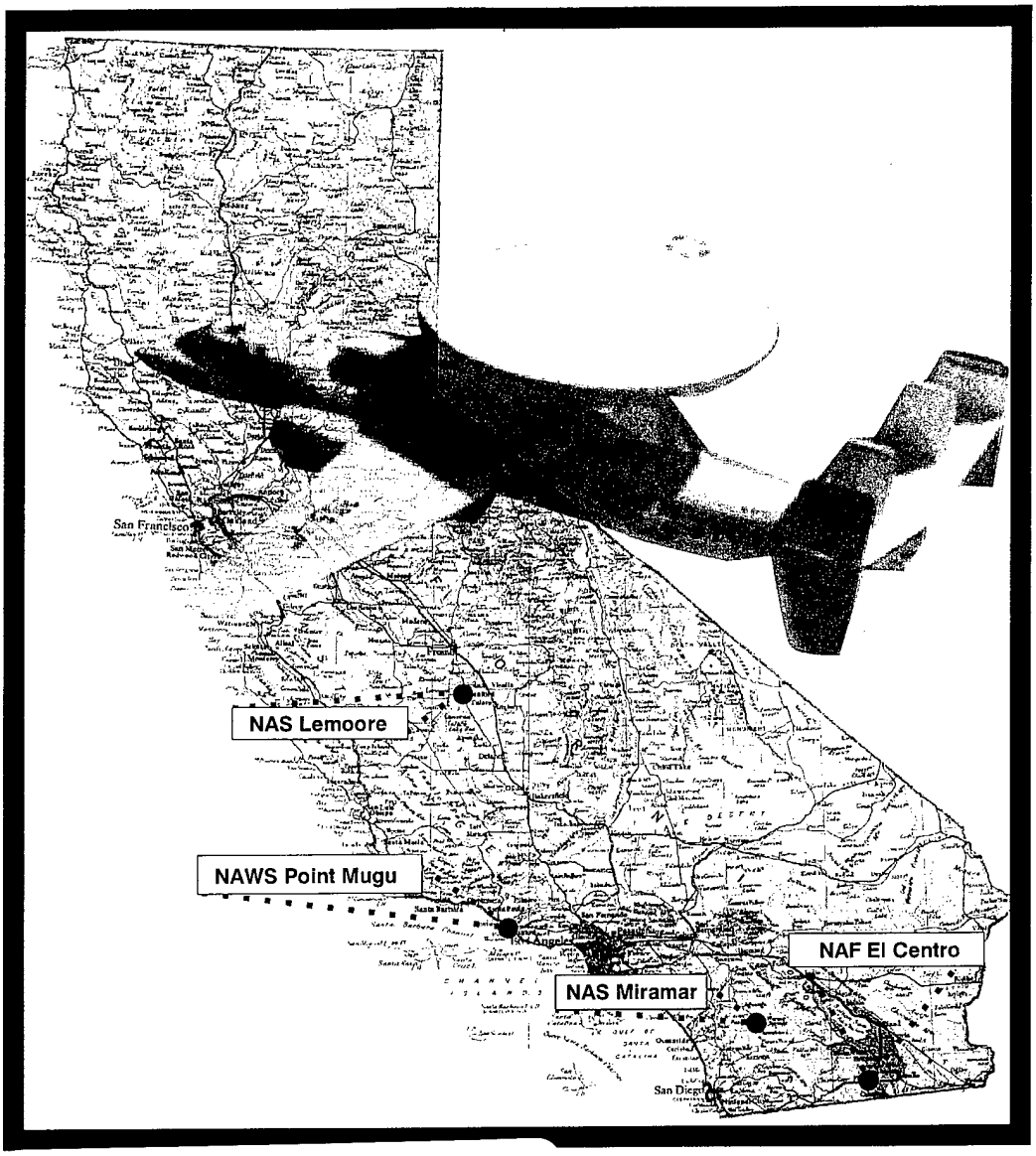
Draft Environmental Impact Statement for the Realignment of E-2 Squadrons from Naval Air Station (NAS) Miramar

Volume I



19971118 049

DTIC QUALITY INSPECTED 3

US Department of Defense
Department of the Navy

November 1997

DEPARTMENT OF THE NAVY
SOUTHWEST DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
1220 PACIFIC HIGHWAY
SAN DIEGO, CA 92132-5190

5090
Ser 553.KK/338
November 12, 1997

Dear Librarian:

We request that the enclosed Draft Environmental Impact Statement (DEIS) for the Realignment of E-2 Squadrons from Naval Air Station Miramar be made available for public review through January 5, 1998. Please retain this document in your reference section. The Notice of Availability will appear in the Federal Register on November 21, 1997.

If you have any questions or require additional information, please contact the undersigned at (619) 532-2456. All public comments must be provided to the undersigned in writing by January 5, 1998.

Sincerely,

Kelly K Knight

KELLY K. KNIGHT
Environmental Planner
By direction of the Commander

DRAFT ENVIRONMENTAL IMPACT STATEMENT (EIS) FOR REALIGNMENT OF E-2 SQUADRONS FROM NAVAL AIR STATION MIRAMAR

Lead Agency for the EIS:	US Department of the Navy
Title of Proposed Action:	Realignment of E-2 Squadrons from Naval Air Station Miramar
Affected Jurisdictions:	Ventura, Fresno, Kings, and Imperial Counties, California
Designation:	Draft Environmental Impact Statement

Abstract

The purpose of the proposed action is to relocate four E-2 aircraft squadrons and related support personnel, equipment, and functions from NAS Miramar to one of three alternative naval bases in California. The proposed action includes siting 16 E-2 aircraft, relocating 988 associated personnel and their families, and expanding or constructing facilities to support aircraft and personnel, and to provide associated training functions. In addition to the increased staffing and equipment levels, there would be an increase in Navy training activities and an increase in flight operations at the receiving installation. The three installations considered for the receiving base are Naval Air Weapons Station (NAWS) Point Mugu (the preferred alternative), Naval Air Station (NAS) Lemoore, and Naval Air Facility (NAF) El Centro. NAS North Island was initially considered as a potential alternative base, but was eliminated due to the need to support Clean Air Act requirements with regard to the BRAC-mandated Marine Corps realignment to MCAS Miramar.

This EIS evaluates the potential environmental impacts that may result from constructing and/or operating airfield, training, maintenance and personnel support facilities required to carry on the E-2 mission at the three alternative base locations. This EIS has been prepared in accordance with the National Environmental Policy Act (NEPA) of 1969 as amended, the Council on Environmental Quality implementing regulations (Title 40 Code of Federal Regulations Parts 1500-1508), and the Navy's NEPA implementing regulations (OPNAVINST [Office of the Chief of Naval Operations Instruction] 5090.1B). This EIS also has been prepared in accordance with the Defense Base Closure and Realignment Act of 1990 (DBCRA, Public Law 101-510) and the pertinent base closure and realignment decisions of the Defense Base Closure and Realignment Commission approved by the President and accepted by Congress in September 1993 and September 1995.

The EIS analyzes potential environmental impacts of the proposed action on biological resources, hydrology/surface water quality, land use and airspace, socioeconomics, traffic and circulation, air quality, noise, aesthetics and visual resources, utilities and services, cultural resources, public health and safety, and hazardous materials and wastes. Potentially significant and mitigable environmental impacts include impacts to air quality schools, and cultural resources at NAWS Point Mugu, air quality, and schools at NAS Lemoore, and biological resources, noise/land use compatibility, and exceedence of imaginary surfaces (aircraft operations) at NAF El Centro. Unavoidable adverse impacts have not been identified.

Prepared by:
US Department of Defense, Department of the Navy

Point of Contact: Ms. Kelly Knight
Naval Facilities Engineering Command, Southwest Division
1220 Pacific Highway, Code 553.KK
San Diego, California 92132-5190
Phone: (619) 532-2456
Facsimile: (619) 532-1242

DTIC QUALITY INSPECTED 3

November 1997

TABLE OF CONTENTS

Chapter — Page

VOLUME I

EXECUTIVE SUMMARY ES-1

1. PURPOSE OF AND NEED FOR PROPOSED ACTION 1-1
- 1.1 E-2 AIRCRAFT DESCRIPTION, MISSION, AND HISTORY 1-2
- 1.2 PURPOSE OF THE PROPOSED ACTION 1-2
- 1.3 NEED FOR THE PROPOSED ACTION 1-3
- 1.4 SCOPE OF ENVIRONMENTAL REVIEW 1-5
  - 1.4.1 Scope of EIS 1-5
  - 1.4.2 Document Organization 1-5
  - 1.4.3 Related Studies 1-6
- 1.5 PUBLIC INVOLVEMENT PROCESS 1-7
  - 1.5.1 Scoping Process 1-8
  - 1.5.2 Public Review Process 1-9

2. PROPOSED ACTION AND ALTERNATIVES 2-1
- 2.1 PROPOSED ACTION 2-1
- 2.2 E-2 AIRCRAFT SITING CRITERIA 2-3
  - 2.2.1 Site Screening Criteria 2-3
  - 2.2.2 Site Facility Requirements 2-4
- 2.3 DESCRIPTION OF ALTERNATIVES 2-5
  - 2.3.1 Preferred Alternative: NAWS Point Mugu 2-7
  - 2.3.2 NAS Lemoore Alternative 2-12
  - 2.3.3 NAF El Centro Alternative 2-17
  - 2.3.4 No Action Alternative 2-22
- 2.4 ALTERNATIVES CONSIDERED BUT ELIMINATED 2-22
  - 2.4.1 NAS North Island 2-23
  - 2.4.2 NAS Oceana 2-23
  - 2.4.3 NAS Fallon 2-24
  - 2.4.4 Other Possible Air Installations 2-24
- 2.5 PROJECT PERMIT REQUIREMENTS 2-24
- 2.6 COMPARISON OF ALTERNATIVES 2-24

3. AFFECTED ENVIRONMENT 3-1
- 3.1 BIOLOGICAL RESOURCES 3-1
  - 3.1.1 Preferred Alternative: NAWS Point Mugu 3-2
  - 3.1.2 NAS Lemoore Alternative 3-8
  - 3.1.3 NAF El Centro Alternative 3-14
- 3.2 HYDROLOGY/SURFACE WATER QUALITY 3-22
  - 3.2.1 Preferred Alternative: NAWS Point Mugu 3-23
  - 3.2.2 NAS Lemoore Alternative 3-26
  - 3.2.3 NAF El Centro Alternative 3-29
- 3.3 LAND USE AND AIRSPACE 3-32
  - 3.3.1 Preferred Alternative: NAWS Point Mugu 3-36
  - 3.3.2 NAS Lemoore Alternative 3-44
  - 3.3.3 NAF El Centro Alternative 3-51
- 3.4 SOCIOECONOMICS 3-61
  - 3.4.1 Preferred Alternative: NAWS Point Mugu 3-61
  - 3.4.2 NAS Lemoore Alternative 3-65
  - 3.4.3 NAF El Centro Alternative 3-70

TABLE OF CONTENTS *(continued)*

Chapter Page

3.5 TRAFFIC AND CIRCULATION 3-75
3.5.1 Preferred Alternative: NAWS Point Mugu 3-76
3.5.2 NAS Lemoore Alternative 3-79
3.5.3 NAF El Centro Alternative 3-84
3.6 AIR QUALITY 3-88
3.6.1 Preferred Alternative: NAWS Point Mugu 3-95
3.6.2 NAS Lemoore Alternative 3-97
3.6.3 NAF El Centro Alternative 3-97
3.7 NOISE 3-100
3.7.1 Preferred Alternative: NAWS Point Mugu 3-104
3.7.2 NAS Lemoore Alternative 3-106
3.7.3 NAF El Centro Alternative 3-109
3.8 AESTHETICS AND VISUAL RESOURCES 3-113
3.8.1 Preferred Alternative: NAWS Point Mugu 3-114
3.8.2 NAS Lemoore Alternative 3-115
3.8.3 NAF El Centro Alternative 3-117
3.9 UTILITIES AND SERVICES 3-119
3.9.1 Preferred Alternative: NAWS Point Mugu 3-121
3.9.2 NAS Lemoore Alternative 3-125
3.9.3 NAF El Centro Alternative 3-130
3.10 CULTURAL RESOURCES 3-135
3.10.1 Preferred Alternative: NAWS Point Mugu 3-137
3.10.2 NAS Lemoore Alternative 3-138
3.10.3 NAF El Centro Alternative 3-141
3.11 PUBLIC HEALTH AND SAFETY 3-143
3.11.1 Preferred Alternative: NAWS Point Mugu 3-144
3.11.2 NAS Lemoore Alternative 3-148
3.11.3 NAF El Centro Alternative 3-150
3.12 HAZARDOUS MATERIALS AND WASTES 3-156
3.12.1 Preferred Alternative: NAWS Point Mugu 3-160
3.12.2 NAS Lemoore Alternative 3-164
3.12.3 NAF El Centro Alternative 3-170

4. ENVIRONMENTAL CONSEQUENCES 4-1
4.1 BIOLOGICAL RESOURCES 4-1
4.1.1 Preferred Alternative: NAWS Point Mugu 4-5
4.1.2 NAS Lemoore Alternative 4-7
4.1.3 NAF El Centro Alternative 4-8
4.2 HYDROLOGY/SURFACE WATER QUALITY 4-10
4.2.1 Preferred Alternative: NAWS Point Mugu 4-10
4.2.2 NAS Lemoore Alternative 4-11
4.2.3 NAF El Centro Alternative 4-12
4.3 LAND USE AND AIRSPACE 4-14
4.3.1 Preferred Alternative: NAWS Point Mugu 4-14
4.3.2 NAS Lemoore Alternative 4-16
4.3.3 NAF El Centro Alternative 4-18
4.4 SOCIOECONOMICS 4-20
4.4.1 Preferred Alternative: NAWS Point Mugu 4-23
4.4.2 NAS Lemoore Alternative 4-25
4.4.3 NAF El Centro Alternative 4-26

TABLE OF CONTENTS *(continued)*

Chapter		Page
4.5	TRAFFIC AND CIRCULATION	4-29
4.5.1	Preferred Alternative: NAWS Point Mugu	4-32
4.5.2	NAS Lemoore Alternative	4-36
4.5.3	NAF El Centro Alternative	4-40
4.6	AIR QUALITY	4-45
4.6.1	Preferred Alternative: NAWS Point Mugu	4-46
4.6.2	NAS Lemoore Alternative	4-49
4.6.3	NAF El Centro Alternative	4-53
4.7	NOISE	4-56
4.7.1	Preferred Alternative: NAWS Point Mugu	4-57
4.7.2	NAS Lemoore Alternative	4-62
4.7.3	NAF El Centro Alternative	4-62
4.8	AESTHETICS AND VISUAL RESOURCES	4-64
4.8.1	Preferred Alternative: NAWS Point Mugu	4-64
4.8.2	NAS Lemoore Alternative	4-66
4.8.3	NAF El Centro Alternative	4-66
4.9	UTILITIES AND SERVICES	4-68
4.9.1	Preferred Alternative: NAWS Point Mugu	4-70
4.9.2	NAS Lemoore Alternative	4-74
4.9.3	NAF El Centro Alternative	4-78
4.10	CULTURAL RESOURCES	4-82
4.10.1	Preferred Alternative: NAWS Point Mugu	4-84
4.10.2	NAS Lemoore Alternative	4-85
4.10.3	NAF El Centro Alternative	4-86
4.11	PUBLIC HEALTH AND SAFETY	4-87
4.11.1	Preferred Alternative:	4-88
4.11.1	NAWS Point Mugu	4-88
4.11.2	NAS Lemoore Alternative	4-88
4.11.3	NAF El Centro Alternative	4-89
4.12	HAZARDOUS MATERIALS AND WASTES	4-91
4.12.1	Preferred Alternative: NAWS Point Mugu	4-91
4.12.2	NAS Lemoore Alternative	4-94
4.12.3	NAF El Centro Alternative	4-96
5.	**CUMULATIVE IMPACTS**	**5-1**
5.1	PREFERRED ALTERNATIVE: NAWS POINT MUGU	5-1
5.2	NAS LEMOORE ALTERNATIVE	5-6
5.3	NAF EL CENTRO ALTERNATIVE	5-16
6.	**OTHER CONSIDERATIONS**	**6-1**
6.1	ENVIRONMENTAL JUSTICE (EO 12898)	6-1
6.1.1	Preferred Alternative: NAWS Point Mugu	6-2
6.1.2	NAS Lemoore Alternative	6-3
6.1.3	NAF El Centro Alternative	6-3
6.2	PROTECTION OF CHILDREN FROM ENVIRONMENTAL HEALTH RISKS (EO 13045)	6-4
6.3	IRREVERSIBLE OR IRRETRIEVABLE COMMITMENT OF RESOURCES	6-5
6.4	UNAVOIDABLE ADVERSE EFFECTS	6-5
6.5	RELATIONSHIP BETWEEN SHORT-TERM USES AND LONG-TERM PRODUCTIVITY	6-5
7.	**REFERENCES**	**7-1**

TABLE OF CONTENTS *(continued)*

Chapter		Page
8.	**CONSULTATION AND COORDINATION**	**8-1**
8.1	AGENCIES AND REPRESENTATIVES CONTACTED	8-1
8.2	SCOPING	8-7
9.	**LIST OF PREPARERS**	**9-1**
9.1	NAVY PERSONNEL	9-1
9.2	PRIME CONTRACTOR	9-1
9.3	SUBCONTRACTORS	9-4
10.	**DISTRIBUTION LIST**	**10-1**
11.	**GLOSSARY AND INDEX**	**11-1**
11.1	GLOSSARY	11-1
11.2	INDEX	11-13

FIGURES

Figure		Page
Figure 1-1	E-2 Squadrons Realignment Alternatives	1-4
Figure 2-1	NAWS Point Mugu Regional Location Map	2-8
Figure 2-2	NAWS Point Mugu Proposed Project Sites	2-11
Figure 2-3	NAS Lemoore Regional Location Map	2-13
Figure 2-4	NAS Lemoore Proposed Project Sites: Operations Area	2-15
Figure 2-5	NAS Lemoore Proposed Project Sites: Administration/Housing Area	2-16
Figure 2-6	NAF El Centro Regional Location Map	2-18
Figure 2-7	NAF El Centro Proposed Project Sites	2-21
Figure 3-1	NAWS Point Mugu Wetland Areas	3-4
Figure 3-2	NAWS Point Mugu Habitat for Special Status Species	3-9
Figure 3-3	NAS Lemoore Wetland Areas: Operations Area	3-11
Figure 3-4	NAS Lemoore Wetland Areas: Administration/Housing Area	3-12
Figure 3-5	NAS Lemoore Habitat for Special Status Species: Operations Area	3-16
Figure 3-6	NAS Lemoore Habitat for Special Status Species: Administration/Housing Area	3-17
Figure 3-7	NAF El Centro Wetland Areas	3-19
Figure 3-8	NAF El Centro Habitat for Special Status Species	3-21
Figure 3-9	NAWS Point Mugu Principal Surface Water Features	3-24
Figure 3-10	NAS Lemoore Principal Surface Water Features	3-27
Figure 3-11	NAF El Centro Principal Surface Water Features	3-30
Figure 3-12	NAWS Point Mugu Regional Land Uses	3-38
Figure 3-13	NAWS Point Mugu Existing Land Uses	3-39
Figure 3-14	NAWS Point Mugu Airspace Use	3-41
Figure 3-15	NAWS Point Mugu Accident Potential Zones	3-43
Figure 3-16	NAS Lemoore Regional Land Uses	3-45
Figure 3-17	NAS Lemoore Existing Land Uses: Operations Area	3-47
Figure 3-18	NAS Lemoore Existing Land Uses: Administration/Housing Area	3-48
Figure 3-19	NAS Lemoore Airspace Use	3-49
Figure 3-20	NAS Lemoore Accident Potential Zones	3-50
Figure 3-21	NAF El Centro Regional Land Uses	3-52
Figure 3-22	NAF El Centro Existing Land Uses	3-54
Figure 3-23	NAF El Centro Airspace Use	3-55
Figure 3-24	NAF El Centro and Imperial County Airport Traffic Interface	3-56
Figure 3-25	NAF El Centro Accident Potential Zones	3-58
Figure 3-26	NAF El Centro Imaginary Helicopter Surfaces	3-60
Figure 3-27	NAWS Point Mugu BaselineTraffic Volumes AM/PM Hours & ADTs	3-78
Figure 3-28	NAS Lemoore Baseline Traffic Volumes AM/PM Hours & ADTs	3-82
Figure 3-29	NAF El Centro Baseline Traffic Volumes AM/PM Hours & ADTs	3-86
Figure 3-30	Land Use Compatibility within AICUZ Zones	3-102
Figure 3-31	NAWS Point Mugu Existing Noise Contours	3-105
Figure 3-32	NAS Lemoore Existing Noise Contours	3-108
Figure 3-33	NAF El Centro Existing Noise Contours	3-111
Figure 3-34	NAWS Point Mugu ESQD Arcs	3-147
Figure 3-35	NAWS Point Mugu EMR Arcs	3-149
Figure 3-36	NAS Lemoore ESQD Arcs	3-151
Figure 3-37	NAS Lemoore EMR Arcs	3-152
Figure 3-38	NAF El Centro ESQD Arcs	3-154
Figure 3-39	NAF El Centro EMR Arcs	3-155
Figure 4-1	NAWS Point Mugu 1999+Project Traffic Volumes AM/PM Hours & ADTs	4-33
Figure 4-2	NAS Lemoore 1999+Project Traffic Volumes AM/PM Hours & ADTs	4-38
Figure 4-3	NAF El Centro 1999+Project Traffic Volumes AM/PM Hours & ADTs	4-43
Figure 4-4	NAWS Point Mugu Proposed E-2 Realignment Noise Contours	4-60
Figure 5-1	NAS Lemoore Cumulative Noise Contours	5-14
Figure 5-2	NAF El Centro Cumulative Noise Contours	5-23

TABLES

Table		Page
Table 2-1	Comparison of Facility/Equipment Requirements for the Realignment Alternatives	2-6
Table 2-2	E-2 Construction—Expansion Projects at NAWS Point Mugu	2-10
Table 2-3	Other Equipment/Facility Needs at NAWS Point Mugu	2-10
Table 2-4	E-2 Construction—Expansion Projects at NAS Lemoore	2-14
Table 2-5	Other Equipment/Facility Needs at NAS Lemoore	2-17
Table 2-6	E-2 Construction—Expansion Projects at NAF El Centro	2-20
Table 2-7	Other Equipment/Facility Needs at NAF El Centro	2-20
Table 2-8	E-2 Site Screening	2-23
Table 2-9	Potentially Required Permits and Agency Consultation	2-25
Table 2-10	Summary of Significant Environmental Impacts and Mitigations	2-26
Table 3-1	Sensitive Species Known to Inhabit or Potentially Inhabit the Vicinity of NAWS Point Mugu	3-7
Table 3-2	Sensitive Species Known to Inhabit or Potentially Inhabit the Vicinity of NAS Lemoore	3-15
Table 3-3	Sensitive Species Known to Inhabit or Potentially Inhabit the Vicinity of NAF El Centro	3-20
Table 3-4	Population, Ventura County	3-62
Table 3-5	Sector Employment, Ventura County	3-63
Table 3-6	Labor Force and Unemployment, Ventura County	3-63
Table 3-7	Income by Place of Residence, Ventura County	3-64
Table 3-8	Housing Stock and Vacancy Rate, Ventura County	3-64
Table 3-9	Business Volume ($1,000s), Ventura County	3-65
Table 3-10	Net Government Revenues, Ventura County	3-65
Table 3-11	Population, Kings and Fresno Counties	3-66
Table 3-12	Sector Employment, Kings and Fresno Counties	3-67
Table 3-14	Income by Place of Residence, Kings and Fresno Counties	3-68
Table 3-15	Housing Stock and Vacancy Rates, Kings and Fresno Counties	3-69
Table 3-16	Business Volume ($1,000s), Kings and Fresno Counties	3-69
Table 3-17	Net Government Revenues, Kings and Fresno Counties	3-70
Table 3-18	Population, Imperial County	3-71
Table 3-19	Sectors Employment, Imperial County	3-71
Table 3-20	Labor Force and Unemployment, Imperial County	3-72
Table 3-21	Income by Place of Residence, Imperial County	3-72
Table 3-22	Housing Stock and Vacancy Rate, Imperial County (1990, 1992, and 1994)	3-73
Table 3-23	Business Volume ($1,000s), Imperial County	3-73
Table 3-24	Net Government Revenues, Imperial County	3-74
Table 3-25	Intersections Level of Service Definitions	3-75
Table 3-26	Street Segments Level of Service Definitions	3-76
Table 3-27	NAWS Point Mugu Unsignalized Intersection Operations	3-79
Table 3-28	NAWS Point Mugu Daily Street Segment Operations	3-80
Table 3-29	NAS Lemoore Signalized Intersection Operations	3-83
Table 3-30	NAS Lemoore Unsignalized Intersections Operations	3-83
Table 3-31	NAS Lemoore Daily Street Segment Operations	3-84
Table 3-32	NAF El Centro Unsignalized Intersection Operations	3-87
Table 3-33	NAF El Centro Daily Street Segment Operations	3-87
Table 3-34	Ambient Air Quality Standards	3-90
Table 3-35	Federal and State Attainment Status for Alternative Receiving Installations	3-92
Table 3-36	Nonattainment Pollutants and *De Minimis* Levels for Alternative E-2 Realignment Sites	3-94
Table 3-37	Air Quality Monitoring Data for the NAWS Point Mugu Vicinity (1991-1995)	3-96
Table 3-38	Air Quality Monitoring Data for the NAS Lemoore Vicinity (1991-1995)	3-98
Table 3-39	Air Quality Monitoring Data for the NAF El Centro Vicinity (1991-1995)	3-99
Table 3-40	Existing Roadway Noise Levels Near NAWS Point Mugu	3-106
Table 3-41	Existing Traffic Noise Levels Near NAS Lemoore	3-109
Table 3-42	Existing Traffic Noise Levels Near NAF El Centro	3-112
Table 3-43	IRP Sites at NAS Lemoore within One Quarter Mile of the Proposed Project Sites	3-166

TABLES *(continued)*

Table		Page
Table 4-1	Summary of Potential Environmental and Socioeconomic Impacts	4-2
Table 4-2	Summary of Biological Resources Impacts	4-5
Table 4-3	Summary of Hydrology/Surface Water Quality Impacts	4-10
Table 4-4	Summary of Land Use and Airspace Impacts	4-14
Table 4-5	Summary of Socioeconomic Impacts	4-21
Table 4-6	Realignment Personnel	4-21
Table 4-7	Estimated Personnel Build-Up	4-22
Table 4-8	Estimated Annual Construction Costs	4-22
Table 4-9	Socioeconomic Effects at NAWS Point Mugu (Preferred Alternative)	4-23
Table 4-10	Socioeconomic Effects at NAS Lemoore	4-25
Table 4-11	Socioeconomic Effects at NAF El Centro	4-27
Table 4-12	Summary of Traffic and Circulation Impacts	4-31
Table 4-13	NAWS Point Mugu Projected Traffic Generation	4-32
Table 4-14	NAWS Point Mugu Unsignalized Intersection Operations	4-34
Table 4-15	NAWS Point Mugu Daily Street Segment Operations	4-35
Table 4-16	NAS Lemoore Projected Traffic Generation	4-36
Table 4-17	NAS Lemoore Signalized Intersection Operations	4-37
Table 4-18	NAS Lemoore Unsignalized Intersections Operations	4-39
Table 4-19	NAS Lemoore Daily Street Segment Operations	4-39
Table 4-20	NAF El Centro Projected Traffic Generation	4-41
Table 4-21	NAF El Centro Unsignalized Intersection Operations	4-42
Table 4-22	NAF El Centro Daily Street Segment Operations	4-44
Table 4-23	Summary of Air Quality Resource Impacts	4-46
Table 4-24	Annual Emissions for E-2 Squadron Activity NAWS Point Mugu Alternative	4-47
Table 4-25	Annual Emissions for E-2 Squadron Activity NAS Lemoore Alternative	4-51
Table 4-26	Annual Emissions for E-2 Squadron Activity NAF El Centro Alternative	4-54
Table 4-27	Summary of Noise Impacts	4-57
Table 4-28	Typical Construction Noise Impacts	4-58
Table 4-29	Peak Noise Levels From E-2 Aircraft Flyover Events	4-61
Table 4-30	Summary of Aesthetics and Visual Resources Impacts	4-64
Table 4-31	Summary of Utilities and Services Impacts	4-68
Table 4-32	Summary of Cultural Resources Impacts	4-84
Table 4-33	Summary of Public Health and Safety Impacts	4-87
Table 4-34	Summary of Hazardous Materials and Wastes Impacts	4-92
Table 5-1	List of Cumulative Projects: NAWS Point Mugu	5-2
Table 5-2	Cumulative Trip Generation for NAWS Point Mugu	5-3
Table 5-3	Unsignalized Intersection Operations at NAWS Point Mugu	5-4
Table 5-4	Daily Street Segment Operations at NAWS Point Mugu	5-4
Table 5-5	List of Cumulative Projects: NAS Lemoore	5-6
Table 5-6	Cumulative Socioeconomic Effects, NAS Lemoore	5-8
Table 5-7	Cumulative Trip Generation for NAS Lemoore	5-9
Table 5-8	Signalized Intersection Operations at NAS Lemoore	5-10
Table 5-9	Unsignalized Intersection Operations at NAS Lemoore	5-10
Table 5-10	Daily Street Segment Operations at NAS Lemoore	5-11
Table 5-11	List of Cumulative Projects: NAF El Centro	5-17
Table 5-12	Cumulative Socioeconomic Effects at NAF El Centro	5-18
Table 5-13	Cumulative Trip Generation for NAF El Centro	5-19
Table 5-14	Unsignalized Intersection Operations at NAF El Centro	5-20
Table 5-15	Daily Street Segment Operations at NAF El Centro	5-20
Table 6-1	Racial Composition and Poverty by Census Tract Compared with Ventura County	6-2
Table 6-2	Racial Composition and Poverty by Census Tract Compared with Fresno and Kings Counties	6-3
Table 6-3	Racial Composition and Poverty by Census Tracts Compared with Imperial County	6-4

