

**Environmental Assessment:
Los Angeles AFB
Military Housing Privatization Initiative
Los Angeles County, California**



Prepared for:

U.S. Air Force Center for Environmental Excellence

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14. ABSTRACT This EA evaluates the potential for environmental consequences from the proposed action and the no action alternative for implementing the MHPI at LA AFB. LA AFB currently has 618 housing units, and has a requirement for military family housing for 572 families. The proposed action is for the Air Force to convey the 618 existing housing units and certain associated improvements, and lease approximately 155 acres of land divided among four parcels, to a private real estate development and property management company. The Air Force proposes that the developer would demolish 45 existing units, renovate 220 units, and convert two 2-bedroom units to one 4-bedroom unit; no renovation is required for 351 existing units. The developer would own all housing units and related infrastructure would lease the land from LA AFB, and would maintain and manage the housing area for a minimum of 572 military families for 50 years. Under the no action alternative, the Air Force would not implement the MHPI at LA AFB and would continue to maintain and manage military family housing in accordance with Air Force policy. Resources and issues addressed in the EA include air quality; soils, geology, and topography; water resources; biological resources; human health and safety; solid waste and hazardous materials; noise; cultural resources; land use; traffic and transportation; and socioeconomics and environmental justice.					
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**Cover Sheet:
Environmental Assessment
Military Housing Privatization Initiative
Los Angeles Air Force Base, California**

- A. *Responsible Agency:* Department of the Air Force, Los Angeles Air Force Base (LA AFB), California (CA).
- B. *Cooperating Agencies:* None.
- C. *Proposals and Actions:* This environmental assessment (EA) has been prepared in accordance with the *National Environmental Policy Act* to analyze the potential environmental consequences of the proposed Military Housing Privatization Initiative (MHPI) at LA AFB, CA. The housing areas of LA AFB are situated separately from the main base areas, and are located in the San Pedro district of the City of Los Angeles. No public comments were received on the Draft EA during a 30-day availability period ending November 24, 2006. The attached Finding of No Significant Impact documents the U.S. Air Force's decision to implement the proposed action.
- D. *Comments and Inquiries:* Comments or inquiries regarding this document should be directed to Mr. Claude Youssafzadeh, 61 CELS/CELEV, 2420 Vela Way, Suite 1866, Los Angeles AFB, El Segundo, CA 90245-4659, (310) 653-5496
- E. *Designation:* Environmental Assessment and Finding of No Significant Impact
- F. *Abstract:* This EA evaluates the potential for environmental consequences from the proposed action and the no action alternative for implementing the MHPI at LA AFB. LA AFB currently has 618 housing units, and has a requirement for military family housing for 572 families. The proposed action is for the Air Force to convey the 618 existing housing units and certain associated improvements, and lease approximately 155 acres of land divided among four parcels, to a private real estate development and property management company. The Air Force proposes that the developer would demolish 45 existing units, renovate 220 units, and convert two 2-bedroom units to one 4-bedroom unit; no renovation is required for 351 existing units. The developer would own all housing units and related infrastructure, would lease the land from LA AFB, and would maintain and manage the housing area for a minimum of 572 military families for 50 years. Under the no action alternative, the Air Force would not implement the MHPI at LA AFB and would continue to maintain and manage military family housing in accordance with Air Force policy. Resources and issues addressed in the EA include air quality; soils, geology, and topography; water resources; biological resources; human health and safety; solid waste and hazardous materials; noise; cultural resources; land use; traffic and transportation; and socioeconomics and environmental justice.

Finding of No Significant Impact
Military Housing Privatization Initiative
Los Angeles Air Force Base, California

INTRODUCTION

The United States Air Force proposes to implement a Military Housing Privatization Initiative (MHPI) at Los Angeles Air Force Base (LA AFB). LA AFB currently has 618 housing units, and has a requirement for military family housing for 572 families. Pursuant to Section 102(2)(c) of the *National Environmental Policy Act* (NEPA) of 1969, the Council on Environmental Quality (CEQ) regulations (40 Code of Federal Regulations (CFR) Sec 1500-1508) implementing procedural provisions of NEPA, and Air Force regulations for the Environmental Impact Analysis Process (32 CFR 989), the Department of Defense (DoD) gives notice that an environmental assessment (EA) has been prepared for the proposed housing privatization initiative at LA AFB, attached and incorporated by reference. This document serves as a Finding of No Significant Impact (FONSI).

THE PROPOSED ACTION AND NO ACTION ALTERNATIVE

The following paragraphs describe the proposed action and the no action alternative.

Proposed Action

The proposed action is for the Air Force to convey 618 existing housing units and certain associated improvements, and lease approximately 155 acres of land divided among four parcels, to a private real estate development and property management company. The Air Force proposes that the developer would demolish 45 existing units (all located at Fort MacArthur), renovate 220 units (50 at Fort MacArthur and all units at Pacific Heights I and Pacific Crest), and convert two 2-bedroom units to one 4-bedroom unit (at Fort MacArthur); no renovation is required for 351 existing units (all Pacific Heights II units and 280 units at Fort MacArthur). The developer would own all housing units and related infrastructure, would lease the land from LA AFB, and would maintain and manage the housing area for a minimum of 572 military families for 50 years. Two areas of land with 39 of the units to be demolished will revert to the Government after the transition period (estimated to be six years). The base's current vision is for administration and community land uses for these areas; however, future use of these areas is outside the scope of this EA. The area of land with the other 6 units to be demolished is expected to be used as residential, administration, and/or open space by the Project Owner, depending on the details of the Project Owner's proposal. This area and all other conveyed land, houses, and improvements would be leased to the Project Owner for 50 years.

No Action Alternative

Under the no action alternative, the Air Force would not implement the MHPI at LA AFB and would continue to manage and maintain military family housing in accordance with existing Air Force policy. The Air Force would likely demolish and renovate houses to eventually reach the same end state as under the proposed action to reach the minimum requirement of 572 units.

ENVIRONMENTAL EFFECTS

The environmental effects of the proposed action and no action alternative are summarized below.

Summary of Environmental Impact Analysis Results

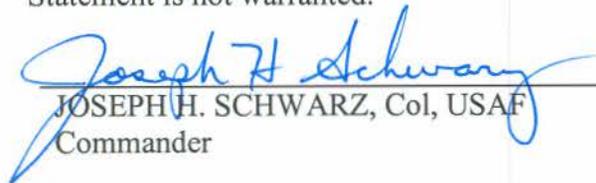
Resource	Summary of Impact Analysis Results	
	Proposed Action	No Action
Air Quality	Temporary slight increase in criteria pollutants from demolition and renovation. Fugitive dust permits may be required. Slight decrease in long-term emissions from unpermitted sources (residential furnaces). No significant impacts.	No impact.
Soils, Geology, and Topography	Temporary soil disturbance during demolition / renovation, in accordance with permit requirements. Erosion control measures required, particularly at Fort MacArthur. No significant impacts.	No impact.
Water Resources	Surface water impacts from temporary soil disturbance would be limited by best management practices. No significant impacts.	No impact.
Biological Resources	No significant impact.	No impact.
Human Health and Safety	No significant adverse impacts; long-term beneficial impact due to removal of hazardous substances of construction (asbestos and lead-based paint).	No adverse impact. Decreased potential for long-term beneficial impact due to removal of any potentially present hazardous substances of construction (asbestos and lead-based paint).
Solid Waste and Hazardous Materials	Short-term increase followed by a long-term decrease in solid waste generation. Short-term increase in hazardous waste generation leading to a long-term decrease in the potential for residential exposure to hazardous substances used in building materials. No significant adverse impacts.	No significant impacts.
Noise	Intermittent, short-term impacts, not significant.	No significant impacts.
Cultural Resources	Controls on vibration near historic structures, conducting renovation of historic housing in accordance with consultation with the SHPO, and maintenance of sites in accordance with the NHPA and other agreements will result in no significant impacts to cultural resources.	No impact.
Land Use	No impact.	No impact.

Resource	Summary of Impact Analysis Results	
	Proposed Action	No Action
Traffic and Transportation	Short-term increases in heavy vehicle traffic during transition period, long-term decrease in vehicular traffic associated with decreased residential population. No significant impacts.	No significant impacts.
Socioeconomics and Environmental Justice	No significant impact.	No impact.

There would be no significant cumulative impacts.

Finding of No Significant Impact

Based on the attached EA, conducted in accordance with the CEQ and Air Force regulations implementing NEPA, an assessment of the identified environmental effects has been prepared for the proposed MHPI at LA AFB. No public comments were received on the Draft EA during a 30-day availability period ending November 24, 2006. I find that the action will have no significant impact on the quality of the human environment; thus, an Environmental Impact Statement is not warranted.


 JOSEPH H. SCHWARZ, Col, USAF
 Commander

10 Jan 07
 Date

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B – Air Emissions Estimates for the Proposed Action

ENVIRONMENTAL ASSESSMENT: MILITARY HOUSING PRIVATIZATION INITIATIVE AT LOS ANGELES AIR FORCE BASE

SECTION 1. PURPOSE AND NEED

1.1 Introduction

The quality of government-owned housing has declined for more than 30 years primarily due to lack of Air Force funding and program priorities. The Department of Defense (DoD) estimates that about 200,000 military family housing units are old, lack modern amenities, and require renovation or replacement. According to DoD, completing this work at current funding levels and using traditional military construction methods would take 30 years and cost about \$16 billion (Yim 1999). To improve housing more economically and faster than could be achieved if only traditional military construction funds were used, the Congress enacted legislation at DoD's request authorizing a five-year pilot program, termed the Military Housing Privatization Initiative (MHPI), to allow private sector financing, ownership, operation, and maintenance of military housing. Under the program, which is authorized by 10 U.S.C. Section 2871 et. seq, DoD can provide direct loans, loan guarantees, and other incentives to encourage private developers to construct and operate housing either on or off military installations. The program takes advantage of the private sector's investment capital and housing construction expertise to provide better quality housing to its service members. DoD believes that the authorities the MHPI provides will contribute significantly to its plan to solve its housing situation by 2010, when combined with traditional funded government construction (Yim 1999).

The Space and Missile Systems Center and its predecessor organizations have been headquartered at Los Angeles Air Force Base (LA AFB) since 1954. More than 4,400 military and civilian personnel work at the base. Housing for military personnel is at four remote sites: Fort MacArthur, Pacific Heights I, Pacific Heights II, and Pacific Crest. The area occupied by Fort MacArthur has been a government reservation since at least the mid 19th century, and was declared a military reservation in 1888. In 1914, it was established as Fort MacArthur to provide a home for coastal artillery batteries that the government had built at San Pedro; housing and headquarters were constructed by 1919. After several mission changes over the intervening years, Fort MacArthur was transferred from Army to Air Force jurisdiction in 1979, with the site designated for military family housing. The need for additional housing led to the 1987 acquisition of land for the Pacific Heights I and Pacific Crest developments, and construction was initiated in the late 1990s for additional homes designated as Pacific Heights II. All four of these developments are in the San Pedro district of Los Angeles.

LA AFB proposes to conduct a real estate transaction authorized by the MHPI to convey 618 existing housing units and certain associated improvements, and lease approximately 155 acres of land divided among four parcels of improved land, to a private developer, referred to as the Project Owner. The Project Owner will obtain necessary financing; provide required equity; and plan, design, develop, renovate, demolish, own, operate, maintain, and manage a rental housing development, including all paving and drainage, as well as any utilities conveyed to or constructed by the Project Owner, for a minimum of 572 military families for 50 years. The

Project Owner will be the successful bidder in response to a Request for Proposals (RFP) for this activity and has not yet been identified.

Housing privatization is considered a major Federal action subject to the requirements of the *National Environmental Policy Act* (NEPA) of 1969, as amended, which requires Federal agencies to consider environmental impacts in their decision-making process. This environmental assessment (EA) evaluates the potential for environmental consequences of real property transactions associated with the privatization of housing at LA AFB, in accordance with the President's Council on Environmental Quality (CEQ) regulations for implementing NEPA (Title 40 Code of Federal Regulations (CFR) 1500-1508) and Air Force regulations for the Environmental Impact Analysis Process (32 CFR 989). These Federal regulations establish both the administrative process and substantive scope of the environmental impact evaluation, designed to ensure deciding authorities have a proper understanding of the potential environmental consequences of a contemplated course of action. A notice of availability was published in the *El Segundo Herald* on October 26, 2006, and in the *Daily Breeze* on October 27 through October 29, 2006, announcing the availability of the Draft EA for a 30-day review period ending November 24, 2006; no public comments were received.

This EA presents the purpose and need for the action (Section 1), describes the proposed action and alternatives (Section 2), identifies the characteristics of the affected environment (Section 3), and summarizes the analysis of the potential for environmental consequences (Section 4). Agencies contacted (Section 5), the list of preparers (Section 6), and references (Section 7) are also included. Appendices present terms, acronyms and abbreviations used (Appendix A); and air emissions estimates from the proposed action (Appendix B).

1.2 Project Location

The housing areas of LA AFB are situated separately from the main base areas (referred to as Areas A and B). Fort MacArthur (Parcel A) encompasses 93 acres and lies within the San Pedro district of the City of Los Angeles; it is approximately 15 miles south southeast of Areas A and B and is just west of Los Angeles Harbor along Pacific Avenue. Pacific Heights I (Parcel B) and Pacific Heights II (Parcel C) encompass 40 acres located southwest of the Pacific Crest housing area, also in the San Pedro district of Los Angeles. The Pacific Crest housing area (Parcel D) is located in a residential portion of the San Pedro district of Los Angeles, consisting of 22 acres approximately 1.2 miles west of Fort MacArthur. Figures 1 and 2 present the general and specific locations of these housing areas.

1.3 Purpose of and Need for Action

Air Force policy establishes a minimum family housing requirement for each installation, based on the following four criteria:

- The need for a military community,
- Housing for personnel in key and essential positions,
- Preservation of historic housing, and

