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14. ABSTRACT

This report presents the environmental analysis for the construction of a modern laboratory and administrative complex at Air Force Research Laboratory (AFRL). The environmental assessment (EA) was requested by Air Force Research Laboratory/Chief, Experimental Dem Branch, Edwards AFB, California. This EA has analyzed several components of the natural and manmade environment for potential impacts as a result of the proposed action. The EA was prepared in accordance with the requirements of the *National Environmental Policy Act* (NEPA) of 1969, as amended (42 United States Code 4321 et seq.), the *Council of Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of NEPA* (40 Code of Federal Regulations 1500-1508), and Air Force Instruction 32-7061, *The Environmental Impact Analysis Process*.

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FINAL

ENVIRONMENTAL ASSESSMENT FOR THE CONSTRUCTION OF A PROPULSION ENERGETICS LABORATORY, AIR FORCE RESEARCH LABORATORY, EDWARDS AIR FORCE BASE, CALIFORNIA

March 2004

AIR FORCE FLIGHT TEST CENTER
ENVIRONMENTAL MANAGEMENT
EDWARDS AFB CA 93524

CH2-AFC-SRPT-03282-0006A

FINDING OF NO SIGNIFICANT IMPACT FOR THE CONSTRUCTION OF A PROPULSION ENERGETICS LABORATORY, AIR FORCE RESEARCH LABORATORY, EDWARDS AIR FORCE BASE, CALIFORNIA

1.0 INTRODUCTION

The Experimental Demonstration Branch at Air Force Research Laboratory (AFRL/PRSO) proposes to construct a modern laboratory (lab) and administrative complex at AFRL on Edwards AFB in support of the growing demand for AFRL mission-related research and development services.

The new 37,000-square-foot facility would contain a computational science section with ample, varied power and backup power; special flooring; appropriate heating, ventilation, and air conditioning (HVAC) and fire suppression systems; and security and lightning protection. Another section of the building would contain administrative spaces with branch offices, a teleconference room, and support staff spaces. The seminar room, break room, and research laboratory would be located near the main entrance of the building. The final section would contain laboratory space with appropriate HVAC, fume hoods, laboratory gases and deionized water, waste systems, and other specialized research equipment. Included as part of the lab section are pharmacies, chemical storage, and a loading dock. The new facility would be roughly 40 percent administrative and computational science space while the remaining 60 percent would continue research similar to but less volatile (light experiments) than those conducted in the existing laboratory facility, Building 8451, where the more dangerous and potentially explosive activities would continue. Additional information on specifics regarding design plans for this proposed facility can be found in *Science Laboratory Project Definition, AFRL Air Force Research Laboratory, Edwards Air Force Base, California* (Sacramento Corps of Engineers 2002).

The cost of the construction project is estimated at $14.1 million.

Under Alternative B, the No Action Alternative, AFRL would continue to utilize the existing chemistry laboratory for all types of experimentation, including heavy and light functions, computational science, and administrative functions. The more dangerous, potentially explosive activities would not be separated from the light functions, computational science, and administrative activities. Existing laboratory facility fume hoods and airflows, which currently are of marginal capacity for removing and preventing the spread of the volume of hazardous fumes presently generated by laboratory activities, would not be upgraded. There would be no new site preparation or building construction-related activities. Building 8451 facilities would not expand to meet growing mission requirements for additional heavy laboratory space, while continuing computational science and other administrative and light laboratory tasks. The existing potential risk to worker health and safety would remain at an elevated level due to the continued use of Building 8451 for both heavy and light functions. Existing difficulties in retaining and recruiting personnel would persist due to the overcrowded work environment.

The Environmental Assessment (EA) documents the analysis of the activities required to construct a modern laboratory facility and administrative complex and supports this finding.

2.0 ENVIRONMENTAL EFFECTS

The proposed construction of a Propulsion Energetics Laboratory at AFRL is not expected to significantly alter the productivity of the environment. This EA has analyzed several components of the natural and manmade environment for potential impacts as a result of the proposed action. The potential impacts evaluated included: Land Use, Air Quality, Water Resources, Safety and Occupational Health, Hazardous Materials and Waste, Biological Resources, Geology and Soils, Socioeconomics, Infrastructure, and Energy Resources. No potentially significant impacts were identified in any of these areas.

3.0 FINDINGS

A Finding of No Significant Impact (FONSI) for the Proposed Action has been determined based on the absence of significant adverse impacts to the environment. Background information that supports the research and development of this FONSI and the EA is on file at Edwards AFB and can be obtained by contacting the following:

AFFTC/EM
Environmental Management
Attn: Mr. Gary Hatch
5 East Popson Avenue, Building 2650A
Edwards AFB CA 93524-8060
(661) 277-1454

Robert W Wood

ROBERT W. WOOD, Director
Environmental Management

12 March 04

Date

FINAL

Environmental Assessment for the Construction of a Propulsion Energetics Laboratory, Air Force Research Laboratory, Edwards Air Force Base, California
AF Form 813 #03-0166

Contract
F42650-01-C-7218
Letter of Technical Direction
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March 2004

Prepared by:

JT3/CH2M HILL
FLIGHT TEST SUPPORT CENTER

For:
Air Force Flight Test Center
Environmental Management Directorate
Edwards AFB CA

COVER SHEET

ENVIRONMENTAL ASSESSMENT FOR CONSTRUCTION OF A PROPULSION ENERGETICS LABORATORY, AIR FORCE RESEARCH LABORATORY, EDWARDS AIR FORCE BASE, CALIFORNIA

a. Lead Agency: U.S. Air Force

b. Cooperating Agency: None

c. Proposed Action: Construct a Propulsion Energetics Laboratory at Air Force Research Laboratory, Edwards Air Force Base, California

d. Inquiries on this document should be directed to the Air Force Flight Test Center, Environmental Management (AFFTC/EM), Attn: Gary Hatch, 5 East Popson Avenue, Building 2650A, Edwards Air Force Base, California 93524-8060, (661) 277-1454, or e-mail gary.hatch@edwards.af.mil.

e. Designation: Final Environmental Assessment

f. Abstract: Pursuant to the *National Environmental Policy Act of 1969*, this document has been prepared in order to analyze the potential environmental consequences of the proposed action. The analysis in this Environmental Assessment (EA) illustrates that none of the environmental impacts from the proposed action will be significant if the required/ recommended minimization measures are followed.

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LIST OF ABBREVIATIONS AND ACRONYMS

95 ABW/CE	95th Air Base Wing/Civil Engineer and Transportation Directorate
95 ABW/CEFT	95th Air Base Wing/Fire Protection Division
95 ABW/SPOL	95th Air Base Wing/Security Police
95 AMDS/SGPB	95th Aerospace Medicine Squadron/Bioenvironmental Engineering
412 TW/MXG	412th Test Wing/Maintenance Squadron
AB	Assembly Bill
ACCS	accumulation site
ACM	asbestos-containing material
ADCA	Animal Damage Control Act
AF	Air Force
AFB	Air Force Base
AFFTC	Air Force Flight Test Center
AFFTC/EM	Air Force Flight Test Center/Environmental Management
AFFTC/EMC	Air Force Flight Test Center/Environmental Quality Division
AFFTC/EMCC	Air Force Flight Test Center/Environmental Compliance Branch
AFFTC/EMR	Air Force Flight Test Center/Environmental Remediation Division
AFFTC/EMXC	Air Force Flight Test Center/Environmental Conservation Branch
AFFTC/IT	Air Force Flight Test Center/Information Technology
AFFTC/JA	Air Force Flight Test Center/Deputy Staff Judge Advocate
AFFTC/PA	Air Force Flight Test Center/Director, Public Affairs
AFFTC/SE	Air Force Flight Test Center/Chief of Safety
AFFTC/XP	Air Force Flight Test Center/Plans and Programs Office
AFFTCI	Air Force Flight Test Center Instruction
AFI	Air Force Instruction
AFMC	Air Force Materiel Command
AFOSH	Air Force Occupational Safety and Health
AFPD	Air Force Policy Directive
AFRL	Air Force Research Laboratory
AFRL/PR	Air Force Research Laboratory/Propulsion Directorate
AFRL/PRSO	Air Force Research Laboratory/Experimental Demonstration Branch
AOC	area of concern
ARB	Air Resources Board
ATC	Authority to Construct
AVAQMD	Antelope Valley Air Quality Management District
AVEK	Antelope Valley-East Kern
BACT	Best Available Control Technology
BCE	Base Civil Engineer
bgs	below ground surface
bhp	brake horsepower
BL	breathing loss
BMP	best management practice
CAA	Clean Air Act
CAAA	Clean Air Act Amendments
CAAQS	California Ambient Air Quality Standards

LIST OF ABBREVIATIONS AND ACRONYMS (Continued)

Cal/EPA	California Environmental Protection Agency
Cal-OSHA	California Occupational Safety and Health Administration
CARB	California Air Resources Board
CATEX	categorical exclusion
CCR	California Code of Regulations
CDFG	California Department of Fish and Game
CDW	construction/demolition waste
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
CO	carbon monoxide
CSF	Conforming Storage Facility
CUBFT	cubic feet
CWA	Clean Water Act
CWRCB	California Water Resources Control Board
DCE	cis-1, 2-dichloroethene
DOD	Department of Defense
DODD	Department of Defense Directive
DODI	Department of Defense Instruction
DOT	Department of Transportation
DRMO	Defense Reutilization Marketing Office
EA	Environmental Assessment
EIR	economic impact region
EM	Environmental Management
EO	Executive Order
ERP	Environmental Restoration Program
ESA	Endangered Species Act of 1973
ESOH	Environmental Safety and Occupational Health
FONSI	Finding of No Significant Impact
FY	fiscal year
gal	gallon
gpd	gallons per day
gpm	gallons per minute
HAP	hazardous air pollutant
HASP	Health and Safety Plan
HP	horsepower
HVAC	heating, ventilation, and air conditioning
HWMP	Hazardous Waste Management Plan
IAP	initial accumulation point
IAW	in accordance with
IC	internal combustion
ICE	internal combustion engine

LIST OF ABBREVIATIONS AND ACRONYMS (Continued)

INRMP	Integrated Natural Resources Management Plan
KCAPCD	Kern County Air Pollution Control District
lab	laboratory
lb	pound
LBP	lead-based paint
LL	load loss
MBTA	Migratory Bird Treaty Act
MCL	maximum contaminant level
MDAB	Mojave Desert Air Basin
MDAQMD	Mojave Desert Air Quality Management District
MMBTU/hr	Million British Thermal Units per hour
mph	miles per hour
MSDS	material safety data sheet
NAAQS	National Ambient Air Quality Standards
NEC	National Electric Code
NEPA	National Environmental Policy Act of 1969
NESHAP	National Emissions Standards for Hazardous Air Pollutants
NFPA	National Fire Protection Association
NO_2	nitrogen dioxide
NO_x	oxides of nitrogen
NPL	National Priorities List
NRHP	National Register of Historic Places
NSR	New Source Review
O_3	ozone
OSHA	Occupational Safety and Health Administration
OU	Operable Unit
OWS	oil/water separator
Pb	lead
PCB	polychlorinated biphenyls
PCE	tetrachloroethene
PID	Program Introduction Document
PIRA	Precision Impact Range Area
PL	Public Law
PM10	particulate matter less than or equal to 10 microns
POSS	polyhedral oligomeric silsesquioxanes
POV	personally owned vehicle
PPE	personal protective equipment
ppm	parts per million
PTE	potential to emit
PTO	Permit to Operate
QTY	quantity
RCRA	Resource Conservation and Recovery Act of 1976
RI	Remedial Investigation
SIP	State Implementation Plan
SOP	standard operating procedure

LIST OF ABBREVIATIONS AND ACRONYMS (Concluded)

SO_2	sulfur dioxide
SO_x	sulfur oxides
SWPPP	Stormwater Pollution Prevention Plan
TCE	trichloroethene
tpy	tons per year
TSCA	Toxic Substances Control Act
TSE	tactical support equipment
UBC	Uniform Building Code
UPC	Uniform Plumbing Code
U.S.	United States
USACE	United States Army Corps of Engineers
USAF	United States Air Force
USC	United States Code
U.S. EPA	United States Environmental Protection Agency
USFWS	United State Fish and Wildlife Service
VOC	volatile organic compound
WL	working loss
WWTP	wastewater treatment plant
$\mu g/m^3$	1×10^{-6} grams per cubic meter

1.0 INTRODUCTION

This Environmental Assessment (EA) evaluates the potential for environmental impacts associated with the proposed construction of a Propulsion Energetics Laboratory at Air Force Research Laboratory (AFRL), Edwards Air Force Base (AFB), California.

This EA was prepared IAW the requirements of the *National Environmental Policy Act* (NEPA) of 1969, as amended (42 United States Code [USC] 4321 et seq.); the *Council of Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of NEPA* (40 Code of Federal Regulations [CFR] 1500–1508); and Air Force Instruction (AFI) 32-7061, *The Environmental Impact Analysis Process.* The United States Air Force Flight Test Center (AFFTC) is representing the Department of Defense (DOD) as the lead agency.

1.1 Background

Air Force Research Laboratory develops aerospace vehicle propulsion system and propulsion system-related technologies for the Air Force including: turbine and rocket engines, rocket motors, advanced propulsion systems, fuels, propellants, lubricants, and aircraft power systems. The current propulsion sciences laboratory facility, Building 8451, dates from the 1950s, and much of its infrastructure is in poor condition. In addition to its administrative space, it supports laboratory research in the areas of chemical and physical property measurement, materials compatibility, and development of methods for analysis of aerospace fluids and materials. In addition, it is involved in the development of new rocket propellants and propellant ingredients. It contains storage space, machine and fabrication shops, and a technical library. Several of its laboratories are explosion resistant. Currently, both heavy and light laboratory functions occur in the existing laboratory. Heavy laboratory functions deal with explosives as well as rocket and engine testing. Light laboratory functions involve the potential synthesis of energetics where no combustion of energetics occurs. Energetic science research is the study and synthesis of solid propellants, oxidizers and liquid fuels used to power rocket engines and motors. At any one time, no more than 60 personnel work in the facility, appropriate for the on-going experimentation and the degree of risk.

1.2 Purpose and Need

The proposed action is to construct a Propulsion Energetics Laboratory (a modern laboratory and administrative complex) at AFRL, Edwards AFB, California, in support of the growing demand for AFRL mission-related research and development services. It is inefficient and unsafe to combine light laboratory functions and administrative space with heavy laboratory functions as currently occurs at the current laboratory facility, Building 8451. Existing laboratory fume hoods and airflows in Building 8451 are considered marginal for the control and removal of the volume of hazardous fumes generated by experiments in the existing facility. This situation results in an elevated potential work environment risk for staff. This also hampers the recruitment and retention of workers in a critical area of research and development. In addition, demand for AFRL mission-related research and development services is expected to increase two to three times over current levels; therefore, an increase in laboratory space will be needed to meet this demand. To meet AFRL requirements to expand heavy laboratory space, while continuing the computational science and other administrative and light laboratory tasks, additional modernized laboratory facilities are

necessary. A new laboratory facility would allow energetic science research to expand in the existing building, while computational science, light laboratory uses, and administrative functions would move to the new buildings. A modern, integrated complex located adjacent to the existing laboratory is preferred for the continued fostering of close working relationships between personnel.

This EA only addresses the construction of a Propulsion Energetics Laboratory: a modern laboratory and administrative complex. Discussion and analysis of the activities planned to occur within the facility can be found in the *Programmatic Environmental Assessment of Propulsion Testing Capabilities at the Phillips Laboratory, Edwards Air Force Base, California* (Air Force Flight Test Center [AFFTC] 1998b). Future undefined activities that are not discussed in that document will need to be addressed in a future document.

1.3 Location and Scope of the Proposed Action

Edwards AFB is located in the Antelope Valley region of the western Mojave Desert in southern California. It is about 60 miles northeast of Los Angeles, California. The Base occupies an area of approximately 301,000 acres or 470 square miles. Portions of the Base lie within Kern, Los Angeles, and San Bernardino counties (Figure 1).

The proposed project is located in the AFRL portion of Edwards AFB, approximately 10 miles east of the Main Base. Figure 2 shows the approximate distance from Main Base to AFRL. The proposed project entails construction of a 37,000-square foot facility for administrative and light laboratory tasks. This facility would be located near the existing laboratory at the triangular intersection of Mercury and Saturn Boulevards and Antares Road (Figures 3 and 4).

1.4 Issues and Concerns

The following Sections discuss environmental factors that may be affected and may be of concern due to the proposed action. The factors that are not affected as a result of the proposed action are also presented.

1.4.1 Issues and Concerns Studied in Detail

During the analysis process, the following issues and concerns were identified as requiring assessment when considering the potential environmental impacts of the alternatives.

a. Land Use –The new facility would be subject to the land use provisions of the *Edwards Air Force Base General Plan* (Base General Plan) (AFFTC 2001a) and the architectural compatibility requirements specified in the *Design Standards of the Edwards Air Force Base Comprehensive Plan* (Edwards AFB Design Standards) (AFFTC 1997) that were prepared and adopted as part of the Base General Plan.

b. Air Quality – Implementation of the project would generate air emissions, including criteria pollutant emissions from mobile and stationary sources. These emission sources would include construction vehicles and equipment, privately owned vehicles, and hazardous air pollutants from various construction activities. In addition, particulate matter less than or equal to 10 microns (PM10) would be generated from grading operations during facility construction.

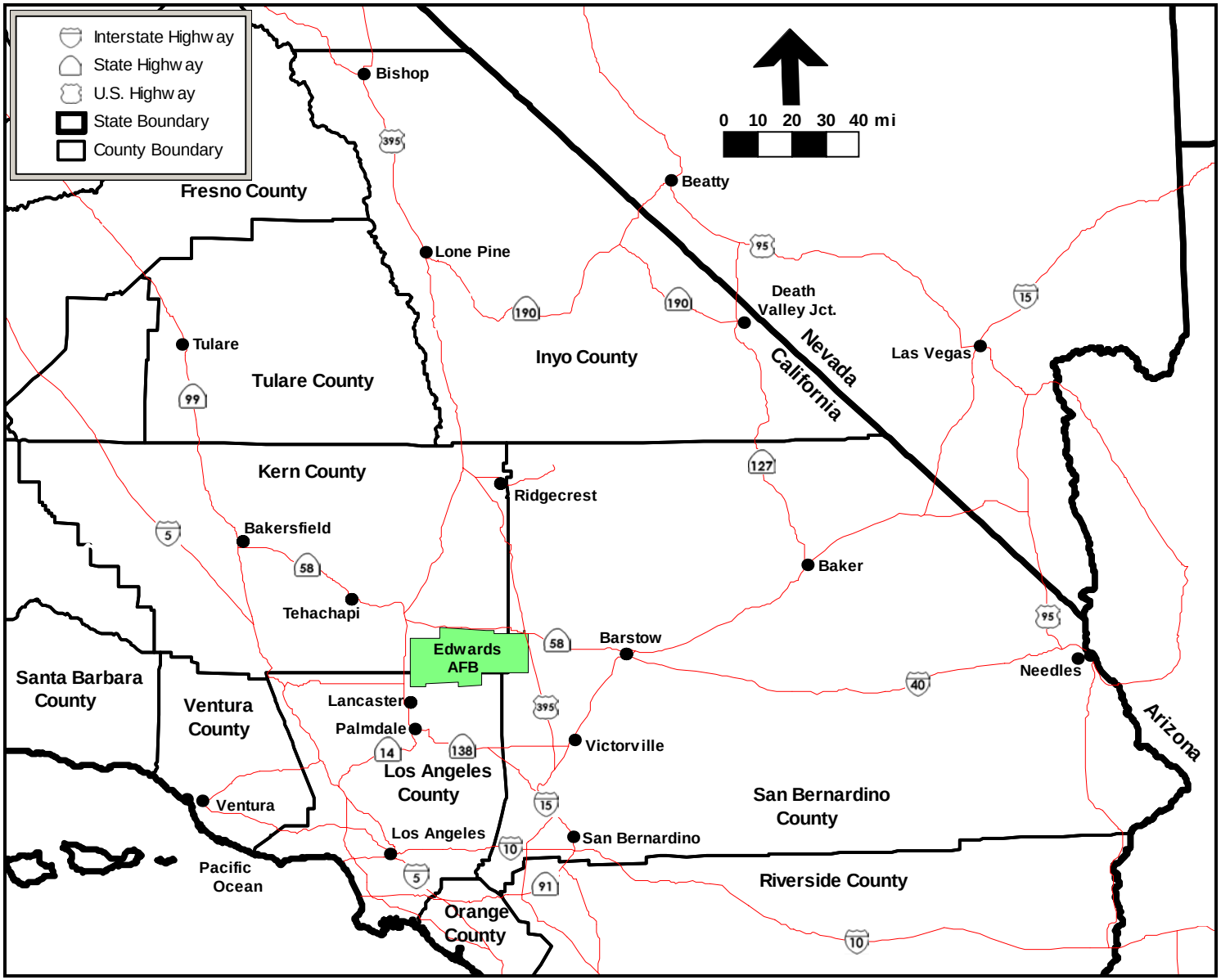

Figure 1 General Vicinity Map

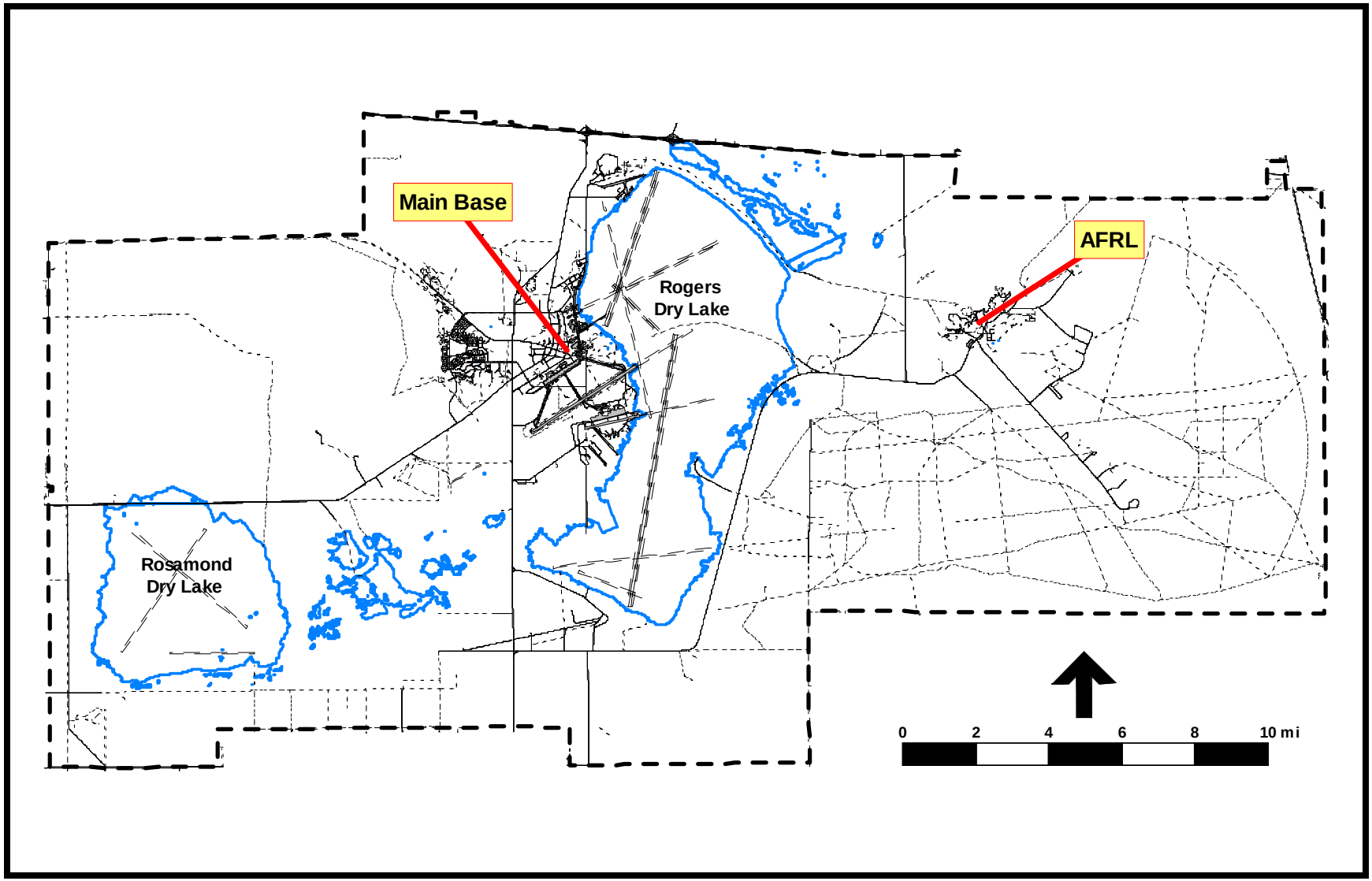

Figure 2 Edwards Air Force Base Overview Map

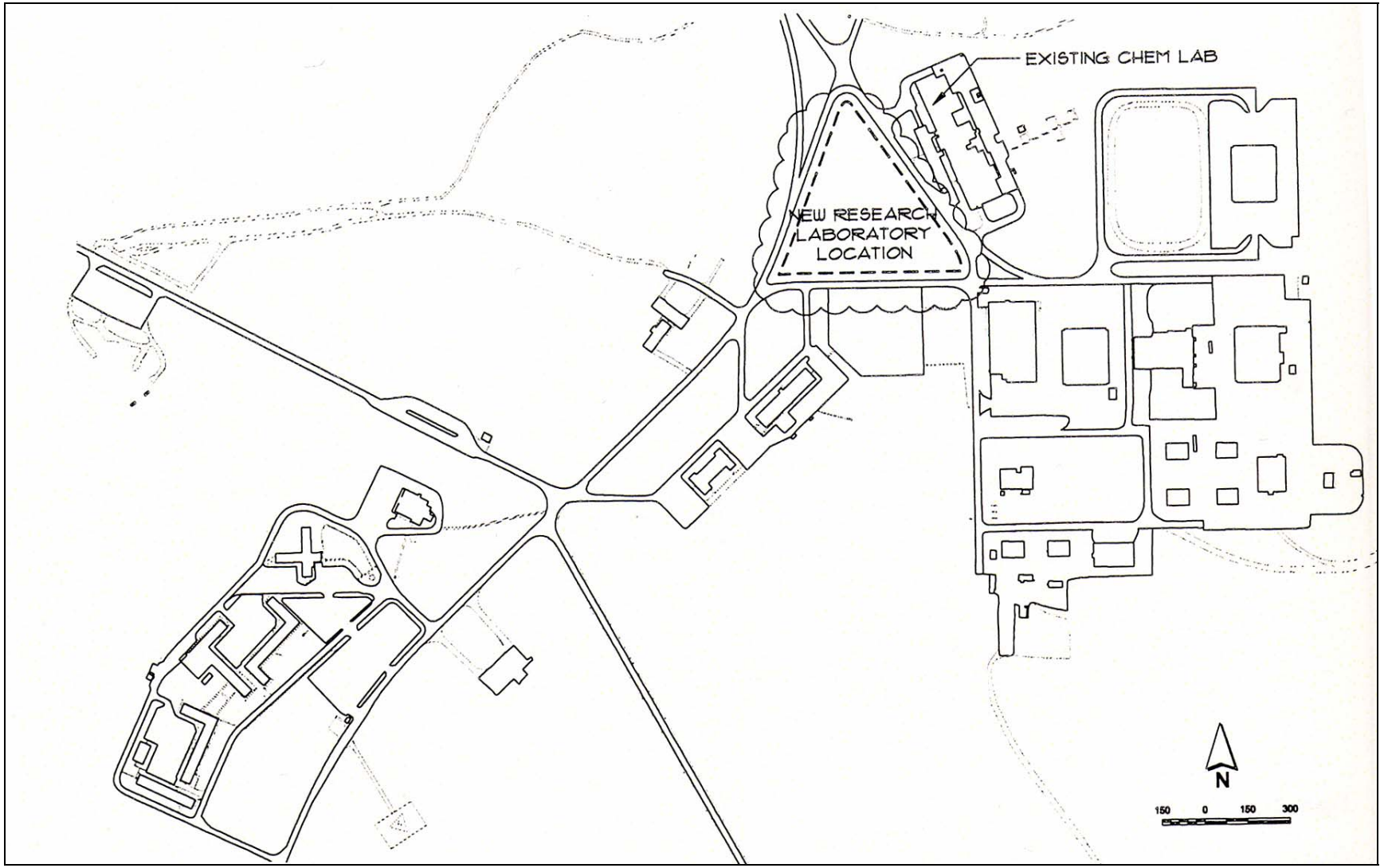

Figure 3 Project Location Map

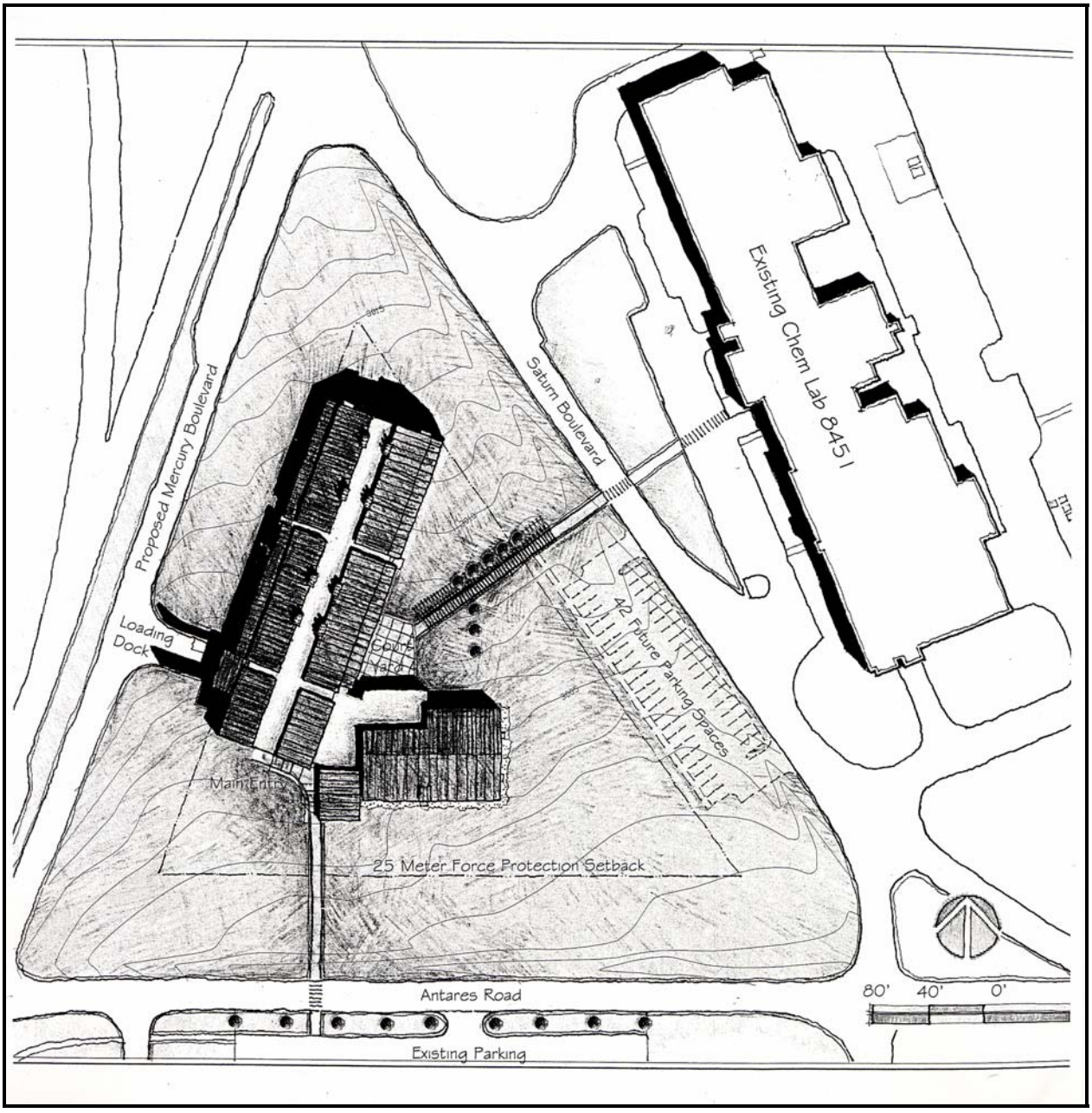

Figure 4 Conceptual Drawing of New Laboratory

c. Water Resources – Construction activities could potentially affect stormwater drainage patterns through changes in site topography and an increase in impermeable surface area.

d. Safety and Occupational Health – Elements of the project have the potential to pose short-term health and safety issues to onsite workers during construction activities. The use of heavy equipment will expose contractors to health and safety risks.

e. Hazardous Materials and Waste – Construction of the new facility will result in the use of hazardous materials and the generation of hazardous wastes. These activities will require the proper use, handling, transportation, and storage of hazardous materials and hazardous waste to prevent human exposure and environmental contamination.

f. Biological Resources – Project activities are not located within a floodplain. The proposed project site is in a developed area of AFRL, where the presence of sensitive or listed species, including desert tortoise, is not likely.

g. Geology and Soils – Building construction must comply with current seismic building codes for the region. Fill material might be required for project activities. The proposed project is located adjacent to an Environmental Restoration Program (ERP) site. Construction activities have the potential to disturb ongoing or future remediation activities.

h. Socioeconomic – The proposed construction activities would generate revenue into the local economy, resulting in a positive impact.

i. Infrastructure – During construction activities, the potential exists for traffic impacts associated with the transportation of material and equipment. Utility lines could be accidentally severed and service interrupted during construction activities.

j. Energy Resources – A newly constructed facility would be more energy efficient, resulting in increased dollar savings to the Air Force.