LIST OF APPENDICES

Appendix

VOLUME II

A	Public Involvement
B	Biological Resources
C	Socioeconomics
D	Conformity Determination/Air Quality
E	Noise
F	Cultural Resources

$\mu g/m^3$	micrograms per cubic meter
AB	Assembly Bill
ACHP	Advisory Council on Historic Preservation
ACM	asbestos-containing material
ADT	average daily trips
AEWWINGPAC	Airborne Early Warning Wing Pacific
AFB	Air Force Base
AHERA	Asbestos Hazardous Emergency Response Act
AIB	applied instruction building
AICUZ	air installation compatible use zone
AIMD	Aircraft Intermediate Maintenance Department
APCD	Air Pollution Control District
APE	area of potential effect
APZ	accident potential zone
ARPA	Archaeological Resources Protection Act
ARTCC	air route traffic control center
AST	aboveground storage tank
ATC	authority to construct
ATCAA	air traffic control authorized airspace
ATE	automated test equipment
BASH	bird air strike hazard
BEAP	Base Exterior and Architecture Plan
BEQ	bachelor enlisted quarters
BODERS	Bureau of Naval Personnel
BOQ	bachelor officer's quarters
BRAC	Defense Base Closure and Realignment Commission
CAA	Clean Air Act
CAAQS	California ambient air quality standards
CAEWWINGPAC	Commander Airborne Early Warning Wing Pacific
CAL EPA	California Environmental Protection Agency
CalTrans	California Department of Transportation
CAMAIR	Camarillo Airport
CARB	California Air Resources Board
CCA	California Coastal Act
CCAA	California Clean Air Act
CCC	California Coastal Commission
CCD	Coastal Consistency Determination
CCMP	California Coastal Management Program
CCR	California Code of Regulations
CDFG	California Department of Fish and Game
CEC	Cooperative Engagement Capability
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
cfd	cubic feet per day
CFR	Code of Federal Regulations
CH&SC	California Health & Safety Code
cmd	cubic meters per day
CMWD	Calleguas Municipal Water District
CNEL	community noise equivalent level
CNO	Chief of Naval Operations
CO	carbon monoxide
COE	Army Corps of Engineers
COMNAVAIRPAC	Commander Naval Air Force Pacific Fleet

CVP	Central Valley Project
CVPIA	Central Valley Project Improvement Act
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
dB	decibel
dBA	A-weighted decibel scale
DBCRA	Defense Base Closure and Realignment Act
DDT	dichlorodiphenyltrichloroethane
DEIS	draft environmental impact statement
DOD	Department Of Defense
DRMO	Defense Reutilization and Marketing Office
DTSC	California Department of Toxic Substances Control
DWR	Department of Water Resources
EA	environmental assessment
EIFS	Economic Impact Forecast System
EIS	environmental impact statement
EMR	electromagnetic radiation
EMT	Emergency Medical Technician
EPCRA	Emergency Planning and Community Right-to-Know Act
ESQD	explosive safety quantity distance
FAA	Federal Aviation Administration
FCLP	field carrier landing practice
FEIS	final environmental impact statement
FEMA	Federal Emergency Management Agency
FFPA	Farmland Protection Policy Act
FHWA	Federal Highway Administration
FIFRA	Federal Insecticide, Fungicide and Rodenticide Act
FIRM	flood insurance rate map
FR	Federal Register
FRS	fleet replacement squadron
FS	feasibility study
FTA	Federal Transit Administration
gpd	gallons per day
HARD	Historic and Archeological Resources Protection
HERF	Navy regulations for hazards of electromagnetic radiation to fuel
HERO	Navy regulations for hazards of electromagnetic radiation to ordnance
HERP	Navy hazards of electromagnetic radiation to personnel program
HRS	Hazard ranking system
HSWA	Hazardous and Solid Waste Amendments
I	Interstate
IAS	initial assessment study
ICS	Imperial County Sanitation
IDC	Independent duty corpsman
IFR	instrument flight rule
IID	Imperial Irrigation District
IR	instrument route
IRP	Installation Restoration Program
JATO	jet assisted take-off
KCWMA	Kings County Waste Management Authority
KV	kilovolt
KWH	kilowatt hour
LBP	lead-based paint
LCP	Local Coastal Program

Ldn	day-night average sound level
Leq	equivalent noise level
LOS	level of service
Lpd	liters per day
MCAS	Marine Corps air station
MCB	Marine Corps base
mg/L	milligrams per liter
mgd	million gallons per day
mgy	million gallons per year
MILCON	military construction
mLd	million liters per day
mLy	million liters per year
MMPA	Marine Mammal Protection Act
MOA	military operations area
MOU	Memorandum of Understanding
MSL	mean sea level
MTR	military training route
MW	megawatts
MWR	Morale, Welfare, and Recreation
NAAQS	national ambient air quality standards
NAESU	Naval Aviation Support Engineering Unit
NAF	Naval Air Facility
NAGPRA	Native American Graves Protection and Repatriation Act
NALF	Naval Auxiliary Landing Field
NAS	Naval Air Station
NASLEMINST	Naval Air Station Lemoore Instruction
NAVAIR	Naval Air Systems Command
NAWC	Naval Air Weapons Center
NAWS	Naval Air Weapons Station
NCBC	Naval Construction Battalion Center
NEPA	National Environmental Policy Act
NESHAP	National Emissions Standards for Hazardous Air Pollutants
NEX	Naval Exchange
NFIP	National Flood Insurance Program
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NO_2	nitrogen dioxide
NOI	Notice of Intent
Nox	oxides of nitrogen (nitric oxide plus nitrogen dioxide)
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
NSR	new source review
O_3	ozone
ODD	Oxnard Drainage Ditch
OPNAVINST	Office of the Chief of Naval Operations Instruction
OSHA	Occupational Safety and Health Administration
OTF	operational trainer facility
OWS	oil/water separators
PA	preliminary assessment
PCBs	Polychlorinated biphenyls
pCi/L	picocuries per liter
PG&E	Pacific Gas and Electric Company
PHWA	Port Hueneme Water Agency

PL	public law
PMRAA	Point Mugu Regional Airport Authority
PM_{10}	inhalable particulate matter
ppm	parts per million
PSD	prevention of significant deterioration
PTO	permit to operate
PWT	Public Works Transportation
RA	remedial action
RAP	Remedial Action Plans
RATCF	radar air traffic control facility
RCRA	Resource Conservation and Recovery Act
RD	remedial design
RI	remedial investigation
ROD	Record of Decision
ROG	reactive organic compounds
ROI	region of influence
RONA	Record of Non-applicability
RTV	rational threshold value
RWQCB	Regional Water Quality Control Board
SARA	Superfund Amendments and Reauthorization Act
SB	Senate Bill
SCAG	Southern California Association of Governments
SCE	Southern California Edison
SCGC	Southern California Gas Company
SCIF	special compartmented information facility
SD	site discovery
SHPO	State Historic Preservation Officer
SI	site inspection
SIP	State Implementation Plan
SJVAB	San Joaquin Valley Air Basin
SJVUAPCD	San Joaquin Valley Unified Air Pollution Control District
SO_2	sulphur dioxide
SOCALOPAREA	Southern California Operations Area
SOP	standard operating procedures
SOx	sulfur oxides
SPCC	spill prevention control and countermeasure
SR	state route
SRA	subregional area
SWAT	Special Weapons and Tactic Team
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
T/R	Training and Readiness
TDS	total dissolved solids
TSCA	Toxic Substances Control Act
US	United States
USC	United States Code
USDA	US Department of Agriculture
USEPA	US Environmental Protection Agency
USFWS	US Fish and Wildlife Service
UST	underground storage tank
UWCD	United Water Conservation District
V/C	volume-to-capacity ratio
VCAPCD	Ventura County Air Pollution Control District

VCCMP	Ventura County Congestion Management Program
VFR	visual flight rule
VR	visual route
WAPA	Western Area Power Administration
WQCP	Water Quality Control Plans

EXECUTIVE SUMMARY 1

Purpose of the Proposed Action 1
Need for the Proposed Action 3
Public Scoping 3
Proposed Action 4
Alternatives 5
Site Eligibility Limitations 5
Realignment Alternatives 10
No Action Alternative 11
Alternatives Considered but Eliminated 12
Environmental Analysis 12
Affected Environment 12
Environmental Consequences 16
Cumulative Impacts 16
Preferred Alternative: NAWS Point Mugu 16
NAS Lemoore Alternative 16
NAF El Centro Alternative 17
Other Considerations 18
Environmental Justice 18
Irreversible and Irretrievable Commitment of Resources 18
Unavoidable Adverse Impacts 19
Relationship Between Short-term Uses and Long-term Productivity 19

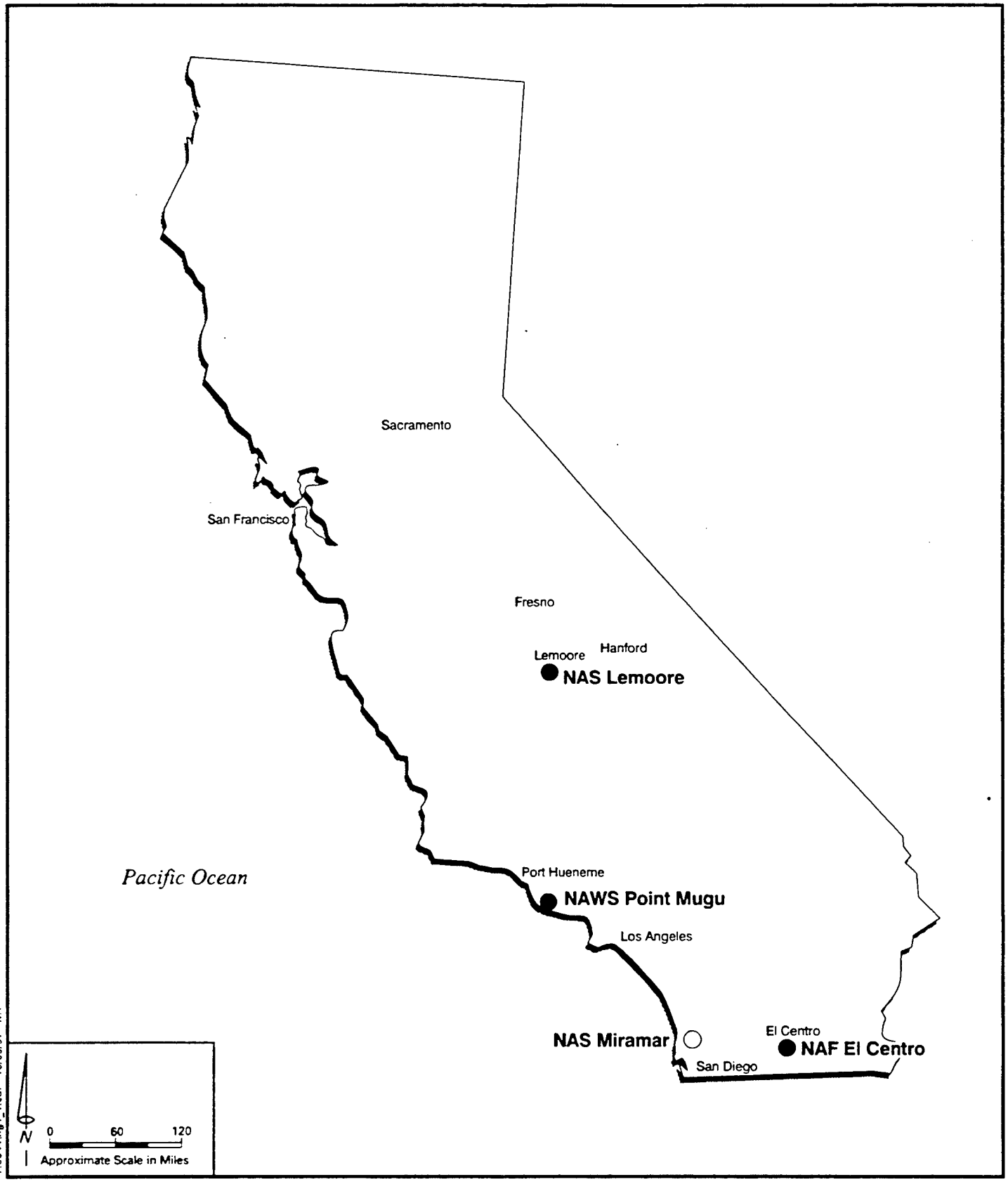
EXECUTIVE SUMMARY

This draft environmental impact statement (DEIS) analyzes the potential impacts to the environment that may result from the proposed E-2 aircraft squadrons' realignment. This document has been prepared in accordance with the National Environmental Policy Act (NEPA) of 1969 as amended, the Council on Environmental Quality (CEQ) implementing regulations (Title 40 Code of Federal Regulations [CFR] Parts 1500-1508), and the Navy's NEPA implementing regulations (OPNAVINST [Office of the Chief of Naval Operations Instruction] 5090.1B). The Navy is the lead agency for the decision regarding the selection of the receiving installation.

This DEIS also has been prepared in accordance with the Defense Base Closure and Realignment Act of 1990 (DBCRA, Public Law 101-510), and the pertinent base closure and realignment decisions of the Defense Base Closure and Realignment Commission approved by the President and accepted by Congress in September 1993 and September 1995. DBCRA established the Defense Base Closure and Realignment Commission for the purpose of ensuring a timely, independent, and fair process for closure and realignment of United States (US) military installations.

PURPOSE OF THE PROPOSED ACTION

The purpose of the proposed action is to relocate four E-2 aircraft squadrons and related support personnel, equipment, and functions from Naval Air Station (NAS) Miramar in California. The proposed action includes siting 16 E-2 aircraft, relocating 988 associated personnel and their family members, and expanding or constructing facilities to support aircraft and personnel and to provide associated training functions. In addition to the increased staffing and equipment levels, there would be an increase in Navy training activities and an increase in flight operations at the receiving installation. Three installations considered reasonable alternatives for the receiving base are Naval Air Weapons Station (NAWS) Point Mugu, Naval Air Station (NAS) Lemoore, and Naval Air Facility (NAF) El Centro, all in California (Section 1.2). The locations of these bases are shown on Figure ES-1.



r:\0544\fig1_1.cdr - 10/05/97 - MY

The alternative sites are located in three distinctively different parts of California: the Central Valley, the Southern California Coast, and the Imperial Valley.

LEGEND:

- ○ Existing E-2 Squadrons Base
- ● Alternative Receiving Base

E-2 Squadrons Realignment Alternatives

E-2 Aircraft Squadrons Realignment EIS
California

Source: Tetra Tech 1997.

Figure ES-1

NEED FOR THE PROPOSED ACTION

The proposed action is pursuant to 1993 and 1995 BRAC Commission recommendations. In 1993, the BRAC Commission recommended that the Marine Corps Air Station (MCAS) El Toro, California be closed and its aircraft along with their dedicated personnel, equipment, and support be relocated to other naval air stations, primarily NAS Miramar, California, and MCAS/Marine Corps Base (MCB) Camp Pendleton, California. In associated actions, the squadrons and related activities at NAS Miramar would be moved to other naval air stations, primarily NAS Lemoore and NAS Fallon, Nevada in order to make room for the relocation of MCAS El Toro squadrons.

In 1995, the BRAC Commission modified the 1993 Commission-recommended receiving sites from NAS Lemoore and NAS Fallon to other naval air stations, primarily NAS Oceana, Virginia, NAS North Island, California, and NAS Fallon, Nevada.

The President approved and Congress accepted these recommendations. In September 1997, the Navy transferred ownership of NAS Miramar to the Marine Corps. The base was redesignated MCAS Miramar. The transfer of ownership to the Marine Corps requires that the Navy relocate the four E-2 squadrons now at NAS Miramar to a receiving Navy installation. The E-2 squadrons have operational and logistical requirements, including specific airfield capabilities, training efficiencies, and infrastructure that the Navy considered when selecting the potential receiving installations (Section 1.3).

The Navy has realigned the F-14 and TOPGUN/TOPDOME squadrons formerly stationed at NAS Miramar to NAS Oceana and NAS Fallon, respectively, in accordance with the 1995 BRAC recommendation. However, because they do not fulfill the criteria, the NAS Oceana and NAS Fallon locations specified in the 1995 BRAC Commission recommendations were eliminated from further consideration as E-2 squadron receiving installations. NAS North Island was also eliminated from consideration due to the need to support Clean Air Act requirements with regard to the Marine Corps realignment to MCAS Miramar.

PUBLIC SCOPING

Issues and concerns related to the proposed action were solicited during the public scoping period conducted from May 1 to June 6, 1996. The purpose of the public scoping process is to solicit comments on the proposed action, the range of alternatives, and any potential environmental issues associated with the alternatives. The scoping process included publishing notices in the *Federal Register* and local newspapers, holding public meetings in the vicinity of the alternative receiving installations, and mailing information to agencies, organizations, and individuals who might be interested in the proposed action. The Navy considered comments received during the scoping process in determining the issues to be evaluated in this EIS. The public was notified of the Navy's intent to prepare this EIS by a notice of

intent (NOI) published in the May 1, 1996, *Federal Register* (Volume 61, Number 85) (Section 1.5).

Overall, approximately 155 individuals attended the scoping meetings, and 68 persons provided public testimony. In addition, 48 letters were received from members of the public; interested groups; and federal, state, and local agencies (Section 1.5). A summary of the scoping comments is included in Appendix A.

PROPOSED ACTION

The proposed action evaluated in this DEIS is the realignment of four E-2 squadrons (16 aircraft total) and associated support personnel and their families from NAS Miramar. To support this action, facilities would need to be constructed, expanded, and renovated at the receiving base. The amount of construction necessary would be determined by which receiving base is selected. The construction schedules would vary depending on the base selected. In addition to the increased staffing and equipment levels, the volume of flight operations would increase at the receiving installation with the proposed action. The following discussion provides a more detailed description of the proposed action (Section 2.1).

Aircraft. The proposed action would relocate four E-2 squadrons with four aircraft each (16 aircraft total). Realignment of the E-2 aircraft squadrons is scheduled to occur in July 1998 through January 1999. Squadrons would relocate over six months due to deployment cycles.

Aircraft operations. Generally, up to 3,650 annual take-offs and arrivals are conducted by the E-2s, during which the squadrons perform approximately 12,000 field carrier landing practices (FCLPs) and 550 touch-and-go exercises. Ninety percent of the FCLPs are conducted during the night to simulate nighttime aircraft carrier landings. Daily aircraft maintenance activities are conducted after flights are completed. Squadron workforce needs diminish through the night as daily maintenance requirements are satisfied.

Typically, each squadron is away from the home base for a period of 14-15 months every two years. Over this period, each squadron spends approximately six months deployed to the Western Pacific; two months deployed to Panama doing counter-drug operations; and approximately seven months away from home base involved in air wing/battle group training. An average of two squadrons of E-2s are at the home base at any one time.

Personnel. Realignment of the four E-2 squadrons and associated functions would relocate a total of 988 personnel, consisting of approximately 130 officers, 818 enlisted personnel, and 40 civilians, to the receiving installation. These 988 personnel consist of 612 squadron personnel (153 each) and 376 administrative and support employees. In addition to squadron and support personnel, the Navy

would relocate to the receiving installation approximately 1,500 family members, including approximately 710 spouses and 790 children. Realignment of the entire E-2 community would involve approximately 2,488 people. These population estimates are approximate and subject to change and refinement.

Facilities. Facilities necessary for the proposed action include aircraft operational facilities, maintenance facilities, supply facilities, personnel support facilities, and bachelors' quarters. All facilities would be required to support the E-2 aircraft and associated personnel; however some facilities may already exist at certain installations. The existing facilities available to accommodate the E-2 realignment and new or expanded facilities that would be required are described in Section 2.3 for each alternative site.

Figures ES-2 through ES-5 show proposed construction/expansion and renovation projects at the alternative bases.

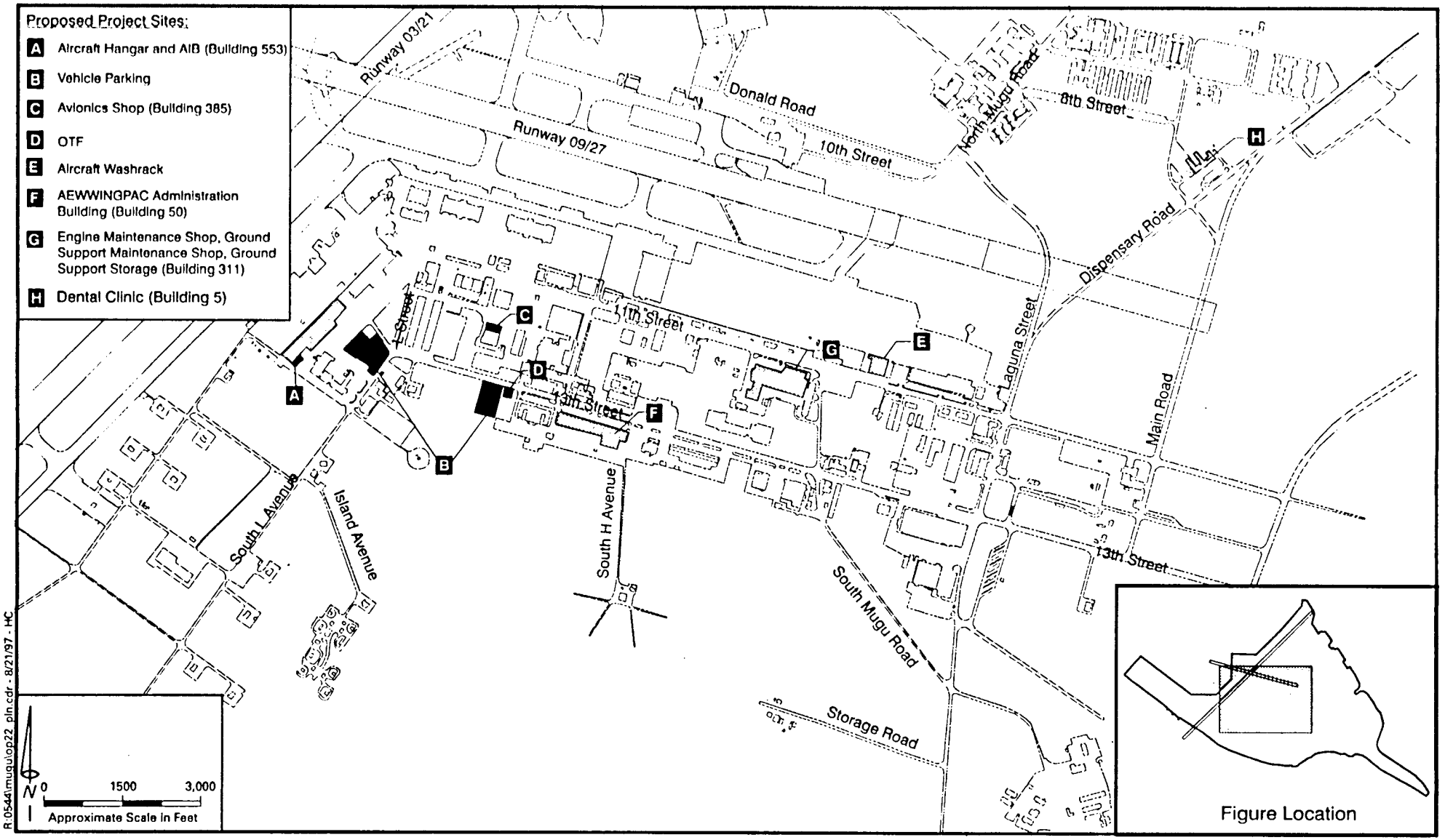
ALTERNATIVES

Site Eligibility Limitations

Commander Naval Air Force, US Pacific Fleet (COMNAVAIRPAC) conducted a planning process to determine feasible and practical locations to receive the E-2 community. This process included analysis of operational and logistical requirements for the realignment of the E-2 squadrons and support personnel/functions.

To be eligible for consideration, the site must fall within the Commander in Chief, US Pacific Fleet Area of Responsibility (AOR). A basic concept for force structure, personnel and equipment planning, assigning specific aircraft assets to Pacific Fleet and Atlantic Fleet Commanders simplifies logistics, minimizes overhead, and meets Navy goals of minimizing the time spent by personnel away from their homes.

Basing the 16 Pacific Fleet E-2 aircraft and operational assets at more than one location is unacceptable because of operational constraints and high support costs associated with maintaining and operating the aircraft in multiple locations. It would impede force readiness levels and decrease effectiveness of training for E-2 aircrews and support personnel. Neither the Navy's current authorized personnel levels, funding, or the Navy's inventory of E-2 spare parts and equipment would be able to adequately support such a separation (Section 2.2).



R:\0544\mugu\op22_pln.cdr - 8/21/97 - HC

ES-6

With the exception of the proposed vehicle parking lots, all construction/ expansion sites are located on sites that are paved or developed.

LEGEND:

Construction/Expansion

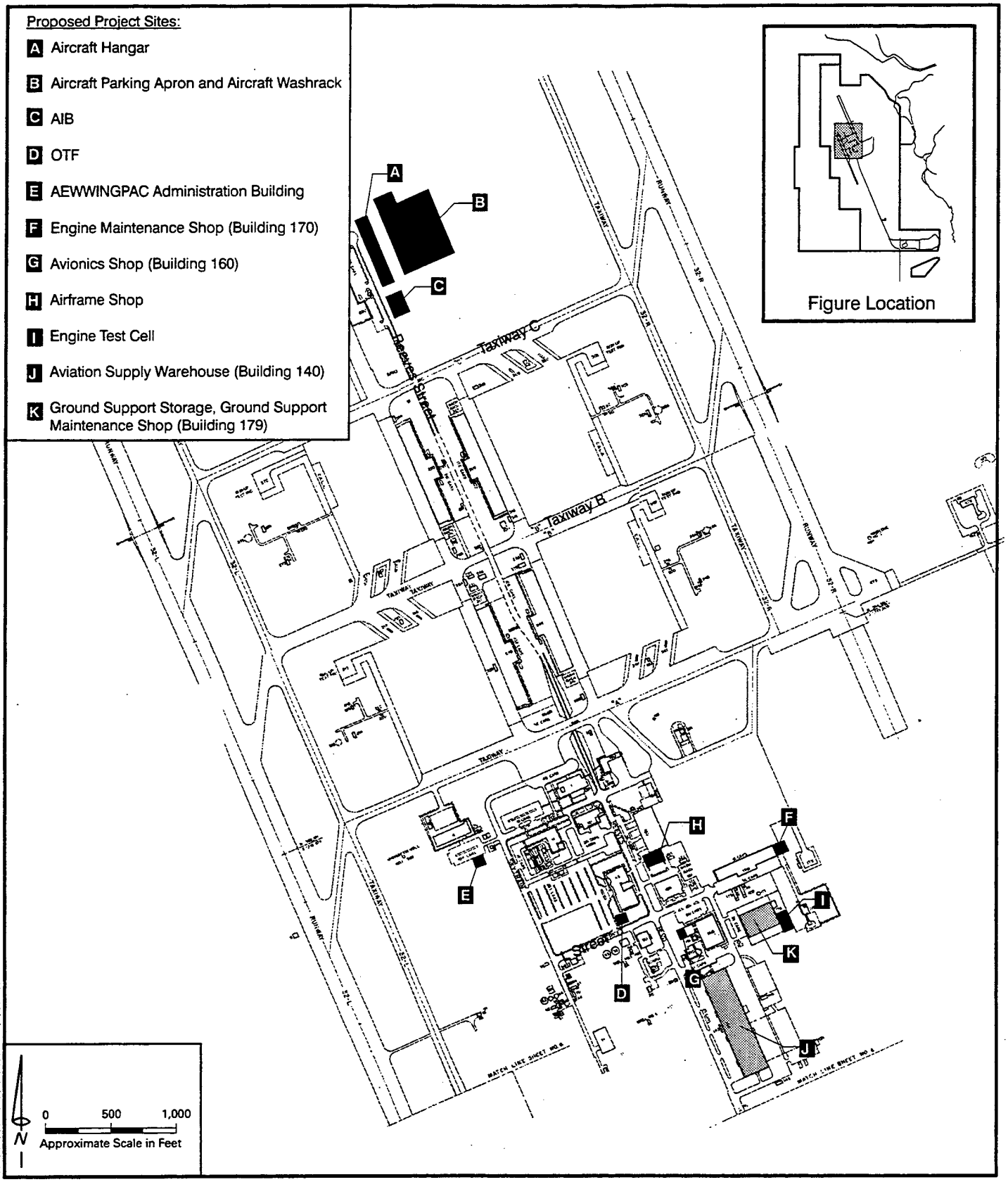
Renovation

NAWS Point Mugu Proposed Project Sites

E-2 Aircraft Squadrons Realignment EIS
NAWS Point Mugu, California

Source: Hovde 1997.

Figure ES-2



r:\0544\lemore\es-3r.cdr - 11/2/97 - KP

The proposed aircraft hangar, aircraft parking apron, aircraft washrack, AIB, AEWWINGPAC administration building, airframe shop, engine test cell, and OTF would be located on sites that are not currently paved or developed.