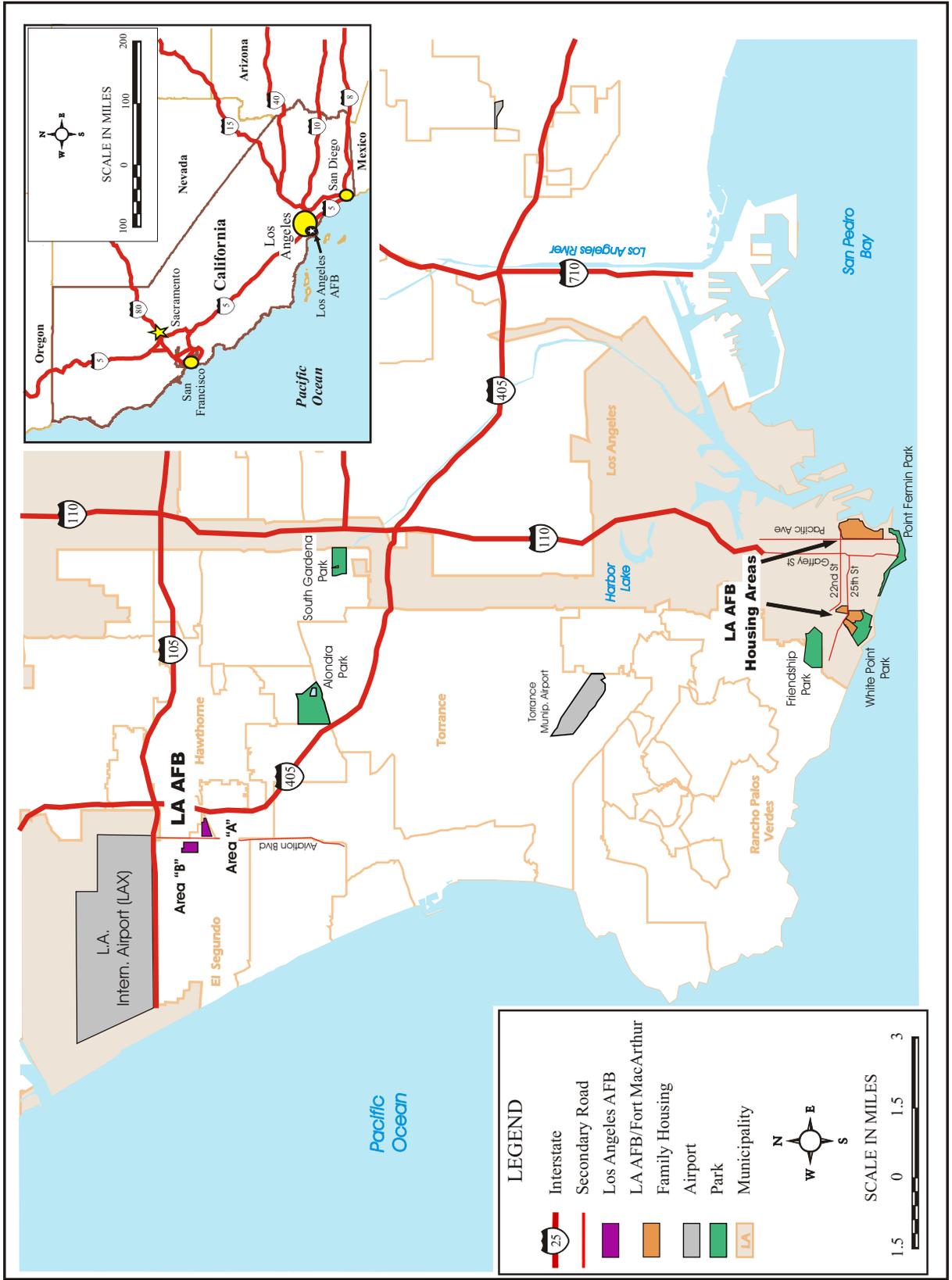


Figure 1. General Location of Los Angeles AFB

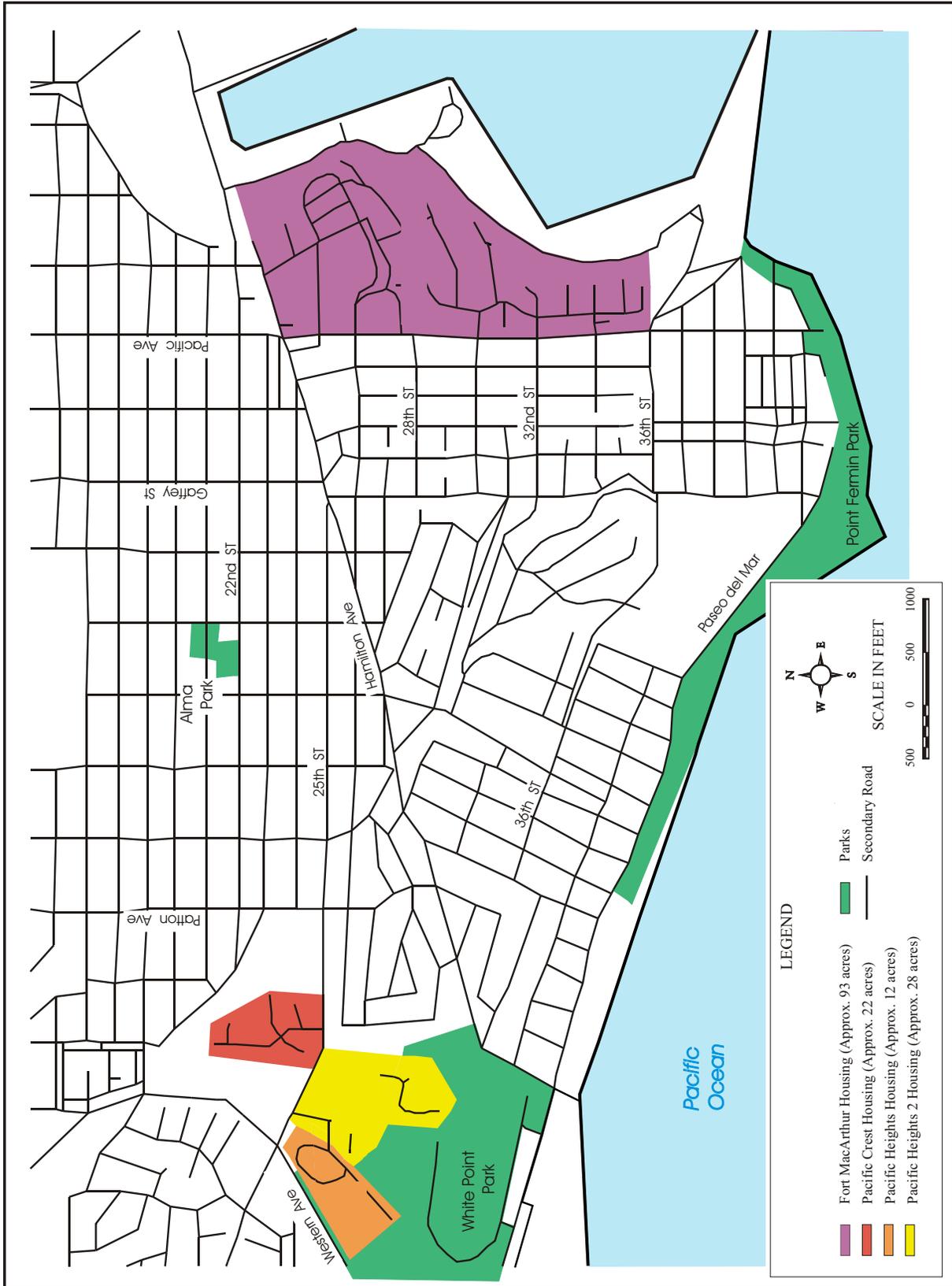


Figure 2. Los Angeles AFB Family Housing Locations

- Housing for the personnel whose level of regular military compensation is below 50% of the median family income in the local area.

The 2004 Housing Requirements and Market Analysis (HRMA) report for LA AFB concluded that there will be a requirement by 2008 for housing for 572 families at LA AFB (USAF 2004b).

LA AFB has identified a need to improve the quality of the military housing available to its service members. Of the 618 existing housing units proposed for conveyance, only 57% (352 units), have been rated as meeting or exceeding Air Force standards. A total of 280 units were renovated in the 2002 to 2006 timeframe, and the 71 units in Pacific Heights II were constructed in 1998 to 2000. All other units were graded as below Air Force standards. At Fort MacArthur, 12 houses were built in 1918, 8 were built in 1934, and the remaining 357 units were built in 1982 and 1985. During 2002 - 2006, 280 of the 322 non-demolition units at Fort MacArthur received whole house renovations: plumbing and wiring were not updated, but roofs, kitchens, baths, forced air gas furnaces, and floorings were replaced (none of these units has air conditioning). The Pacific Heights I and Pacific Crest housing units were built in 1987 to 1988, and have fallen below Air Force standards. The Pacific Heights II houses were constructed in 1998 to 2000 and still exceed Air Force standards. No renovations have been undertaken in the latter three housing areas to date.

Under the MHPI, LA AFB is permitted to enter into a variety of arrangements with private sector entities to renovate and manage military housing both on and off military bases. DoD believes that the authorities the MHPI provides will contribute significantly to its plan to solve its housing situation, when combined with traditional funded government construction.

SECTION 2. ALTERNATIVES INCLUDING THE PROPOSED ACTION

This section presents the proposed action and the no action alternative, and briefly describes an alternative that was identified but was not considered in detail in the EA.

2.1 Alternative 1 – Proposed Action

The MHPI allows LA AFB to address housing needs through conveyance of improvements and leasing of specialized land parcels to a private developer for the purpose of privately financing the renovation, demolition, and management of military housing areas.

The proposed action involves a non-Federal Acquisition Regulation real estate transaction with the Project Owner under which the Government will convey 618 existing housing units and certain associated improvements, and lease approximately 155 acres of land divided among four parcels (see Figure 2), as follows:

Housing Area	Existing Units	Approximate Acres
Parcel A: Fort MacArthur housing area	377	93
Parcel B: Pacific Heights	79	12
Parcel C: Pacific Heights II	71	28
Parcel D: Pacific Crest	91	22
Total Housing Conveyed	618	155

The Project Owner will be the successful bidder in response to an RFP for this activity, and has not yet been identified. The remainder of this subsection summarizes the detailed requirements from the most recent version of the Draft RFP (January 13, 2006). Dates regarding the transaction's milestones are subject to change. However, at the time of this EA, the expected timeline for the proposed project consists of release of the solicitation / RFP in Summer 2006, proposals due in Fall 2006, identification of the highest ranked offeror in Winter 2006-2007, and closing the transaction in Spring 2007. All demolition and renovation activities will be completed within six years of closing the transaction.

The Project Owner would obtain necessary financing; provide required equity; and renovate, demolish, own, operate, maintain, and manage a rental housing development, including all paving and drainage, as well as any utilities conveyed to or constructed by the Project Owner, for a minimum of 572 military families for 50 years. The 572 units are referred to as "privatized units," and are reflected in the following major project components:

Action	Number of Units
Convey	618
Demolition	45
Conversion with renovation	2*
Renovation	220
No Renovation Required	351
Total End-State	572

*Conversion of two 2-bedroom units into one 4-bedroom unit.

Figures 3 and 4 show aerial views of the housing areas. A general description and proposed disposition of the units in each parcel are as follows:

- **Parcel A: Fort MacArthur Housing Area.** There are currently 377 single family, duplex, and multi-family units on approximately 93 acres. Twenty single and duplex units are historic, 12 having been constructed in 1918 and 8 in 1934. The remainder of the units were constructed in 1982 and 1985. The Project Owner will demolish 45 of the units constructed in the 1980s, convert two 2-bedroom units into one 4-bedroom unit (with renovation), and renovate 50 additional units. The historic units will be renovated as required and maintained for occupancy for either the transition period or 50 years; the Final RFP will contain updated information on the Air Force's decision as to the term of the lease for the historic units. Two areas of land with 39 of the units to be demolished will revert to the Government after the transition period (estimated to be six years). The base's current vision is for administration and community land uses for these areas (see further discussion below). The area of land with the other 6 units to be demolished is expected to be used as residential, administration, and/or open space by the Project Owner, depending on the details of the Project Owner's proposal. This area and all other conveyed land, houses, and improvements would be leased to the Project Owner for 50 years.
- **Parcel B: Pacific Heights I Housing Area.** There are currently 79 single family homes on approximately 12 acres; they were constructed in 1988. All units will be renovated. The land, houses, and other improvements would be leased to the Project Owner for 50 years.
- **Parcel C: Pacific Heights II Housing Area.** There are currently 71 single family homes on approximately 28 acres; they were constructed in 1998 to 2000. No renovations are required. The land, houses, and other improvements would be leased to the Project Owner for 50 years. Historic World War I and World War II fortifications are located within Parcel C, both above and under ground. The Final RFP will contain updated information on the Air Force's decision as to whether these structures will be conveyed.
- **Parcel D: Pacific Crest Housing Area.** There are currently 91 single family homes on approximately 22 acres; they were constructed in 1988. All 91 units will be renovated. The land, houses, and other improvements would be leased to the Project Owner for 50 years.

LA AFB's vision for the two Fort MacArthur areas that will revert to the Government after demolition of housing units during the transition period is as follows:

- Buildings 1695, 1696, and 1697: installing landscaping buffers between housing and administrative areas, construction of a new civil engineer administration building, construction of additional parking to support the civil engineer facility, and construction of a new base housing office.
- Buildings 1642, 1643, 1644, 1645, 1646, 1647, and 1648: demolition of Facility 451 (currently used as gym and Teen Center) that is adjacent to but not part of the privatization land lease, construction of a new community medical clinic, construction of a new chapel and religious education facility, and construction of a new fitness center.



Figure 3. Los Angeles AFB Family Housing at Fort MacArthur



Figure 4. Los Angeles AFB Family Housing at Pacific Crest/Heights I/Heights II

Appropriations have not been approved for either proposed redevelopment, and therefore this vision is subject to change. The scope of related activities under this EA is limited to demolition of housing and associated improvements which may include rerouting utility lines, as necessary. Upon completion of this work, the land lease will be terminated for this parcel and the land will revert to full government control. Future development of this land is outside the scope of this EA, and any environmental considerations associated with future development will be assessed in a future NEPA document, as required.

With the exception of computer network lines and secure government telephone cable to some units in Fort MacArthur, all government-owned utility systems would be conveyed to the Project Owner. The draft RFP states that the Project Owner must install individual electric and natural gas meters on the 572 end-state units no later than the end of the transition period, to capture the actual usage for each unit. The Project Owner shall be responsible for collecting all utility payments from the tenants. The Government will continue to own, install, and maintain the secure government telephone cable lines and computer network lines. All other utility distribution infrastructure currently owned by the Government will be conveyed to the Project Owner. The housing Project Owner would be responsible for coordinating new installation as required, capital upgrades, operations, and maintenance of the utility distribution system within the housing areas. The Project Owner will also be conveyed 3 tennis courts (all in Parcel A), 3 picnic areas (one in Parcel A and two in Parcel D), 21 tot lots (playgrounds; 12 in Parcel A, 4 in Parcel B, and 5 in Parcel D), and 6 basketball courts (1 in Parcel A, 2 in Parcel B, and 3 in Parcel D). All perimeter fencing around Parcels B, C, and D, except for the entrance gate at each area, will be conveyed to the Project Owner. The portions of the perimeter fence and westside force protection wall around Parcel A that are adjacent to the housing areas will be conveyed to the Project Owner, as follows: on the western perimeter, from 30th Street to the southern end of Fort MacArthur, with the exception of the entry gates that cross over 32nd Street and 34th Street; across the southern end of Fort MacArthur; on the eastern perimeter from the southern end of Fort MacArthur to south of 32nd Street, from 32nd Street to the point just south of 31st Street (for transition period only), and from 31st Street to just south of 29th Street; and a separate section along the eastern perimeter from the southern point of the basketball court west of MacArthur Boulevard to Quartermaster Court.

At the expiration of the 50-year lease, the term of the lease may be extended. After the expiration of the lease and any extension, one of two additional options will be implemented: the Project Owner will demolish all improvements with the exception of the historic structures and all perimeter fencing/force protection walls, which will be returned to the Government; or all facilities and improvements will be transferred to ownership by the Government.

Any easements and other property interests (such as rights-of-way or licenses) will be identified in a forthcoming metes and bounds survey. Government communications lines within Parcel A will be retained by the Government. The Government will retain the right to access utility systems within the conveyed areas of Parcel A, including those systems conveyed to the Project Owner, in the event that impacts to nonconveyed areas are encountered.

2.2 Alternative 2 – No Action

Inclusion of the no action alternative is required by CEQ and Air Force regulations for implementing NEPA. Although the no action alternative does not satisfy the purpose and need for the proposed action, it serves as a baseline against which the impacts of the proposed action and alternatives can be evaluated.

Under the no action alternative, LA AFB would not implement the proposed action, and would continue to provide for the family housing needs of its personnel through use of traditional military maintenance and construction procedures. LA AFB would continue to obtain funding for family housing through the Congressional authorization and appropriations process. Based on historical trends, it is assumed that the amount of Congressional funding for family housing would not increase and that the number of units in critical need of renovation would continue to grow. Any major changes to housing in the future would require that appropriate NEPA analyses be completed before implementing such actions.

2.3 Alternative Identified But Not Considered in Detail

One additional alternative was identified but was not concluded to be reasonable, and therefore was not evaluated in detail in the EA, as follows:

Private Sector Reliance

Under this alternative, LA AFB would rely solely on the private sector to meet the housing needs of service members.

The alternative is premised, in part, on the view that competitive marketplace forces would lead to the creation of sufficient affordable, quality family housing. There are several intangible benefits to military personnel and their families living on-post. These include camaraderie and esprit de corps among the military personnel, convenient access to military community services, and a sense of “family” among dependents. In addition, in the Los Angeles area specifically, the high cost of living has limited the housing available to the base’s service members, with shortages of affordable rental houses and rental apartments.

As a practical matter, termination of LA AFB family housing would prove difficult. If the base’s family housing was terminated over a period of years, in the absence of maintenance funding, the existing housing would become unsuitable due to age or necessity of repairs. Residents could then find themselves living in blighted and partially abandoned neighborhoods. If the family housing program was terminated all at once, it is unlikely the private sector could provide the requisite amount of affordable, quality housing on short notice.

This alternative is not reasonable and was not further evaluated in the EA.

2.4 Summary of Environmental Impacts

Potential impacts resulting from the proposed action and no action alternative, based on the analysis details presented in Section 4 of this EA, are summarized in Table 1.

Table 1. Summary of Impact Analysis Results

Resource	Summary of Impact Analysis Results	
	Proposed Action	No Action
Air Quality	Temporary slight increase in criteria pollutants from demolition and renovation. Fugitive dust permits may be required. Slight decrease in long-term emissions from unpermitted sources (residential furnaces). No significant impacts.	No impact.
Soils, Geology, and Topography	Temporary soil disturbance during demolition / renovation, in accordance with permit requirements. Erosion control measures required, particularly at Fort MacArthur. No significant impacts.	No impact.
Water Resources	Surface water impacts from temporary soil disturbance would be limited by best management practices. No significant impacts.	No impact.
Biological Resources	No significant impact.	No impact.
Human Health and Safety	No significant adverse impacts; long-term beneficial impact due to removal of hazardous substances of construction (asbestos and lead-based paint).	No adverse impact. Decreased potential for long-term beneficial impact due to removal of any potentially present hazardous substances of construction (asbestos and lead-based paint).
Solid Waste and Hazardous Materials	Short-term increase followed by a long-term decrease in solid waste generation. Short-term increase in hazardous waste generation leading to a long-term decrease in the potential for residential exposure to hazardous substances used in building materials. No significant adverse impacts.	No significant impacts.
Noise	Intermittent, short-term impacts, not significant.	No significant impacts.
Cultural Resources	Controls on vibration near historic structures, conducting renovation of historic housing in accordance with consultation with the SHPO, and maintenance of sites in accordance with the NHPA and other agreements will result in no significant impacts to cultural resources.	No impact.
Land Use	No impact.	No impact.

Resource	Summary of Impact Analysis Results	
	Proposed Action	No Action
Traffic and Transportation	Short-term increases in heavy vehicle traffic during transition period, long-term decrease in vehicular traffic associated with decreased residential population. No significant impacts.	No significant impacts.
Socioeconomics and Environmental Justice	No significant impact.	No impact.

There would be no significant cumulative impacts.

SECTION 3. AFFECTED ENVIRONMENT

This section describes the existing condition of resources at LA AFB, laying the groundwork for the discussions in Section 4 of the potential for environmental impacts to each area.

3.1 Air Quality

This section discusses the climate and meteorology of the area, air quality standards, existing air pollutant sources, and regional air quality.

3.1.1 Climate and Meteorology

Fort MacArthur and the Pacific Heights and Pacific Crest housing areas are located on the southeastern end of the Palos Verdes Peninsula, along the western edge of the Los Angeles Harbor, at the southern edge of the Los Angeles Basin. The Los Angeles Basin is located between the Pacific Ocean and the San Gabriel, San Bernardino, and San Jacinto Mountains. The area has a Mediterranean climate, with a dry summer and a rainy winter, but relatively modest transitions in temperature.

