water use by Peterson AFB, more water must be purchased from the local water utility company. The impact of the proposed action or Alternatives 1 through 4 to the potable water use at Falcon AFB would be mitigated by increasing the annual delivery of water necessary to supply the base. The Cherokee Water District appears to be willing to negotiate a new agreement with the base. Amounts to be negotiated would be limited due to the overdraw of the aquifer. A water conservation and reuse program would also be necessary.

4.5.8 Air Quality

4.5.8.1 Proposed Action

In the short term, construction of the proposed facilities would affect air quality primarily through soil disturbance (fugitive dust) and construction vehicle emissions. Long-term effects of the project would be caused by emissions from the additional vehicles used by project personnel and their families. Short-term impacts were determined by comparing project emissions with the estimated El Paso County emissions inventory. The long-term impacts from related increases in motor vehicle traffic were estimated using the CALINE 4 line source dispersion model.

The primary sources of particulates during construction would be from clearing and grading activities which generate wind-blown dust, and exhaust emissions from heavy-duty construction equipment. Emission factors for fugitive dust and combustive emissions from heavy-duty diesel equipment were obtained from the Environmental Protection Agency's (EPA's) "Compilation of Air Pollution Emission Factors (AP-42) (EPA, 1985). Particulate emissions were assumed to be reduced by 50 percent through the application of water on disturbed soil during and after grading activities. Construction activities were assumed to occur over a 3-year period. The assumed distribution of equipment categories and annual operation hours (AP-42) are shown in Table 4.3.8-1 (Section 4.3.8). Exhaust emissions were calculated by estimating annual usage of the equipment. A comparison of total annual construction emissions, with El Paso County emissions is presented on Table 4.5.8-1. As shown in the table, the project emissions for all pollutants are less than 1 percent of the county emissions. Therefore, the air quality impacts from project construction activities at Peterson AFB and Falcon AFB would not be significant.

Table 4.5.8-1

Comparison of Project Construction Emissions with El Paso County Emissions Proposed Action (Tons Per Year)

Source	CO	HC	NO_x	SO_x	Part
Construction Emissions	16.9	2.8	44.0	4.8	12.6
El Paso County	98,666	26,317	23,871	10,364	108,702
% County Emissions	0.017	0.01	0.18	0.046	0.012

The primary short- and long-term air quality impacts, resulting from operations of the proposed project, would be due to carbon monoxide (CO) emissions from project-related increases in motor vehicle traffic. Based on the transportation analysis for proposed Peterson AFB Sites 1, 2, and 3, the greatest increase in CO emissions would occur at the intersection of State Highway 94 and Marksheffel Road north of the proposed project sites where a traffic light would control the flow of vehicles. Traffic congestion in the morning nd afternoon peak hours may occur. Assuming a worst-case situation in which the peak hourly traffic would increase by approximately 4,600 vehicles, the maximum hourly CO concentrations would increase by 19.5 parts per million (ppm). Based on ambient maximum concentrations recorded in the area, a background CO concentration of 15 ppm was assumed. Operational emissions from added vehicular traffic would not cause violations of the federal ambient air quality standards for CO. However, even though the increase in CO concentrations would be less than the federal standard, because the Colorado Springs area is nonattainment for CO, the overall long-term impact of project emissions on air quality would not be significant. The project emissions could cause a delay in the achievement of attainment status for the area.

Based on the transportation analysis for proposed Falcon AFB Site 4, the greatest increase in CO emissions would be expected to occur at the intersection of State Highway 94 and Enoch Road north of the entrance road to the bases where a traffic light would control the flow of vehicles to the site. Traffic congestion in the morning and afternoon peak hours may occur. Assuming a worst-case situation in which the peak hourly traffic would increase by approximately 4,600 vehicles, the maximum hourly CO concentrations would increase by 22.7 parts per million (ppm). Based on ambient maximum concentrations recorded in the area, a background CO concentration of 9 ppm was assumed. Operational emissions from added vehicular traffic would not cause violations of the federal ambient air quality standards for CO. Therefore, because the Falcon AFB area is attainment for CO, the overall long-term impact of project emissions on air quality would not be significant.

4.5.8.2 Alternative Actions

Air quality impacts for Alternatives 1 and 2 would similar to the proposed action at both bases, although the increased concentrations of CO would be proportionally smaller. The federal standards would not be exceeded.

4.5.8.3 No Action Alternative

Air quality impacts for the no action alternative would not be significant.

4.5.9 Noise

Temporary construction noise at Peterson AFB would not cause any significant impacts because the nearest sensitive receptors are about 1-mile from the proposed sites. In addition, at Falcon AFB, no significant noise impacts would occur because of the administrative and industrial nature of existing facilities. Since most activities take place inside the Consolidated Space Operations Center facility, where noise would be buffered, construction noise levels would be reduced to insignificant levels.

Long-term noise from the project would be the result of increased vehicular traffic in the area. Increased traffic along the roadway leading to the proposed sites would increase present day-night (L_{dn}) noise levels by decibels on the A-weighted scale 2 (dBA) to 3 dBA. Background L_{dn} noise near Peterson AFB ranges from 60 dBA to 65 dBA. These noise levels are largely due to civilian and military aircraft operations. This small increase (2 to 3 dBA) in noise levels would hardly be noticed, and the noise impacts would be considered insignificant. At Falcon AFB, where there are few sensitive receptors on or off the base, the noise impacts would also be insignificant. However, the increase in L_{dn} noise levels in the vicinity of Falcon AFB would be noticed more than at Peterson AFB, because the present L_{dn} background levels are quite low in the former area ranging from 40 dBA to 45 dBA. It is well known that noise increases in quiet areas (background less than 50 dBA) may be perceived as greater than the same increase in noise areas.

4.5.10 Biological Resources

4.5.10.1 Proposed Action

Vegetation.

Peterson AFB. Studies indicate that the proposed action would not have a significant impact on the vegetation in the area of Peterson AFB.

Falcon AFB. If the wetland areas on the Falcon AFB site are avoided (see wetlands discussion below), the proposed action would not have a significant impact on the vegetation in the area.

Wildlife.

Peterson AFB. Studies indicate that the proposed action would not have a significant impact on the wildlife in the area of Peterson AFB because of the abundance of similar habitat in the area.

Falcon AFB. If the wetland areas on the Falcon AFB site are avoided (see wetlands discussion below), the proposed action would not have a significant impact on the wildlife in the area of Falcon AFB because of the abundance of similar habitat in the area.

Threatened and Endangered Species.

Peterson AFB. No threatened or endangered species are known to occur on the Peterson AFB site. Therefore, the proposed action would not have a significant impact on threatened or endangered species in the area of Peterson AFB.

Falcon AFB. No threatened or endangered species are known to occur on the Falcon AFB site. Therefore, the proposed action would not have a significant impact on threatened or endangered species in the area of Falcon AFB.

Wetlands.

Peterson AFB. Studies indicate that no wetlands exist on the Peterson AFB site. Therefore, the proposed action would not have a significant impact on wetlands in the Peterson AFB area.

Falcon AFB. One rather large pond and several smaller ponds occur on the Falcon AFB site (Figure 3.5.10-2). These ponds support wetland-associated plants and at least the largest pond supports a variety of wetland-associated wildlife. If the proposed action includes development on or around these ponds the resulting habitat destruction would have a significant detrimental impact on these wetlands. Sufficient land exists adjacent to the proposed site to locate the proposed facilities without affecting these wetland areas.

4.5.10.2 Alternative Actions

Peterson AFB. The impacts of the alternative actions on the biological resources in the area of Peterson AFB would decrease in direct proportion to decreases in the acreage disturbed and elevation in human activity.

Falcon AFB. The impacts of the alternative actions on the biological resources in the area of Falcon AFB would decrease in direct proportion to decreases in the acreage disturbed and elevation of human activity, with the exception of the wetlands areas. If the project is sited in the wetlands areas, even Alternative 4 will completely destroy the wetlands areas. Mitigation involves relocation of the proposed facilities.

4.5.10.3 No Action Alternative

Peterson AFB. The no action alternative would not have a significant impact on the biological resources of the Peterson AFB area. However, if there is future development on or around the sites, significant impacts may occur. These impacts would be discussed in a separate EA.

Falcon AFB. The no action alternative would not have a significant impact on the biological resources of the Falcon AFB area. However, if there is future development on or around the sites, significant impacts may occur. These impacts would be discussed in a separate EA.

4.5.11 Cultural and Paleontological Resources

4.5.11.1 Proposed Action

Site 1 is characterized by a small ridge overlooking the Jimmy Camp Creek drainage to the east. The ridgetop provides a good observation point of the valley, and prehistoric sites are expected. However, these sites may represent limited activity locations that may not be considered National Register of Historic Places (NRHP) eligible. Small historic sites may be identified; however, they may be small and lack physical integrity. Paleontological materials are not likely to be encountered. The proposed action for Site 1 may have no adverse effect on cultural or paleontological resources. Site 2 consists of the uplands and bluffs overlooking Jimmy Camp Creek. Prehistoric sites are also expected to occur along the bluffs, and site types would include limited activity sites and small campsites. Some small campsites may be considered NRHP eligible. No standing structures occur in this area; however, historic archaeological sites may be encountered. Historic sites, without standing structures, may be small and lack physical integrity or may not be important to understanding local or regional history. Such sites would most likely be considered not NRHP eligible. Paleontological materials associated with the Denver or Laramie formations may be encountered and would be considered important. If NRHP eligible sites are identified along the bluffs, the proposed action for Site 2 would have an adverse effect on cultural resources. Site 3 is characterized by uplands. Prehistoric sites may occur but would most likely be small, limited activity sites with limited research potential. Several historic railroad grades are located in this area; however, they may lack physical integrity and are not likely to be considered NRHP eligible. Paleontological materials are not likely to be encountered. The proposed action for Site 3 may have no adverse effect on cultural or paleontological resources.

Falcon AFB Site 4 can be characterized as a relatively flat plain with intermittent drainages. Prehistoric sites may occur in this type of setting; however, the sites would be small and represent very limited activity locations. Such sites would most likely be considered not eligible for the NRHP. Historic sites may also be identified and would most likely represent ranching and farming activities. However, these small historic sites may lack physical integrity and may not be considered eligible. Paleontological materials are associated with the Denver Formation and would be considered important if encountered. The proposed action for Site 4 may have no adverse effect on cultural or paleontological resources.

4.5.11.2 Alternative Actions

Peterson AFB. Program effects at Sites 1, 2, and 3 would be the same as the proposed action.

Falcon AFB. Program effects at Site 4 would be the same as the proposed action.

4.5.11.3 No Action Alternative

There would be no effect on cultural and paleontological resources.

4.5.11.4 Mitigation Measures

If potentially eligible cultural resources are identified during the present survey, test excavations will be needed to formally evaluate these sites for eligibility to the NRHP. If the SHPO concurs with recommendations of eligibility, a mitigation plan should be prepared, approved, and implemented for all NRHP eligible sites prior to construction.

4.6 KIRTLAND AIR FORCE BASE, NEW MEXICO

4.6.1 Community Setting

4.6.1.1 Impacts of the Proposed Action

The proposed action would generate approximately 1,900 jobs beginning in 1992, increasing to a peak of 21,400 jobs in 1996, then declining to 14,800 in 1997. During the peak year for construction (1996), 14,500 of total employment would be direct jobs while another 6,800 would be indirect.

The proposed action would produce $148,709,000 of personal income in 1993, $403,471,000 in the peak construction year of 1996, then fall to $380,316,000 in 1997 and every year thereafter in the north county.

Population inmigration resulting from the project would begin at 1,900 in 1993 and increase to about 32,000 by 1996. The permanent increase in population would be about 26,000 people who would live offbase in the Albuquerque area.

It is estimated that this increase in population could require the development of nearly 1,400 acres of land in the vicinity of Kirtland AFB for residential, commercial, industrial, and public uses. Although the specific areas in which this development would occur cannot be specifically identified, the conversion of this amount of land for community use could result in some adverse impacts to the natural environment. The currently developed land in the Albuquerque area should be adequate for the project without requiring additional land disturbance.

4.6.1.2 Alternative Actions

Alternative action for the relocation of SSD activities located at Los Angeles AFB and San Bernardino, California involve personnel requirements that are smaller than those for the proposed action. The effects of these alternative actions on communities serving Kirtland AFB are summarized in Table 4.6.1-1.

4.6.1.3 No Action Alternative

Under the No Action Alternative, socioeconomic activity in the region surrounding Kirtland AFB will be characterized by the baseline descriptions found in Chapter 3.0.

4.6.2 Land Use and Aesthetics

4.6.2.1 Proposed Action

Site 1. The Site 1 alternative involves three areas designated as "Site A", "Site B" and "Site C".