LEGEND:

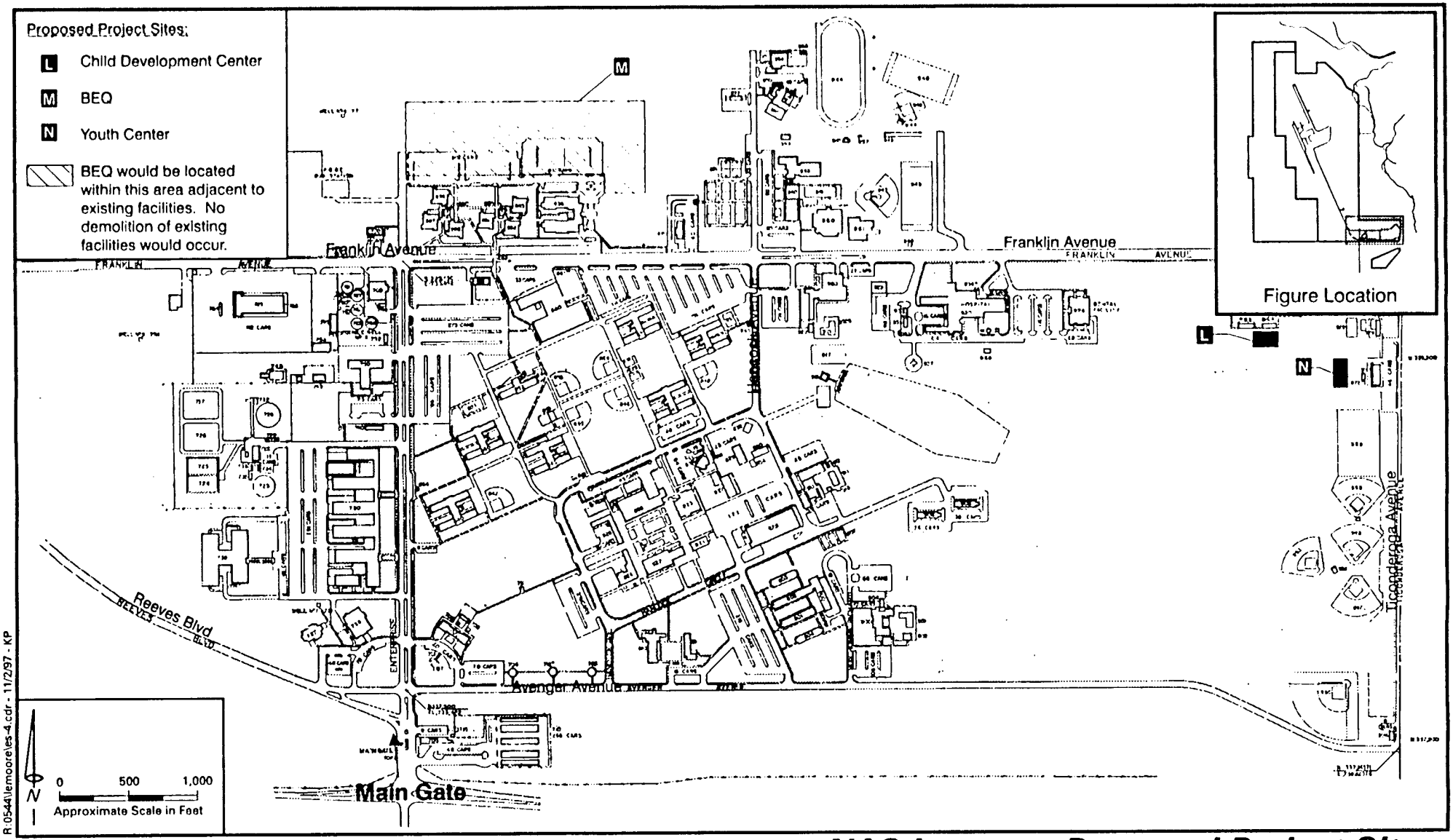
- Construction/Expansion
- Renovation

Source: O'Donnell 1997.

NAS Lemoore Proposed Project Sites: Operations Area

E-2 Aircraft Squadrons Realignment EIS
NAS Lemoore, California

Figure ES-3



The proposed child development center and youth center would be located on sites that are not currently paved or developed.

LEGEND:

Construction/Expansion

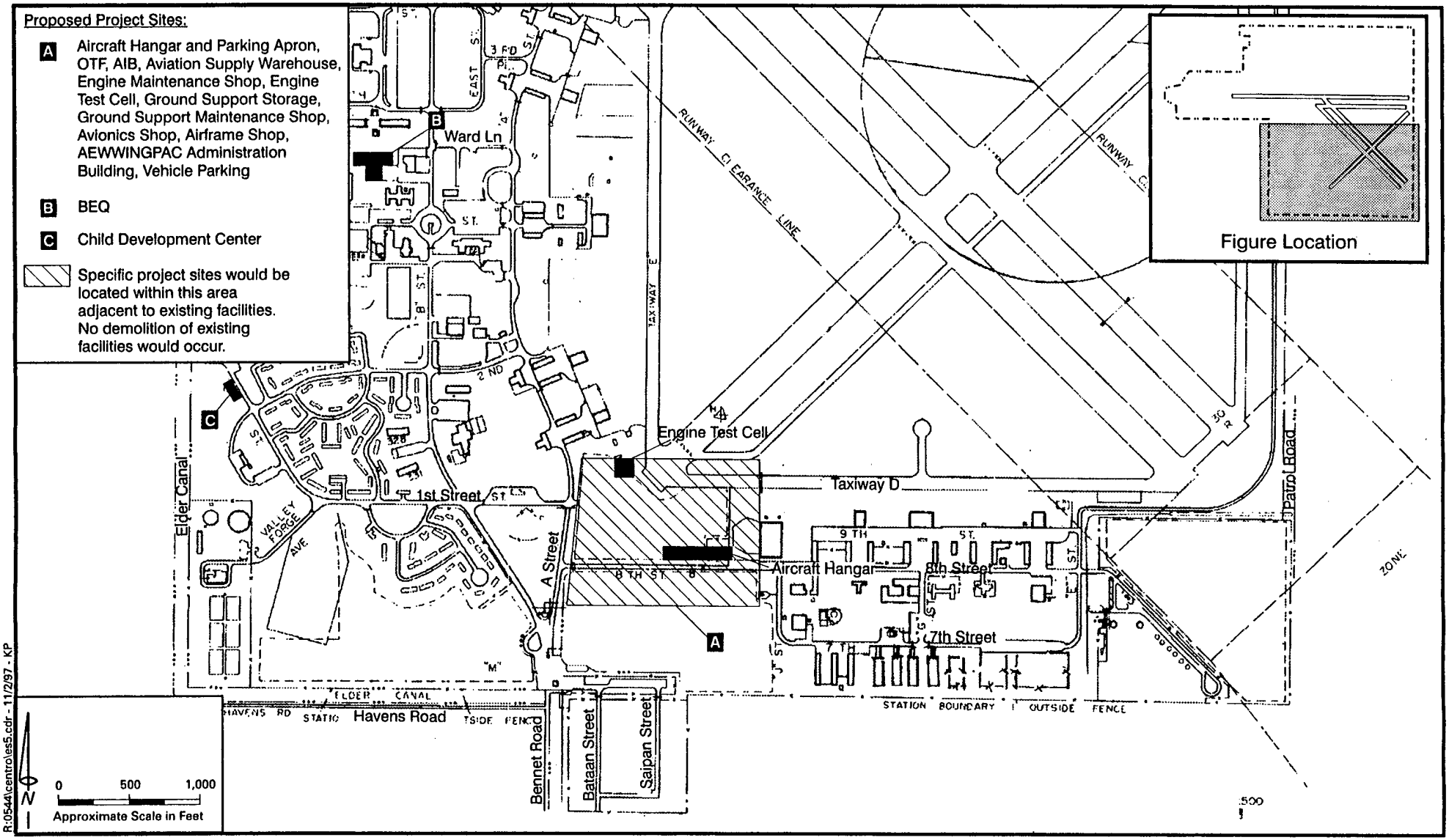
NAS Lemoore Proposed Project Sites: Administration/Housing Area

E-2 Aircraft Squadrons Realignment EIS
NAS Lemoore, California

Figure ES-4

Source: O'Donnell 1997.

R:\0544\lemoore\es-4.cdr - 11/2/97 - KP



Implementation of the proposed action at NAF El Centro would require new construction of all required facilities.

LEGEND:

Construction/Expansion

NAF El Centro
Proposed Project Sites

E-2 Aircraft Squadrons Realignment EIS
NAF El Centro, California

Source: Sewester 1997.

Figure ES-5

R:\0544\centro\es5.cdr - 11/2/97 - KP

Realignment Alternatives

Preferred Alternative: NAWS Point Mugu. NAWS Point Mugu encompasses approximately 4,575 acres (1,851 hectares) of land and marsh area in southern Ventura County. It is located 7 miles (11 kilometers) southeast of the City of Oxnard and 8 miles (13 kilometers) east of the City of Port Hueneme. The base is approximately 5 miles (8 kilometers) from the Los Angeles County line and situated along the Pacific Coast, which forms the southern boundary of the base.

The primary mission at NAWS Point Mugu is the development, testing, engineering support, and training support for naval weapons, weapons systems, and related devices. NAWS Point Mugu manages onshore facilities at the main base, where all proposed E-2 facilities would be constructed. These proposed facilities are addressed in this EIS.

NAWS Point Mugu also manages offshore land and airspace of the Western Sea Test Range of the Naval Air Weapons Center (NAWC). The 36,000-square-mile (77,700-square-kilometer) air/sea test ranges extend 125 miles (201 kilometers) southwest of Point Mugu and 250 miles (402 kilometers) northwest to southeast, surrounding the islands of San Nicolas, San Miguel, Santa Cruz, Santa Rosa, Anacapa, and Santa Barbara. There are airspace restrictions and warning areas over much of the test range area to allow the test range to carry out its mission. However, the E-2 realignment will not change or increase the use of any of these areas, therefore the ranges are not evaluated in this document.

Many of the facility requirements could be met through the use of existing facilities at NAWS Point Mugu. Realignment of the E-2s to NAWS Point Mugu would require relocation of several existing tenants and remodeling of other buildings on base. NAWS Point Mugu has adequate space in the existing BEQ to accommodate the E-2 enlisted personnel. Table 2-2 (Chapter 2) provides a summary of the construction and facility modification projects proposed with this alternative. The total cost to construct, remodel, and relocate functions at NAWS Point Mugu in support of the realignment of the E-2 squadrons would be approximately $28.6 million (Section 2.3.1).

In addition, several specific projects/services would be incorporated such as oil/water separators; sand filters, or other structural or non-structural methods of treating runoff from new parking areas; separation of engine wash water at the engine test cell from the storm drain system; and one physician, one physician's assistant and one flight surgeon.

NAS Lemoore. NAS Lemoore encompasses 18,784 acres (7,601 hectares) of Navy-owned land and 11,032 acres (4,467 hectares) of easements in the Central San Joaquin Valley, California. The 29,823-acre (12,069-hectare) base is located approximately 80 miles (128 kilometers) inland from the Pacific Ocean and halfway between Los Angeles and Sacramento. The cities of Lemoore and Hanford are located approximately 7 miles (11 kilometers) and 17 miles

(27 kilometers), respectively, east of the base. The closest large urban center is Fresno, located approximately 35 miles (56 kilometers) to the northeast.

The official mission of NAS Lemoore is to maintain and operate facilities and provide services and material to support operations of aviation activities and units of the operating forces of the Navy and other activities or units as designated by the Chief of Naval Operations (CNO).

Realignment of the E-2 squadrons to NAS Lemoore would require new construction, modification of existing facilities, and new equipment. Table 2-4 (Chapter 2) provides a summary of construction and facility modification projects proposed with this alternative. The total cost to construct, remodel, and relocate functions at NAS Lemoore in support of the realignment of E-2 squadrons would be approximately $58.3 million.

NAF El Centro. NAF El Centro occupies approximately 2,640 acres (1,069 hectares) in Imperial County, California, approximately 7 miles (11 kilometers) west of the City of El Centro (the County seat). The base is located approximately 100 miles (193 kilometers) east of the Pacific Ocean and 65 miles (104 kilometers) west of Yuma, Arizona. The US/Mexico Border is situated 12 miles (19 kilometers) to the south.

The primary mission of NAF El Centro is to support fleet air squadrons performing tactical air training and to provide additional support to other Department of Defense (DOD) components.

With this alternative, new construction of facilities and new equipment in support of the realignment of the E-2 squadrons and associated personnel would be required. Existing resources at NAF El Centro are limited, and existing hangars, supply warehouses, and maintenance facilities are occupied. Table 2-6 (Chapter 2) provides a summary of the proposed construction projects in support of the realignment of the E-2 squadrons to NAF El Centro. Construction of new E-2 facilities at NAF El Centro would cost approximately $69.8 million.

In addition, several specific projects/services would be incorporated such as utility improvements to the natural gas and electrical systems.

No Action Alternative

The no action alternative would not realign Commander Airborne Early Warning Wing Pacific (AEWWINGPAC) assets and personnel to another naval air station following the transfer of NAS Miramar to the Marine Corps. Existing functions and capabilities of NAWS Point Mugu, NAS Lemoore, and NAF El Centro would be preserved with no subsequent need for new or modified E-2 facilities. This alternative has been eliminated from further consideration for two reasons. First, the DBCRA exempts from the NEPA process the consideration of both the need for closing a military installation and the need for transferring functions to

receiving installations as directed by Congress. This DEIS does, however, address alternative methods of accommodating the realignment and transfer of functions (alternative receiving site analysis), an analysis that is not exempt from the NEPA process. Second, the no action alternative would fail to meet the legal directives of DBCRA to realign E-2 aircraft and facilities, which is the purpose of the proposed action. It is therefore not considered a reasonable alternative and has been eliminated from further analysis in this DEIS (Section 2.3.4)

Alternatives Considered but Eliminated

The 1995 BRAC Commission recommended redirection of the E-2 squadrons from NAS Miramar to another naval air station, primarily NAS Oceana (Virginia), NAS North Island (California), and NAS Fallon (Nevada). NAS Oceana and NAS Fallon would not be capable of achieving the operational and logistical criteria listed in Section 2.2. The reasons for their elimination are shown in Table ES-1. NAS North Island was also eliminated from consideration due to the need to support CAA requirements with regard to the Marine Corps realignment to MCAS Miramar.

Table ES-1
E-2 Site Screening

Site	Field Elevations	Training Ranges	Airfield Tempo of Operations	24-Hour Operations	Dual Runway	FCLP
NAS Oceana	✓	-.-	✓	✓	✓	✓
NAS Fallon	-.-	-.-	✓	✓	✓	✓
NAS Whidbey Island	✓	-.-	✓	✓	✓	✓

✓ meets criteria
-.- did not meet operational criteria

ENVIRONMENTAL ANALYSIS

The environmental analysis evaluates the potential environmental consequences associated with the realignment of the E-2 aircraft squadrons. The resource areas analyzed include biological resources, hydrology/surface water quality, land use and airspace, socioeconomics, traffic and circulation, air quality, noise, aesthetics and visual resources, utilities and services, cultural resources, public health and safety, and hazardous materials and wastes.

Affected Environment

Chapter 3, Affected Environment, contains descriptions of the existing environmental and socioeconomic conditions at each of the three proposed receiving bases, which include NAWS Point Mugu, NAS Lemoore, and NAF El Centro. The information serves as baseline data to identify and evaluate any potential impacts that could result from implementation of the proposed action.

Environmental Consequences

Chapter 4, Environmental Consequences, evaluates the potential impacts on the environment that would result from implementation of the proposed action at each alternative site. For each impact, a determination has been made whether it would be significant or less than significant. Mitigation measures are identified for any impacts determined to be significant. Criteria used to determine significance are described in each resource-specific discussion in Chapter 4. Table ES-2 at the end of this Executive Summary shows a summary of these impacts.

Biological resources. Potentially significant and mitigable impacts would occur to one state and federal species of concern (the Western burrowing owl) at NAF El Centro. The Western burrowing owl, a California and federal Species of Concern, was observed at the intersection of Taxiway D and Taxiway E during the July 29, 1997 site visit. This area is adjacent to the proposed site for the majority of new construction at NAF El Centro, including the construction of the hangar, engine test cell, and supply warehouse. To avoid impacts to Western burrowing owls, a biologist would conduct a pre-construction survey to ensure that no burrowing owls are nesting at the site. If owls were found at the site, they would be relocated elsewhere on the base.

No other significant impacts to vegetation and wildlife, birds protected by the Migratory Bird Treaty Act, or marine resources (including marine mammals protected by the Marine Mammal Protection Act of 1972), would result from implementation of the proposed action under any of the realignment alternatives.

Hydrology/surface water quality. No significant impacts to water quality, flooding, or exceedence of storm water drainage capacity would occur from implementation of the proposed action with any of the realignment alternatives.

Land use and airspace. A significant and mitigable impact would occur at NAF El Centro from locating the bachelor enlisted quarters (BEQ), the Child Development Center, and the AEWWINGPAC Administration Building in areas incompatible with AICUZ noise restrictions. No other feasible sites have been identified for these buildings. These facilities would be in areas of 75-dB CNEL or greater and would be clearly incompatible land uses. Incorporation of noise attenuation measures into facility design would bring these uses into compliance with the adopted goals and objectives of the AICUZ program. Implementation of this mitigation would reduce the impact to a less than significant level.

A significant and mitigable impact would occur at NAF El Centro from locating E-2 facilities within the helicopter imaginary surface restrictions. (Imaginary surfaces are another way to describe clearances for air navigation). The necessary aircraft hangar, aircraft parking apron, operational trainer facility (OTF), applied instruction building (AIB), AIMD facilities, AEWWINGPAC administration building, aviation supply warehouse, and engine test cell would exceed the helicopter imaginary surface at the end of Runway 3. The only suitable location

to construct these facilities is in the helicopter approach; therefore, the Navy would modify the approach-departure path of the helicopter pad to avoid the new structures. Implementation of this mitigation would reduce the impact to a less than significant level.

No significant impacts to airspace operations would result from implementation of the proposed action with any of the realignment alternatives. Other than the imaginary surface incompatibility discussed above, no other significant impacts related to compatibility with regional land uses or consistency with plans and policies would occur with any of the realignment alternatives.

Socioeconomics. No significant impacts to population, employment, income, housing, sales volume, or net government revenue would result from the E-2 relocation at NAWS Point Mugu, NAS Lemoore, or NAF El Centro.

Traffic and circulation. No significant impacts to intersection operations, roadway segment operations, and parking, or from traffic associated with construction would occur at NAWS Point Mugu, NAS Lemoore, or NAF El Centro.

Air quality. Significant and mitigable impacts to air quality would occur with implementation of the NAWS Point Mugu Alternative and the NAS Lemoore Alternative. Emission sources under Navy control would result in incremental emission increases that exceed the *de minimis* thresholds for ozone precursors. Consequently, a conformity determination would be required for these alternatives under the US Environmental Protection Agency's (EPA) general conformity rule promulgated to enforce the federal Clean Air Act (CAA). Implementation of the NAWS Point Mugu and NAS Lemoore alternatives would also result in significant and mitigable increases in overall emissions of ozone precursors that are excluded from CAA conformity determination analysis requirements, but which are still associated with the E-2 realignment.

No significant impacts to air quality would occur from implementation of the proposed action at NAF El Centro.

Noise. No significant construction-, traffic-, or aircraft-related noise impacts would occur from implementation of the proposed action with any of the realignment alternatives. Noise associated with E-2 aircraft operations would have a less than significant impact because noise levels generated by E-2 aircraft are significantly lower than noise levels from existing flight operations. The added flight activity from the E-2 squadrons would cause only minor alterations in the shapes of existing noise contours at NAWS Point Mugu. Because NAS Lemoore and NAF El Centro have a large number of jet aircraft flight operations, the introduction of E-2 aircraft would not cause any change in overall aircraft noise contours around these bases.

Aesthetics and visual resources. No significant impacts to visual character or to sensitive views would result from implementation of any of the alternatives. No significant impacts would result with any of the alternatives from inconsistencies with relevant plans and regulations, including Base Exterior and Architecture Plan (BEAP) design guidelines during construction. Pursuant to the Coastal Zone Management Act (CZMA), federal activities that could affect land, water, or natural resources in the coastal zone must be consistent with the enforceable policies of the approved state coastal zone program to the maximum extent practicable. Because NAWS Point Mugu is the preferred alternative, the Navy has prepared a Coastal Consistency Determination (CCD), as required by the Act, for concurrence by the California Coastal Commission (CCC).

Utilities and services. A potential impact to schools would occur due to the action at NAWS Point Mugu and NAS Lemoore, but would be mitigated by federal payments to the school districts. Area schools are either near or over capacity. Affected school districts may be eligible for compensation for the addition of federally connected students by impact aid, which is intended to compensate local school districts for burdens placed on their resources by federal activity. Schools must apply for impact aid through a competitive process and funds are paid directly by the Department of Education.

Cultural resources. A significant and mitigable impact to potentially National Register of Historic Places (NRHP)-eligible subsurface deposits could occur during ground-disturbing activities at NAWS Point Mugu. Subsurface prehistoric deposits may exist under fill soil at depths of 1 meter (3 feet) to 4 meters (12 feet). This impact would be mitigated to a less than significant level because any contract, lease or permit for construction at NAWS Point Mugu in connection with the E-2 realignment would include a requirement to halt work in the event of a discovery of archaeological materials.

No significant impacts to prehistoric or historic archaeological resources, traditional cultural properties, or historic subsurface deposits would result from implementation of the proposed action with any of the other realignment alternatives.

Public health and safety. No significant impacts related to airspace safety, accident potential zones, explosive safety quantity distance arcs, or electromagnetic radiation would result from implementation of the proposed action with any of the realignment alternatives.

Hazardous materials and wastes. No significant impacts from hazardous materials management, hazardous wastes management, installation restoration program sites, asbestos, polychlorinated biphenyls (PCBs), storage tanks and oil/water separators, pesticides, lead, ordnance, or radon would result from implementation of the proposed action with any of the realignment alternatives.

CUMULATIVE IMPACTS

Chapter 5, Cumulative Impacts, evaluates the effects of the proposed action in combination with other past, present, and reasonably foreseeable future actions taking place in the project areas, regardless of what agency (federal or non-federal) or person undertakes such other actions.

Preferred Alternative: NAWS Point Mugu

The addition of traffic related to the NAWS Point Mugu alternative to other cumulative traffic would contribute to LOS F cumulative conditions during the PM peak hour at the intersection of North Mugu Road and Frontage Road. By providing a signal at the intersection of North Mugu Road and Frontage, this cumulative impact would be reduced to a less than significant level.

Cumulative projects identified for the NAWS Point Mugu area include some on-base construction activities. These projects could have an impact on prehistoric subsurface deposits on the base. These impacts, considered together with potential impacts under the proposed E-2 aircraft realignment at NAWS Point Mugu, could result in a cumulative decrease in the overall amount and density of this non-renewable resource. This could result in a significant cumulative impact to prehistoric subsurface deposits on NAWS Point Mugu.

No other cumulatively significant impacts are expected to result from implementation of the proposed action at NAWS Point Mugu.

NAS Lemoore Alternative

The addition of cumulative traffic at NAS Lemoore would result in unacceptable LOS at the intersections of SR-198/Main Gate during the AM peak hour and Grangeville Road/SR-41 during the PM peak hour. The intersection of Grangeville Road/SR-41 changes from LOS E to F. With or without the proposed action, this intersection would operate at an unacceptable level. The addition of project traffic at the intersection of SR-198/Main Gate results in a change from an acceptable LOS C to an unacceptable LOS E.

By increasing the signal cycle length to 120 seconds, the impacts to the intersection of SR-198 and the Main Gate would be reduced to less than significant levels. The intersection would operate at LOS C and B under cumulative with project conditions during the AM and PM peak hours, respectively.

At the intersection of Grangeville Road and SR-41, widening the eastbound approach to provide a left turn lane would improve operations to LOS C and B during the AM and PM peak hours, respectively, thus reducing cumulative impacts to less than significant levels.

Potentially significant cumulative impacts to air quality could result from implementation of the proposed action at NAS Lemoore. The potential basing of F/A-18 E/F aircraft squadrons at NAS Lemoore is the most significant potential

cumulative project from an air quality perspective. Emissions associated with the first phase of F/A-18 E/F arrivals would exceed the CAA conformity rule *de minimus* thresholds for the San Joaquin Valley, thus requiring a conformity determination. This would be a significant and mitigable impact.

The basing of F/A-18E/F aircraft squadrons at NAS Lemoore is the most significant potential cumulative project from a noise perspective. As noted previously, a separate EIS is being prepared for the siting of F/A-18E/F squadrons, with NAS Lemoore identified as the preferred alternative. That EIS will provide a detailed evaluation of the direct, indirect, and cumulative noise impacts of the F/A-18E/F action.

Potentially significant cumulative effects could occur to available water supply. The water that the Westlands Water District (Westlands) receives from the State Water Project is variable. Although NAS Lemoore has contracted for 3,000 acre-feet (370 hectare-meters) per year, Westlands cannot guarantee delivery of the full contract amount. A range of mitigation measures are available to address the impacts of decreased state water project deliveries.

No cumulatively significant impacts associated with other resources would result from implementation of the proposed action at NAS Lemoore.

NAF El Centro Alternative

The increased water demand resulting from the project would contribute to a potentially significant impact on water resources in the region. The water supply for the Imperial Valley is limited by international and interstate agreements governing the allocation of water from the Colorado River, and the supply is not expected to increase despite future regional development. Therefore, increased municipal and industrial demand must be met by decreasing the amount of water allocated to other uses, primarily agriculture. A range of mitigation measures are available to address the impacts of decreased regional water supply.

The addition of cumulative traffic would result in LOS F at the intersections of Bennett Road/Even Hewes Highway and Forrester Road/Even Hewes Highway during the AM and PM peak hours. By installing a signal at the intersection of Forrester Road and Evan Hewes Highway, the impacts of the cumulative traffic would be reduced and operations would improve to LOS C or better during the AM and PM peak hours.

By installing a signal, providing a separate southbound left turn lane, and allowing free-right-turns for westbound traffic at the intersection of Bennett Road and Evan Hewes Highway, the cumulative impacts would be reduced and the operation would improve to LOS C during the AM and PM peak hours. This mitigation would require widening the southbound approach to provide a separate outbound left-turn lane and an inbound lane for the free-right-turns.

The basing of F/A-18E/F aircraft squadrons at NAF El Centro is the most significant potential cumulative project from an air quality perspective. The first phase of the F/A-18E/F action would require significant new facility construction, including a new engine test cell and new central boilers for new and expanded facilities, which would require air quality permits. If based at NAF El Centro, the first phase of F/A-18E/F squadron arrivals would add about 87,400 additional flight events and associated aircraft emissions per year. Emissions associated with each phase of F/A-18E/F activity would exceed the CAA conformity rule *de minimus* thresholds for Imperial County, thus requiring a conformity determination.

Cumulative increases in aircraft noise associated with the combined operation of E-2 and F/A-18E/F aircraft is an issue of potential concern. Preliminary noise analyses for the first phase of F/A-18E/F arrivals indicate that the area exposed to noise levels above 65-dB CNEL would expand noticeably in all directions around NAF El Centro.

No cumulatively significant impacts associated with other resources would result from implementation of the proposed action at NAF El Centro.

OTHER CONSIDERATIONS

Environmental Justice

None of the alternatives evaluated in the EIS would have disproportionately high and adverse human health or environmental effects on minority or low-income populations because no significant adverse impacts have been identified at NAWS Point Mugu, NAS Lemoore, and NAF El Centro, that cannot be mitigated to a less than significant level (Section 6.1).

Protection of Children from Environmental Health Risks

Executive Order 13045, Protection of Children from Environmental Health Risks and Safety Risks, states that each Federal agency shall (1) make it a high priority to identify and assess environmental health risks and safety risks that may disproportionately affect children, and (2) ensure that its policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks or safety risks. Environmental health risks and safety risks mean risks to health or to safety that are attributable to products or substances that the child is likely to come in contact with or ingest (Federal Register 1997). No impacts with respect to children's environmental health and safety were identified in the analysis (Section 6.2).

Irreversible and Irretrievable Commitment of Resources

NEPA requires a discussion of any irreversible or irretrievable commitment of resources which would be involved in the proposal should it be implemented (40 CFR 1502.16). Resources that are irreversibly or irretrievably committed to a project are those that are utilized on a long-term or permanent basis. This

includes the use of non-renewable resources such as metal, wood, fuel, paper, and other natural or cultural resources. Another impact that falls under the category of the irreversible and irretrievable commitment of resources is the unavoidable destruction of natural resources that could limit the range of potential uses of that particular environment.

The proposed realignment of four E-2 squadrons, related support personnel and their family members, equipment and functions, would require the construction, modification or renovation of facilities to provide space for operational, training, maintenance, and personnel support. Construction of the proposed facilities would result in an irretrievable commitment of non-renewable resources such as building materials, fuel for aircraft, construction vehicles, and equipment, and other resources. In addition, the project would commit human labor for construction, engineering, environmental review, and compliance, and after project completion, operation and maintenance time.

The proposed action would ultimately result in a net increase in the number of aircraft and air operations at the receiving installation, and, subsequently, the commitment of fuel and other non-renewable resources would also be increased. Therefore, the proposed action would constitute an irreversible or irretrievable commitment of non-renewable or depletable resources (Section 6.3).