In the dry season, the eastern Pacific high pressure area dominates the weather over much of southern California. Warm and very dry air descending from this Pacific high caps cool, ocean-modified air under a strong inversion (warm air aloft trapping cooler air below), producing a marine layer (an area of cool moist air). This marine layer is the primary weather feature for the Los Angeles Basin for much of the year, especially from late spring through early fall. The average high temperature at Long Beach (the nearest National Weather Service reporting station) is 75 °F and the average low temperature is 55 °F. Precipitation is rare from May through October, and is highly variable from November through April. The area is subject to thunderstorms and heavy rainfall, which primarily occur from May through August. Mean precipitation is about 12.94 inches per year at the Long Beach Airport. The record precipitation for one day is 6.71 inches on January 20, 1969. Prevailing winds are predominantly from the north throughout the year. Winds are generally light, with frequent afternoon sea breezes of 10 to 15 miles per hour. While severe weather is uncommon, strong offshore wind, known as Santa Ana, can reach hurricane strength below passes and canyons. Also, passing winter storms can bring southeast winds to gale force. Winds are predominantly out of the west and west-northwest from July through April, and from the south during May and June, averaging 5 to 8 miles per hour (NWS 2006a, NWS 2006b, NWS 1999, WRCC 2006).

Surface pollutants trapped under the marine inversion result in smog – a mixture of fog, particulate matter, nitrogen oxides (NO_x), ozone, volatile organic compounds (VOCs), and peroxyacetyl nitrates. The smog is often trapped in the Los Angeles Basin, with light onshore winds and mountains to the north and northeast of the basin.

3.1.2 Air Quality Standards

The National Ambient Air Quality Standards (NAAQS), established by the U.S. Environmental Protection Agency (USEPA), and adopted by the California Air Resources Board (CARB),

define the maximum allowable ambient concentrations of pollutants that may be reached but not exceeded within a given time period. The CARB has also adopted stricter standards for these pollutants, as well as standards for visibility reducing particles, sulfates, hydrogen sulfide, and vinyl chloride (CARB 2005). These standards were selected to protect human health with a reasonable margin of safety. Section 110 of the *Clean Air Act* (CAA) requires states to develop air pollution regulations and control strategies to ensure that state air quality meets the NAAQS established by USEPA. The California Ambient Air Quality Standards (CAAQS) are established under Section 109 of the CAA, and they currently address six criteria pollutants: carbon monoxide (CO), nitrogen dioxide (NO₂), ozone, lead, particulate matter, and sulfur dioxide (SO₂). Particulate matter has been further defined by size. There are standards for particulate matter smaller than 10 microns in diameter (PM₁₀) and smaller than 2.5 microns in diameter (PM_{2.5}). Each state must submit these regulations and control strategies for approval and incorporation into the Federally enforceable state implementation plan (SIP). Exceeding the concentration levels within a given time period is a violation and constitutes a nonattainment of the pollutant standard. Table 2 summarizes the Federal and State ambient air quality standards.

Requirements of the CAA are implemented locally by the South Coast Air Quality Management District (SCAQMD). Under Rule 201 and 203 of Regulation II, a facility shall not install or operate equipment, the use of which may cause the issuance of air contaminants or reduce or control the issuance of air contaminants, without first obtaining a written permit from SCAQMD unless specifically exempted under Rule 219. Any new air emission source or modification to an existing air emission source must be reviewed under the list of exemptions under Rule 219 to determine if the new equipment is exempt. If not, LA AFB must apply for and obtain a construction permit from SCAQMD for the equipment. If the source or modification is considered major (exceeds the thresholds of Title V of the CAA), then a major New Source Review permit must be obtained. The Title V thresholds and emissions from LA AFB and Fort MacArthur are shown in Table 3. In accordance with 40 CFR 51, fugitive and mobile emissions are not included as part of Title V permitting requirements unless they are from a major source in one of 27 industrial categories. LA AFB does not have any sources in these categories. Fugitive emissions are those emissions that could not reasonably pass through a stack, chimney, vent, or other functionally equivalent opening, and include construction and demolition operations, vehicles driving on paved and unpaved roads, and miscellaneous chemical and paint usage.

Actual emissions of non-fugitive stationary source criteria pollutants from the main base and Fort MacArthur are all 20% or less of the Title V threshold. Potential emissions of NO_x from the main base exceed the Title V threshold; however, under SCAQMD Regulation XXX, Rule 3008, if the actual emission of a criteria pollutant is less than 50% of the threshold, a Title V permit is not needed if the potential emission exceeds the threshold (SCAQMD 1997). All potential emissions from Fort MacArthur are below the Title V thresholds. Both the main base and Fort MacArthur are minor sources of criteria pollutants and do not require a Title V operating permit. Emissions from Pacific Crest and Pacific Heights I and II consist of exempt stationary sources (such as residential furnaces) and do not require a Title V permit.

Sources of pollutants at Fort MacArthur housing include heating units (using natural gas), diesel- and gasoline-fired equipment (emergency generators and miscellaneous equipment), and fuel storage and transfer from a 500-gallon diesel aboveground storage tank.

Table 2. NAAQS and CAAQS

Pollutant	Averaging Time	Standard – $\mu\text{g}/\text{m}^3$ (ppm) ^a		
		NAAQS		CAAQS
		Primary ^b	Secondary ^c	
O ₃	1 hour	No Federal standard	No Federal standard	180 (0.09)
	8 hours	157 (0.08)	Same	137 (0.070)
CO	1 hour	40,000 (35)	None	23,000 (20)
	8 hours	10,000 (9)	None	10,000 (9)
NO ₂	AAM ^c	100 (0.053)	Same	None
	1 hour	None	None	470 (0.25)
SO ₂	1 hour	None	None	655 (0.25)
	3 hours	None	1,300 (0.5)	None
	24 hours	365 (0.14)	none	105 (0.04)
	AAM	80 (0.03)	none	None
PM ₁₀	AAM	50	Same	20
	24 hours	150	Same	50
PM _{2.5}	AAM	15	Same	12
	24 hours	65	Same	None
Lead	30 days	None	None	1.5
	¼ year	1.5	Same	
Visibility reducing particles	8 hours	None	None	Extinction coefficient of 0.23 per kilometer – visibility of 10 miles or more due to particles when relative humidity is less than 70%
Hydrogen sulfide	1 hour	None	None	42 (0.03)
Vinyl chloride	24 hours	None	None	26 (0.01)

^a $\mu\text{g}/\text{m}^3$ — micrograms per cubic meter; ppm — parts per million.

^bNational Primary Standards establish the level of air quality necessary to protect the public health from any known or anticipated adverse effects of a pollutant, allowing a margin of safety to protect sensitive members of the population.

^cNational Secondary Standards establish the level of air quality necessary to protect the public welfare by preventing injury to agricultural crops and livestock, deterioration of materials and property, and adverse impacts on the environment.

^dAAM — annual arithmetic mean.

Source: 40 CFR 50; California Air Resources Board.

Table 3. Title V Permit Thresholds and Emissions from LA AFB

	Emissions ¹ (tons per year)						
	PM ₁₀ ²	SO ₂	NO _x	VOCs	CO	Single HAP ³	Total HAPs
Permit Thresholds - Actual	56	80	8	8	40	8	20
Main Base Emissions - Actual	0.2	0.01	1.6	0.1	1.4	0.2	0.3
Fort MacArthur - Actual	0.1	0.003	0.3	0.03	0.2	0.3	0.5
Permit Thresholds - Potential to Emit	70	100	10	10	50	10	25
Main Base - potential to emit	3.1	0.3	28.8	2.4	30.8	0.7	1.7
Fort MacArthur - potential to emit	1.0	0.1	7.8	0.5	5.0	1.2	2.3

Source: SCAQMD 1997, USAF 2005a.

¹ Fugitive emissions are not included for calculating Title V emissions, per 40 CFR 51.165.

² Title V permit thresholds have not been established for PM_{2.5}

³ Hazardous air pollutant.

HAPs are regulated under 40 CFR 61, National Emission Standards for Hazardous Air Pollutants (NESHAP), and 40 CFR 63, NESHAP for Source Categories. In the South Coast Air Basin, a major source is defined as one emitting 8 tons per year or having the potential to emit 10 tons per year of any single HAP, or having actual emissions of 20 tons per year or the potential to emit 25 tons per year total HAPs (SCAQMD Regulation XXX, Rule 3001). Major sources, as specified in 40 CFR 63, require the implementation of maximum achievable control technology. A minor source is defined as one emitting or having the potential to emit less than these thresholds. LA AFB and Fort MacArthur are minor sources of HAPs. HAPs emissions from stationary sources at Pacific Crest and Pacific Heights I and II are negligible.

3.1.3 Air Pollutant Sources

Particulate matter (PM₁₀ and PM_{2.5}) is generated during ground disturbing activities and during combustion. SCAQMD requires fugitive dust controls for all construction and demolition activities.

The fugitive dust rules (SCAQMD Rule 403) include mandatory controls to stabilize soil to prevent generation of fugitive dust. Specific measures are required to stabilize soil surfaces and demolition debris to reduce dust (such as watering), and measures to prevent vehicles from tracking dust-generating material offsite on unpaved or paved roads (watering, chemical stabilizers, limiting vehicle speeds, washing vehicle wheels, street cleaning, or gravelling entry and exit paths).

Demolition and renovation of housing also generates other criteria pollutants, such as CO, VOCs, NO_x, SO₂, and various hazardous pollutants from operation of construction equipment. Any demolition project must also comply with the provisions of SCAQMD Rule 1403, Asbestos Emissions from Demolition/Renovation Activities. This rule specifies work practices that must be followed where there is the potential for asbestos containing materials (ACMs) to be present where demolition or renovation is occurring. Section 3.6 discusses asbestos in more detail.

3.1.4 Regional Air Quality

Fort MacArthur and the Pacific Heights and Pacific Crest housing areas are located in the Los Angeles Metropolitan Area, which lies within the SCAQMD. The district is currently in serious nonattainment for CO and PM₁₀, nonattainment for PM_{2.5}, Severe-17 nonattainment for ozone,¹ and has been in maintenance for NO₂ since September 22, 1998 (USEPA 2006a). The district is in attainment for SO₂ and lead. The SCAQMD is under an air quality management plan (AQMP). Every three years, SCAQMD prepares an overall plan for air quality improvement. Each iteration of the plan is an update of the previous plan and has a 20-year horizon. The Final 2003 AQMP was adopted by the SCAQMD Governing Board on August 1, 2003 (SCAQMD 2005). The plan includes attainment demonstrations for CO, PM₁₀, PM_{2.5}, and ozone (strategies to achieve attainment); a maintenance plan for NO₂; and emission inventories for these pollutants. Emission inventories have been established for pollutants from point, area, off-road, and on-road sources for a baseline year (1995) and various years up to 2020. Point sources are those emitted from a defined (usually a stack or vent) permitted source. Area sources are generated over a widespread area, such as dust generated from bare soil or unpaved roads. Area sources include emissions from construction and demolition activities. Off-road mobile sources include construction equipment. Table 4 shows emission inventories for construction and demolition activities, trucks driving on paved and unpaved roads, and mobile on-road sources.

Table 4. Emission Inventory for South Coast Air Basin

	Emissions (tons per day)					
	PM _{2.5}	PM ₁₀	SO _x ¹	NO _x	VOCs	CO
2006						
Construction and demolition	9.11	43.66	–	–	–	–
Trucks on paved roads	22.75	134.95	–	–	–	–
Trucks on unpaved roads	1.85	8.70	–	–	–	–
Construction equipment	10.33	11.61	0.37	162.06	80.85	851.20
Mobile on-road	13.55	19.90	4.92	562.87	266.14	2602.36
2010						
Construction and demolition	9.90	47.44	–	–	–	–
Trucks on paved roads	22.32	138.31	–	–	–	–
Trucks on unpaved roads	1.85	8.70	–	–	–	–
Construction equipment	9.09	10.26	0.38	130.95	72.08	792.22
Mobile on-road	13.89	20.76	2.16	434.48	212.34	2048.06

Source: SCAQMD 2005

¹ Sulfur oxides.

3.2 Soils, Geology, and Topography

Geological resources discussed in this section include physical features of the earth such as geology (surface and subsurface features), topography, and soils.

¹ Severe-17 nonattainment for ozone is an area that has an 8-hour ozone level of 0.127 ppm up to but not including 0.187 ppm at time of designation (2004 for South Coast Air Basin), and has 17 years (until 2021 for South Coast Air Basin) to attain the standard.

Fort MacArthur and Pacific Crest and Pacific Heights I and II are located on the southeastern end of the Palos Verdes Peninsula, along the western edge of the Los Angeles Harbor. Bedrock in the vicinity of Fort MacArthur and Pacific Crest and Pacific Heights I and II consists of Jurassic Schist and Miocene age volcanics. The Palos Verdes Fault is about 2 miles to the north of Fort MacArthur and about 3 miles north of Pacific Crest and Pacific Heights I and II. The fault is a northwest to southeast trending feature with little surficial displacement in the last 10,000 years. The Cabrillo fault runs through the Fort MacArthur housing area and about ½ mile to the north of the Pacific Crest and Pacific Heights I and II areas. This faulting has resulted in exposure of Jurassic age Catalina Schist, Miocene age volcanics, and the Miocene Monterey Formation (USAF 2000, USGS 2004). The Monterey Formation consists of predominately massive shale, micaceous siltstone, and lesser amounts of fine to medium-grained sandstone. The Pliocene Repetto Formation overlies the Monterey. The Repetto Formation consists of marine, sandy siltstone, claystone, and shales (USAF 2000).

The Cabrillo and Palos Verdes faults are both active. There is a 10% chance that a peak acceleration of 45.0% of gravity would be exceeded in 50 years at Fort MacArthur and 43.2% of gravity in the vicinity of Pacific Crest and Pacific Heights I and II (CGS 2006). This would approximately equal a value of VIII on the Modified Mercalli Scale for earthquake intensity. Earthquakes of this magnitude would typically cause slight damage in specially designed structures, considerable damage in ordinary substantial buildings, and great damage in poorly built structures. On average, this would equal magnitudes in the range of 6.0 to 6.9 on the Richter Scale (depending on the proximity of the earthquake to the site). Since 1973, there have been 3,507 earthquakes recorded within 160 kilometers (100 miles) of the site, with magnitudes ranging from 2.1 to 6.9 (USGS 2006a).

Because of the bedrock nature of the underlying geologic units, the area encompassing Fort MacArthur and Pacific Crest and Pacific Heights I and II does not have a well-developed aquifer system. The Monterey shale is considered highly impervious, with groundwater occurring in localized sand units. The water is highly saline and does not have a hydraulic connection to freshwater recharge. Small, localized perched water tables may occur on top of the silty clay units; however, an aquifer system has not been defined (USAF 2000, EDR 2006).

The elevation of Fort MacArthur is between 40 and 70 feet above mean sea level and generally slopes from west to east. The elevation of Pacific Crest and Pacific Heights I and II is approximately 380 feet above mean sea level and generally slopes from northeast to southwest. Slopes range from nearly level to steep (about 40%).

Soils at Fort MacArthur are classified as Urban land-Ramona-Zamora (a mixture of soil types highly modified by construction of housing and pavement) and Alo-Bosanko-Calleguas clay loam. Soils at Pacific Crest and Pacific Heights I and II are Alo-Bosanko-Calleguas clay loam (USDA 1994). Water infiltrates and moves very slowly in these soils. These soils are vulnerable to erosion and landslides with heavy rainfall.

During the site inspections for the environmental baseline survey (EBS), the investigators observed an area of severe erosion along the Fort MacArthur housing parcel's eastern perimeter,

immediately adjacent to a paved walking path in the housing area and including the fenceline, some of which has been lost as a result.

3.3 Water Resources

Water resources include surface and groundwater sources, quantity, and quality. The hydrologic cycle results in the transport of water into various media such as the air, the ground surface, and subsurface. Natural and human-induced factors determine the quality of water resources. Water resources discussed in this section include groundwater, surface water (including storm water runoff), floodplains, wetlands, and the coastal zone.

3.3.1 Groundwater

Fort MacArthur and the Pacific Crest and Pacific Heights I and II housing areas are underlain by the Repetto Formation and the Monterey Formation. The Monterey Formation consists of predominately massive shale, micaceous siltstone, and lesser amounts of fine to medium-grained sandstone. The Pliocene Repetto Formation overlies the Monterey and consists of marine, sandy siltstone, claystone, and shales (USAF 2000). The Monterey shale is considered highly impervious, with groundwater occurring in localized sand units. The water is highly saline and does not have a hydraulic connection to freshwater recharge. Small, localized perched water tables may occur on top of the silty clay units; however, an aquifer system has not been defined (USAF 2000, EDR 2006).

3.3.2 Surface Water

The project area lies within the Santa Monica Bay Watershed (USGS hydrologic unit catalog 18070104), which drains into the Pacific Ocean. At its closest point to the ocean, Fort MacArthur lies about 50 feet west of a small bay at the south end of the Los Angeles Harbor (part of the ocean). Pacific Heights I and II are located about 1,100 feet from the Pacific Ocean, with White Point Park, a street, and a beach lying between the housing area and the ocean. Pacific Crest is located about 2,700 feet to the northeast of the ocean, with Pacific Heights II, White Point Park, a street, and a beach lying between Pacific Crest and the ocean. There are no lakes, rivers, or streams that flow within, through, or near any property operated or controlled by LA AFB (USAF 2005c USGS 2006b). In addition, no ephemeral ponds or natural drainages exist on LA AFB property. Storm water runoff flows across impermeable areas to a series of inlets and pipes that discharge to the Los Angeles Harbor from Fort MacArthur and the Pacific Ocean from Pacific Crest and Pacific Heights I and II (USAF 2005c, USAF 2001).