1.4.2 Issues and Concerns Eliminated from Detailed Study

The following issues and concerns were initially considered, but subsequently eliminated from further consideration in this EA.

a. Cultural Resources – The proposed project utilizes properties that already have been developed and are not located in or adjacent to any property of historic, archaeological, or architectural significance, or within American Indian sites.

b. Environmental Justice and Protection of Children – The Executive Orders (EOs) on Environmental Justice and the protection of children require Federal agencies to identify and address disproportionately high adverse effects of its activities on minority and low-income populations and children. This action has been reviewed in accordance with (IAW) EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, and EO 13045, *Protection of Children from Environmental Health and Safety Risks*. Given that the construction activities would occur entirely at AFRL, the USAF has determined that this action has no substantial, disproportionate impacts to minority, low-income populations, and/or children.

1.5 Regulatory Requirements, Permits, and Approvals

1.5.1 Regulatory Requirements

This EA has been prepared in order to comply with the *National Environmental Policy Act of 1969* (NEPA) and the CEQ regulations implementing NEPA. This document is intended to fulfill the requirements for compliance with Title 40 CFR Parts 1500–1508 and AFI 32-7061, *The Environmental Impact Analysis Process,* the applicable AFI for implementing NEPA.

1.5.2 Permits and Approvals

The contractor/proponent performing the work is responsible for obtaining the relevant permits and accomplishing any required notification. Environmental permitting requirements for all work on Base are coordinated through Environmental Management (EM). The following permits would be required. However, as permitting requirements change, others may also be required.

a. Air quality operational permits are required for stationary construction equipment (e.g., generators, air compressors, welders) exceeding 50 brake horsepower (bhp) that remain on Base for more than 45 days.

b. This project will require an AFFTC Form 5852, *Permit for Industrial Wastewater Discharge, Edwards AFB, California*, to discharge nonhazardous wastewater to the AFRL Wastewater Treatment Facility.

c. In accordance with AFI 32-7042, *Solid and Hazardous Waste Compliance,* a hazardous waste initial accumulation point (IAP) and its proposed location must be approved by and coordinated with Environmental Management.

d. An Air Force Form 103, *Base Civil Engineering Work Clearance Request* (digging permit), is required for any trenching or digging operations that extend 12 or more inches below the ground surface.

e. A traffic control plan shall be filed with Security Police (95 ABW/SPOL), Fire Protection Division (95 ABW/CEFT), and Public Affairs Office (AFFTC/PA).

1.6 Related Environmental Documents

A number of related environmental documents have been prepared and approved that address activities related to project activities as discussed in this EA. The following documents contain information used in the preparation of this EA.

a. *Edwards Air Force Base General Plan* (AFFTC 2001a).

b. *Programmatic Environmental Assessment of Propulsion Testing Capabilities at the Phillips Laboratory, Edwards Air Force Base, California* (AFFTC 1998b).

c. *Science Laboratory Project Definition, AFRL Air Force Research Laboratory, Edwards Air Force Base, California* (Sacramento District Corps of Engineers 2002).

1.7 Future Applicability/Nonapplicability of this Document

Future proposed actions documented on an AF Form 813, *Request for Environmental Impact Analysis*, would be reviewed and evaluated to determine if the future action falls within the scope of this EA. In the event that a future action is determined to fall within the scope of this EA, and no new environmental impacts would occur as a result of the future action, a categorical exclusion (CATEX) could be prepared upon submittal of the AF Form 813. In some cases, a supplement to this EA might be required. In that case, a new Finding of No Significant Impact (FONSI) would be required. Future actions that are found to result in significant impacts to the environment that cannot be minimized to a level of insignificance would need to be addressed in a separate Environmental Impact Statement.

1.8 Organization of this Environmental Assessment

The EA consists of seven Sections and two appendices and are summarized accordingly.

- Section 1.0, Introduction – describes the underlying purpose and need for the proposed action.
- Section 2.0, Description of the Proposed Action and Alternatives – describes the alternatives and summarizes the alternative analysis, including the summary of potential environmental impacts of the alternatives.
- Section 3.0, Affected Environment – describes the existing (affected) environment at Edwards AFB and the surrounding area.
- Section 4.0, Environmental Consequences – discusses the environmental impact of the proposed action, including any environmental effects that cannot be avoided, the relationship between short-term uses of the human environment and the maintenance and enhancement of long-term productivity including cumulative effects resulting from actions taken, and any irreversible or irretrievable commitment of resources that would be involved in the proposed action.
- Section 5.0, References – Provides the references cited throughout the document.
- Section 6.0, List of Preparers and Reviewers – Lists the persons who were primarily responsible for preparing this EA.
- Section 7.0, List of Agencies and Organizations to Whom Copies of the Environmental Assessment are Sent – lists the various agencies and organizations to whom copies of the EA are sent.
- Appendix A, Total AFRL Air Emissions for 2002 – provides the total AFRL air emissions reported for 2002.
- Appendix B, Air Calculations and Conformity Letter – provides air emission calculations and the air conformity letter.

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2.0 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

This Section describes the Proposed Action, Alternative A – Construct a Modern Laboratory and Administrative Complex, and Alternative B – No Action Alternative. In addition, this Section includes a brief discussion of the alternatives considered but eliminated from further study and a comparative analysis of the impacts of the alternatives.

2.1 Alternative A – Construct a Modern Laboratory and Administrative Complex (Proposed Action Alternative)

The Experimental Demonstration Branch at Air Force Research Laboratory (AFRL/PRSO) proposes to construct a modern laboratory (lab) and administrative complex at AFRL on Edwards AFB. To meet the requirements to expand heavy laboratory space while maintaining computational science and other administrative and light laboratory space, a new 37,000-square foot complex would be constructed.

The new facility would contain a computational science section with ample, varied power and backup power; special flooring; appropriate heating, ventilation, and air conditioning (HVAC) and fire suppression systems; and security and lightning protection. Another section of the building would contain the administrative spaces with branch offices, a teleconference room, and support staff. A seminar room, break room, and research laboratory would be located near the main entrance of the building. The final section would contain laboratory space with appropriate HVAC, fume hoods, laboratory gases and deionized water, waste systems, and other specialized research equipment. Included as part of the lab section are pharmacies, chemical storage, and a loading dock. The new facility would be roughly 40 percent administrative and computational science space while the remaining 60 percent would continue research similar to but less volatile (light experiments) than those conducted in the existing laboratory facility, Building 8451. Additional information regarding design plans for this proposed facility can be found in *Science Laboratory Project Definition, AFRL Air Force Research Laboratory, Edwards Air Force Base, California* (Sacramento Corps of Engineers 2002).

All aspects of the architectural design for the building exterior are governed by the Edwards AFB Design Standards. The new building would be a single-story structure approximately 24 feet tall at the laboratory modules and 21 feet tall at the office wing with sloped standing seam roofs.

2.1.1 Site Preparation Activities

Site preparation activities for the construction of a modern laboratory and administrative complex would include:

a. Establishing construction staging areas, access routes, and/or a temporary construction office;

b. Preparing building pads; and

c. Trenching for required underground utilities (e.g., communication links for telephone, fire water, fiber optic, or gas).

2.1.2 Building Construction Activities

Construction activities for the laboratory facility would include:

a. Pour required concrete (e.g., foundations and slabs, function structures, footings, aprons);

b. Install insulation in building and complete needed interior finish work;

c. Install plumbing, fire sprinklers, electrical systems, HVAC systems, fume hoods, waste systems, chemical storage area, and pharmacies;

d. Install project-specific equipment and facilities;

e. Install a truck loading dock;

f. Reroute the existing sanitary sewer and prepare a catch area for chemical waste from the laboratory spaces;

g. Install chemical storage areas with three storage spaces that are 12 by 18 feet or the equivalent area with shelving for bottle storage – one for organics, one for solvents, and one for inorganics. Two storage rooms are required that are 9 by 6 feet with bottle storage – one for oxidizers and one for corrosives/acids; and

h. Prepare the location and install landscape utilizing xeriscape techniques.

2.1.3 Projected Building Occupancy

Based on current floor plans, the maximum number of personnel occupying the new laboratory and administrative complex is calculated at approximately 80. No more than 60 personnel work in the existing facility at a time. This is appropriate for the on-going experimentation and the degree of risk involved. The estimated daily visitor population of the building is 10, including delivery and shipping personnel and potential visitors/scientists to the laboratory itself. The new library and seminar space will also attract people into the building who would not normally work there.

2.1.4 Types of Activities and Experiments

All of the experiments that would occur in the new laboratory are related to administration and research, computational and physical. Several types of laboratory work will be included in the new building. These include: computational, synthesis, fluorine, polyhedral oligomeric silsesquioxanes (POSS), laser, plastics processing, nuclear magnetic resonance imaging, and instructor labs.

2.2 Alternative B – No Action Alternative

Under this alternative, AFRL would continue to utilize the existing chemistry laboratory for all types of experimentation, including heavy and light functions, computational science, and administrative functions. The more dangerous, potentially explosive activities would not be separated from the light functions, computational science, and administrative activities. Existing laboratory facility fume hoods and airflows, which currently are of marginal capacity for removing and preventing the spread of the volume of hazardous fumes presently generated by laboratory activities, would not be upgraded. There would be no new site preparation or building construction-related activities. Building 8451 facilities would not expand to meet growing mission

requirements for additional heavy laboratory space, while continuing computational science and other administrative and light laboratory tasks. The existing potential risk to worker health and safety would remain at an elevated level due to the continued use of Building 8451 for both heavy and light functions. Existing difficulties in retaining and recruiting personnel would persist due to the potentially hazardous work environment.

2.3 Criteria for Selection of a Reasonable Range of Alternatives

The criteria identified in this section establish a minimum set of requirements that must be met in order for an alternative to be considered viable. Those not meeting one or more of the selection criteria have been eliminated from further discussion. Reason(s) for elimination is/are documented in Section 2.4. Alternatives meeting all selection criteria are retained and fully analyzed in Section 4.0, Environmental Consequences, of this EA. The criteria used to select the alternatives discussed in this document are:

a. Technical
   (1) Provide a modern laboratory facility to better support the AFFTC mission.
   (2) Comply with Military Handbook 1190, Part II, *Facility Planning and Design Guide*.
   (3) Comply with the Edwards AFB Design Standards (AFFTC 1997).
   (4) Comply with AF Handbook 32-1084, *Facility Requirements* (1996).
   (5) Comply with the *Edwards Air Force Base Energy Plan* (AFFTC 1995b).
   (6) Comply with national energy goals established by Public Law (PL) 102-486, *Energy Policy Act of 1992*.

b. Operational
   (1) Meet requirements to expand heavy laboratory space while continuing the computational science and other administrative and light laboratory tasks.
   (2) Facilitate scientific collaboration for light and heavy experimentation.
   (3) Meet the expected need to recruit and retain additional laboratory workers.

c. Environmental
   (1) Minimize the amount of area disturbed.

d. Economic
   (1) Meet the expected increase for AFRL mission research and development support.

The AFRL location at Edwards AFB for a new modern laboratory facility is desirable because it will facilitate and allow for increased laboratory research in the areas of chemical and physical property measurement, materials compatibility, development of methods for analysis of aerospace fluids and materials, and in the development of new rocket propellants and propellant ingredients. The Base General Plan indicates that a future building located in the triangular site just to the south of Building 8451, the existing laboratory, is preferred for a new science laboratory.

2.4 Alternatives Considered But Dismissed From Further Consideration

Five alternatives were considered and dismissed from further evaluation because the alternatives did not meet either the stated purpose and need or the selection criteria.

An existing building at AFRL was identified that could potentially be renovated and expanded to meet the needs for a modern laboratory facility. The facility, Building 8424, has convenient access to Building 8451. Building 8424 is known as the Rocket Science Center, and functions as a prototype model construction facility. Building 8424 is currently occupied and contains machine shops and active laboratories. Presentations also occur in the facility. The building was constructed in 1964, was involved in Cold War research, and has been found eligible for the National Register of Historic Places (NRHP) as a historic building. Prior to being modified for use as a new laboratory facility, it would need to be evaluated, and consultation with the State Historic Preservation Office would be required. The high anticipated cost of renovating and expanding the building to meet the needs of a modern facility, required evaluations and consultations with the State Historic Preservation Office, and current usage of the building make converting this building impracticable.

A new facility could be sited elsewhere at AFRL, but other locations also would not enable convenient access to Building 8451 or meet the area development plans for AFRL. The development plan indicates that other locations are selected for other uses; therefore, if a new laboratory facility is located elsewhere, it might impact existing programs.

A new laboratory building located on Main Base could be constructed or an existing building renovated and utilized as a modern laboratory facility. Neither of these options are a viable alternative because siting a laboratory facility on Main Base would not allow a collaborative relationship between the various scientific disciplines found in the two facilities.

Outsourcing scientific research to an off-Base facility is an alternative. Outsourcing the research would not allow a collaborative relationship between AFRL scientists and off-Base scientists.

The alternatives considered for the location of a modern laboratory facility are summarized in Table 1.

2.5 Comparison Summary of Alternatives

Table 2 provides a comparison summary of the project description and location for the Proposed Action, Alternative A – Construct a Modern Laboratory and Administrative Complex, and Alternative B – No Action Alternative. Table 3 provides a summary of the environmental impacts associated with implementing these two alternatives.

TABLE 1
SUMMARY OF ALTERNATIVES CONSIDERED BUT DISMISSED

ALTERNATIVE	DESCRIPTION	REASON DISMISSED
Renovate and expand an existing building at Air Force Research Laboratory (AFRL)	Renovate and expand an existing AFRL building to 37,000 square feet to meet the needs of a modern laboratory.	Only one existing facility is located with convenient access to the existing laboratory. It is currently occupied by another program and the building is eligible for the National Register of Historic Places. Costs are prohibitive.
Construct a new building at AFRL	Construct a 37,000-square foot building at AFRL to meet the needs of a modern laboratory.	No other locations at AFRL would enable convenient access to the existing laboratory or meet the area development plans for AFRL.
Construct a building on Main Base	Construct a 37,000-square foot building on Main Base to meet the needs of a modern laboratory.	Siting a laboratory on Main Base would not allow a collaborative relationship between the scientific disciplines found in the two facilities.
Renovate a building on Main Base	Renovate a building on Main Base to 37,000 square feet to meet the needs of a modern laboratory.	Siting a laboratory on Main Base would not allow a collaborative relationship between the scientific disciplines found in the two facilities.
Outsource the scientific research to an off-Base facility.	Outsource the scientific research to an off-Base facility.	Outsourcing the research would not allow a collaborative relationship between AFRL scientists and off-Base scientists. Security requirements could also present a concern.

TABLE 2
COMPARISON OF ALTERNATIVES

	ALTERNATIVE A (PROPOSED ACTION ALERNATIVE)	ALTERNATIVE B NO ACTION ALTERNATIVE
Title	Construct a Modern Laboratory and Administrative Complex	No Action Alternative
Location	Adjacent to the existing laboratory at the triangular intersection of Mercury and Saturn Boulevards and Antares Road.	Not Applicable
Size	Approximately 37,000 square feet	Not Applicable

TABLE 3
SUMMARY OF POTENTIAL ENVIRONMENTAL IMPACTS

ENVIRONMENTAL ISSUE	ALTERNATIVE A – CONSTRUCT A MODERN LABORATORY AND ADMINISTRATIVE COMPLEX (PROPOSED ACTION ALTERNATIVE)	ALTERNATIVE B NO ACTION ALTERNATIVE
LAND USE		
• Compatibility with the Base General Plan and the Edwards Air Force Base (AFB) Design Standards	The newly constructed building would be compatible with the Base General Plan, the Edwards AFB Design Standards, and all Air Force instructions and regulations regarding building design. Minimizations: Compliance with the Base General Plan and the Edwards AFB Design Standards. The proposed project shall obtain final siting approval from the Base Planning and Zoning Committee.	Construction activities would not occur under this alternative. Minimizations: None required.
AIR QUALITY		
• Tons and types of pollutants generated	Construction of the proposed project would generate 1.28 tons per year (tpy) of volatile organic compounds (VOC) and 12.223 tpy of oxides of nitrogen (NO_x). Hazardous air pollutants (HAP) would be generated during construction activities below the HAP potential to emit (PTE) threshold values. Toxic AB2588 emissions would be similar to, but less than, existing (Assembly Bill 2588, *Air Toxics "Hot Spots" Information and Assessment Act of 1987*).	Minimizations: None required because the air quality from the current facility will not change and will remain in accordance with Kern County Air Pollution Control District (KCAPCD) air quality regulations.
• Regional significance of emissions	Not regionally significant. Minimizations: None required.	Not regionally significant. Minimizations: None required.
• Permits required	Air quality operational permits are required for construction equipment exceeding 50 brake horsepower remaining on Base more than 45 days. A permit is required for the exhaust fumes in the laboratory. Minimizations: Compliance with air quality rules and regulations (Air Force Instruction 32-7040, Air Quality Compliance, Air Toxics, Air Force Materiel Command standard operating procedures (SOPs), HAP, best available control technology [BACT]). Construction-related particulate matter less than 10 microns (PM10) controls will be implemented. Maintain mechanical equipment in working order according to applicable technical orders and equipment maintenance manuals to reduce emissions to acceptable levels.	No permits are required for this alternative. Minimizations: None required because there will be no increase in air emissions that would require monitoring or reduction.

TABLE 3 (Continued)
SUMMARY OF POTENTIAL ENVIRONMENTAL IMPACTS

ENVIRONMENTAL ISSUE	ALTERNATIVE A – CONSTRUCT A MODERN LABORATORY AND ADMINISTRATIVE COMPLEX (PROPOSED ACTION ALTERNATIVE)	ALTERNATIVE B NO ACTION ALTERNATIVE
WATER RESOURCES		
• Quality of stormwater runoff	Construction debris or hazardous materials have the potential to be introduced into the stormwater drainage system.	No change from existing conditions.
	Minimizations: Project proponent/contractor should develop a site-specific Stormwater Pollution Prevention Plan and follow the Best Management Practices within this Plan.	Minimizations: None required because no new construction would occur.
• Generation of wastewater	Project activities would generate wastewater.	No change from existing conditions.
	Minimizations: All conditions and requirements of California Water Resources Control Board (CWRCB) Order 6-99-33, *Air Force Research Laboratory Wastewater Treatment Facility*, shall be met prior to disposal of nonhazardous wastewater to the wastewater treatment facility (CWRCB, Lahontan District 1999). The proposed project shall comply with Air Force Flight Test Center Instruction 32-6, *Edwards AFB Wastewater Instruction.*	Minimizations: None required.
• Temporary closure of roadways or rerouting of traffic may be required	Any required road closure or rerouting of traffic would be expected to be temporary.	There would be no change from existing conditions.
	Minimizations: All work affecting closure, rerouting, or other modification of roadways or streets shall be coordinated with the Security Forces, Fire Department, and Public Affairs Office.	Minimizations: None required.
SAFETY AND OCCUPATIONAL HEALTH		
• Potential for exposure to hazardous noise levels	Hazardous noise levels would be generated by construction equipment activities.	No change from existing conditions.
	Minimizations: Personnel present within hazardous noise areas as stated in Air Force Occupational Safety and Health Administration Standard 48-19, *Hazardous Noise Program*, shall follow the applicable hearing protection measures.	Minimizations: None required.

TABLE 3 (Continued)
SUMMARY OF POTENTIAL ENVIRONMENTAL IMPACTS

ENVIRONMENTAL ISSUE	ALTERNATIVE A – CONSTRUCT A MODERN LABORATORY AND ADMINISTRATIVE COMPLEX (PROPOSED ACTION ALTERNATIVE)	ALTERNATIVE B NO ACTION ALTERNATIVE
SAFETY AND OCCUPATIONAL HEALTH (Concluded)		
• Potential for exposure to Environmental Restoration Program (ERP) site contamination	Project activities will occur adjacent to ERP Site 133. Project activities are not expected to encounter contaminated soil or groundwater.	No change from existing conditions.
• Potential for exposure to hazardous materials	Hazardous materials such as solvents, sealants, paints, and oil products would potentially be present at the construction site.	Buildings constructed prior to 1980 still contain asbestos-containing materials (ACM), lead-based paint (LBP), and possible polychlorinated biphenyls (PCB)-containing light fixtures. Potential exposure to hazardous material would not change.
	Minimizations: The proponent/contractor shall comply with all applicable Federal, State, and local laws and regulations.	Minimizations: Some building locations contain ACM and LBP that may pose a health risk. These locations will require abatement by removal of material or surface covering and will occur on an as-needed basis.
HAZARDOUS MATERIALS AND WASTE		
• Type and amount of hazardous material used	Materials used to clean equipment parts such as solvents, sealants, paints, and oil products would be similar to those already used on Edwards AFB. The types of hazardous materials most commonly used during construction projects include acids, corrosives, caustics, glycols, compressed gases, paints and paint thinners, solvents, sealants, adhesives, cements, caulking, fire retardant, and hot asphalt (140 degrees Fahrenheit or greater).	No change from existing conditions.
	Minimizations: The proponent/contractor shall comply with all applicable Federal, State, and local laws and regulations.	Minimizations: The proponent/contractor shall comply with all applicable Federal, State, and local laws and regulations.

TABLE 3 (Continued)
SUMMARY OF POTENTIAL ENVIRONMENTAL IMPACTS

ENVIRONMENTAL ISSUE	ALTERNATIVE A – CONSTRUCT A MODERN LABORATORY AND ADMINISTRATIVE COMPLEX (PROPOSED ACTION ALTERNATIVE)	ALTERNATIVE B NO ACTION ALTERNATIVE
HAZARDOUS MATERIALS AND WASTE (Concluded)		
• Type and amount of hazardous waste generated	Waste material could include paint blast media, used oil, and used solvent similar to other minor equipment repair/cleaning shops at Edwards AFB. Minimizations: The proponent/contractor shall comply with all applicable Federal, State, and local laws and regulations. In accordance with AFI 32-7042, *Solid and Hazardous Waste Compliance*, a hazardous waste initial accumulation point and its proposed location must be approved by and coordinated with Environmental Management.	No change from existing conditions. Minimizations: The proponent/contractor shall comply with all applicable Federal, State, and local laws and regulations.
• Proposed action would generate construction/ demolition waste (CDW)	This alternative would generate CDW through the construction of the building. Minimizations: The proponent/contractor should segregate recoverable and recyclable materials from the wastestream and deliver the material to the appropriate reclamation facility. Solid waste shall be transported to a State-licensed facility (off Base).	New construction would not occur. Maintenance conducted on an as-needed basis at the existing facility may generate minor amounts of CDW. Minimizations: Conditions would remain the same and disposal of any CDW debris generated would follow all Federal, State, and local laws and regulations.
BIOLOGICAL RESOURCES		
• Potential Impact to Animal Species	Proposed project activities could result in injury or loss of desert tortoise habitat/burrows located within borrow-site areas. Minimizations: Contractor shall adhere to the terms and conditions of the biological opinions listed in Section 3.6.2 of this EA.	Construction of a new facility in the area would not occur; therefore, fill material would not be required. Consequently, disturbance to biological habitats and the chances of accidental takes would not occur. Minimizations: None required.

TABLE 3 (Continued)
SUMMARY OF POTENTIAL ENVIRONMENTAL IMPACTS

ENVIRONMENTAL ISSUE	ALTERNATIVE A – CONSTRUCT A MODERN LABORATORY AND ADMINISTRATIVE COMPLEX (PROPOSED ACTION ALTERNATIVE)	ALTERNATIVE B NO ACTION ALTERNATIVE
GEOLOGY AND SOILS		
• Soil disturbance/erosion	Site preparation, grading, and construction activities may disturb soil surfaces; short-term erosion may occur when soils become exposed to high winds, heavy rains, or vehicular and equipment use.	New construction would not occur. There would be no change from existing conditions.
	Minimizations: All earthwork activities should be planned and conducted to minimize the duration that soils would be left unprotected. The extent of the area of disturbance necessary to complete the project should be minimized. Ground-disturbing activities should be delayed during high-wind conditions (in excess of 25 miles per hour). Exposed surfaces should be periodically sprayed with water.	Minimizations: None required.
• Fill material will be needed for site preparation and grading activities	Use of on-Base approved borrow pits can incrementally contribute to a future requirement to expand on-Base borrow pits once the supply of fill material available within the approved boundaries of excavation is exhausted. The overall impact is not expected to be substantial. No more than 111,000 cubic yards of fill material will be needed for this project.	No fill material will be needed.
	Minimizations: Fill material shall be obtained from an on-Base or State-licensed off-Base borrow area.	Minimizations: None required.
• Environmental Restoration Project (ERP) wells and lines in the area	An ERP monitoring well is located on the project site.	New construction would not occur. There would be no change from existing conditions..
	Minimizations: Damage to monitoring wells must be avoided. Coordinate with the operable unit manager.	Minimizations: None required.

TABLE 3 (Continued)
SUMMARY OF POTENTIAL ENVIRONMENTAL IMPACTS

ENVIRONMENTAL ISSUE	ALTERNATIVE A – CONSTRUCT A MODERN LABORATORY AND ADMINISTRATIVE COMPLEX (PROPOSED ACTION ALTERNATIVE)	ALTERNATIVE B NO ACTION ALTERNATIVE
GEOLOGY AND SOILS (Concluded)		
• Seismicity	Should existing dormant faults become active, the earthquakes and tremors may become an issue in the area. Minimizations: Design standards to be followed include: Air Force Manual 88-3(CH-13), *Seismic Design of Buildings*; the U.S. Army Corps of Engineers Guide Specification No. 13080, *Seismic Protection for Mechanical and Electrical Equipment*; the Uniform Building Code Chapters 23, 26, 27, and 29 (International Conference of Building Officials 1997) with the applicable California Supplements; and Kern County building codes.	No change from existing environment. Minimizations: Should building renovations be required in the future, Alternate A minimizations should be followed.
SOCIOECONOMICS		
• Generation of revenue into the local economy	Incremental benefit would be realized from funds spent in nearby communities. Minimizations: None required.	There would be no change from existing conditions. Minimizations: None required.
INFRASTRUCTURE		
• Construction equipment and materials to and from the project site have the potential to impact existing traffic patterns	Minor, short-term traffic congestion is expected when large, slow-moving vehicles travel on access roads through AFRL. Minimizations: Traffic routes should be limited.	There would be no change from existing conditions. Minimizations: None required.
• Potential for interruption of utility services	Damage to existing utility lines within the project area may occur through accidental severance during earth-moving activities and would result in an interruption of service. Minimizations: Coordinate AF Form 103, *Base Civil Engineering Work Clearance Request*, through the Civil Engineer Group.	There would be no change from existing conditions. No new construction would occur. Minimizations: None required.

TABLE 3 (Concluded)
SUMMARY OF POTENTIAL ENVIRONMENTAL IMPACTS

ENVIRONMENTAL ISSUE	ALTERNATIVE A – CONSTRUCT A MODERN LABORATORY AND ADMINISTRATIVE COMPLEX (PROPOSED ACTION ALTERNATIVE)	ALTERNATIVE B NO ACTION ALTERNATIVE
ENERGY RESOURCES		
• Use of energy-efficient equipment	The incorporation of energy-saving heating and air conditioning systems, hot water systems, and energy management control systems would meet the goals of the *Energy Policy Act of 1992* (Public Law 102-486) and Executive Order 13123, 1999, *Greening the Government Through Efficient Energy Management*. It would also result in energy and cost savings to the Air Force. Minimizations: Implementing energy efficient awareness to building personnel would be added to energy cost savings over the long term.	Current systems may not be energy efficient. Minimizations: Measures would be implemented on an as-needed basis.