Unavoidable Adverse Impacts

NEPA requires a discussion of any adverse environmental effects that cannot be avoided (40 CFR 1502.16). All potentially significant impacts of the proposed action would be mitigable to a less than significant level by the implementation of mitigation measures recommended in this document (Section 6.4).

Relationship Between Short-term Uses and Long-term Productivity

NEPA requires a discussion of the relationship between short-term uses of the environment and the maintenance and enhancement of long-term productivity (40 CFR 1502.16). The environmental productivity of the three alternative bases considered for siting the E-2 aircraft has historically been related to their operation as naval air stations/facilities. The proposed realignment of four E-2 squadrons would result in both short- and long-term environmental effects. Short-term effects are primarily related to construction activities. Temporary impacts would include construction-related traffic and emissions at all three bases. The proposed action's long-term benefit of providing jobs and housing at the three alternative bases, and its satisfaction of national defense requirements, would offset these environmental impacts (Section 6.5).

Table ES-2
Summary of Impacts

IMPACT ISSUES	REALIGNMENT ALTERNATIVES NAWS Point Mugu (Preferred Alternative)	NAS Lemoore	NAF El Centro
Biological Resources			
Jurisdictional wetlands	○	○	○
Special status species	◐	○	◑
Vegetation and wildlife	◐	◐	◐
Birds protected by the Migratory Bird Treaty Act	◐	◐	◐
Marine resources	◐	○	○
Hydrology/Surface Water Quality			
Exposure to flood hazards	◐	○	○
Exceedence of storm water drainage capacity	◐	◐	◐
Surface water quality degradation	◐	◐	◐
Land Use and Airspace			
Compatibility with on-base land uses	◐	◐	◐
Consistency with AICUZ compatibility guidelines: safety	○	○	◐
Consistency with AICUZ compatibility guidelines: noise	◐	◐	◑
Exceedance of imaginary surface restrictions	○	◐	◑
Compatibility with regional land uses	◐	◐	◐
Impacts to airspace operations	◐	◐	◐
Consistency with coastal zone policies	◐	○	○
Socioeconomics			
Population	◐	◐	◐
Employment	◐	◐	◐
Income	◐	◐	◐
Housing	◐	◐	◐
Business volume	◐	◐	◐
Net government revenues	◐	◐	◐
Traffic and Circulation			
Intersection operations	◐	◐	◐
Roadway segment operations	◐	◐	◐
Construction traffic	◐	◐	◐
Parking	◐	◐	◐

LEGEND:

● = Significant and not mitigable impact

◑ = Significant and mitigable impact

◐ = Less than significant impact

○ = No impact

Table ES-2
Summary of Impacts *(continued)*

IMPACT ISSUES	REALIGNMENT ALTERNATIVES NAWS Point Mugu (Preferred Alternative)	NAS Lemoore	NAF El Centro
Air Quality			
Clean Air Act conformity	◑	◑	⊖
Emissions of nonattainment pollutants	◑	◑	⊖
Intersection carbon monoxide concentrations	⊖	⊖	⊖
Noise			
Construction noise	⊖	⊖	⊖
Aircraft noise	⊖	⊖	⊖
Traffic noise	⊖	⊖	⊖
Aesthetics and Visual Resources			
Visual character	⊖	⊖	⊖
Sensitive views	⊖	⊖	⊖
Consistency with plans and policies	⊖	⊖	⊖
Utilities and Services			
Water supply	⊖	⊖	⊖
Wastewater collection and treatment	⊖	⊖	⊖
Storm water collection and treatment	⊖	⊖	⊖
Solid waste collection and disposal	⊖	⊖	⊖
Natural gas and electric services	⊖	⊖	⊖
Schools	◑	◑	⊖
Child care	⊖	⊖	⊖
Health services	⊖	⊖	⊖
Recreational and community facilities	⊖	⊖	⊖
Police services	⊖	⊖	⊖
Fire protection	⊖	⊖	⊖
Cultural Resources			
Prehistoric resources	○	○	○
Traditional cultural properties	○	○	○
Historic archaeological resources	○	○	○
Historic architectural resources	○	○	○
Prehistoric subsurface deposits	◑	○	○
Historic subsurface deposits	○	○	○
Public Health and Safety			
Airspace safety	⊖	⊖	⊖
Accident potential zones	⊖	⊖	⊖
Explosive safety quantity distance arcs	○	○	○
Electromagnetic radiation	○	○	○

LEGEND:

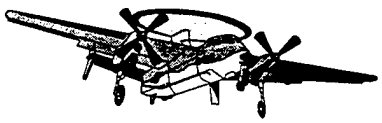
● = Significant and not mitigable impact
◑ = Significant and mitigable impact
⊖ = Less than significant impact
○ = No impact

Table ES-2
Summary of Impacts *(continued)*

IMPACT ISSUES	REALIGNMENT ALTERNATIVES		
	NAWS Point Mugu (Preferred Alternative)	NAS Lemoore	NAF El Centro
Hazardous Materials and Wastes			
Hazardous materials management	◐	◐	◐
Hazardous wastes management	◐	◐	◐
Installation restoration program sites	◐	◐	◐
Asbestos	◐	◐	◐
PCBs	○	○	○
Storage tanks and OWSs	◐	◐	◐
Pesticides	○	○	○
Lead	◐	◐	◐
Ordnance	○	○	○
Radon	○	○	○

LEGEND:

● = Significant and not mitigable impact
◑ = Significant and mitigable impact
◐ = Less than significant impact
○ = No impact



1.0 Purpose and Need for Proposed Action

1. PURPOSE OF AND NEED FOR PROPOSED ACTION 1-1

1.1 E-2 Aircraft Description, Mission, and History 1-2
1.2 Purpose of the Proposed Action 1-2
1.3 Need for the Proposed Action 1-3
1.4 Scope of Environmental Review 1-5
1.4.1 Scope of EIS 1-5
1.4.2 Document Organization 1-5
1.4.3 Related Studies 1-6
1.5 Public Involvement Process 1-7
1.5.1 Scoping Process 1-8
1.5.2 Public Review Process 1-9

CHAPTER 1
PURPOSE OF AND NEED FOR PROPOSED ACTION

This draft environmental impact statement (DEIS) analyzes the potential impacts to the environment that may result from the proposed realignment of four E-2 aircraft squadrons and related support personnel, equipment, and functions from Naval Air Station (NAS) Miramar to one of three alternative naval air stations. This document has been prepared in accordance with the National Environmental Policy Act (NEPA) of 1969 as amended, the Council on Environmental Quality (CEQ) implementing regulations (Title 40 Code of Federal Regulations [CFR] Parts 1500-1508), and the Navy's NEPA implementing regulations (OPNAVINST [Office of the Chief of Naval Operations Instruction] 5090.1B). The federal action evaluated in this DEIS is the realignment of 16 E-2 aircraft, the associated 988 personnel and their family members, and expanding or constructing facilities to support aircraft and personnel and to provide associated training functions at one of three Navy bases in California. The Navy is the lead agency for the decision regarding the selection of the receiving installation.

This DEIS also has been prepared in accordance with the Defense Base Closure and Realignment Act of 1990 (DBCRA, Public Law 101-510), and the pertinent base closure and realignment decisions of the Defense Base Closure and Realignment Commission approved by the President and accepted by Congress in September 1993 and September 1995. DBCRA established the Defense Base Closure and Realignment Commission for the purpose of ensuring a timely, independent, and fair process for closing and realigning US military installations.

The descriptions and analysis of the proposed realignment presented in this DEIS are based on preliminary site utilization information. Prior to BRAC-mandated realignment, final designs will be prepared that may eliminate a specific project or alter the preliminary design data, size, or site location.

1.1 E-2 Aircraft Description, Mission, and History

The E-2 aircraft, also referred to as the E-2C Hawkeye, is an integral part of the Navy's air defense and power projection missions. Deployed from either land or aircraft carrier, the E-2 provides early warning of approaching enemy aircraft, directs intercepting forces into attack position, and provides information to friendly forces. This aircraft also provides strike control, area surveillance, search and rescue coordination, navigational assistance, and communication relay for naval forces.

The E-2 supports an advanced radar processing system, which is identifiable by the rotodome radar antenna on top of the aircraft. This advanced radar processing system can track over 600 targets and control more than 40 airborne intercepts. The aircraft dimensions are as follows:

Wingspan	80.6 feet (24.6 meters)
Length	57.6 feet (17.6 meters)
Height	18.3 feet (5.6 meters)
Weight (without fuel)	approx. 20.5 tons (18,598 kilograms)

This aircraft is powered by two T56-A-427 turbo-prop engines, which develop a maximum of 5,100 horsepower at takeoff.

The radar transmitter on top of the E-2 aircraft produces a high frequency electromagnetic field to detect enemy aircraft and weapons systems. The transmitter is deactivated by the landing gear to prevent the radar system from radiating while on the ground or aircraft carrier deck. Standard operating procedures (SOP) for the squadrons is to not activate the radar below 2,000 feet (610 meters) above ground level (AGL).

The E-2 is operated by a crew of five, which includes a pilot, copilot, radar officer, combat information officer, and air control officer. Four squadrons, with four aircraft each, are under the administrative command of Commander Airborne Early Warning Wing Pacific (CAEWWINGPAC), and under the operational control of its respective Carrier Airwing Commander currently at Miramar. Generally, one or two of the four E-2 squadrons are deployed at any one time.

1.2 Purpose of the Proposed Action

The purpose of the proposed action is to relocate four E-2 aircraft squadrons and related support personnel, equipment, and functions from NAS Miramar. The proposed action includes siting 16 E-2 aircraft, relocating 988 associated personnel and their family members, and expanding or constructing facilities to support aircraft and personnel, and to provide associated training functions. In addition to the increased staffing and equipment levels, there would be an increase in training and volume of flight operations at the receiving installation with the proposed

action. The three installations considered for the receiving base are Naval Air Weapons Station (NAWS) Point Mugu, NAS Lemoore, and Naval Air Facility (NAF) El Centro, all in California. The locations of these bases are shown in Figure 1-1.

1.3 NEED FOR THE PROPOSED ACTION

The proposed action is pursuant to 1993 and 1995 BRAC Commission recommendations. In 1993, the BRAC Commission recommended the following:

> "Close Marine Corps Air Station (MCAS) El Toro, California. Relocate its aircraft along with their dedicated personnel, equipment, and support to other naval air stations, primarily Naval Air Station (NAS) Miramar, California, and Marine Corps Air Station (MCAS)/Marine Corps Base (MCB) Camp Pendleton, California. In associated actions, the squadrons and related activities at NAS Miramar will move to other naval air stations, primarily NAS Lemoore and NAS Fallon in order to make room for the relocation of MCAS El Toro squadrons."

In 1995, the BRAC Commission modified the 1993 Commission recommended actions as follows:

> "Change the receiving sites for squadrons and related activities at NAS Miramar specified by the 1993 Commission (BRAC Commission 1993) from NAS Lemoore and NAS Fallon to other naval air stations, primarily NAS Oceana, Virginia, NAS North Island, California and NAS Fallon, Nevada."

The President approved and Congress accepted these recommendations. In September 1997, the Navy transferred ownership of NAS Miramar to the Marine Corps. The base was redesignated MCAS Miramar.

The transfer of ownership to the Marine Corps occurred in September 1997 and requires the Navy to relocate the four E-2 squadrons now at MCAS Miramar to a receiving Navy installation. The E-2 squadrons have operational and logistical requirements, including specific airfield capabilities, training efficiencies, and infrastructure, that the Navy had to consider when selecting the receiving installation. These criteria are discussed in detail in Section 2.2.

Based on these criteria, NAWS Point Mugu, NAS Lemoore, and NAF El Centro were selected as alternative receiving locations for the E-2 squadrons. Because they do not fulfill the criteria, the NAS Oceana and NAS Fallon locations specified in the 1995 BRAC Commission recommendations were eliminated from further consideration as E-2 squadron receiving installations. NAS North Island was also eliminated from consideration due to the need to support Clean Air Act requirements with regard to the Marine Corps realignment to MCAS Miramar

r:\0544\fig1_1.cdr - 10/05/97 - MY

The alternative sites are located in three distinctively different parts of California: the Central Valley, the Southern California Coast, and the Imperial Valley.

LEGEND:

- ○ Existing E-2 Squadrons Base
- ● Alternative Receiving Base

E-2 Squadrons Realignment Alternatives

E-2 Aircraft Squadrons Realignment EIS
California

Source: Tetra Tech 1997.

Figure 1-1

(see Section 2.4, Alternatives Considered but Eliminated). The Navy has, however, realigned the F-14 and TOPGUN/TOPDOME squadrons formerly stationed at NAS Miramar to NAS Oceana and NAS Fallon, respectively, in accordance with the 1995 BRAC recommendation. (See Section 1.4.3 for more information on these realignments.)

1.4 SCOPE OF ENVIRONMENTAL REVIEW

1.4.1 Scope of EIS

This DEIS provides information and analyses regarding the realignment of four E-2 squadrons from NAS Miramar to one of three proposed receiving installations. It provides the Navy the basis to make well informed, sound decisions prior to project implementation. For each potential receiving base, resource-specific issues discussed and analyzed include:

- Biological Resources;
- Hydrology/Surface Water Quality;
- Land Use and Airspace;
- Socioeconomics;
- Traffic and Circulation;
- Air Quality;
- Noise;
- Aesthetics and Visual Resources;
- Utilities and Services;
- Cultural Resources;
- Public Health and Safety; and
- Hazardous Materials and Waste.

Several issues were evaluated to determine potential impacts associated with the realignment, but were eliminated from consideration in the DEIS because the impacts were determined to be negligible. These issues include:

Geology, topography, and soils. All proposed construction projects would require minimal grading on disturbed, flat sites without topographic features. The structures would be designed to meet building codes for local and regional seismic conditions and foundation stability.

Public use facilities/access. All proposed construction projects would be located within the boundaries of naval bases, which are secured facilities not designated for public use or access.

1.4.2 Document Organization

This DEIS consists of two volumes: Volume I, the main text and Volume II, technical appendices. The document's general organization, which complies with NEPA requirements, is described below.

Chapter 1, Purpose of and Need for Proposed Action, provides an overview of and the reasons for the proposed action. It also describes the DEIS content and approach, a description of the E-2 aircraft, and the public involvement process.

Chapter 2, Proposed Action and Alternatives, describes the requirements for realignment of the four E-2 aircraft squadrons, related support personnel, equipment, and functions. The chapter describes pertinent existing operations at each proposed receiving installation and addresses required facility construction and expansion.

Chapter 3, Affected Environment, describes existing environmental and socioeconomic conditions at each of the three receiving installations. Each technical section identifies a region of influence (ROI) appropriate to the resource. An ROI is a geographic area in which impacts for a particular resource would likely occur.

Chapter 4, Environmental Consequences, identifies the potential environmental impacts of the proposed realignment for each resource. The purpose of this chapter is to provide the public, interested agencies, and decision-makers with a clear understanding of the environmental effects of the proposed action. Mitigation measures are identified for any impact determined to be significant.

Chapter 5, Cumulative Impacts, identifies impacts that may result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions.

Chapter 6, Other Considerations, identifies any unavoidable adverse impacts to the environment, identifies irreversible and irretrievable commitments of resources, and describes the relationship between short-term uses of the environment and maintenance and enhancement of long-term productivity. The potential disproportionate adverse impacts on children in accordance with Executive Order 13045 and on low-income or minority populations in accordance with Executive Order 12898 are also described.

Chapters 7-11 provide background information on coordination with interested and responsible agencies, references, a list of this document's preparers, the distribution list, and an index.

1.4.3 Related Studies

The scope of an EIS includes consideration of similar actions, which encompasses common timing or geography [40 CFR 1508.25(3)]. Other NEPA studies have been completed on BRAC actions related to the NAS Miramar realignment. In addition to these BRAC actions, some of the receiving bases analyzed in this EIS are currently preparing EISs for other actions. These actions are discussed in more detail and evaluated for cumulative impacts in Chapter 5 of this EIS.

EIS for the Realignment of NAS Miramar. BRAC recommendations in 1993 directed the realignment of Marine Corps aircraft, equipment, and personnel from two air stations (MCAS Tustin and MCAS El Toro) to NAS Miramar, which would then become MCAS Miramar. The Record of Decision for the EIS for this action was published in December 1996.

EA for the Realignment of F-14 Pacific Fleet Aircraft and Operational Functions from NAS Miramar, California to NAS Oceana, Virginia - In compliance with directives of BRAC 95, an environmental assessment (EA) was prepared for the transfer of approximately 56 F-14 aircraft from NAS Miramar to NAS Oceana. The action involved operational adjustments to accommodate the aircraft into the regional airspace structure, and limited construction/renovation necessary to support the additional aircraft and approximately 1,700 personnel. The finding of no significant impact (FONSI) was signed in March 1996.

EA for the Naval Fighter Weapons School Realignment. In compliance with the directives of BRAC 93, the Navy commenced realignment of its Naval Fighter Weapons School (i.e. TOPGUN) from Miramar in 1994. The action included relocation of F-18 and F-14 aircraft. An EA was prepared and a FONSI was issued in July 1994.

EIS for Development of Facilities to Support Basing US Pacific Fleet F/A-18E/F Aircraft on the West Coast of the United States. An EIS is currently being prepared to address the impacts of establishing a West Coast base for the Navy's new F/A-18 E/F aircraft. This action is unrelated to the BRAC-mandated E-2 realignment and is therefore analyzed in a separate EIS. The two installations considered for the West Coast base are NAS Lemoore and NAF El Centro. This action would include siting aircraft, locating associated personnel and their families, and expanding or constructing facilities necessary to support the aircraft and personnel.

EIS for the Point Mugu Sea Range. The Navy is preparing an EIS for activities associated with the Point Mugu Sea Range. The Point Mugu Sea Range is a 36,000 square mile area, which parallels the California coastline from San Luis Obispo to Santa Catalina Island for 200 miles and extends seaward for more than 180 miles. The EIS will evaluate impacts on a range-wide basis of increased testing and training activities. Five scoping meetings for the EIS were conducted in August 1997 and the Draft EIS will be published in 1998.

1.5 PUBLIC INVOLVEMENT PROCESS

The EIS process, as mandated by NEPA, is designed to involve the public in federal and local decision-making. Opportunities for public comment on and participation in the process are reviewed in this and following sections. Comments from agencies and the public have been solicited to help identify the important issues. The public notification process has been designed to reach all

interested residents and community organizations in the vicinity of the three alternative receiving installations.

At the beginning of the E-2 realignment EIS process, the potential alternative receiving bases included NAS North Island. Therefore, the communities of Coronado and San Diego were included in the scoping process. However, NAS North Island is no longer considered as an alternative base, and is not evaluated in this EIS (see Sections 1.3 and 2.4 for more information on alternative bases that were considered but eliminated from detailed consideration).

Methods employed to involve the public in this EIS process have included the following:

- Publishing a notice of intent (NOI) to prepare an EIS in the *Federal Register* on May 1, 1996;
- Publishing notices of the public scoping meetings in local newspapers and mailing public announcements;
- Creating and maintaining an extensive mailing list to disseminate information; and
- Holding four public scoping meetings in the cities of Oxnard, El Centro, Coronado, and Lemoore on May 21, 23, 28, and 29, 1996, respectively, prior to initiating the environmental study to solicit comments and to identify issues of concern.

One goal for public involvement, under Executive Order 12898 on Environmental Justice, is to involve affected low-income and minority populations in the public participation process. Actions taken to achieve this include:

- Announcing public meetings in newspapers with a wide circulation and encouraging written comments for those unable to attend the meetings;
- Notifying neighborhood associations and minority organizations that may be affected by or interested in the action and requesting comments; and
- Holding public scoping meetings in the cities of Oxnard, El Centro, Coronado, and Lemoore on May 21, 23, 28, and 29, 1996, respectively.

1.5.1 Scoping Process

The purpose of scoping is to solicit comments on the proposed action, the range of alternatives, and on any potential environmental issues associated with the

alternatives. The scoping process for this EIS included publishing notices in the *Federal Register* and local newspapers, holding public meetings in the vicinity of the alternative receiving installations, and direct mail (Appendix A). The Navy considered comments received during the scoping process in determining the issues to be evaluated in this EIS. The public was notified of the Navy's intent to prepare this EIS by an NOI, published in the May 1, 1996, *Federal Register* (Volume 61, Number 85).

To initiate the scoping process, press releases were sent to the news media and a public notice was published in nine local newspapers, including the Hanford Sentinel, Lemoore Advance, Fresno Bee, Imperial Valley Press, San Diego Union Tribune, Eagle (Coronado), Coronado Journal, Ventura County Star, and the Los Angeles Times, Ventura County Edition. Scoping letters were sent to public agencies, public interest groups, and individuals either known to have an interest in, or thought to have a possible interest in, the proposed action. Attached to the letters was a fact sheet, which described the operational components and facility requirements of the proposed realignment. Public scoping meetings were held near each of the three proposed receiving installations to solicit input from local entities. Scoping meeting locations included the following:

- City of Oxnard, May 21, 1996;
- City of El Centro, May 23, 1996;
- City of Coronado, May 28, 1996 ; and
- City of Lemoore, May 29, 1996.

Overall, approximately 155 individuals attended the scoping meetings and 68 persons provided public testimony.

During the EIS scoping process, which ended June 6, 1996, 48 letters were received from members of the public; interested groups; and federal, state, and local agencies. Scoping comments identified issues and concerns that were particular to each alternative base under consideration. These issues have been evaluated in the DEIS. A summary of scoping comments is included in Appendix A.

1.5.2 Public Review Process

Public review is an important part of the NEPA process and provides the public and other interested parties an opportunity to comment on the DEIS. The public will have 45 days to comment on this DEIS. Comments received on the DEIS will be responded to in the Final EIS (FEIS). NEPA provides for a 30-day review period after publication of the FEIS, prior to a final Record of Decision (ROD).

DEIS

The public is invited to comment on the DEIS. A notice of availability was published in the *Federal Register*, public notices were mailed to those on the mailing list, and press releases have been furnished to local news media. There will

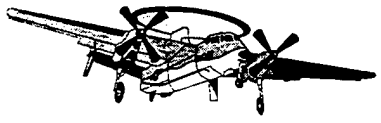
be a 45-day public comment period on the DEIS, commencing with the official release of the DEIS to the public and interested agencies. This period provides an opportunity for the public to review the issues addressed and to offer comments on the analysis of environmental and socioeconomic impacts. The public and concerned agencies are invited to send comments on the DEIS to:

Commander, Southwest Division
Naval Facilities Engineering Command
Attn: Ms. Kelly Knight (Code 553.KK)
1220 Pacific Highway
San Diego, CA 92132-5190
Telephone: (619) 532-2456
Fax: (619) 532-1242

Public hearings will be held during the 45-day review period to formally receive oral and written comments on the DEIS. These hearings will be held near NAS Lemoore, NAWS Point Mugu, and NAF El Centro. The location, date, and time of these hearings will be provided in a *Federal Register* announcement, newspaper advertisements, and public mailing.

FEIS

An FEIS incorporating and responding to comments received on this DEIS will be published and made available to the public. A notice of availability will be published in the *Federal Register* and in public notices and press releases. As required by NEPA, there will be a 30-day waiting period after the FEIS is published. During this period, the public may comment on the adequacy of responses to comments and the FEIS. After that time, the Navy will prepare a ROD detailing the decisions on project approval.



2.0 Proposed Action and Alternatives

2. PROPOSED ACTION AND ALTERNATIVES 2-1

2.1 Proposed Action 2-1
2.2 E-2 Aircraft Siting Criteria 2-3
2.2.1 Site Screening Criteria 2-3
2.2.2 Site Facility Requirements 2-4
2.3 Description of Alternatives 2-5
2.3.1 Preferred Alternative: NAWS Point Mugu 2-7
2.3.2 NAS Lemoore Alternative 2-12
2.3.3 NAF El Centro Alternative 2-17
2.3.4 No Action Alternative 2-22
2.4 Alternatives Considered But Eliminated 2-22
2.4.1 NAS North Island 2-23
2.4.2 NAS Oceana 2-23
2.4.3 NAS Fallon 2-24
2.4.4 Other Possible Air Installations 2-24
2.5 Project Permit Requirements 2-24
2.6 Comparison of Alternatives 2-24

CHAPTER 2
PROPOSED ACTION AND ALTERNATIVES

This chapter describes the Navy planning process and the alternatives considered in the draft environmental impact statement (DEIS). Alternatives considered but eliminated from detailed analysis also are described. The preferred alternative evaluated in this DEIS is the realignment of the E-2 aircraft squadrons and personnel and families to Naval Air Weapons Station (NAWS) Point Mugu because it best meets the operational criteria of the E-2 aircraft. Other alternative bases considered for siting the E-2 aircraft include Naval Air Station (NAS) Lemoore, and Naval Air Facility (NAF) El Centro.

2.1 PROPOSED ACTION

The proposed action evaluated in this DEIS is the realignment of four E-2 squadrons (16 aircraft total) and associated support personnel and their families from NAS Miramar. To support this action, facilities would need to be constructed, expanded, and renovated at the receiving base. The amount of construction necessary would be determined by which receiving base is selected. The schedules will vary depending on the base selected.

Regardless of which alternative is selected, construction cannot be completed at the receiving site before the E-2 squadrons and support functions are required to move. They would operate at the receiving site initially from temporary facilities. It is essential that construction is not delayed; prolonged operation from temporary facilities would cause unacceptable negative impact on operational readiness.

In addition to the increased staffing and equipment levels, the volume of flight operations would increase at the receiving installation with the proposed action. The following discussion provides a more detailed description of the proposed action.

Aircraft. The proposed action would relocate four E-2 squadrons with four aircraft each (16 aircraft total). Realignment of the E-2 aircraft squadrons is scheduled to occur in July 1998 through January 1999. Squadrons would relocate over six months due to deployment cycles.

Aircraft operations. Generally, up to 3,650 annual take-offs and arrivals are conducted by the E-2s, during which the squadrons perform approximately 12,000 field carrier landing practices (FCLPs) and 550 "touch and go" exercises. Ninety percent of the FCLPs are conducted during the night to simulate nighttime aircraft carrier landings. Daily aircraft maintenance activities are conducted after flights are completed. Squadron workforce needs diminish through the night as daily maintenance requirements are satisfied.

Typically, each squadron is away from the home base for a period of 14-15 months every two years. Over this period, each squadron spends approximately six months deployed to the Western Pacific; two months deployed to Panama doing counter-drug operations; and approximately seven months away from home base involved in air wing/battle group training. An average of two squadrons of E-2s are at the home base at any one time.

Personnel. Realignment of the four E-2 squadrons and associated functions would relocate a total of 988 personnel, consisting of approximately 130 officers, 818 enlisted personnel, and 40 civilians, to the receiving installation. These 988 personnel consist of 612 squadron personnel (153 each) and 376 administrative and support employees. In addition to squadron and support personnel, the Navy would relocate to the receiving installation approximately 1,500 family members, including approximately 710 spouses and 790 children. Realignment of the entire E-2 community would involve approximately 2,488 people. These population estimates are approximate and subject to change and refinement.

To generate extra support at some of the bases, it is anticipated that auxiliary civilian personnel would be hired (8 at NAWS Point Mugu, 0 at NAS Lemoore, and 65 at NAF El Centro).

Facilities. Facilities necessary for the proposed action include aircraft operational facilities, maintenance facilities, supply facilities, personnel support facilities, and bachelors' quarters. All facilities would be required to support the E-2 aircraft and associated personnel; however, some facilities may already exist at certain installations. The existing facilities available to accommodate the E-2 realignment and new or expanded facilities that would be required are described in Section 2.3 for each alternative site.

2.2 E-2 AIRCRAFT SITING CRITERIA

The alternatives development process consisted of determining the functions to be realigned from NAS Miramar and identifying potential receiving bases that could accommodate these functions. Then construction, expansion and rehabilitation projects needed to support the operational and personnel requirements of the E-2 aircraft squadrons at each potential alternative receiving base were identified, based on the functions relocating from NAS Miramar and the availability and capacity at each alternative receiving base.

Site Eligibility Limitations

The BRAC mandate is to relocate the E-2 aircraft squadrons to another naval air station. Commander Naval Air Force, US Pacific Fleet (COMNAVAIRPAC) conducted a planning process to determine feasible and practical locations to receive the E-2 community. This process included analysis of operational and logistical requirements for the realignment of the E-2 squadrons and support personnel/functions.

To be eligible for consideration, the site must fall within the Commander in Chief, US Pacific Fleet Area of Responsibility (AOR). A basic concept for force structure, personnel and equipment planning, assigning specific aircraft assets to Pacific Fleet and Atlantic Fleet Commanders simplifies logistics, minimizes overhead, and meets Navy goals of minimizing the time spent by personnel away from their homes.

Basing the 16 Pacific Fleet E-2 aircraft and operational assets at more than one location would be unacceptable because of operational constraints and high support costs associated with maintaining and operating the aircraft in multiple locations. It would impede force readiness levels and decrease effectiveness of training for E-2 aircrews and support personnel. Neither the Navy's current authorized personnel levels, funding, or the Navy's inventory of E-2 spare parts and equipment would be able to adequately support such a separation.

2.2.1 Site Screening Criteria

Airfield Operational Capabilities

The following criteria were used to select the alternative bases for the E-2 aircraft realignment.

Field elevation. Home base field elevation must be less than 1,000 ft MSL to adequately replicate aircraft flight characteristics experienced at sea level when operating from aircraft carriers. It is particularly important that aircraft performance in the landing pattern be as close as possible to that experienced at the aircraft carrier. Differences in aircraft performance become significant at altitudes above 1,000 ft MSL.