Site 1A. Site 1A consists of 30 acres at Kirtland AFB and 82 acres of DOE land. Approximately 110.6 acres are undeveloped and 1.4 acres are fenced, undeveloped Girl Scout campground. The base plan has designated 9 acres of the Air Force-owned land for future General Officers' Quarters. The remaining 21 acres is designated for the existing Girl Scout camp, open space, and right-of-way for

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Table 4.6.1-1

Projected Increases in Employment, Personal Income, and Population
Proposed Action and Alternatives
Kirtland AFB
1997

	Proposed Action	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Employment	1,920	11,110	11,340	3,730	1,470
Direct	1,300	7,560	7,740	2,530	1,000
Indirect	620	3,550	3,600	1,200	470
Personal Income ($000)	545	316	322	105	42
Population	25,900	19,300	19,900	6,560	2,580

a future light rail public transit line. The base comprehensive plan has designated the DOE land for a future public transit line station, conference center, Air Reserve Museum, National Atomic Museum, and a contractor's complex. The proposed action would amend the base comprehensive plan which is not considered a land use effect because base planning is an ongoing process. The proposed action would result in no significant land use or aesthetics effects.

Site 1B. Site 1B is a 30 acre area. Site 1B would reuse existing Buildings 20201, 20202, and 20203 and the old hospital (Building 20140). Parking would be on a 3.5-acre vacant parcel located west of Building 20140; 1.2 acres of landscaped area east of Building 20140; and the area now occupied by headquarters 1606th Air Base Wing Building (Building 20200). The Kirtland AFB Comprehensive Plan has designated Buildings 20200, 20201, 20202, and 20203 as administrative; Building 20140 as medical; existing parking and vacant land Open Space. The use of Site 1B would redevelop and infill an existing developed parcel. The conversion of 1.2 acres of landscaped area for a parking would have a localized aesthetic impact upon the reuse of Building 20140 and the base Chapel; these uses would directly benefit by the creation of new parking. The land use effects of the proposed action would be beneficial, and the aesthetic effects would not be significant.

Site 1C. Site 1C consists of 124 acres of vacant land on an incorporated parcel under the jurisdiction of the City of Albuquerque. The Albuquerque Public Schools own much of the property and are preparing a specific plan to develop it. The current zoning ordinance allows a senior high school, junior high school, elementary school, a public park/recreation area, commercial office and residential use. Site 1C land use impacts would be rated not significant because the base would be expanded in a logical manner. The proposed uses are consistent with existing developed use or would involve the conversion of vacant residential developable land to a higher and better use for the benefit of the property owners and the City of Albuquerque.

The aesthetic effects would be negligible as the proposed action would be on land adjacent to existing development at Kirtland AFB, Sandia National Laboratories, and offbase light industries. The planned use is an expansion of these uses and would not deviate from the existing views.

Site 2. The proposed action at Site 2 consists of a 175-acre site approximately 2.5 miles southeast of the base support area. The site is in a sparsely developed area of the base. Site 2 is located within a 3-kilometer exclusion area of two nuclear reactors; a fast pulse reactor and an annular research reactor. Both reactors are research-type reactors sited in the Department of Energy (DOE) Technical Area V south of the proposed Site 2. The exclusion area was selected by the Atomic Energy Commission and Sandia National Laboratories (SNL) because the land is wholly owned and directly controlled either by the Air Force or DOE. The exclusion area was designed with a longer radius than required by regulation because the extensive federally-owned land would permit a large exclusion area and give SNL maximum flexibility to conduct research.

SNL has informed the Air Force that the siting of the proposed action within the exclusion area would have only minor impact on the DOE Technical Area V reactor operations. However, SNL has recommended development at Site 2 be designed with adequate traffic circulation capabilities to allow evacuation of the area within a reasonable period of time. The Air Force and SNL would prepare coordinated emergency response plans for the area. SNL further recommends the emergency response plan contain policies that discourage residential use and the placement of personnel that cannot be evacuated within a reasonable time.

Site 2 is also located within a fault zone of the Sandia Fault as defined by Grant. The siting of the proposed action would require the adequate setback of buildings as determined by geological studies. Areas within the setback may be developed for parking areas, outdoor recreation, or open space without any adverse land use effects.

The siting of the proposed action at Site 2 would not effect the surrounding land uses which include the golf course, riding club, caretaker's residence, Interservice Nuclear Weapons School training areas, Radioactive Burial Site No. 11, cobalt 60 test facility, wastewater treatment plant, and the nonradioactive general use landfills (both active and closed). The siting of the proposed action at Site 2 would not result in any significant land use effects.

Site 2 is visible from the Four Hills Village Community of Albuquerque located on the high alluvial fan of Manzano Mountain. However the distance between the community and the site is more than a mile and would result in some reduction of the site visibility. The siting of the proposed action would not result in any significant aesthetic effects.

Military Housing. The proposed action would site the military housing in a 21-acre parcel on land occupied by the family campground and service building. The associated land use and aesthetic effects would not be significant.

Offbase Host Community. The City of Albuquerque is the community anticipated to be host to those Kirtland AFB and Aerospace Corporation employees living offbase. The City of Albuquerque has historically been host to most of the Kirtland AFB employees choosing to reside offbase (including military, civil service, and civilian contractors). It is anticipated that Albuquerque would continue to be a host community to Kirtland AFB. The city has indicated that it can accommodate the new offbase employees of the proposed action without any significant land use or aesthetic effects.

4.6.2.2 Alternative Actions

Land use and aesthetic effects associated with Alternatives 1, 2, 3, and 4 at Kirtland AFB would be about the same (not significant) as for the proposed action except proportionally fewer acres of Kirtland AFB and offbase lands would be used. Land use effects the host community of Albuquerque would essentially be the same as the proposed action.

4.6.2.3 No Action Alternative

Kirtland AFB would continue with its existing missions. The acquisition of private lands offbase would not occur. There would be no land use or aesthetic effects.

4.6.3 Transportation

Roadway Traffic. Traffic associated with the proposed action would increase daily round-trips to Kirtland AFB by over 15,000 vehicles during the peak construction year and approximately 9,200 vehicles during the operations phase.

Because of the preliminary status of program planning, traffic analyses were based on changes to projected baseline conditions as a result of operations phase trip generation. It is recognized that ADT could increase by up to 60 percent during the peak construction year, resulting in temporary and adverse reductions in LOS.

Tables 4.6.3-1 and 4.6.3-2 present a comparison of daily traffic volumes to estimated roadway capacities in the vicinity of Kirtland AFB resulting from the proposed action. This comparison is generally the same for all sites. Changes in LOS occur for six road segments.

The proposed action would result in changes in peak-hour traffic, ADT, and LOS, causing an increase in automotive air emissions that exacerbate nonattainment air quality conditions.

Air Traffic. The addition of up to 80,000 enplanements and deplanements to Albuquerque Airport, the commercial facility nearest Kirtland AFB, would increase current levels by about 20 percent in 1997. This increase would not affect environmental conditions.

4.6.4 Utilities

4.6.4.1 Proposed Action

Water Supply. Program-related potable water demand is shown on Table 4.6.4-1 for the City of Albuquerque and Kirtland AFB. The potable demand to the City of Albuquerque for the proposed action would increase average daily demand 4 percent above the projected baseline in 1996, the peak construction year, and during operations (beginning in 1997). With the additional increase the system would be operating at 53 percent of capacity in 1996 and 55 percent in 1997. The would be no significant impacts from the proposed action.

The program-related potable water increases from the proposed action would be met by the system at Kirtland AFB. With the additional demand the system would be operating at 89 percent of capacity.

Wastewater Treatment. Program-related wastewater flow is shown on Table 4.6.4-2 for the City of Albuquerque and the base. The City of Albuquerque treatment facility treats the wastewater flow from Kirtland AFB. The combined flows would increase 5 percent over the projected baseline in 1996 and 4 percent in 1997. The system would be operating at 92 percent in 1996, the peak construction year, and decrease to 88 percent during operations (beginning in 1997). The system would be able to treat the projected increased flows. No significant impacts would occur.

Solid Waste. Program-related solid waste generation is shown on Table 4.4.4-2. An addition 5 percent increase would result from the proposed action to the City of Albuquerque. The present collection and disposal system would meet the increased demand. The city-owned sanitary landfill has the capacity to handle additional solid waste generation. No significant impacts would occur.

A private contractor collects and disposes of solid waste in the landfill located onbase. The increased solid waste generation from the proposed action would be met. No significant impacts would occur.

Energy. Electrical energy generation for the City of Albuquerque and Kirtland AFB would be met by the Public Service Company of New Mexico. The estimated increased residential demand would be

Table 4.6.3-1

Comparison of Daily Traffic Volumes to Estimated Roadway Capacities for Road Segments in the Vicinity of Kirtland AFB Proposed Action - Sites 1A/1B and 1C/1B

Road Segment	Road Capacity	Projected Conditions (1996)			Projected Conditions (Proposed Action)				
		ADT[1]	V/C Ratio[2]	LOS[3]	Peak Hour Traffic	Total Daily Traffic	ADT	V/C Ratio	LOS
Gibson Boulevard									
I-25 to Carlisle Boulevard	50,400	42,131	0.78	C	90	530	42,660	0.79	C
Carlisle Boulevard to San Mateo Blvd.	50,400	40,779	0.76	C	185	1,065	41,845	0.77	C
San Mateo Boulevard to Louisiana Blvd.	50,400	36,949	0.68	B	230	1,330	38,280	0.71	C
Carlisle Boulevard									
Gibson Boulevard to Central Avenue	26,400	11,040	0.42	A	90	530	11,570	0.44	A
San Mateo Boulevard									
Gibson Boulevard to Central Avenue	28,800	33,457	1.16	F	46	270	33,720	1.17	F
Louisiana Boulevard									
Gibson Boulevard to Central Avenue	36,000	26,698	0.74	C	58	330	27,030	0.75	C
Central Avenue to I-40	36,000	38,301	1.06	F	0	0	38,300	1.06	F
Wyoming Boulevard									
Central Avenue to I-40	43,200	45,398	1.05	F	600	3,660	49,055	1.14	F
Central Avenue to Wyoming Gate	43,200	27,937	0.65	B	800	4,650	32,590	0.75	C
Central Avenue to I-40	43,200	34,133	0.79	C	2,590	14,960	49,095	1.14	F
I-40 to Menaul Boulevard	43,200	37,287	0.86	D	970	5,590	42,875	0.99	E
Central Avenue									
Louisiana Boulevard to Wyoming Blvd.	43,200	40,892	0.95	E	115	665	41,560	0.96	E
Wyoming Boulevard to Eubank Blvd	43,200	39,427	0.91	E	690	3,990	43,420	1.01	F
Eubank Boulevard to I-40	43,000	35,935	0.83	D	400	2,330	38,260	0.89	D

Table 4.6.3-1, Page 2 of 2

Road Segment	Road Capacity	Projected Conditions (1996)			Projected Conditions (Proposed Action)				
		ADT[1]	V/C Ratio[2]	LOS[3]	Peak Hour Traffic	Total Daily Traffic	ADT	V/C Ratio	LOS
Interstate 40									
I-25 to Louisiana Boulevard	84,000	149,824	1.78	F	1,930	11,170	161,000	1.90	F
San Mateo to Louisiana Boulevard	126,000	139,685	1.11	F	1,930	11,170	150,860	1.20	F
Louisiana Boulevard to Wyoming Blvd.	126,000	114.452	0.91	E	1,930	11,170	125,625	1.00	E
Wyoming Blvd. to Eubank Boulevard	126,000	89,894	0.71	C	1,575	9,110	99,000	0.79	C
Eubank Boulevard to Central Avenue	126,000	68,716	0.55	A	90	530	69,250	0.55	A

Notes: [1]ADT = Average Daily Traffic.
[2]V/C Ration represents the ratio of Average D.
[3]LOS = Level of Service (Section 3.1.3, Table

Table 4.6.3-2

Comparison of Daily Traffic Volumes to Estimated Roadway Capacities for Road Segments in the Vicinity of Kirtland AFB
Proposed Action - Site 2