3.0 AFFECTED ENVIRONMENT

This Section describes the relevant resources at Edwards AFB that may impact or may be impacted by any of the action alternatives if implemented. This Section also establishes the baseline against which the decision maker and the public can compare the effects of all action alternatives. The following attributes comprise the existing environment: Land Use, Air Quality, Water Resources, Safety and Occupational Health, Hazardous Materials and Waste, Biological Resources, Geology and Soils, Socioeconomics, Infrastructure, and Energy Resources. These elements are described in the following sections.

3.1 Land Use

The proposed project is located within AFRL in a moderately disturbed area. The Base General Plan (AFFTC 2001a) identifies the proposed project location as an ideal location for a new science laboratory. Construction of a facility in this area would anchor the northeastern portion of the entry drive along Mercury Boulevard.

3.1.1 Regulatory Requirements/Guidance

Air Force Instruction 32-7062, *Air Force Comprehensive Planning*, contains the responsibilities and requirements for comprehensive planning and describes the procedures for developing, implementing, and maintaining the Comprehensive Plan within the installation.

3.1.2 On-Base Land Use

The overall land use of AFRL is engineering test with limited quality of life amenities (Figure 5). All land use changes should be made according to the guidelines of the *Integrated Natural Resources Management Plan for Edwards Air Force Base* (AFFTC 2001b) and the Edwards AFB Planning and Zoning Committee.

3.1.2.1 Architectural Compatibility

The Edwards AFB Design Standards (AFFTC 1997) have been prepared and adopted as part of the Base General Plan in order to:

a. Ensure consistency in the construction and design of buildings, their interiors, and infrastructure systems throughout Edwards AFB; and

b. Create a common level of understanding on how to design future projects at Edwards AFB.

The Design Standards deal with all aspects of facility development, from new construction and design, to additions and remodeling. For new construction, the general approach targets the development of modernized facilities that incorporate solar control features such as deep overhangs, recessed windows, and protected entrances and exits. The recommended scale is generally low, with a marble crème color and redwood-colored low-hip roofs. Composite building panels in a marble crème color are acceptable for building wall construction; redwood is the preferred accent color. This approach is characterized as a modern, southwest style with features softer than the flat roof box look of the traditional southwest style.

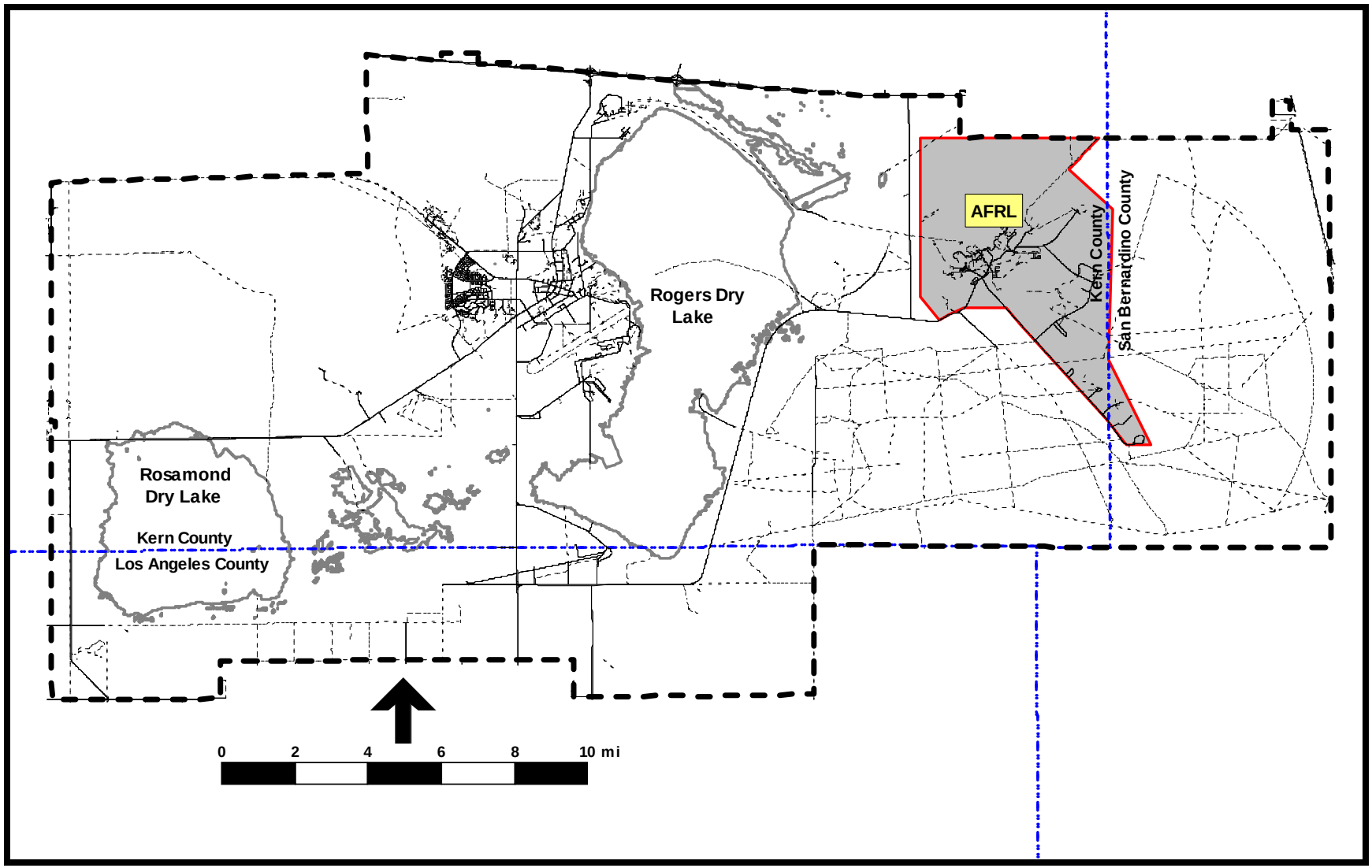


Figure 5 AFRL Overview

3.2 Air Quality

3.2.1 Regulatory Requirements/Guidance

The 1970 *Clean Air Act* (CAA) and the 1990 *Clean Air Act Amendments* (CAAA) (42 USC 7401–7671 and 42 USC 7661) regulate air pollution emissions from stationary and mobile sources to protect public health and welfare. Air quality regulations were first promulgated with the CAA and revised with the CAAA. Stationary sources at Edwards AFB typically include fixed sources such as internal combustion engine (ICE) generators, external combustion boilers, and spray paint booths. Mobile sources typically include motor vehicles, construction equipment, and aircraft.

Title 40 CFR Part 61, *National Emission Standards for Hazardous Air Pollutants*, states that in addition to complying with the provisions of this Part, the owner or operator of a stationary source subject to standards in this Part may be required to obtain an operating permit issued to stationary sources by an authorized State air pollution control agency or by the Administrator of the U.S. EPA pursuant to Title V of the CAA as amended 15 November 1990 (42 USC 7661).

States are required to develop a State Implementation Plan (SIP) that sets forth how the CAAA provisions will be implemented within the State. The SIP is the primary means for the implementation, maintenance, and enforcement of the measures needed to attain and maintain the National Ambient Air Quality Standards (NAAQS) within each State. The purpose of the SIP is twofold. First, it must provide a control strategy that will result in the attainment and maintenance of the NAAQS. Second, it must demonstrate that progress is being made in attaining the standards in each nonattainment area. The California Ozone (O_3) SIP was approved by the U.S. EPA in September 1996 and codified as law in 40 CFR 52, Subpart F, *Approval and Promulgation of Implementation Plans – California*.

3.2.2 Environmental Setting

Edwards AFB lies within the Mojave Desert Air Basin (MDAB). Three different air pollution control districts have jurisdiction over some part of the Base. The proposed project site lies within the Kern County Air Pollution Control District (KCAPCD). The Mojave Desert Air Quality Management District (MDAQMD) has jurisdiction in San Bernardino County to the east of the site, and the Antelope Valley Air Quality Management District (AVAQMD) has jurisdiction in Los Angeles County, south of the site.

3.2.2.1 Climate

The Mojave Desert is sheltered from maritime weather influences of the Pacific Ocean by the Coastal range to the west and the San Gabriel Mountains to the south.

The MDAB has an arid continental desert climate.

The climate of the Mojave Desert is governed by the strength and location of a semipermanent, subtropical, high-pressure cell over the Pacific Ocean. In general, hot summers, cold winters, infrequent rainfall, active air movement, and very low relative humidity characterize the climate of most of the region.

Thunderstorm activity in the region is rare. Relative humidity at the Base is very low in the summer (30 to 50 percent in the early morning; 10 to 20 percent in the late afternoon). These conditions promote intensive heat during the day in the summer and marked cooling at night. The intense solar radiation in the summer is highly conducive to the formation of ozone and other photochemical oxidants in the atmosphere, but only when precursor chemicals are present.

3.2.2.2 Wind/Pollutant Dispersion

The prevailing wind direction is from the west-southwest (240 degrees) throughout the year with an average wind speed of 8 miles per hour (mph). The highest average wind speeds occur during the spring and summer, with the lowest wind speeds occurring during the winter. Calm winds occur about 19.3 percent of the time on an annual basis. Atmospheric stability, the measure of vertical dispersion of pollutants, is high at Edwards AFB. Stable conditions, which are an indication of weak pollutant dispersion, exist about 57 percent of the time; thus indicating that the potential for collection of pollution in the area is relatively high.

Area mountain and valley patterns can cause a wide fluctuation in the levels of rainfall, and temperatures influence basin wind flow that in turn affect dispersion along mountain ridges, vertical mixing, and photochemistry of pollutants.

The Tehachapi Pass in the Tehachapi Mountains and the pass through Saugus on Highway 14 serve as conduits allowing air movement from the San Joaquin Valley and the Los Angeles areas into the western portion of the MDAB. This air movement allows pollutant transport from the San Joaquin Valley and the Los Angeles basin to influence the air quality of the MDAB. Air pollution also enters the Antelope Valley from the San Bernardino area through the Cajon Pass (AFFTC 1995a).

3.2.2.3 Baseline Air Quality

Air quality in a given location is described by the concentration of various pollutants in the atmosphere, generally expressed in units of parts per million (ppm) or micrograms per cubic centimeter. Air quality is determined by the type and amount of pollutants emitted into the atmosphere, the size and topography of the air basin, and the prevailing meteorological conditions. The significance of the pollutant concentration is determined by comparing it to the Federal ambient air quality standards. The U.S. EPA has established ambient air quality standards for various pollutants. They are referred to as the NAAQS. The California Air Resources Board (CARB) has also established California Ambient Air Quality Standards (CAAQS). These standards represent the maximum allowable atmospheric concentrations that may occur while ensuring protection of public health and welfare, with a reasonable margin of safety.

The U.S. EPA has developed numerical concentration-based NAAQS for seven criteria pollutants under the provisions of the CAA. The NAAQS have been established for O_3, PM10, fine particulate matter (PM2.5), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), and lead (Pb).

The CARB has developed numerical concentration-based CAAQS for the same seven criteria pollutants plus visibility reducing particles, sulfates, hydrogen sulfide, and vinyl chloride. The criteria pollutants and State CAAQS and Federal NAAQS are presented in Table 4.

Air quality in a given location is described by the concentration of various pollutants in the atmosphere. The type and amount of pollutants emitted into the atmosphere, the size and topography of the air basin, and the prevailing weather conditions determine air quality. The significance of the pollutant concentration is determined by comparing it to the Federal and State ambient air quality standards. These standards represent the maximum allowable atmospheric concentrations that may occur while ensuring protection of public health and welfare, with a reasonable margin of safety.

The CARB and U.S. EPA track air quality on an ongoing basis and designate areas or basins as either attainment or nonattainment, on a pollutant-specific basis, IAW either CAAQS or NAAQS. Several levels of nonattainment may exist for a particular pollutant, depending upon the severity of noncompliance with applicable CAAQS and NAAQS. *Marginal*, *moderate*, *serious*, *severe*, and *extreme* nonattainments are all legally mandated classifications for an area or basin that is in nonattainment for a particular pollutant. Unclassified denotes a lack of data or other information sufficient to make a designation. Unclassified areas are treated as attainment areas until proven otherwise.

Air Quality in the KCAPCD has *serious* nonattainment status for ozone under Federal and State regulations, although air-monitoring data from the western Mojave justifies a marginal status and KCAPCD is currently working with CARB and the Air Resources Board (ARB) to have the status changed. The area is in attainment status for PM10 under Federal regulations, but is nonattainment under State standards. Table 5 presents the attainment status of eastern Kern County for criteria pollutants.

3.2.2.3.1 Ozone

Ozone is what is referred to as a secondary pollutant, a pollutant formed in the atmosphere by photochemical reactions involving previously emitted pollutants or precursors. Ozone precursors are mainly two types, volatile organic compounds (VOCs) and NO_x. The VOCs are organic compounds that contain carbon and hydrogen. The U.S. EPA defines a VOC as any organic compound that participates in atmospheric photochemical reactions. Nitrogen oxides is the designation given to the group of all oxygenated nitrogen species, including nitric oxide, nitrogen dioxide, nitric anhydride, and nitrous anhydride. Since VOCs and NO_x participate in atmospheric photochemical reactions that produce ozone, the attempt is made to control ozone through the control of VOCs and NO_x. Therefore, the pollutants of concern are VOCs and NO_x.

Identifying the region of influence for air quality assessment requires knowledge of the pollutant types, source emission rates and release parameters, and local and regional meteorological conditions. For inert pollutants (all pollutants other than ozone, its precursors, and NO_2), the region of influence is generally limited to an area within a few miles downwind from the source. The region of influence for ozone may extend much farther downwind than that for other pollutants. In the presence of solar radiation, the maximum effect of precursor emissions on ozone

TABLE 4
FEDERAL AND STATE AMBIENT AIR QUALITY STANDARDS

Pollutant	Averaging Time	California Standards[1]		Federal Standards[2]		
		Concentration[3]	Method[4]	Primary[3,5]	Secondary[3,6]	Method[7]
Ozone (O_3)	1 Hour	0.09 ppm (180 µg/m^3)	Ultraviolet Photometry	0.12 ppm (235 µg/m^3)[8]	Same as Primary Standard	Same as Primary Standard
	8 Hours	N/A		0.08 ppm (157 µg/m^3)[8]		
Respirable Particulate Matter (PM10)	24 Hours	50 µg/m^3	Gravimetric or Beta Attenuation	50 µg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	20 µg/m^{3*}		150 µg/m^3		
Fine Particulate Matter (PM2.5)	24 Hours	No Separate State Standard		65 µg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	12 µg/m^{3*}	Gravimetric or Beta Attenuation	15 µg/m^3		
Carbon Monoxide (CO)	8 Hours	9 ppm (10 mg/m^3)	Nondispersive Infrared Photometry (NDIR)	9 ppm (10 mg/m^3)	None	NDIR
	1 Hour	20 ppm (23 mg/m^3)		35 ppm (40 mg/m^3)		
	8 Hours (Lake Tahoe)	6 ppm (7 mg/m^3)		N/A		N/A
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean	N/A	Gas Phase Chemiluminescence	0.053 ppm (100 µg/m^3)	Same as Primary Standard	Gas Phase Chemiluminescence
	1 Hour	0.25 ppm (470 µg/m^3)		N/A		
Sulfur Dioxide (SO_2)	Annual Arithmetic Mean	N/A	Ultraviolet Fluorescence	0.03 ppm (80 µg/m^3)	N/A	Spectrophotometry (Pararosaniline Method)
	24 Hours	0.04 ppm (105 µg/m^3)		0.14 ppm (365 µg/m^3)	N/A	
	3 Hours	N/A		N/A	0.5 ppm (1300 µg/m^3)	
	1 Hour	2.25 ppm (655 µg/m^3)		N/A	N/A	N/A
Lead (Pb) [9]	30-Day Average	1.5 µg/m^3	Atomic Absorption	N/A	N/A	N/A
	Calendar Quarter	N/A		1.5 µg/m^3	Same as Primary Standard	High Volume Sampler and Atomic Absorption
Visibility Reducing Particles	8 Hours	Extinction coefficient of 0.23 per kilometer-visibility of 10 miles or more (0.07 per kilometer-visibility, 30 miles or more for Lake Tahoe) due to particles when relative humidity is less than 70 per percent. Method: Beta Attenuation and Transmittance through Filter Tape.		No Federal Standards		
Sulfates	24 Hours	25 µg/m^3	Ion Chromatography			

TABLE 4 (Concluded)
FEDERAL AND CALIFORNIA AMBIENT AIR QUALITY STANDARDS

Pollutant	Averaging Time	California Standards[1]		Federal Standards[2]		
		Concentration[3]	Method[4]	Primary[3,5]	Secondary[3,6]	Method[7]
Hydrogen Sulfide	1 Hour	0.03 ppm (42 μg/m^3)	Ultraviolet Fluorescence	No Federal Standards		
Vinyl Chloride[9]	24 Hours	0.01 ppm (26 μg/m^3)	Gas Chromatography			

Source: California Air Resources Board, 09 July 2003

Notes: 1. ppm – parts per million
2. μg/m^3 – 1 x 10^{-6} grams per cubic meter
3. N/A – Not Applicable

*****On 20 June 2002, the Air Resources Board approved staff's recommendation to revise the PM10 annual average standard to 20 μg/m^3 and to establish an annual average standard for PM2.5 of 12 μg/m^3. These standards will take affect upon final approval by the Office of Administrative Law, which is expected in May 2003. Information regarding these revisions can be found at http://www.arb.ca.gov/research/aaqs/std-rs/std-rs.htm**.**

[1]California standards for ozone, carbon monoxide (except Lake Tahoe), sulfur dioxide (1 and 24 hour), nitrogen dioxide, suspended particulate matter – PM10, PM2.5, and visibility reducing particles, are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the *Table of Standards* in Title 17 California Code of Regulations Section 70200.

[2]Federal standards (other than ozone, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest 8-hour concentration in a year, averaged over 3 years, is equal to or less than the standard. For PM10, the 24-hour standard is attained when 99 percent of the daily concentrations, averaged over 3 years, are equal to or less than the standard. For PM2.5, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over 3 years, are equal to or less than the standard. Contact the U.S. EPA for further clarification and current Federal policies.

[3]Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25 degrees Centigrade and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25 degrees Centigrade and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

[4]Any equivalent procedure that can be shown to the satisfaction of the ARB to give equivalent results at or near the level of the air quality standard may be used.

[5]National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.

[6]National Secondary Standards: The levels of air quality necessary to protect the public welfare from any know or anticipated adverse effects of a pollutant.

[7]Reference method is as described by the U.S. EPA. An "equivalent method" of measurement may be used but must have a "consistent relationship to the reference method" and must be approved by the U.S. EPA.

[8]The U.S. EPA promulgated new Federal 8-hour ozone and fine particulate matter standards on 18 July 1997. Contact the U.S. EPA for further clarification and current Federal policies.

[9]The ARB has identified lead and vinyl chloride as "toxic air contaminants" with no threshold of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

TABLE 5
ATTAINMENT STATUS OF EASTERN KERN COUNTY

Pollutant	Federal Status	State Status
Ozone (O_3)	*Serious* Nonattainment	*Moderate* Nonattainment
Respirable Particulate Matter (PM10)	Unclassified	Nonattainment
Fine Particulate Matter (PM2.5)	Unclassified[1]	Unclassified[1]
Carbon Monoxide (CO)	Unclassified/Attainment	Unclassified
Nitrogen Dioxide (NO_2)	Unclassified/Attainment[2]	Attainment[3]
Sulfur Dioxide (SO_2)	Unclassified/Attainment[2]	Unclassified[3]
Lead[4]	Attainment	Attainment[3]
Visibility Reducing Particles	No Federal Standard	Unclassified[3]
Sulfates	No Federal Standard	Attainment
Hydrogen Sulfide	No Federal Standard	Unclassified
Vinyl Chloride[4]	No Federal Standard	Unclassified

Source: California Air Resources Board, 9 June 2003

[1]PM2.5 is currently not classified due to technical difficulties with measuring these particles. PM10 is being used as a surrogate for New Source Review until difficulties are resolved.
[2]All areas in the State are either attainment or unclassified for nitrogen dioxide and sulfur dioxide.
[3]All areas in the State are either attainment or unclassified for nitrogen dioxide, sulfur dioxide, lead, and visibility reducing particles.
[4]The ARB has identified lead and vinyl chloride as 'toxic air contaminants' with no threshold of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

levels usually occurs several hours after they are emitted and many miles from the source. Ozone and its precursors transported from other regions can also combine with local emissions to produce high local ozone concentrations. Ozone concentrations are generally the highest during the summer months and coincide with periods of maximum solar radiation. The maximum effect of precursor emissions on ozone levels usually occurs several hours after they are emitted and many miles from the source. Ozone and its precursors transported from other regions can also combine with local emissions to produce high local ozone concentrations. Ozone concentrations are generally the highest during the summer months and coincide with periods of maximum solar radiation. Maximum ozone concentrations tend to be regionally distributed because precursor emissions are homogeneously dispersed in the atmosphere (AFFTC 1995a). Ozone may pose a health threat to those who already suffer from respiratory diseases as well as healthy people.

3.2.2.3.2 Particulate Matter

Particulate matter consists of very small liquid and solid particles in the air. Particulate matter less than 10 microns in diameter are referred to as PM10. Sources of PM10 include motor vehicles; wood-burning stoves and fireplaces; dust from construction, landfills, and agriculture; wildfires and bush/waste burning; industrial sources; and windblown dust from open lands. Particulate matter also forms when gases are emitted from motor vehicles. Particulate matter also causes reduced visibility. Health effects include increased respiratory disease, lung damage, and cancer, thus resulting in premature death.

The measurement of existing ambient criteria pollutant concentrations is accomplished using air quality monitoring stations. The closest CARB air quality monitoring station to Edwards AFB is located in Mojave, California. Table 6 presents the 2000 through 2002 data received at the monitoring station for criteria pollutants as they relate to NAAQS and CAAQS and the number of times the criteria pollutants measured at the Mojave Air Station equaled or exceeded the standards

TABLE 6
NUMBER OF DAYS MOJAVE AIR STATION WAS ABOVE
THE HOURLY STANDARD FOR CRITERIA POLLUTANTS

CRITERIA POLLUTANT	DAYS EQUAL TO OR EXCEEDING AIR QUALITY STANDARDS	
	NAAQS	CAAQS
Ozone	0 (2000) 1 (2001) 0 (2002)	25 (2000) 33 (2001) 18 (2002)
Respirable Particulate Matter (PM10)	0 (2000) 0 (2001) 1 (2002)	0 (2000) 0 (2001) 0 (2002)
Fine Particulate Matter (PM2.5)	0 (2000) 0 (2001) 0 (2002)	0 (2000) 0 (2001) 0 (2002)
Nitrogen Dioxides		0 (2000) 0 (2001) 0 (2002)

Source: California Air Resources Board, 15 May 2003

Notes: 1. NAAQS – National Ambient Air Quality Standards
2. CAAQS – California Ambient Air Quality Standards

for a given year. For the purpose of this EA, these data are provided as information only. It illustrates the current ambient air quality in the Edwards AFB area.

Within the State of California, the authority to regulate sources of air emissions resides with the CARB and is delegated to local air pollution control and air quality management districts. Local districts enact rules and regulations to achieve SIP requirements. As shown in Figure 6, Edwards AFB is located within the jurisdiction of three local air districts: KCAPCD, MDAQMD, and AVAQMD.

3.2.3 Local District Control

The nonattainment status of the KCAPCD is shown in Figure 7. The KCAPCD is designated as being in *serious* O_3 nonattainment and in attainment or unclassified for all other pollutants.[1]

For KCAPCD, New Source Review (NSR) is implemented under KCAPCD Rule 210.1, *New and Modified Stationary Source Review (NSR)*. Specifically, these rules and regulations provide for the preconstruction review of new and modified stationary sources of affected air pollutants to ensure emissions will not interfere with the attainment of ambient air quality standards; ensure appropriate new and modified sources of affected pollutants are constructed with the Best Available Control Technology (BACT); and provide for no net increase in emissions from new and modified stationary sources for all nonattainment pollutants and their precursors.

In order to enforce these rules, air districts have established baseline emission levels for new or modified stationary sources of PM10, sulfur oxides (SO_x), NO_x, and VOCs in nonattainment areas (Table 7). Projects that generate emissions in excess of these threshold levels would require offsets.

[1]The KCAPCD has jurisdiction over the eastern half of Kern County. All of Kern County is designated as *serious* O_3 nonattainment.

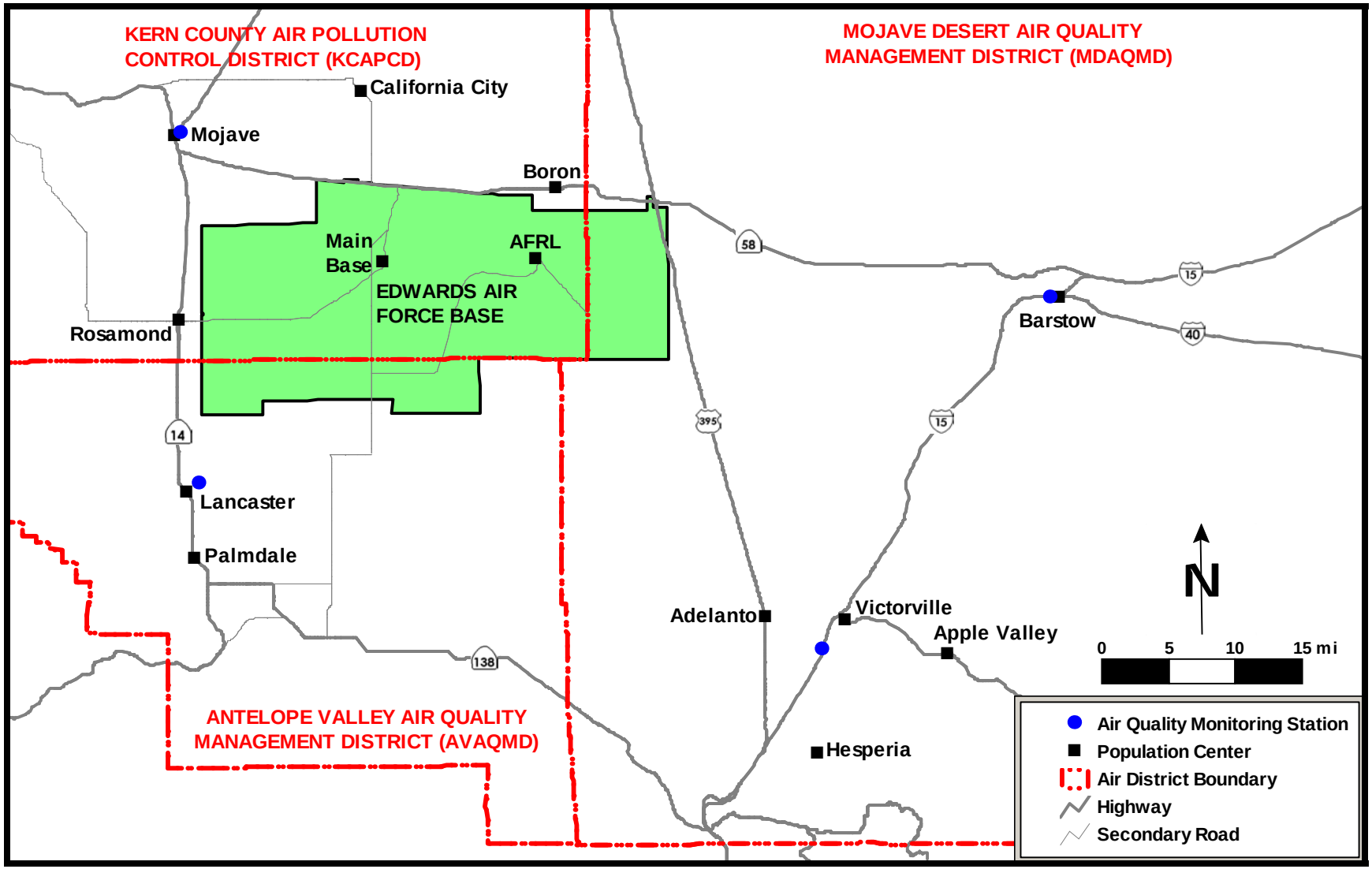
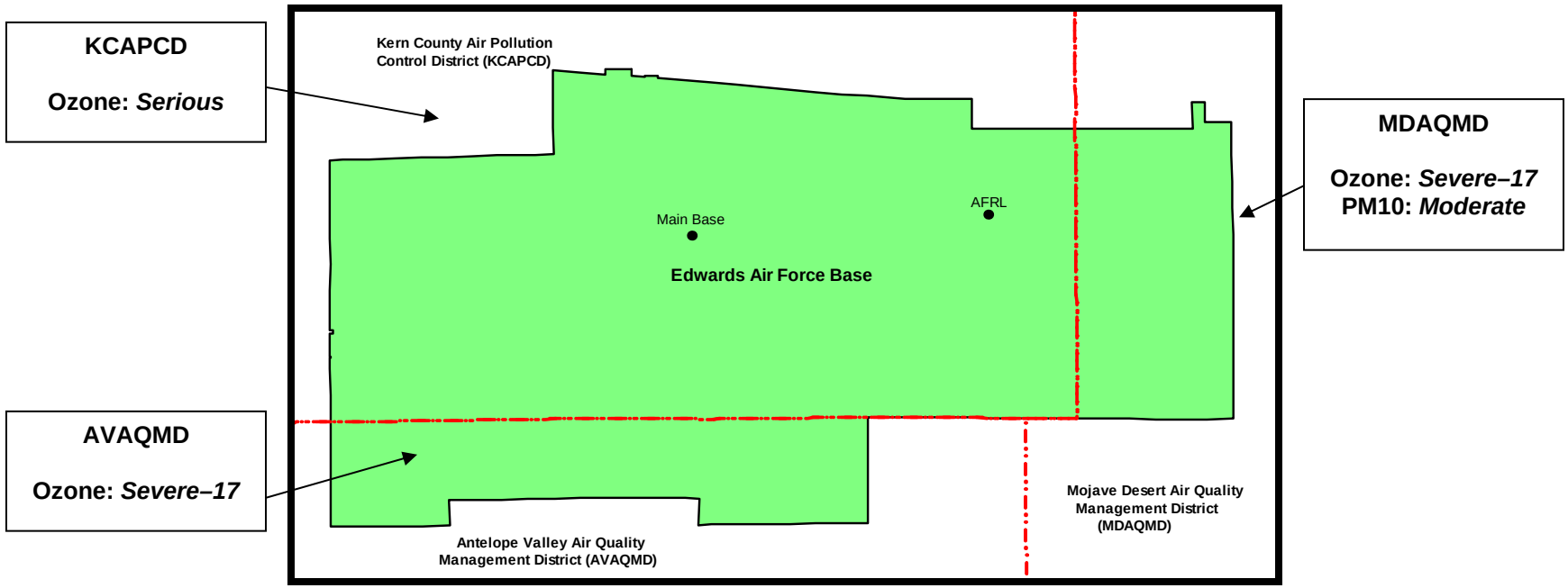


Figure 6 Air District Map

EDWARDS AFB
Current NAAQS Attainment Status



LEGEND

Severe-17 – 25-ton limit per pollutant per action per year
Moderate – 100-ton limit per pollutant per action per year
Serious – 50-ton limit per pollutant per action per year
Unclassified – no established limit

SOURCE: 40 Code of Federal Regulations 81.305

Figure 7 Air Quality Attainment Status Map

TABLE 7
NEW SOURCE REVIEW THRESHOLD EMISSION LEVELS

	New Source Review Threshold Emission Levels per Pollutant (tons/year)			
Air District	**PM10**	**SO_x**	**VOC**	**NO_x**
KCAPCD	15	27	25	25

Source: Zellar 1999

Notes: 1. PM10 – particulate matter less than or equal to 10 microns
2. SO_x – sulfur oxides
3. VOC – volatile organic compounds
4. NO_x – oxides of nitrogen
5. KCAPCD – Kern County Air Pollution Control District

To ensure compliance with all relevant Federal and State air laws, each district enacts their own rules and regulations. Local air districts use permits such as an Authority to Construct (ATC) and a Permit to Operate (PTO) as one method of implementing these rules and regulations.