Training ranges. The home airfield must be within 40 minutes (one-way transit time)/150 miles by air to the E-2 training ranges, including the Southern California Operations Area (SOCAL OPAREA). This time/distance requirement is based on fuel costs, aircraft parts usage, rate of airframe life expenditure and limits placed on length of aircrews' flying days for safety.

Airfield tempo of operations. The level of existing flight activity must be sufficiently low to permit unrestricted operations of the E-2 aircraft based there. Both military and civilian flight activity must be considered in the airspace nearby as well as at the airfield itself. It is especially important that routine operations not interfere with FCLPs.

24-Hour operations. The ability to conduct 24-hour aircraft operations with normal traffic flow must not be restricted. This is critical because the E-2s conduct an important part of their training at night, up to 90 percent of the FCLP operations.

Dual runways. Home base must have dual runways to permit continuous landings in the event the primary runway should become blocked or otherwise unusable. Intersecting runways are acceptable providing there is sufficient provision for conducting FCLPs concurrently with routine take off and landing operations. For this reason it is usually preferable that the dual runways be parallel rather than intersecting.

Field carrier landing practice (FCLP). The ability to conduct efficient FCLPs is essential and may be accomplished in one of two ways. FCLPs are preferably conducted at the home field, concurrently with routine aircraft operations, or if use of the home field is not feasible, it would be acceptable to conduct FCLPs at a sufficiently configured outlying airfield located within 30 minutes transit time/100 miles (one way). A greater distance would not allow the aircraft sufficient time in the landing pattern at the outlying field with adequate fuel reserve to return to the home base.

2.2.2 Site Facility Requirements

Primary runway length. The primary runway must be of sufficient length to allow E-2 aircraft to accelerate to takeoff speed, rotate, then abort the takeoff and stop, at maximum takeoff weight, without the use of arresting gear. This must be achievable on a wet runway and at the highest normally foreseeable density altitude experienced at the specific location. Based on these factors, 8,000 feet is the minimum primary runway length required for the alternatives in this analysis.

Secondary runway length. Secondary runways must be of sufficient length to allow E-2 aircraft to land safely at maximum landing weight without the use of arresting gear. This must also be achievable on a wet runway at the highest likely density altitude. Based on these factors, 9,200 feet is the minimum length acceptable for secondary runways at alternatives considered in this analysis.

Separate hangar modules. Each fleet squadron requires a separate hangar module in which to house its maintenance, training and administrative functions.

Criteria for Facilities at Alternative Bases

Facilities do not currently exist at any of the bases to fully accommodate the realignment of the E-2 squadrons, equipment, and 988 support personnel and their families. Required construction and facility upgrade projects were determined that would enable each potential receiving site to support the needs of the E-2 wing and their families. Opportunities to retrofit or remodel, and to use off-base facilities were considered. Specific project locations at each base were selected for their ability to:

- Satisfy the needs of the E-2 squadrons' mission;
- Centralize E-2 operations, training, and maintenance activities;
- Provide access to aircraft operation and maintenance facilities, runways/taxiways, and flight communications;
- Maximize compatibility with existing base uses, aircraft circulation systems, and flight patterns;
- Minimize disruption of existing facilities and functions;
- Minimize environmental impacts; and
- Minimize the financial costs of realignment.

Four categories of facilities or equipment are needed for the E-2 squadrons: airfield, Aircraft Intermediate Maintenance Department (AIMD), training/ administration, and personnel support. Table 2-1 lists the required facilities and the ability of the alternative receiving bases to satisfy these requirements.

2.3 DESCRIPTION OF ALTERNATIVES

As described in Section 1.3, the BRAC process directed the realignment of NAS Miramar to other naval air stations air stations, primarily NAS Oceana, Virginia; NAS North Island, California; and NAS Fallon, Nevada. The Navy has, however, realigned the F-14 and TOPGUN/TOPDOME squadrons formerly stationed at NAS Miramar to NAS Oceana and NAS Fallon, respectively, in accordance with the 1995 BRAC recommendation. However, after applying the criteria for the E-2 realignment (described in Section 2.2 above) to several installations; only four sites, (NAS North Island, NAWS Point Mugu, NAS Lemoore and NAF El Centro), were identified for further consideration. NAS North Island was subsequently eliminated from consideration due to the need to support Clean Air Act requirements with regard to the Marine Corps realignment to MCAS Miramar.

Table 2-1
Comparison of Facility/Equipment Requirements for the Realignment Alternatives

Facility/Equipment	NAWS Point Mugu (Preferred Alternative)	NAS Lemoore	NAF El Centro
Airfield Facilities			
Hangar 01, 02, and OH Space (w/Special Compartmented Information Facility (SCIF))	■	■	■
Bridge Crane	■	■	■
Aircraft Parking Apron	□	■	■
Apron Canopy	□	■	■
Fixed-point Utility System	■	■	□
Fixed-point Utility Compressor	■	■	■
Aircraft Washrack	⊟	■	□
Power Check Pad	□	■	□
Naval Aviation Support Engineering Unit (NAESU)	□	□	□
Vehicle Parking	■	■	■
AIMD Facilities			
Aviation Supply Warehouse	□	⊟	■
Engine Maintenance Shop	⊟	▬	■
Engine Test Cell	□	■	■
Ground Support Storage	⊟	⊟	■
Ground Support Maintenance Shop	⊟	⊟	■
Avionics shop	▬	▬	■
Airframe shop	□	■	■
Training/Administration Facilities			
AEWWTNGPAC Admin. Bldg.	⊟	■	■
Applied Instruction Building (AIB)	⊟	■	■
Operational Trainer Facility (OTF)	■	■	■
Personnel Support Facilities			
Child Development Center	□	■	■
Gymnasium/Fitness Center	□	□	□
BEQ	□	■	■
Youth Center	□	■	□
Family Services Center	□	□	□
Medical and Dental Clinic	⊟	□	□
Galley	□	□	□
Commissary	□	□	□
Other			
Utility upgrade	■	□	■
Relocation of existing functions	▬	⊟	□

■ New construction required
▬ Facility expansion required
⊟ Facility renovation or rehabilitation required
□ Existing facilities adequate

Because NAS Lemoore is home base to the Pacific Fleet's F/A-18 Strike-Fighter community, as well as four of the Fleet's five carrier air wing staffs, the site offers significant synergistic efficiencies and tactical team building opportunities if the E-2 squadrons were to be based there. Accordingly, NAS Lemoore is considered as an alternative even though it is located more than 150 nautical miles from the Southern California operating area. NAS Lemoore remains a reasonable alternative despite its location because E-2 aircraft need not be directly over ships and other aircraft with which they operate. The E-2 radar's ability to "see" and communicate at considerable distance would permit the aircraft to operate effectively with ships and aircraft in the operating area while the E-2 itself was positioned to the north, within 150 miles of Lemoore.

Therefore, the three alternatives considered in this EIS are NAWS Point Mugu, NAS Lemoore and NAF El Centro. The descriptions of these alternative bases that follow include a summary of the specific construction or modification projects needed to meet the E-2 requirements. The construction projects described for each alternative include the preferred locations for the E-2 facilities. No other alternative construction sites that met all of the above criteria were identified.

As part of the preferred alternative selection process, the Navy compared and contrasted the alternative locations with operational, logistical, and personnel requirements of the E-2 community. Consideration of environmental impacts and cost were also factored into the decision-making process. The preferred receiving installation is the NAWS Point Mugu Alternative described herein.

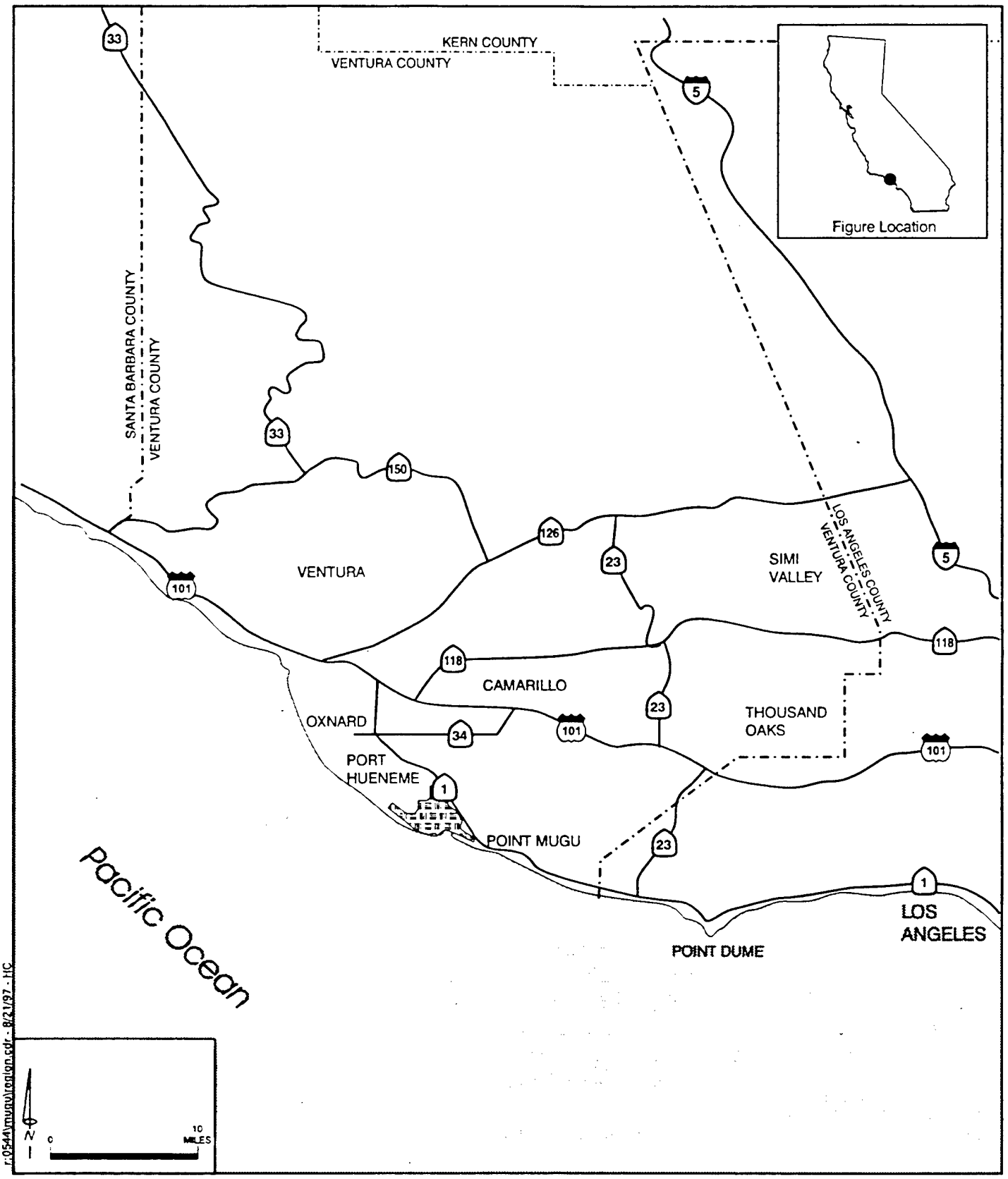
2.3.1 Preferred Alternative: NAWS Point Mugu

NAWS Point Mugu encompasses approximately 4,575 acres (1,851 hectares) of land and marsh area in southern Ventura County. It is located 7 miles (11 kilometers) southeast of the City of Oxnard and 8 miles (13 kilometers) east of the City of Port Hueneme. The base is approximately 5 miles (8 kilometers) from the Los Angeles County line and situated along the Pacific Coast, which forms the southern boundary of the base (Figure 2-1).

Existing Base Operations

The primary mission at NAWS Point Mugu is the development, testing, engineering support, and training support for naval weapons, weapons systems, and related devices. NAWS Point Mugu manages onshore facilities at the main base, where all proposed E-2 facilities would be constructed. These proposed facilities are addressed in this EIS.

NAWS Point Mugu also manages offshore land and airspace of the Western Sea Test Range of the Naval Air Weapons Center (NAWC). The 36,000-square-mile (77,700-square-kilometer) air/sea test ranges extend 125 miles (201 kilometers) southwest of Point Mugu and 250 miles (402 kilometers) northwest to southeast, surrounding the islands of San Nicolas, San Miguel, Santa Cruz, Santa Rosa,



r:\0544\mugu\region.cdr - 8/21/97 - HC

NAWS Point Mugu is located on the coastline of the Pacific Ocean near Port Hueneme and Oxnard.

LEGEND:

- NAWS Point Mugu
- Road
- County Boundary

NAWS Point Mugu Regional Location Map

E-2 Aircraft Squadrons Realignment EIS
NAWS Point Mugu, California

Source: Creations Graphic Design Company 1997.

Figure 2-1

Anacapa, and Santa Barbara. There are airspace restrictions and warning areas over much of the test range area to allow the test range to carry out its mission. San Nicolas Island is wholly owned by the Navy and is part of the range. Because the E-2 realignment will not change or increase the use of any of these areas, they are not evaluated in this document.

The airfield at NAWS Point Mugu has two runways, 03/21 and 09/27, which are at an elevation of approximately 12 feet above MSL. Runway 03/21 is 11,000 feet long (3,353 meters), and Runway 09/27 is 5,500 feet long (1,676 meters). Runway 03/21 is the main runway and is used for most takeoffs and landings (i.e., 80 percent), while Runway 09/27 is considered a secondary runway. These runways support approximately 17,620 takeoffs and landings, and 8,000 touch-and-go exercises annually; FCLPs are seldom conducted at NAWS Point Mugu. Runway 03/21 at NAWS Point Mugu and NALF San Clemente would be used for FCLPs if the E-2 squadrons realigned to this base. Approximately 92 percent of the FCLPs would be conducted at Runway 03/21 and 8 percent at NALF San Clemente, representing no change over the present E-2 squadron use of San Clemente Island.

NAWS Point Mugu currently maintains a total of 61 helicopter and fixed-wing aircraft, including H-60 helicopters, C-130 transports, F-4 and F-14 fighters, and P-3 maritime patrol aircraft. The overall permanent workforce consists of approximately 7,814 personnel, including 4,369 military and 3,445 civilian employees.

Implementation Requirements—NAWS Point Mugu

Many of the facility requirements could be met through the use of existing facilities at NAWS Point Mugu. Realignment of the E-2s to NAWS Point Mugu would require relocation of several existing tenants and remodeling of other buildings on base. NAWS Point Mugu has adequate space in the existing Bachelors' Enlisted Quarters (BEQ) to accommodate the E-2 enlisted personnel. Table 2-2 provides a summary of the construction and facility modification projects proposed with this alternative. Figure 2-2 illustrates the proposed project locations. The total cost to construct, remodel, and relocate functions at NAWS Point Mugu in support of the realignment of the E-2 squadrons would be approximately $28.6 million.

Airfield facilities. An existing 115,000-square-foot (10,683-square-meter) hangar (Building 553) would be expanded by 7,000 square feet (650 square meters) and the interior of the entire hangar would be remodeled to accommodate the squadrons. The rehabilitated hangar would include approximately 650 square feet (60 square meters) for the Special Compartmented Information Facility (SCIF) and 30,346 square feet (2,819 square meters) for the Applied Instruction Building (AIB). The existing aircraft parking apron would be used without modification. The aircraft

Table 2-2
E-2 Construction—Expansion Projects at NAWS Point Mugu

Figure Key	Facility	Units[1]	Project Size	Project Type
A	Aircraft Hangar, SCIF, and AIB (Building 553)	SF	7,000	Expansion
A	Aircraft Hangar and AIB (Building 553)	SF	114,652	Modification
B	Vehicle Parking	SP	375[2]	Construction
C	Avionics Shop (Building 385)	SF	7,000	Expansion
D	OTF	SF	9,664	Construction
E	Aircraft Washrack (Existing Rinserack)	SF	30,600	Modification
F	AEWWINGPAC Administrative Building (Building 50)	SF	84,000	Modification
G	Engine Maintenance Shop, Ground Support Storage & Maintenance Shop (Building 311)	SF	91,173	Modification
H	Dental Clinic (Building 5)	SF	3,158	Modification

[1]SF = Square Feet; SP = Spaces
[2]For the NEPA analysis it is assumed that of the proposed 375 spaces, 150 spaces would be located adjacent to the OTF and 225 spaces would be located west of L Street. A study will be conducted to identify exact number and location of needed parking spaces.

washrack would be accommodated through expansion of an existing rinserack. Simulated aircraft carrier deck lighting and a landing signal officer station would be added to the runway. This alternative would require the addition of a fixed-point utility system, a fixed-point utility system compressor and two bridge cranes (Table 2-3). The existing power check pad would accommodate the E-2 squadrons.

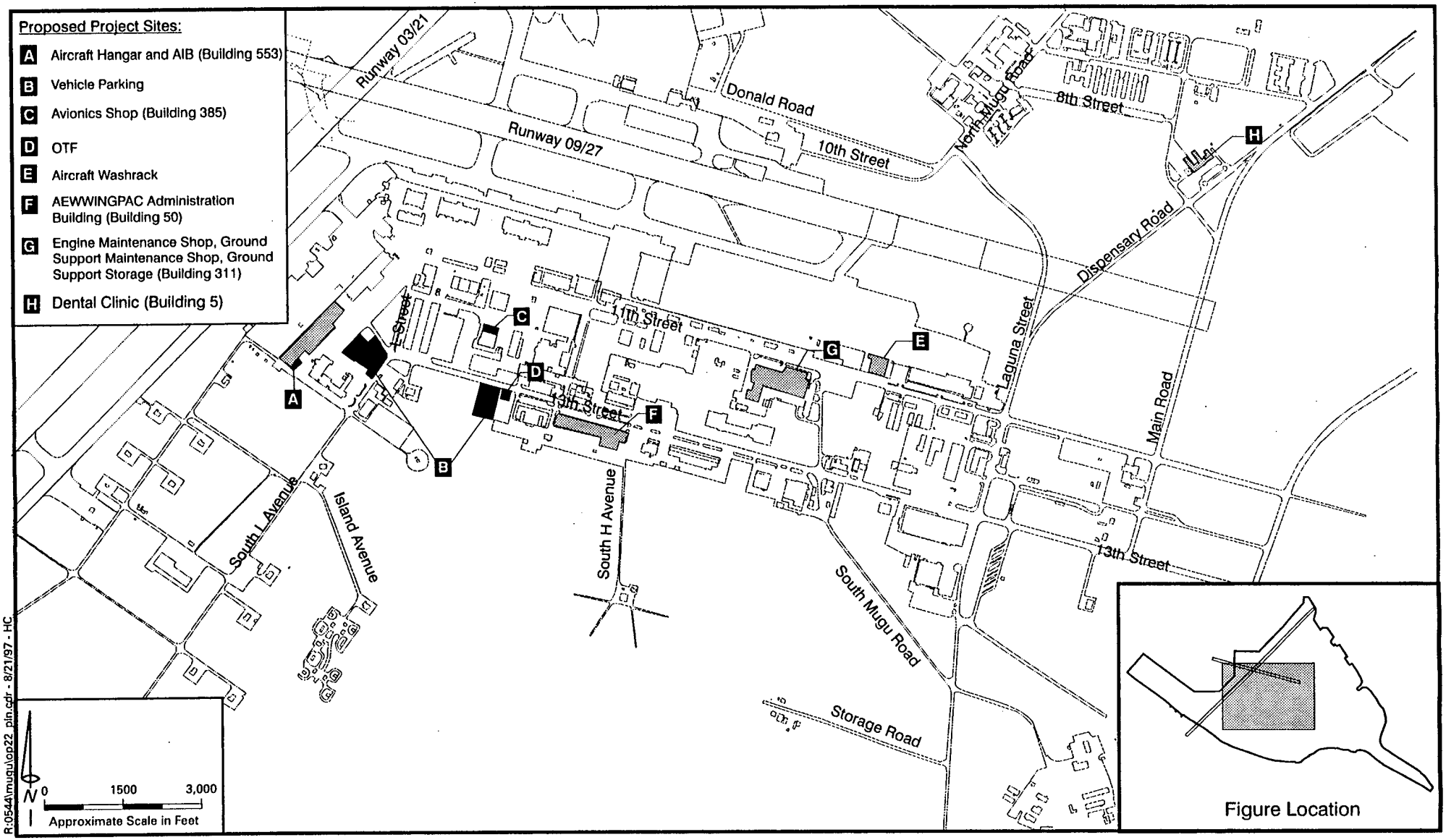
Table 2-3
Other Equipment/Facility Needs at NAWS Point Mugu

Equipment/Facility	Requirement
Bridge Crane	2 cranes
Fixed-point Utility System	1 system with 8 plug-ins
Fixed-point Utility System Compressor	1 compressor

AIMD facilities. Building 385 would be expanded by 7,000 square feet (929 square meters) for the avionics shop. Building 311 would be renovated to accommodate the engine maintenance shop, ground support storage, and ground support maintenance shop. The engine test cell and the aviation supply warehouse could be accommodated through the use of existing facilities.

Training/administration facilities. A new 9,664-square-foot (898-square-meter) building would be constructed for the Operational Trainer Facility (OTF) and 375 additional parking spaces would be provided. Building 50 would be renovated to accommodate the AEWWINGPAC administration activities. The AIB would be accommodated in the renovated hangar (Building 553).

Personnel support facilities. Internal modifications to the dental clinic (Building 5) would also be needed. Existing BEQ, galley, family services center, child



R:\0544\mugu\op22_pln.cdr - 8/21/97 - HC

With the exception of the proposed vehicle parking lots, all construction/ expansion sites are located on sites that are paved or developed.

LEGEND:

- Construction/Expansion
- Renovation

NAWS Point Mugu Proposed Project Sites

E-2 Aircraft Squadrons Realignment EIS
NAWS Point Mugu, California

Source: Hovde 1997.

Figure 2-2

development center, gymnasium, and commissary facilities would have the capacity to accommodate incoming personnel. In addition, some facilities at nearby Naval Construction Battalion Center (NCBC) Port Hueneme are used by NAWS Point Mugu personnel, including a new commissary.

Specific Assumptions for the NAWS Point Mugu Alternative

Implementation of the proposed action at NAWS Point Mugu would involve the addition of specific projects/services described below:

- Oil/water separators, sand filters, or other structural or non-structural methods of treating runoff from new parking areas.
- Separation of engine wash water at engine test cell from storm drain system.
- One physician and one physician's assistant would be necessary to accommodate the E-2 Squadron personnel and maintain adequate service (Willis 1997).
- One flight surgeon is required for the E-2 Squadrons.

2.3.2 NAS Lemoore Alternative

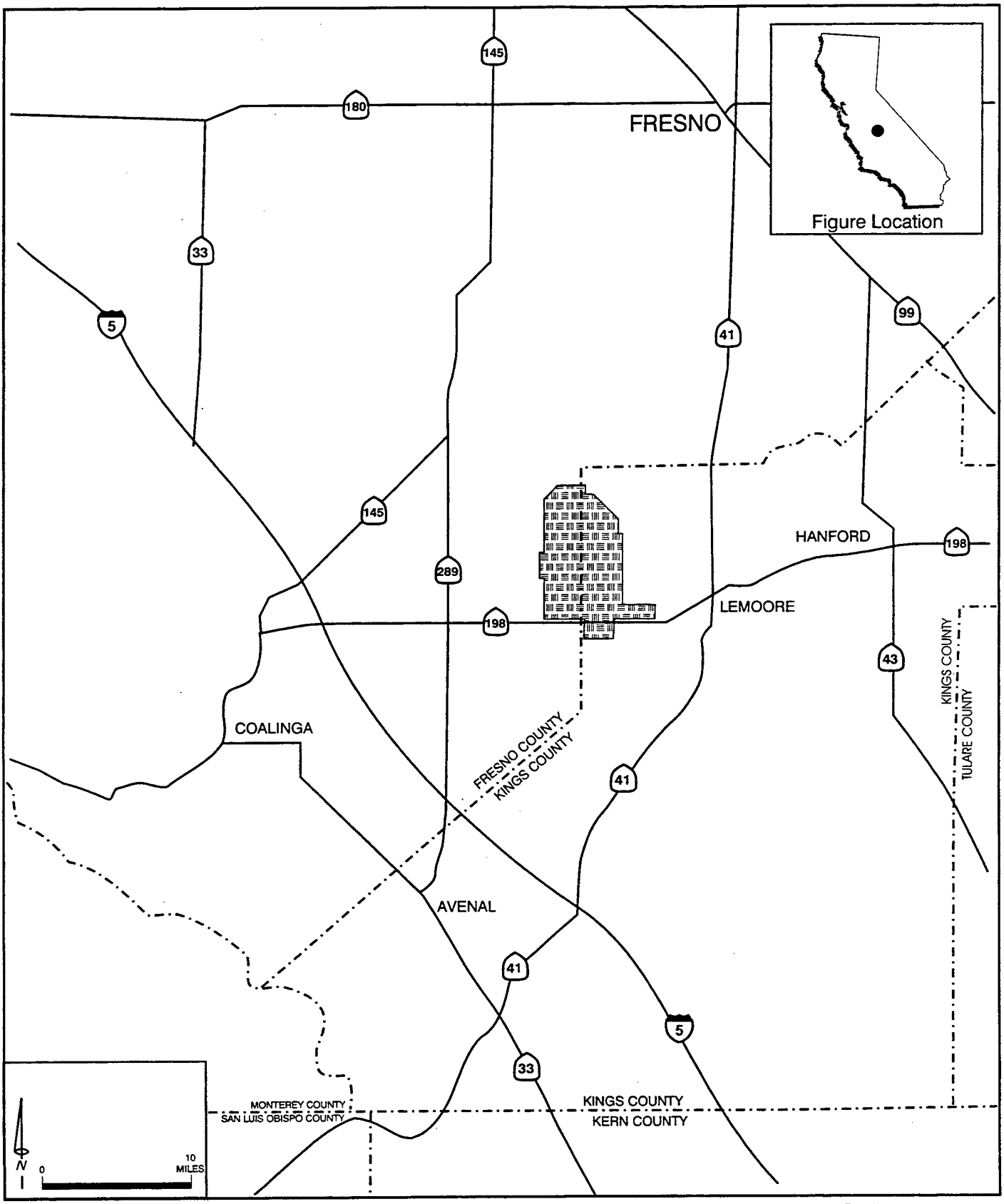
NAS Lemoore encompasses 18,784 acres (7,601 hectares) of Navy-owned land and 11,032 acres (4,467 hectares) of easements in the Central San Joaquin Valley, California (Figure 2-3). The 29,823-acre (12,069-hectare) base is located approximately 80 miles (128 kilometers) inland from the Pacific Ocean and halfway between Los Angeles and Sacramento. The cities of Lemoore and Hanford are located approximately 7 miles (11 kilometers) and 17 miles (27 kilometers), respectively, east of the base. The closest large urban center is Fresno, located approximately 35 miles (56 kilometers) to the northeast.

Existing Base Operations

The official mission of NAS Lemoore is to maintain and operate facilities and provide services and material to support operations of aviation activities and units of the operating forces of the Navy and other activities or units as designated by the Chief of Naval Operations (CNO).

NAS Lemoore is home base for all Pacific Fleet F/A-18 aircraft, except those forward deployed units permanently based in Japan. NAS Lemoore home-based aircraft include the F/A-18C/D fleet replacement squadron (FRS) and 10 fleet squadrons totaling 162 aircraft. The installation maintains a workforce of 6,209 people, composed of 4,518 military personnel and 1,691 civilian personnel.

NAS Lemoore airfield contains two parallel runways—14L/32R and 14R/32L. Both runways are about 13,500 feet (4,115 m) long and are at an elevation of 235



NAS Lemoore is located in Kings and Fresno counties near the City of Fresno.

LEGEND:

- NAS Lemoore
- Road
- County Boundary

NAS Lemoore Regional Location Map

E-2 Aircraft Squadrons Realignment EIS
NAS Lemoore, California

Source: Creations Graphic Design Company 1997.

Figure 2-3

feet above MSL. Annual flight activity at NAS Lemoore averages 18,773 takeoffs and landings, 29,402 touch-and-go patterns, 50,989 FCLP patterns, and 6,908 GCA box patterns. The F/A-18C/D aircraft constitute over 80 percent of the flight activity at the airfield. Training exercises originating from NAS Lemoore are conducted in ranges in California and Nevada and in the air/sea warning areas immediately off the coast of California. If E-2 squadrons realigned to NAS Lemoore, approximately 92 percent of the FCLPs would be conducted on base and 8 percent at NALF San Clemente, representing no change over the present E-2 squadrons use of San Clemente Island.