Road Segment	Road Capacity	Projected Conditions (1996)			Projected Conditions (Proposed Action				
		ADT[1]	V/C Ratio[2]	LOS[3]	Peak Hour Traffic	Total Daily Traffic	ADT	V/C Ratio	LOS
Gibson Boulevard									
I-25 to Carlisle Boulevard	50,400	42,131	0.78	C	90	530	42,660	0.79	C
Carlisle Boulevard to San Mateo Blvd.	50,400	40,779	0.76	C	185	1,065	41,840	0.77	C
San Mateo Boulevard to Louisiana Blvd.	50,400	36,949	0.68	B	230	1,330	38,280	0.71	C
Carlisle Boulevard									
Gibson Boulevard to Central Avenue	26,400	11,040	0.42	A	90	530	11,570	0.44	A
San Mateo Boulevard									
Gibson Boulevard to Central Avenue	28,800	33,457	1.16	F	45	265	33,725	1.17	F
Louisiana Boulevard									
Gibson Boulevard to Central Avenue	36,000	26,698	0.74	C	230	1,330	28,030	0.78	C
Wyoming Boulevard									
Central Avenue to I-40	43,200	45,398	1.05	F	230	1,130	46,730	1.08	F
Central Avenue to Wyoming Gate	43,200	27,937	0.65	B	460	2,660	30,600	0.71	C
South of Central Avenue	28,000	15,433	0.54	A	3,680	21,280	36,715	1.27	F
Central Avenue to I-40	43,200	34,133	0.79	C	2,990	17,290	51,425	1.19	F
I-40 to Menaul Boulevard	43,200	37,287	0.86	D	1,060	6,120	43,405	1.00	E
Central Avenue									
Louisiana Boulevard to Wyoming Blvd.	43,200	40,892	0.95	E	230	1,330	42,225	0.98	E
Wyoming Boulevard to Eubank Blvd	43,200	39,427	0.91	E	230	1,330	40,760	0.94	E
Eubank Boulevard to I-40	43,000	35,935	0.83	D	460	2,660	38,600	0.89	D

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Table 4.6.3-2, Page 2 of 2

Road Segment	Road Capacity	Projected Conditions (1996)			Projected Conditions (Proposed Action				
		ADT[1]	V/C Ratio[2]	LOS[3]	Peak Hour Traffic	Total Daily Traffic	ADT	V/C Ratio	LOS
Interstate 40									
I-25 to Louisiana Boulevard	84,000	149,824	1.78	F	1,840	10,640	160,465	1.91	F
San Mateo to Louisiana Boulevard	126,000	139,685	1.11	F	1,840	10,640	150,325	1.19	F
Louisiana Boulevard to Wyoming Blvd.	126,000	114.452	0.91	E	1,840	10,640	125,090	0.99	E
Wyoming Blvd. to Eubank Boulevard	126,000	89,894	0.71	C	1,840	10,640	100,535	0.88	C
Eubank Boulevard to Central Avenue	126,000	68,716	0.55	A	92	530	69,250	0.55	A

Notes: [1]ADT = Average Daily Traffic.
[2]V/C Ration represents the ratio of Average D.
[3]LOS = Level of Service (Section 3.1.3, Table.

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Table 4.6.4-1

Project-Related Potable Water Requirements for Kirtland AFB

	Baseline (MGD)	Proposed Action Demand[1] (MGD)	Proposed Action %[2]	Alternative 1 Demand (MGD)	Alternative 1 %	Alternative 2 Demand (MGD)	Alternative 2 %	Alternative 3 Demand (MGD)	Alternative 3 %	Alternative 4 Demand (MGD)	Alternative 4 %
Albuquerque											
1996	135.8	5.9	4	4.2	3	4.2	3	1.32	1	0.55	0.4
1997	137.5	5.1	4	3.9	3	3.9	3	1.25	1	0.52	0.4
Kirtland AFB											
1996	5.28	0.50	9	0.39	7	0.39	7	0.123	2	0.05	1
1997	5.28	0.50	9	0.39	7	0.39	7	0.123	2	0.05	1

Notes: [1]Potable water demand is based on 200 gallons per capita per day (gpcd) for Albuquerque. Potable water demand for Kirtland AFB is based on 150 gpcd for military family housing residents and 50 gpcd for personnel.
[2]Percent increase over baseline demand.

Table 4.6.4-2

Project-Related Wastewater Flows at Kirtland AFB

		Proposed Action		Alternative 1		Alternative 2		Alternative 3		Alternative 4	
	Baseline (MGD)	Flow[1]	%	Flow	%	Flow	%	Flow	%	Flow	%
Albuquerque											
1996	62.7	3.34	5	2.40	4	2.40	4	0.77	1	0.32	1
1997	63.5	2.64	4	2.25	4	2.25	4	0.63	1	0.30	0.5
Kirtland											
1996	-	0.39	-	0.3	-	0.3	-	0.1	-	0.4	-
1997	-	0.39	-	0.3	-	0.3	-	0.1	-	0.4	-

Note: [1]Wastewater flows for Albuquerque are based on 100 gpcd.
Wastewater flows for Kirtland AFB based on 120 gallons gpcd for Military Family Housing residents and 40 gallons gpcd for nonresidents.

63,377,000 kilowatt-hour (kWh) in 1996, the peak construction year, decreasing to 55,233,000 kWh during operations (beginning in 1997). The Public Service Company of New Mexico would have adequate supplies for the proposed action. No significant impacts would occur.

The 125-megavolt-ampere (MVA) electrical system had an estimated peak demand of 66 MVA in 1989. The estimated facilities peak demand of 28 MVA would be met by the present system.

Public Service Company of New Mexico supplies the City of Albuquerque with natural gas for heating purposes. Total residential demand for the proposed action is an estimated 948,000 thousand cubic feet (Mcf) in 1996, and decreasing to 821,000 Mcf during operations (beginning in 1997). The Public Service Company of New Mexico would have adequate supplies to meet the required natural gas demands of the proposed action.

Kirtland AFB is supplied natural gas by Union Gas Company of Texas, a privately owned utility. Project facilities would require approximately 306,000 Mcf annually. The utility would be able to meet the required natural gas demands of the proposed action.

4.6.4.2 Alternative Actions

No significant impacts would occur to the potable water systems, wastewater collection facilities, solid waste generation infrastructure, or the energy systems if Alternatives 1 through 4 were selected.

4.6.4.3 No Action Alternative

No significant impacts would occur to the potable water systems, wastewater collection facilities, solid waste generation infrastructure, or the energy systems if the no action alternative were selected.

4.6.5 Hazardous Materials/Waste Management

4.6.5.1 Proposed Action

Hazardous Materials Management. The volume and composition of hazardous materials used and stored on Kirtland AFB would increase with the proposed action. Any needed state or federal permits associated with these materials would be obtained. Aerospace Corporation would be responsible for the permits associated with their use of hazardous materials. These would be obtained in accordance with state and federal regulations. The increased inventory of hazardous materials and related potential for increased spills would pose adverse impacts on public health, water resources, soils, and biological resources. Utilization of present management plans for the handling and storage of hazardous materials would decrease the adverse impacts associated with the increased inventory.

Hazardous Waste Management. The volume and composition of hazardous waste would increase at Kirtland AFB. The current volume of 104 tons at Los Angeles AFB would not be directly transferable. The elimination of the duplication of base operation functions would decrease the waste stream. The current composition would also change. The asbestos-containing and PCB wastes would not be transferred. The current volume and composition of the waste stream from Aerospace Corporation would be transferred, with the exception of the asbestos-containing and PCB wastes. The increase in the current hazardous waste disposal activities and the potential for spills would pose adverse impacts on public health, water resources, soils, and biological resources. Utilization of present management plans for the handling and disposal of hazardous waste would mitigate the adverse impacts of the increased generation of hazardous waste onbase.

Installation Restoration Program Sites. No IRP sites are located on the Site 1A, 1B, 1C, or Site 2. No adverse impacts are associated with the location of any IRP sites on Kirtland AFB.

4.6.5.2 Alternative Actions

Alternative 1. The impacts of Alternative 1 are the same as those stated above for the proposed action because the Ballistic Missile Organization does not maintain hazardous materials inventories or generate a hazardous waste stream.

Alternative 2.

Hazardous Materials Management. If Alternative 2 is selected, Aerospace Corporation and the Special Program Office would not relocate. Under this alternative the composition of the hazardous materials inventory at Kirtland AFB would be similar to its present inventory. There would be an expected increase in the inventory of materials associated with base operations. Any adverse impacts posed to public health or the environment would be mitigated by the continued implementation of current management plans.

Hazardous Waste Stream. If Alternative 2 is selected, the composition of the waste stream at Kirtland AFB would be similar to its current waste stream. There would be an expected increase in the volume of the waste stream. Any adverse impacts posed to the public health or the environment by the increased hazardous waste disposal activities and the potential for spills would be mitigated by the continued implementation of current management plans.

Alternative 3. If Alternative 3 is selected, the Ballistic Missile Organization would relocate. The volume and composition of both the hazardous materials inventory and hazardous waste generation would continue at present levels at Kirtland AFB. The possible adverse impacts associated with the storage and use of hazardous materials and the generation of hazardous wastes would continue.

Alternative 4. If this alternative is selected, the volume and composition of both the hazardous materials inventory and hazardous waste generation would continue at present levels at Kirtland AFB. The possible adverse impacts associated with the storage and use of hazardous materials and the generation of hazardous wastes would continue.

4.6.5.3 No Action Alternative

If the no action alternative is selected, the volume and composition of both the hazardous materials inventory and hazardous waste generation would continue at present levels. The possible adverse impacts associated with the storage and use of hazardous materials and the generation of hazardous wastes would continue.

4.6.6 Geology and Soils

4.6.6.1 Proposed Action

Geologic Hazards. Kirtland AFB is located in the Rio Grande Valley of the Mexican Highland Subdivision of the Basin and Range Physiographic Province. Four major fault systems exist within the boundaries of Kirtland AFB. There are differing reports to the exact location of these faults. In the Installation Restoration Program, Phase II Report, the Sandia Fault is represented as a north-trending fault that transverses from north to south just west of the golf course located adjacent to Site 2. The USGS geologic map of this same area does not detail this fault in that area. Mitigation would entail delineation of the exact location of this fault. The Tijeras and Hubbell Springs faults intersect southwest of Site 2, south of Manzano Mountain. The Sandia Fault bisects the base from the Sandia area south of Site 2, and parallels the eastern limit of Manzano Mountain. The Sandia fault may represent the northern extension of the Hubbell Springs Fault. This fault system is listed as being currently active but seismicity of earthquake events has not been recorded to exceed 2.5 on the Richter scale from 1980 to 1985.

Soils.

Construction Phase. Some impacts may occur to soil resources in the proposed alternative sites on Kirtland AFB as a result of construction activity. Construction of the necessary facilities has the potential to increase erosion unless proper mitigation measures are taken.

Standard measures would be employed during the construction phase to minimize wind and water erosion. The amount of soil loss due to water erosion is dependent on rainfall intensity and erodibility of the soil. It is also dependent on texture, location within the landscape, and plant cover. Without erosion control measures, the maximum soil loss due to water erosion would be 4 tons/acre/year (Table 4.6.6-1). Proper construction practices could reduce this loss by 50 percent (Table 4.6.6-1). These practices could include construction of retaining walls, berms to guide overland flow, and contouring steep grades.

The wind can also be a significant force to reduce soil resources. Determining how much soil can be lost due to wind is dependent on soil texture, speed and direction of the wind, location within the landscape, and plant cover. Without erosion control measures, the maximum soil loss due to wind erosion would be 130 tons/acre/year (Table 4.6.6-1). Proper construction practices could reduce this loss by 50 percent (Table 4.6.6-1). These practices could include spraying down the construction site with water.

Operational Phase. As buildings and landscapes would be installed, and pavement established for parking lots and roads, no impact to soil resources due to erosion is anticipated.

4.6.6.2 Alternative Actions

If one of the remaining alternatives (1 through 4) were to be realigned at Kirtland AFB, impacts on soil resources would decrease correspondingly to how much construction would be required. The areas designated for the various components of the realigned mission would still be set aside, but as only a

Table 4.6.6-1

Soil Loss Due to Wind and Water Erosion for the Proposed Action and Alternatives Kirtland AFB (tons/acre/year)

	Proposed Action	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Total Disturbed Acres	197	162	133	25	4
Mitigation:					
Water Erosion[1]	394	324	333	50	8
Wind Erosion[2]	12,805	10,530	8,645	1,625	260
No Mitigation:					
Water Erosion[1]	788	648	665	100	16
Wind Erosion[2]	25,610	21,060	17,290	3,250	520
Soil Formation Rate[3]	985	810	665	125	20

Notes: [1]Maximum soil loss due to water erosion for the Wirk-Madurvez Association is 4 tons/acre/year.
[2]Maximum soil loss due to wind erosion for the Wirk-Madurvez Association is 130 tons/acre/year.
[3]Average soil formation rate is 5 tons/acre/year (Soil Conservation Service [SCS], 1982).

portion of the facilities would be required, only a relational fraction of the land might be exposed to the erosional forces of wind and water.

4.6.6.3 No Action Alternative

There would be no adverse impact to the existing geology and soil resources of the proposed alternative area at Kirtland AFB if the no action alternative was selected.