Although LA AFB is not required to obtain a National Pollutant Discharge Elimination System (NPDES) permit for storm water discharges associated with industrial activities, the base has a Storm Water Pollution Prevention Management Plan in place (USAF 2005c).

A separate NPDES permit is required for each construction project on the base, in accordance with the requirements of Section 402 of the *Clean Water Act* (projects impacting one or more acres where storm water runoff would potentially impact waters of the U.S.). Waters of the U.S. include all waters used, previously used, or that could be used for interstate or foreign commerce,

including all waters subject to the ebb and flow of the tide; interstate waters, including interstate wetlands; waters whose destruction or degradation could affect interstate or foreign commerce; all impoundments or tributaries of these waters; the territorial sea; and wetlands adjacent to any of these waters. Waters of the U.S. include lakes, rivers, perennial and intermittent streams, mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, and natural ponds (40 CFR 122.2, 33 CFR 328). The tidal area of the Pacific Ocean is among the waters of the U.S. The NPDES permit would require stabilization or structural measures to limit discharge of sediment and erosion to preconstruction levels.

An area of severe erosion and unstable soils occurs along a bluff at the eastern side of Fort MacArthur. This area could potentially erode or collapse, causing damage to a road and sidewalk below and increased siltation to an area of the Los Angeles Harbor to the east.

3.3.3 Floodplains

Fort MacArthur, Pacific Crest, and Pacific Heights I and II are outside of the Federally delineated 100-year floodplain (USAF 2005c).

3.3.4 Wetlands

Wetlands are defined as those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions (33 CFR 328). Wetlands are diverse ecosystems that provide ecological benefits by supporting commercial fisheries, controlling floods, filtering wastes from water, and serving as recreation areas. They also provide habitat for many plant and animal species, including economically valuable waterfowl and one-third of the nation's endangered species.

There are no wetlands on Fort MacArthur, Pacific Crest, or Pacific Heights I and II.

3.3.5 Coastal Zone

The coastal zone, as delineated by the State of California, extends seaward three miles from the shore, including all offshore islands, and extends inland approximately 1,000 yards (3,000 feet) from the mean high tide line. The Pacific Heights housing area and Fort MacArthur lie within the coastal zone. At the Pacific Crest housing area, the area south of Perigee Circle (the majority of the housing area) is within the coastal zone.

Although Federal lands are excluded from the coastal zone, the California Coastal Commission must review activities that affect the coastal zone for consistency with the *Coastal Zone Management Act*. The Coastal Protection Program is applied through the Coastal Development Permit (CDP) process, which regulates new development in the coastal zone. Any facilities proposed within the coastal zone are required to obtain a CDP prior to construction. In accordance with the *California Coastal Act*, repair and maintenance of existing facilities may not require a permit; the Coastal Commission would make a determination of any potential environmental impacts and require a permit if needed.

Under the *California Coastal Act*, development in coastal areas must assure stability and structural integrity, and neither create nor contribute significantly to erosion, geologic instability, or destruction of the site or surrounding area or in any way require the construction of protective devices that would substantially alter natural landforms along bluffs and cliffs.

3.4 Biological Resources

Biological resources consist of an area's vegetation and wildlife, and the habitats (including wetlands) in which they occur. This section provides discussions of vegetation, wildlife, and threatened, endangered, and sensitive species at the LA AFB housing areas, as inventoried for the base's *Integrated Natural Resource Management Plan* (USAF 2001).

3.4.1 Vegetation

Fort MacArthur Middle Reservation and the Pacific Crest and Pacific Heights housing areas of LA AFB are highly urbanized and landscaped. One plant community, disturbed coastal scrub, was identified at the Pacific Heights housing area during a 1999 survey but was removed during housing construction. Most landscaping on LA AFB lands is not native to California. In response to the lack of natural vegetation, the U.S. Army planted many palm trees within the 500 Vargas Square area at Fort MacArthur Middle Reservation before the property was acquired by the Air Force. Other evergreen, nonnative trees were planted and several large trees remain from the 19th century. Vegetation within the housing areas consists of manicured lawns, residential landscaping plants, ornamental shrubs, and both young and mature trees.

No sensitive plant communities have been identified within the housing areas. However, at Fort MacArthur, Southern Coastal Bluff Scrub lies along the southern slope immediately adjacent to the fence line, outside of the LA AFB boundary. Southern Coastal Bluff Scrub occurs on cliffs and bluffs immediately near the coast, on rocky and very shallow poorly developed soils. It is exposed to nearly constant winds and salt spray as well as to coastal fog drip. Shrubs and low-growing plants characterize vegetation, some forming mats and others with succulent leaves. Species found in this community are encelia (*Encelia californica*), lemonadeberry (*Rhus integrifolia*), dudleyas (*Dudleya* spp.), goldenbush (*Isocoma menziesii*), box thorn (*Lycium californicum*), big saltbush (*Atriplex lentiformis*), and prickly pears (*Opuntia* spp.). Southern Coastal Bluff Scrub is threatened by development and disturbance associated with exotics and invasive exotics.

Three Federal plant species of concern (aphanisma, south coast saltscale, and bright green dudleya) that have been located on the Palos Verde Peninsula do not have any habitat on the LA AFB housing parcels.

3.4.2 Wildlife

Within the housing areas of LA AFB, landscaping provides the only habitat for wildlife species, which are expected to consist of species tolerant of highly disturbed urban conditions such as the

American crow, rock dove (pigeon), white crowned sparrow, and California ground squirrel (USAF 2001).

Bat species and monarch butterflies may use buildings in urban areas for roosting, but this is not likely to be the case in the LA AFB housing areas due to the absence of nearby water sources (USAF 2001).

3.4.3 Endangered, Threatened, and Sensitive Species

LA AFB’s *Integrated Natural Resources Management Plan* (USAF 2001) lists the sensitive species in Table 5 as occurring or potentially occurring near the base.

Table 5. Sensitive Species

Species	Status
<i>Terrestrial Invertebrates</i>	
Monarch butterfly (<i>Danaus plexippus</i>)	Species of local concern
Palos Verdes blue butterfly (<i>Glaucopsyche lygdamus palosverdesensis</i>)	Federally listed as endangered
<i>Reptiles</i>	
San Diego horned lizard (<i>Phrynosoma coronatum blainvillei</i>)	Federal species of concern State species of concern
<i>Birds</i>	
Burrowing owl (<i>Athene cunicularia</i>)	Federal species of concern State species of concern
Coastal cactus wren (<i>Campylorhynchus brunneicapillus couesi</i>)	State species of concern
Loggerhead shrike (<i>Lanius ludovicianus</i>)	Federal species of concern State species of concern
Coastal California gnatcatcher (<i>Polioptila californica californica</i>)	Federally listed as threatened State species of concern
<i>Mammals</i>	
Pale Townsend’s big-eared bat (<i>Corynorhinus townsendii pallescens</i>)	Federal species of concern
Townsend’s western big-eared bat (<i>Corynorhinus townsendii townsendii</i>)	Federal species of concern
Western mastiff bat (<i>Eumops perotis</i>)	Federal species of concern
Small-footed myotis bat (<i>Myotis ciliolabrum</i>)	Federal species of concern
Long-eared myotis bat (<i>Myotis evotis</i>)	Federal species of concern
Occult little brown bat (<i>Myotis occultus</i>)	Federal species of concern
Long-legged myotis bat (<i>Myotis volans</i>)	Federal species of concern
Yuma myotis bat (<i>Myotis yumanensis</i>)	Federal species of concern
San Diego desert woodrat (<i>Neotoma lepida intermedia</i>)	State species of concern
Pacific pocket mouse (<i>Perognathus longimembris pacificus</i>)	Federally listed as endangered State species of concern

With the exception of the loggerhead shrike, these species are not likely to occur on LA AFB lands (USAF 2001). The loggerhead shrike is a Federal species of concern and California species of special concern. The main habitat requirement for this bird species is scattered shrubs, trees, posts, or other suitable perches with open land below. Its diet consists primarily of insects but it will also eat small birds, mammals, amphibians, reptiles, fish, carrion, and other invertebrates. Breeding occurs in March to May. Although this species was not observed during a 1999 survey, the loggerhead shrike may occur at LA AFB (USAF 2001).

3.5 Human Health and Safety

A safe environment is one in which there is little or no potential for death, severe injury or illness, or property damage. The housing parcels are residential areas, and thus the primary public safety concern is that from traffic incidents in residential areas. Presently, LA AFB personnel mitigate these risks through strict surveillance of posted speed limits.

Other potential safety risks in the housing developments are those due to hazardous materials used in residential areas. Pesticides are applied to landscaped areas within the subject parcels. Additionally, asbestos and lead-based paint materials may be present in the historical structures at Fort MacArthur. Naturally occurring radon may be present in some housing units, given their location in USEPA's Zone 2 (see discussion in Section 3.6.2). Children are more sensitive to some environmental effects than adults, including those resulting from exposure to the hazards identified above.

3.6 Solid Waste and Hazardous Materials

3.6.1 Solid Waste

Solid wastes include all waste materials that are neither hazardous nor toxic, and which are normally disposed of by landfilling or incineration, or are recycled or recovered. In accordance with Air Force Instruction (AFI) 32-7042, *Solid and Hazardous Waste Compliance* and AFI 32-7080, *Pollution Prevention Program*, LA AFB strives to recycle as much of their solid waste stream as possible. The management of solid (non-hazardous) waste on LA AFB includes the collection and disposal of solid wastes and recyclable material by contract. There are no active landfills on LA AFB.

3.6.2 Hazardous Materials and Wastes and Petroleum

Hazardous materials are substances that, because of their quantity, concentration, or physical, chemical, or infectious characteristics, may present a substantial danger to public health or the environment if released. When improperly stored, transported, or otherwise managed, hazardous materials can significantly affect human health and safety, and the environment. These materials are defined within various laws to have specific meanings. For this EA, substances identified as hazardous by the *Comprehensive Environmental Response, Compensation, and Liability Act* (CERCLA), as well as petroleum products, are considered hazardous materials.

The use or a release of a hazardous material usually results in the generation of a hazardous waste. Examples of hazardous wastes generated include contaminated fuels and spent or off-specification solvents, paints, and thinners. Hazardous wastes, as defined for this document, include those substances identified by the *Resource Conservation and Recovery Act (RCRA)*. Special wastes include wastes that require special handling (e.g., used oil, dewatered sludge), and are also tracked and managed by LA AFB. Hazardous waste management consists of the collection, storage, and transportation of hazardous wastes (as defined by RCRA). Hazardous wastes are processed for disposal through a private hazardous waste disposal contractor and ultimately disposed at a treatment, storage, and disposal facility.

Hazardous wastes and toxic materials in the parcels proposed for privatization are restricted largely to household building materials and typical household chemicals. The use and storage of hazardous materials and wastes including petroleum and oils are not considered a concern for the MHPI parcels at LA AFB. As would be expected in any residential area, petroleum staining in areas where vehicles are parked was observed during the EBS. These stains were not significant and were not the result of large quantity releases of petroleum products.

Installation Restoration Program: DoD's Defense Environmental Restoration Program (AFI 32-7020) requires installations to identify, confirm, quantify, and remediate suspected problems associated with past hazardous material disposal sites. CERCLA, as amended by the *Superfund Amendments and Reauthorization Act (42 U.S.C. 9601, et seq.)*, provides Federal agencies with the authority to inventory, investigate, and clean up uncontrolled or abandoned hazardous waste sites. Areas that may be contaminated by hazardous materials or wastes through spills or leaks caused by DoD activities are being investigated and cleaned up through the Installation Restoration Program (IRP). The IRP is the Air Force's CERCLA-based environmental restoration program.

Ten IRP sites have been identified on Fort MacArthur (see Table 6). Seven of the sites were either storm water drains or vehicle washracks and were found to have little potential for environmental contamination. An underground storage tank (UST) site, a battery acid neutralization pit, and a pesticide wastewater soakage pit were also identified (USAF 1994, USAF 2000). Each of the sites is closed and categorized as "no further action required" with concurrence from the California Environmental Protection Agency (Cal/EPA) Department of Toxic Substance Control (DTSC) and the Los Angeles Regional Water Quality Control Board (USAF 1997a, USAF 1998). As the metes and bounds survey has not yet been completed, it cannot be conclusively stated whether these IRP sites are within or outside of the boundaries of Parcel A (Fort MacArthur). However, based on available maps and the current description of the areas proposed for transfer, IRP sites ST02, WP14, SD-5, SD-6, and SD-7 appear to be outside the boundaries of Parcel A, and sites SD-1 through 4 and DS-1 appear to be within the parcel boundary. At these latter five sites potentially within the parcel boundary, they were assessed as IRP sites, and no removal or remedial response was found to be required.

Table 6. Fort MacArthur IRP Locations

IRP Identifier	IRP Site Description
ST02	10,000-gal UST site, east of residence building numbers 102 through 105.
WP14	Pesticide wastewater soakage pit, northeast of building 400 (swimming pool).
DS-1	Battery acid neutralization pit, near residence building 01642.
SD-1	Storm water drain, near residence building 01674.
SD-2	Vehicle washrack, near residence building 01642.
SD-3	Storm water drain, near residence building 01672.
SD-4	Vehicle washrack, near residence building 01688.
SD-5	Storm water drain, northeast of building 400 (swimming pool).
SD-6	Storm water drain, at building 400 (swimming pool).
SD-7	Storm water drain, at building 410.

Source: USAF 1994

One IRP site was identified on the Pacific Heights I site as a disposal area; buried drums and petroleum-contaminated soil were found when construction excavation was initiated for the housing area. Soils from the area were excavated and disposed off-site; the area was given a No Further Action recommendation in 1997 with concurrence from the Cal/EPA DTSC (USAF 1997b, USAF 2000). A UST site and a septic tank drain field site were also located in the Pacific Heights I area (see Table 7). Equipment at both areas was removed in 1987. No IRP sites were identified on the Pacific Heights II or Pacific Crest sites.

Table 7. Pacific Heights I IRP Locations

IRP Identifier	IRP Site Description
LF04	Disposal area, at Pacific Heights I.
UG-1	1,000-gal UST site, in northeast Pacific Heights I area.
STD-2	Septic tank drain field, in northeast Pacific Heights I area.

Source: USAF 1994

Historically, Pacific Heights occupied a portion of an area known as Whites Point. In the 1940s, several artillery emplacements and support facilities were constructed for purposes of harbor defense. After World War II, the artillery emplacements were dismantled, and Whites Point became a NIKE missile battery. The site housed NIKE-AJAX missiles in the 1950s and NIKE-Hercules missiles in the 1960s. The NIKE Air Defense Program was disbanded in the early 1970s, and the Whites Point site was declared excess (USAF 1994). IRP sites were identified in the Whites Point area south of the Pacific Heights I and II parcels; none are included in the MHPI properties.

All IRP sites have been closed to date (Szekely 2006).

Underground Storage Tanks and Aboveground Storage Tanks: There was no evidence of USTs or aboveground storage tanks observed on any of the MHPI parcels during the site reconnaissance for the EBS, and no evidence of any USTs identified on the parcels during the EBS records review. Several USTs were historically located on areas of Fort MacArthur that are not being transferred as part of this MHPI initiative. During interviews, LA AFB personnel indicated that no USTs are currently present at Fort MacArthur.

The records review did identify USTs at fifteen locations near the parcels. Thirteen leaking UST (LUST) sites were identified within one mile of the parcels (12 near Fort MacArthur and 1 near Pacific Heights/Crest), seven of which have a status of closed (EDR 2006). The LUSTs with non-closed status are as follows:

- Good Automotive Service at 2010 Pacific Ave. (at 20th St.) near Fort MacArthur, gasoline leak reported in 2002, current status is listed as “remediation plan.”
- GSV San Pedro Business Center at 2100 Gaffey St. (at Westmont Dr.; this is almost 3 miles north of Fort MacArthur), detection of total petroleum hydrocarbons as gasoline reported in 2001 as a result of an overfill, current status is listed as “leak being confirmed.”
- CIREG at 1503 Center St. S. (at 15th St.) near Fort MacArthur, diesel leak detected and stopped in 2003, current status is listed as “remedial action (cleanup) underway.”
- Gaffey and Fifteenth Associates at 1500-1510 Gaffey St. S. (at 15th St.) near Fort MacArthur, gasoline leak discovered in 2002, current status is listed as “leak being confirmed.”
- Cabrilla Marina, Berth 31 at 20 Whalers Walk near Fort MacArthur, gasoline leak discovered in 1994, current status is listed as “pollution characterization.”
- Mobil 18-MVM service station at 2490 Western Ave. S. (at 25th St.) near Pacific Crest/Heights, gasoline leak detected and stopped in 2001, current status is listed as “pollution characterization.”

Since potable water is supplied by local utility companies and no groundwater wells are located in the subject parcels, these sites do not pose an immediate drinking water health hazard.

Asbestos: Asbestos is a regulated substance because it is a carcinogen and a cause of asbestosis (a lung disease). Asbestos is a designated hazardous air pollutant under the National Emission Standards for Hazardous Air Pollutants under the CAA. The USEPA issues regulations to ensure compliance with the CAA. California regulates ACMs under the California Health and Safety Code Section 25915 et seq. There are no indications that any ACMs were ever stored or disposed on the parcels. ACMs may be found in wiring, adhesive and caulking, original roofing and felt, crawlspace liners, floor tiles, and pipe insulation. Asbestos sampling at Fort MacArthur housing in 2000-2003 identified ACMs in floor tiles, roof sealant tar materials, exterior stucco, mastic under floor tiles/carpet, backing behind linoleum, roofing asphalt, and linoleum (USAF 2005b). In addition, any time a building renovation is planned, an asbestos survey is conducted and the data are compiled in a Microsoft Access Database maintained by Base Environmental Engineering. The database provides percentages of asbestos found in the material of concern (USAF 2000).