Under the CAAA of 1990, Title V requires that major sources of air pollutants within each air district obtain a Federal-operating permit. This permit is an all-encompassing permit that includes all local air district permits (e.g., criteria pollutants and HAPs) and documents compliance with other CAA regulations. Edwards AFB received their nine Title V permits on 29 March 2001. Edwards AFB is required to comply with all Title V permit requirements.

In addition to the requirements for regulation of criteria pollutants, the CAAA sets forth regulations to control emissions of HAPs. Hazardous air pollutants are defined as air pollutants that cause serious human health effects including mortality. Title III of the CAAA lists 17 compounds and 171 chemicals (188 total pollutants) that are defined as HAPs and are regulated by the U.S. EPA. Since pollutants can be added to and deleted from this list, the 188 pollutants should be recognized as the initial list and not the definitive list of HAPs. Chemicals listed range from trace metals, which are inherent in fuel combustion; to solvents, which are used in a variety of painting, degreasing, and cleaning operations; to chemical intermediates used to produce a variety of everyday products (Bradstreet 1995).

Title III of the CAAA requires the U.S. EPA to develop a set of rules and regulations designed to implement control technologies and procedures that limit HAP emissions.[2] These rules and regulations are collectively known as National Emissions Standards for Hazardous Air Pollutants (NESHAP). The U.S. EPA is required to develop specific NESHAP for a wide range of industrial source categories. A NESHAP that applies to Edwards AFB is the Aerospace NESHAP (40 CFR Part 63, Subpart GG). This NESHAP controls HAP emissions resulting from aerospace manufacturing and rework facilities.[3] The applicability of a NESHAP to a facility operation is determined by the potential to emit (PTE) of HAPs from all applicable sources, and a PTE threshold value that is set by the area nonattainment status. Edwards AFB is defined as a major source of

[2]The HAP emission sources at Edwards AFB can occur from stationary sources and/or operations such as: aboveground storage tanks, cleaning operations, degreasers, fuel dispensing activities, general solvent use, internal combustion engines, jet engine testing, lubricating operations, paint booths, painting operations, heaters, welding/soldering machines, and underground storage tanks.

[3]Typical processes and operations at Edwards AFB include hand-wipe cleaning, spray-gun cleaning, primer and topcoat application, paint stripping, waste storage and handling, and chemical milling maskant.

HAPs and must comply with the Aerospace NESHAP. The HAP PTE threshold values for all local districts are 10 tons per year for a single HAP and 25 tons per year for any two or more HAPs.

The Air Toxic Hot Spots Program was created by the *Air Toxics "Hot Spots" Information and Assessment Act of 1987* (Assembly Bill [AB] 2588 and California State Health and Safety Code Sections 44300 through 44384). The Act establishes a program to inventory routine emissions of toxic substances into the air and to assess the public health risk to those who are exposed. As of 1998, there are over 450 toxic substances listed under AB 2588. Toxics can be added to or deleted from this list. At Edwards AFB, toxic substances are generated as a result of various processes including aircraft cleaning and painting, lubricating processes, the operation of ICEs (e.g., tactical support equipment [TSE], boilers, turbine engines), and adhesives/sealant applications.

Assembly Bill 2588 requires facilities to submit emission inventory plans and reports to local air districts. These plans and reports track the emissions of the listed air toxics. Based on these reports, facilities are designated by the local air district as high, medium, or low priority. This designation is used to determine the specific requirements needed to comply with AB 2588. In 1994, the KCAPCD rated Edwards AFB as a medium-priority facility.

There are four basic types of facilities at AFRL which produce, or are capable of producing, air emission pollutants: ambient pressure, laboratory, altitude, and storage facilities. The ambient pressure facilities and altitude facilities are commonly referred to as test areas or test pads within a test area. The ambient pressure facilities, which are the test areas, release rocket effluent directly into the atmosphere. The altitude facility use steam to combine with the rocket exhaust and transports this combination in a closed system to condensation towers where air pollutants are removed from the rocket exhaust. Abatement of air pollution within the altitude facilities minimizes the release of pollutants into the atmosphere. The laboratory facilities emissions are minimal, usually less than 0.1 pound (less than 0.04 kilogram) per action. These emissions are vented through an exhaust system. The storage facilities would only produce emissions in the unlikely event a chemical container began leaking. Table A-1, Appendix A, presents the total AFRL air emissions for 2002.

3.2.4 Conformity Requirements

Federal facilities located in a NAAQS nonattainment area are required to comply with Federal Air Conformity rules and regulations of 40 CFR 51/93. Under Air Conformity, a facility (such as Edwards AFB) that initiates a new action (such as the proposed action) must quantify air emissions from stationary and mobile sources associated with that action. Calculated emissions are first compared to established *de minimis* emission levels (based on the nonattainment status for each applicable criteria pollutant in the area of concern) to determine the relevant compliance requirements. If the calculated emissions are equal to or greater than *de minimis* levels, then the requirements of air conformity apply to the action.

The proposed project is located within the Kern County portion of Edwards AFB. Thus, the NAAQS nonattainment and regional planning emission inventories for KCAPCD would be used to determine the applicability of air conformity requirements to the proposed action. In accordance with the air conformity requirements of 40 CFR 51.853/93.153(b)(1) and KCAPCD Rule 210.7,

the *de minimis* levels set for the O_3 *serious* nonattainment area of KCAPCD for O_3 precursor emission is up to 50 tons per O_3 precursor pollutant (NO_x and VOC) per year per action.

In addition, even if calculated emissions are less than *de minimis* levels, a subsequent comparison must be made. Specifically, the calculated project emissions must be compared to the regional planning emission inventories for each applicable criteria pollutant in the nonattainment area of concern. If the calculated emissions are equal to or greater than 10 percent of the regional planning emission inventory, then the action is considered to be regionally significant and the requirements of air conformity apply. Otherwise, if the calculated emissions are less than both *de minimis* levels and 10 percent of the regional planning emissions inventories, then the requirements of air conformity do not apply to the action. Table 8 shows the 1990 baseline values and the 10-percent threshold values.

For KCAPCD, the regional planning emission inventories for the district for O_3 precursor pollutant (NO_x and VOC) emissions are included in the 1994 California O_3 SIP. In the California O_3 SIP, the regional planning baseline year for the district is 1990.

3.3 Water Resources

The primary responsibility for the protection of water resources quality in California rests with the State Water Resources Control Board and nine Regional Water Quality Control Boards. Edwards AFB lies within the jurisdiction of the Lahontan Regional Water Quality Control Board. Water resources describe the quality, quantity, source, and use of water at Edwards AFB. This includes drinking (potable) water, wastewater, and stormwater. The sources of water on Edwards AFB include groundwater, Antelope Valley-East Kern (AVEK) Water Agency water, treated wastewater (irrigation), and stormwater.

Edwards AFB has various facilities dedicated to water resources. They include six chlorination points for drinking (potable) water, numerous potable and nonpotable water storage tanks, two operating wastewater treatment plants (WWTPs) (Main Base and AFRL with associated evaporation ponds), and stormwater retention ponds.

The *Clean Water Act* (CWA) (33 USC 1251 et seq.), as amended, is designed to restore and maintain the chemical, physical, and biological integrity of surface waters. The CWA establishes effluent standards on an industry basis and addresses water pollution issues through a permitting system designed to control, and eventually eliminate, water pollution. Violations of the CWA can result in large fines and/or imprisonment.

TABLE 8
1990 BASELINE AND 10-PERCENT THRESHOLD VALUES

	1990 Baseline Values (tons/year)			10-Percent Threshold (tons/year)		
District	**NO_x**	**VOC**	**PM10**	**NO_x**	**VOC**	**PM10**
KCAPCD	14,965	6,205	N/A	1,496.5	620.5	N/A

Notes: 1. NO_x – oxides of nitrogen
2. VOC – volatile organic compound
3. PM10 – particulate matter less than or equal to 10 microns
4. KCAPCD – Kern County Air Pollution Control District
5. N/A – Not Applicable

3.3.1 Regulatory Requirements

Air Force Instruction 32-7041, *Water Quality Compliance*, provides details of the AF Water Quality Compliance Program. It applies to generating, collecting, treating, reusing, and disposing of domestic and industrial wastewater, stormwater, nonpoint-source runoff, sewage sludge, and water treatment residuals. It also explains how to assess, attain, and sustain compliance with the CWA; other Federal, State, and local environmental regulations; and related DOD and AF Directives.

Air Force Flight Test Center Instruction 32-6, *Edwards AFB Wastewater Instruction*, establishes Base policy, assigns responsibility for wastewater system oversight and operation and for accomplishing, monitoring, and reporting requirements of the CWA and associated directives. It applies to domestic and nondomestic wastewater treatment and pretreatment systems, including, but not limited to, collection systems, trucked wastewater, lift station, septic tanks, stormwater treatment, industrial wastewater treatment, oil/water separators (OWS), grease traps, leachate, and groundwater treatment facilities. It applies to all discharges and emphasizes eliminating, reducing, and controlling nondomestic wastewater. Environmental Management establishes and publishes technical policy and guidance through this Instruction to Base organizations for collection, treatment, storage, and disposal of domestic and industrial wastes. Environmental Management establishes restrictions on what can be discharged and what volumes and concentrations will be permitted.

Construction activities are required to adhere to the terms and conditions of the *Stormwater Pollution Prevention Plan (SWPPP), Edwards Air Force Base, California* (AFFTC 1998c). The SWPPP identifies and assesses sources of stormwater pollution and develops practices and controls to reduce the amount of pollutants in stormwater discharges.

The *Water Quality Control Plan for the Lahontan Region, North and South Basins* (CWRCB 1994b) sets forth water quality standards for surface waters and groundwaters of the region, including designated beneficial uses and objectives to be maintained for protection of those uses.

3.3.2 Water Quantity and Source

Water from AVEK is delivered to AFRL via pressurized pipeline to water Storage Tanks 4 (Building 8741) and 5 (Building 8740) on Leuhman Ridge. From Tanks 4 and 5, water is distributed to AFRL facilities, including other AFRL water storage tanks. The water storage capacities of Tanks 4 and 5 are 125,000 and 400,000 gallons, respectively. The AVEK Water Agency supplies up to 350 gallons per minute (gpm) to AFRL using one booster pump, and up to 490 gpm using two booster pumps. The AVEK Water Agency supplies approximately 391,080 gallons per day (gpd) during the summer and 262,024 gpd during the remainder of the year (AFFTC 1999c).

Groundwater at AFRL is obtained from the PIRA water distribution system, which collects its water from three wells on the PIRA and one just west of the PIRA. Water is pumped from Wells A, B, C, and D to three storage tanks (1, 2, and 3) located adjacent to Mary's Wells, where it is chlorinated, making it potable for human use. The total storage capacity of Storage Tanks 1, 2, and 3 is 600,000 gallons. Water from Storage Tanks 1, 2, and 3 is delivered via an underground

pipeline to Storage Tanks 4 and 5. Water from Mary's Wells is used as a backup system in the event that AVEK supplied water is interrupted for maintenance, or when there is a high demand for water at AFRL that cannot be met by AVEK-supplied water. During the year, up to 500,000 gpd of groundwater may be needed to maintain the required water capacity at AFRL during high demand periods. This depends on the month, AFRL demand, number and length of power outages, and how often the AVEK water pipeline shuts down for maintenance operations. Groundwater use has reduced the water levels at Mary's Wells approximately 2 feet per year from 1965 to 1985. Three wells (Wells 1, 2, and 3) previously pumped water to the Rocketdyne booster station, but have been abandoned and capped (Coffey 1999b).

Air Force Research Laboratory is part of the Main Base Outlying Region stormwater drainage area. The SWPPP describes the drainage area in detail including watershed association, area covered, containment structures and areas, and facility association (AFFTC 1998c). The uses of containment structures to control stormwater pollution include containment dikes, curbs, drainage ditches, and evaporation ponds. Current stormwater controls in place at AFRL include stormwater conveyance to the open desert, best management practices specified in the SWPPP, and AFRL WWTP.

Air Force Research Laboratory generates domestic and industrial wastewater. Domestic sources include wastewater resulting from sanitary uses and miscellaneous domestic chores. Industrial sources include wastewater resulting from industrial productions, paint stripping, metal plating, maintenance and repair, aircraft and vehicle cleaning, power or heat plant operations, photographic processing, boiler and cooling water discharges, and oil and solvent recovery operations.

3.3.3 Water Quality

Rainfall in the San Gabriel Mountains southwest of Edwards AFB and in the Tehachapi Mountains northwest of the Base drains predominantly into well-defined channels toward an intramontane basin. Sediments carried by various ephemeral streams are deposited along the way into the basin. The resulting landforms are alluvial fans formed along mountain fronts, desert plateaus toward the middle of the basin, and lakebeds at the low points of the basin. No streams or drainage channels cross the proposed area of development.

Buildings that generate industrial wastewater are required to process an AFFTC Form 5852, *Permit for Industrial Wastewater Discharge, Edward AFB, California,* prior to discharging any wastewater. The permit must be approved by the Base Civil Engineer (BCE), EM, and Bioenvironmental Engineering, and is applicable to all dischargers of industrial wastewater. Air Force Flight Test Center Form 5852 ensures compliance with required hazardous materials handling protocols, and should remove significant impacts caused by industrial wastewater to the WWTPs (Coffey 1999a).

The Edwards AFB SWPPP identifies and assesses sources of stormwater pollution and develops practices and controls to reduce the amount of pollutants in stormwater discharges. The SWPPP helps identify the sources of pollution that affect the quality of industrial stormwater and authorized nonstormwater discharges, and ensures the implementation of the best management

practices (BMP) to reduce or prevent pollutants in industrial stormwater discharges and authorized nonstormwater discharges.

3.4 Safety and Occupational Health

Safety and occupational health is defined as the protection of workers and the public from accidents and hazards. The total accident spectrum encompasses not only injury to personnel, but also damage or destruction of property or products. For worker safety, the boundary of the immediate work area defines the region of influence.

At AFRL, the potential health and safety issues associated with implementing the proposed action include exposure to hazardous noise and physical hazards (e.g., construction equipment and construction activities).

3.4.1 Regulatory Requirements/Guidance

The Ground Safety Division of the Air Force Safety Center is responsible for developing ground safety programs and procedures to provide a safe work environment for Air Force personnel. It researches, writes, and maintains Air Force Occupational Safety and Health standards to ensure compliance with Federal laws.

The Occupational Safety and Health Administration (OSHA) developed standards to promote a safe working environment. These standards establish general environmental controls, including personal protective equipment (PPE), wherever necessary because of hazards, processes, or the environment. Exposure limits for noise, ionizing and nonionizing radiation, and toxic and hazardous substances have been established, as well as requirements for handling and storing compressed gases and flammable liquids. The OSHA Act also provides standards for emergency response to related hazardous chemical and hazardous wastes.

Federal OSHA requirements and AFIs are the applicable regulatory requirements for safety and occupational health. California OSHA (Cal-OSHA) regulations do not apply to Edwards AFB DOD workers (e.g., military and civilian). Independent contractors are responsible for meeting Cal-OSHA requirements.

Locally, Bioenvironmental Engineering, Ground Safety, and the Base Fire Department enforce statutory and regulatory requirements of the Federal OSHA and the Air Force Occupational Safety and Health (AFOSH) Standards that apply to the safety of workers on Edwards AFB. In addition, various offices for specific activities supervise operational safety.

The OSHA General Duty Clause, Section 5(a)1, states that employers will provide a workplace free of recognized hazards that cause or are likely to cause death or serious physical harm.

Safety, health, and environmental controls outlined in the *Environmental Safety and Occupational Health (ESOH) Programs* (Air Force Research Laboratory/Propulsion Directorate [AFRL/PR] Operating Instruction 91-202) ensure that risk to personnel and the environment from experimental and test activities are eliminated or reduced to an acceptable level.

Title 29 CFR 1910.95, *Occupational Noise Exposure*, states that protection against the effects of noise exposure shall be provided when the sound levels exceed those shown in that regulation.

Title 40 CFR Part 61 Subpart M, *National Emission Standards for Hazardous Air Pollutants*, states that in addition to complying with the provisions of this part, the owner or operator of a stationary source subject to a standard in this part may be required to obtain an operating permit issued to stationary sources by an authorized State air pollution control agency or by the Administrator of the U.S. EPA pursuant to Title V of the CAA, as amended 15 November 1990 (42 USC 7661).

3.4.2 Exposure Hazards

Hazardous noise exposure occurs when workers are present in areas where ambient noise levels exceed 85 decibels. To prevent potentially harmful effects to AF and civilian personnel from exposure to hazardous noise, the USAF established a hazardous noise program under AFOSH Standard 48-19, *Hazardous Noise Program*. Under this program, Bioenvironmental Engineering is responsible for accomplishing hazardous noise surveillance to determine if military or DOD civilian personnel working in areas where hazardous noise exposure may occur require engineering controls, administrative controls, or personal protection, or if potential hazardous noise areas require signage. Non-DOD civilian personnel working on the installation are exempt from AFOSH Standard 48-19, but must comply with applicable Federal and State regulations.

For over 50 years, hazardous materials and wastes have been handled with varying levels of care and concern at Edwards AFB. Past hazardous materials/waste handling practices considered standard for the industry and routinely used before the adoption of more stringent Federal and State laws and regulations often resulted in contamination of the environment. These practices have resulted in known and potential contamination at Edwards AFB.

The proposed project is located within ERP Operable Unit (OU) 4, a contaminated groundwater area that is being remediated for solvent concentrations that exceed the maximum concentration level (MCL). Details regarding the groundwater contamination can be found in Section 3.7.4, Environmental Restoration Program (ERP) Site Disturbance. Depth to groundwater in the area is 35 feet below ground surface (bgs) and the depth to solvent contamination is 50 feet bgs. One monitoring well is located in the project area (Figure 8).

One ERP site has been identified in the vicinity of the project area. Environmental Restoration Program Site 133 is the former Phillips Lab Civil Engineering Yard located north of the proposed project. Environmental Restoration Program Site 133 has been documented to contain trichloroethene (TCE)-contaminated groundwater. Details on this ERP site can be found in Section 3.7.4, Environmental Restoration Program (ERP) Site Disturbance of this EA.

Elements of the existing environment at AFRL can present a human health hazard to personnel in the forms of heat stress or hypothermia from exposure, venomous snakebites, or contract Hantavirus and/or valley fever from exposure to soils hosting spores.

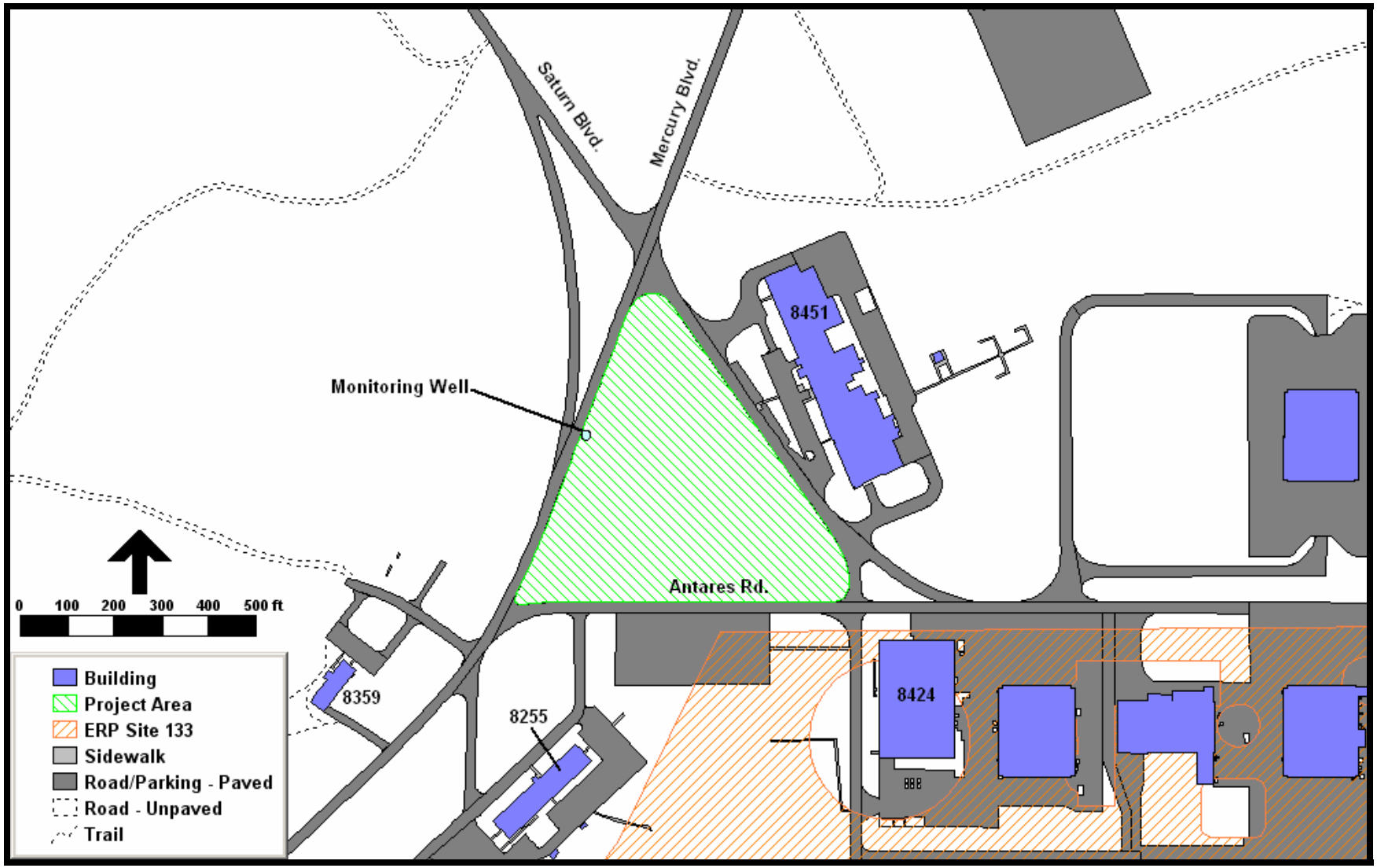


Figure 8 Project Location with ERP Site and Monitoring Well Depicted

3.5 Hazardous Materials and Waste

A hazardous material is any material whose physical, chemical, or biological characteristic, quantity, or concentration may cause or contribute to adverse effects in organisms or their offspring; pose a substantial present or future danger to the environment; or result in damage to or loss of equipment, property, or personnel.

Hazardous wastes are those substances that have been "abandoned, recycled, or are inherently waste like" and (because of their quantity, concentration, or characteristics) have the potential to cause an increase in mortality or serious irreversible illness, or pose a substantial hazard to human health and/or the environment if improperly treated, stored, transported, and/or discarded.

Solid waste refers to nonhazardous garbage, refuse, sludge, and any other discarded solid material resulting from residential, commercial, and industrial activities or operations. Solid waste can be classified as construction/demolition, nonhazardous recyclable, or nonhazardous nonrecyclable waste.

For purposes of this analysis, hazardous materials and hazardous wastes are those substances as defined by the CERCLA, the Resource Conservation and Recovery Act of 1976 (RCRA) and the Toxic Substances Control Act (TSCA).

3.5.1 Regulatory Requirements/Guidance

The U.S. EPA administers the RCRA (42 USC 6901). The act regulates the handling, transport, storage, treatment, and disposal of solid and hazardous waste. It places responsibility for hazardous waste on the facilities generating the waste and requires them to meet various standards regarding personnel training, facility inspections, waste identification and analysis, emergency response planning, and record keeping.

The CERCLA (42 USC 9601) provides broad Federal authority to respond directly to releases or threatened release of hazardous substances that may endanger public health or the environment. The act authorizes short-term removal actions and long-term remedial response actions. The act establishes prohibitions and requirements concerning closed and abandoned hazardous waste sites; provides for liability of persons responsible for release of hazardous waste at these sites; and establishes a trust fund to provide for cleanup when no responsible party can be identified.

The TSCA (15 USC 2601), which is administered by the U.S. EPA, is intended to ensure that the human health and environmental effects of chemical substances are identified and adequately addressed prior to production or transport of those substances. Chemical substances regulated by TSCA include "Any organic or inorganic substances of a particular molecular identity including any combination of such substances occurring, in whole or in part, as a result of chemical reaction or occurring in nature and any element or uncombined radical."

Air Force Instruction 32-7042, *Solid and Hazardous Waste Compliance*, implements Air Force Policy Directive (AFPD) 32-70, *Environmental Quality*. The instruction identifies compliance

requirements for all solid and hazardous waste, except radioactive waste.[4] In the United States and its territories, use this guidance with applicable Federal, State, and local standards for solid and hazardous waste. Specifically, it contains requirements for solid and hazardous waste characterization, training, accumulation, turn-in and disposal, as well as procedures for managing disposal contracts, inspections, permits, and record keeping.

Air Force Instruction 32-7086, *Hazardous Materials Management*, establishes procedures and standards that govern the management of hazardous materials throughout the AF. The Instruction applies to all AF personnel who procure, use, or dispose of hazardous materials.

Hazard Communication code, 29 CFR 1910.1200, states that all hazardous materials shall be documented with required Material Safety Data Sheets (MSDSs) as part of a complete hazardous materials inventory.

Air Force Flight Test Center Instruction 32-19, *Hazardous Material Management Process*, ensures the AFFTC remains in compliance with all applicable Federal, State, local, and AF regulations and laws regarding hazardous materials management. The instruction involves the use of information systems and positive control of hazardous material to minimize waste disposal. The hazardous material processes will be reviewed by the workplace supervisor, Environmental Management, Ground Safety, and Bioenvironmental Engineering to ensure the least occupationally and environmentally hazardous materials are used. All hazardous material transactions will occur using the most current automated data system fielded for use at Edwards AFB.

The *Edwards Air Force Base Hazardous Waste Management Plan Number 32-7042* (HWMP) (AFFTC 1999a) supports AF directives and is intended to ensure compliance with applicable Federal, State, and local regulations. The objective of the HWMP is to provide sufficient administrative direction and instructions for originators of RCRA and non-RCRA wastes to properly characterize, package, label, store, treat, handle, and transport hazardous waste at Edwards AFB. The goals are to ensure compliance with the applicable Federal, State, and local hazardous waste regulations; simplify administrative procedures; and reduce pollution and environmental impacts through improved waste management practices.

The *Edwards Air Force Base Solid Waste Management Plan* (AFFTC 1999b) describes Environmental Management's functional management of municipal solid waste disposal and recycling on Edwards AFB. The purpose of the plan is to comply with Federal, State, and local regulations and AF policy and guidance on the management of nonhazardous municipal solid waste.

3.5.2 Hazardous Materials

The types of hazardous materials most commonly used during construction projects include acids, corrosives, caustics, glycols, compressed gases, paints and paint thinners, solvents, sealants, adhesives, cements, caulking, fire retardant, and hot asphalt (140 degrees Fahrenheit or greater).

[4]The applicable solid waste regulations are in Subtitle D of Title 40, Code of Federal Regulations (CFR) Parts 240 to 244, 257, and 258; for hazardous waste, the applicable regulations are in Subtitle C, 40 CFR 260–272.

When any construction project is considered at Edwards AFB, Program Introduction Documents (PID), or the equivalent, are reviewed by Bioenvironmental Engineering and Environmental Management to identify any hazardous material/hazardous waste concerns. Prior to bringing any new hazardous material on Base, contractors are required to provide a copy of the relevant MSDS to Bioenvironmental Engineering, who maintains a master hazardous material inventory list for Edwards AFB with all listed MSDSs.[5] All organizations and contractors are required to maintain strict inventories of all hazardous materials. Furthermore, organizations are also required to reduce the quantity of hazardous materials used or replace them with nonhazardous material, if possible, as part of the Pollution Prevention Program. Guidelines used by Edwards AFB include AFI 32-7086, *Hazardous Materials Management*; AFI 32-7042, *Solid and Hazardous Waste Compliance*; and AFFTCI 23-1, *Hazardous Material Management Program*.

3.5.3 Hazardous Waste

The use of hazardous materials results in the generation of hazardous waste (e.g., paint waste, used oil, contaminated rags,) that requires proper handling and disposal. The U.S. EPA enforces RCRA, which provides guidelines for the generation, storage, transportation, and disposal of hazardous waste. The California Environmental Protection Agency (Cal/EPA) enforces hazardous waste laws as stated in Title 22 California Code of Regulation (CCR) Chapters 10, 13, 14 and 20 and the California State Health and Safety Code (Section 25100). Environmental Management administers hazardous waste accumulation. Guidelines used by Edwards AFB include the HWMP (AFFTC 1999a), which was prepared IAW AFI 32-7042, *Solid and Hazardous Waste Compliance*. The plan establishes procedures to achieve compliance with applicable Federal, State, and local regulations for hazardous waste management, except munitions, explosives, biohazard, and radioactive waste.[6] The plan contains requirements for solid and hazardous waste characterization, training, accumulation, turn-in and disposal, as well as procedures for inspections, permits, and record keeping.