4.6.6.4 Mitigations

Geologic Hazards. No significant faults are known to cross Site 1A or Site 1B. The Sandia Fault appears to bisect the alternative Site 2. Movement along the Sandia Fault would occur with unpredictable frequency and would expose the relocated mission to the same risk as the surrounding community. Mitigation measures for this hazard might include placing of buildings and facilities a safe distance from the fault zone.

Soils. During the construction phase, soil loss caused by wind might be a significant impact. This can be mitigated in various ways. Through wind months the prevailing winds can exert a dominant influence to increase erosional activities. Awareness of these windy months and application of mitigation measures would reduce the amount of soil loss. The application of water to the exposed soil surface can allow a crust to form. This crust reduces the amount of unconsolidated soil particles dispersed by winds. Standard construction practices would be employed to prevent water erosion due to overland flow of storm water or as a result of the impact of rainfall. These practices would include the construction of berms and channels to direct flowing water from the construction site.

4.6.7 Water Resources

4.6.7.1 Proposed Action

Groundwater Resources. Kirtland AFB currently uses groundwater from wells onbase. The yearly allocation from these wells is 6,398 acre-feet per year. The balance required by Kirtland AFB is purchased from the City of Albuquerque. The water requirement for the proposed action would not affect the groundwater resources beneath Kirtland AFB as the withdrawal rate cannot exceed the current allocation.

Surface Water.

Construction Phase. During the construction of the facilities required at Kirtland AFB, 12,500 gallons of water per acre would be used to spray down exposed soil surfaces to reduce wind-blown sediments and mitigate the erosion potential of this resource (Table 4.6.7-1). The proposed action would require 2.4 million gallons of water to control airborne dust and mitigate for potential wind erosion. Based on the 145 acres disturbed during construction, 456,652 gallons of water would be used to control windblown soil for the proposed action. This amount of water would be used to control windblown sediments when appropriate. Construction outfits commonly spray down the site once a day to control windblown dust. Alternatives 1 through 4 would require less acres for construction activities and subsequently less water to mitigate blowing dust.

Table 4.6.7-1

**Water Requirements During Construction and Operations Phases
for the Proposed Action and Alternatives
Kirtland AFB
[million gallons per day]**

	Proposed Action	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Construction Phase[1]	2.4	2.0	1.6	0.3	0.05
Operations Phase[2]	5.0	3.75	3.8	1.25	0.05

[1]Water used to spray down exposed soil is estimated at 12,500 gallons per acre, including water for revegetation efforts.

[2]Requirements are based on 80 gallons/day for facility and industrial use.

Operational Phase. The use of this resource during the operational phase of this mission would necessitate an increase in water to the base. This could be accomplished by purchasing more water from the public utility of Albuquerque.

4.6.7.2 Alternative Actions

If one of the remaining Alternatives (1-4) were to be realigned at Kirtland AFB, impacts to water resources would decrease correspondingly based on how much construction would be required. The areas designated for the various components of the realigned mission would require water, but, because only a portion of the facilities would be required, only a relational fraction of the water would be needed.

4.6.7.3 No Action Alternative

There would be no adverse impact to the existing water resources of the proposed alternative area at Kirtland AFB if the no action alternative was selected.

4.6.7.4 Mitigations

Surface Water.

Construction Phase. To offset any water shortages, more water would need to be purchased. It may be feasible to use alternative technologies for reducing the amount of wind-blown sediments. As previously mentioned, using organic polymers commonly known as tackifiers would reduce the water requirement during construction activities.

Operational Phase. If the daily operations of the Air Force and the realigned mission resulted in water usage that exceeds the current water use by Kirtland AFB, more water must be purchased from the Albuquerque water district.

4.6.8 Air Quality

4.6.8.1 Proposed Action

In the short term, construction of the proposed facilities would affect air quality primarily through soil disturbance (fugitive dust) and construction vehicle emissions. Long-term effects of the project would be caused by emissions from the additional vehicles used by project personnel and their families. Short-term impacts were determined by comparing project emissions with the estimated Bernalillo County emissions inventory. The long-term impacts from related increases in motor vehicle traffic were estimated using the CALINE 4 line source dispersion model.

The primary sources of particulates during construction would be from clearing and grading activities which generate wind-blown dust, and exhaust emissions from heavy-duty construction equipment. Emission factors for fugitive dust and combustive emissions from heavy-duty diesel equipment were obtained from the Environmental Protection Agency's (EPA's) "Compilation of Air Pollution Emission Factors (AP-42) (EPA, 1985). Particulate emissions were assumed to be reduced by 50 percent through the application of water on disturbed soil during and after grading activities. Construction activities were assumed to occur over a 3-year period. The assumed distribution of equipment categories and annual operation hours (AP-42) are shown in Table 4.3.8-1 (Section 4.3.8). Exhaust emissions were calculated by estimating annual usage of the equipment. A comparison of total annual construction emissions, with Bernalillo County emissions is presented on Table 4.6.8-1. As shown in the table, the project emissions for all pollutants except oxides of sulfur (SO_x) are less than 1 percent of the county emissions. However, an increase of 1.71 percent would not be significant as the county is in compliance with the ambient air quality standard for SO_x. Therefore, the air quality impacts from project construction activities at Peterson AFB and Falcon AFB would not be significant.

The primary short- and long-term air quality impacts, resulting from operations of the proposed project, would be due to carbon monoxide (CO) emissions from project-related increases in motor vehicle traffic. Based on the transportation analysis for proposed Peterson AFB Sites 1a/1b and 1c/1b, the greatest increase in CO emissions would occur at the intersection of Eubank Boulevard and the proposed gate for the project complex where a traffic light would control the flow of vehicles into the site. Traffic congestion in the morning nd afternoon peak hours may occur. Assuming a worst-case situation in which the peak hourly traffic would increase by approximately 4,600 vehicles, the maximum hourly CO concentrations would increase by 17.8 parts per million (ppm). Based on ambient maximum concentrations recorded in the area, a background CO concentration of 14 ppm was assumed. Operational emissions from added vehicular traffic would not cause violations of the federal ambient air quality standards for CO. However, even though the increase in CO concentrations would be less than the federal standard, because the Albuquerque area is nonattainment for CO, the overall long-term impact of project emissions on air quality would not be significant. The project emissions could cause a delay in the achievement of attainment status for the area. Air quality impacts would be similar for proposed Site 2, although the CO concentration would only increase by 13.5 ppm.

Table 4.6.8-1

Comparison of Project Construction
Emissions with Bernalillo County Emissions
Proposed Action
(Tons Per Year)

Source	CO	HC	NO_x	SO_x	Part
Construction Emissions	16.9	2.8	44.0	4.8	12.6
Bernalillo County	183,424	22,154	15,967	280	60,847
% County Emissions	0.009	0.012	0.006	1.71	0.02

4.6.8.2 Alternative Actions

Air quality impacts for Alternatives 1 and 4 would similar to the proposed action, although the increased concentrations of CO would be proportionally smaller. The federal standards would not be exceeded.

4.6.8.3 No Action Alternative

Air quality impacts for the no action alternative would not be significant.

4.6.9 Noise

Noise levels resulting from construction in the proposed Site 1A and 1B areas would be annoying to inhabitants of nearby base residential areas when the day-night (L_{dn}) noise levels range from 52 decibels on the A-weighted scale (dBA) to 57 dBA. Construction activities in these site areas would cause an increase of 5 dBA to 10 dBA in the nearby areas, which include a hospital and an elementary school. Therefore, short-term noise impacts for the proposed Site 1A and 1B areas would be significant.

Noise levels resulting from construction in the proposed Site 2 area would not have a significant impact because no sensitive receptors are close to the site.

Long-term noise from the project would result from increased vehicular traffic in the area. Residential properties near Kirtland AFB and the Albuquerque International Airport, Interstates 25 and 40, arterial roadways, and industrial areas are currently affected by excessive L_{dn} noise levels (i.e., 62 to 67 dBA). The increase in noise levels resulting from project-related vehicular traffic would be 2 dBA to 4 dBA. This increase would be hardly noticeable in the percent high background ambient noise. Therefore, the long-term noise impacts would be insignificant.

4.6.10 Biological Resources

4.6.10.1 Proposed Action

Vegetation. Sites 1a and 1c have been heavily disturbed and site 1b has been previously developed. Therefore, the proposed action would not have a significant impact on the vegetation of these areas.

Site 2 is relatively undisturbed. However, similar habitat exists in the area and the proposed action would not have a significant impact on the vegetation in the area.

Wildlife. Habitats similar to those on the proposed sites are relatively abundant in the area. Therefore, the proposed action would not have a significant impact on the wildlife of the region.

Threatened and Endangered Species. Gramma grass cactus (*Toumeya papyracanthus*), a USFWS category 2 candidate species, occurs in relative abundance over a small area of site 1a (Figure 3.6.10-1). Significant impacts to this species can be avoided by locating development elsewhere on the site and preventing construction activities from disturbing this area. The specimens of gramma grass cactus and Wright's pincushion cactus (*Mammillaria wrightii*), a State of New Mexico sensitive species, discovered on site 2 undoubtedly represent larger populations in these areas. However, the proposed action is not expected to have a significant impact on these sensitive species.

The American bald eagle (*Haliaeetus leucocephalus*), American peregrine falcon (*Falco peregrinus anatum*), and whooping crane (*Grus americana*) are all federally listed endangered species, and the Mexican spotted owl (*Strix occidentalis lucida*) is a USFWS category 2 candidate species. These species are all known to occur in Bernalillo County. None of these species is known to occur within the proposed project areas and the proposed action would, therefore not have a significant impact on these species.

Wetlands. Sites 1a, 1b, and 1c contain no wetlands. The ephemeral streams on Site 2 are not expected to be large or persistent enough to be considered jurisdictional wetlands. Therefore, the proposed action is not expected to have a significant impact on wetlands in the area.

4.6.10.2 Alternative Actions

The impacts of the alternative actions on the biological resources of the area would decrease in direct proportion to decreases in the acreage disturbed and elevation of human activity.

4.6.10.3 No Action Alternative

The no action alternative would not have a significant impact on the biological resources of the area.

4.6.11 Cultural and Paleontological Resources

4.6.11.1 Proposed Action

Site 1A is characterized as uplands. Prehistoric sites that may be identified include ceramic and lithic scatters. These types of sites may not be considered NRHP eligible. Historic sites may also be identified in this area; however, it is likely that any historic site located here may lack physical integrity and be considered not eligible. Geological deposits in the area are Quaternary gravels which may contain Pleistocene fauna. Intact Pleistocene fossils may be considered important. The proposed action for Site 1A may not adversely affect cultural resources.

No prehistoric sites have been identified in the area of Site 1B. Five standing structures (Buildings 20200, 20201, 20202, 20203, and 20204) are identified in this area; one (Building 20200) was built in 1947, the rest were built in 1948. These buildings are not considered NRHP eligible because they do not meet the 50-year age requirement, do not represent a unique or unusual architectural style, and are not representative of particular events important in history. It is possible that Pleistocene faunal remains may be identified in this area; however, only intact deposits (i.e., complete skeletons) would be considered important. The proposed action for Site 1B would not adversely affect cultural resources.

Site 1C consists of uplands and may contain small ceramic and lithic scatters. However, these small sites may have limited research potential and may not be considered NRHP eligible. Small historic sites may also be present but may lack physical integrity and be considered not eligible. Pleistocene faunal remains may also be identified and would be important if intact deposits were encountered. The proposed action for Site 1C may not adversely affect cultural resources.

Site 2 has been previously inventoried for cultural resources. No prehistoric sites were identified. One historic site, a modern dump with a few historic artifacts, has been recorded in this area. However, this small historic site lacks integrity and is not considered NRHP eligible. Pleistocene fauna has been associated with the Quaternary deposits in the region and intact paleontological materials may be considered important. The proposed action for Site 2 may not adversely affect cultural resources.

The housing area is adjacent to Site 1A and may contain similar types of cultural and paleontological resources. The proposed action may not adversely affect cultural resources in this area.

4.6.11.2 Alternative Actions

Alternative Actions 1 and 2. Alternative actions 1 and 2 would have the same impacts as the proposed action for each siting option.

Alternative Actions 3 and 4. Alternative actions 3 and 4 consist of Site 1B and the housing area. There may be no adverse effect on cultural resources for these alternatives.

4.6.11.3 No Action Alternative

There would be no effect on cultural and paleontological resources.

4.6.11.4 Mitigation Measures

If potentially eligible cultural resources are identified during the present survey, test excavations will be needed to formally evaluate these sites for eligibility to the NRHP. If the SHPO concurs with recommendations of eligibility, a mitigation plan should be prepared, approved, and implemented for all NRHP eligible sites prior to construction.