The historical structures and many of the newer structures at Fort MacArthur have been remodeled since their original construction (1918 to early 1980s). Due to the age of the historical structures at Fort MacArthur, many may still contain original materials of construction, including asbestos. The newer housing units at Fort MacArthur, Pacific Crest, and Pacific Heights I and II were constructed after the point where most construction materials containing asbestos had been phased out. However, these units may potentially have ACM in the roofing material.

With respect to parcel utilities, some older piping at Fort MacArthur has the potential to contain asbestos. This piping may take the form of transite pipe or possibly asbestos-cement pipe. ACM material was not used in piping within the Pacific Crest or the Pacific Heights I and II areas (USAF 2004b).

Lead-Based Paint: Lead-based paint was used on interior and exterior surfaces in buildings constructed prior to 1978. The historical structures and many of the newer structures at Fort MacArthur had been remodeled since their original construction. Due to the age of the historical structures at Fort MacArthur, many may still contain original materials of construction, including lead-based paints. The newer housing units at Fort MacArthur, Pacific Crest, and Pacific Heights I and II were constructed after the point where most construction materials containing lead-based paint had been phased out.

Pesticides: Pesticides are a group of biological or chemical materials that includes herbicides, fungicides, insecticides, and rodenticides. Pesticides vary greatly in toxicity, and can pose a threat to human health and safety and the environment if improperly managed. Pesticides vary greatly in their persistence in the environment. Factors that influence the environmental fate of pesticides include soil type (coarse soil types allow more leaching), adsorption (clay and organic matter favor strong adsorption), solubility of the pesticide, and degradation rates (dependent on the pesticide, sunlight, temperature, soil pH, soil moisture, and microbial activity).

Pesticides are routinely applied throughout Fort MacArthur, Pacific Crest, and Pacific Heights I and II. Herbicides are applied to lawns and other vegetative areas, and insecticides and rodenticides are applied as required. There are no surface waters on any of the subject parcels that would necessitate larvicide application. LA AFB has a pest management program with a list of approved pesticides. Pesticide applications are conducted by an outside contractor who stores pesticides and conducts mixing activities off-site in their own facilities (Sohn 2006). Only those insecticides, herbicides, and fungicides found on the DoD standardized approval list are applied (USAF 2000). Recent projects include tenting and fumigation of housing units under renovation at Fort MacArthur with sulfuryl fluoride + chloropicrin for termite infestation, and as-needed treatments with herbicide of palm trees at Fort MacArthur for pink rot disease (Sohn 2006). It is possible that residents may have stored and used household quantities of non-restricted-use pesticides in housing units during their occupancy, as is typical of households throughout the U.S. (Sohn 2006). It is also possible that chlordane may have been used as a subterranean termiticide treatment in the housing areas at Fort MacArthur, as was commonly done consistent with residential use before its registration for this purpose was cancelled by the USEPA in 1988; however, there is no information available to indicate if this was the case (Sohn 2006).

Polychlorinated Biphenyls: Polychlorinated biphenyls (PCBs) are a synthetic molecular additive used in lubricating oils to enhance cooling characteristics and are typically found in electrical transformers, fluorescent light ballasts, and machinery gear case oils. PCBs were also used as a plasticizing agent. PCBs were used in the U.S. from 1929 to 1979 and are regulated by the *Toxic Substances Control Act* (15 U.S.C. Sec. 2601, et seq.) and, in the absence of a release, are not regulated by CERCLA. The provisions of CERCLA do apply if there is a release of PCBs. PCBs on LA AFB are contained in fluorescent light fixture ballasts. The majority of residential structures have some fluorescent lighting. Although many were constructed with or have been retrofitted with non-PCB-ballasts, there remains the potential that some lighting ballasts may contain PCB materials. Civil Engineering has instituted a program to slowly eliminate PCB ballasts by replacing the ballasts when repairs are needed (USAF 2000). As of January 2002, all transformers maintained by LA AFB are non-PCB transformers (USAF 2005c).

Radon: Radon is a naturally occurring odorless, colorless gas with radioactive qualities that may be harmful to human health. The USEPA action level for radon is 4 picocuries per liter (pCi/L). USEPA has mapped the U.S. for radon potential, assigning one of three categories to each county (greater than 4 pCi/L, between 2 and 4 pCi/L, or less than 2 pCi/L). Los Angeles County is assigned to USEPA's Zone 2, indicating a predicted indoor radon screening level between 2 and 4 pCi/L; Zone 2 is considered a moderate risk area. LA AFB's Housing Community Profile (USAF 2003) reported no radon detected in houses surveyed, but recommended monitoring due to location in USEPA's Zone 2.

3.7 Noise

Noise is sound that injures, annoys, interrupts, or interferes with normal activities or otherwise diminishes the quality of the environment. Noise can be described as intermittent or continuous, steady or impulsive, stationary or transient.

The parcels proposed for transfer under the MHPI lie within the boundaries of LA AFB. The subject parcels are presently occupied by residential structures. Industrial operations are minimized in the subject areas. As such, noise levels are consistent with residential areas. Noise in the area is primarily intermittent, impulsive, and transient, and is most closely associated with vehicle traffic noise.

Other occasional noise sources in the areas are typically temporary and associated with construction activities. These noises are commonly limited to the daytime hours.

3.8 Cultural Resources

Cultural resources are archaeological, historical, and Native American items, places, or events considered important to a culture, community, tradition, religion, or science. Archaeological and historic resources are locations where human activity measurably altered the earth or left deposits of physical or biological remains. Prehistoric examples include arrowheads, rock scatterings, and village remains, whereas historic resources generally include campsites, roads, fences, homesteads, trails, and battlegrounds. Architectural examples of historic resources include bridges, buildings, canals, and other structures of historic or aesthetic value. Native

American resources can include tribal burial grounds, habitations, religious ceremonial areas or instruments, or anything considered essential for the persistence of their traditional culture.

Cultural resources are protected under several Federal regulations, including the following: *Antiquities Act of 1906*; *Historic Sites, Buildings, Objects, and Antiquities Act of 1935*; *National Historic Preservation Act of 1966* (NHPA); NEPA; *Archeological and Historic Data Preservation Act of 1974*; *American Indian Religious Freedom Act of 1978*; *Archeological Resources Protection Act of 1979*; and the *Native American Graves Protection and Repatriation Act of 1990*. DoD Directive 4710.1: *Archaeological and Historic Resources Management Program*; DoD Instruction 4715.3: *Environmental Conservation Program*; several executive orders; Air Force Policy Directive 32-70, *Environmental Quality*; and AFI 32-7065, *Cultural Resource Management*, also govern the protection and management of cultural resources on LA AFB.

Section 110 of the NHPA requires that Federal agencies assess the significance of cultural resources and assume responsibility for their preservation. Such properties may include archaeological sites, buildings, structures, districts, landscapes, objects, and traditional cultural properties. Compliance with Section 110 involves compiling an inventory of cultural resources whose significance is measured by eligibility for listing in the National Register of Historic Places (NRHP), and managing those significant resources to preserve the integrity of the information they represent. All DoD installations are required to identify and evaluate all cultural resources under its control, including resources from the Cold War Era, to determine which meet the criteria for nomination to the NRHP (specified in 36 CFR 60) (USAF 2004c).

Pursuant to the NHPA, the California State Historic Preservation Office (SHPO), a state agency, and the Advisory Council on Historic Preservation (ACHP), a Federal agency, are responsible for reviewing any undertakings that may affect historic properties, those properties that are listed or have been determined eligible for listing, in the NRHP. Undertakings that occur on Federal land, are funded with Federal money, or require a Federal permit are subject to review by the SHPO and, if applicable, the ACHP.

The Fort MacArthur Middle Reservation and the Pacific Crest and Pacific Heights Housing Areas are located within the San Pedro district of the City of Los Angeles. These LA AFB military housing areas consist primarily of residential development. No intact archaeological sites remain on any of these three parcels.

Fort MacArthur

The 96-acre Fort MacArthur Middle Reservation was entirely surveyed for archaeological resources in 1979, and no archaeological sites were identified. A records search conducted by the South Central Coastal Information Center of the California Historical Resources Information System also identified no archaeological sites on the Middle Reservation. Development of this area began in 1823 and has continued through the present day. This development has likely disturbed or destroyed all surface manifestations of any resources that once existed here. However, several prehistoric archaeological sites have been recorded within 0.5 mile of the Middle Reservation. Therefore, subsurface deposits may exist within the reservation beneath the

existing structures, pavement, and landscaped areas. Fort MacArthur is considered an area of medium archeological sensitivity (a moderate potential for finding subsurface artifacts) (USAF 2004c).

The Fort MacArthur Middle Reservation contains one NRHP-listed historic district (500 Varas Square), and one NRHP-listed individual property (the American Trona Plant). The 500 Varas Square Historic District is composed of 35 early 20th century buildings and objects surrounding a historic parade ground and a quadrangle plaza (See Figure 5). Within 500 Varas Square is the site where the first structure in the local area was built in 1823, the 100 Varas Tract site. This site is a California Historical Landmark. Seventeen other historic age buildings and objects at the Fort MacArthur Middle Reservation were evaluated and determined to not meet the criteria necessary for listing in the NRHP (USAF 2004c). A study was also conducted to investigate the possible existence of underground bunkers and tunnels dating from World War I and World War II beneath the Middle Reservation. The study confirmed the presence of a mining casemate, storage magazine, and access tunnel in the bluff slopes east of the Middle Reservation (into the bluff that separated the Middle and Lower Reservations), and the location of a now-buried firing gun platform and observation platform along the eastern-central bluff top overlooking the former Lower Reservation. None of these facilities remain in their original condition. It is apparent that the mining casemate and associated features and the firing gun platform no longer possess sufficient integrity (of location, setting, materials, or feeling) to qualify either for independent nomination for listing in the NRHP or as contributing elements of the 500 Varas Square Historic District. No other underground tunnels, bunkers, or other features were confirmed through physical surveys or archival research, although speculative data suggests that underground facilities may exist below the American Trona Plant (USAF 2004c).

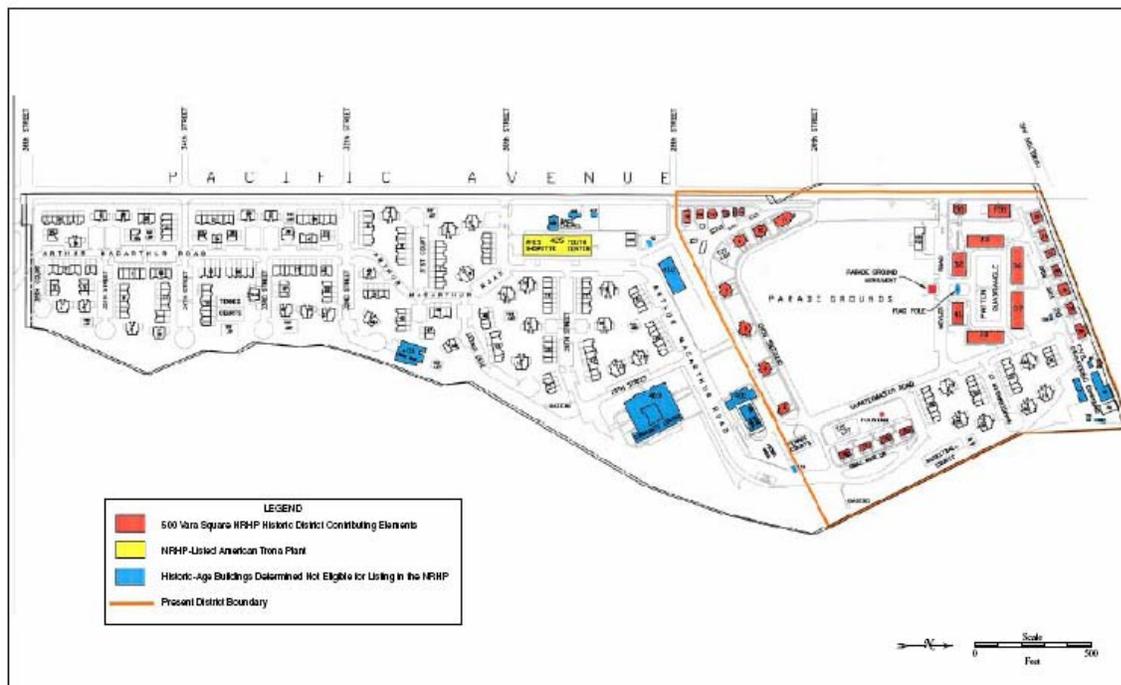


Figure 5. Historical Sites at Fort MacArthur

Given the number of NRHP-listed and eligible historic properties on LA AFB, especially at the Fort MacArthur Middle Reservation, and the frequent routine maintenance of these properties, a Programmatic Memorandum of Agreement (PMOA) is currently being developed with the SHPO, ACHP, and other stakeholders. The PMOA will outline standardized maintenance activities (such as painting, asbestos abatement, or mechanical upgrades) necessary to support the military mission of LA AFB, and will specify procedures to avoid or minimize possible impacts on historic properties. With such an agreement in place, LA AFB could avoid lengthy consultation and Section 106 compliance procedures for each maintenance activity that is specified in the PMOA.

Pacific Crest

Two prehistoric archaeological sites (CA-LAN-105 and CA-LAN-291) were partially located on LA AFB property where the Pacific Crest housing area now stands. The sites were recorded in 1939 and many items (shell, animal bone, mortar and pestle, stone tools, effigies and effigy fragments) were recovered from the sites between 1939 and 1989; artifacts were prepared for curation and are housed at the Fowler Museum at the University of California-Los Angeles (UCLA). Much of the area of both sites was destroyed by development. Any subsurface deposits associated with these sites that may remain underneath the housing area are likely to be minimal and severely disturbed. However, if any intact deposits associated with these site remain buried on LA AFB, they may be considered eligible for listing in the NRHP. Pacific Crest is considered an area of high archeological sensitivity (having a high potential for finding subsurface artifacts) (USAF 2004c).

There are no historic-age architectural resources located at the Pacific Crest housing area (USAF 2004c).

Pacific Heights

One archaeological site (CA-LAN-1144) is known to have existed within the Pacific Heights I housing area. Portions of site CA-LAN-1144 were located where the western portion of the Pacific Heights Housing Area now stands. This site was first recorded in 1984, and consisted of a lithic and shell scatter over an area of approximately 15,000 square meters. A large amount of artifacts were recovered from the site, including stone tools, shell, and animal bone, and are now housed at the Fowler Museum at UCLA. Any subsurface deposits associated with this site that may remain underneath the housing area are likely to be minimal and severely disturbed. However, if any intact deposits associated with this site remain buried on LA AFB, they may be considered eligible for listing in the NRHP (USAF 2004c). Pacific Heights I is considered an area of high archeological sensitivity (having a high potential for finding subsurface artifacts) (USAF 2004c).

The Pacific Heights II housing development contains four historic structures that were recently determined to be eligible for listing in the NRHP as contributing elements to a potential Whites Point Coastal Defense Historic District, if it is created in the future (USAF 2004c). These include two 1920 Base End Stations, one World War II Alternate Battery Commander's Stations, and a

World War II subterranean Plotting, Survey, and Radio Room. The Air Force's commitments for managing these sites are recorded in a Memorandum of Agreement with the SHPO (USAF 1997c), the Finding of No Significant Impact (FONSI) for an EA for construction of the Pacific Heights II housing (USAF 1997d), and in letters from SMC/CV to Los Angeles City Councilman Rudy Svorinich, the San Pedro Bay Historical Society, and the Fort MacArthur Museum Association (USAF 1997e, USAF 1997f, USAF 1997g). Commitments for ongoing management (other than those completed or related to original construction of Pacific Heights II housing) include the following:

- The Air Force shall design and install in a prominent public space in the housing area an interpretive marker describing the history of the batteries and their relationship to the base end stations. (This marker is in place.)
- The structure will be secured to prevent vandalism but the Museum Association and San Pedro Bay Historical Society will be provided with prearranged access to the site for purpose of conducting group tours, etc., in furtherance of their historical mission.

3.9 Land Use

Land use consists of natural conditions or human-modified activities occurring at a particular location. Land use categories include residential, commercial, industrial, transportation, communications and utilities, agricultural, institutional, recreational, and undeveloped areas. Management plans and zoning regulations determine the type and extent of land use allowable in specific areas and are often intended to protect specially designated or environmentally sensitive areas.

Fort MacArthur consists of approximately 93 acres of military family housing, with a medical clinic, recreational areas, a civil engineering annex, an administrative center, a parade ground, and an industrial area making up the remainder of land use at the installation. There are currently 377 single family, duplex, and multi-family housing units at Fort MacArthur. Twenty of these units are historic, constructed between 1918 and 1934. The remainder of the units were constructed from 1982 to 1985.

Pacific Heights I (12 acres), Pacific Heights II (28 acres), and Pacific Crest (22 acres) are predominately military family housing, with small areas of recreational use (USAF 2005c). There are currently 79 single family homes constructed in 1988 at Pacific Heights I. At Pacific Heights II, there are 71 single family homes constructed from 1998 to 2000. Pacific Crest has 91 single family homes constructed in 1988.

Fort MacArthur, Pacific Heights I, Pacific Heights II, and Pacific Crest are all located in the San Pedro District of Los Angeles, an area of residential and commercial land use. The Los Angeles Harbor is located east of Fort MacArthur. To the immediate east of the Fort, a hotel and marina and Cabrillo Beach Park and Fishing Pier are located in a historic part of the harbor.