Implementation Requirements—NAS Lemoore

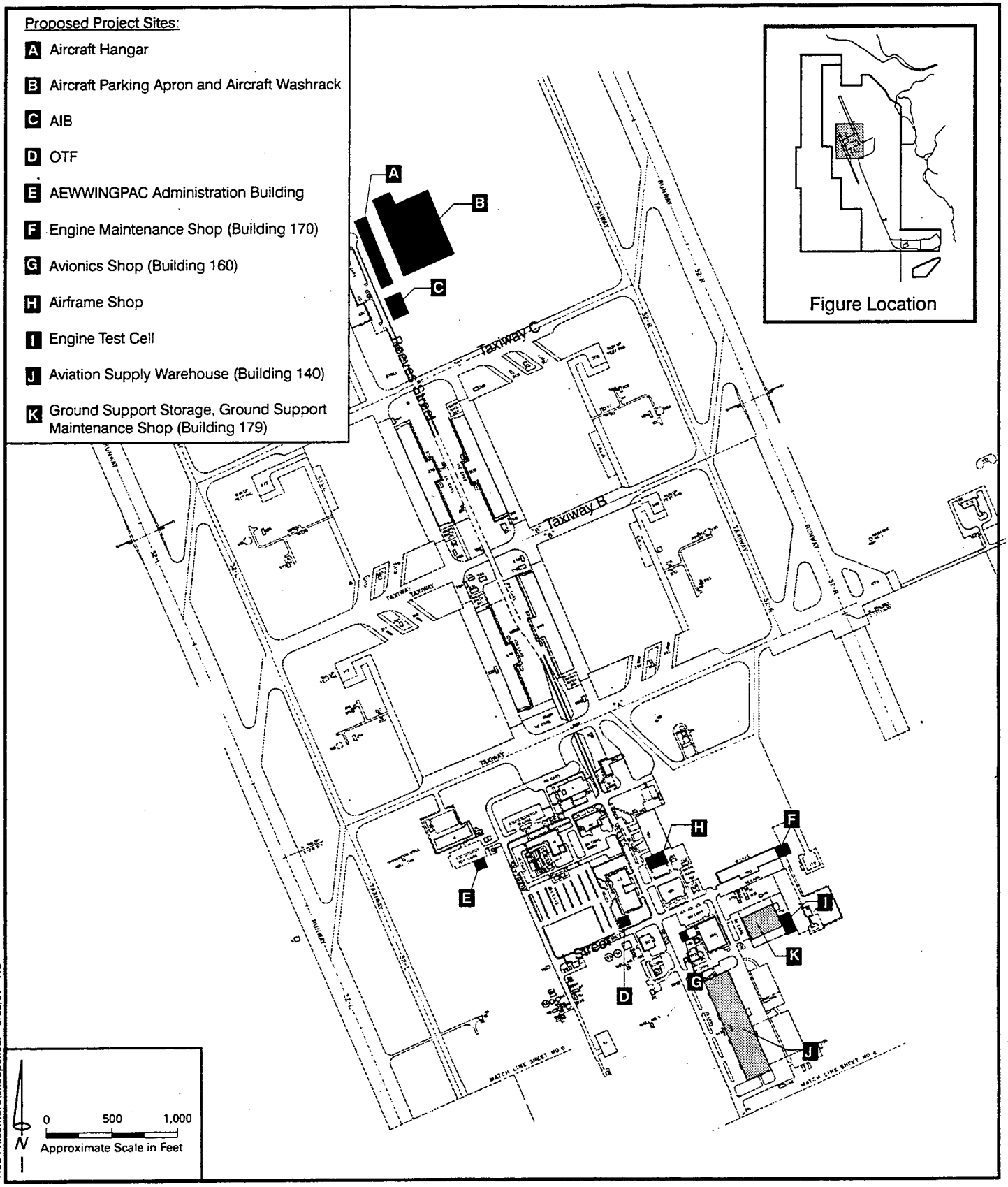
Realignment of the E-2 squadrons to NAS Lemoore would require new construction, modification of existing facilities, and new equipment. Table 2-4 provides a summary of construction and facility modification projects proposed with this alternative. Figures 2-4 and 2-5 illustrate the proposed construction project locations. The total cost to construct, remodel, and relocate functions at NAS Lemoore in support of the realignment of E-2 squadrons would be approximately $58.3 million.

Table 2-4
E-2 Construction—Expansion Projects at NAS Lemoore

Figure Key	Facility	Units[1]	Project Size	Project Type
A	Aircraft Hangar	SF	91,811	Construction
A	Aircraft Washrack	SF	30,600	Construction
B	Aircraft Parking Apron	SF	397,350	Construction
C	AIB	SF	30,346	Construction
D	OTF	SF	9,664	Construction
E	AEWWINGPAC Administration Building	SF	14,000	Construction
F	Engine Maintenance Shop (Building 170)	SF	10,000	Expansion
G	Avionics Shop (Building 160)	SF	4,500	Expansion
H	Airframe Shop	SF	23,491	Construction
I	Engine Test Cell	SF	7,065	Construction
J	Aviation Supply Warehouse (Building 140)	SF	40,000	Modification
K	Ground Support Storage (Fenced area around Building 179)	SF	40,000	Modification
K	Ground Support Maintenance Shop (Building 179)	SF	20,180	Modification
L	Child Development Center	SF	11,035	Construction
M	BEQ	SF	110,760	Construction
N	Youth Center	SF	4,000	Construction
	Vehicle Parking	SP	500	Construction

[1]SF = Square Feet; SP = Spaces

Airfield facilities. A new 91,811-square-foot (8,529-square-meter) hangar and 397,350-square-foot (36,915-square-meter) aircraft parking apron adjacent to the existing Hangar 5 would be constructed. Included in the space would be all three types of hangar space (O1, O2, and OH) and SCIF space. Due to high summer



The proposed aircraft hangar, aircraft parking apron, aircraft washrack, AIB, AEWWINGPAC administration building, airframe shop, engine test cell, and OTF would be located on sites that are not currently paved or developed.

LEGEND:

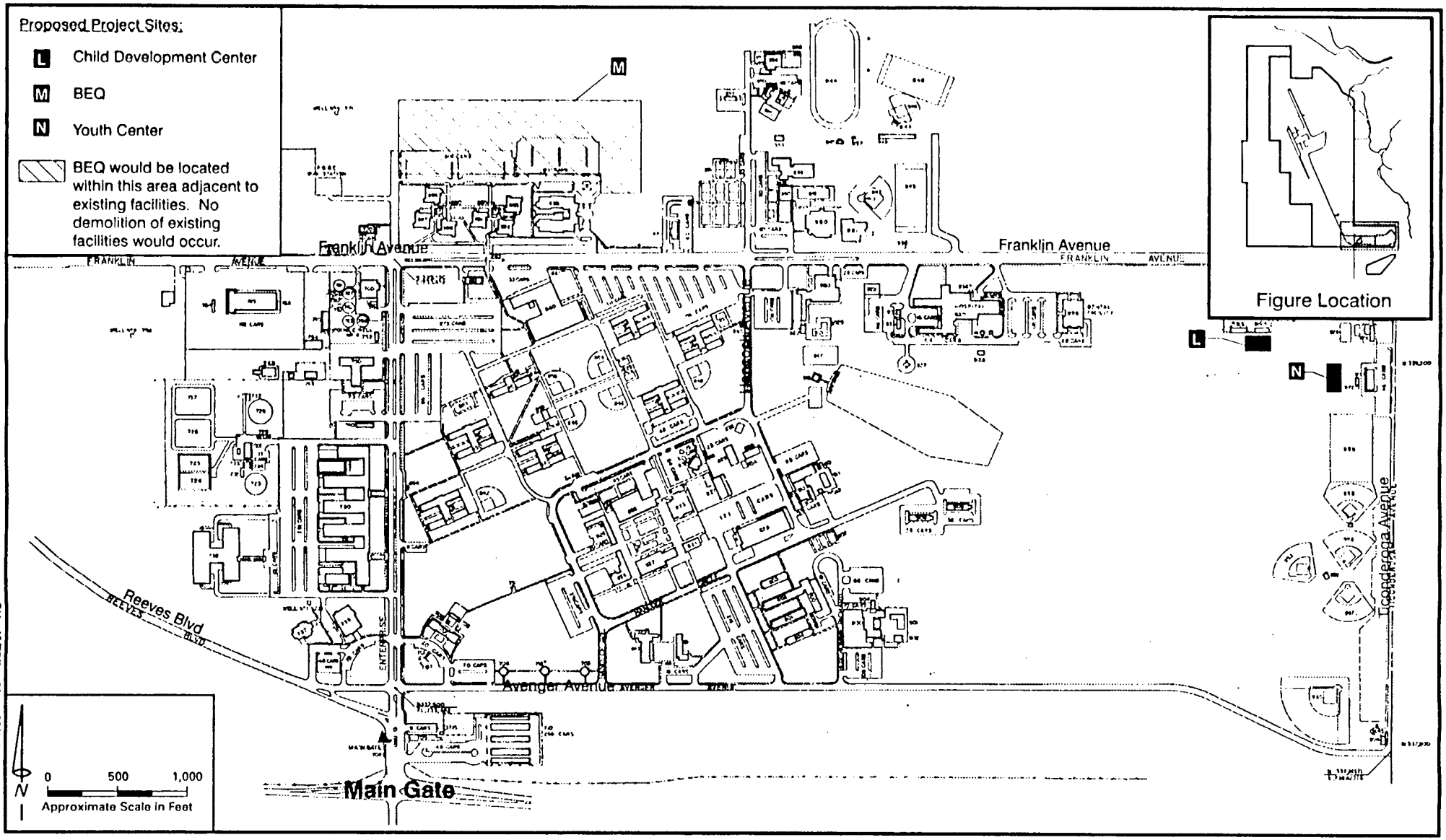
- Construction/Expansion
- Renovation

Source: O'Donnell 1997.

NAS Lemoore Proposed Project Sites: Operations Area

E-2 Aircraft Squadrons Realignment EIS
NAS Lemoore, California

Figure 2-4



2-16

R:\0544\Lemoore\siteadmn.cdr - 8/22/97 - HC

The proposed child development center and youth center would be located on sites that are not currently paved or developed.

LEGEND:

Construction/Expansion

NAS Lemoore Proposed Project Sites: Administration/Housing Area

E-2 Aircraft Squadrons Realignment EIS
NAS Lemoore, California

Source: O'Donnell 1997.

Figure 2-5

temperatures, cooling air and shaded parking (i.e., canopies) would be provided on the apron. Equipment required with this alternative includes one new fixed-point utility system, two bridge cranes, a fixed-point utility system compressor, aircraft washrack, power check pad (Table 2-5), and the addition of sufficient parking spaces.

Table 2-5
Other Equipment/Facility Needs at NAS Lemoore

Equipment/Facility	Requirement
Bridge Crane	2 cranes
Apron Canopy	10 canopies
Fixed-Point Utility System	1 system with 8 plug ins
Fixed-Point Utility System Compressor	1 compressor
Power Check Pad	1 power check pad (11,997 SF)
Aircraft Washrack	1 washrack (30,600 SF)

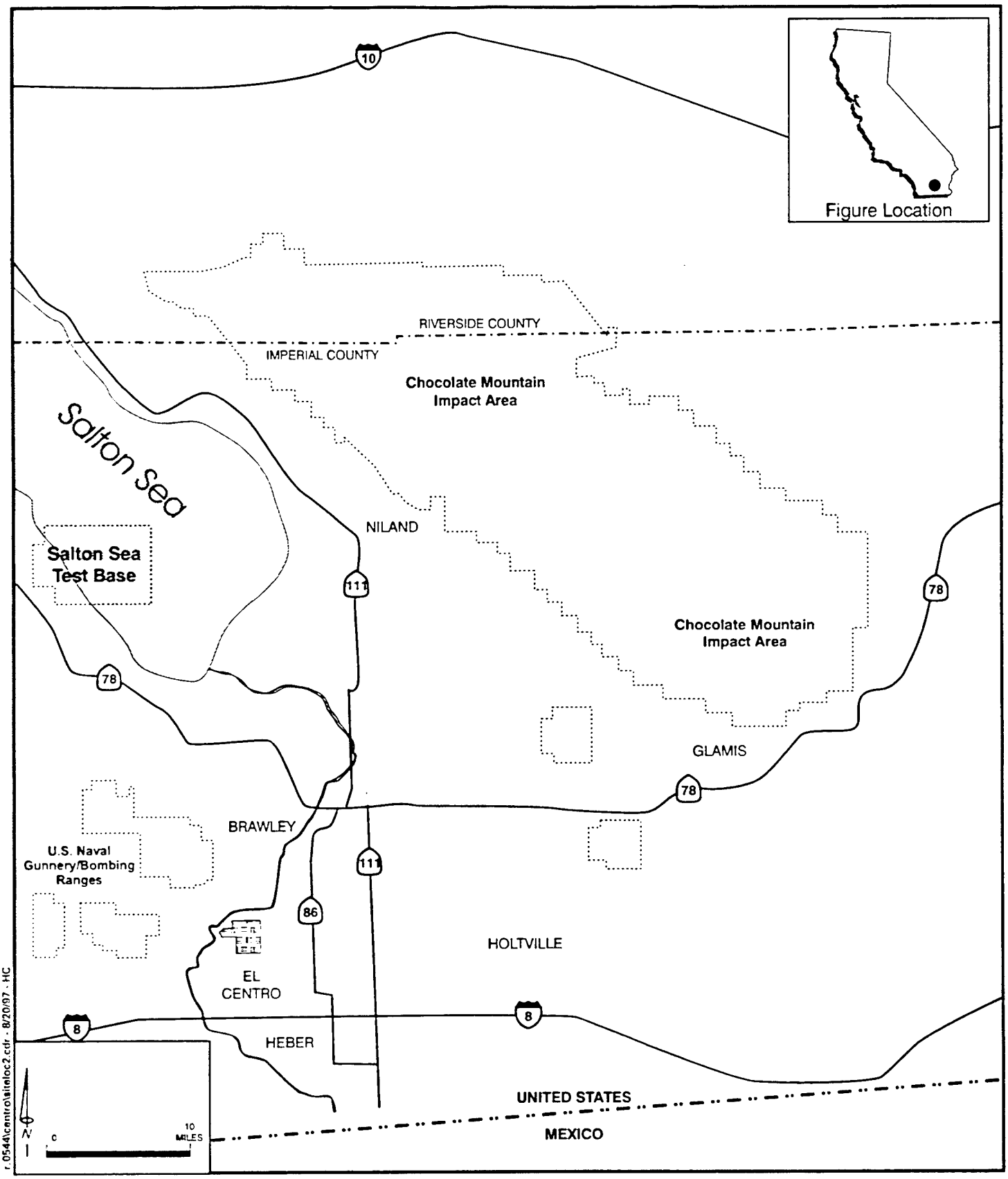
AIMD facilities. Existing facilities on the base have the capacity to accommodate the E-2's aviation supply warehouse, ground support storage, and maintenance shops. An additional 10,000 square feet (929 square meters) for the engine maintenance shop (Building 170) and 4,500 square feet (418 square meters) for the avionics shop (Building 160) would be required. A new 23,491-square-foot (2,183 square meters) airframe shop would be constructed. A new engine test cell also would be required with this alternative.

Training/administration facilities. Training/administration facilities would include new construction of a 30,346-square-foot (2,819-square-meter) AIB, a 9,664-square-foot (898-square-meter) OTF and a 14,000-square-foot (1,300-square-meter) AEWWINGPAC administration building.

Personnel support facilities. Personnel support facilities would be expanded with a new 11,035-square-foot (1,025-square-meter) child development center, a new 4,000-square-foot (371-square-meter) youth center, and new 110,760-square-foot (10,290-square-meter) BEQ to house 311 persons. Existing family services facilities, medical and dental facilities, galley, fitness center (Building 941) gymnasium, and commissary would accommodate incoming personnel and their families.

2.3.3 NAF El Centro Alternative

NAF El Centro occupies approximately 2,640 acres (1,069 hectares) in Imperial County, California, approximately 7 miles (11 kilometers) west of the City of El Centro (the County seat) (Figure 2-6). The base is located approximately 100 miles (193 kilometers) east of the Pacific Ocean and 65 miles (104 kilometers) west of Yuma, Arizona. The US/Mexico Border is situated 12 miles (19 kilometers) to the south.



r:\0544\centro\siteloc2.cdr - 8/20/97 - HC

NAF El Centro is located in Imperial County near the California/Mexico border.

LEGEND:

- NAF El Centro
- Road
- County Boundary

NAF El Centro Regional Location Map

E-2 Aircraft Squadrons Realignment EIS
NAF El Centro, California

Source: Creations Graphic Design Company 1997.

Figure 2-6

Existing Base Operations

The primary mission of NAF El Centro is to support fleet air squadrons performing tactical air training and to provide additional support to other Department of Defense (DOD) components.

The NAF El Centro airfield has two runways, numbered 08/26 and 12/30, which support nearby desert range target practice exercises. The 08/26 runway tracks west-east for a distance of 9,500 feet (2,896 meters). The 7,000-foot (2,133-meter) 12/30 runway intersects the 08/26 at a 45-degree angle. Flight patterns to the west, toward the coast, and to the north, toward the range, are the most heavily used. FCLPs are primarily conducted on runway 08/26. Both runways are at an elevation of 45 feet below MSL. The base currently supports approximately 17,150 takeoffs and landings, 25,575 touch-and-go exercises, and 78,840 FCLPs each year. If E-2 squadrons realigned to NAF El Centro, approximately 92 percent of the FCLPs would be conducted on-base and 8 percent at NALF San Clemente, representing no change over the present E-2 squadrons use of San Clemente Island.

The predominant aircraft at NAF El Centro is the F-18. The base also supports squadrons of F-14s, T-45s, AV-8s, S-3s and C-2s. Several transient units use facilities and services at NAF El Centro throughout the year, including the Blue Angels Flight Demonstration Squadron (during their winter stay). Additionally, the S-3 aircraft based at NAS North Island, use NAF El Centro to conduct FCLPs and other training. The base is staffed with a permanent workforce of approximately 863 people, comprised of 343 military personnel and 520 civilian employees.

Implementation Requirements—NAF El Centro

With this alternative, new construction of facilities and new equipment in support of the realignment of the E-2 squadrons and associated personnel would be required. Existing resources at NAF El Centro are limited, and existing hangars, supply warehouses, and maintenance facilities are occupied. Table 2-6 provides a summary of the proposed construction projects in support of the realignment of the E-2 squadrons to NAF El Centro. Figure 2-7 illustrates the locations of the new structures. Construction of new E-2 facilities at NAF El Centro would cost approximately $69.8 million.

Airfield facilities. Approximately 91,811 square feet (8,529 square meters) of hangar space, approximately 375 parking spaces, and a 397,350-square-foot (36,915-square-meter) aircraft parking apron would be required. SCIF space would be provided with the new hangar. Existing power check pads and aircraft washracks would be available for use by the E-2 squadrons. This alternative would require the addition of two bridge cranes, and a fixed-point utility system compressor. Cooling air and shaded parking (i.e., canopies) would be provided on the aircraft parking apron (Table 2-7).

Table 2-6
E-2 Construction— Expansion Projects at NAF El Centro

Figure Key	Facility	Units[1]	Project Size	Project Type
A	Aircraft Hangar	SF	91,811	Construction
A	Aircraft Parking Apron	SF	397,350	Construction
A	Aviation Supply Warehouse	SF	40,000	Construction
A	Engine Maintenance Shop	SF	20,000	Construction
A	Engine Test Cell	SF	7,065	Construction
A	Ground Support Storage	SF	11,555	Construction
A	Ground Support Maintenance Shop	SF	8,445	Construction
A	Avionics shop	SF	16,302	Construction
A	Airframe shop	SF	14,380	Construction
A	AEWWINGPAC Administration Building	SF	14,000	Construction
A	AIB	SF	30,346	Construction
A	OTF	SF	9,664	Construction
A	Vehicle Parking	SP	375	Construction
B	BEQ	SF	110,760	Construction
C	Child Development Center	SF	11,035	Construction

[1]SF = Square Feet; SP = Spaces

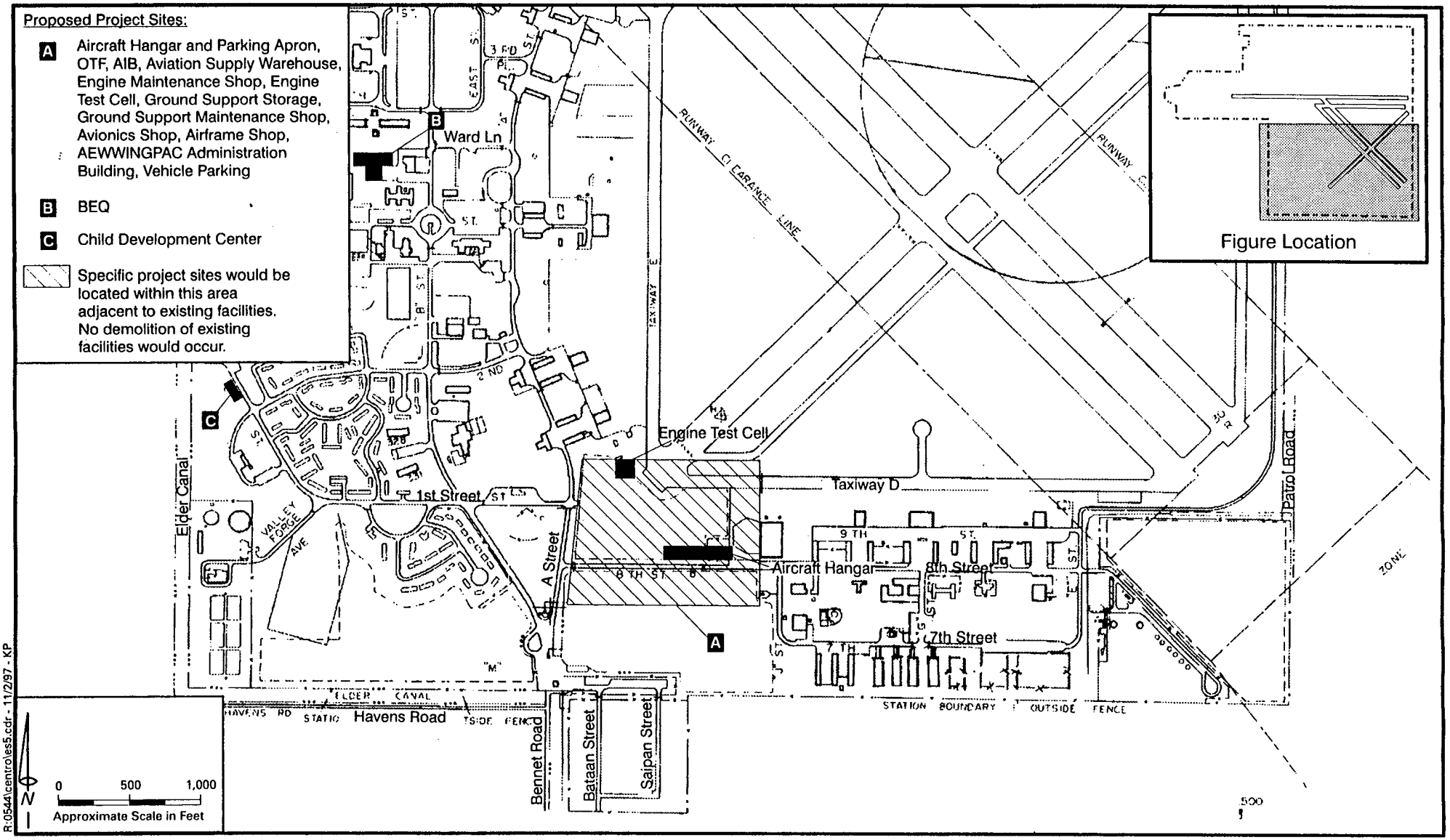
Table 2-7
Other Equipment/Facility Needs at NAF El Centro

Equipment/Facility	Requirement
Bridge Crane	2 cranes
Apron Canopy	10 canopies
Fixed-Point Utility System Compressor	1 compressor

AIMD facilities. NAF El Centro does not have available AIMD facility assets, and consequently, all the required AIMD facilities would need to be constructed. AIMD facilities would require 110,682 square feet (10,283 square meters) of new construction. An engine test cell also would be constructed.

Training/administration facilities. NAF El Centro does not have available training/administration facilities to support the realignment of the E-2 squadrons. New construction would include a 14,000-square-foot (1,301-square-meter) AEWWINGPAC administration building, a 30,346-square-foot (2,819-square-meter) AIB, and a 9,664-square-foot (898-square-meter) OTF.

Personnel support facilities. New personnel support facilities would include an 11,035-square-foot (1,025-square-meter) child development center and an 110,760-square-foot (10,289-square-meter) BEQ to house 311 persons. Existing family services facilities, the galley, gymnasium and the commissary have the capacity to provide necessary services for the E-2 community.



Implementation of the proposed action at NAF El Centro would require new construction of all required facilities.

LEGEND:

Construction/Expansion

NAF El Centro
Proposed Project Sites

E-2 Aircraft Squadrons Realignment EIS
NAF El Centro, California

Source: Sewester 1997.

Figure 2-7

R:\0544\centro\es5.cdr - 11/2/97 - KP

Specific Assumptions for the NAF El Centro Alternative

Implementation of the proposed action at NAF El Centro would involve the addition of specific projects/services described below:

- The central gas main would be enlarged from 3 inches (8 centimeters) to 4 inches (10 centimeters) and the peripheral laterals would be enlarged from 1.25 inches (3 centimeters) to 2 inches (5 centimeters) to accommodate increased natural gas usage. Some peripherals are already 2 inches, but the smaller (1.25 inch) peripherals would need to be upgraded.

- Fifteen to twenty 50-kilovolt-ampere transformers, new transmission lines, and switchgear would be needed to accommodate the increase in electricity usage.

2.3.4 No Action Alternative

The no action alternative would not realign AEWWINGPAC assets and personnel to another naval air station following the transfer of NAS Miramar to the Marine Corps. Existing functions and capabilities of NAWS Point Mugu, NAS Lemoore, and NAF El Centro would be preserved with no subsequent need for new or modified E-2 facilities. This alternative has been eliminated from further consideration for two reasons. First, the Defense Base Closure and Realignment Act (DBCRA) exempts from the National Environmental Policy Act (NEPA) process the consideration of both the need for closing a military installation and the need for transferring functions to receiving installations as directed by Congress. This DEIS does, however, address alternative methods of accommodating the realignment and transfer of functions (alternative receiving site analysis), an analysis that is not exempt from the NEPA process. Second, the no action alternative would fail to meet the legal directives of DBCRA to realign E-2 aircraft and facilities, which is the purpose of the proposed action. It is therefore not considered a reasonable alternative and has been eliminated from further analysis in this DEIS.

2.4 Alternatives Considered But Eliminated

The 1995 BRAC Commission recommended redirection of the E-2 squadrons from NAS Miramar to another naval air station, primarily NAS Oceana (Virginia), NAS North Island (California), and NAS Fallon (Nevada). NAS Oceana and NAS Fallon would not be capable of achieving the operational and logistical criteria listed in Section 2.2. NAS North Island was also eliminated from consideration due to the need to support CAA requirements with regard to the Marine Corps realignment to MCAS Miramar. The reasons for their elimination are shown in Table 2-8 and summarized below.

Table 2-8
E-2 Site Screening

Site	Field Elev.	Trng Ranges	Tempo of Ops	24 Hour Ops	Dual Runway	FCLP
NAS Oceana	✓	-.-	✓	✓	✓	✓
NAS Fallon	-.-	-.-	✓	✓	✓	✓
NAS Whidbey Island	✓	-.-	✓	✓	✓	✓

✓ meets criteria
-.- did not meet operational criteria

2.4.1 NAS North Island

The Navy initially identified the following potential realignment locations for the E-2s: NAS North Island, NAWS Point Mugu, NAS Lemoore, and NAF El Centro. Required NEPA documentation for the relocation of the El Toro and Tustin assets to NAS Miramar was completed by the Navy in December 1996. The Miramar EIS did not preclude keeping the E-2s in the San Diego area.

Subsequent to the Miramar ROD, and in response to concerns raised by the US Environmental Protection Agency and individuals, the Navy reevaluated the then-current conformity analysis required by the Clean Air Act. One of the results of the reevaluation was a determination that, in order to support the Marine Corps realignment to NAS Miramar as required by law, and so as to support CAA requirements with regard to that realignment, relocation of the E-2 squadrons to a site located in a different air quality district from that NAS Miramar occupies was necessary.

Therefore, the Navy has decided that the NAS North Island location, which, like NAS Miramar, is in the San Diego Air Quality Management District, is not a practicable alternative and will not be further analyzed in this document as a candidate receiving site for the E-2 squadrons. NAS North Island was not the preferred alternative, and even with the elimination of this potential alternative, there continues to be an adequate range of alternatives for purposes of the NEPA analysis.

2.4.2 NAS Oceana

The E-2 aircraft training requirements necessitate that the squadrons work regularly with other west coast-based aircraft squadrons, surface ships, and battle group commanders with whom they deploy. NAS Oceana (in Virginia) is obviously much farther than the 40-minute one-way transit time by air between home base and west coast E-2 training areas. Additionally, several E-2 squadrons are already based on the east coast at NAS Norfolk (located 10 miles from NAS Oceana). Realignment of Pacific Fleet E-2 squadrons to any east coast location would leave Pacific Fleet carrier air wings without a vital part of their tactical team, essential for effective training. No other members of the air wing, nor even any land based naval aircraft could fill the vital role. Because realignment of the west-coast-based E-2s to NAS Oceana, Virginia is inconsistent with their mission,

it is an unreasonable alternative, and therefore, is eliminated from further consideration.

2.4.3 NAS Fallon

The airfield elevation at NAS Fallon (3,934 feet) exceeds the established criteria of 1,000 feet maximum FCLP altitude, and there is no suitable outlying field where FCLPs could be conducted. NAS Fallon is also located in western Nevada, well beyond the established 150-mile maximum distance to routine E-2 training areas. Moreover, NAS Fallon is already frequently loaded to capacity hosting carrier air wings for interdeployment training in addition to the several other organizations based there permanently. For these reasons, realignment of the E-2s to NAS Fallon is an unreasonable alternative and is eliminated from further consideration.

2.4.4 Other Possible Air Installations

Beyond the bases considered in detail in Section 2.3, there are no other receiving bases in the continental US or Hawaii that would provide for a 40-minute one-way flight time (150 NM) between the home base and the primary training areas used by the E-2 squadrons. Training interaction with aircraft and ships is vital to effective training of the entire force, which operates almost exclusively in Southern California operating areas. Therefore, air stations such as NAS Whidbey Island were not considered reasonable alternatives.