4.7 RELATIONSHIP BETWEEN SHORT-TERM USE AND LONG-TERM PRODUCTIVITY OF THE ENVIRONMENT

The closure of the Space Systems Division (SSD) facilities at Los Angeles Air Force Base (AFB) and in San Bernardino, California, and the relocation of SSD operations to selected Air Force installations, was proposed by the Secretary of Defense in early 1990.

Total or partial closure of Los Angeles AFB would discontinue some or all current military and civilian activities on the base. After closure, the risk of accidental spills of hazardous materials by the military would be eliminated or reduced. Reuse or development of lands associated with Los Angeles AFB containing hazardous waste sites would be precluded until those sites have been fully characterized and all remedial work is accomplished.

The total or partial relocation of SSD to Vandenberg AFB, California; March AFB, California; Peterson/Falcon AFBs, Colorado; or Kirtland AFB, New Mexico would result in the short-term use of some human and natural resources, but the use of these resources would not significantly affect the maintenance and enhancement of long-term productivity.

4.8 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

The resources irreversibly and irretrievably committed in the proposed base closure or closures and realignment of units would be minimal. Some energy resources would be expended in moving realigned units and there would be some minor construction at the receiving bases to accommodate these units. Base closures would generally reduce the commitment of resources to defense programs.

5.0 CONSULTATION AND COORDINATION

The federal, state, and local agencies, and private organizations and agencies that were contacted during the course of preparing the Environmental Impact Statement (EIS) are listed below.

5.1 CONSULTATIONS REQUIRED BY ENVIRONMENTAL REVIEW LAWS AND OTHER REGULATIONS

5.1.1 Federal Agencies

- Advisory Council on Historic Preservation, Golden, Colorado (Alan Stanfill)
- Environmental Protection Agency, Region VI, Dallas, Texas (Robert Layton, Jr.)
- Environmental Protection Agency, Region VIII, Denver, Colorado (James Scherer)
- Environmental Protection Agency, Region IX, San Francisco, California (Daniel McGovern)
- Federal Aviation Administration, Fort Worth, Texas (Don Watson)
- Federal Aviation Administration, Northwest Mountain Region, Seattle, Washington (Frederick Issac)
- Federal Aviation Administration, Western Pacific Region, Los Angeles, California (Gerald Chavkin)
- Federal Highway Administration, Region VI, Fort Worth, Texas (Wesley Mendenhall, Jr.)
- Federal Highway Administration, Region VIII, Denver, Colorado (Louis MacDonald)
- Federal Highway Administration, Region IX, San Francisco, California (Edwin Wood)

5.1.2 State Agencies

California:
- California Coastal Conservancy, Oakland (Reed Holderman)
- California Department of Health Services, Sacramento (Kenneth Kizer)
- California Native American Heritage Commission
- California Regional Water Quality Control Board, Los Angeles (Robert Ghirelli)
- U.S. Department of Interior, Bureau of Indian Affairs, Riverside

Colorado:
- Colorado Commission of Indian Affairs, Denver (Robin Bodderinger)
- Colorado Department of Health, Denver (Thomas Looby)
- Colorado Division of Local Governments, Denver
- Colorado Highways Department, Denver (A. Ray Chamberlain)

New Mexico:
- New Mexico Office of Indian Affairs, Santa Fe (Regis Pecos)

5.1.3 Native American Groups

- All Indian Pueblo Council, Albuquerque, New Mexico (Herman Agoyo)
- Santa Ynez Chumash Indian Reservation, Santa Ynez, California (Manuel Armenta)

5.2 AGENCIES CONTACTED

5.2.1 Federal Agencies

- Soil Conservation Service, Albuquerque, New Mexico
- Soil Conservation Service, Colorado Springs, Colorado
- Soil Conservation Service, Redlands, California
- Soil Conservation Service, Santa Barbara, California
- U.S. Department of Housing and Urban Development, Region VIII, Denver, Colorado
- U.S. Fish and Wildlife Service, Albuquerque, New Mexico
- U.S. Fish and Wildlife Service, Denver, Colorado
- U.S. Fish and Wildlife Service, Rocky Mountain Region, Colorado Springs, Colorado
- U.S. Geological Survey, Albuquerque, New Mexico

5.2.2 State Agencies

California:
- California Department of Fish and Game, Natural Heritage Program, Sacramento
- California Department of Transportation, District 7, San Bernardino

Colorado:
- Colorado State Department of Labor and Employment, Denver
- Colorado Historical Society, Denver

New Mexico:
- New Mexico State Historical Preservation Office, Santa Fe
- State of New Mexico, Bureau of Mines and Mineral Resources, Santa Fe

5.2.3 Local Agencies

California:
- City of El Segundo, Planning Division
- City of Hawthorne, Planning Department
- City of Lompoc
  - Planning Department
  - Public Works Department
  - Utilities Department
  - Wastewater Department

- City of Los Angeles
  - Parks and Recreation Department
  - Planning Department
- City of Riverside
  - Planning Department
  - Public Works Departments
  - Public Utilities Department
- City of Santa Barbara, Planning Department

- City of Santa Maria
  - Community Development Department
  - Economic Development Department
  - Public Airport
  - Water Department
- County of Los Angeles, Regional Planning Department, Los Angeles
- County of Riverside, Waste Management Department, Riverside
- Eastern Municipal Water District, San Jacinto
- Lompoc Unified School District, Lompoc
- Moreno Valley Unified School District, Moreno Valley
- Perris Unified School District, Perris
- Sanitation Districts of Los Angeles County, Whittier
- Val Verde School District, Perris

Colorado:

- City of Colorado Springs
  - Department of Public Utilities
  - Planning Department
- Pikes Peak Area Council of Governments, Colorado Springs

New Mexico:

- City of Albuquerque
  - Planning Department
  - Public Works Department
  - Solid Waste Department

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APPENDIX A - GLOSSARY OF TERMS AND ACRONYMS

TERMS

Accident Potential Zones (APZ). Areas immediately beyond the ends of Department of Defense fixed-wing runways that are subject to more aircraft accidents than other areas. Specifically, APZs fall into two categories: APZ 1 is the area beyond the runway clear zone that possesses a significant potential for accidents, and APZ 2 is an area beyond APZ 1 that has a measurable potential for accidents.

Acre-Foot. The volume of the water that covers 1 acre to a depth of 1 foot; approximately 326,000 gallons.

Active Fault. A fault on which movement has occurred during the past 10,000 years and which may be subject to recurring movement usually indicated by small, periodic displacement or seismic activity.

Advisory Council on Historic Preservation. A 19-member body appointed, in part, by the President of the United States to advise the President and Congress and to coordinate the actions of federal agencies on matters relating to historic preservation, to comment on the effects of such actions on historic and archaeological cultural resources, and to perform other duties as required by law (Public Law 89-655; 16 USC § 470).

Air Installation Compatible Use Zone. A concept developed by the Air Force to promote land use development near its airfields in a manner that protects adjacent communities from noise and safety hazards associated with aircraft operations, and to preserve the operational integrity of the airfields.

Air Quality Control Region. An area designated by Section 107 of the Clean Air Act, which is based on jurisdictional boundaries, urban-industrial concentrations, and other factors including atmospheric areas, that is necessary to provide adequate implementation of air quality standards.

Alluvium. A general term applied to sediments deposited by a stream or running water.

Ambient Air. That portion of the atmosphere, outside of buildings, to which the general public has access.

Ambient Air Quality Standards. Standards established on a state or federal level that define the limits for airborne concentrations of designated "criteria" pollutants (e.g., nitrogen dioxide, sulfur dioxide, carbon monoxide, total suspended particulates, ozone, lead, and hydrocarbons) to protect public health with an adequate margin of safety (primary standards) and to protect public welfare, including plant and animal life, visibility, and materials (secondary standards).

Aquifer. The water-bearing portion of subsurface earth material that yields or is capable of yielding useful quantities of water to wells.

Archaeology. A scientific approach to the study of human ecology, cultural history, and cultural process.

Archaic. A stage of prehistoric cultural development, recognized throughout North America, characterized by broad spectrum hunting and gathering economies and seasonal mobility. The material remains are recognized by the development of barbed and stemmed spear points, the extensive use of groundstone tools, and the lack of ceramics. The Archaic is also commonly used to designate a prehistoric period (generally 6000 B.C. to A.D. 500), but the dates vary from one region to another.

Arterial. Signalized streets with signal spacings of 2 miles or less and turning movements at intersections that usually do not exceed 20 percent of total traffic. Urban arterials primarily serve through-traffic, and, as a secondary function, provide access to abutting properties (urban); roadways that provide large traffic volume capacity between major traffic generators, designed to facilitate traffic movement and discourage land access when feasible. Includes primary state roads (functional).

Artifact. Anything that owes its shape, form, or placement to human activity. In archaeological studies, the term is applied to portable objects (e.g., tools and the by-products of their manufacture).

Attainment Area. An area that has been designated by the Environmental Protection Agency and the appropriate state air quality agency as having ambient air quality levels below the ceiling levels defined under the National Ambient Air Quality Standards.

Attenuation. A decrease in the amplitude or energy (intensity) of a seismic wave with distance from the epicenter.

Available Vacancy. A vacant housing unit that is either for sale or for rent.

Average Annual Daily Traffic. For a 1-year period, the total volume passing a point or segment of a highway facility in both directions, divided by the number of days in the year.

Baseline. The existing and future-growth characterization of an area without the proposed program.

Basin. A drainage or catchment area of a stream or lake.

Bedrock. Geologic formation or unit which underlies soil or other unconsolidated surficial deposits.

Biological Diversity. Refers to the number of species and their relative abundance in an area or habitat.

Biome. Major regional ecological community of plants and animals extending over large natural areas.

Bonds. Financial instruments used by government agencies to fund major capital improvement projects; typically either a general obligation bond or revenue bond.

Bottomland. Land topographically low and typically found along a stream course.

Breaks. Terrain characterized by abrupt changes in surface slope (e.g., a line of cliffs and associated spurs and small ravines).

Budget. Document prepared by a government unit which estimates future revenues expected to be collected and the expenditure needs of the jurisdiction in a forthcoming fiscal year or years; includes estimates of potential revenues and expected expenditures by major fund groups (governmental funds, proprietary funds, and fiduciary fund types).

Cairn. A distinctly artificial pile of rocks that may mark or enclose burials, vision quests, caches, or geodetic locales.

Campsite. A short-term habitation site containing evidence of daily living activities, as opposed to specialized activities (e.g., quarry site). Campsites are generally open-air occupations of perhaps weeks to months in duration.

Capacity (Transportation). The traffic-carrying ability of a facility while maintaining prescribed operational qualities (e.g., a specific level of service); the maximum amount of traffic that can be accommodated by a given facility. (Note: Traffic facilities generally operate poorly at or near capacity, and facilities are rarely designed or planned to operate within this range.)

Capacity (Utilities). The maximum load a system is capable of carrying under existing service conditions.

Capehart Housing. A design of onbase family housing that was generally built in the 1950s.

Capital Costs. Expenditures by local governments on physical infrastructure.

Capital Projects Fund. One of the governmental fund types used to account for capital improvement projects other than those financed by proprietary funds or special assessment funds.

Carbonaceous. Pertaining to a sedimentary rock containing carbon as the major constituent.

Cenozoic. An era in geologic history extending from 66 million years ago to the present which is characterized by the rapid evolution of mammals, birds, grasses, shrubs, and higher flowering plants.

Ceramic Scatter. A spatially limited distribution of pot sherds on the ground surface.

Ceremonial Center. The central portion of a prehistoric village site containing large civic and ceremonial structures.

Chronology. The science of arranging time in periods and ascertaining the dates and historical order of past events.

Civilian Labor Force. The sum of the number of persons who are unemployed but able, willing, and actively seeking work and the number of nonmilitary persons who are working. The number of unemployed divided by the civilian labor force defines the unemployment rate. Military personnel are not considered in the unemployment rate calculations because, by definition, persons working in the military are fully employed and inclusion would tend to skew rates downward.

Clear Zone. The area surrounding a runway where the overall risk is so high that necessary land use restrictions would prohibit reasonable economic use of the land.

Climate. The prevalent or characteristic meteorological conditions (and their extremes) of any given location or region.

Collector Streets. Surface streets that provide land access and traffic circulation service within residential, commercial, and industrial areas (urban); secondary roads that provide access to higher-type roads, connect small communities and nearby areas, and serve adjacent property (functional).

Component. One location or element within a settlement/subsistence system. Archaeological sites may contain several components that reflect the use of the locality by different groups in different time periods.

Comprehensive Plan. A public document, usually consisting of maps, text, and supporting materials, adopted and approved by a local government legislative body, which describes future land uses, goals, and policies.