Due to the historic and largely residential nature of Fort MacArthur, the installation's land use is planned to remain as it is (USAF 2005c). The Pacific Heights I and II and Pacific Crest areas are also planned to remain the same.

3.10 Traffic and Transportation

Traffic and transportation issues refer to the movement of vehicles and humans throughout a road or highway network. None of the parcels proposed for privatization under the MHPI is directly served by major interstate or U.S. highways. The parcels are currently accessed by paved roads within and adjacent to LA AFB property.

Traffic in all areas is dominated by personal vehicles. Construction and heavy equipment traffic are limited in the housing areas, typically occurring during specialized project activities.

Traffic in and around the housing areas is typically highest during daylight hours and is maximized during morning and afternoon rush hours. Traffic does occur at other times, but is qualified as "light" during off-hours.

3.11 Socioeconomics and Environmental Justice

3.11.1 Population

Los Angeles County had an estimated total population in 2004 of 9,761,037, a 2.5% increase from the population in the year 2000 (USBC 2006). Over the 50-year period following the 2000 national census, county population is estimated to increase by 9.1, 4.1, 3.2, 1.3, and 0.4% each respective decade (CalDOF 2006).

The 2004 American Community Survey (USBC 2006) reported demographic characteristics for Los Angeles County, the State of California, and the U.S., as summarized in Table 8. Also presented are demographic data on the immediate San Pedro area from the 2000 national census, provided by the Los Angeles Department of City Planning (LADCP 2005).

In 2004, there were 3,194,434 households in Los Angeles County. The average household size was 3.1 people, compared to an average of 2.9 people in California and the nationwide average of 2.4 people. Families (both married-couple families and other families) made up 68% of the households in Los Angeles County, the same percentage as in the state and compared 67% nationwide (USBC 2006).

3.11.2 Employment and Income

The unemployment rate in Los Angeles County was estimated at 7.7% for 2004; the state and national unemployment rates were 7.6% and 7.2%, respectively (USBC 2006). In 2004, for the employed population 16 years and older, the leading industries in Los Angeles County were educational, health, and social services (18%) and manufacturing (13%) (USBC 2006). The median income of households in Los Angeles County was \$45,958, compared to state and national medians of \$51,185 and \$44,684, respectively (USBC 2006).

Table 8. Demographic Characteristics of Area, County, State, and Nation

	San Pedro Community Plan Area	Los Angeles County	State of California	U.S.
Total population	76,028	9,761,037	35,055,227	285,691,501
Age (years)				
<5	5,732 (7.5%)	751,246 (7.7%)	2,639,402 (7.5%)	20,008,152 (7.0%)
5 to 14	11,329 (14.9%)	1,542,612 (15.8%)	5,378,712 (15.3%)	40,743,721 (14.3%)
15 to 19	4,790 (6.3%)	678,208 (6.9%)	2,436,852 (7.0%)	19,077,645 (6.7%)
20 to 64	45,369 (59.7%)	5,846,913 (59.9%)	20,945,142 (59.7%)	171,656,682 (60.1%)
>64	8,808 (11.6%)	942,058 (9.7%)	3,655,119 (10.4%)	34,205,301 (12.0%)
Median age (years)		33.4	34.2	36.2
One race		9,516,704 (97.5%)	33,992,365 (97.0%)	280,285,784 (98.1%)
White	33,957 (44.7%)	5,388,591 (55.2%)	22,098,468 (63.0%)	216,036,244 (75.6%)
Black or African American	4,529 (6.0%)	876,304 (9.0%)	2,158,436 (6.2%)	34,772,381 (12.2%)
Native American and Alaska Native	306 (0.4%)	44,925 (0.5%)	262,015 (0.7%)	2,151,322 (0.8%)
Asian	3,483 (4.6%)	1,257,148 (12.9%)	4,256,198 (1.2%)	12,097,281 (4.2%)
Native Hawaiian and other Pacific Islander	261 (0.3%)	33,027 (0.3%)	122,251 (0.3%)	403,832 (0.1%)
Other	134 (0.2%)	1,916,709 (19.6%)	5,094,997 (14.5%)	14,824,724 (5.2%)
Two or more races	2,215 (2.9%)	244,333 (2.5%)	1,062,862 (3.0%)	5,405,717 (1.9%)
Hispanic or Latino	31,145 (50.0%)	4,584,498 (47.0%)	12,246,122 (34.9%)	40,459,196 (14.2%)

3.11.3 Housing

Of the 3,319,806 housing units in Los Angeles County in 2004, about 3.8% was vacant; the corresponding vacancy rate for the State of California was 6.5% (USBC 2006). Approximately 50% of occupied housing units in Los Angeles County are owner-occupied, and the homeowner vacancy rate stood at 0.7% in 2004. The rental vacancy rate was 2.9%, which was lower than the rate for the State (4.8%) (USBC 2006). The median monthly rent in the county was \$873, with 43% of renters paying 35% or more of their income for rent (USBC 2006).

3.11.4 Public Schools

The four housing developments associated with LA AFB are located in Los Angeles Unified School District. The district schools serving the housing developments' locations are White Point Elementary School, Point Fermin Elementary School, Dana Middle School, and San Pedro Senior High School. A new charter school, the Port of Los Angeles High School, opened in Fall 2005, and accepts applications from all state students. The District had 693 K-12 schools in 2004 (NCES 2006). Total district-wide student enrollment in the 2003-2004 school year was 747,009. There are 35,492.7 full-time equivalent (FTE) teachers in the district and an overall student-teacher ratio of 21.0 (NCES 2006). Details for the four schools in Local District 8 serving the LA AFB housing developments' locations are summarized below (NCES 2006):

- White Point Elementary School has 26.5 FTE teachers and 492 students in kindergarten through sixth grade.

- Point Fermin Elementary School has 18.0 FTE teachers and 339 students in kindergarten through sixth grade.
- Dana Middle School has 79.4 FTE teachers and 2,011 students in sixth through eighth grade.
- San Pedro Senior High School has 137.7 FTE teachers and 3,435 students in ninth through twelfth grade.

Planning for the Port of Los Angeles High School calls for serving approximately 250 ninth grade students in 2005-2006, 500 ninth and tenth grade students in 2006-2007, 750 ninth through eleventh grade students in 2007-2008, and 1,000 students in grades nine through twelve in the following years

The schools are all located in San Pedro, with distances from the base housing areas as follows: White Point Elementary is approximately 0.25 miles southeast of Pacific Heights II, Point Fermin Elementary is approximately 0.1 mile west of Fort MacArthur, Dana Middle is approximately 0.7 mile northwest of Fort MacArthur, and San Pedro is approximately 1 mile northwest of Fort MacArthur. The Port of Los Angeles High School is about 1.2 miles north-northwest of Fort MacArthur.

SECTION 4. ENVIRONMENTAL CONSEQUENCES

4.1 Air Quality

The analysis was based on a review of existing air quality in the region, information on LA AFB and area air emission sources, projections of emissions from the proposed activities, and a review of the Federal and California regulations for air quality.

Proposed Action

Demolition of 45 existing units and renovation of 220 housing units would generate emissions of criteria pollutants from demolition, grading operations, equipment, trucks driving on paved and unpaved roads, and worker vehicles. Up to 58 acres would be disturbed with demolition and renovation of housing (estimated 12 acres at Pacific Heights I, 22 acres at Pacific Crest, and up to 24 acres at Fort MacArthur). Fugitive dust emissions (including PM_{2.5} and PM₁₀) would be generated from demolition, grading operations, and truck trips on paved and unpaved roads. Best management practices would need to be implemented in accordance with SCAQMD Rule 403 to reduce fugitive dust to the point where it is not visible off of the property and the opacity is less than 20%. As described in Section 3.1.3, these practices would include measures to stabilize soil surfaces and demolition debris to reduce dust (such as watering), and measures to prevent vehicles from tracking dust-generating material offsite on unpaved or paved roads (watering, chemical stabilizers, limiting vehicle speeds, washing vehicle wheels, street cleaning, or gravelling entry and exit paths).

Estimated emissions from construction were screened for potential local significance using the Local Significance Thresholds developed by the SCAQMD (SCAQMD 2003). This model is typically used for project sites less than 5 acres. The proposed action would take place over a period of time, and it is assumed that several housing units would be demolished at a time, rather than all at once. The three sites of the proposed action are geographically separated and local impacts would not substantially overlap. Using a project size of 5 acres and assuming a receptor distance of 25 meters, the significance thresholds and estimated emissions are shown in Table 9. Emissions would not be locally significant.

Table 9. Estimated Emissions Compared to Local Significance Thresholds

	Emissions (pounds per day)		
	PM ₁₀	NO _x	CO
LST ^a	14.0	310.0	789.0
Proposed action	5.2	23.0	15.1

^a Local significance thresholds (SCAQMD 2003). Thresholds are calculated using the southwestern coastal Los Angeles County source reception area with a receptor distance of 25 meters and a project size of 5 acres.

Emissions from stationary sources would slightly decrease with the proposed action. As 45 housing units are demolished, the number of existing residential furnaces would be reduced. Newly renovated units would operate with newer, more efficient furnaces. No new permitted stationary sources would be added. Fort MacArthur would remain below CAA Title V permit

thresholds, as actual emissions and the potential to emit would remain far below thresholds for each of these requirements under the proposed action. There would be no CAA Title V permit requirements at the other housing areas as a result of the proposed action. Long-term emissions from stationary sources would be reduced and would not be significant. Local significance thresholds were not applied to operations emissions because emissions are projected to decrease slightly from the proposed action.

Emissions would be regionally significant if they exceeded 10% of the inventory for any affected pollutant. The affected pollutants are PM_{2.5}, PM₁₀, NO_x, VOCs, and CO. The emission inventory (SIP budget) for each pollutant is shown in Table 10, along with estimated emissions from the proposed action; see detailed calculations in Appendix B. Emissions from the proposed action would comprise less than 1% of the annual average SIP budget and are not regionally significant.

Table 10. Estimated Emissions Compared to South Coast Air Basin Emission Inventory

	Emissions (tons per day)					
	PM _{2.5}	PM ₁₀	SO _x	NO _x	VOCs	CO
<i>Construction and demolition</i>						
Emission inventory	9.11 (9.90) ^a	43.66 (47.44)				
Proposed action	0.0001	0.0010				
<i>Trucks on paved roads</i>						
Emission inventory	22.75 (22.32)	134.95 (138.31)				
Proposed action	0.00003	0.00013				
<i>Trucks on unpaved roads</i>						
Emission inventory	1.85	8.70				
Proposed action	0.0001	0.0006				
<i>Construction equipment</i>						
Emission inventory	10.33 (9.09)	11.61 (10.26)	0.37 (0.38)	162.06 (130.95)	80.85 (72.08)	851.20 (792.22)
Proposed action	0.00034	0.00001	0.00161	0.00769	0.00053	0.00266
<i>Mobile on-road</i>						
Emission inventory	13.55 (13.89)	19.90 (20.76)	4.92 (2.16)	562.87 (434.48)	266.14 (212.34)	2602.36 (2048.06)
Proposed action	0.00000	0.00000	0.00002	0.00018	0.00015	0.00250

^a Values in parentheses indicate the 2010 emission inventory value; all others are for 2006.

^b “Construction” in this usage refers to renovation activities.

Conformity thresholds, as defined in 40 CFR 51, Subpart W, are used to determine conformity with a SIP. The threshold for each pollutant is shown in Table 11, along with estimated emissions from the proposed action. Estimated emissions from the proposed action are less than the thresholds and would conform to the SIP, and are not significant. The proposed action is not regionally significant and the total direct and indirect emissions would be below the de minimis thresholds for each pollutant. Therefore, this project is exempt from further conformity analysis pursuant to 40 CFR 93.153.

Table 11. Estimated Emissions Compared to South Coast Air Basin Conformity Thresholds

	Emissions (tons per year)					
	PM _{2.5}	PM ₁₀	SO _x	NO _x	VOCs	CO
Conformity threshold ¹	70.00 ²	70.00	NA ³	25.00	25.00	100.00
Proposed action	0.22	0.65	0.60	2.87	0.25	1.88

¹ Emission thresholds per 40 CFR 51 Subpart W for severe nonattainment for ozone (thresholds for VOC and NO_x), serious nonattainment for CO, serious nonattainment for PM₁₀, and maintenance for NO₂.

² The interim threshold value for PM_{2.5} is the same as for PM₁₀ (USEPA 2006b).

³ Not applicable – SCAQMD is in attainment for SO₂.

Construction equipment would generate small amounts of HAPs (about 0.06 tons per year). These emissions would not be significant. Long-term emissions of HAPs would not increase as a result of the proposed action. HAPs from stationary sources would not increase and LA AFB would remain a minor source for HAPs. Impacts to air quality would not be significant.

Estimated emissions would not result in an exceedance of the NAAQS or CAAQS due to the small amount of criteria pollutants (see Table 11) and HAPs generated, and the timeframe in which the emissions would be generated (estimated to be 2 years).

No Action Alternative

Emissions of criteria pollutants and HAPs would slightly increase (less than the proposed action) under the no action alternative, since some renovation would occur under the no action alternative, but likely at a slower rate. Impacts to air quality from the no action alternative would not be significant.

4.2 Soils, Geology, and Topography

Proposed Action

The proposed action would disturb up to 24 acres at Fort MacArthur, 12 acres at Pacific Heights I, and 22 acres at Pacific Crest during demolition and renovation of housing areas. Any soil disturbance would be minor and temporary, as no new construction is planned. The proposed action would require a fugitive dust permit from SCAQMD and, depending on the extent of disturbance, could require a NPDES permit. These permits are discussed in more detail in Section 4.1 and 4.3, respectively, but requirements under these permits would control erosion through mandatory best management practices. All of the affected areas are also subject to the requirements of the *Coastal Zone Management Act*. The demolition and renovation activities would take place in areas with slight to steep slopes, with a moderate to severe risk of erosion. During the site inspections for the EBS, the investigators observed an area of severe erosion at Fort MacArthur, immediately adjacent to the eastern perimeter of the housing area and including the fenceline. In accordance with the requirements of the *Coastal Zone Management Act* and the *California Coastal Act*, the Project Owner will need to ensure that demolition, renovation, and housing area management activities do not exacerbate the erosion in this area. During demolition and renovation activities, access to eroded areas by heavy equipment and people needs to be restricted. Areas currently eroded and subject to erosion need to be stabilized with retaining

walls, slope repair, revegetation, or other appropriate engineering strategies in accordance with the *California Coastal Act* and the California Coastal Commission requirements. With appropriate erosion control measures, impacts would not be significant.

The fugitive dust permit (SCAQMD Rule 403) will include mandatory controls to stabilize soil to prevent generation of fugitive dust during demolition and renovation activities. If needed, the NPDES permit would require stabilization or structural measures to limit discharge of sediment and erosion to pre-project levels (see Section 4.3). Storm water runoff could be controlled by sediment barriers such as silt fences or straw bales, or structural controls such as a temporary sediment basin. Best management practices would be implemented in accordance with permit requirements. Due to limited disturbance and required control measures, impacts to geological resources would not be significant. In accordance with permit requirements and best management practices, topsoil would be restored and vegetation would be reestablished to reduce the potential for erosion. Existing areas of erosion at Fort MacArthur would need to be stabilized to prevent severe erosion. Long-term soil productivity would not be significantly impacted. Further permit requirements and potential impacts to hydrogeology and groundwater are discussed in Section 4.3.

As discussed in Section 3.2, there are two major faults in the project area. The risk of potential earthquake damage is severe, with the expected magnitudes of any seismic events in the range of 6.0 to 6.9 on the Richter Scale (VIII on the Modified Mercalli Scale). To the extent required, renovations would be completed in accordance with Air Force Manual 88-3. Impacts from seismicity would not be significant.

No Action Alternative

The proposed renovation of housing would occur at a slower pace under the no action alternative. A fugitive dust permit would be required, and if more than one acre is disturbed at any time, a NPDES permit would be required. Requirements of the *Coastal Zone Management Act* would also apply (discussed in Sections 3.3 and 4.3). The area of severe erosion on Fort MacArthur would need to be stabilized to prevent severe erosion, and to comply with the Act. Impacts to geological resources would not be significant.

4.3 Water Resources

To establish the potential impacts of the proposed action and the no action alternative, documents on the hydrology and hydrogeology of the area were reviewed. Maps showing topography, watersheds, and base drainage were examined. The review focused on the proximity of the proposed activities to surface waters, hydrogeology in the project area, and evaluated the effects of the actions with regard to those factors. Regulatory requirements and the need for permits were also reviewed.

Proposed Action

As discussed in Section 3.3, there are no well-defined aquifers at any of the affected housing areas, and they are generally not recharged by freshwater recharge. Due to the limited impact to

the ground from demolition and renovation, these limited aquifers would not be significantly impacted by the proposed action. A spill or leak of fuel or lubricants is not likely during demolition and renovation in this area, but if one occurs, it should be cleaned up immediately, in accordance with the Spill Response Plan, to prevent potential contamination of groundwater. Given the small amount of oil and fluids used by construction equipment, and the limited extent of groundwater, where present, impacts would not be significant.

As discussed in Section 3.3, storm water in the housing area drains into a series of inlets and pipes and empties to the Pacific Ocean, which is among the waters of the U.S. Demolition of 45 units at Fort MacArthur would likely disturb more than 5 acres and a NPDES permit would be required. In accordance with the NPDES permit, best management practices (including sediment barriers, grading controls, and measures to prevent vehicle tracking of sediment) would be required. Some water erosion could occur during heavy storm events, but sediment controls would limit any runoff and these surface water features. Impacts to surface waters would not be significant.