The storage of hazardous waste begins at the point of generation. An initial accumulation point (IAP) is an area at or near the point of hazardous waste generation where hazardous wastes may be accumulated until they are sent to either an accumulation site (ACCS) (known more commonly as a 90-day accumulation point) or the Conforming Storage Facility (CSF) (a facility permitted to store hazardous wastes for up to 1 year). Any new IAP and its proposed location must be approved by and coordinated with EM in order to minimize the threat to human health and the environment. An IAP has fewer operational requirements than an ACCS, provided the following restrictions in 22 CCR 66264.34 are met.

a. Hazardous waste accumulation/containerization is accomplished only by knowledgeable and trained IAP personnel under controlled circumstances (waste addition logs are used to identify what hazardous waste is added to a container);

[5]Occupational Safety and Health Administration regulations require MSDSs for all hazardous chemicals used on Base (29 CFR 1910.1200). The MSDS identifies a chemicals identity, its physical and health hazard information, safe handling and use procedures (including exposure control measures), and product use warnings. Air Force Occupational Safety and Health Standard 48-21, *Air Force Hazard Communication Program*, reestablishes the minimum requirements for an effective hazard communication program for personnel who use or produce hazardous chemicals.

[6]The applicable hazardous waste regulations are in Subtitle C, 40 CFR 260–272.

b. Hazardous waste accumulation is not more than 55 gallons per wastestream of hazardous waste or 1 quart of acutely or extremely hazardous waste; and

c. Hazardous waste may be accumulated for 270 days or until either of the restrictions listed previously are exceeded.

An IAP must also comply with other operational requirements that ensure wastes are managed IAW applicable regulations, and as specified in the HWMP.

An ACCS either receives hazardous waste generated at an IAP or is used to accumulate waste streams in lieu of using an IAP (i.e., when either the volume or accumulation time restrictions applicable to an IAP cannot be met). In either case, wastes accumulated at an ACCS are subsequently sent to the CSF. Like an IAP, any new ACCS and its proposed location must be approved by and coordinated with EM in order to minimize the threat to human health and the environment. Unlike an IAP, hazardous waste may only be stored at an ACCS for up to 90 days. In addition, the ACCS has more rigorous operational requirements that must be followed in order to ensure that wastes are managed IAW applicable regulations and as specified in the HWMP.

The CSF at Edwards AFB is the final stage of on-Base management of hazardous waste. The CSF is managed by EM under a service contract and operates as a hazardous waste storage facility in Building 4916. This facility is permitted to temporarily store (for up to 1 year) hazardous waste IAW 22 CCR 66270.14 under a Part B Permit. Wastes accumulated at IAPs and ACCSs throughout the Base are transported to the CSF prior to shipment off Base for treatment, storage, or disposal. Federal standards require shipments of hazardous waste to be labeled, marked, and placarded IAW United States Department of Transportation (DOT) regulations 49 CFR, *Transportation*, Chapter I, Subchapters B and C.

The transportation of hazardous waste is governed by DOT regulations that specify procedures for transporting these materials on public highways (49 CFR 100 – 199; 40 CFR 260 – 299; and 22 CCR Division 4.5, Chapter 13, *Standards Applicable to Transporters of Hazardous Waste*). However, these State and Federal DOT regulations do not apply to the transport of hazardous materials and/or hazardous wastes between points on Base.

3.5.4 Solid Waste

Edwards AFB operates a nonhazardous (municipal solid) waste landfill within the Main Base area. At current disposal rates, the landfill is expected to reach permitted capacity in the year 2019. Due to the volume of construction/demolition waste (CDW) generated on Base, most current construction contracts require the contractor to dispose of such wastes at an approved off-Base landfill in order to reduce the impacts to the Main Base landfill.

The Base actively participates in a recycling program. A contractor operates the program under contract with Edwards AFB with program oversight provided by EM. Some waste metals generated during construction projects, as well as the routine operations of various Base organizations, are diverted to the Defense Reutilization Marketing Office (DRMO) for resale.

3.6 Biological Resources

Naturally occurring organisms, the physical and biological aspects of their environment, and the relationships between them make up biological resources. In general, biological resources include native and introduced plants that comprise the various habitats, the animals that are found in such habitats, and natural areas that help to support plant and wildlife populations.

Edwards AFB contains and manages biological resources that are typical of a desert environment. These include animal and plant species (including the associated habitats of each), floodplains, and watersheds.

The proposed construction location at AFRL is an undeveloped parcel located within a lightly developed area. The parcel has minimal vegetation (salt bush scrub and low grasses) and no sensitive or listed species are present.

3.6.1 Regulatory Requirements/Guidance

The *Endangered Species Act of 1973* (ESA) (16 USC 1531–1544) provides a framework for the protection of endangered and threatened species. Federal agencies may not jeopardize the existence of listed species, which includes ensuring that actions they authorize, fund, or carry out do not adversely affect the species or adversely modify designated critical habitats. Under the ESA, all Federal departments and agencies must utilize their authorities, as appropriate, to promote the recovery of listed species. In addition, the ESA prohibits all persons, including Federal agencies, from harming or killing (taking) individuals of a listed species without authorization. While Federal agencies must consult with the United States Fish and Wildlife Service (USFWS) or National Marine Fisheries Service when their activities may affect listed species, projects cannot be stopped unilaterally by the services; however, for any anticipated "take" to be authorized, applicable measures to minimize the take that are developed in the consultation must be followed.

The *Migratory Bird Treaty Act* (MBTA) of 1918 (16 USC 703–712), as amended, provides for Federal protection of all migratory bird species, their active nests or eggs. Permits are required to remove these birds and their nests from their roosting and nesting areas.

The *Sikes Act* (16 USC 670a–670o), as amended, provides for cooperation between the Departments of the Interior, Defense, and State agencies in planning, developing, and maintaining fish and wildlife resources on military reservations throughout the United States.

The *California Endangered Species Act* (CESA) (California Fish and Game Code Section 2050 et seq.) generally parallels the main provisions of the Federal ESA and is administered by the California Department of Fish and Game (CDFG). Under the CESA, the term "endangered species" is defined as "a species of plant, fish, or wildlife which is in serious danger of becoming extinct throughout all, or a significant portion of its range" and is limited to species native to California. The CESA establishes a petitioning process for the listing of State threatened or endangered species, and the CDFG is required to adopt regulations for this process. The CESA prohibits the taking of State-listed species except as otherwise provided in State law. Unlike the Federal ESA, the CESA applies prohibitions to species petitioned for State listing (i.e., State candidates).

The *Animal Damage Control Act* (ADCA) (7 USC 426–426b), as amended, is administered by the Secretary of Agriculture and provides broad authority for investigation and control of mammalian predators, rodents, and birds.

Department of Defense Directive (DODD) 4700.4, *Natural Resources Management Program*, prescribes policies and procedures for an integrated management program of natural resources on DOD property. Enforcement of laws primarily aimed at protecting natural resources and recreation activities that depend on natural resources, is an integral part of a natural resources program and shall be coordinated with, or under the direction of, the natural resources manager for the affected area.

Air Force Instruction 32-7064, *Integrated Natural Resources Management*, implements AFPD 32-70, *Environmental Quality*, and Department of Defense Instruction (DODI) 4715.3, *Environmental Conservation Program*. Air Force Instruction 32-7064 explains how to manage natural resources on AF property in compliance with Federal, State, and local standards. The *Integrated Natural Resources Management Plan for Edwards Air Force Base, California* (INRMP) (AFFTC 2001b) is a key tool for managing the installation's natural resources.

3.6.2 Animal Species

While there are several species of interest at Edwards AFB, there is only one listed species with legally required mandates on management practices, the desert tortoise (*Gopherus agassizii*). The desert tortoise is Federally listed as threatened under the ESA and State listed as threatened by the California Fish and Game Commission. The desert tortoise is an herbivorous reptile whose native range includes the Sonoran and Mojave deserts of southern California, southern Nevada, Arizona, extreme southwestern Utah, and Sonora and northern Sinaloa, Mexico. Desert tortoises are known to occur at Edwards AFB (AFFTC 1996).

The proposed project is not located within the habitat of the desert tortoise. However, the borrow sites that may be used are located within desert tortoise habitat that is governed by the following Biological Opinions:

a. *Biological Opinion for the Development and Operation of Eight Borrow Pits throughout the Air Force Flight Test Center in Kern, Los Angeles, and San Bernardino Counties, California* (1-8-96-F-56) (USFWS 1997) authorizes use of Borrow Sites A, B (16), C, 1, 5, 21, 23, and 28; and

b. *Biological Opinion for the Precision Impact Range Area, Edwards Air Force Base, California* (1-8-96-F-6) (USFWS 1994a) authorizes the use of Borrow Sites 15, 17, 18, and 20 with respect to protection of the desert tortoise and its critical habitat.

Common animal species found in the project area include the black-tailed jackrabbit (*Lepus californicus*), desert cottontail (*Sylvilagus audobonii*), deer mouse (*Peromyscus maniculatus*), grasshopper mouse (*Onychomys torridus*), little pocket mouse (*Perognathus longimembris*), Merriam's kangaroo rat (*Dipodymus merriami*), and Antelope ground squirrel (*Ammospermophilus leucurus*). For a list of common animals found at Edwards AFB, see the *Biological Resources Environmental Planning and Technical Report Basewide Vegetation and Wildlife Surveys and Habitat Quality Analysis* (Mitchell et al. 1993).

3.7 Geology and Soils

Geologic resources consist of naturally formed minerals, rocks, and unconsolidated sediments. Soil refers to the uppermost layers of surficial geologic deposits and is developed by the weathering of those deposits. Concerns associated with the geologic setting at Edwards AFB, which could either affect or be affected by a proposed project, include topography, material site use (mining), ERP site disturbance, seismicity, and land subsidence.

3.7.1 Regulatory Requirements/Guidance

Congress enacted the CERCLA (42 USC 9601) on 11 December 1980. This act provides broad Federal authority to respond directly to releases or threatened release of hazardous substances that may endanger public health or the environment. The act authorizes short-term removal actions and long-term remedial response actions. The act establishes prohibitions and requirements concerning closed and abandoned hazardous waste sites; provides for liability of persons responsible for releases of hazardous waste at these sites; and establishes a trust fund to provide for cleanup on non-DOD property when no responsible party can be identified.

The RCRA (42 USC 6901) was enacted into law in 1976 and is administered by the U.S. EPA. It regulates the handling, transport, storage, treatment, and disposal of solid and hazardous waste. It places responsibility for hazardous waste on facilities generating the waste and requires them to meet the various standards regarding personnel training, facility inspections, waste identification and analysis, emergency response planning, and record keeping.

3.7.2 Topography

The site of the existing science laboratory is located on the southeastern side of Leuhman Ridge, an outcrop of granitic basement rocks that are exposed on the northeastern side of Rogers Dry Lake. The backside of the ridge is a flat, moderately eroded surface that slopes southeastward. The flat, level area is the location of the proposed laboratory and the location of the main AFRL facilities. The northwestern side of the ridge faces Rogers Dry Lake and is strongly eroded with topographic relief of over 700 feet from the base of the ridge to its highest point. Exposed granitic outcrops along the ridge summit are the location of several rocket test stands that are part of the AFRL facility. Surface soils in the area are mainly coarse to fine grained granitic sands.

3.7.3 Material Site Use

The *Final Environmental Assessment for Borrow Sites at Edwards Air Force Base, California* (United States Army Corps of Engineers [USACE] and AFFTC 1996), discusses the environments, advantages, and disadvantages associated with the use of on-Base borrow sites. It evaluates the use of five sites (1, 5, 21, 23, and 28) in addition to those previously in use. Fill material for this project would either come from recycled asphalt and concrete or approved fill material sites. Air Force Research Laboratory borrow pits on Mars Boulevard (Borrow Site 18) or east of Rogers Lake (Borrow Site 16[B]) are proposed to be used for fill material for the proposed project.

Cultural resource site surveys have been performed over a 5-acre area at each of the borrow sites. Partial surveys were performed over a 40-acre area surrounding some of the borrow sites. At other sites, a 40-acre survey was never conducted. Cultural surveys at Borrow Site 16(B) found

cultural artifacts of lithic fragments indicating prehistoric habitation. There is a high probability that further excavation in the borrow pit area may uncover additional cultural artifacts and prehistoric sites. Cultural surveys at Borrow Site 18 did not find any cultural artifacts. Cultural surveys performed at remaining active borrow sites have not found indications of cultural artifacts. The probability of finding prehistoric sites in these areas remains low.

A summary of the issues associated with borrow sites 16(B) and 18 is presented in Table 9. The location of the borrow sites is shown in Figure 9.

3.7.4 Environmental Restoration Program (ERP) Site Disturbance

Geologic resources (e.g., soil and groundwater) are susceptible to contamination from day-to-day operations. Releases of hazardous chemicals, such as petroleum products and solvents, have created soil contamination at military installations. Contaminated soil and/or groundwater may require physical removal or extensive remediation to ensure the protection of public health and safety.

The ERP was established to identify, investigate, assess, and clean up hazardous waste at contaminated sites on the Base in compliance with CERCLA. Under the ERP, a Preliminary Assessment was conducted at Edwards AFB to locate potential areas of concern (AOC) that may have resulted from past activities followed by a Remedial Investigation (RI) to assess the nature and extent of the hazardous substances that may be detrimental to human health and the environment. A Feasibility Study follows the RI and is used to develop a range of remedial alternatives for consideration.

Remediation efforts usually involve extraction wells that are drilled to groundwater, or deeper, and are located throughout the contaminated groundwater plume. These wells can extract groundwater, air, and pollutants from the unsaturated zone. They are connected by a series of underground or aboveground pipes that convey air, water, and compressed air (for pneumatic pumps located within the wells). The extracted material is then piped to a treatment compound where equipment is located to treat the incoming vapors and liquids. The treatment compound has connections for electricity, natural gas, and sewer hookups.

The Environmental Restoration Division schedules and conducts remediation efforts for the ERP. Many of the systems are in construction or planning phases. Any project or activity planned in an ERP site, undergoing or scheduled for remediation, will be scheduled to avoid conflicts with ERP timelines and requirements. This process ensures that equipment is not damaged and program efforts are not negatively affected by the proposed project or activity.

Edwards AFB has been divided into 10 management areas termed operable units (OU) (Figure 10). The remediation system consists of a series of monitoring/extraction wells, subsurface pipelines, and a dual extraction system that removes free product and soil vapor. The Edward AFB EM Restoration Division (AFFTC/EMR) manages the system.

The project area lies within OU 4, a large groundwater contaminated area that is being remediated for solvent contamination. The solvent concentrations are above MCLs and consist of separate plumes of TCE; cis-1, 2-dichloroethene (DCE); tetrachloroethene (PCE); and perchlorate.

TABLE 9
SUMMARY OF ISSUES ASSOCIATED WITH BORROW SITES

Borrow Site	Location and Status	Biological Resource Occurrences	Cultural Resource Occurrences	ERP/AOC Occurrences
B (16)	Rogers Lake, East Shore	Desert tortoise relative density of 27/sq mile	Cultural artifacts observed within 5-acre area of borrow site. Partial survey of 40-acres surrounding site found cultural resources indicating additional artifacts may be buried in the area.	None
18	PIRA	Desert tortoise relative density of 13/sq mile Near desert tortoise critical habitat Near desert cymopterus populations	No cultural artifacts found during survey of 5-acre area of borrow site. No cultural survey inventory conducted in a 40-acre area surrounding this active borrow site.	None

SOURCES: Air Force Flight Test Center (AFFTC) 1993
Boyer 1994
United States Fish and Wildlife Service (USFWS) 1994b
USFWS 1997

Notes:
1. ERP – Environmental Restoration Program
2. AOC – Areas of concern
3. sq mile – square mile
4. PIRA – Precision Impact Range Area

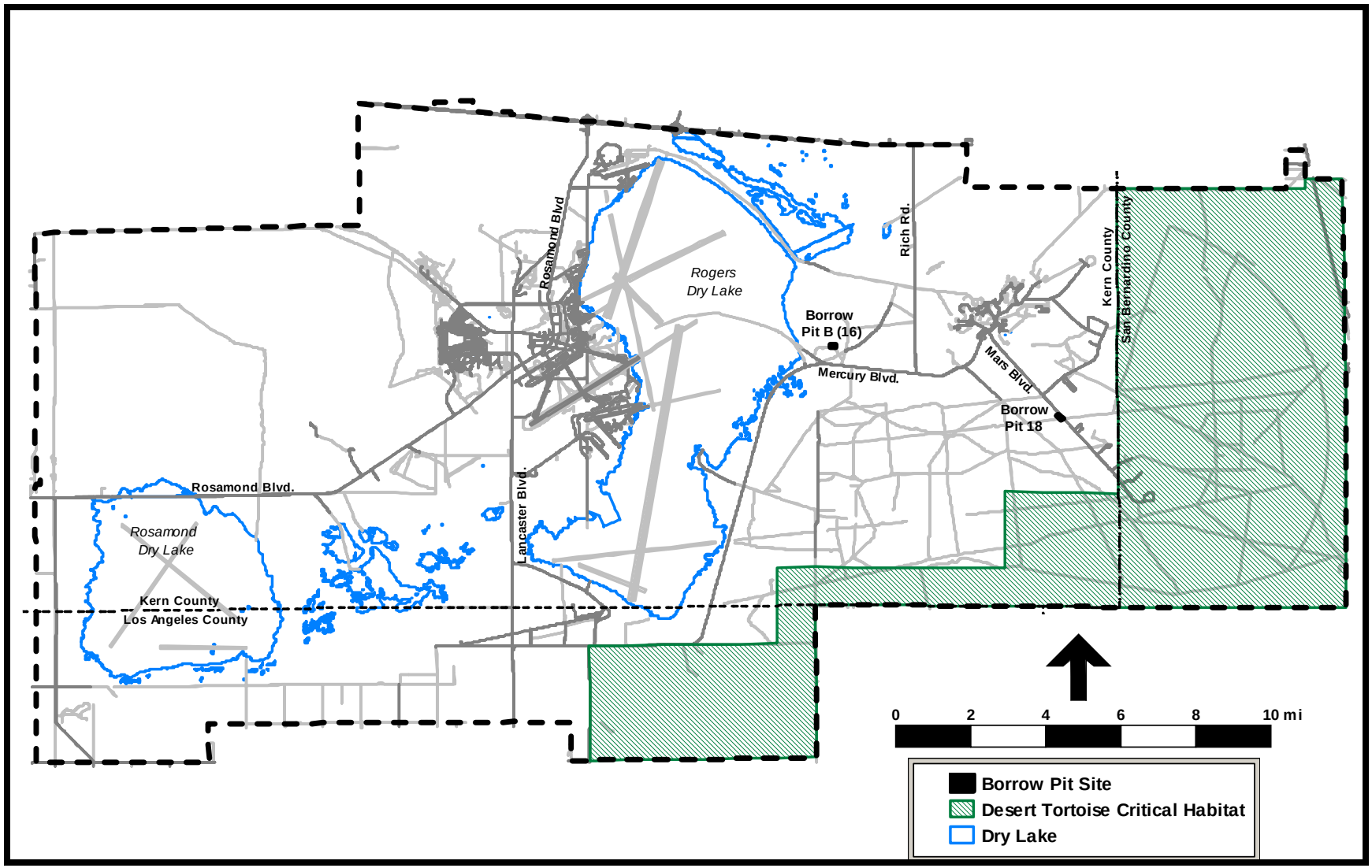


Figure 9 Potential Borrow Sites for Proposed Project

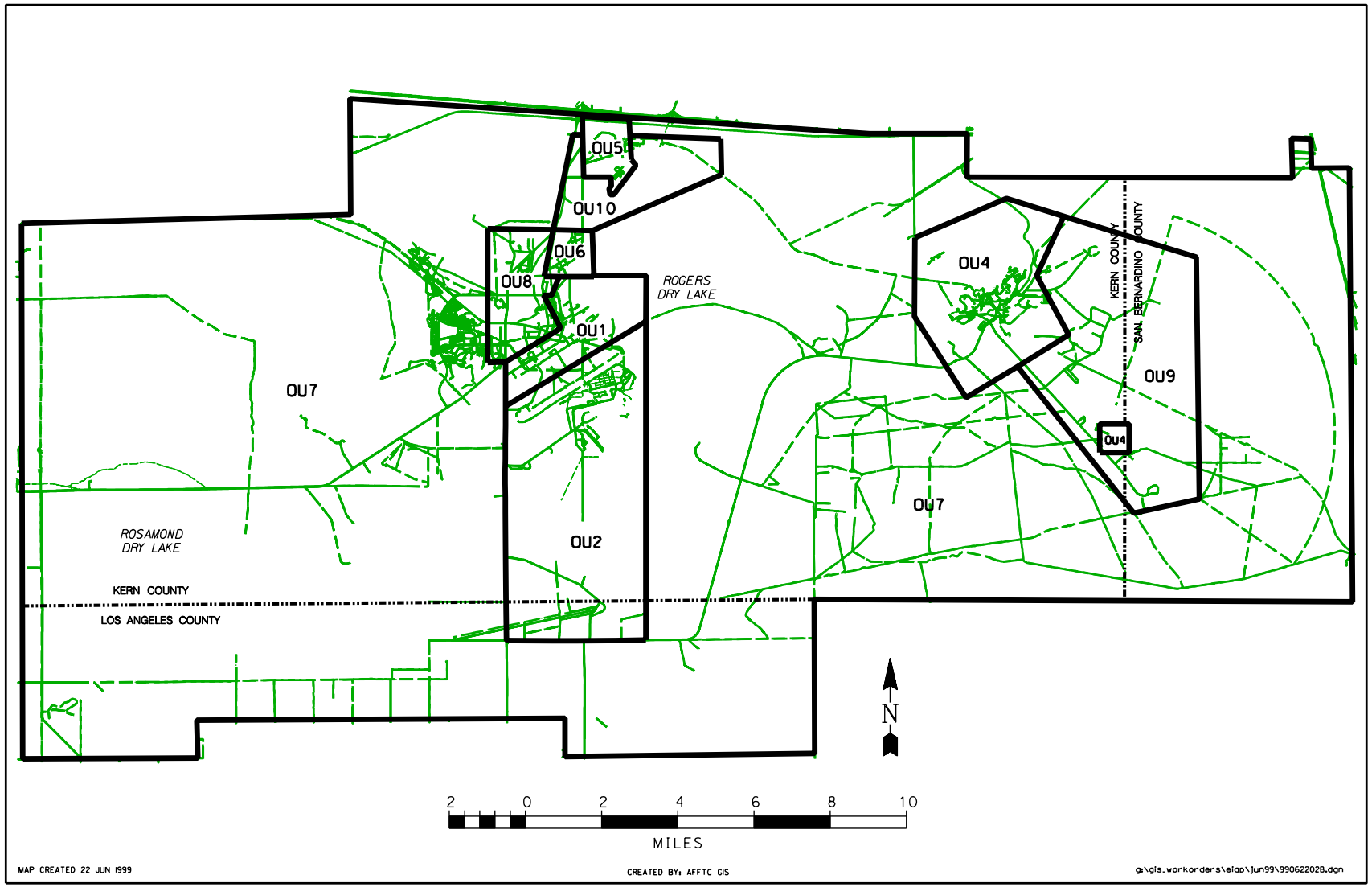


Figure 10 Environmental Restoration Program Operable Units

Depth to the groundwater plumes is 50 feet bgs in the project area. A monitoring well, 150-MW05, is located in the project area and is used to track solvent concentration levels in the OU.

No ERP sites have been identified in the project area; however, there is an ERP site in the vicinity. Environmental Restoration Program Site 133, a former Phillips Lab Civil Engineering Yard is located approximately 50 feet south of the proposed project (see Figure 8). This site consists of TCE-contaminated groundwater.

Site 150, a former beryllium and waste evaporation pond (Building 8451), was closed in December 1999 and was located south of the proposed project. This site also consisted of TCE-contaminated groundwater.

A discussion of the potential exposure of personnel to contaminated soils and/or groundwater can be found in Section 3.4.2, Exposure Hazards of this EA.

3.7.5 Seismicity

There are no major faults mapped within the proposed project area. There are a series of northwest and southwest trending faults mapped throughout the Base. The faults are dormant and seismically inactive based on records maintained by the Earthquake branch of the United States Geologic Survey. The faults, however, have the potential of becoming reactivated during a major seismic event in the region.

3.8 Socioeconomics

Socioeconomic resources are the economic, demographic, and social assets of a community. Key elements include fiscal growth, population, employment, housing, schools, and environmental justice.

For the purpose of this EA, those counties or portion of counties in which the proposed action will occur define the boundary of the socioeconomic environment. The economic impact region (EIR) includes all areas within this boundary. The EIR for an impacted community is fundamentally important to the analysis because it defines the area in which changes in fiscal growth, population, labor force and employment, housing stock and demand, and school enrollment will be assessed. The EIR for Edwards AFB is that area located within 75 miles of the Main Base, and includes portions of Los Angeles, Kern, and San Bernardino counties. However, a majority of potential socioeconomic impacts from Base activities would be expected to occur within the Antelope Valley area (Figure 11).

Additional civilian personnel to the proposed modern laboratory and administrative complex could positively affect the social and economic fabric of the current urban environment. Approximately 28 construction personnel are anticipated to work on the construction of the new facility. The operation of a new laboratory complex at AFRL is expected to add from 80 to 100 personnel to the Base community with additional support drawn from on-Base tenant organizations.

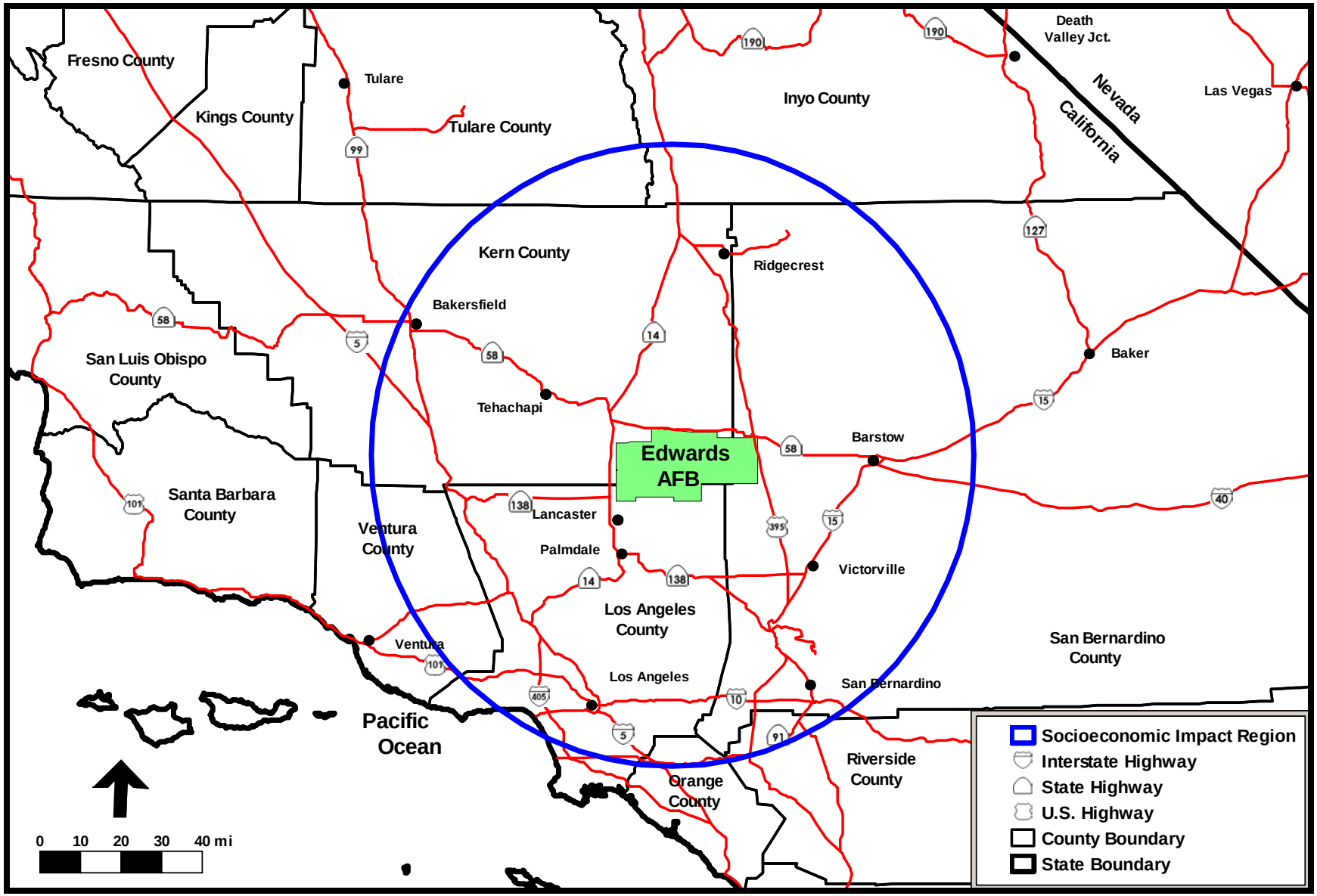


Figure 11 Economic Impact Region for Edwards AFB

3.8.1 Housing

New personnel are expected to be civilian and are not expected to be housed on Base. Within a 35- to 45-mile radius of the Base are the metropolitan cities of Palmdale and Lancaster that offer a variety of housing options.

3.8.2 Schools

Edwards AFB has two elementary schools, one middle school, and one high school, all of which are under the jurisdiction of the Muroc Unified School District. The elementary schools are divided into grade levels with students from kindergarten to second grade attending Bailey Avenue School and students from third through fifth grade attending Branch Elementary School. Students from 6th through 8th grade attend Edwards Middle School and students from 9th through 12th grade attend Desert High School. Based on the school year 2002–2003, student enrollment is as follows:

- Bailey Avenue School 545
- Branch Elementary School 422
- Edwards Middle School 422
- Desert High School 400

The Edwards Child Development Center is available for families with preschool children age 6 weeks to 4 years old who desire day care facilities. The center accommodates about 300 children on an annual basis. Children aged 5 to 12 years who require before and after school activities have access to the Edwards Youth Center. The center can accommodate over 350 children on a daily basis. Children aged 13 to 18 years of age have access to the Edwards Teen Center. Attendance at the center ranges from 60 to 70 children on a daily basis.