Confined Aquifer. An aquifer that is overlain by an impermeable stratum and within which water pressure may build up so that penetration by a well will result in a static water level that is considerably higher than the top of the aquifer.

Constant Dollars. Dollar values that reflect values for a specific year after adjusting for inflation.

Corridor. A strip of land of various widths on both sides of a particular linear facility such as a highway or rail line.

Cultural Complex. A group of artifacts and sites that are distinct from other groups.

Culture. The system of behavior, beliefs, institutions, and objects human beings use to relate to each other and to the environment.

Cumulative Impacts. The combined impacts resulting from all programs occurring concurrently at a given location.

Curie. A unit of radioactivity equal to 3.7×10^{10} disintegrations per second.

Current-Year Dollars. Dollar values that reflect the value in the year for which they are referenced before adjusting for inflation.

Debitage. Waste flakes resulting from stone tool manufacture.

Decibel. The unit of measurement of sound level calculated by taking ten times the common logarithm of the ratio of the magnitude of the particular sound pressure to the standard reference sound pressure of 20 micropascals and its derivatives.

Delay. Additional travel time experienced by a driver, passenger, or pedestrian beyond what would reasonably be desired for a given trip.

Developed. Said of land, a lot, a parcel, or an area that has been built upon, or where public services have been installed prior to residential or commercial construction.

Direct Effects. Effects that are immediate consequences of program activities. In economics, the initial increase in employment and income resulting for program employment and material purchases before the indirect effects of these changes are measured.

Direct Employment. Military and civilian personnel who are employed by the Department of Defense and its contractors, and who are working onsite on the program.

Direct Expenditure. Expenditures of local governments directly related to the provision of goods or services.

Direct Impact. Effects resulting solely from program implementation.

District. National Register of Historic Places designation of geographically defined area (urban or rural) possessing a significant concentration, linkage, or continuity of sites, structures, or objects united by past events (theme) or aesthetically by plan of physical development.

Disturbed Area. Land that has had its surface altered by grading, digging, or other construction-related activities.

Drawdown (Water Resources). The distance between the static water level and the temporarily depressed water level caused by well pumpage.

Earthquake. A sudden motion or trembling in the earth caused by the displacement of rocks below the earth's surface due to a release of strain.

Ecotone. Transitional zone between two distinct ecological communities (e.g., grasslands to forest). Important because of the greater diversity provided by the presence of species from both communities.

Effect. A change in an attribute. Effects can be caused by a variety of events, including those that result from program attributes acting on the resource attribute (direct effect); those that do not result directly from the action or from the attributes of other resources acting on the attribute being studied (indirect effect); those that result from attributes of other programs or other attributes that change because of other programs (cumulative effects); and those that result from natural causes (e.g., seasonal change).

Effluent. Wastewater discharge from a wastewater treatment facility.

Employment. The total number of persons working (includes all wage and salary workers), both civilian and military, and proprietors.

Endangered Species. A species that is threatened with extinction throughout all or a significant portion of its range.

Energy. The capacity for doing work; taking a number of forms which may be transformed from one into another, such as thermal, mechanical, electrical, and chemical; in customary units, measured in kilowatt-hours or British thermal units.

Environmental Impact Analysis Process. The process of conducting environmental studies as outlined in Air Force Regulation 19-2.

Eocene. An epoch of the Tertiary period extending from about 58 million to 36 million years ago.

Ephemeral. Lasting or existing briefly or temporarily.

Epicenter. The point on the earth's surface directly above the focus of an earthquake.

Escarpment. A long cliff or steep slope separating two comparatively level or more gently sloping surfaces; results from erosion or faulting.

Ethnography. The description of human groups and their behavior by direct observation and/or by transcription of statements by living persons.

Eutrophication. The enrichment of a body of water with nutrients, which, in the presence of sunlight, can stimulate the growth of algae and other aquatic plants to the point that undesirable effects may result, such as highly turbid water or a depletion of dissolved oxygen.

Exclusion Area. The area in which the Department of Energy has the authority to determine all activities including exclusion or removal of personnel and property from the area. Residence within the exclusion area shall normally be prohibited. Residents shall be subject to ready removal in case of necessity.

Expenditure. A disbursement of funds by a government entity; includes operation and maintenance costs, as well as capital costs.

Farmstead. Horticultural community consisting of one house and associated structures or features.

Fault. A fracture or zone of fractures along which there has been movement of the sides relative to one another and parallel to the fracture.

Fault Zone. An area or region that is expressed as a zone of numerous fractures or faults.

Feature. Nonportable portion of an archaeological site. These include facilities such as fire pits, storage pits, stone circles, or foundations.

Federal-Candidate Species. Taxa placed in federal Categories 1 and 2 by the U.S. Fish and Wildlife Service, which are candidates for possible addition to the List of Endangered and Threatened Species.

Fiscal Year. In government finance, the 12-month period that corresponds to the jurisdiction's accounting period, typically beginning July 1st and ending June 30th.

Flake. A small stone fragment produced as a by-product of stone tool manufacturing; may also be used unmodified as a tool itself.

Floodplain. The relatively flat land lying adjacent to a river channel that is covered by water when the river overflows its banks.

Flora. Plants; organisms of the plant kingdom taken collectively.

Fluvial (Fluviatile). Pertaining to a river or stream.

Forage. Food for animals (e.g., deer), especially when taken by browsing or grazing.

Freeway. A multilane, divided highway with a minimum of two lanes for exclusive use of traffic in each direction, allowing full control of access and egress.

Fugitive Dust. Particulate matter composed of soil that is uncontaminated by pollutants from industrial activity. Fugitive dust may include emissions from haul roads, wind erosion of exposed soil surfaces, and other activities in which soil is either removed or redistributed.

Fugitive Emissions. Emissions released directly into the atmosphere that could not reasonably pass through a stack, chimney, vent, or other functionally equivalent opening.

Full-Time Equivalent. Employment based on a 40-hour work week (i.e., one person working 40 hours would equal 1 full-time equivalent; one person working 20 hours would equal 0.5 full-time equivalent).

Geologic Hazard. A naturally occurring or man-made geologic condition or phenomenon that presents a risk or is a potential danger to life and/or property.

Geologic Time Scale. Scale of time ranging from Precambrian (approximately 3.8 billion years ago) to the present.

Geologic Unit. A geologic formation, group, or member.

Geothermal. Pertaining to heat in the earth's interior.

Granite. A broadly used term for a quartz-bearing, coarse, crystalline igneous rock formed deep beneath the earth's surface.

Ground Surface Rupture. Surface expression of fractures that are usually a result of seismic activity.

Groundstone Artifacts. Stone artifacts made by grinding rather than flaking (e.g., milling stones and mortar and pestle).

Group. A stratigraphic unit consisting of two or more contiguous or associated geologic formations.

Hazardous Materials. Both nonradioactive (e.g., missile propellants and diesel fuel) and radioactive materials.

Hazardous Waste. A waste, or combination of wastes, which, because of its quantity, concentration, or physical, chemical, or infectious characteristics, may either cause, or significantly contribute to, an increase in mortality or an increase in serious irreversible illness; or pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, disposed of, or otherwise managed.

Hearth/Firepit. A feature used for the placement of fires; may be lined with clay or stones.

Herpetofauna. Referring to amphibians and reptiles.

Historic. A period of time after the advent of written history dating to the time first Euro-American contact in an area. Also refers to items primarily of Euro-American manufacture.

Holocene. The time since the end of the Pleistocene epoch, characterized by the absence of large continental or Cordilleran ice sheets and the extinction of large mammalian life-forms. Generally considered to be the last 10,000 years.

Household Size. The average number of individuals residing in a single dwelling unit.

Hydrology. The science dealing with the properties, distribution, and circulation of water on the surface of the land and in the soil and underlying rocks.

Impact. An assessment of the meaning of changes in all attributes being studied for a given resource; an aggregation of all the adverse effects, usually measured using a qualitative and nominally subjective technique.

Inactive Fault. A fault with no historic activity; not recognized as a source of earthquakes.

Indirect Employment. Employment resulting from the purchases of workers who are directly working on a specified program. Also includes any subsequent employment arising from the increase in purchases in the area.

Indirect Impacts. Program-related impacts (usually population changes and resulting impacts) not directly attributable to the program itself. For example, direct program employees will spend some of their income locally. As a result, local industries will tend to hire more workers as they expand in response to the increased demand. This additional employment is termed an "indirect impact."

Inhabited Structure. Any building currently being used for the purposes of a dwelling or residence, workplace, place of business or industry, or an institutional function. Agricultural buildings such as barns do not generally meet the definition of an inhabited structure.

Inmigrants. All persons relocating to a defined geographic area as a result of the proposed program, usually calculated on an annual basis.

Intermittent Stream. A stream that does not flow continuously during all periods of the year.

Interstate. The designated National System of Interstate and Defense Highways located in both rural and urban areas; they connect the East and West coasts and extend from Canadian border points to various points on the Mexican border.

Isolated Artifact. An artifact, or a small, disarticulated group of artifacts, that cannot be associated with, or are situated outside of, a cultural resource site.

K-factor. The soil erodibility factor (K) used tin the Universal Soil Loss Equation. The index is a measure of the susceptibility of a soil to erode as related to physical and chemical properties of the soil.

Kilowatt. A unit of power equivalent to 1,000 watts.

Known Geological Structure. An area containing oil and gas leases in which an accumulation of hydrocarbons has been discovered by drilling and determined to be productive. The limits include all acreage that is hypothetically proven productive (43 CFR § 3100.0-5[a]).

Known Geothermal Resource Area. An area in which the geology, nearby discoveries, competitive interests, and other indicators would, in the opinion of the Department of the Interior, engender a belief in those who are experienced in the subject matter that the prospects for the extraction of geothermal resources are good enough to warrant expenditures of money for that purpose (43 CFR § 3200.0-5).

Lacustrine. Pertaining to, produced by, or formed in a lake environment.

Land Use Plans and Policies. Guidelines adopted by governments to direct future land use within their jurisdictions.

Landslide. The downslope movement of soil and/or rock material under gravitational influence.

L_{dn} Noise Level. The 24-hour average-energy sound level expressed in decibels, with a 10-decibel penalty added to sound levels between 10:00 P.M. and 7:00 A.M.

L_{eq} Noise Level. A constant amount of acoustic energy equivalent to the energy contained in the time-varying noise measured from a given source for a given time.

Level of Service. In transportation analyses, a qualitative measure describing operational conditions within a traffic stream and how they are perceived by motorists and/or passengers. In public services, a measure describing the amount of public services (e.g., fire protection and law enforcement services) available to community residents, generally expressed as the number of personnel providing the services per 1,000 population.

Liquefaction. The transformation during an earthquake of unconsolidated, water-saturated sediment into a liquid form.

Lithic Scatter. An archaeological site consisting only of stone artifacts.

Lithology. The physical character of a rock such as its color, hardness, mineral composition, and grain size.

Locality. A particular spot within a geologic unit from which a specimen is obtained or may be found; usually a location of dense or well-preserved fossils.

Long Term. Impacts that would occur over an extended period of time, whether they start during the construction or operations phase. Most impacts from the operations phase are expected to be long term since program operations essentially represent a steady-state condition (i.e., impacts resulting from actions that occur repeatedly over a long period of time). However, long-term impacts could also be caused by construction activities if a resource is destroyed or irreparably damaged or if the recovery rate of the resource is very slow.

Low Population Zone. The area immediately surrounding the exclusion area which contains residents, the total number and density of which are such that there is a reasonable probability that appropriate protective measures could be taken in their behalf in the event of a serious accident.

Magnitude (earthquake). A measure of strength of an earthquake or the energy it releases.

Maximum Credible Earthquake. The largest earthquake capable of being produced from a source, structure, or region under the currently known tectonic framework.

Maximum Tolerable Soil Loss. Represents the maximum amount of soil that can be removed by wind and/or sheet erosion without reducing the productivity of the land or altering the natural ecosystem of an area. The value conceptually represents a balance between the rate of soil formation and soil erosion of a given area.

Megafauna. Various species of large mammals that became extinct in North America sometime before 6,000 years before present. These mammals include the mammoth, giant bison, camel, and giant sloth.

Megawatt. One thousand kilowatts or one million watts.

Mesotrophic. A body of water with moderate amounts of plant nutrients that result in a medium level of primary productivity, and that usually has a moderate level of dissolved oxygen.

Mesozoic. An era in geological history, ranging from about 245 million to 66 million years ago, characterized by the development of reptiles.

Microcurie. One-millionth of a curie.

Microgram. One-millionth of a gram.