Renovation of housing units would be confined to inside the existing structures and would not disturb any land areas. A NPDES permit would not be required for the renovation of housing at Fort MacArthur, Pacific Crest, or Pacific Heights I.

The proposed action would not impact any floodplains, as none of the affected areas are within the 100-year floodplain.

Proposed demolition of housing at Fort MacArthur would slightly decrease impermeable surfaces, slightly decreasing storm water runoff. Renovation of housing at Fort MacArthur, Pacific Crest, and Pacific Heights I would not change the amount of impermeable surface.

There are no wetlands on LA AFB properties; therefore, the proposed action would not impact any wetland areas.

Demolition and renovation projects do not normally require a CDP. However, the California Coastal Commission would review the project to determine if there is potential for significant environmental impacts and determine if a permit would be required.

As discussed in Section 3.3, there is an area of severe erosion along the eastern side of Fort MacArthur. In accordance with the provisions of the *Coastal Zone Management Act* and the *California Coastal Act* to control coastal erosion, the Project Owner will need to ensure that demolition, renovation, and housing area management activities do not exacerbate the erosion in this area. During demolition and renovation activities, access to eroded areas by heavy equipment and people needs to be restricted. Areas currently eroded and subject to erosion need to be stabilized with retaining walls, slope repair, revegetation, or other appropriate engineering strategies in accordance with the *California Coastal Act* and the California Coastal Commission's requirements. With appropriate erosion control measures, impacts would not be significant.

No Action Alternative

Under the no action alternative, ongoing maintenance and renovation would continue, although renovation would likely occur at a slower rate than under the proposed action. Groundwater, surface water, floodplains, wetlands, and the coastal zone would not be significantly impacted. Areas of erosion and unstable soils at Fort MacArthur would need to be repaired in accordance with coastal zone requirements, as discussed above.

4.4 Biological Resources

Proposed Action

In the developed areas that comprise all of the land proposed for privatization, activities during renovation and demolition may lead to limited short-term impacts on landscape-type vegetation. The RFP states that “Existing trees shall be saved to the maximum extent possible.” The Project Owner is also required to develop a Facilities Maintenance Plan that addresses grounds maintenance (individual yards, common and recreational areas), and tree and shrub maintenance at units including vacant units (foundation plantings) and common areas (including tree trimming, dead tree/plant replacement). LA AFB’s acceptance of this plan and the Project Owner’s subsequent implementation is expected to result in no adverse impacts to vegetation maintenance in developed areas. No significant impacts on vegetation resource values are predicted as a result of the proposed action, due to the non-native state of vegetation currently existing in the areas proposed for transfer.

Local wildlife species include crows, rock doves (pigeons), sparrows, and squirrels, which are highly adapted to urban conditions. Individual animals will tend to avoid increased levels of human and mechanical activity, shifting their presence to adjacent and nearby less disturbed areas during active renovation or demolition. Since all activities will occur in previously improved areas, no significant adverse effects on wildlife, including the sensitive loggerhead shrike (if it is present in the housing areas), are expected as a result of the proposed action.

No Action Alternative

Management of LA AFB’s natural resources by the Air Force has been conducted in accordance with policies summarized in the base’s *Integrated Natural Resources Management Plan* (USAF 2001). Under the no action alternative, management of these resources would continue as in the past, and no impacts to the effective management of biological resources would occur.

4.5 Human Health and Safety

Proposed Action

Under the proposed action, 45 existing residential units will be demolished and a majority of the remainder of housing units will be renovated. The net decrease of 45 units (7% decrease) would result in a decrease in the risks associated with traffic in and around the housing parcels. Safety risks posed by vehicle traffic can be mitigated by speed control, effective signage, pedestrian

rights-of-way, and planning to limit access between housing units and major traffic arteries. Renovation of existing housing units would provide the opportunity to remove hazardous materials of construction (such as any asbestos and lead-based paint that may be present, particularly in the historic structures in Parcel A; see Section 3.6.2), and thereby reduce the safety risks posed by these materials.

Demolition and renovation activities present a new set of safety risks. These risks include health risks due to the potential of hazardous materials to become airborne, risks associated with temporary increases in heavy equipment, and risks associated with construction zones in general (including trip and fall hazards and noise hazards). These safety risks would be short-term, ceasing to continue after demolition and renovation activities are completed. Additionally, these safety risks could be mitigated through the use of water sprays during demolition and industry standard construction protective measures (including fall protection and hearing protection).

Children are more sensitive to some environmental effects than adults, including those resulting from exposure to the hazards identified above. The removal of hazardous materials, including any potentially present asbestos and lead-based paint (particularly in the historic structures in Parcel A; see Section 3.6.2), would benefit the environment for children in the residences. Implementation of measures to restrict access to demolition and renovation sites may deter children from entering such areas during work and non-work hours. Finally, since noise increases would be intermittent and short in duration, special risks to children from demolition and renovation noises are not anticipated.

Overall, the short-term increases in safety risk associated with demolition and renovation activities would be outweighed by the long-term benefits of removal of hazardous materials. Industrial risks thought to be more damaging to children would be reduced as a whole. Long-term traffic safety risks are expected to decrease due to the net decrease of 45 housing units.

No Action Alternative

Under the no action alternative, no changes from current health hazards and safety risks would be realized. Any hazardous materials of construction that are present (such as asbestos and lead-based paint, particularly in the historic structures in Parcel A; see Section 3.6.2) would remain in some housing units. Traffic volumes would not appreciably change from current levels. Safety risks from a long-term renovation campaign would remain.

4.6 Solid Waste and Hazardous Materials

Proposed Action

Under the proposed action, 45 existing residential units will be demolished and a majority of the remainder of housing units will be renovated, resulting in a net decrease of 45 units (7% decrease). Solid waste generation would show a short-term increase due to housing renovations and demolitions, followed by a decrease in long-term recurring solid waste generation due to the decrease in the number of residential housing units. The Project Owner would be responsible for disposal of solid waste generated from the proposed action, using local landfills.

Solid waste generation amounts can be estimated using empirical data. Based on documented sampling studies (Franklin Associates 1998), approximately 77.6 pounds per square foot (lb/ft²) of solid waste would be generated during residential demolition. With an estimated average of 1,030 ft² per unit for the specific units slated for demolition, the demolition of these 45 units is expected to generate approximately 1,800 tons of solid waste. Common practices such as deconstruction, recycling, and salvage can reduce the total amount of solid waste destined for landfill disposal in addition to resulting in significant cost savings.

In addition to demolition activities, 220 units are planned for renovation. Appropriate unit-based estimates for renovation activities could not be located, but solid waste generation from these activities is expected to be similar (although higher) to that which would be associated with new construction (estimated at 4.38 lb/ft²) (Franklin Associates 1998). Using a conservative estimate of 1,800 ft² per unit and the unit waste generation estimate for new construction, approximately 867 tons of solid waste would be generated from renovation activities.

Fuels and lubricants would be used for equipment during demolition, excavation, grading, and renovation of housing units within the proposed action site. Other hazardous materials (such as paints, thinners, and sealants) may be used during the renovation activities, but would be controlled under standard safety and handling procedures. Standard safety procedures will be implemented (e.g., no smoking while fueling equipment). Overall, demolition/renovation activities would minimally change the short-term usage of hazardous materials.

Demolition and renovation activities will result in a short-term increase in hazardous waste generation. Existing residential units, particularly the historical structures in Parcel A (see Section 3.6.2) have been identified as possibly containing ACMs, lead-based paint, and potentially PCBs. Underground utilities may be encountered that may also contain ACMs. In accordance with the most recent draft of the RFP, the Project Owner is responsible for inquiring as to whether the Government has records of the location of ACMs or lead-based paint in any housing unit or other leased structure prior to the start of work that may disturb suspect materials. If the Government does not have adequate records to substantiate the status or presence of these substances, the Project Owner is required to perform sampling and analysis, and conduct the removal and disposal of any such materials in compliance with Federal, state, and local laws, regulations, and standards. Even though the USEPA Radon Map for Los Angeles County, CA, indicates that the project site is located in Zone 2, an area with predicted average indoor radon screening levels between 2 and 4 pCi/L, the most recent draft of the RFP requires that the MHPI contractor will need to take all necessary measures consistent with the Air Force Radon Assessment and Mitigation Program to ensure that levels of radon within all housing units are lower than the Air Force action level of 4 pCi/L.

Overall, the proposed action would be associated with a short-term increase in solid waste generation from demolition and renovation activities, followed by a long-term localized decrease in generation of municipal-type solid waste from reduced residential occupation of the housing units. This decrease would likely be offset by dispersed localized increases in the areas where LA AFB families would reside off-base, resulting in no net change to municipal solid waste generation in the area. A short-term increase in hazardous waste generation would also occur

during the demolition/renovation phase, but would not have any significant environmental impact.

No Action Alternative

Under the no action alternative, there would be no currently planned changes to the solid waste and hazardous materials and waste content of the housing area. Residential housing would continue to look and operate the same as it currently does with the management of solid waste and recycling at LA AFB. Scheduled maintenance and renovation of housing buildings would likely continue as needed, and solid waste and hazardous materials and waste generation would create minimal impacts.

4.7 Noise

Proposed Action

Under the proposed action, 45 existing residential units will be demolished and a majority of the remainder of housing units will be renovated. As a result of the overall reduction in housing units (7% decrease), associated traffic would be expected to decrease, thereby reducing noise created by area traffic.

During demolition and renovation activities, noise would increase due to operation of heavy equipment, increases in traffic from waste hauling activities, and other project-related sources. These noises would be short-term, ceasing to continue after the transition is concluded. The current draft of the RFP states “[u]nless coordinated with the Government, . . . renovation . . . and demolition in or adjacent to existing housing areas shall be limited to daylight hours from Monday through Friday and no earlier than 0700 hrs and no later than 1800 hrs . . .”

Overall, the short-term increases in noise caused by demolition and renovation activities are not anticipated to be significant, and the long-term reductions in area noise due to reduced traffic would outweigh any short-term noise increases.

No Action Alternative

Under the no action alternative, no changes from current noise levels would be realized. Noises would continue to be created by area traffic, residential use, and isolated ancillary activity. While some noise associated with renovation may still be realized under this alternative, the activities would be conducted less frequently.

4.8 Cultural Resources

Proposed Action

The U.S. Air Force is required to comply with existing legislation to ensure that properties that are listed on the NRHP or that may qualify for inclusion on the NRHP are not inadvertently transferred, sold, demolished, substantially altered, or allowed to deteriorate significantly. The

majority of the housing units at Fort MacArthur were constructed from 1982 to 1985 and are not historic. Twenty housing units located at the northern end of the installation are listed on the NRHP.

The 45 housing units to be demolished were built in the 1980s. Demolition of this housing is not anticipated to impact the historic housing or other historic structures. However, measures must be implemented to ensure that vibration from construction equipment does not impact any nearby historic structures. Renovation of the 20 historic housing units would be conducted in accordance with consultation with the SHPO and NHPA Section 106 compliance procedures, or in accordance with a PMOA that may be developed (see Section 3.8). The historic units will be renovated as required and maintained for occupancy for either the transition period or 50 years; the Final RFP will contain updated information on the Air Force's decision as to the term of the lease for the historic units. The owner of these units would be responsible for preserving these structures in accordance with the NHPA and other agreements that may be reached.

Renovation of the non-historic 50 housing units is not anticipated to impact the historic housing. If necessary, measures must be implemented to ensure that vibration from construction equipment does not impact nearby historic structures.

Demolition of the 45 housing units at Fort MacArthur is not anticipated to disturb much subsurface area, and would not likely further disturb areas impacted by previous construction. Previous development at Fort MacArthur has likely disturbed or destroyed all surface manifestations of any archeological resources that once existed here, but there are several archeological sites within 0.5 mile of the Fort and it is possible that some subsurface artifacts remain. Fort MacArthur is an area of medium archeological sensitivity. In accordance with AFI 32-7065 and the base's *Integrated Cultural Resources Management Plan*, monitoring of ground disturbance should be conducted by a qualified archaeologist to ensure that subsurface archaeological deposits are not inadvertently disturbed or destroyed.

As discussed in Section 3.8, there are no historic structures at the Pacific Crest housing area. Renovation of existing structures is not anticipated to disturb any subsurface areas. No impacts to potential subsurface archaeological artifacts, if present, are anticipated.

Renovation of existing housing at Pacific Heights I is not anticipated to disturb any subsurface areas. No impacts to potential subsurface archeological artifacts, if present, are anticipated. The renovations would not disturb the four historic sites at Pacific Heights II. Existing units at Pacific Heights II would not be renovated, as they were recently constructed, but the houses and land would be leased to the Project Owner. If the historic sites at Pacific Heights II are included in the lease, the Project Owner would be responsible for maintenance of the sites in accordance with the NHPA and other agreements that have been or may be reached. If the historic sites are not leased, the Air Force would remain responsible for protection of the sites.

With controls on vibration near historic structures, conducting renovation of historic housing in accordance with consultation with the SHPO, and maintenance of sites in accordance with the NHPA and other agreements, no significant impacts to cultural resources are expected as a result of the proposed action.

No Action Alternative

Under the no action alternative, the Air Force would continue limited renovation of housing units. Renovation of historic structures would be conducted in accordance with SHPO consultation. As applicable, controls on vibration would be implemented to protect historic structures. There would not be any significant impacts to cultural resources.

4.9 Land Use

Proposed Action

Under the proposed action, 45 existing units at Fort MacArthur (built between 1982 and 1985) would be demolished. Fifty housing units would be renovated, and the remainder of the units at Fort MacArthur would remain as they are. The land on which the 45 units to be demolished would revert to the government after the transition period. There are currently no specific plans for this land. Other land uses (community, recreational, historic and special use, and industrial) would not be affected.

All of the housing units at Pacific Heights I would be renovated. All of the existing housing units at Pacific Heights II would remain as they are. All of the existing housing units at Pacific Crest would be renovated. No land use changes would occur at any of these locations.

These proposed changes are currently part of General Plan and would not significantly impact existing land use.

No Action Alternative

Under the no action alternative, renovation of housing would occur at a slower rate. There would not be any changes to land use at the affected installations.

4.10 Traffic and Transportation

Proposed Action

Under the proposed action, 45 existing residential units will be demolished and a majority of the remainder of housing units will be renovated. As a result of the overall reduction in housing units (7% decrease), associated traffic volumes would be expected to decrease.

During demolition and renovation activities, localized increases in traffic volumes may occur. These increases would be dominated by project-related vehicle and heavy equipment traffic. These volume increases would be short-term, ceasing to continue after demolition and renovation activities are completed. Additionally, activities could be scheduled to time these traffic volume increases to daylight hours and away from morning and afternoon rush hours.

Overall, the short-term increases in traffic volumes caused by demolition and renovation activities are not anticipated to be significant, and the long-term reductions in traffic volumes would outweigh any short-term traffic volume increases.

No Action Alternative

Under the no action alternative, no changes from the current traffic volumes would be realized. While some traffic volume increases associated with renovation may still be realized under this alternative, the activities would be conducted less frequently.

4.11 Socioeconomics and Environmental Justice

Proposed Action

During the transition period of the proposed action (estimated to be six years), new jobs will be created to directly accomplish demolition and renovation activities, and indirectly as a result of purchasing goods and services needed for renovation and consuming goods and services made possible by wage and salary expenditures of direct workers. Overall, there would be a short-term beneficial impact to the local economy. The proposed reduction in family residences at LA AFB of 46 units represents a negligible impact on the local housing supply. Because the current occupancy rate in the housing is about 82% (approximately 112 units unoccupied), the proposed overall reduction of 46 units would have little, if any, effect on the number of students attending local public schools or the associated Federal impact aid (approximately \$1,000 per student) to the local public school district.

Impacts to environmental justice would be considered significant if impacts to children, minority populations, or low-income communities due to the proposed action were disproportionately high and adverse. Because (1) all proposed activities would take place on base, and (2) no adverse impacts to the local school district are predicted, there would not be any disproportionate impacts to minorities or children. Since no significant environmental impacts are projected from the proposed action, no disproportionate impacts to any sub-populations would occur, and therefore, no environmental justice concerns have been identified.

No Action Alternative

There would be no currently planned activities affecting local employment and income, housing, school enrollment, or environmental justice under the no action alternative.

4.12 Cumulative Impacts

Cumulative impacts are those changes to the physical and biological environments that would result from the proposed action in combination with reasonably foreseeable future actions. Significant cumulative impacts could result from impacts that are not significant individually, but when considered together, are collectively significant.

The proposed action shall comply with Federal and California air quality laws and Air Force policies that are designed to minimize long-term cumulative impacts to air quality. The proposed action shall conform with the SCAQMD nonattainment plans for ozone, CO, and PM_{2.5} and PM₁₀; and the maintenance plan for NO₂. Short-term demolition/renovation emissions would not violate state or Federal standards and would be minimal compared to existing emissions generated at LA AFB and in the South Coast Basin. Long-term emissions would not increase. Cumulative impacts to air quality would not be significant.

Impacts to soils from the proposed action and other ongoing and planned actions over the next two years (from potential erosion) would be limited by the scope of work and permit requirements and would not be significant. Impacts to surface water would also be limited by permit requirements and would not be significant. Impacts to groundwater would be minimal.

All activities at Los Angeles AFB affecting natural resources are managed in accordance with the *Integrated Natural Resources Management Plan* and applicable regulations, and any impacts from the proposed action and other activities would have limited effects to vegetation and wildlife species. None of these impacts would be significant.