3.8.3 Fiscal Growth

Edwards AFB makes a substantial contribution to the economic status of the surrounding communities within the Antelope Valley of California. For fiscal year (FY) 98, the estimated cumulative economic impact from Edwards AFB's annual operating expenditures including salaries, DOD acquisitions, and educational assistance in the surrounding communities was $1.3 billion (AFFTC 1998a).

3.9 Infrastructure

Infrastructure refers to the physical components that are used to deliver something (e.g., electricity or traffic) to the point of use. Elements of the Base infrastructure system include water, wastewater, electricity, natural gas, communications lines (e.g., telephone or computer), and circulations systems (e.g., streets and railroads) that run in a network through the Base.

3.9.1 Regulatory Requirements/Guidance

The *Uniform Plumbing Code* (UPC) (International Association of Plumbing and Mechanical Officials 1997) establishes standards applicable to the erection, installation, alteration, repair,

relocation, replacement, addition to, or maintenance of plumbing systems. These standards ensure protection of public health, safety, and welfare.

The *Uniform Building Code* (UBC) (International Conference of Building Officials 1997) establishes minimum standards to safeguard life, health, property, and public welfare by regulating and controlling the design, construction, quality of materials, use and occupancy, location, and maintenance of all buildings and structures.

The National Fire Protection Association's (NFPA) *National Electrical Code* (NEC), NFPA 70, was first published in 1897 and is adopted and enforced in all 50 states. It provides practical safeguarding of persons and property from hazards arising from the use of electricity by establishing requirements for electrical wiring and equipment in virtually all buildings. It specifically covers the installation of electric conductors and equipment in public and private buildings, industrial substations, and other premises (e.g., parking lots); installation of fiber-optic cable, wiring, and general electrical equipment; the use of electricity in specific occupancies and equipment; special conditions (e.g., emergency and standby power or conditions requiring more than 600 volts); and communication systems.

3.9.2 Transportation System

Air Force Research Laboratory is accessed via U.S. Highway 58 to 20 Mule Team Road to Rich Road and Mercury Boulevard. Air Force Research Laboratory-related traffic comprises government, contractor, and personally owned vehicles (POVs) belonging to those that live and/or work on Base. In addition, commercial vehicles deliver material to businesses and facilities in the area. Commercial and AF vehicles are used for service and construction work done in the area (e.g., repairs). Emergency vehicles require access to all buildings and roads.

3.9.3 Utilities

Existing utility lines run in a network in the project area. Utilities that may be encountered during digging and trenching operations include water, natural gas, electrical, communications, sprinklers, and/or sewer systems. Water mains are typically transite™ (e.g., asbestos cement) pipe. Utility service lines are galvanized steel or copper pipe. Natural gas lines are wrapped black steel or plastic pipe. Sewer lines are vitrified clay pipes that run beyond 5 feet from the buildings and cast iron within the 5-foot line and under building slabs.

3.10 Energy Resources

The use of energy resources at Edwards AFB includes, but is not limited to natural and propane gas, fuel oil, electricity, and solar.

The general policy of the AF regarding energy is: "Energy is essential to the AF's capability to maintain peacetime training, readiness, and credible deterrence; to provide quality of life; and to perform and sustain wartime operations. In short, energy is an integral part of the weapon system…The most fundamental Air Force energy policy goal is to assure energy support to the national security mission of the Air Force in a manner which emphasizes efficiency of use, effectiveness of costs, and independence from foreign sources for mission-essential operations…" (AFFTC 1995b).

3.10.1 Regulatory Requirements/Guidance

The *Energy Policy Act of 1992* (PL 102-486) requires Federal entities to identify and accomplish all energy and water conservation measures with payback periods of less than 10 years.

Executive Order 13123, *Greening of the Government through Efficient Energy Management*, identifies the Department of Energy as the lead agency responsible for implementing the act and establishes seven goals regarding energy use that are applicable to Federal agencies. These goals target expanded use of renewable energy and reduction of

a. Greenhouse gases;

b. Petroleum use;

c. Energy use by industrial, laboratory, and other facilities;

d. Total energy use (as measured at the source); and

e. Water consumption (and associated energy use).

The *Edwards Air Force Base Energy Plan* (AFFTC 1995b) serves as a component of the Base General Plan and documents the policies, direction of development, and specific projects associated with the Base's desire to meet the national energy goals established by the *Energy Policy Act of 1992* (PL 102-486).

3.10.2 Energy Consumption

Edwards AFB and AFRL use electricity, natural gas/propane, and other petroleum-based products (e.g., gasoline, jet fuel, and diesel) as sources of energy to operate facilities, vehicles, equipment, and aircraft. Consistent with Federal law and AF policy, Edwards AFB has developed various programs and methods to reduce energy use. These include an awareness and education program (including standards for heating and cooling), and installation of energy management control systems for cooling, heating, and lighting. Electric, gas, and water meters are being installed to heighten awareness of consumption. Other energy reduction projects at Edwards AFB include the installation of swamp coolers, ceiling and wall insulation, double-pane windows, building foyers, and energy-efficient lighting tubes.

Currently, there are no permanent or temporary facilities located at the proposed project location; therefore, no energy is being consumed.

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4.0 ENVIRONMENTAL CONSEQUENCES

4.1 Land Use

4.1.1 Alternative A Impacts (Proposed Action)

4.1.1.1 On-Base Land Use

Construction of a new science laboratory at AFRL in the project site southwest of Building 8451, the existing laboratory, is consistent with the land use designation established for this location in the Base General Plan (AFFTC 2001a). The proposed project area is part of the AFRL portion of Edwards AFB, a moderately disturbed and developed area, and the new facility would be constructed near the existing laboratory at the triangular intersection of Mercury and Saturn Boulevards and Antares Road. The overall land use designation of AFRL is engineering test with limited quality of life amenities. The new laboratory facility would be developed to be compatible with the Edwards AFB Design Standards (AFFTC 1997) that was prepared and adopted as part of the Base General Plan. In addition, the siting and construction of new facilities requires approval from the Base Planning and Zoning Committee. Therefore, no changes in existing land use designations are expected, and no significant impacts to on-Base land use are anticipated from implementation of the proposed project.

4.1.1.2 Architectural Compatibility

Construction of a new science laboratory at AFRL would be subject to and consistent with the Edwards AFB Design Standards. Consultation with the Base Civil Engineer (BCE) for coordination of architectural styles and paint schemes and with the Design/Construction Flight Office for the design of signs, roads, parking, utilities, and landscapes, would ensure consistency with the Edwards AFB Design Standards and the intent of the Base General Plan (AFFTC 1997, 2001a). Therefore, no significant impacts are anticipated from implementation of the proposed project.

4.1.1.3 Direct/Indirect Effects

Construction of a new science laboratory at AFRL in the project site southwest of Building 8451, the existing laboratory, is consistent with and subject to the land use and architectural compatibility designations for this location as specified in the Base General Plan. Therefore, no direct or indirect effects to established architectural styles or designated/planned land uses are anticipated from implementation of the proposed project.

4.1.1.4 Short-Term/Long-Term Effects

Construction of a new science laboratory at AFRL in the project site southwest of Building 8451, the existing laboratory, is subject to and consistent with the land use designation established for this location in the Base General Plan. The Base General Plan has identified the proposed project site as a preferred location for a new science laboratory. Therefore, no short- or long-term effects to established or planned land use are anticipated from implementation of the proposed project.

4.1.2 Alternative A Minimization Measures (Preferred Alternative)

The following minimization measures are required if Alternative A is chosen.

a. The proposed project shall obtain final siting approval from the Base Planning and Zoning Committee. Contact the Base Comprehensive Planning Branch for more information on the planning process.

b. The proposed project shall comply with the Edwards AFB Design Standards (AFFTC 1997) and Air Force Instruction 32-7062, *Air Force Comprehensive Planning*.

4.1.3 Alternative B Impacts

Under this alternative, the construction of a new science laboratory would not occur. Therefore, no new impacts to land use would occur under this alternative.

4.1.4 Alternative B Minimization Measures

No new minimization measures are required for this alternative.

4.2 Air Quality

4.2.1 Alternative A Impacts (Proposed Action)

A short-term degradation in air quality may be experienced during construction activities. Fugitive dust emissions (PM10) could be generated through building construction activities and grading in unpaved areas in preparation for the construction of the laboratory facility. Use of associated motor vehicles and construction equipment could cause degradation in air quality from engine emissions.

The proposed action would involve the use of construction equipment over 50 bhp. If such equipment remains on Base for more than 45 days, an air quality operational permit is required from KCAPCD.

Hazardous air pollutants are considered to be (or have the potential to be) carcinogenic, mutagenic, toxic, poisonous, and may cause nausea and a variety of immunological, neurological, reproductive, developmental, and respiratory effects. Exposure to HAPs could result in immediate or future health problems and can range from short-term minor illness to sudden death depending upon the nature of the pollutant and the circumstance of the exposure. The HAP PTE threshold values are 10 tons per year for a single HAP and 25 tons per year for any two or more HAPs. For Edwards AFB, the total HAP emissions were 4.683 and 5.561 tons in 2000 and 2001, respectively.

Hazardous air pollutant emissions generated from construction-related activities could include, but are not limited to, xylene, benzene, trichloroethene, hexane, toluene, beryllium compounds, hydrochloric acid, chromium compounds, cobalt compounds, methanol, lead compounds, polycyclic compounds, acrylic acid, mercury compounds, formaldehyde, nickel compounds, and styrene. These HAP emissions would be short-term, occurring only during construction, and would be well below the HAP PTE threshold values. Compliance with all CAA Title III HAP requirements, or any more stringent State or local requirements as they apply to stationary sources that emit HAPs, would be required. Therefore, no significant HAP-related impacts would be expected during construction.

The existing laboratory facilities comprise only a portion of the overall Edwards AFB HAP emissions. Alternative A would construct and operate a separate smaller light (less dangerous) laboratory and administrative space with enhanced air emission controls (fume hoods), including those for HAPs. An air permit would be required for the laboratory fume system. Project-related HAP emissions would be expected to be similar in nature to, but of a lower volume than, those presently emitted by the existing laboratory facility. In addition, the relatively small increase in workforce at the project site over existing conditions is not anticipated to result in a substantial increase in the generation of HAP-related emissions for AFRL, as a whole. For these reasons, the proposed project is not expected to result in substantial additional HAP emissions above existing conditions and, therefore, no significant impacts associated with operation are anticipated.

Toxic air emissions regulated under AB 2588 would be generated as a result of construction and operational activities, including operation of portable or stationary ICEs, painting operations, and/or the use of solvents, cleaners, and adhesives. Project-related emissions from these sources would be expected to be similar in nature to, but of a lower volume than, those presently used in the existing laboratory facility. These emissions would require inclusion in the biannual Toxic Emissions Inventory Report provided to the KCAPCD by Edwards AFB. This would ensure compliance with AB 2588 implementing regulations. Temporary construction activities and the relatively small increase in workforce at the project site over existing conditions is not anticipated to result in a substantial increase in the generation of AB 2588-related emissions for AFRL, as a whole. As a result, no significant construction- or operations-related impacts are expected from implementation of the proposed project.

A conformity determination IAW 40 CFR 93.153(c)(1) is not required as the total direct and indirect emissions from the action alternatives are below the *de minimis* thresholds specified in 40 CFR 93.153(b)(1) and are not regionally significant. Total air emissions during site preparation and the construction of a laboratory facility are presented in Table 10. The values represent 1-year emissions from construction equipment and personal vehicles that would be at the complex during the proposed construction project, based on 28 vehicles arriving at the laboratory facility. Total emissions during construction do not exceed the 50 tons per year *de minimis* levels for NO_X and VOCs. An increase in scientists and administrative personnel would be expected at the laboratory facility during operational and developmental phases of the program. The total emissions are compared to *de minimis* levels for the KCAPCD and are below the 50 tons per year *de minimis* levels for NO_X and VOCs.

TABLE 10
ESTIMATED TOTAL EMISSIONS FROM VARIOUS SOURCES[1]

Emission Source	NO_x	VOC
Equipment for construction	3.564	0.702
Personal support vehicles	4.267	1.122

Note: 1. NO_x – oxides of nitrogen
2. VOC – volatile organic compound

[1]Emission values in tons per year

A copy of the air conformity letter and emission calculations can be found in Appendix B. The proposed action would comply with all applicable Federal, State, and local laws and regulations. Compliance with the minimization measures listed in Section 4.2.2 of this EA would further reduce anticipated impacts due to criteria pollutant or ozone precursor pollutant air emissions. Therefore, no significant impacts are expected from implementation of the proposed project.

The relevant and applicable *de minimis* levels for criteria pollutant emissions in all air districts are already less than the corresponding 10 percent regional planning emission inventory threshold values. The proposed action has emissions that are below KCAPCD *de minimis* levels, and changes in *de minimis* level emissions are not expected from operation of the proposed laboratory facility. Thus, the proposed action would not have a regionally significant impact in the KCAPCD.

4.2.1.1 Direct/Indirect Effects

The use of construction equipment and vehicular traffic from laboratory personnel would directly affect local air emission levels. However, based on air emission calculations, emission levels would be at or below *de minimis* levels. In addition, implementation of a new facility with up-to-date air emission control systems likely would provide a beneficial reduction in total HAP emissions as compared to the current laboratory system. Because emission levels would be at or below *de minimis* levels, any indirect effect on regional air quality values also would be insignificant from implementation of the proposed project.

4.2.1.2 Short-Term/Long-Term Effects

Air quality levels would be affected by the use of construction equipment and would be short-term and insignificant based on air emission calculations. Because emission levels would be at or below *de minimis* levels, the potential for long-term effects to regional and local air quality from implementation of the proposed project would be insignificant.

4.2.2 Alternative A Minimization Measures (Proposed Action)

The following minimization measures are required or recommended if Alternative A is chosen.

a. The proposed project shall comply with all *Air Toxics "Hot Spots" Information and Assessment Act* requirements (AB 2588), including revision of existing emission inventory plans and/or health risk assessments.

b. The proposed project shall comply with all applicable rules and regulations as identified in AFI 32-7040, *Air Quality Compliance*.

c. Air quality operational permits are required for ICEs over 50 bhp rating (e.g., welders, generators, compressors, or crushers). Any ICEs operated on Edwards AFB will require a permit from the local air agency. If such equipment is to remain on Base less than 45 calendar days, then a written exemption shall be obtained from the local air agency.

d. An air permit is required for the fume exhaust hoods in the laboratory.

e. The proposed project shall comply with Air Force Materiel Command (AFMC) Standard Operating Procedures for air quality stationary source management.

f. The proposed project shall comply with all CAA Title III HAP requirements, or any more stringent State or local requirements as they apply to stationary sources that emit HAPs.

g. The proposed project shall comply with all BACT specified in KCAPCD Rule 210.1, *New and Modified Stationary Source Review (NSR).*

h. All vehicles transporting clean fill material or construction debris require a cover to reduce PM10 emissions during transport.

i. All earthwork shall be planned and conducted to minimize the duration that soils would be left unprotected. The extent of the area of disturbance necessary to accomplish the project shall be minimized. Exposed surfaces shall be periodically sprayed with water.

j. Ground-disturbing activities shall be delayed during high-wind conditions (over 25 mph).

k. All mechanical equipment shall be kept in working order according to applicable Technical Orders and equipment maintenance manuals to reduce emissions to acceptable levels.

4.2.3 Alternative B Impacts

Under this alternative, the construction of a new science laboratory would not occur. Therefore, no new impacts to air quality are anticipated from this alternative and no potential emission control improvements would result.

4.2.4 Alternative B Minimization Measures

No new minimization measures are required or recommended.

4.3 Water Resources

4.3.1 Alternative A Impacts (Proposed Action)

4.3.1.1 Water Quantity and Source

The proposed project would involve the construction of a new light laboratory, administrative office, and computational facility. This action would require provision of potable water for a temporary construction-related workforce of 28 and an estimated 80 additional personnel to occupy the new facility over the current 60-person operational workforce at the existing laboratory. The temporary construction workforce and the increase in the workforce at the project site of approximately one-third over existing conditions is not anticipated to result in a substantial increase in demand for potable water for AFRL as a whole. A combination of continuing AVEK purchases and existing groundwater production wells is expected to provide water. In addition, the existing 10-inch potable water loop line west of the project site has been determined to be of sufficient capacity to provide for the additional needs of the new facility (Sacramento District Corps of Engineers 2002). Further, construction and operation of the proposed project will not affect existing groundwater production wells or storage facilities. Therefore, implementation of the proposed project is not expected to result in a significant impact to potable water sources/supplies.

4.3.1.2 Water Quality

Construction of the new laboratory facility could potentially affect existing stormwater runoff drainage patterns through changes in grade and an increase in impermeable surface area. Concrete curbing and gutters would be constructed as part of the new facility. Presently, there are no curbs or gutters on the project site. The new curbing and gutters would provide more effective management of stormwater runoff from the project site, with offsite water drainage occurring primarily through open culverts to the southeast under Antares Road to an existing drainage swale along South Saturn Boulevard.

Ground-disturbing activities of less than 1 acre no longer require coverage under the Stormwater General Permit associated with construction activities. Therefore, construction activities need not submit a Notice of Intent with the Regional Water Quality Control Board. However, it is recommended that construction projects develop a site-specific SWPPP and implement the BMPs within the Plan.

The proposed project may generate wastewater as a result of construction activities. If released into the wastewater system without meeting the standards set forth in the Board Order for the AFRL WWTP, it could cause an upset to the WWTP. This could result in the quality of the effluent not meeting established effluent limits. Compliance with the *Revised Waste Discharge Requirements for U.S. Department of the Air Force Edwards Air Force Base – AFRL Wastewater Treatment Plant, Board Order No. 6-94-52* (California Water Resources Control Board [CWRCB] 1994a), and AFFTCI 32-6 would minimize any potential impacts to wastewater quality.

Wastewater generated by construction activities would be minimal and is not expected to significantly impact the environment.

Operation of the proposed project would result in new sources of laboratory-related industrial and domestic wastewater. Although the proposed project would provide a new facility for existing light laboratory activities presently conducted in Building 8451, some of the industrial wastewater associated with the new facility would offset a portion of the existing wastewater sources from Building 8451. Project-related wastewater would be expected to be similar in nature to but of a lower volume than those presently released by the existing laboratory facility. In addition, the increase in workforce at the project site of approximately one-third over existing conditions is not anticipated to result in a substantial increase in the generation of domestic wastewater for AFRL, as a whole. Therefore, implementation of the proposed project is not expected to result in a significant wastewater-related impact to water quality.

4.3.1.3 Direct/Indirect Effects

Construction of a new laboratory facility has the potential to directly affect surface runoff, water quality, and water quantity; however, by implementing a stormwater pollution prevention plan as part of the construction plan, the effects of runoff would be minimized. Instituting appropriate control measures would prevent excess soil erosion from entering the stormwater sewer lines. These control measures would indirectly affect water quality and quantity of the

shallow groundwater by preventing excess contaminated soil from entering the sewer lines. The depth to groundwater at the project location is approximately 35 feet.

4.3.1.4 Short-Term/Long-Term Effects

Construction of a new laboratory facility could disrupt normal surface drainage patterns in the area over the short-term. Implementation of a stormwater pollution prevention plan would minimize any adverse effects due to stormwater runoff. Instituting control measures would have a long-term effect in minimizing potential flooding due to excess surface runoff. The addition of approximately 80 personnel to AFRL would have a long-term effect on the quantity of water used.

Temporary, construction-related impacts include the potential for increased sediment and pollutant loadings to surface waters from surface runoff. Disturbance of soil from excavation and grading activities can increase runoff and the potential for erosion. Pollutant loadings into receiving waters can occur from accidental discharge of waste products produced during construction and can include paints or petroleum by-products from vehicles and equipment.

The construction-related impacts anticipated from project implementation are considered negligible due to the minimal footprint of construction disturbance involved. The total construction-disturbed area of the new facility is estimated to be 6.07 acres (264,386 square feet). There are no surface waters within the immediate vicinity of project construction. Any net increase in stormwater runoff as a result of a permanent increase in impervious surface is expected to be minimal and, therefore, operational-related runoff likewise is not expected to result in a significant impact.

4.3.2 Alternative A Minimization Measures (Proposed Action)

The following minimization measures are required or recommended if Alternative A is chosen.

a. The proponent/contractor shall develop a site-specific SWPPP and follow the BMPs within this plan in order to meet the requirements of the CWA. The site-specific SWPPP shall be submitted to AFFTC/EMC (EM Compliance Branch) for review prior to construction activities.

b. All conditions and requirements of CWRCB Board Order 6-99-33, *Reviewed Waste Discharge Requirements for U.S. Department of the Air Force, Edwards Air Force Base – Air Force Research Laboratory Wastewater Treatment Plant* (CWRCB 1999), shall be met prior to disposal of nonhazardous wastewater to the WWTP.

c. The proposed project shall comply with AFFTCI 32-6, *Edwards AFB Wastewater Instruction*.

d. If industrial wastewater is discharged into the sewer system, then an AFFTC Form 5852, *Permit for Industrial Wastewater Discharge, Edwards AFB, California*, to discharge nonhazardous wastewater to the AFRL Wastewater Treatment Facility will be required.

4.3.3 Alternative B Impacts

Under this alternative, the construction of a new science laboratory would not occur. Therefore, no new impacts to water resources would result.

4.3.4 Alternative B Minimization Measures

No new minimization measures are required or recommended.

4.4 Safety and Occupational Health

4.4.1 Alternative A Impacts (Proposed Action)

4.4.1.1 Exposure Hazards

Elements of the proposed project can pose short-term noise and physical hazard-related health and safety issues for personnel during construction activities. Personnel working outdoors could experience heat stress or hypothermia from exposure, venomous snakebites, or could contract Hantavirus and/or valley fever from exposure to soils hosting spores. The use of heavy equipment will expose workers to health and safety risks. Compliance with the measures listed in Section 4.4.2 of this EA is expected to minimize health and safety hazards to personnel.

The groundwater beneath the area of the proposed laboratory facility is contaminated with TCE, DCE, PCE, and perchlorate from ERP Site 150, which was closed December 1999. The contamination is currently being monitored under ERP Site 133. Exposure to the solvent fumes in the project area is not anticipated due to the depth of the solvent plume; however, with the monitoring well being located in the project area, the monitoring well could provide a path for direct exposure to workers with either approved or accidental contact with the monitoring well.

Soil contamination at Site 150 has been remediated. The contamination plume for ERP Site 133 trends to the south of the proposed project location. Neither of these sites are anticipated to impact the proposed project.

4.4.1.2 Direct/Indirect Effects

Construction of a new laboratory would have the direct effect of exposing onsite workers to noise and physical hazards. Completion of a new laboratory would have a beneficial indirect effect to human health by removing some personnel from the potential exposure to ACMs, LBPs and heavy-metal paints, and PCBs.

4.4.1.3 Short-Term/Long-Term Effects

The construction of a new laboratory would expose onsite personnel to noise and physical hazards during construction of the facility, thereby causing a short-term effect. Completion of a new laboratory would have a long-term positive effect on the laboratory personnel working in the new facility because they would benefit from working in a modern, updated laboratory.

4.4.2 Alternative A Minimization Measures (Proposed Action)

The following minimization measures are required if Alternative A is chosen.

a. All personnel present within hazardous noise areas as stated in AFOSH Standard 48-19, *Hazardous Noise Program*, shall follow the applicable hearing protection guidelines.

b. This project is located within ERP OU 4; however, activities in this area are not expected to encounter contaminated soil and a site-specific Health and Safety Plan (HASP) is not required. Contaminated groundwater was reached at a depth of approximately 50 feet bgs. If the proponent/contractor notices soil discoloration or odors during activities, they shall report this observation immediately to Bioenvironmental Engineering (95 AMDS/SGPB) and EM (AFFTC/EMR).

c. The proposed project shall comply with the standards, instructions, and regulations listed in Section 3.4 of this EA that are applicable to the proposed project.

4.4.3 Alternative B Impacts

Under this alternative, the construction of a new science laboratory would not occur. The potential for exposure to ACM, LBP, and PCB-containing fixtures would continue to occur through routine maintenance activities. Therefore, no new impacts to safety and occupational health would result.

4.4.4 Alternative B Minimization Measures

No new minimization measures are required or recommended.

4.5 Hazardous Materials and Waste

4.5.1 Alternative A Impacts (Proposed Action)

4.5.1.1 Hazardous Materials

The types and quantities of hazardous materials used during the construction of the new science laboratory would not be different from those already used on Base. Hazardous materials used in the laboratory upon completion of construction would be expected to be similar in nature to, but of a lower volume than, those presently used at the existing laboratory facility at Building 8451. Compliance with all applicable standards and/or regulations addressing hazardous materials management would be required, and would ensure proper handling, use, and storage of these substances during construction and use of the new facility. In addition, an increase in the workforce at the project site of approximately one-third over existing conditions is not anticipated to result in a substantial increase in the use of hazardous materials for AFRL, as a whole. Occasional incidents, such as accidents involving trucks delivering hazardous materials to the new facility, may result in hazardous releases. It is expected that these releases would be cleaned up as part of established Edwards AFB emergency response procedures. Therefore, implementation of the proposed project is not expected to result in a significant impact related to hazardous materials.

4.5.1.2 Hazardous Waste

The proposed project is not located on or adjacent to a known hazardous waste materials site. Hazardous wastes generated during construction and operation of the proposed project could create significant impacts if the wastes were not managed properly and/or releases to the environment were to occur without appropriate cleanup. Construction and operation of the proposed project would be required to comply with all of the existing hazardous waste laws and regulations.

The Federal government regulates hazardous wastes through the RCRA and CERCLA, and their amendments; as well as the implementing Federal regulations in Title 40 of the CFR. Compliance with these laws and regulations would reduce the potential for hazardous materials impacts to less than significant.

Hazardous wastes generated through laboratory actions, once constructed and in use, would be expected to be similar in nature to, but of a lower volume than, those presently generated at the existing laboratory facility in Building 8451. Compliance with all applicable standards and/or regulations addressing hazardous waste management, including standard operating procedures identified in the Edwards AFB HWMP, would ensure proper handling, storage, and disposal of hazardous wastes generated at the new facility. Therefore, implementation of the proposed project is not expected to result in a significant impact related to hazardous wastes.

An IAP and its proposed location must be approved by and coordinated with EM in order to minimize the threat to human health and the environment. An IAP has fewer operational requirements than an ACCS, providing the following restrictions in 22 CCR 66264.34 are met.

a. Hazardous waste accumulation/containerization is accomplished only by knowledgeable and trained IAP personnel under controlled circumstances (waste addition logs are used to identify what hazardous waste is added to a container);

b. Hazardous waste accumulation is not more than 55 gallons per wastestream of hazardous waste or 1 quart of acutely or extremely hazardous waste; and

c. Hazardous waste may be accumulated for 270 days or until either of the restrictions listed are exceeded.

An IAP must also comply with other operational requirements that ensure wastes are managed IAW applicable regulations, and as specified in the Edwards AFB HWMP (AFFTC 1999a).

4.5.1.3 Solid Waste

This alternative would not be expected to create a large quantity of CDW, because the proposed project represents construction of an entirely new facility. In FY00, CDW disposed of at the Main Base Landfill was estimated at 9,825 tons. Construction-related solid waste would require disposal at an approved off-Base, licensed landfill, as stipulated by contractual agreement. This policy of requiring off-Base disposal of most contractor-generated solid waste ensures that no impacts to the Main Base Landfill capacity will occur. No impact to off-Base landfills would be anticipated from their continued use by contractors due to the relatively small quantity of waste generated by the proposed project.

4.5.1.4 Direct/Indirect Effects

Construction of the new facility would have a direct effect on the use of hazardous materials and the generation of hazardous waste. The use of hazardous materials such as paints, solvents, and petroleum products, including lubricants, during construction would be no different than those already in use on Base. By following regulatory practices, the indirect effect would be the minimization of risk to human health in the workplace.

4.5.1.5 Short-Term/Long-Term Effects

During construction of the facility, the use of hazardous materials and generation of hazardous and solid waste would be a short-term effect in the area. The control and uses of hazardous materials through pollution prevention programs, the institution of pharmacy practices, and conducting operations IAW environmental regulations would have a long-term beneficial effect on the generation, storage, and disposal of hazardous waste from the facility.

4.5.2 Alternative A Minimization Measures (Proposed Action)

The following minimization measures are required or recommended if Alternative A is chosen.

a. In accordance with 29 CFR 1910.1200 on hazard communication, all hazardous materials shall be documented with required MSDSs as part of a complete hazardous materials inventory. A copy of the inventory and all pertinent MSDSs shall be submitted to Bioenvironmental Engineering in support of the Base Hazardous Materials Program and *Air Force Hazard Communication Program* (AFOSH Standard 48-21).

b. The Base Director of Safety shall be notified at least 48 hours prior to off-loading hazardous materials.

c. Any hazardous waste generated during construction activities shall be handled IAW applicable regulations: 49 CFR 171–177, *Waste Transportation and Packaging*; 40 CFR 260–299, *Storage, Treatment, and Disposal of Waste*; AFI 32-7042, *Solid and Hazardous Waste Compliance*; and the Edwards AFB HWMP (AFFTC 1999a).

d. In accordance with AFI 32-7042, *Solid and Hazardous Waste Compliance,* a hazardous waste IAP and its proposed location must be approved by and coordinated with EM.

e. Hazardous wastes are subject to land disposal restriction requirements. Signed hazardous waste disposal manifests shall be required for all hazardous wastes prior to transportation for off-Base disposal to an approved landfill.

f. The proponent/contractor shall submit all hazardous waste manifests to the AFFTC/ EMCC (Environmental Management Compliance Branch) manager.

g. This project will generate CDW. The proponent/contractor shall be responsible for transporting solid waste to a State-licensed facility.

h. The contractor shall segregate recyclable and reusable materials from solid waste for delivery to the appropriate on- and off-Base recovery or disposal facilities. The 95th Civil Engineer Squadron, Group Environmental Office, should be contacted regarding recyclable debris.

4.5.3 Alternative B Impacts

Under this alternative, construction of a new laboratory would not occur and no construction-related hazardous material or waste impacts would result. Hazardous material utilization and hazardous waste generation at the existing laboratory would continue. Therefore, no new impacts to hazardous materials and waste would result.

4.5.4 Alternative B Minimization Measures

No new minimization measure are required or recommended.