2.5 PROJECT PERMIT REQUIREMENTS

Several laws and regulations would apply or potentially would apply to implementation of the E-2 aircraft squadron realignment. Table 2-9 lists potential permit and review requirements from applicable federal, state, and local agencies that would likely be involved in the project approval and implementation process.

2.6 COMPARISON OF ALTERNATIVES

NEPA requires that the EIS include a presentation of the alternatives in comparative form, to define the issues and to provide a clear basis for choice among options by the decision-makers and the public. Table 2-10 lists the significant impacts and corresponding mitigation measures for each alternative.

Table 2-9
Potentially Required Permits and Agency Consultation

Permit/Consultation	Agency	NAWS Point Mugu Action Needed	NAS Lemoore Action Needed	NAF El Centro Action Needed
Clean Air Act (CAA) Conformity Determination	US Environmental Protection Agency, California Air Resources Board, local Air Pollution Control District (APCD)	Ventura County APCD Emissions are above *de minimis* for ozone. Need conformity determination (see Appendix D)	San Joaquin Valley Unified APCD Emissions are above *de minimis* for ozone, below *de minimis* for PM_{10}. Need conformity determination (see Appendix D)	Imperial County APCD Emissions are below *de minimis* levels for ozone and PM10. RONA included in Appendix D
Stationary Air Emission Source Permits	Appropriate local APCD	Depending on size, backup generators, compressors, or related equipment may require permits. Existing permit for engine test cell may require amendment	A permit may be necessary for the new jet engine test cell. Any boilers for new buildings may require permits. Depending on size, backup generators, compressors, degreasing tanks, or related equipment may require permits	A permit may be necessary for the new jet engine test cell. Any boilers for new buildings may require permits. Depending on size, backup generators, compressors, degreasing tanks, or related equipment may require permits
Coastal Zone Management Act of 1972 and the California Coastal Act of 1976	California Coastal Commission	The Navy has submitted a Coastal Consistency Determination in accordance with the California Coastal Management Plan	Coastal Consistency requirements not applicable at this site	Coastal Consistency requirements not applicable at this site
CWA, Section 401/402	Regional Water Quality Control Board (RWQCB)	Obtain RWQCB stormwater permits prior to construction	Obtain RWQCB stormwater permits prior to construction	Obtain RWQCB stormwater permits prior to construction
CWA, Section 401/402	Regional Water Quality Control Board (RWQCB)	Existing NPDES permit restrictions for wastewater discharge would not be exceeded	Existing NPDES permit restrictions for wastewater discharge would not be exceeded	Modification of existing NPDES permit restrictions for wastewater required
National Historic Preservation Act - Section 106 Consultation	State Historic Preservation Officer (SHPO), Advisory Council on Historic Preservation	An historic building survey was completed and no NRHP-eligible buildings will be affected by the E-2 realignment. Section 106 consultation would be necessary only if NRHP-eligible prehistoric subsurface deposits are encountered during ground-disturbing activities.	No eligible resources would be affected	No eligible resources would be affected

Table 2-10
Summary of Significant Environmental Impacts and Mitigations

REALIGNMENT ALTERNATIVES		
NAWS Point Mugu (Preferred Alternative)	**NAS Lemoore**	**NAF El Centro**
Biological Resources		
No significant impacts are expected.	No significant impacts are expected.	*Impact 1: Special status species.* Potentially significant and mitigable impacts would occur to one state and federal species of concern (the Western burrowing owl). The Western burrowing owl, a California and federal Species of Concern, was observed at the intersection of Taxiway D and Taxiway E during the July 29, 1997 site visit. This area is adjacent to the proposed site for the majority of new construction at NAF El Centro, including the construction of the hangar, engine test cell, and supply warehouse. *Mitigation 1.* To avoid impacts to western burrowing owls, a biologist would conduct a pre-construction survey within the disturbed habitat to ensure that no burrowing owls are nesting in the area. If burrowing owls were found at the site, they would be relocated elsewhere on the base. Implementation of these mitigation measures would reduce the impact to a less than significant level.
Hydrology/Surface Water Quality		
No significant impacts are expected.	No significant impacts are expected.	No significant impacts are expected.
Land Use and Airspace		
No significant impacts are expected.	No significant impacts are expected.	*Impact 1: Consistency with AICUZ land use compatibility guidelines: noise.* A significant and mitigable impact would occur at NAF El Centro from locating the BEQ, the Child Development Center, and the AEWWINGPAC Administration Building in areas incompatible with AICUZ noise restrictions. No other feasible sites have been identified for these buildings. These facilities would be in areas of 75-dB CNEL or greater and would be clearly incompatible land uses. *Mitigation 1.* Incorporation of noise attenuation measures into facility design would bring these uses into compliance with the adopted goals and objectives of the AICUZ program. Implementation of this mitigation would reduce the impact to a less than significant level.

Table 2-10
Summary of Significant Environmental Impacts and Mitigations *(continued)*

REALIGNMENT ALTERNATIVES		
NAWS Point Mugu (Preferred Alternative)	**NAS Lemoore**	**NAF El Centro**
		Impact 2: Exceedance of imaginary surface restrictions. A significant and mitigable impact would occur at NAF El Centro from locating E-2 facilities within the helicopter imaginary surface restrictions. (See Chapter 11, Glossary for a definition of imaginary surfaces.) The proposed aircraft hangar, aircraft parking apron, OTF, AIB, AIMD facilities, and AEWWINGPAC administration building would exceed the helicopter imaginary surface at the end of Runway 3. *Mitigation 1.* The only suitable location to construct these facilities is in the helicopter approach; therefore, the Navy would modify the approach-departure path of the helicopter pad to avoid the new structures. Implementation of this mitigation would reduce the impact to a less than significant level.
Socioeconomics		
No significant impacts are expected.	No significant impacts are expected.	No significant impacts are expected.
Traffic and Circulation		
No significant impacts are expected.	No significant impacts are expected.	No significant impacts are expected.
Air Quality		
Impact 1: Clean Air Act Conformity. A significant and mitigable impact would result from increases in the emissions of ozone precursors at NAWS Point Mugu. Emission sources under Navy control would result in incremental emission increases that exceed the 25-ton-per-year *de minimis* threshold for ozone precursors in Ventura County. Conformity-related ozone precursor emissions would be 31.9 tons per year of reactive organic compounds and 49.2 tons per year of nitrogen oxides. *Mitigation 1.* Significant reductions have occurred in activity levels at NAWS Point Mugu since 1990, resulting in fewer emissions. The emission reductions for ozone precursors (reactive organic compounds and nitrogen oxides) more than offset the emissions increases associated with the E-2 realignment.	*Impact 1: Clean Air Act Conformity.* A significant and mitigable impact would result from increases in the emissions of ozone precursors at NAS Lemoore. Emission sources under Navy control would result in incremental emission increases that exceed the 50-ton-per year *de minimis* threshold for ozone precursors in the San Joaquin Valley. Conformity-related ozone precursor emissions would be 31.4 tons per year of reactive organic compounds and 52.3 tons per year of nitrogen oxides. *Mitigation 1.* The ozone SIP for the San Joaquin Valley anticipated increases in aircraft activity at NAS Lemoore that have not occurred. The forecasted increase in nitrogen oxide emissions (65.7 tons per year) exceeds the increase in nitrogen oxide emissions associated with the E-2 realignment action (52.3 tons per year).	No significant impacts are expected.

Table 2-10
Summary of Significant Environmental Impacts and Mitigations *(continued)*

REALIGNMENT ALTERNATIVES		
NAWS Point Mugu (Preferred Alternative)	**NAS Lemoore**	**NAF El Centro**
Impact 2: Overall Emissions of Nonattainment Pollutants. A significant and mitigable impact would result from increases in the overall emissions of ozone precursors. Overall emissions of ozone precursors are estimated to be 46.9 tons per year of reactive organic compounds and 72.7 tons per year of nitrogen oxides.	*Impact 2: Overall Emissions of Nonattainment Pollutants.* A significant and mitigable impact would result from increases in the overall emissions of ozone precursors. Overall emissions of ozone and PM_{10} precursors are estimated to be 46.0 tons per year of reactive organic compounds, 76.1 tons per year of nitrogen oxides, and 68.1 tons per year of PM_{10}. The overall emission increases for reactive organic compounds and PM_{10} are below the relevant conformity *de minimis* levels, and thus are less than significant. The incremental emissions increase for nitrogen oxides exceeds the relevant *de minimis* level.	
Mitigation 2. NAWS Point Mugu has experienced significant emission reductions since 1990. Emission reductions for ozone precursors more than offset the overall emissions increases associated with the E-2 realignment action.	*Mitigation 2.* The ozone SIP for the San Joaquin Valley already accounts for most of the nitrogen oxide emissions increase that would occur. Part of the remaining increase would be accounted for when SIP emission forecasts are updated to include all stationary sources with permits from the APCD. At least a portion of the remaining increase is accounted for within the SIP's generalized population growth forecasts (and associated vehicle travel and household emission sources).	
Noise		
No significant impacts are expected.	No significant impacts are expected.	No significant impacts are expected.
Aesthetics and Visual Resources		
No significant impacts are expected.	No significant impacts are expected.	No significant impacts are expected.
Utilities and Services		
Impact 1: Schools. A potential impact to schools would occur due to the action at NAWS Point Mugu, but would be mitigated by federal payments to the school districts. Federal agencies affect local schools districts either through federal ownership of property in the district (federal property is tax-exempt and may decrease funds available for education), or by adding "federally-connected children" to the number of students that would ordinarily need to be educated by local school districts. Federally-connected children include those who (1) live and have parents who work on federal property and (2) those who either live on federal property or have parents who work on federal property. With the NAWS Point Mugu Alternative, the highest demand on the local school system would occur in 1999 (due to construction and operations occurring simultaneously at their	*Impact 1: Schools.* A potential impact to schools would occur due to the action at NAS Lemoore, but would be mitigated by federal payments to the school districts. Area schools are either near or over capacity. In many cases portable classrooms have been added to the school sites. With this alternative, the highest demand on the local school system would occur in 1999 (due to construction and operations occurring simultaneously at their peak) when an additional 441 students would attend schools in the vicinity of the base. In the year 2001 and beyond, it is expected that approximately 416 students would attend school in the vicinity of the base. (There are more students in 1999 under the NAS Lemoore Alternative than under the NAWS Point Mugu alternative because there is more construction at NAS	No significant impacts are expected.

Table 2-10
Summary of Significant Environmental Impacts and Mitigations *(continued)*

REALIGNMENT ALTERNATIVES		
NAWS Point Mugu (Preferred Alternative)	**NAS Lemoore**	**NAF El Centro**
peak) when an additional 429 students would attend schools in the vicinity of the base. In the year 2001 and beyond, it is expected that approximately 417 students would attend schools in the vicinity of the base. All affected schools in Ventura County are operating over design and expansion capacity.	Lemoore and, therefore, more additional students from construction worker families.)	
Mitigation 1. School districts may be eligible for compensation for the addition of Federal students by impact aid, which is intended to compensate local school districts for burdens placed on their resources by Federal activity. Schools must apply for impact aid and funds are paid directly by the Department of Education (US Department of Education 1995). Implementation of this mitigation would reduce the level of impact to one that is less than significant.	*Mitigation 1.* Mitigations for schools would be similar to those under the NAWS Point Mugu alternative. School districts may be eligible for compensation for the addition of federally connected students by direct payment of impact aid funds. Implementation of this mitigation would reduce the impact to a less than significant level.	
Cultural Resources		
Impact 1: Prehistoric subsurface deposits. A significant and mitigable impact to potentially NRHP-eligible subsurface deposits could occur during ground disturbing activities at NAWS Point Mugu. Subsurface prehistoric deposits may exist under fill soil at depths of 1 meter (3 feet) to 4 meters (12 feet).	No significant impacts are expected.	No significant impacts are expected.
Mitigation 1. Any contract, lease, or permit for ground-disturbing activities at NAWS Point Mugu in conjunction with the implementation of the proposed action at NAWS Point Mugu would include a requirement to halt work in the event of a discovery of archaeological materials. In such an event, the Contracting Officer would be notified immediately, and the Base Archaeologist allowed to document and evaluate the resource before work in the discovery area continues (in compliance with Section 106 of the NHPA). Implementation of this mitigation measure would reduce the impact to a less than significant level.		
Public Health and Safety		
No significant impacts are expected.	No significant impacts are expected.	No significant impacts are expected.
Hazardous Materials and Wastes		
No significant impacts are expected.	No significant impacts are expected.	No significant impacts are expected.

3.0 Affected Environment

3.	**AFFECTED ENVIRONMENT**	**3-1**
	3.1 Biological Resources	3-1
	3.2 Hydrology/Surface Water Quality	3-22
	3.3 Land Use and Airspace	3-32
	3.4 Socioeconomics	3-61
	3.5 Traffic and Circulation	3-75
	3.6 Air Quality	3-88
	3.7 Noise	3-100
	3.8 Aesthetics and Visual Resources	3-113
	3.9 Utilities and Services	3-119
	3.10 Cultural Resources	3-135
	3.11 Public Health and Safety	3-143
	3.12 Hazardous Materials And Wastes	3-156

CHAPTER 3
AFFECTED ENVIRONMENT

This chapter contains descriptions of the existing environmental and socioeconomic conditions at each of the three proposed receiving bases which include Naval Air Weapons Station (NAWS) Point Mugu (the Preferred Alternative), Naval Air Station (NAS) Lemoore, and Naval Air Facility (NAF) El Centro. The information in this chapter will serve as baseline data to identify and evaluate any potential impacts that could result from the proposed action. Baseline information is presented for the current year where this information is available or, in some cases, information from documents prepared in previous years.

A region of influence (ROI) has been identified and analyzed for each resource. An ROI is a geographic area in which environmental effects for that resource would be most likely to occur. The affected environment is described for biological resources, hydrology/surface water quality, land use and airspace designations, socioeconomics, traffic and circulation, air quality, noise, aesthetics and visual resources, utilities and public services, cultural resources, public health and safety, and hazardous materials and wastes.

3.1 BIOLOGICAL RESOURCES

This section describes the biological resources for the three alternative bases. The discussion of biological resources includes vegetation, wildlife, special status species, sensitive habitats, and, where appropriate, marine mammals. Due to its marine location, the NAWS Point Mugu alternative includes a discussion of marine resources.

Definition of Resource

For the purpose of this report, biological resources are defined as all plant and animal species that occur within the proposed project sites. Plant associations or recognizable floristic groupings or "plant communities" are referred to as habitat types in this report, and vegetation and wildlife associated with the groupings are described. Sensitive biological resources are defined as those plant and animal species that are listed as threatened or endangered by the United States Fish and

Wildlife Service (USFWS) or California Department of Fish and Game (CDFG), species proposed for federal or state listing, and other species specifically protected by applicable laws. Also included as sensitive species are those listed by the California Native Plant Society (CNPS). Sensitive vegetation types and wildlife habitat include those that receive federal regulatory protection. Sensitive marine life includes marine mammals protected by the National Marine Fisheries Service (NMFS) and the Marine Mammal Protection Act (MMPA) of 1972.

Approach to the Analysis

Biological resource data were collected from existing reports as described for each base and from field investigations. Nomenclature used throughout this report conforms to Hickman (1993) for plants, Holland (1986) for plant communities, Farrand (1985) for birds, Stebbins (1985) for reptiles and amphibians, and Jones et al. (1992) and Ingles (1965) for mammals.

Special status species were identified by querying the California Natural Diversity Database, an electronic database of the CDFG (1997), and the Electronic Inventory, an electronic database for the California Native Plant Society (Skinner and Pavlik 1994). Sensitive plant communities and wildlife habitat include those that receive federal regulatory protection. Sensitive marine life includes marine mammals protected by the NMFS and the MMPA of 1972. In addition, field investigations were conducted on July 28 to August 1, 1997 to verify information contained in the reference documents and to identify any significant resources not indicated.

Region of Influence

Biological resources at each base and in the surrounding areas can be affected by development plans for each base, as well as associated aircraft operations. The impacts associated with the aircraft operations at each base can extend up to one mile (1.6 kilometers) from the base's airfield, based on noise levels above 75 dB from aircraft operations. Therefore, the ROI for aircraft operations associated with the proposed action will include biological resources within one mile (1.6 kilometers) of the bases being considered and the ROI for development will include resources within each base's boundaries.

3.1.1 Preferred Alternative: NAWS Point Mugu

This section describes the biological resources for NAWS Point Mugu. The discussion of biological resources includes vegetation types, wildlife, special status species, and sensitive habitats.

Vegetation

The vegetation found within NAWS Point Mugu consists of over 250 species of plants. The NAWS Point Mugu Natural Resources Summary Report (US Navy 1996b) identified four habitat types potentially affected by the proposed action at NAWS Point Mugu. These are described below.

Developed and landscaped areas. Vegetation in the developed and landscaped areas consists of ornamental trees, shrubs, and lawns near buildings in the NAWS Point Mugu developed areas. Little native vegetation exists in these areas.

Disturbed/ruderal areas. These areas include roadways, areas of bare sand, and disturbed lands with vegetation. Plant species observed within these disturbed areas include Bermuda grass (*Cynodon dactylon*), ice plant (*Mesembryanthemum edule*), wild oat (*Avena fatua*), foxtail (*Hordeum jubatum*), ripgut brome (*Bromus rigidus*), black mustard (*Brassica nigra*), coyote brush (*Baccharis pilularis*), and white sweet-clover (*Melilotus albus*). Ice plant generally dominates disturbed sites with sandy soils closer to the coast at NAWS Point Mugu, while grasses dominate the sites that are located further inland.

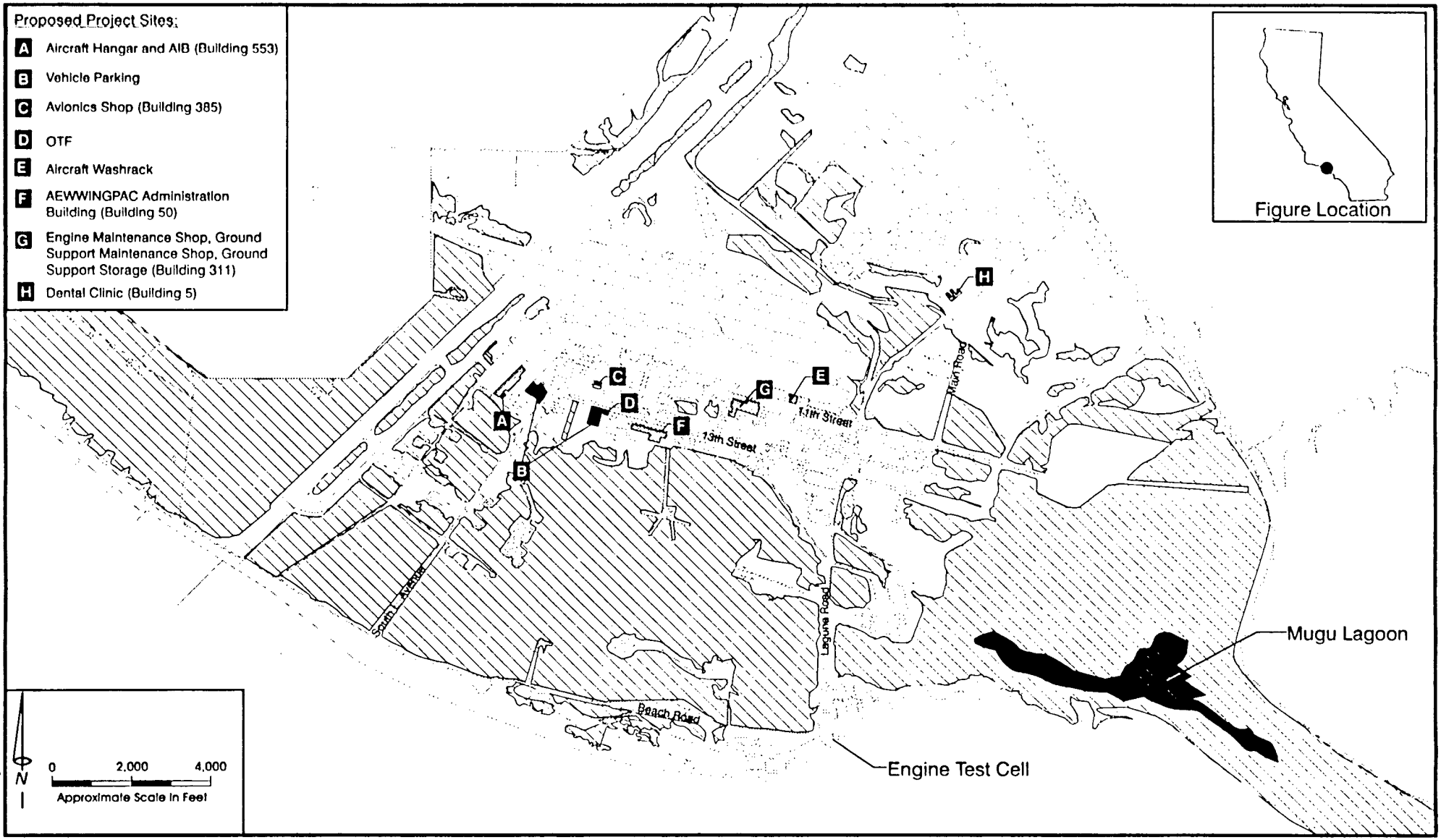
Saltmarsh wetland. The 2,500-acre (1,011-hectare) saltmarsh wetland (Figure 3-1) is the most significant biological resource on base. It includes Mugu Lagoon, which encompasses 580 acres (235 hectares) of subtidal water areas. Mugu Lagoon, the largest saltmarsh ecosystem left in southern California, is an important food, nursery, shelter, and breeding area for over 190 species of benthic invertebrates, 200 species of birds, and 40 species of fish, and the flora consists of over 250 species of plants (Keeney, et al. 1996; Saiki 1994; Onuf 1987). Freshwater from Calleguas Creek and tidal flows provides a rich nutrient source that serves as a base for the food web of the lagoon and offshore biota.

The saltmarsh wetland found within NAWS Point Mugu can be divided into two zones: the lower and upper marsh. The lower marsh is characterized by longer and more frequent periods of tidal inundation than the upper marsh. Common pickleweed (*Salicornia virginica*) is the dominant species in both the lower and upper marsh zones. Cordgrass (*Spartina foliosa*) is also present in the lower marsh zone. The upper marsh is a more diverse vegetation community than the lower marsh. In addition to common pickleweed, marsh rosemary (*Limonium californicum*), alkali heath (*Frankenia grandifolia*), jaumea (*Jaumea carnosa*), saltwort (*Batis maritima*), arrow-grass (*Triglochin concinna*), sea-blite (*Suaeda californica*), and annual pickleweed (*Salicornia bigelovii*) are found in the lower marsh (US Navy 1996b).

Drainage ditches/levee areas. The drainage ditches within NAWS Point Mugu are generally filled with brackish water, and many are influenced by tidal flow from Mugu Lagoon (Figure 3-1). Wetland species observed in these areas include cattail (*Typha* sp.), bulrush (*Scirpus* sp.), mulefat (*Baccharis viminea*), and pickleweed, and are generally found in thin strips along the edges of the ditch.

Wildlife

Developed and landscaped areas. Wildlife associated with the developed and landscaped areas of NAWS Point Mugu includes rabbit (*Sylvilagus* sp.); black-tailed jack rabbit (*Lepus californicus*); striped skunk (*Mephitis mephitis*), and a number of



R:\0544\mugu\wetsm.cdr - 10/31/97 - MY

Saltmarsh wetlands are distributed throughout NAWS Point Mugu and includes Mugu Lagoon, the largest saltmarsh system in southern California.

LEGEND:

- Wetland areas
- Construction/Expansion
- Renovation

NAWS Point Mugu Wetland Areas

E-2 Aircraft Squadrons Realignment EIS
NAWS Point Mugu, California

Source: NAWS Point Mugu GIS data/Advanced Resources Tech Lab University of Arizona.

Figure 3-1

rodents, such as ground squirrels (*Spermophilus beecheyi*); voles (*Microtus californicus*); gophers (*Thomomys bottae*); and mice (*Mus musculus*). Birds found in this area are typical of those found in urban areas. Common species include mourning dove (*Zenaida macroura*), house sparrow (*Passer domesticus*), house finch (*Carpodacus mexicanus*), European starling (*Sturnus vulgaris*), rock dove (*Columba livia*), and Brewer's blackbird (*Euphagus cyanocephalus*).

Disturbed/ruderal areas. Overlap in habitat use exists between developed/landscaped and disturbed/ruderal areas. Therefore, many of the species listed above are commonly found in disturbed/ruderal areas. A species that is less tolerant of human disturbance may also be found in these areas as well, including coyotes (*Canis latrans*). Other species include ground squirrels, red-tailed hawk (*Buteo jamaicensis*), American kestrel (*Falco sparverius*), western kingbird (*Tyrannus verticalis*), mourning dove, western meadowlark (*Sturnella neglecta*), and lark sparrow (*Chondestes grammacus*).

Saltmarsh wetland. The saltmarsh wetland provides habitat for many wildlife species associated with wetlands. Some of the more common species include muskrat (*Ondatra zibethica*), striped skunk, American avocet (*Recurvirostra americana*), sandpipers (*Calidris* spps.), great blue heron (*Ardea herodias*), great egret (*Casmerodius albus*), black-necked stilt (*Himantopus mexicans*), waterfowl, and several special status species described below. Mugu Lagoon also supports a resident population of harbor seals (*Phoca vitulina*). These are described in more detail in the following section.

Drainage ditch/levee areas. The drainage ditches create a connection to the interior area of NAWS Point Mugu and contain some of the fishes found in tidal wetland areas. Common wildlife species occurring here include those species that feed on the small fish, including the American bittern (*Botaurus lentiginosus*), great egret (*Casmerodius albus*), snowy egret (*Egretta thula*) and western aquatic garter snake (*Thamnophis couchi*). Other common species associated with this habitat include skunk (*Mephitis* sp.), opossum (*Didelphis marsupialis*), muskrat, American coot (*Fulica Americana*), and pond turtle (*Clemmys marmorata*).

Aquatic and Marine Resources

Mugu Lagoon is the largest estuary in southern California, and the open water and intertidal wetlands support over 40 species of fish (Onuf 1987). The most common species found in the shallow water and tidal wetlands include topsmelt (*Atherinops affinis*), California killifish (*Fundulus parvipinnis*), western mosquitofish (*Gambusia affinis*), arrow goby (*Clevelandia ios*), Pacific staghorn sculpin (*Leptocottus armatus*), and arroyo chub (*Gila orcutti*) (Saiki 1994). Common species found in the deeper waters include topsmelt, Pacific staghorn sculpin, California killifish, shiner surfperch (*Cymatogaster aggregata*), diamond turbot (*Hypsopsetta guttulata*), bay pipefish (*Sygnathus leptorhynchus*), California halibut (*Paralichthys californicus*), and longjaw mudsucker (*Gillichthys mirabilis*) (Saiki 1994). Most of the smaller species of fish serve as a food source for many bird

species found at NAWS Point Mugu, including the California least tern and California brown pelican, both special status species.

The waters immediately off of NAWS Point Mugu support a wide diversity of sea life. This includes mobile biota such as macroinvertebrates and fish. Marine mammal species in this area include various dolphin species and gray whales (*Eschrichtius robustus*). Inshore dolphin species mainly consist of the common dolphin (*Delphinus delphis*), the Pacific bottlenose dolphin (*Tursiops truncatus*), and on occasion, Risso's dolphins (*Grampus griseus*). Gray whales regularly migrate both northward and southward within one mile (1.6 kilometers) offshore at NAWS Point Mugu and the runways. Incidental individual California Sea Lions (*Zalophus californianus*) are known to occur in the waters off of Point Mugu, but no consistent rookeries or haul-outs are present. There is a large population of harbor seals located on mud flats found within the central basin of the Point Mugu base, i.e. at Mugu Lagoon. The area is known as harbor seal flats. The population varies in size from approximately 180 animals in the winter to as many as 350 in the breeding season (March through July). This is the second largest harbor seal population south of Pt. Conception on the mainland coast. There are normally a small number of harbor seal pups, 20 to 35, born each year. (Keeney 1997). These animals are habituated to overflight noise and typically remain undisturbed as long as aerial operations are above 500 feet. (This limit applies to all fixed-wing craft.)

Sensitive Habitat

Sensitive habitats are natural plant communities and wildlife habitat that are protected by federal or state law, local ordinance, or policies of land management agencies. Wetlands are considered important to the public interest because they perform significant biological functions, such as providing nesting, breeding, foraging and spawning habitat for a wide variety of resident and migratory animal species (US Army Corps of Engineers [COE] Regulatory Program Regulations, 33 CFR 320.4). The wetlands of NAWS Point Mugu, shown on Figure 3-1, are considered jurisdictional wetlands by the US Army Corps of Engineers, and are recognized sensitive habitat. Wetlands also qualify as sensitive habitat under CDFG and USFWS, which have "no net loss" policies for wetlands. The Navy has a "no net loss" policy on wetlands as well.

Wetlands defined as jurisdictional wetlands by the COE are "those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas" (33 CFR 328.3(b); 1984). All wetlands meeting this definition, which include all the wetlands shown on Figure 3-1, are protected from dredge or fill activities under Section 404 of the Clean Water Act.