Only minor impacts to human health and safety, solid waste and hazardous materials, and noise from the proposed action were identified. Impacts to these resource areas would not substantially contribute to ongoing and future impacts at LA AFB or in the local area.

Only minor impacts to cultural resources and land use from the proposed action were identified. Impacts to these resource areas would not substantially contribute to ongoing and future impacts at LA AFB or in the local area.

Impacts to traffic would be minor over the short term, with a long-term slight decrease in local community traffic. No significant cumulative impacts would result from the proposed action.

No significant adverse socioeconomic impacts were identified. Given the lack of significant environmental impacts overall (and, therefore, a lack of any disproportionate impacts to minorities), there would not be any significant cumulative impacts to environmental justice.

Future redevelopment of the land that will revert to the Government on which 10 buildings containing 39 housing units are proposed for demolition is outside the scope of this EA. However, LA AFB currently envisions administration and community land uses for the two areas, which do not raise any immediate concerns for cumulative impacts when considered with this action. Any future Federal actions that may have potentially significant impacts to the environment would be assessed in separate NEPA documents.

SECTION 5. AGENCIES CONTACTED

Sources for this EA included the documents and electronic resources listed in Section 7, and LA AFB personnel, including the following:

- Jon Bruinooge, Special Counsel for Compliance Matters, SMC/JA
- Jon Lutz, Environmental Engineer, 61 CELS/CELEV
- Don Morgan, Housing Flight Chief, 61 CELS/CELOH
- Randall Muir, Community Planner, 61 CELS/CELEC
- Scott Sheehan, contractor assistance for housing privatization, 61 CES/CELOH (Booz Allen Hamilton)
- Michael Szekely, Environmental Manager, 61 CELS/CELEV
- Jim Weston, Chief, Safety Operations, SMC/SEO
- Ed Wilson, Energy Manager, 61 CELS/CEZVE
- Claude Youssafzadeh, Environmental Operations Manager, 61 CELS/CELEV
- Ivar Sohn, Environmental Compliance Manager, 61 CELS/CELEV

SECTION 6. LIST OF PREPARERS

Christine Modovsky, Project Director, Labat Environmental, Inc.

M.S., Environmental Science; B.S., Environmental Chemistry.

18 years experience.

Project management, purpose and need, description of proposed action and alternatives, biological resources, socioeconomics and environmental justice, cumulative impacts.

Dean Converse, Environmental Scientist, Labat Environmental, Inc.

B.S., Geography-Environmental Studies.

6 years experience.

Maps and figures.

Randall McCart, Senior Environmental Scientist, Labat Environmental, Inc.

M.A., Geography; B.S., Geography; B.S., Education.

18 years experience.

Air quality; soils, geology, and topography; water resources; cultural resources, land use, cumulative impacts.

Douglas Schlagel, P.E., Project Engineer, Labat Environmental, Inc.

B.S., Chemical Engineering.

11 years experience.

Human health and safety, solid waste and hazardous materials, noise, traffic and transportation, maps and figures.

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APPENDIX A

ACRONYMS, ABBREVIATIONS, AND DEFINITION OF TERMS

ACRONYMS AND ABBREVIATIONS

$\mu\text{g}/\text{m}^3$	micrograms per cubic meter
AAM	annual arithmetic mean
ACHP	Advisory Council on Historic Preservation
ACM	asbestos-containing material
AFB	Air Force base
AFI	Air Force Instruction
AQMP	air quality management plan
CA	California
CAA	<i>Clean Air Act</i>
CAAQS	California Ambient Air Quality Standards
Cal/EPA	California Environmental Protection Agency
CARB	California Air Resources Board
CDP	Coastal Development Permit
CEQ	Council on Environmental Quality
CERCLA	<i>Comprehensive Environmental Response, Compensation, and Liability Act</i>
CFR	Code of Federal Regulations
CO	carbon monoxide; Colorado
DTSC	Department of Toxic Substance Control
EA	environmental assessment
EBS	environmental baseline survey
DoD	Department of Defense
FONSI	finding of no significant impact
ft^2	square feet
FTE	full-time equivalent
HAP	hazardous air pollutant
HRMA	Housing Requirements and Market Analysis
IRP	Installation Restoration Program
LA AFB	Los Angeles Air Force Base
lb/ft^2	pounds per square foot
LST	local significance threshold
LUST	leaking underground storage tank
MHPI	Military Housing Privatization Initiative
NAAQS	national ambient air quality standard
NEPA	<i>National Environmental Policy Act</i>
NESHAP	National Emission Standards for Hazardous Air Pollutants
NHPA	<i>National Historic Preservation Act</i>
NO_2	nitrogen dioxide
NO_x	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
PCBs	polychlorinated biphenyls
pCi/L	picocuries per liter
$\text{PM}_{2.5}$	particulate matter less than 2.4 microns in diameter

PM ₁₀	particulate matter less than 10 microns in diameter
PMOA	Programmatic Memorandum of Agreement
ppm	parts per million
RCRA	<i>Resource Conservation and Recovery Act</i>
RFP	request for proposals
SCAQMD	South Coast Air Quality Management District
SHPO	State Historic Preservation Office
SIP	state implementation plan
SO ₂	sulfur dioxide
SO _x	sulfur oxides
USAF	U.S. Air Force
USEPA	U.S. Environmental Protection Agency
USGS	U.S. Geological Survey
UST	underground storage tank
VOC	volatile organic carbon compound

DEFINITION OF TERMS

Aquifer. The water-bearing portion of subsurface earth material that yields or is capable of yielding useful quantities of water to wells.

Asbestos. A carcinogenic substance formerly used widely as an insulation material by the construction industry, often found in older buildings.

Cultural resources. Remains of human activity, occupation, or endeavor, reflected in districts, sites, structures, building, objects, artifacts, ruins, works of art, architecture, and natural features that were of importance in past human events. Cultural resources consist of (1) physical remains, (2) areas where significant human events occurred, even though evidence of the events no longer remains, and (3) the environment immediately surrounding the actual resource.

Cumulative impact. The impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time

Endangered species. Plant or animal species that are in danger of extinction throughout all or a significant part of their range.

Environmental assessment. A systematic environmental analysis of site-specific activities used to determine whether such activities would significantly affect the human environment, and whether an environmental impact statement is required.

Environmental baseline survey. An EBS is prepared for any property to be transferred, purchased, or leased. An EBS is based on all existing environmental information related to storage, release, treatment, or disposal of hazardous substances or petroleum products on the property to determine or discover the obviousness of the presence or likely presence of a release or threatened release of any hazardous substance or petroleum product.

Environmental impact statement. An analytical document developed for use by decisionmakers to weigh the environmental consequences of a potential action.

Erosion. Wearing away of soil and rock by weathering and the action of streams, wind, and underground water.

Groundwater. Water within the earth that supplies wells and springs.

Habitat. The environment in which an organism occurs.

Hazardous Substance. A substance defined as a hazardous substance pursuant to CERCLA 42 U.S.C. Sec. 9601(14), as interpreted by USEPA regulations and the courts.

Hazardous Waste. Any hazardous waste having the characteristics identified under or listed pursuant to Section 3001 of the *Solid Waste Disposal Act* (42 U.S.C. Sec. 6921) (but not including any waste the regulation of which under the *Solid Waste Disposal Act* (42 U.S.C. Sec. 6901, et. seq.) has been suspended by Act of Congress). The *Solid Waste Disposal Act* of 1980 amended the *Resource Conservation and Recovery Act* (RCRA). RCRA defines a hazardous waste in 42 U.S.C. Sec. 6903 as “a solid waste, or combination of solid wastes, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may (a) cause, or significantly contribute to an increase in mortality or an increase in serious irreversible, or incapacitation reversible, illness; or (b) pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed.”

Intermittent stream. A stream that flows only at certain times of the year when it receives water from winter rain or melting snow.

Military Housing Privatization Initiative. A program to allow private sector financing, ownership, operation, and maintenance of military housing. Under the program, which was initially authorized in 1996 under the *National Defense Authorization Act* and was reauthorized in 2001 for an additional five years, DoD can provide direct loans, loan guarantees, and other incentives to encourage private developers to construct and operate housing either on or off military installations.

National Environmental Policy Act. Federal legislation enacted in 1969 that requires Federal agencies to consider environmental impacts in their decision-making process.

Perennial stream. A stream that flows continuously year round.

Project Owner. The private developer who would be contracted by the Air Force to implement the Military Housing Privatization Initiative at LA AFB.

Runoff. The part of the precipitation in a drainage area that is discharged from the area in stream channels, including surface runoff, ground water runoff, and seepage.

Threatened species. A plant or animal species that is not in danger of extinction but is likely to become so within the foreseeable future throughout all or a significant portion of its range.

Toxic Substances Control Act. This law was enacted in 1976 to give the USEPA the ability to track industrial chemicals currently produced or imported into the United States. The USEPA repeatedly screens these chemicals and can require reporting or testing of those that may pose an environmental or human health hazard, or can ban the manufacture and import of those chemicals that pose an unreasonable risk.

Underground Storage Tank (UST). Any tank, including underground piping connected to the tank, which is or has been used to contain hazardous substances or petroleum products and the volume of which is ten percent or more beneath the surface of the ground.

APPENDIX B

AIR EMISSIONS ESTIMATES FOR THE PROPOSED ACTION

Estimated Air Emissions from Proposed Demolition and Renovation Activities

This appendix presents calculations performed for estimating air emissions generated from activities related to the demolition and renovation of housing units at Fort MacArthur, and renovation of housing units at Pacific Heights I and Pacific Crest.

Table B-1. Emissions Summary ¹

Source	Emissions (tons)						
	CO	VOC	NO _x	SO _x	PM ₁₀	PM _{2.5}	HAPs
Demolition (fugitive dust)					0.125		
Grading (fugitive dust)					0.64	0.09	
Trucks - paved roads					0.09	0.02	
Trucks - unpaved roads					0.44	0.07	
Equipment	1.94	0.39	5.61	1.17	0.01	0.25	0.12
Worker Vehicles	1.83	0.11	0.13	0.02	0.002		
Total Emissions	3.77	0.50	5.75	1.19	1.31	0.43	0.12
Tons per year	1.88	0.25	2.87	0.60	0.65	0.22	0.06
Pounds per year	7538	997	11493	2380	2618	863	232
Tons/day avg	0.0075	0.0010	0.0115	0.0024	0.0026	0.0009	0.0002
Pounds / day avg	15.1	2.0	23.0	4.8	5.2	1.7	0.5

¹ See Tables B-2 through B-8 for emissions estimate calculations.

Table B-2. PM Emissions from Demolition

Volume of units	13200 cubic feet
PM ₁₀ emission rate ²	0.00042 pounds per cubic foot ³
PM ₁₀ per unit	5.544 pounds
Units demolished	45
Total PM ₁₀	249.48 pounds
Total PM ₁₀	0.125 tons

¹ Assumed 1200 ft² area and average 11-ft roof height.

² An emission factor for PM_{2.5} is not available

³ Emission factor from SCAQMD 1992.

Table B-3. PM Emissions from Grading (fugitive dust)

Calculation	Result
PM emission rate = $\frac{1.0 \times S^{1.5}}{M^{1.4}}$ lb/hr ¹	3.561 lb/hr PM
where s = silt (%), M = moisture (%) ^{2,3}	
PM ₁₀ = PM * 0.75	2.67 lbs/hr PM ₁₀
PM _{2.5} = PM * 0.105	0.37 lbs/hr PM _{2.5}
Total grading hours = 480 hours ⁴	1281.9 lbs PM ₁₀ 179.46 lbs PM _{2.5}
Total grading emissions (tons) =	0.64 tons PM ₁₀ 0.09 tons PM _{2.5}

¹ Sources: EPA 1995, EPA 1998

² The soils in the affected areas are clay loam, loamy sand, and silt (USDA 1994)
Clay loam and loamy sand are typically 0-40% silt; an average of 20% was used.

³ 10% soil moisture was assumed.

⁴ One 8-hour day per demolition site (total of 45 days) and
fifteen 8-hour days total for erosion repair and renovation of areas.

Table B-4. PM Emissions from Trucks Driving on Paved Roads

Equation¹: $EF = k(sL/2)^{0.65} (W/3)^{1.5}$
 where:
 EF = emission factor for normal conditions on high traffic roads
 k= particle size multiplier for PM₁₀ (0.016) or PM_{2.5} (0.004)
 sL = silt loading (g/m²); default value for high traffic roads = 0.1
 W = mean vehicle weight (tons); assumed to be 15

PM₁₀ emission factor 0.026 lb/mile
 PM_{2.5} emission factor 0.006 lb/mile

Additional assumptions:

10 Miles/round trip
 1 Trucks/hour
 8 Hours of activity
 90 Days

Yield:

7200 Total vehicle miles travelled

 183.755 Total PM₁₀ emissions (lbs)
 0.09 Total PM₁₀ emissions (tons)

 45.9386 Total PM_{2.5} emissions (lbs)
 0.023 Total PM_{2.5} emissions (tons)

¹ Emission factor formula from USEPA 2003a.

Table B-5. PM Emissions from Trucks Driving on Unpaved Roads

Equation¹: $EF = k(s/12)^a (W/3)^b$
 where:
 EF = emission factor for PM on unpaved roads (uncontrolled)
 k = particle size multiplier for PM₁₀ (1.5) or PM_{2.5} (0.23)
 s = silt %; assumed to be 20%
 W = mean vehicle weight (tons); assumed to be 15
 a and b are empirical constants; a = 0.9 and b = 0.45

PM₁₀ emission factor 4.901 lb/mile

PM_{2.5} emission factor 0.751 lb/mile

Additional assumptions:

1 Miles/round trip

0.5 Trucks/hour

8 Hours of activity

45 Days

Yield:

180 Total vehicle miles travelled

882.19 Total PM₁₀ emissions (lbs)

0.44 Total PM₁₀ emissions (tons)

135.27 Total PM_{2.5} emissions (lbs)

0.07 Total PM_{2.5} emissions (tons)

¹ Emission factor formula from USEPA 2003b.

Table B-6. Equipment Emissions

Equipment	Days	Hr/day	Pieces	CO	VOCs	NO _x	SO _x	PM ₁₀ ²	PM _{2.5} ²
Excavator	90	8	2						
Emissions factor (grams/hr) ¹				104.62	27.53	305.20	73.15	0.52	16.79
Emissions (grams)				150649.63	39644.64	439489.15	105341.47	747.58	24171.90
Emissions (lbs)				331.83	87.32	968.04	232.03	1.65	53.24
Bulldozer	90	8	2						
Emissions factor (grams/hr) ¹				114.06	30.02	332.75	79.76	0.57	18.30
Emissions (grams)				164247.6	43223.0	479158.3	114849.8	815.1	26353.7
Emissions (lbs)				361.78	95.20	1055.41	252.97	1.80	58.05
Backhoe/loader	90	8	2						
Emissions factor (grams/hr) ¹				277.55	38.35	236.92	38.80	0.64	20.81
Emissions (grams)				399674.88	55218.24	341169.84	55875.60	926.88	29969.04
Emissions (lbs)				880.34	121.63	751.48	123.07	2.04	66.01
Dump Truck	90	8	4						
Emissions factor (grams/hr) ¹				316.91	41.76	1009.70	218.65	1.18	38.13
Emissions (grams)				912713.2	120280.0	2907946.7	629701.3	3396.1	109808.6
Emissions (lbs)				2010.38	264.93	6405.17	1387.01	7.48	241.87
Air Compressors	500	8	1						
Emissions factor (grams/hr) ¹				33.70	23.59	232.50	40.10	0.29	9.48
Emissions (grams)				134784.00	94348.80	930009.60	160392.96	1172.62	37914.74
Emissions (lbs)				296.88	207.82	2048.48	353.29	2.58	83.51
Total Emissions	lbs			3881.21	776.90	11228.58	2348.37	15.55	502.68
	tons			1.94	0.39	5.61	1.17	0.01	0.25

¹ Calculated with the following formula: emissions (grams/horsepower-hour) x horsepower x typical load factor
Emission rates and horsepower from USEPA 2006
Assumes Tier 2 equipment (model years between 2001 and 2007, depending on engine size)
Typical load factor from USAF 2002.

² Per USEPA 2004, PM₁₀ from construction equipment exhaust is calculated at 3% of total PM, and PM_{2.5} is calculated at 97% of total PM.

Table B-7. HAPs Emissions from Equipment

$$\begin{aligned} \text{HAPs emissions} &= \text{VOCs emissions} \times 29.83\% \quad ^1 \\ \text{VOCs emissions} &= 776.90 \text{ lbs} \quad ^2 \\ \text{HAPs emissions} &= 231.751 \text{ lbs} \\ &= 0.12 \text{ tons} \end{aligned}$$

¹ From USAF 2002.

² From Table B-6.

Table B-8. Worker Vehicle Trips Emissions

		Vehicle Exhaust Component				
		CO	VOCs	NOx	SOx	PM ₁₀
Number of workers ¹	20					
Commute (miles) ²	20					
Days ³	500					
Total Miles	200,000					
Emissions factor (grams/mile) ⁴		8.300	0.500	0.60	0.072	0.011
	lbs/mile	0.01828	0.00110	0.00132	0.00016	0.000024
Total Emissions	lbs	3656.39	220.26	264.32	31.72	4.846
	tons	1.83	0.11	0.13	0.02	0.002

¹ Assumed to average 20 per day for the life of the project.

² Assumed to average 20 miles.

³ Number of work days in the two-year project, assumed to be 250 work days per year.

⁴ From Tables 4-5, 4-6, 4-7, and 4-50 in USAF 2002 for calendar year 2005; assumes average vehicle model year of 2003 for low altitude light duty gas vehicles.

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