4.6 Biological Resources

4.6.1 Alternative A Impacts (Proposed Action)

4.6.1.1 Animal Species

Of the several species of interest at Edwards AFB, there is only one listed species, the desert tortoise (*Gopherus agassizii*), with legally required mandates on management practices. It is Federally listed as threatened under the ESA and State listed as threatened by the California Fish and Game Commission. The proposed project is not located within or adjacent to habitat of the desert tortoise. The proposed project, however, could involve ground-disturbing activities at borrow site areas that may indirectly disturb desert tortoise habitat or otherwise create conditions that are adverse to the species success. This constitutes a short-term impact to biological resources.

4.6.1.2 Direct/Indirect Effects

Construction of facilities could use fill material for building pads. The fill material would be hauled from existing borrow pits, which would have a direct effect on the local biology in the area. By using designated borrow pits and consulting with EM prior to soil excavation, environmental issues regarding potential biological encounters would be identified. This would be an indirect beneficial effect to the local biology, since accidental takes would be minimized.

4.6.1.3 Short-Term/Long-Term Effects

Short-term effects to biological resources would result during the construction of the facility. Habitat found near the borrow pits may be affected during removal of fill materials. By consulting with EM prior to using the borrow pit, awareness of local biological habitats would result in the minimization of accidental disturbances and long-term effects beneficial to the biological community.

4.6.2 Alternative A Minimization Measures (Proposed Action)

The following minimization measures are required if Alternative A is chosen.

a. The proponent/contractor shall adhere to the Terms and Conditions of the applicable Biological Opinion listed in Section 3.6.2 of this EA.

   (1) The desert tortoise may be encountered at borrow fill sites. Vehicles shall, to the maximum extent possible, remain on established roads. If this is not possible, an authorized biologist shall survey the route to be traveled. Equipment and vehicle operators shall be alert for desert tortoises and other wildlife in and along access routes. All desert tortoise burrows shall be avoided during off-road travel. When traveling off-road, speed limits shall not exceed 5 mph and shrubs shall be avoided as much as possible.

(2) At no time shall project personnel or site visitors touch, move, harass, harm, or kill any desert tortoise. Workers and visitors shall immediately report all desert tortoise sightings to Air Force Flight Test Center/Environmental Management Conservation Branch (AFFTC/EMXC).

(3) All trash shall be placed in raven-proof receptacles for proper disposal to reduce the attractiveness of desert tortoise predators (e.g., coyotes and common ravens).

b. Preactivity surveys (48 hours before construction begins) shall be conducted in areas of desert tortoise habitat by authorized biologists as determined by the Base wildlife biologist. If monitoring is deemed necessary by the Base biologist, the monitor shall be available to ensure compliance with any minimization measures and subsequent Terms and Conditions of the Biological Opinion.

c. Prior to commencement of work activities at approved borrow sites the proponent/ contractor shall specifically establish approved locations, perimeters, and dimensions of the approved site. To establish these coordinates, the contractor shall consult with EM to identify specific environmental issues including, but not limited to, endangered species, threatened species, and sensitive species.

d. A depredation permit is required to remove birds or active bird nests. An AFFTC/EM representative must perform removal of birds or active bird nests.

4.6.3 Alternative B Impacts

Under this alternative, the construction of a new science laboratory would not occur. Therefore, no new impacts to biological resources would result.

4.6.4 Alternative B Minimization Measures

No new minimization measures are required or recommended.

4.7 Geology and Soils

4.7.1 Alternative A Impacts (Proposed Alternative)

4.7.1.1 Topography

Topography is the greatest factor increasing soil erosion. For the purpose of this discussion, topographic features that increase erosion may be defined as any slope greater than 1:1. The soils of such slopes are influenced by gravity and have a greater tendency to erode than do those on flat land. In such cases, vegetation is often an important factor in keeping such soils stable. The topography of the proposed project site is a gradual grade drop of approximately 20 feet to the southeast over the proposed construction footprint.

Trenching and grading activities expose soils to wind erosion. Due to the high winds that are common to the western Mojave, exposed soils can contribute to PM10 emissions and reduction in visibility due to airborne particulate matter. Wind erosion has a short-term and minor impact to soil erosion.

Given the relatively flat topography and small construction footprint, no significant impacts related to soil erosion are anticipated with implementation of the proposed project.

4.7.1.2 Material Site Use

Fill material is a nonrenewable natural resource available at Edwards AFB. Fill material would be required in order to level areas for the proposed project. Fill material may be obtained from the AFRL borrow pit on Mars Boulevard. However, approved off-Base sources of fill material may be used to meet specific soil type requirements and/or to augment and avoid depletion of finite, on-Base resources. Fill material is available and the minimization measures listed in Section 4.7.2 of this EA should minimize any potential impacts. Onsite soil would be utilized as much as possible, but an estimated quantity of 111,000 cubic yards of fill material would be necessary to accomplish the leveling of the ground surface.

The AFRL borrow pit on Mars Boulevard, Borrow Site 18, or Borrow Site 16(B) east of Rogers Lake will be used for fill material for the proposed project.

4.7.1.3 Environmental Restoration Program Site Disturbance

Environmental Restoration Program sites and AOCs often undergo long-term monitoring and remediation efforts. These sites can be susceptible to damage from adjacent ground-disturbing activities. Numerous wells, which consist of little more than short aboveground pipes, may be positioned to sample groundwater representing hours of work and precise locations. Valuable equipment that is calibrated and easily damaged may be left on site. The environment of a remediation or monitoring site is sensitive to disturbance because precise measurements may require controlled conditions. The data obtained is required to accomplish ERP goals and objectives.

The groundwater beneath the area of the proposed laboratory facility is contaminated with solvents that include TCE, DCE, PCE, and perchlorate. The groundwater contamination is being remediated as part of the OU 4 cleanup action. The groundwater contamination is at about 50 feet bgs and is unlikely to be an exposure risk. Construction activities that include subsurface excavations and the use of heavy equipment have the potential to damage monitoring wells and associated subsurface utilities. One monitoring well located at the project site is used to monitor solvent concentration levels in the OU 4 area. Prior to construction of the proposed laboratory, the OU project manager shall be consulted to determine if wellheads need to be replaced due to the construction, or whether the monitoring well must be capped and abandoned and a second monitoring well drilled at another location.

A groundwater extraction system is in place at ERP Site 133 located south of the project site. This system consists of monitoring and extraction wells, and piping. No lines, wells, or equipment associated with ERP Site 133 are located in the proposed project area. Therefore, ERP Site 133 is not expected to be impacted by the proposed project.

4.7.1.4 Seismicity

Seismic damage is not anticipated to occur at the new laboratory facility from dormant regional faults. The use of building codes with seismic construction requirements would reduce the potential impacts if dormant faults become active.

4.7.1.5 Direct/Indirect Effects

The groundwater beneath the area of the proposed facility is contaminated with TCE. Construction activities have the potential for a direct effect to damage monitoring wells and associated subsurface equipment. Consultation with the AFFTC/EMR group would be required prior to construction to minimize health risk and potential damage to ERP equipment.

4.7.1.6 Short-Term/Long-Term Effects

Wind erosion due to trenching and grading has a short-term and minor impact to soil erosion. Use of material from Edwards borrow pits has a long-term effect on the availability of a nonrenewable natural resource. Fill material obtained off Base may be used to meet specific soil type requirements, and helps to avoid depletion of the finite on-Base resource.

4.7.2 Alternative A Minimization Measures (Proposed Action)

The following minimization measures are required or recommended if Alternative A is chosen.

a. All earthwork shall be planned and conducted to minimize the duration that soils would be left unprotected. The extent of the area of disturbance necessary to accomplish the project shall be minimized. Ground-disturbing activities shall be delayed during high-wind conditions (in excess of 25 mph). Vehicular traffic, grading, and digging shall not be permitted in the project area during high-wind conditions.

b. Exposed surfaces shall be periodically sprayed with water.

c. Design standards to be followed include: Air Force Manual 88-3(CH-13), *Seismic Design of Buildings;* the USACE Guide Specification No. 13080, *Seismic Protection for Mechanical and Electrical Equipment*; the UBC Chapters 23, 26, 27, and 29 (International Conference of Building Officials 1997) with the applicable California Supplements; and Kern County building codes.

d. Prior to commencement of work activities at approved borrow sites the proponent/ contractor shall specifically establish approved locations, perimeters, and dimensions of the approved site. To establish these coordinates, the contractor shall consult with EM to identify specific environmental issues including, but not limited to, natural resources, cultural resources, and ERP concerns.

e. Fill material shall be delivered according to all applicable Federal, State, and local regulations regarding the transport of fill material. Contact EM for assistance.

f. Project activities are located in close proximity to an ERP monitoring well. Prior to starting work on the project, the proponent/contractor shall contact AFFTC/EMR to identify the location of ERP equipment to the proponent. Damage to ERP equipment must be avoided.

4.7.3 Alternative B Impacts

Under this alternative, the construction of a new science laboratory would not occur. Therefore, no new impacts to geology and soils would result.

4.7.4 Alternative B Minimization Measures

No new minimization measures are required or recommended.

4.8 Socioeconomics

4.8.1 Alternative A Impacts (Preferred Alternative)

4.8.1.1 Housing and Schools

Temporary construction and new laboratory personnel are expected to be civilian and would not be housed on Base. Civilian personnel have several housing and school options available in the local communities that surround the Base. The communities of Rosamond, Californian City, Lancaster, Palmdale, and Tehachapi are within driving distance to the Base. Additional personnel associated with the proposed project are not expected to constitute a significant impact to housing and school resources in the region.

4.8.1.2 Fiscal Growth

Implementation of the proposed project would provide a minor, short-term positive incremental impact to the economy of the Antelope Valley from increased revenue generation. This increase in revenue is expected to occur as a result of money spent off Base for construction materials and services. In addition, any increase of the Base workforce would have a positive ripple effect to the economy both on Base and in the local communities.

4.8.1.3 Direct/Indirect Effects

The construction of the proposed facility would have a minor direct effect on Base population and services. It is anticipated that the Base would be able to absorb these indirect effects due to the transitory nature of military assignments and mission programs Basewide.

4.8.1.4 Short-Term/Long Term Effects

Construction of the facility would have a short-term effect to the local economy with the increase in workforce and expenditure of funds to construct the building. Construction of the facility would have a long-term effect to the local economy with the attraction of new workers to the modern facility.

4.8.2 Alternative A Minimization Measures (Preferred Alternative)

No minimization measures are required or recommended.

4.8.3 Alternative B Impacts

Under this alternative, the construction of a new science laboratory would not occur. The number of personnel would remain the same. Therefore, no new impacts to fiscal growth, housing, or schools would result.

4.8.4 Alternative B Minimization Measures

No minimization measures are required or recommended.

4.9 Infrastructure

4.9.1 Alternative A Impacts (Proposed Action)

4.9.1.1 Transportation System

Proposed project activities have the potential to affect the transportation system through traffic delays or the temporary closure of roadways. Construction-related traffic delays would be temporary and short-term. Early coordination with Base organizations would ensure that necessary safety precautions are taken, and would allow ample advance notice to affected commuters and personnel. The addition of an additional 80 laboratory personnel would not be expected to adversely affect the existing transportation system. Therefore, no significant construction- or operational-related impacts to the existing transportation system are anticipated.

4.9.1.2 Utilities

Proposed action activities have the potential to impact existing utility lines, such as water, sewer, electrical, or natural gas, through accidental penetration. This could result in temporary service interruption and the repair and replacement of the severed utility line. However, the proposed facility has been designed and will be constructed to be consistent with the existing utility system. Implementation of the proposed project would not impose a substantial additional burden on the existing AFRL wastewater treatment system, because the amount of wastewater produced would be a minimal incremental increase over current laboratory volumes, relative to the treatment capacity available. In addition, the proposed project will not require the construction or expansion of water or wastewater facilities. The quantity of additional stormwater generated from the facility would be minimal, in comparison to the capacity of the existing storm drainage system. Therefore, no significant utility-related impacts are associated with the proposed project.

4.9.1.3 Direct/Indirect Effects

The construction of a new facility would directly affect existing utility systems through adding to the existing usage at AFRL. New utility systems at the facility would indirectly affect program efficiencies through providing modern systems and enhancing the working environment and worker productivity.

4.9.1.4 Short-Term/Long-Term Effects

During construction of the facility there may be short-term disruptions in vehicular traffic due to the movement of construction material and workers.

4.9.2 Alternative A Minimization Measures (Proposed Action)

The following minimization measures are required if Alternative A is chosen.

a. All work that would affect closure, rerouting, or modification of roadways, streets, or highways shall be coordinated 15 days in advance with the Security Forces, Base Fire Department, and Public Affairs Office. A current copy of the California Department of Transportation *Manual of Traffic Controls for Construction and Maintenance Work Zones* (California Department of Transportation 1990) shall be used as guidance for traffic signs.

b. The proponent/contractor shall be responsible for obtaining an AF Form 103, *Base Civil Engineering Work Clearance Request* (digging permit). Contact the Base Civil Engineer Infrastructure Controller for coordination.

c. Some utilities require a representative to be present on site at all times when motorized construction equipment is being used closer than 20 feet from existing lines. The project sponsor shall coordinate with the Civil Engineer Group in order to identify the location of affected lines.

d. If current as-built drawings indicating existing utility lines are not available, no mechanical digging can be performed within 4 feet of utilities or communication cables until they are physically exposed by hand digging.

4.9.3 Alternative B Impacts

Under this alternative, construction of a new science laboratory would not occur. Utilities and roads would continue to be used. Therefore, no new impacts to the Base transportation or utility systems would occur.

4.9.4 Alternative B Minimization Measures

No new minimization measures are required or recommended.

4.10 Energy Resources

4.10.1 Alternative A Impacts (Proposed Action)

Energy measures incorporated into the design of a newly constructed facility have the potential to reduce the energy costs compared to standard construction designs. These measures include the incorporation of energy-saving HVAC, hot water, and energy management control systems and could result in a substantial cost savings to the AF. Use of these measures would contribute to the achievement of energy-reduction goals and requirements established in PL 102-486, *Energy Policy Act of 1992*, and EO 13123, *Greening the Government through Efficient Energy Management*. Construction of the new laboratory would utilize up-to-date energy efficient systems.

4.10.1.1 Direct/Indirect Effects

The installation of energy efficient systems would indirectly affect worker productivity by creating a modern working environment.

4.10.1.2 Short-Term/Long-Term Effects

The installation of energy-efficient systems would have a long-term beneficial effect to the AF.

4.10.2 Alternative A Minimization Measures (Proposed Action)

The following minimization measure is recommended if Alternative A is chosen. It is recommended that the best available energy conservation measures be incorporated into the design of the laboratory facilities.

4.10.3 Alternative B Impacts

Under this alternative, the construction of a new science laboratory would not occur. Energy resources would continue to be consumed at their present rate. Therefore, no new impacts to energy resources would result.

4.10.4 Alternative B Minimization Measures

No new minimization measures are required or recommended.

4.11 National Environmental Protection Act-Mandated Analysis

The construction of the proposed facility would affect certain aspects of the environment. These aspects have been evaluated together with five additional impacts that include

a. Direct/Indirect Effects;

b. Short-Term/Long-Term Effects;

c. Cumulative Effects;

d. Unavoidable Adverse Effects; and

e. Irreversible and Irretrievable Commitments of Resources.

The evaluation of direct/indirect effects and short-term/long-term effects are presented in the discussion of the affected environment in the Environmental Consequences section (Sections 4.1 through 4.10 of this EA). A discussion of cumulative effects, unavoidable adverse effects, and irreversible and irretrievable commitments of resources are discussed in the following sections.

4.11.1 Cumulative Impacts

The CEQ regulations implementing NEPA require agencies to consider the potential for cumulative impacts of proposed actions. “Cumulative impact” is defined in 40 CFR 1508.7 as “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. Cumulative impacts can result from individually minor but collectively significant actions taking place over time."

Cumulative impacts are those changes to the physical, biological, and socioeconomic environments that would result from the combination of construction, operation, and associated impacts resulting from the proposed action when added to other past, present, and reasonably foreseeable actions. Past projects, or those implemented or built before 2003, can be considered to be part of the existing conditions environment baseline presented in this EA. Included within the concept of past projects are all maintenance activities, land development projects, and other actions that occurred before detailed analysis began on this EA. Cumulative impacts can result from individually minor but collectively significant actions taking place over time.

Current projects that are ongoing on the Base include repaving and regrading of AFRL and Main Base roads, construction of the Consolidated Support Facility, add on to TRACON (Building 2580) and demolition of older Military Family Housing. The long-term cumulative impacts to the Base from these activities would be minimal since the new development represents a small percentage of existing development, and the remainder are maintenance or demolition activities.

For the Preferred Alternative, the addition of a Propulsion Energetics Laboratory would be compatible with the Air Force Research Laboratory Master Plan and the Edwards AFB General Plan. Air Force Research Laboratory serves as Edwards AFB's development center for propulsion and related technologies for the Air Force. As part of the planning process for Edwards AFB, a General Plan for the entire Base has been established and Area Development Plans for subareas within the Base have been developed. One Area Development Plan guides development of the AFRL portion of the Base. This Area Development Plan identifies needs and sets out an approach by which these needs can be met. It incorporates planning and designing guidelines to ensure compatibility of all future development with existing facilities. It also coordinates the overall planning and design concepts for the AFRL area of the Base.

Impacts to physical resources related to construction activities, such as noise, air quality, and erosion, would not contribute substantially to cumulative impacts since they are typically localized and temporary. Long-term impacts to adjoining areas would be slight because a portion of the personnel anticipated to occupy the new facility would merely be relocated from Building 8451, the existing Science Lab. The current Base workforce is 11,789. Increases in mission support personnel at the new facility are anticipated to be up to 80 personnel. This increase in personnel would be a gradual increase over several years and would total a less than 1 percent increase in Base personnel. Demands on regional utilities to provide sanitary services, solid and hazardous waste services, electrical demand, natural gas supply, telephone and other communication services, would be well within existing capabilities for the area.

Long-term impacts to these resources through the implementation of the Preferred Alternative would be minimal. No significant cumulative impacts to geology, topography, or soils would result. The project location is in a developed area near the existing laboratory at the triangular intersection of Mercury and Saturn Boulevards and Antares Road.

Approximately 5.8 acres of land would be developed under the Preferred Alternative. The area to be developed would include a 37,000-square-foot building, sidewalks, and landscaping. Landscape design would conform to the Edwards AFB Design Standards and would use a variety of native plants, rock, mulch, and other xeriscape techniques. This type of landscaping minimizes maintenance, reduces irrigation, and offers a natural desert setting that is a minimal impact to the setting of the area.

Minimal impact to wildlife species would occur as a result of this development.

Implementation of the Preferred Alternative would enhance the economics of the local area through the purchase of building materials and provision of employment, both for construction of the facility and later for mission support personnel.

The No Action Alternative would result in no change to the existing conditions. Therefore, no significant impacts would result. However, with continued use of the existing laboratory, renovations or repairs have the potential to expose personnel to ACM, LBP, and PCBs. This impact would occur whether or not the preferred alternative is implemented. The activities currently occurring at the existing laboratory would remain relatively unchanged. Renovations and repairs to the facility would occur on an as-funded basis. In addition, worker productivity and retention, along with personnel recruitment, is challenged due to overcrowded conditions that create an inefficient and nonuser friendly environment.

According to Civil Engineering, other projects currently proposed for AFRL are to construct a liquid oxygen generating plant and to construct a visitor's center/support facility. These projects are both lower priorities than construction of the Propulsion Energetics Laboratory, and neither is funded.

Proposed projects for the Main Base area of Edwards AFB include renovation and construction of facilities to accommodate additional flight test missions, construction of a new base physical fitness complex; upgrading the existing munitions complex; and replacement or repair of the Main Base Runway. The implementation of these proposed projects is not guaranteed and will depend upon program funding in outlying years. It is not anticipated that the implementation of any or all of these projects would create a negative cumulative impact.

4.11.2 Unavoidable Adverse Impacts

Unavoidable adverse impacts include those that are negative, occurring regardless of any identified minimization measures.

a. Physical Resources – Exposure of surface soils during construction activities would cause some erosion, especially during wind or rain events. Short-term increases in suspended sediment loading due to soil erosion during construction would occur. Construction activities would increase fugitive dust levels, and emissions would occur from construction equipment and worker vehicles. Noise levels would increase during construction, but would only occur during normal work hours.

b. Biological Resources – Approximately 5.8 acres of land would be developed for the proposed facility. This would include landscaping and sidewalks adjacent to the proposed

building. Ample parking is already provided for this site. Minimal impact to wildlife species would occur as a result of this project.

c. Socioeconomic Resources – Long-term commitments of resources would result from operation and maintenance of the proposed facility from the provision of water, sewage, electricity, natural gas, solid waste, and hazardous waste services for the facility. Building and construction materials would also be long-term commitments.

The preferred alternative would positively benefit the local area in terms of economic activity, employment, and income. Local services such as schools, police, fire and emergency medical services would not be adversely impacted.

Under the No Action Alternative, a new science laboratory would not be constructed and, therefore, overcrowded conditions would continue. In addition, there is the potential for exposure to ACM, LBP, and PCBs from the existing laboratory and any repairs or modifications undertaken in the future.

4.11.3 Means to Mitigate or Minimize Adverse Environmental Impacts

Impacts to physical resources as a result of implementation of Alternative A – the Preferred Alternative, would occur primarily during construction of the proposed facility. Although the impacts would be short-term, contractors would have to adhere to environmental regulations regarding adverse effects from soil erosion, noise, air pollution, water contamination, and other impacts that would affect the physical environment. Environmental impacts from the No Action Alternative would be minimal since no new construction would occur.

4.11.4 Irreversible and Irretrievable Commitment-of-Resources

Irreversible commitment of resources entails the consumption of or adverse effect upon resources that cannot be reversed or persists for an extremely long period of time. Irretrievable commitment-of-resources are those that are consumed or affected for a short period of time and that would be restored over time. Irreversible and irretrievable commitment of resources would result from the construction of a new laboratory facility. Construction of the new facility would require the commitment of labor, capital, energy, biological resources, building materials, and land resources. Short-term commitments include labor, capital, and fossil fuels that result directly from construction activities and indirectly from the provision of services to the proposed site during construction. Long-term commitments of resources would result directly from operation and maintenance of the facility from the provision of water, sewage, electricity, solid waste, and hazardous waste services to the building and associated new occupants during use. New building materials would also be long-term commitments.

Under the No Action Alternative, Alternative B, there would be no commitment of such resources.

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FINAL

APPENDICES

March 2004

APPENDIX A
TOTAL AFRL AIR EMISSIONS FOR 2002

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TABLE A-1
TOTAL AFRL AIR EMISSIONS FOR 2002

BLDG	DEVICE	PERMIT	DESCRIPTION	QTY USED	UOM	CO EMISSIONS (LB/YR) CY02	NO_X EMISSIONS (LB/YR) CY02	PM10 EMISSIONS (LB/YR) CY02	SO_X EMISSIONS (LB/YR) CY02	VOC EMISSIONS (LB/YR) CY02
8000	81607		Furnace, Natural Gas, 0.12 MMBTU/Hr, (7 Units)	94504.0000	CUBFT	7.9383	9.4504	0.7182	0.0567	0.5198
8000	81702		Furnace, Propane, 0.0240 MMBTU/Hr, (16 Each)	2865.0000	GAL	5.4435	40.1100	1.1460	0.0516	0.8595
8000	81608		Water Heater, Natural Gas, 0.12 MMBTU/Hr, (3 Each)	133716.0000	CUBFT	11.2321	13.3716	1.0162	0.0802	0.7354
8040	82107		Aboveground Tank, Diesel, 250 Gal, BL	250.0000	GAL	0.0000	0.0000	0.0000	0.0000	0.1797
8040	82107		Aboveground Tank, Diesel, 250 Gal, WL	191.0000	GAL	0.0000	0.0000	0.0000	0.0000	0.0051
8040	50116	0134092	Emergency Engine with Generator, Diesel, 102 Bhp	190.7000	GAL	24.8196	69.1291	7.8378	1.3194	0.9405
8120	50117	0134113	Emergency Engine with Generator, Diesel, 97 Bhp	33.3000	GAL	4.3340	12.0713	1.3686	0.2304	0.1642
8356	55606		Boiler, Natural Gas, 1.08 MMBTU/Hr	1304800.0000	CUBFT	109.6032	65.2400	9.9165	0.7829	7.1764
8359	68101		Aboveground Tank, Diesel, 1000 Gal, LL	1000.0000	GAL	0.0000	0.0000	0.0000	0.0000	0.5262
8359	68101		Aboveground Tank, Diesel, 1000 Gal, WL	73.0000	GAL	0.0000	0.0000	0.0000	0.0000	0.0020
8359	55607		Boiler, Natural Gas, 0.25 MMBTU/Hr	40470.4000	CUBFT	3.3995	2.0235	0.3076	0.0243	0.2226
8359	50114	0134084	Emergency Engine with Generator, Diesel, 102 Bhp	73.0000	GAL	9.5010	26.4627	3.0030	0.5051	0.3600
8361	65600		Boiler, Natural Gas, 3.2 MMBTU/Hr	1687350.0000	CUBFT	141.7374	84.3675	12.8239	1.0124	9.2804
8361	65601		Boiler, Natural Gas, 3.2 MMBTU/Hr	1687350.0000	CUBFT	141.7374	84.3675	12.8239	1.0124	9.2804
8370	94001		Ic Generator, Unleaded, 27 Bhp	13.4000	GAL	109.2234	2.8395	0.1672	0.1463	5.0170
8377	82104		Aboveground Tank, Diesel, 250 Gal, BL	250.0000	GAL	0.0000	0.0000	0.0000	0.0000	0.1797
8377	82104		Aboveground Tank, Diesel, 250 Gal, WL	75.0000	GAL	0.0000	0.0000	0.0000	0.0000	0.0020
8377	94119	Pending	Ic Generator, Diesel, 52 Hp	74.5000	GAL	9.6962	45.0107	3.0620	0.5154	3.6743
8403	81639		Furnace, Natural Gas, 0.1 MMBTU/Hr, (3 Each)	150948.3000	CUBFT	12.6797	15.0948	1.1472	0.0906	0.8302
8406	55601		Boiler, Natural Gas, 0.15 MMBTU/Hr	111590.7000	CUBFT	9.3736	5.5795	0.8481	0.0670	0.6138
8406	63003		Cleaning Operations	262.3134	LB	0.0000	0.0000	0.0000	0.0000	8.5739
8406	61001		Lubricating Operation	111.9236	LB	0.0000	0.0000	0.0379	0.0000	0.6004
8406	60001		Painting/Coating	0.0000	GAL	0.0000	0.0000	0.0000	0.0000	0.0000
8406	73005		Penetrant Inspection	1.1444	LB	0.0000	0.0000	0.0000	0.0000	0.0000
8406	66000		Welding Soldering/Flux	2.3549	LB	0.0000	0.0000	0.0000	0.0000	0.8690
8409	68117		Aboveground Tank, Diesel, 5000 Gal, BL	5000.0000	GAL	0.0000	0.0000	0.0000	0.0000	3.1480
8409	68118		Aboveground Tank, Diesel, 5000 Gal, BL	10000.0000	GAL	0.0000	0.0000	0.0000	0.0000	1.8888
8409	68117		Aboveground Tank, Diesel, 5000 Gal, LL	13008.0000	GAL	0.0000	0.0000	0.0000	0.0000	0.3492
8409	68118		Aboveground Tank, Diesel, 5000 Gal, WL	2084.0000	GAL	0.0000	0.0000	0.0000	0.0000	0.0559
8409	52001	0134077	Aboveground Tank, Gasoline, 10000 Gal, BL	10000.0000	GAL	0.0000	0.0000	0.0000	0.0000	2733.7432
8409	52001	0134077	Aboveground Tank, Gasoline, 10000 Gal, LL	62732.0000	GAL	0.0000	0.0000	0.0000	0.0000	604.5684
8411	64021		Adhesive/Sealant Operation	0.0000	LB	0.0000	0.0000	0.0000	0.0000	0.0000
8411	55609		Boiler, Natural Gas, 0.6 MMBTU/Hr	388748.8000	CUBFT	32.6549	19.4374	2.9545	0.2333	2.1381