Military Operating Area (MOA). An airspace assignment of defined vertical and lateral dimensions established outside positive control areas to separate or segregate certain military activities from instrument flight rules (IFR) traffic and to identify for visual flight rules (VFR) traffic where these activities are conducted.

Miocene. An epoch of the Tertiary period, 24 million to 5 million years ago, market by the development of apes and the appearance of ancestral gibbons.

Mitigation. A method or action to reduce or eliminate program impacts.

Mixed Open Space. A land use type that includes range and pasture land, noncommercial forests, riparian areas, water bodies, and vacant land.

Multifamily Housing. Townhouse or apartment units that accommodate more than one family though each dwelling unit is only occupied by one household.

Multilane Highway. A highway with at least two lanes for the exclusive use of traffic in each direction, with no or partial control of access, that may have periodic interruptions to flow at signalized intersections.

National Landmark (Historic). A site, building, or object in private or public ownership that possesses national significance in American history, archaeology, or culture. In order to achieve landmark status, a property must be, or have the clear potential to be, recognized, understood, and appreciated publicly and professionally for the strength and clarity of its historical association, its architectural or design excellence, or its extraordinary information content on a national scale.

National Register of Historic Places. A register of districts, sites, buildings, structures, and objects important in American history, architecture, archaeology, and culture, maintained by the Secretary of the Interior under authority of Section 2(b) of the Historic Sites Act of 1935 and Section 101(a)(1) of the National Historic Preservation Act of 1966, as amended.

Native Americans. Used in a collective sense to refer to individuals, bands, or tribes who trace their ancestry to indigenous populations of North America extant to Euro-American contact.

Native Vegetation. Plant life that occurs naturally in an area without agricultural or cultivational efforts.

Nonattainment Area. An area that has been designated by the Environmental Protection Agency and the appropriate state air quality agency as exceeding one or more National Ambient Air Quality Standards.

Overall Vacancy. Total number of single-family, multifamily, or mobile homes that are not occupied at any given time.

Paleo-. Prefix meaning "old" or "ancient."

Paleontological Resources. Fossilized organic remains from past geological periods.

Paleozoic. An era in geological history occurring between 570 million and 245 million years ago, marked by the culmination of almost all invertebrates except the insects; in its later periods, marked by the first appearance of land plants, amphibians, and reptiles.

Peak Demand. The highest instantaneous amount of electrical power (in kilowatts) that an electrical system is required to supply over a given time frame, usually 1 year.

Peak Hour. The hour of highest traffic volume on a given section of roadway between 7 A.M. and 9 A.M. or between 4 P.M. and 6 P.M.

Peak Year. The year when a particular program-related effect is greatest.

Pennsylvanian. A period of the Paleozoic era extending from about 320 million to 286 million years ago.

Perennial Stream. A stream that flows continuously throughout the year.

Permanent Housing. Units intended for year-round use.

Permanently Disturbed Land. Surfaces covered by impervious materials or kept in a cleared condition to accommodate buildings, parking lots, roads, and security zones.

Permian. A period of the Paleozoic era extending from about 286 million to 245 million years ago.

Personal Income. Current income received by persons from all sources; includes transfer payments from governments or businesses.

Physiographic Province. A region with similar geologic structure and climate that has a unified geomorphic history.

P.L. 81-874 Programs. Federal law that authorizes financial assistance to local school districts when federal actions place fiscal burdens on the districts.

Pleistocene. The last 1.6 million years of geological history, marked by repeated glaciation and the first indication of social life in human beings.

Pliocene. An epoch of the Tertiary period extending from about 5 million to 1.6 million years ago.

Potentiometric Level. The level to which groundwater would rise under unconfined conditions; it may assume values higher than the local topography.

Precambrian. All geologic time before the Paleozoic era, equivalent to about 90 percent of geologic time.

Prehistoric. The period of time before the written record, and before Europeans entered an area.

Prevention of Significant Deterioration Area. A requirement of the Clean Air Act (§ 160 et seq.) that limits the increases in ambient air pollutant concentrations in clean air areas to certain increments even though ambient air quality standards are met.

Primary Road. A consolidated system of connected main roads important to regional, interstate, and statewide travel; they consist of rural arterial routes and their extensions into and through urban areas of 5,000 or more population.

Prime Farmland. Land that has the best combination of physical and chemical characteristics for producing food, feed, fiber, forage, oilseed, and other agricultural crops with minimum inputs of fuel, fertilizer, pesticides, and labor, and without intolerable soil erosion, as determined by the Secretary of Agriculture (Farmland Protection Policy Act, 7 CFR § 658).

Principal Aquifer. The particular aquifer that supplies the majority of the groundwater used in a given region.

Property Tax. Tax imposed by local governments based on the value of the property within their jurisdiction.

Protohistoric. The period when nonliterate Native American cultures were affected by Euro-Americans without direct contact. For instance, inland Indian tribes received trade goods and reports of European cultures from coastal tribes before the arrival of European explorers in the interior.

Quarry. A locality where lithic material was extracted and initially prepared for the manufacture of stone implements. In the narrow sense, the term refers to places where raw materials were actually excavated, but its use is commonly extended to localities where materials are collected at the surface (e.g., gravel deposits).

Quaternary. A geologic period representing the last 1.6 million years of earth's history which includes the Pleistocene and Holocene (Recent) epochs.

Recent. A geologic epoch of the Quaternary period representing the last 10,000 years of geologic time.

Recharge. The process by which water is absorbed and added to the zone of saturation, either directly into a formation or indirectly by way of another formation.

Relief. The vertical difference in elevation between the hilltops or mountain summits and the lowlands or valleys of a given region.

Revegetation. Regrowth or replacement of a plant community on a disturbed site. Revegetation may be assisted by site preparation, planting, and treatment, or it may occur naturally.

Revenue. Money that a government entity collects or receives.

Revenue Bond. Financial instrument used by government agencies to fund major capital improvements. Used for projects that generate revenue from user charges or similar fees or charges that are applied toward both project operation and debt retirement (e.g., water and sewer plant operations).

Richter Magnitude Scale. Measure of an earthquake size based on the amplitude of seismic waves that are recorded on a seismograph. The magnitude is based on a logarithmic scale (base 10) of the largest ground motion.

Riparian. Of or relating to land lying immediately adjacent to a water body, and having specific characteristics of that transitional area (e.g., riparian vegetation).

Rockshelter. A naturally formed sheltered overhang that was commonly inhabited by prehistoric groups; it is generally found on a vertical rock face and is not as deep as a cave.

Runoff. The noninfiltrating water entering a stream or other conveyance channel shortly after a rainfall event.

Rural Area. The area outside towns, cities, or communities that is characterized by very low-density housing concentrations, agricultural land uses, and a general lack of most public services.

Safe Yield. The pumpage from a groundwater basin or aquifer that can be permanently maintained without substantially lowering the groundwater below a predetermined level.

Sampling. The selection of a portion of a study area or population, the analysis of which is intended to permit generalization about the entire population. In archaeology, samples are often used to reduce the amount of land area covered in a survey or the number of artifacts analyzed from a site. Statistical sampling is generally preferred since it is possible to specify the bias or probability of error in the results, but judgmental or intuitive samples are sometimes used.

Sandstone. A sedimentary rock composed of detrital materials generally consisting of quartz and deposited by physical processes.

Secondary Employment. In economics, the additional employment and income generated by the economic activity required to produce the inputs to meet the initial material requirements. The term often is used to include induced effects.

Secondary Highways. Rural major collector routes that carry extensive local traffic.

Seismic. Pertains to the characteristics of an earthquake or earth vibrations including those that are artificially induced.

Seismic Zone. An area of intense local seismicity.

Seismotectonic Province. A region characterized by similar tectonic and seismic characteristics.

Shale. A fine-grained sedimentary rock formed by the consolidation of clay, silt, and mud.

Sheet Erosion. Erosion caused by a layer of water moving downward on a surface that has not yet developed channels, rills, or gullies. Uneven sheet erosion leads to the formation of rills and eventually gullies.

Short Term. Transitory effects of the proposed program that are of limited duration and are generally caused by construction activities or operations start-up.

Significance. The importance of a given impact on a specific resource as defined under the Council on Environmental Quality regulations.

Siltstone. A fine-grained sedimentary rock composed of silt-sized detritus.

Single-Family Housing. A conventionally built house consisting of a single dwelling unit occupied by one household.

Site. Any location where humans have altered the terrain or discarded artifacts.

Slough. A water-filled channel with little flow; often a former river channel.

Soil. A natural body consisting of layers or horizons of mineral and/or organic constituents of variable thickness and differing from the parent material in their morphological, physical, chemical, and mineralogical properties, and biological characteristics.

Soil Association. A collection of soils found to geographically occur together.

Soil Series. The lowest category used for differentiating groups of soils based on similar properties and characteristics. Soils are homogenous with respect to profile characteristics except for the A or surface horizon, which may vary in texture.

Soil Types. A category or detailed mapping unit used for soil surveys based on phases or changes within a series (e.g., slope, salinity).

Sole Source Aquifer. An aquifer that provides all or most of the potable water in an area and that has been specifically designated by the Environmental Protection Agency as provided for in the Safe Drinking Water Act. Projects that might affect a sole source aquifer are subject to special review procedures.

Special Assessment Funds. One of the governmental fund types used to account for financing of public improvements or services deemed to benefit the properties against which special assessments are levied (e.g., a charge for sidewalk construction, based on the linear footage of property frontage and a cost per linear foot for sidewalk construction).

Special District. Local government unit charged with provision of a specific service. Examples include water supply districts, lighting districts, and flood control districts. Generally, funding is from property taxes levied on the property benefitting from the service.

Special Revenue Funds. Used to account for the proceeds of special revenue sources (redistributed state-shared revenues such as gasoline taxes) that are legally restricted to expenditures for specific purposes (e.g., road construction); also supported in part by local property taxes.

State Historic Preservation Officer. The official within each state, authorized by the state at the request of the Secretary of the Interior, to act as liaison for purposes of implementing the National Historic Preservation Act.

State-Sensitive/State-Recognized Species. Plant and wildlife species in each state that are monitored and listed for purposes of protection.

Stratified Site. An archaeological site exhibiting various strata or layers of occupation; usually implies a large site with a long occupation. The interpretation and analysis of strata are concerned with the original succession and age relations of layered materials and their individual properties (i.e., cultural materials are dated relative to each other by their position in stratigraphic layers).

Subsistence Economy. The method of producing the food or goods necessary to provide a minimal standard of living, as opposed to a market economy in which a surplus is produced for redistribution.

Surface Collection. Systematic mapping and removal of artifacts from a site by means not involving excavation.

Tax Revenue. Revenue of local governments, generally based on the valuation of goods or services; includes property, sales, excise, and other miscellaneous taxes.

Taxon (pl.) Taxa. A taxonomic entity (species, subspecies, or variety) or a group of such entities.

Tectonic. Dealing with the regional assembling of structural or deformational features, and includes a study of their mutual relations, origin, and historical evolution.

Temporarily Disturbed Land. Surfaces disturbed during construction, but later regraded and/or revegetated; or those able to return to a natural state during the operational life of the program.

Temporary Housing. Dwellings meant for occupancy on a temporary basis (generally for less than a month), such as rooms in hotels and motels.

Terrace. A flat portion of land created when a stream or river cuts farther into its channel and migrates laterally to a different location. In river valleys, they typically represent former levels of the valley floodplain.

Terrain Failure. A generalized term for any number of mechanisms by which soil or rock is transported downslope under the effect of gravity.

Terrestrial. Living on or in, or growing from, the land.

Tertiary. The first period of the Cenozoic era extending between 66 million and 1.6 million years ago.

Threatened Species. Plant and wildlife species likely to become endangered in the foreseeable future.

Thrust Fault. A fault with a low angle of dip on which the hanging wall has moved upward relative to the footwall.

Ton. A unit of weight equal to 2,000 pounds.

Topsoil. The upper or productive layer(s) of a soil.

Total Dissolved Solids. The concentration of solid materials that are dissolved in a sample of water; determined as the weight of the residue of a water sample upon filtration and evaporation divided by the volume of the sample.

Total Water Use. The amount of water withdrawn from the natural resource base for a beneficial purpose, excluding water used for hydroelectric power generation, and certain nonconsumptive uses such as once-through cooling water for thermoelectric power generation, wildlife habitat, and fish farming.

Triassic. A period of the Mesozoic era extending from about 245 million to 208 million years ago.

Two-Lane Highway. A roadway having a two-lane cross section, with one lane for each direction of flow, and where passing maneuvers must be made in the opposing lane.

Unconfined Aquifer. An aquifer where the water table is exposed to the atmosphere through openings (pores) in the overlying materials.

Unemployment Rate. The number of civilians, as a percentage of the total civilian labor force, without jobs but actively seeking employment.