TABLE A-1 (Continued)
TOTAL AFRL AIR EMISSIONS FOR 2002

BLDG	DEVICE	PERMIT	DESCRIPTION	QTY USED	UOM	CO EMISSIONS (LB/YR) CY02	NO_X EMISSIONS (LB/YR) CY02	PM10 EMISSIONS (LB/YR) CY02	SO_X EMISSIONS (LB/YR) CY02	VOC EMISSIONS (LB/YR) CY02
8411	63054		Cleaning Operations	3.2634	LB	0.0000	0.0000	0.0474	0.0000	0.6676
8411	61006		Lubricating Operation	397.9782	LB	0.0000	0.0000	0.0000	0.0000	1.0982
8412	81641		Furnace, Natural Gas, 0.205 MMBTU/Hr	0.0000	CUBFT	0.0000	0.0000	0.0000	0.0000	0.0000
8412	81642		Furnace, Natural Gas, 0.205 MMBTU/Hr	0.0000	CUBFT	0.0000	0.0000	0.0000	0.0000	0.0000
8414	64038		Adhesive/Sealant Operation	8.9964	LB	0.0000	0.0000	0.3150	0.0000	0.0000
8414	64039		Adhesive/Sealant Operation	220.1715	LB	0.0000	0.0000	7.7060	0.0000	100.0000
8414	55602		Boiler, Natural Gas, 3.31 MMBTU/Hr	2994874.9000	CUBFT	251.5695	149.7438	22.7611	1.7969	16.4718
8414	63116		Cleaning Operations	87.2364	LB	0.0000	0.0000	3.0400	0.0000	0.1811
8414	72009		Cooling Maintenance Operation	5.6007	LB	0.0000	0.0000	0.0000	0.0000	0.2684
8414	61039		Lubricating Operation	110.7042	LB	0.0000	0.0000	0.5574	0.0000	0.5500
8414	60115		Painting/Coating	15.8672	GAL	0.0000	0.0000	2.6000	0.0000	59.3589
8414	60125		Painting/Coating	2.8665	GAL	0.0000	0.0000	1.5448	0.0000	1.1466
8417	72020		Cooling Maintenance Operation	36.3141	LB	0.0000	0.0000	0.0000	0.0000	1.7316
8417	61007		Lubricating Operation	49.5552	LB	0.0000	0.0000	0.0394	0.0000	0.2489
8419	55611		Boiler, Natural Gas, 1.69 MMBTU/Hr	3447600.0000	CUBFT	289.5984	172.3800	26.2018	2.0686	18.9618
8419	63041		Cleaning Operations	0.0000	LB	0.0000	0.0000	0.0000	0.0000	0.0000
8419	63032		Penetrant Inspection	0.0000	LB	0.0000	0.0000	0.0000	0.0000	0.0000
8421	51003	0134093	Abrasive Operation - Steelshot	0.0000	TONS	0.0000	0.0000	0.0000	0.0000	0.0000
8421	55612		Boiler, Natural Gas, 2.19 MMBTU/Hr	3512845.0000	CUBFT	295.0790	175.6423	26.6976	2.1077	19.3207
8421	63128		Cleaning Operations	0.2315	LB	0.0000	0.0000	0.0000	0.0000	0.1586
8421	61055		Lubricating Operation	97.1391	LB	0.0000	0.0000	0.0000	0.0000	0.5070
8421	60044		Painting/Coating	795.2310	GAL	0.0000	0.0000	25.4729	0.0000	61.8831
8421	60128		Painting/Coating	0.8754	GAL	0.0000	0.0000	0.0000	0.0000	3.0612
8421	60043		Painting/Coating	8.2776	GAL	0.0000	0.0000	0.0000	0.0000	8.5548
8421	63114		Penetrant Inspection	0.5513	LB	0.0000	0.0000	0.0000	0.0000	0.3650
8423	81643		Furnace, Natural Gas, 0.714 MMBTU/Hr	581583.3000	CUBFT	48.8530	58.1583	4.4200	0.3490	3.1987
8423	81644		Furnace, Natural Gas, 0.714 MMBTU/Hr	581583.3000	CUBFT	48.8530	58.1583	4.4200	0.3490	3.1987
8423	81645		Furnace, Natural Gas, 0.8 MMBTU/Hr	581583.3000	CUBFT	48.8530	58.1583	4.4200	0.3490	3.1987
8423	81646		Furnace, Natural Gas, 0.8 MMBTU/Hr	581583.3000	CUBFT	48.8530	58.1583	4.4200	0.3490	3.1987
8424	51000	0134076	Abrasive Operation - Sand	0.1900	TONS	0.0000	0.0000	0.2737	0.0000	0.0000
8424	64046		Adhesive/Sealant Operation	0.0066	LB	0.0000	0.0000	0.0000	0.0000	0.0000
8424	55613		Boiler, Natural Gas, 1.93 MMBTU/Hr	3252900.0000	CUBFT	273.2436	162.6450	24.7220	1.9517	17.8910
8424	62001		Cleaning Operations	0.0000	LB	0.0000	0.0000	0.0000	0.0000	0.0000
8424	63119		Cleaning Operations	0.0000	LB	0.0000	0.0000	0.0000	0.0000	0.0000

TABLE A-1 (Continued)
TOTAL AFRL AIR EMISSIONS FOR 2002

BLDG	DEVICE	PERMIT	DESCRIPTION	QTY USED	UOM	CO EMISSIONS (LB/YR) CY02	NO_X EMISSIONS (LB/YR) CY02	PM10 EMISSIONS (LB/YR) CY02	SO_X EMISSIONS (LB/YR) CY02	VOC EMISSIONS (LB/YR) CY02
8424	63171		Cleaning Operations	3020.8093	LB	0.0000	0.0000	0.0000	0.0000	1.3820
8424	61008		Lubricating Operation	0.0000	LB	0.0000	0.0000	0.0000	0.0000	0.0000
8424	61041		Lubricating Operation	0.7277	LB	0.0000	0.0000	0.0000	0.0000	0.0037
8424	63083		Propellant Mixing	0.0000	LB	0.0000	0.0000	0.0000	0.0000	0.0000
8424	54029	0134103	Propellant Testing	0.0000	LB	0.0000	0.0000	0.0000	0.0000	0.0000
8425	64040		Adhesive/Sealant Operation	0.0000	LB	0.0000	0.0000	0.0000	0.0000	0.0000
8425	63124		Cleaning Operations	0.0000	LB	0.0000	0.0000	0.0000	0.0000	0.0000
8425	61054		Lubricating Operation	0.0000	LB	0.0000	0.0000	0.0000	0.0000	0.0000
8451	54028	0134102	B/8451 (EC-1 Injector Test)	151.1500	LB	0.0000	0.3200	0.0000	0.0000	0.0000
8451	55615		Boiler, Natural Gas, 0.6 MMBTU/Hr	756986.0000	CUBFT	63.5868	37.8493	5.7531	0.4542	4.1634
8451	55616		Boiler, Natural Gas, 4.19 MMBTU/Hr	6615064.0000	CUBFT	555.6654	330.7532	50.2745	3.9690	36.3829
8451	55614		Boiler, Natural Gas, 4.2 MMBTU/Hr	4195287.4000	CUBFT	352.4041	209.7644	31.8842	2.5172	23.0741
8451	43548		Cleaning Operations	609.3672	LB	0.0000	0.0000	0.0000	0.0000	15.5618
8451	63082		Propellant Mixing	0.0000	LB	0.0000	0.0000	0.0000	0.0000	0.0000
8451	81629		Water Heater, Natural Gas, 0.27 MMBTU/Hr	420750.0000	CUBFT	35.3430	42.0750	3.1977	0.2525	2.3141
8460	55617		Boiler, Natural Gas, 1.08 MMBTU/Hr	1093700.0000	CUBFT	91.8708	54.6850	8.3121	0.6562	6.0154
8473	62700		Boiler, Propane, 0.56 MMBTU/Hr	9819.0000	GAL	18.6561	137.4660	3.9276	0.1767	2.9457
8473	63010		Propellant Testing	0.0000	LB	0.0000	0.0000	0.0000	0.0000	0.0000
8475	55717		Boiler, Propane, 0.4 MMBTU/Hr	9584.0000	GAL	18.2096	134.1760	3.8336	0.0479	2.8752
8475	61042		Lubricating Operation	0.3660	LB	0.0000	0.0000	0.0000	0.0000	0.0253
8475	60045		Painting/Coating	0.2646	GAL	0.0000	0.0000	0.0849	0.0000	0.9526
8475	63012		Propellant Mixing	449.7330	GAL	0.0000	0.0000	284.2800	0.0000	50.4859
8475	63013		Propellant Mixing	0.0000	LB	0.0000	0.0000	0.0000	0.0000	0.0000
8477	62701		Boiler, Propane, 0.56 MMBTU/Hr	9819.0000	GAL	18.6561	137.4660	3.9276	0.0491	2.9457
8477	63102		Cleaning Operations	0.0000	LB	0.0000	0.0000	0.0000	0.0000	0.0000
8477	63104		Cleaning Operations	144.8701	LB	0.0000	0.0000	0.0000	0.0000	93.2598
8477	61052		Lubricating Operation	0.0000	LB	0.0000	0.0000	0.0000	0.0000	0.0000
8477	63103		Propellant Mixing	0.0000	LB	0.0000	0.0000	0.0000	0.0000	0.0000
8488	82106		Aboveground Tank, Diesel, 230 Gal, BL	230.0000	GAL	0.0000	0.0000	0.0000	0.0000	0.1797
8488	82106		Aboveground Tank, Diesel, 230 Gal, WL	75.0000	GAL	0.0000	0.0000	0.0000	0.0000	0.0020
8488	50103	0134027	Emergency Engine with Generator, Diesel, 900 Bhp	0.0000	GAL	0.0000	0.0000	0.0000	0.0000	0.0000
8494	60031		Painting/Coating	0.0000	GAL	0.0000	0.0000	0.0000	0.0000	0.0000
8494	63117		Propellant Mixing	0.0000	LB	0.0000	0.0000	0.0000	0.0000	0.0000
8522	50104	0134055	Emergency Engine with Firewater Pump, Diesel, 231 Bhp	19.4000	GAL	2.5249	10.5488	0.7973	0.1342	0.9568

TABLE A-1 (Continued)
TOTAL AFRL AIR EMISSIONS FOR 2002

BLDG	DEVICE	PERMIT	DESCRIPTION	QTY USED	UOM	CO EMISSIONS (LB/YR) CY02	NO_X EMISSIONS (LB/YR) CY02	PM10 EMISSIONS (LB/YR) CY02	SO_X EMISSIONS (LB/YR) CY02	VOC EMISSIONS (LB/YR) CY02
8522	55704	0134050	Steam Generator, Propane, 31.2 MMBTU/Hr	156920.0000	GAL	298.1480	1318.1280	62.7680	0.7846	47.0760
8522	55703	0134051	Steam Generator, Propane, 31.2 MMBTU/Hr	114114.0000	GAL	216.8166	958.5576	45.6456	0.5706	34.2342
8525	50107	0134054	Emergency Engine with Generator, Diesel, 425 Bhp	2702.7000	GAL	351.7564	1306.3122	111.0810	18.6986	133.2972
8525	50105	0134079	Emergency Engine with Generator, Diesel, 440 Bhp	174.2000	GAL	22.6721	37.8887	7.1596	1.2052	8.5915
8525	50106	0134053	Emergency Engine with Generator, Diesel, 830 Bhp	232.7000	GAL	30.2859	98.8277	1.8267	1.6099	11.4768
8585	31015	0134118	Abrasive Operation - Plastic Beads	0.1700	TONS	0.0000	0.0000	1.8375	0.0000	0.0000
8595	64004		Adhesive/Sealant Operation	0.0000	LB	0.0000	0.0000	0.0000	0.0000	0.0000
8595	55603		Boiler, Natural Gas, 1.08 MMBTU/Hr	1727200.0000	CUBFT	145.0848	86.3600	13.1267	1.0363	9.4996
8595	41309		Lubricating Operation	8.5775	LB	0.0000	0.0000	0.0000	0.0000	0.0425
8595	63115		Penetrant Inspection	16.6147	LB	0.0000	0.0000	16.6000	0.0000	0.0000
8620	64009		Adhesive/Sealant Operation	0.0000	LB	0.0000	0.0000	0.0000	0.0000	0.0000
8620	55709	0134057	Boiler, Propane, 6.3 MMBTU/Hr	51474.9000	GAL	97.8021	432.3816	20.5600	0.2574	15.4422
8620	62000		Cleaning Operations	179.2643	LB	0.0000	0.0000	0.0000	0.0000	1.3241
8620	62002		Cleaning Operations	30.1490	LB	0.0000	0.0000	1.0850	0.0000	0.1115
8620	61009		Lubricating Operation	1.3693	LB	0.0000	0.0000	0.1158	0.0000	0.0068
8620	60010		Painting/Coating	0.0000	GAL	0.0000	0.0000	0.0000	0.0000	0.0000
8620	63084		Penetrant Inspection	0.0000	LB	0.0000	0.0000	0.0000	0.0000	0.0000
8620	55705	0134066	Steam Generator, Propane, 20.9 MMBTU/Hr	29594.9000	GAL	56.2303	331.4629	11.8380	0.1480	8.8785
8620	55706	0134067	Steam Generator, Propane, 20.9 MMBTU/Hr	14606.5000	GAL	27.7524	163.5928	5.8426	0.0730	4.3820
8620	55707	0134068	Steam Generator, Propane, 20.9 MMBTU/Hr	12708.7000	GAL	24.1465	142.3374	5.0835	0.2288	3.8126
8620	55708	0134065	Steam Generator, Propane, 20.9 MMBTU/Hr	19168.2000	GAL	36.4196	214.6838	7.6673	0.0958	5.7505
8620	55710	0134075	Vaporizer, Propane, 2.5 MMBTU/Hr (2 Units)	3803.9000	GAL	7.2274	53.2546	1.5216	0.0190	1.1412
8620	66019		Welding Soldering/Flux	0.0000	LB	0.0000	0.0000	0.0000	0.0000	0.0000
8626	64047		Adhesive/Sealant Operation	0.0000	LB	0.0000	0.0000	0.0000	0.0000	0.0000
8626	62003		Cleaning Operations	0.0000	LB	0.0000	0.0000	0.0000	0.0000	0.0000
8626	60011		Painting/Coating	0.0000	GAL	0.0000	0.0000	0.0000	0.0000	0.0000
8634	59001	0134114	Aerospace Components Carbon Deposition Reactor No. 1	8.8000	LB	0.0000	0.0000	0.0000	0.0000	0.0004
8634	59002	0134115	Aerospace Components Carbon Deposition Reactor No. 2	385.0000	LB	0.0000	0.0000	0.0000	0.0000	0.0250
8634	59003	0134116	Aerospace Components Carbon Deposition Reactor No. 3	1386.0000	LB	0.0000	0.0000	0.0000	0.0000	0.1600
8634	59004	0134117	Aerospace Components Carbon Deposition Reactor No. 4	246.6000	LB	0.0000	0.0000	0.0000	0.0000	0.0290
8634	59006	0134119	Carbon Parts Fabrication Operation	2.3200	LB	0.0000	0.0000	0.2200	0.0000	0.0000
8634	41310		Lubricating Operation	0.5424	LB	0.0000	0.0000	0.0000	0.0000	0.0027
8635	55712		Boiler, Propane, 0.25 MMBTU/Hr	35.5000	GAL	0.0675	0.4970	0.0142	0.0002	0.0107
8702	68115		Aboveground Tank, Diesel, 500 Gal, BL	500.0000	GAL	0.0000	0.0000	0.0000	0.0000	0.2746

TABLE A-1 (Continued)
TOTAL AFRL AIR EMISSIONS FOR 2002

BLDG	DEVICE	PERMIT	DESCRIPTION	QTY USED	UOM	CO EMISSIONS (LB/YR) CY02	NO_X EMISSIONS (LB/YR) CY02	PM10 EMISSIONS (LB/YR) CY02	SO_X EMISSIONS (LB/YR) CY02	VOC EMISSIONS (LB/YR) CY02
8702	68115		Aboveground Tank, Diesel, 500 Gal, WL	406.0000	GAL	0.0000	0.0000	0.0000	0.0000	0.0109
8702	50111	0134063	Emergency Engine With Generator, Diesel, 440 Bhp	405.6000	GAL	52.7888	88.2185	16.6702	2.8061	2.0004
8743	68119		Aboveground Tank, Diesel, 250 Gal, BL	250.0000	GAL	0.0000	0.0000	0.0000	0.0000	0.2978
8743	68119		Aboveground Tank, Diesel, 250 Gal, WL	52.0000	GAL	0.0000	0.0000	0.0000	0.0000	0.0014
8743	50115	0141005	Emergency Engine with Generator, Diesel, 56 Bhp	52.2000	GAL	6.7938	18.9226	2.1454	0.3612	0.2575
8752	64011		Adhesive/Sealant Operation	5.3118	LB	0.0000	0.0000	0.1858	0.0000	0.0000
8752	62004		Cleaning Operations	1.8743	LB	0.0000	0.0000	0.0000	0.0000	0.0000
8752	61011		Lubricating Operation	20.0898	LB	0.0000	0.0000	0.0055	0.0000	0.0998
8752	60114		Painting/Coating	9.2897	GAL	0.0000	0.0000	1.5100	0.0000	27.5942
8752	60012		Painting/Coating	0.0000	GAL	0.0000	0.0000	0.0000	0.0000	0.0000
8752	63085		Penetrant Inspection	0.0000	LB	0.0000	0.0000	0.0000	0.0000	0.0000
8794	64026		Adhesive/Sealant Operation	1.1025	LB	0.0000	0.0000	0.0385	0.0000	0.0000
8794	63064		Cleaning Operations	157.8295	LB	0.0000	0.0000	0.0000	0.0000	0.0000
8794	72030		Cooling Maintenance Operation	9.4815	LB	0.0000	0.0000	0.0000	0.0000	0.4545
8794	61045		Lubricating Operation	2.6372	LB	0.0000	0.0000	0.0152	0.0000	0.0079
8794	60113		Painting/Coating	11.3403	GAL	0.0000	0.0000	1.8427	0.0000	44.4431
8794	85050		Painting/Coating	0.0000	GAL	0.0000	0.0000	0.0000	0.0000	0.0000
8794	63065		Propellant Mixing	0.0000	LB	0.0000	0.0000	0.0000	0.0000	0.0000
8812	63066		Penetrant Inspection	0.4631	LB	0.0000	0.0000	0.0000	0.0000	0.3066
8840	68121		Aboveground Tank, Diesel, 200 Gal, BL	200.0000	GAL	0.0000	0.0000	0.0000	0.0000	0.1797
8840	68121		Aboveground Tank, Diesel, 200 Gal, WL	171.0000	GAL	0.0000	0.0000	0.0000	0.0000	0.0046
8840	82003		Aboveground Tank, Gasoline, 102 Gal, BL	102.0000	GAL	0.0000	0.0000	0.0000	0.0000	287.7755
8840	82003		Aboveground Tank, Gasoline, 102 Gal, WL	245.0000	GAL	0.0000	0.0000	0.0000	0.0000	2.3417
8840	62006		Cleaning Operations	328.4348	LB	0.0000	0.0000	0.0000	0.0000	9.5091
8840	61013		Lubricating Operation	8.4694	LB	0.0000	0.0000	0.0339	0.0000	0.0444
8840	60014		Painting/Coating	106.6625	GAL	0.0000	0.0000	0.0000	0.0000	134.0449
8840	54025	0134091	Rocket Motor Testing	0.0000	LB	0.0000	0.0000	0.0000	0.0000	0.0000
8844	60039		Painting/Coating	0.0000	GAL	0.0000	0.0000	0.0000	0.0000	0.0000
8910	63018		Cleaning Operations	0.0000	LB	0.0000	0.0000	0.0000	0.0000	0.0000
8910	61021		Lubricating Operation	0.0000	LB	0.0000	0.0000	0.0000	0.0000	0.0000
8910	60024		Painting/Coating	0.0000	GAL	0.0000	0.0000	0.0000	0.0000	0.0000
8911	55718		Boiler, Propane, 1.44 MMBTU/Hr	4733.0000	GAL	8.9927	66.2620	1.8932	0.0852	1.4199
9025	63078		Cleaning Operations	146.0151	LB	0.0000	0.0000	0.0000	0.0000	0.0000
9524	94101		Ic Generator, Diesel, 47 Hp	23.6000	GAL	3.0715	14.2584	0.9700	0.1633	1.1640

TABLE A-1 (Continued)
TOTAL AFRL AIR EMISSIONS FOR 2002

BLDG	DEVICE	PERMIT	DESCRIPTION	QTY USED	UOM	CO EMISSIONS (LB/YR) CY02	NO_X EMISSIONS (LB/YR) CY02	PM10 EMISSIONS (LB/YR) CY02	SO_X EMISSIONS (LB/YR) CY02	VOC EMISSIONS (LB/YR) CY02
9620	64015		Adhesive/Sealant Operation	0.0000	LB	0.0000	0.0000	0.0000	0.0000	0.0000
9620	63042		Cleaning Operations	0.0000	LB	0.0000	0.0000	0.0000	0.0000	0.0000
9620	61014		Lubricating Operation	34.4311	LB	0.0000	0.0000	0.0112	0.0000	0.1761
9620	60015		Painting/Coating	0.0000	GAL	0.0000	0.0000	0.0000	0.0000	0.0000
9623	54011	134098	Rocket Motor Testing	0.0000	LB	0.0000	0.0000	0.0000	0.0000	0.0000
9626	63024		Cleaning Operations	0.0000	LB	0.0000	0.0000	0.0000	0.0000	0.0000
9626	55714	0134070	Steam Generator, Propane, 8.5 MMBTU/Hr	1066.7000	GAL	2.0267	14.9338	0.4267	0.0192	0.3200
9626	55715	0134072	Steam Generator, Propane, 8.5 MMBTU/Hr	3807.2000	GAL	7.2337	53.3008	1.5229	0.0190	1.1422
9626	55716	0134071	Steam Generator, Propane, 8.5 MMBTU/Hr	3807.2000	GAL	7.2337	53.3008	1.5229	0.0190	1.1422
9628	54012	134098	Rocket Motor Testing	0.0000	LB	0.0000	0.0000	0.0000	0.0000	0.0000
9636	68120		Aboveground Tank, Diesel, 740 Gal, BL	740.0000	GAL	0.0000	0.0000	0.0000	0.0000	0.3902
9636	68120		Aboveground Tank, Diesel, 740 Gal, WL	6.0000	GAL	0.0000	0.0000	0.0000	0.0000	0.0002
9636	50112	0134043	Emergency Engine with Generator, Diesel, 184 Bhp	6.3000	GAL	0.8199	3.8063	0.2589	0.0436	0.3107
9636	54013	134098	Rocket Motor Testing	0.0000	LB	0.0000	0.0000	0.0000	0.0000	0.0000
AFRL	85034		Painting/Coating	0.0000	GAL	0.0000	0.0000	0.0000	0.0000	0.0000
Area 1-100	54014	0134104	Open Burning, Open Detonation	1919.2000	LB	0.0000	1.9600	891.1800	0.0000	0.0400
AREA 1110	82105		Aboveground Tank, Diesel, 250 Gal, BL	250.0000	GAL	0.0000	0.0000	0.0000	0.0000	0.1797
AREA 1110	82105		Aboveground Tank, Diesel, 250 Gal, WL	0.0000	GAL	0.0000	0.0000	0.0000	0.0000	0.0000
AREA 1110	68108		Aboveground Tank, Diesel, 500 Gal, BL	500.0000	GAL	0.0000	0.0000	0.0000	0.0000	0.1797
AREA 1110	68109		Aboveground Tank, Diesel, 500 Gal, BL	500.0000	GAL	0.0000	0.0000	0.0000	0.0000	0.1797
AREA 1110	68110		Aboveground Tank, Diesel, 500 Gal, BL	500.0000	GAL	0.0000	0.0000	0.0000	0.0000	0.2746
AREA 1110	68108		Aboveground Tank, Diesel, 500 Gal, WL	6.0000	GAL	0.0000	0.0000	0.0000	0.0000	0.0000
AREA 1110	68109		Aboveground Tank, Diesel, 500 Gal, WL	0.0000	GAL	0.0000	0.0000	0.0000	0.0000	0.0000
AREA 1110	68110		Aboveground Tank, Diesel, 500 Gal, WL	0.0000	GAL	0.0000	0.0000	0.0000	0.0000	0.0000
AREA 1-110	63080		Propellant Mixing	0.0000	LB	0.0000	0.0000	0.0000	0.0000	0.0000
AREA 1-120	54020	0134086	Rocket Motor Testing	0.0000	LB	0.0000	0.0000	0.0000	0.0000	0.0000
AREA 1-120	54021	0134087	Rocket Motor Testing	0.0000	LB	0.0000	0.0000	0.0000	0.0000	0.0000
AREA 1-120	54022	0134088	Rocket Motor Testing	0.0000	LB	0.0000	0.0000	0.0000	0.0000	0.0000
AREA 1-125	60117		Painting/Coating	26.3123	GAL	0.0000	0.0000	4.2500	0.0000	90.9345
AREA 1-125	54023	0134089	Rocket Motor Testing	0.0000	LB	0.0000	0.0000	0.0000	0.0000	0.0000
AREA 1-125	54024	0134090	Rocket Motor Testing	0.0000	LB	0.0000	0.0000	0.0000	0.0000	0.0000
AREA 1-14	54002	0134095	Area 1-14 Test	8.0000	LB	0.0000	0.0100	0.0000	0.0000	0.0000
AREA 1-21	54032	0134108	Propellant Testing	0.0000	LB	0.0000	0.0000	0.0000	0.0000	0.0000
AREA 1-30	54026	0134096	Rocket Motor Testing	0.0000	LB	0.0000	0.0000	0.0000	0.0000	0.0000

TABLE A-1 (Concluded)
TOTAL AFRL AIR EMISSIONS FOR 2002

BLDG	DEVICE	PERMIT	DESCRIPTION	QTY USED	UOM	CO EMISSIONS (LB/YR) CY02	NO_X EMISSIONS (LB/YR) CY02	PM10 EMISSIONS (LB/YR) CY02	SO_X EMISSIONS (LB/YR) CY02	VOC EMISSIONS (LB/YR) CY02
AREA 1-32	54003	0134097	Area 1-32 Test	1325.5000	LB	0.0000	0.8500	0.0000	0.0000	0.0000
AREA 1-32	54036	0134098	Rocket Motor Testing	13745.0000	LB	2937.6800	0.0000	3892.5800	0.0000	0.0000
AREA 1-36	54031	0134107	Rocket Motor Testing	0.0000	LB	0.0000	0.0000	0.0000	0.0000	0.0000
AREA 1-40	54033	0134109	Propellant Testing	0.0000	LB	0.0000	0.0000	0.0000	0.0000	0.0000
AREA 1-40	54030	0134109	Rocket Motor Testing	0.0000	LB	0.0000	0.0000	0.0000	0.0000	0.0000
AREA 1-42	54034	0134098	Area 1-42 Tests (B-Cells)	463.0000	LB	0.0000	0.3700	166.2300	0.0000	0.0000
AREA 1-42	54037	0134099	Torch Igniter Test	240.0000	LB	47.8800	0.0000	0.0000	0.0000	0.0000
AREA 1-46	54027	0134099	Rocket Motor Testing	0.0000	LB	0.0000	0.0000	0.0000	0.0000	0.0000
AREA 1-52	64023		Adhesive/Sealant Operation	9.4881	LB	0.0000	0.0000	0.3321	0.0000	0.0000
TOTAL (LB)						**7484.1239**	**7943.1812**	**5912.7286**	**51.9501**	**4858.0487**

Notes:
1. BLDG – Building
2. QTY – Quantity
3. UOM – Unit of Measure
4. CO – Carbon Monoxide
5. CY – Calendar Year
6. NO_X – Nitrogen Oxides
7. PM10 – Particulate Matter Less than 10 Microns
8. SO_X – Sulfur Oxides
9. VOC – Volatile Organic Compounds
10. MMBTU/hr – Million British Thermal Units per Hour
11. CUBFT – Cubic Feet
12. GAL – Gallon
13. BL – Breathing Loss
14. WL – Working Loss
15. BHP – Brake Horsepower
16. LL – Loading Loss
17. IC – Internal Combustion
18. HP - Horsepower

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APPENDIX B
AIR EMISSION CALCULATIONS AND CONFORMITY LETTER

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TABLE B-1
AIR CALCULATIONS FOR CONSTRUCTION EQUIPMENT
AND PRIVATELY OWNED VEHICLES

Mobile Equipment Type	No. of Units	No. of Hours	Emission (lb/hr)		Mobile Equipment Type	Emission (lb/yr)	
			NO_x	VOC		NO_x	VOC
Track Loaders	1	533.0	1.890	0.250	**Track Loaders**	1,007.370	133.250
Wheeled Loaders	1	533.0	1.269	0.188	**Wheeled Loaders**	676.377	100.204
Gas Forklifts	1	2670.0	0.412	0.326	**Gas Forklifts**	110.004	87.042
Diesel Forklifts	1	1600.0	2.010	0.152	**Diesel Forklifts**	321.600	24.320
Track Dozers	1	3200.0	4.166	0.192	**Track Dozers**	1,333.120	61.440
Graders	1	320.0	0.713	0.040	**Graders**	228.160	12.800
Haul Trucks	3	234.0	4.166	0.192	**Haul Trucks**	2,924.532	134.784
Excavator	1	320.0	1.344	0.056	**Excavator**	430.080	17.920
Backhoe Loader	1	320.0	0.237	1.738	**Backhoe Loader**	75.840	556.160
Roller	1	320.0	0.067	0.862	**Roller**	21.440	275.840
Emergency Generator	1	128.7	0.040	0.015	**Emergency Generator**	352.00	133.000
			Total Mobile Equipment Emissions			7,480.523	1,536.760

No. of Units	No. of Days	Motor Vehicle Type	NO_x	VOC
28	1,000.0	**POV (Construction)**	352.470	118.060
80	1,008.0	**POV (Building Occupants)**	8,104.730	2,110.180
3	13.0	**LDGV**	3.776	4.160
1	0.5	**LDDT**	3.320	1.900
2	33.0	**HDDT**	68.930	10.100
	Total Motor Vehicle Emissions		8,533.226	2,244.400

Total Emissions (lb/yr)	16,013.749	3,781.16
Total Emissions (ton/yr)	8.0068745	1.89058

Notes: 1. NO_x – Oxides of nitrogen
2. VOC – Volatile organic compounds
3. POV – Privately owned vehicles
4. LDGV – Light-duty gasoline truck
5. LDDT – Light-duty diesel truck
6. HDDT – Heavy-duty diesel truck

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DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR FORCE FLIGHT TEST CENTER (AFMC)
EDWARDS AIR FORCE BASE, CALIFORNIA

MEMORANDUM FOR AFFTC/CV

FROM: AFFTC/EM
5 East Popson Avenue, Building 2650A
Edwards AFB CA 93524-8060

SUBJECT: Clean Air Act Conformity Statement for Control No. 03-0166, *Construction of a Propulsion Energetics Laboratory*

1. The following finding is made on the need for a conformity statement under the *Clean Air Act* with respect to the Proposed Action.

a. The Proposed Action is located in the Kern County Air Pollution Control District (KCAPCD). Under regulations promulgated pursuant to the *Clean Air Act*, Title 42 United States Code (USC) Part 7506(c), the portion of the project area regulated by the KCAPCD is located in a *Serious* nonattainment area for ozone. The *de minimis* level set for this area for emissions of ozone precursor pollutants (volatile organic compounds [VOC] or oxides of nitrogen [NO_x]), IAW Title 40 Code of Federal Regulation (CFR) Part 51.853/93.153(b)(1) and KCAPCD Rule 210.7, is up to 50 tons per pollutant (VOC or NO_x) per year per action.

b. For the KCAPCD, the 1990 regional planning baseline emission inventories for ozone precursor pollutants are included in the 1994 *California Ozone State Implementation Plan*. The baseline planning values for KCAPCD are 14,965 tons per year (tpy) and 6,205 tpy of NO_x and VOC, respectively. In accordance with 40 CFR 93.153, the 10-percent threshold values for determination of regional significance for KCAPCD are 1,496.5 and 620.5 tpy of NO_x and VOC, respectively.

c. It has been determined that the relevant air emissions for this action are 8.01 tons of NO_x and 1.89 tons of VOC per year. The emission totals represent over the life of the project and do not represent over consecutive years. The direct and indirect emissions, when totaled, are less than the *de minimis* amounts specified in Title 40 CFR 51.853/93.153(b)(1), and are less than the 10-percent threshold values for determination of regional significance; therefore, a conformity determination is not required.

2. Should you have any questions with respect to this finding, please direct them to James Specht at (661) 277-1439.

Gerald E. Callahan

GERALD E. CALLAHAN, Chief
Environmental Quality Division

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