Unique and Sensitive Habitats. Areas that are especially important to regional wildlife populations or protected species that have other important biological characteristics (e.g., severe wintering habitats, nesting areas, and wetlands).

Unique Farmland. Land other than prime farmland that is used for production of specific high-value food and fiber crops as determined by the Secretary of Agriculture. It has the special combination of soil quality, location, growing season, and moisture supply needed to economically produce sustained high quality or high yields of specific crops when treated and managed according to acceptable farming methods. Examples of such crops include citrus, tree nuts, olives, cranberries, fruits, and vegetables.

Universal Soil Loss Equation. An equation that estimates the amount of soil lost to rainfall erosion, commonly measured in tons per acre per year, based on factors such as rainfall intensity, K-factor, slope, and management practices.

Upland. Ground elevated above bottomlands (e.g., rolling hill terrain and terraces).

Vacant Housing Units. Units that are not occupied at the time of enumeration. These units are subdivided into three categories: (1) available vacant units that are vacant year-round units being offered for sale, for rent, or for sale or rent; (2) vacant units under contract that are vacant year-round units that are rented or sold, awaiting occupancy, or held for occasional use; and (3) other vacant units that are vacant year-round units that do not fit into the first two categories. Boarded up units are included in this category.

Visual Attributes. The arrangement of a particular landscape as formed by the variety and intensity of the landscape features and the four basic elements of form, line, color, and texture. These factors give an area the distinctive quality which distinguishes it from other areas.

Volume (Transportation). The total number of vehicles that pass over a given point or section of a roadway during a given time interval. Volumes may be expressed in terms of annual, daily, hourly, or subhourly periods.

Water Table. The sustainable volume of water discharged from a well per units of time, often expressed in gallons per minute.

Waterfowl. Birds species (e.g., ducks, geese, cranes) that live on or near water bodies.

Watershed. See Basin.

Watt. A unit of electrical power equal to 1/756th horsepower.

Well Yield. The sustainable volume of water discharged from a well per unit of time, often expressed in gallons per minute.

Wetlands. Areas that are inundated or saturated with surface or groundwater at a frequency and duration sufficient to support a prevalence of vegetation typically adapted for life in saturated soil, including swamps, marshes, bogs, and similar areas.

Wherry Housing. A design of onbase family housing that was generally built before World War II.

Wind Erodibility Group. An assemblage of soils grouped by their similar properties that affect their resistance to soil blowing.

Wind Erosion. Detachment, transportation, and deposition of loose topsoil by wind action.

Wind Erosion Equation. An equation that estimates the amount of soil lost as a result of wind erosion based on factors such as soil erodibility, climate, and vegetative cover.

Worker Spending. In reference to regional economic impacts, refers to the amount of money spent in local area by program-related workers after leakages (taxes, nonlocal spending, as examples) are taken into account.

Year-Round Housing. Dwellings meant for occupancy throughout the year as distinguished from temporary housing (e.g., hotels and motels). Includes single-family structures, multifamily structures, and mobile homes.

Zoning. The division of a municipality (or county) into districts for the purpose of regulating land use, bulk of building, required yards, necessary off-street parking, and other prerequisites to development. Zones are generally shown on a map and the text of the zoning ordinance specifies requirements for each zoning category.

10-Year, 7-Day Low Flow. Based on a statistical analysis of historical flow records, the lowest average flow over a period of 7 successive days that would be expected to occur once during any 10-year period.

ACRONYMS

A&CO	Assembly and Checkout
ABRES	Advanced Ballistic Reentry Systems
ACHP	Advisory Council on Historic Preservation
ADT	Annual Daily Traffic
AFB	Air Force Base
AFOTEC	Air Force Operational Test and Evaluation Center
AFR	Air Force Regulation
AFSC	Air Force Systems Command
AICUZ	Air Installation Compatible Use Zone
APCD	Air Pollution Control District
AQCR	Air Quality Control Region
ARB	Air Resources Board
ARDC	Air Research and Development Command
BEA	Bureau of Economic Analysis
BMO	Ballistic MIssile Organization
BOS	Base Operating Support
B.P.	Before Present
CAAQS	California Ambient Air Quality Standards
CBPO	Consolidated Base Personnel Office
CBRC	Commission on Base Realignments and Closures
CDP	Census Designated Place
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
CHAMPUS	Civilian Health and Medical Program of the Uniformed Services
COE	U.S. Army Corps of Engineers
CY	Calendar Year
DEIS	Draft Environmental Impact Statement
DOD	U.S. Department of Defense
DOE	U.S. Department of Energy
DOT	U.S. Department of Transportation
DRMO	Defense Reutilization and Marketing Office
EAC	President's Economic Adjustment Committee
EIAP	Environmental Impact Analysis Process
EIS	Environmental Impact Statement
EOD	Explosive Ordnance Disposal
EPA	Environmental Protection Agency
FAA	Federal Aviation Administration
FEIS	Final Environmental Impact Statement
FEMA	Federal Emergency Management Agency
FFRDC	Federally Funded Research and Development Center
FY	Fiscal Year
HQ	Headquarters
HUD	U.S. Department of Housing and Urban Development
ICBM	Intercontinental Ballistic Missile
IRP	Installation Restoration Program
LACTC	Los Angeles County Transportation Commission

LAX	Los Angeles Airport
LOS	Level of Service
MAC	Military Airlift Command
MAW	Military Airlift Wing
MFH	Military Family Housing
MTMC	Military Traffic Management Command
MWR	Morale, Welfare, and Recreation
NAAQS	National Ambient Air Quality Standards
NCO	Noncommissioned Officer
NEDS	National Emission Data System
NEPA	National Environmental Policy Act
NESHAP	National Emission Standards for Hazardous Air Pollutants
NOAA	National Oceanic and Atmospheric Administration
NOI	Notice of Intent
NPL	National Priorities List
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
OEA	Office of Economic Adjustment
PA/SI	Preliminary Assessment/Site Inspection
POL	Petroleum, Oil, and Lubricants
PSD	Prevention of Significant Deterioration
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation
RI/FS	Remedial Investigation/Feasibility Study
ROI	Region of Influence
ROW	Right-of-Way
SAC	Strategic Air Command
SAMSO	Space and Missile System Organization
SARA	Superfund Amendments and Reauthorization Act
SCAQMD	South Coast Air Quality Management District
SCIF	Special Compartmentalized Information Facility
SCS	U.S. Soil Conservation Service
SETA	Systems Engineering and Technical Analysis
SHPO	State Historic Preservation Officer
SIP	State Implementation Plan
SKR	Stephen's Kangaroo Rat
SPO	Support Program Office
SSD	Space Systems Division
SSD-LA	Space Systems Division - Los Angeles
SSD-SB	Space Systems Division - San Bernardino
TAC	Tactical Air Command
TDS	Total Dissolved Solids
THC	Total Hydrocarbons
TSCA	Toxic Substances Control Act
TSDF	Treatment, Storage, and Disposal Facility
UP	Union Pacific Railroad
USC	United States Code
USDA	U.S. Department of Agriculture
USFS	U.S. Forest Service

USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UST	Underground Storage Tank
WDD	Western Development Division
WSA	Weapon Storage Area

UNITS OF MEASUREMENT

acre-ft	acre-foot
acre-ft/yr	acre-foot per year
Bcf	billion cubic feet
Btu	British thermal unit
°C	degrees Celsius
dB	decibel
dBA	decibel on the A-weighted scale
°F	degrees Farenheit
ft	foot
gpcd	gallons per capita per day
kg	kilogram
km	kilometer
kV	kilovolt
kWh	kilowatt-hour
L_{dn}	day/night equivalent noise level
L_{eq}	energy-equivalent continuous noise level
MBtu	million British thermal units
Mcf	thousand cubic feet
MG	million gallons
MGD	million gallons per day
mi	mile
MMcf	million cubic feet
mph	miles per hour
MVA	megavolt-ampere
MW	megawatt
PM_{10}	particulate matter (less than 10 micrometers in diameter)
ppm	parts per million
sq ft	square foot
sq km	square kilometer
sq mi	square mile
T/ac	ton per acre
T/ac/yr	ton per acre per year
T/day	ton per day
T/yr	ton per year

CHEMICAL ABBREVIATIONS

CO	Carbon Monoxide
HC	Hydrocarbons
O_3	Ozone
NO_x	Nitrogen Oxides

NO_2	Nitrogen Dioxide
Pb	Lead
PCB	Polychlorinated Biphenyls
ROG	Reactive Organic Gases
SO_x	Sulfur Oxides
SO_2	Sulfur Dioxide
TCE	Trichlorethylene
THC	Total Hydrocarbons
TOG	Total Organic Gases
TSP	Total Suspended Particulates
VOC	Volatile Organic Compounds

APPENDIX B - RECORD OF PUBLIC NOTIFICATION

As part of the scoping process, the Air Force conducted a series of meetings to determine the issues and concerns that should be identified in the Environmental Impact Statement (EIS) for the proposed closure of Los Angeles Air Force Base (AFB), California, and the relocation of Headquarters Space Systems Division and appropriate supporting units to Vandenberg AFB, California.

The Air Force notified the public of both the scoping meetings and the preparation of the EIS through Notices of Intent (NOIs) published in the *Federal Register* on 9 February 1990. Copies of the NOIs follow.

NOTICE OF INTENT
TO PREPARE ENVIRONMENTAL IMPACT STATEMENTS
LOS ANGELES AFB, CA

The United States Air Force intends to study the closing of Los Angeles AFB, CA beginning in FY 1993. As part of that study process, the Air Force will prepare two Environmental Impact Statements (EISs) for use in decision-making regarding the proposed closure and final disposition/re-use of property at Los Angeles AFB.

The first environmental impact statement (EIS) will be prepared to assess the potential environmental impact of the possible closure of Los Angeles AFB. The EIS will discuss the potential environmental impacts of withdrawal of most of Headquarters Space Systems Division (HQ SSD). Los Angeles AFB units not required to support the proposed relocated HQ SSD will be inactivated. The EIS will also analyze the no action alternative to closing Los Angeles AFB and a partial relocation of HQ SSD.

The other EIS will only be completed if there is a final decision to close the base. This EIS would cover the final disposition/re-use of excess property. All property would be disposed of in accordance with provisions of Public Law, federal property disposal regulations and Executive Order 12512.

The Air Force is planning to conduct a series of scoping meetings to determine the issues and concerns that should be addressed in the two EISs. Notice of the time and place of the planned scoping meetings will be made available to public officials and announced in the news media in the areas where the meetings will be held.

To assure the Air Force will have sufficient time to consider public inputs on issues to be included in the development of the first EIS, comments should be forwarded to the addressee listed below by March 15, 1990. However, the Air Force will accept comments to the addressee below at any time during the environmental impact analysis process.

For further information concerning the study of Los Angeles AFB for possible closure and the EIS activities, contact

Director of Environmental Planning
AFRCE-BMS/DEV
Norton AFB, San Bernardino, CA 92409-6448

NOTICE OF INTENT
TO PREPARE ENVIRONMENTAL IMPACT STATEMENTS
RELOCATION OF SPACE SYSTEMS DIVISION

The United States Air Force intends to study the relocation of Headquarters Space Systems Division (HQ SSD) and appropriate supporting units to Vandenberg AFB, California, by the start of Fiscal Year (FY) 1993. As part of that study process, the Air Force will prepare an Environmental Impact Statement (EIS) for use in decision-making regarding the proposed relocation.

As alternatives, the EIS will also analyze the impacts of relocating HQ SSD and its support units to March AFB, California, Falcon and Peterson AFBs, Colorado or Kirtland AFB, New Mexico. Additionally, the EIS will consider the environmental impacts associated with the relocation of only portions of HQ SSD to Vandenberg, March, Falcon, Peterson, or Kirtland AFBs. The EIS will also analyze the no action alternative to relocating HQ SSD and Los Angeles AFB supporting units.

The Air Force is planning to conduct a series of scoping meetings to determine the issues and concerns that should be addressed in the EIS. Notice of the time and place of the planned scoping meetings will be made available to public officials and announced in the news media in the areas where the meetings will be held. To assure the Air Force will have sufficient time to consider public inputs on issues to be included in the development of the EIS, comments should be forwarded to the addressee listed below by March 15, 1990. However, the Air Force will accept comments to the addressee below at any time during the environmental impact analysis process.

For further information concerning relocation of Space Systems Division and EIS activities contact:

Director of Environmental Planning
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APPENDIX C - DRAFT ENVIRONMENTAL IMPACT STATEMENT MAILING LIST

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APPENDIX D - AIR FORCE POLICY ON MANAGEMENT OF ASBESTOS AT CLOSING BASES - TBS