Special Status Species

The ranges of six state and five federally listed endangered species, one federally threatened species and three species of federal concern are known to include NAWS Point Mugu. In addition, a few marine mammals are found at the site. Table 3-1 describes the status and potential presence at NAWS Point Mugu for threatened and endangered species, and species of special concern that were identified by the USFWS (Appendix B). Western burrowing owl (*Athene cunicularia hypugea)* and Belding's savanna sparrow (*Passerculus sandwichensis beldingi)* are also included in the table because they are known to be present at NAWS Point Mugu. Although included in the USFWS letter (Appendix B), the island night lizard (*Xantusia riversiana)* is indigenous only to San Nicholas Island and not the mainland, and consequently does not appear on Table 3-1. The Western snowy plover (*Charadrius alexandrinus nivosus*) has been identified on the base and a species report is currently being prepared. This species is associated with sandy beaches, alkaline flats, and occasionally mudflats. Portions of NAWS Point Mugu are included in the proposed critical habitat for the snowy plover.

Table 3-1
Sensitive Species Known to Inhabit or Potentially Inhabit the Vicinity of NAWS Point Mugu

Scientific Name	Common Name	Federal/State/ CNPS Status	Present on Project Site?
Mammals			
Phoca vitulina	Harbor seal	*MMPA	C
Eschrichtius robustus	Gray whale	*MMPA	CO
Zalophus californianus	California sea lion	*MMPA	P
Delphinus delphis	Common dolphin	*MMPA	P
Tursiops truncatus	Bottlenose dolphin	*MMPA	P
Grampus griseus	Rissos's dolphin	*MMPA	P
Birds			
Athene cunicularia hypugea	Western burrowing owl	SC/CSC/-	C
Charadrius alexandrinus nivosus	Western snowy plover	T/CSC/-	C
Falco peregrinus anatum	American peregrine falcon	E/E/-	C
Passerculus sandwichensis beldingi	Belding's savanna sparrow	SC/E/-	C
Pelecanus occidentalis californicus	California brown pelican	E/E/-	C
Rallus longirostris levipes	Light-footed clapper rail	E/E/-	C
Sterna antillarum brownii	California least tern	E/E/-	C
Plants			
Cordylanthus maritimus maritimus	Salt marsh bird's beak	E/E/1B	C
Astragalus pycnostachyus var. lanosissimus	Ventura marsh milk-vetch	SC/-/1A	U

Source: USFWS 1997a; Skinner and Pavlik 1994; Biosystems Associates 1994.

Notes:

Federal Status
E = Endangered
T = Threatened
PE = Proposed endangered
PT = Proposed threatened
C = Candidate
SC= Species of concern

State/CDFG Status
E = Endangered
T = Threatened
R = Rare
CSC = California species of special concern
*MMPA = Sensitive Species protected under the Marine Mammal Protection Act of 1972

CNPS Status
1A = Presumed extinct in Calif.
1B = Rare and endangered in California and elsewhere
4 = Limited distribution

Present?
C = Confirmed
CO = Confirmed Offshore
P = Possible
U = Unlikely

The California least tern (*Sterna antillarum brownii*), California brown pelican (*Pelecanus occidentalis californicus*), light-footed clapper rail (*Rallus longirostris levipes*), and American peregrine falcon (*Falco peregrinus anatum*), are federally and state listed as endangered. The light-footed clapper rail occupies coastal saltmarsh within NAWS Point Mugu and is known to exist in habitat on the southern portion of the base. American peregrine falcon, a common winter resident of the area, does not nest at NAWS Point Mugu, but feeds on shorebirds and small ducks in the area. California brown pelican roosts and feeds in Mugu Lagoon (Keeney et al. 1996). California least tern nests on the sandy areas on Ormond Beach, located on the base (Figure 3-2). The saltmarsh bird's beak (*Cordylanthus maritimus maritimus*), a federally and state listed endangered species, exists within the coastal saltmarsh habitat of NAWS Point Mugu (Figure 3-2). Several species of marine mammals occur both on the coastline at Point Mugu and in the waters offshore of the base. All marine mammals have special protected status. Belding's savannah sparrow, a resident of coastal saltmarsh, is designated by the State of California as an endangered species, and is a federal species of concern. Within NAWS Point Mugu, habitat for this species covers roughly 50 percent of the base (Figure 3-2).

Western burrowing owl is also a federal species of concern. The majority of winter roosting habitat for burrowing owl occurs from the end of October through mid-March in the area near where Operational Trainer Facility (OTF) vehicle parking is planned near 13th Street and Photo Road (see Figure 3-2) (Keeney 1997). NAWS Point Mugu contains more than half of the winter roosting population of burrowing owls found within Ventura and Santa Barbara counties (Keeney 1997).

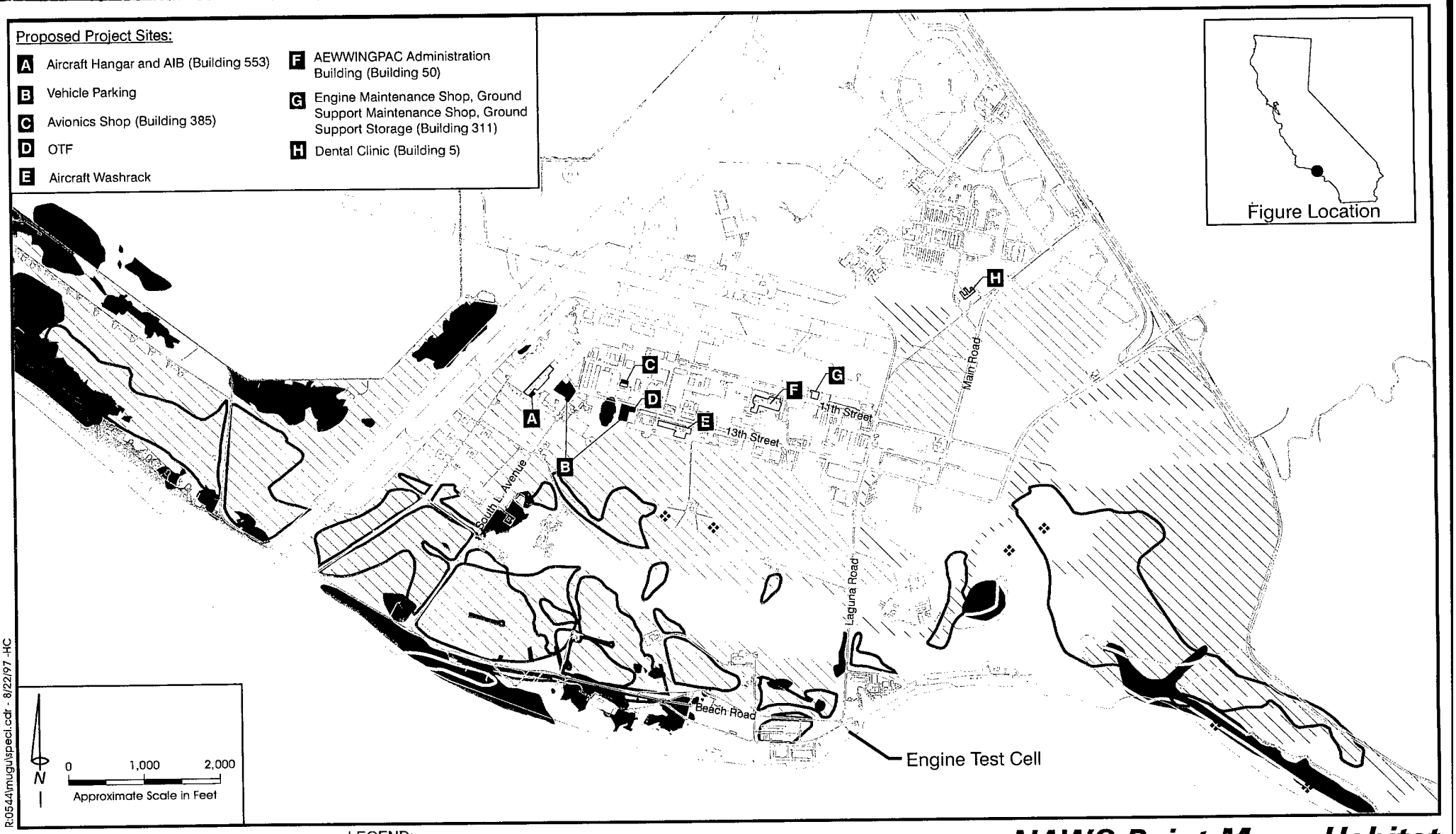
3.1.2 NAS Lemoore Alternative

This section describes the biological resources for NAS Lemoore Operations and Administration/Housing areas only. These are the only areas where there is a potential for impacts. The discussion of biological resources includes vegetation types, wildlife, special status species, and sensitive habitats. The Natural Resources Management Plan for NAS Lemoore (US Navy 1990e) identifies the habitat types found within these areas of the base. These habitat types are described below.

Vegetation

Buildings, roads, parking lots, landscaped areas, and disturbed annual grasslands cover most of NAS Lemoore administrative, housing, and operations areas. Agricultural lands, with little or no native vegetation, surround the developed areas. Wetlands are found associated with the irrigation and drainage ditches in the agricultural areas and in the Sunset Lakes area in the northeast corner of the property.

Developed and landscaped lands. The vegetation in the developed and landscaped areas of NAS Lemoore consists of ornamental trees, shrubs, and small lawn areas near selected buildings. Representative trees and shrubs found within the



Potential habitat for selected special status species occurs mostly on undeveloped portions of the base. Peregrine falcons hunt over most of NAWS Point Mugu. California brown pelicans forage mainly in coastal waters and in the southeastern waters of the base.

LEGEND:

- Salt Marsh Bird's Beak (Cordylanthus) Areas
- Belding's Savannah Sparrow Habitat
- California Least Tern Foraging Habitat
- Potential western snowy plover areas
- Burrowing Owl Winter Roosting Habitat
- Peregrine falcon perch sites
- Construction/Expansion
- Renovation
- California brown pelican roost areas (boundary area only)
- Light footed Clapper Rail (boundary area only)
- Potential and Known California Least Tern Nesting Habitat

Source: NAWS Point Mugu GIS data/Advanced Resources Tech Lab University of Arizona.

NAWS Point Mugu Habitat for Special Status Species

E-2 Aircraft Squadrons Realignment EIS
NAWS Point Mugu, California

Figure 3-2

R:\0544\mugu\speci.cdr - 8/22/97 -HC

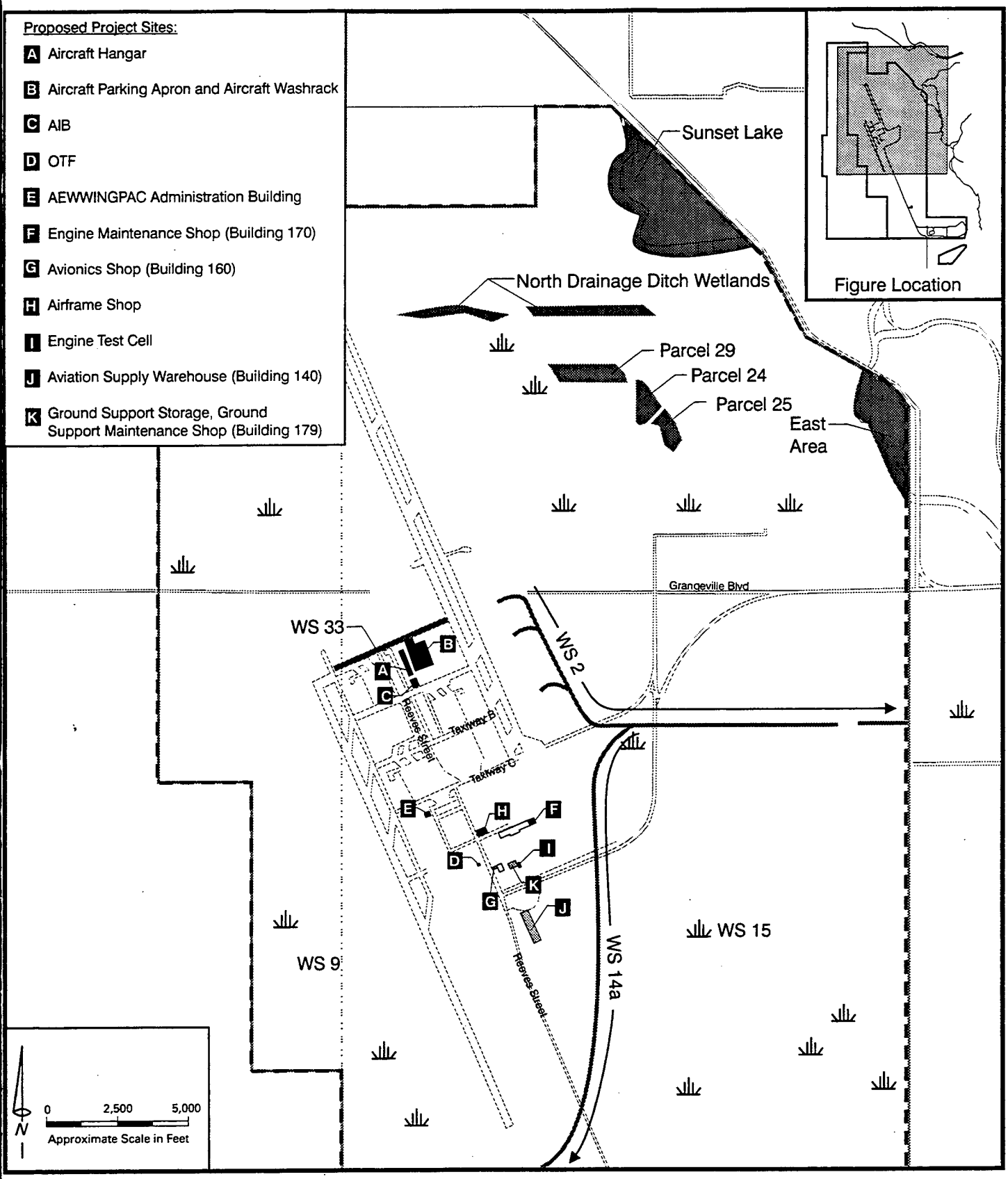
operations area include Washingtonian palms (*Washingtonian sp.*), honey locust (*Gleditsia triacanthos inermis*), black locust (*Robinia pseudo-acacia*), oleander (*Nerium oleander*), and pyracantha (*Pyracantha* sp.). Small lawn areas are planted with Bermuda grass (*Cynodon dactylon*). The administration area includes Juniper (*Juniperus* sp.), fir (*Abies* sp.), pine (*Pinus* sp.), incense cedar (*Libocedrus decurrens*), tamarisk (*Tamarix sp.*), acacia (*Acacia* sp.), honey locust, ash (*Fraxinus* sp.), olive (*Olea* sp.), eucalyptus (*Eucalyptus* sp.), Fremont cottonwood (*Populus fremonti*), poplar (*Populus* sp.), willow (*Salix* sp.), sycamore (*Platanus* sp.), Washington palm, palo ornamental fruit trees (*Cercidium* sp.), palo verde (*Cercidium torreyanum*), crape-myrtle (*Lagerstroemia indica*), and pomegranate (*Punica granatum*). There are few native plant species found in these areas.

Disturbed annual grassland. Disturbed annual grasslands surround the developed areas and are found almost entirely associated with the administrative area. These areas are mowed and plowed annually to reduce the threat of fire. The plants found in these areas include canary grass (*Phalaris canariensis*), barley (*Hordeum stebbinsi*), foxtail chess (*Bromus madritensis*), fiddleneck (*Amsinckia* sp.), Russian thistle (*Salsola pestifer*), wild oats, vinegar weed (*Trichostema lanceolatum*), and sweet fennel (*Foeniculum vulgare*).

Agricultural. Cotton is the largest agricultural crop grown on NAS Lemoore. Other crops grown include barley, wheat, sugar beets, alfalfa, field corn, tomatoes, beans, onions, garlic, safflower, and melons. There is very little natural vegetation in the agricultural areas as the fields are plowed to the edge of roads and irrigation ditches. Plant species common to the disturbed grassland are sparsely distributed along dirt access roads and ditches and some species common to the wetland areas can be found in the irrigation ditches or near well heads.

Wetlands. Wetlands found at the NAS Lemoore site are described in the Wetland Identification and Classification Report (Tetra Tech 1996). Forty-three wetland sites were found to occur on the NAS Lemoore site (Figures 3-3 and 3-4). Nearly all of the wetlands on NAS Lemoore are associated with irrigated agriculture, primarily at the location of Westlands Water District irrigation valves and ditches. All but two wetland areas occur in man-made excavations. Five of the inventoried wetlands are of sufficient size and permanence to be of significance to wildlife of the area. While the remaining wetlands do have hydrophytes growing within them, the hydrology of the area does not naturally provide a sufficient water source for them to be of significance to wildlife. Sufficient water occurs in these locations only as seepage from irrigation pipes or pumped irrigation water.

Only three wetlands occur near the operations area of the NAS Lemoore site; however, none occurs in or directly adjacent to proposed project locations. No wetlands occur within the Administration/Housing area of the NAS Lemoore site. Wetland sites 2, 33 and 9 are located within or partially within the boundary of the operations area (Figure 3-3). Wetland site 2 consists of the main drainage



Wetland areas are scattered throughout adjacent agricultural outlease lands.

LEGEND:

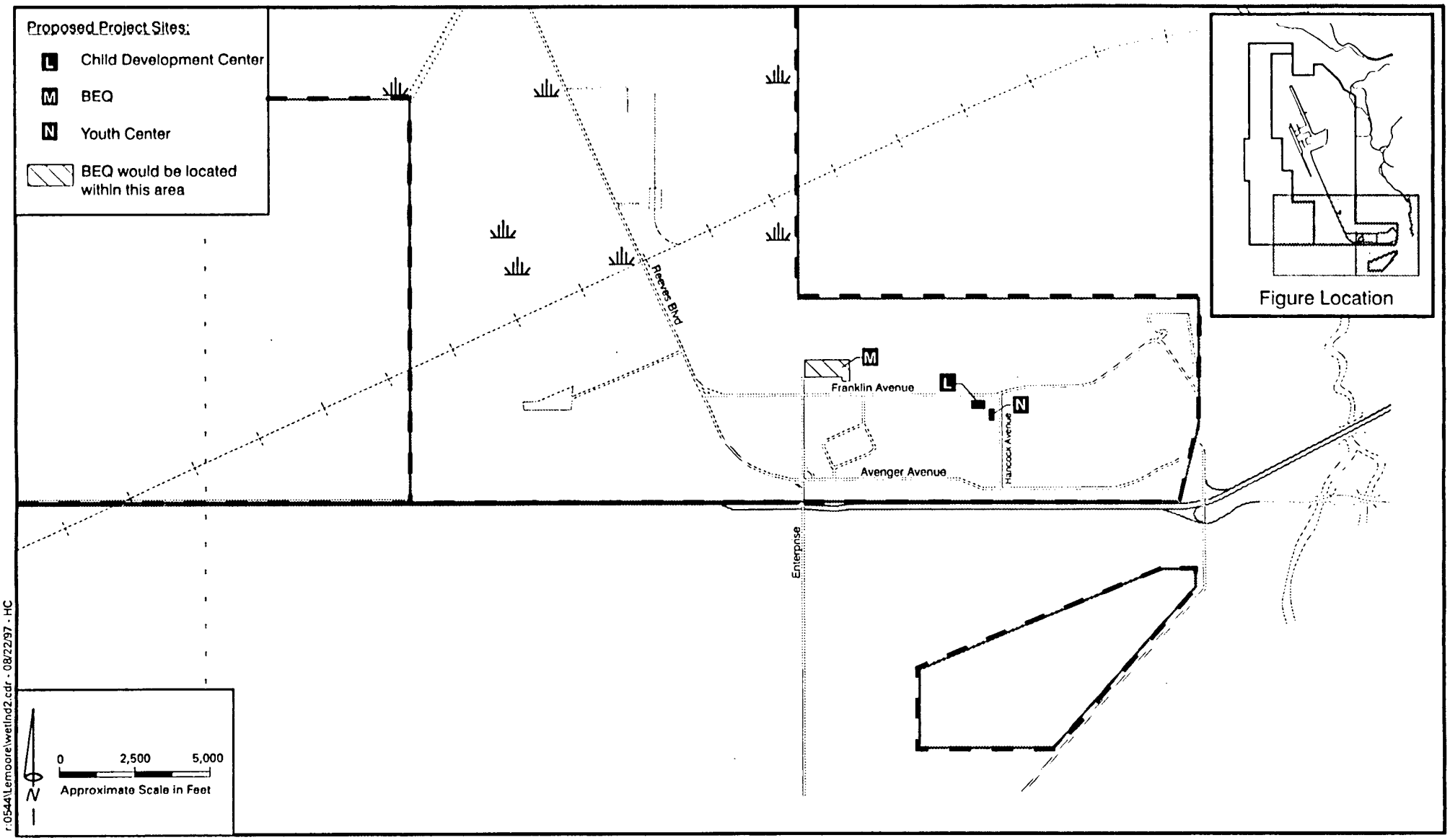
- Wetland areas
- Other wetland areas
- Construction/Expansion
- Installation Boundary

NAS Lemoore Wetland Areas: Operations Area

E-2 Aircraft Squadrons Realignment EIS
NAS Lemoore, California

Source: US Navy GIS Data Crane, 1997; Donn 1997.

Figure 3-3



r:\0544\Lemoore\wetlnd2.cdr - 08/22/97 - HC

Wetland areas in the NAS Lemoore administration/ housing area occur primarily in the vicinity of the proposed BEQ.

LEGEND:

- Wetland areas
- Other wetland areas
- Construction/Expansion
- Installation Boundary

NAS Lemoore Wetland Areas: Administration/Housing Area

E-2 Aircraft Squadrons Realignment EIS
NAS Lemoore, California

Figure 3-4

ditch, running southeast to east along the northeast and east side of Runway 32-R. This wetland site alternates between open water and freshwater marsh habitat. It is heavily overgrown, with the bank edges lined by such freshwater marsh species as cattails, umbrella sedge (*Cyperus* sp.), curly dock (*Rumex crispus*), rabbitfoot beard grass (*Polypogon monspeliensis*), blueweed (*Helianthus ciliaris*), narrow-leaf milkweed (*Asclepias fascicularis*), sea-blite (*Suaeda moquini*), foxtail chess (*Bromus madritensis rubens*), saltgrass (*Distichlis spicata*), and alkali-mallow (*Malvella leprosa*). The main drainage ditch carries run-off from the flight operations area and agricultural land across NAS Lemoore in an easterly direction to the Kings River. Although no proposed project actions are planned in this area, this wetland site has been declared an Installation Restoration (IR) site, due to trapped sediments and heavy metal residuals from numerous years of aircraft washdowns.

Wetland site 33 consists of a drainage ditch that runs between taxiways 32-R and 32-L at the north end of the operations area. This wetland site alternates between open water and freshwater marsh habitat. The dominant vegetation within the ditch includes blueweed, dallis grass (*Paspalum dilatatum*), and heliotrope (*Heliotropium* sp.), with additional plant species including bristly ox-tongue (*Picris echioides*), prickly sow thistle (*Sonchus asper*), and cocklebur (*Xanthium strumarium*). This ditch transports runoff to the Main Drainage Ditch.

Wetland site 9 consists of a small open water sump-pond located on the western side of NAS Lemoore operations area. The wetland contains cattails and water smartweed (*Polypogum amphibium*). Black willows (*Salix gooddingii*), tamarisk, heliotrope, bristly ox-tongue, dallis grass, and blueweed line the edges of the pond. This wetland site is located near the southwest corner of the operations area, well away and up slope of any proposed project sites within the area.

Wildlife

Wildlife species found at NAS Lemoore represent those common to the San Joaquin Valley and are described below by habitat type.

Developed and landscaped lands. Wildlife found in these areas are typical of urban areas and include house mouse (*Mus musculus*), roof rat (*Rattus rattus*), pocket gopher (*Thomomys* sp.), and California ground squirrel (*Spermophilus beecheyi*). Bird species found include mourning dove, house sparrow, house finch, European starling, rock dove, barn swallow (*Hirundo rustica*), and Brewer's blackbird.

Disturbed annual grassland. Mammals associated with this habitat type at NAS Lemoore include black-tailed jackrabbit (*Lepus californicus*), cottontail (*Sylvilagus auduboni*), coyotes, skunks, opossum and a number of rodents, such as ground squirrels, and the Fresno kangaroo rat (*Dipodomys nitratoides exilis*). Reptiles associated with this habitat type include western whiptail (*Cnemidophorus tigris*), western fence lizard (*Sceloporus occidentalis*), side-blotched lizard (*Uta stansburiana*), and gopher snake (*Pituophis melanoleucus*). Common bird species

found include the loggerhead shrike (*Lanius ludovicianus*), common raven (*Corvus corax*), western burrowing owl, and American kestrel.

Agricultural. Some 46 species of water and shore birds have been observed on the base, including a variety of herons, egrets, geese, ducks, plovers, sandpipers, and gulls (US Navy 1990e). These birds are most numerous during the winter and spring months and are most commonly associated with the agricultural and wetland areas. Thirteen species of raptors have also been seen on base. These include nine species of hawk and four species of owl, including the western burrowing owl. In addition, the agricultural areas support game birds such as dove, and ring-necked pheasant (*Phasianus colchicus*), and a wide variety of other birds, including red-winged blackbird, tricolored blackbird (*Agelaius tricolor*), and yellow-headed blackbird (*Xanthocephalus xanthocephalus*). Reptiles, amphibians, and mammals found here include those associated with the disturbed grassland, but at much lower populations.

Wetlands. Most amphibian and reptiles associated with wetland areas are confined to the irrigation and drainage ditches located on the base and the wetland areas in the northeast corner of the base. Common species include the California treefrog (*Hyla californiae*), bullfrog (*Rana catesbeiana*), western aquatic garter snake, and the common kingsnake (*Lampropeltis getulus*). Bird species commonly using the wetland areas include great blue heron, snowy egret, American coot, red-winged blackbird, and marsh wren.

Special Status Species

Table 3-2 describes status and presence at NAS Lemoore for threatened and endangered species and species of special concern that were identified by the USFWS (Appendix B). Seven federally listed endangered species, seven federally threatened species, nineteen species of federal concern, seven state listed endangered species, three state listed threatened species, and four state species of special concern occur in the vicinity and potentially could be present at NAS Lemoore. Figures 3-5 and 3-6 depict known special status species habitat at NAS Lemoore.

3.1.3 NAF El Centro Alternative

This section describes the biological resources for NAF El Centro. The discussion of biological resources includes vegetation types, wildlife, special status species, and sensitive habitats. The Integrated Natural Resources Management Plan for NAF El Centro (US Navy 1997f) and Draft EIS for the Proposed Closure of Naval Air Facility El Centro (US Navy 1990a) identify the habitat types found on base. These habitat types are described below.

Vegetation

Most of the lands at NAF El Centro have been heavily disturbed. Some areas are currently developed with structures or paved with a minimum of landscaping.

Table 3-2
Sensitive Species Known to Inhabit or Potentially Inhabit the Vicinity of NAS Lemoore

Scientific Name	Common Name	Federal/State/ CNPS Status	Present on Project Site?
Mammals			
Ammospermophilus nelsoni	Nelson's antelope ground squirrel	SC/-/-	P
Dipodomys ingens	giant kangaroo rat	E/E/-	U
D. nitratoides	Fresno kangaroo rat	E/E/-	C
D. nitratoides brevinasus	short-nosed kangaroo rat	SC/-/-	P
D. nitratoides nitratoides	Tipton kangaroo rat	E/E/-	C
Eumops perotis californicus	greater western mastiff bat	SC/-/-	P
Myotis ciliolabrum	small-footed myotis bat	SC/-/-	U
Myotis volans	long-legged myotis bat	SC/-/-	P
Myotis yumanensis	Yuma myotis bat	SC/-/-	P
Onychomys torridus tularensis	Tulare grasshopper mouse	SC/-/-	P
Perognathus inomatus	San Joaquin pocket mouse	SC/-/-	U
Plecotus townsendii townsendii	Pacific western big-eared bat	SC/-/-	P
Vulpes macrotis mutica	San Joaquin kit fox	E/T/-	P
Birds			
Athene cunicularia hypugea	western burrowing owl	SC/CSC/-	C
Branta canadensis leucopareia	Aleutian Canada goose	T/-/-	P
Buteo regalis	ferruginous hawk	SC/-/-	P
Charadrius alexandrinus nivosus	western snowy plover	T/CSC/-	P
Charadrius montanus	mountain plover	C/-/-	P
Empidonax traillii brewsteri	little willow flycatcher	SC/E/-	U
Falco peregrinus anatum	American peregrine falcon	E/E/-	P
Haliaeetus leucocephalus	bald eagle	T/E/-	P
Plegadis chihi	white-faced ibis	SC/-/–	C
Sterna antillarum brownii	California least tern	E/E/-	P
Reptiles			
Clemmys marmorata marmorata	northwestern pond turtle	SC/CSC/-	P
Clemmys marmorata pallida	southwestern pond turtle	SC/CSC/-	P
Crotaphytus (Gambelia) silus	blunt-nosed leopard lizard	E/-/-	P
Masticophis flagellum ruddocki	San Joaquin whipsnake	SC/-/-	P
Phrynosoma coronatum frontale	California horned lizard	SC/-/-	U
Thamnophis gigas	giant garter snake	T/T/-	P
Amphibians			
Rana aurora draytonii	California red-legged frog	T/CSC/-	U
Scaphiopus hammondii	western spadefoot toad	SC/CSC/-	U
Fish			
Hypomesus transpacificus	delta smelt	T/T/-	Unknown
Invertebrates			
Branchinecta lynchi	vernal pool fairy shrimp	T/-/-	P
Desmocerus californicus dimorphis	valley elderberry longhorn beetle	T/-/-	P
Lytta molesta	molestan blister beetle	SC/-/-	Unknown

Source: USFWS 1997b; CDFG 1994.

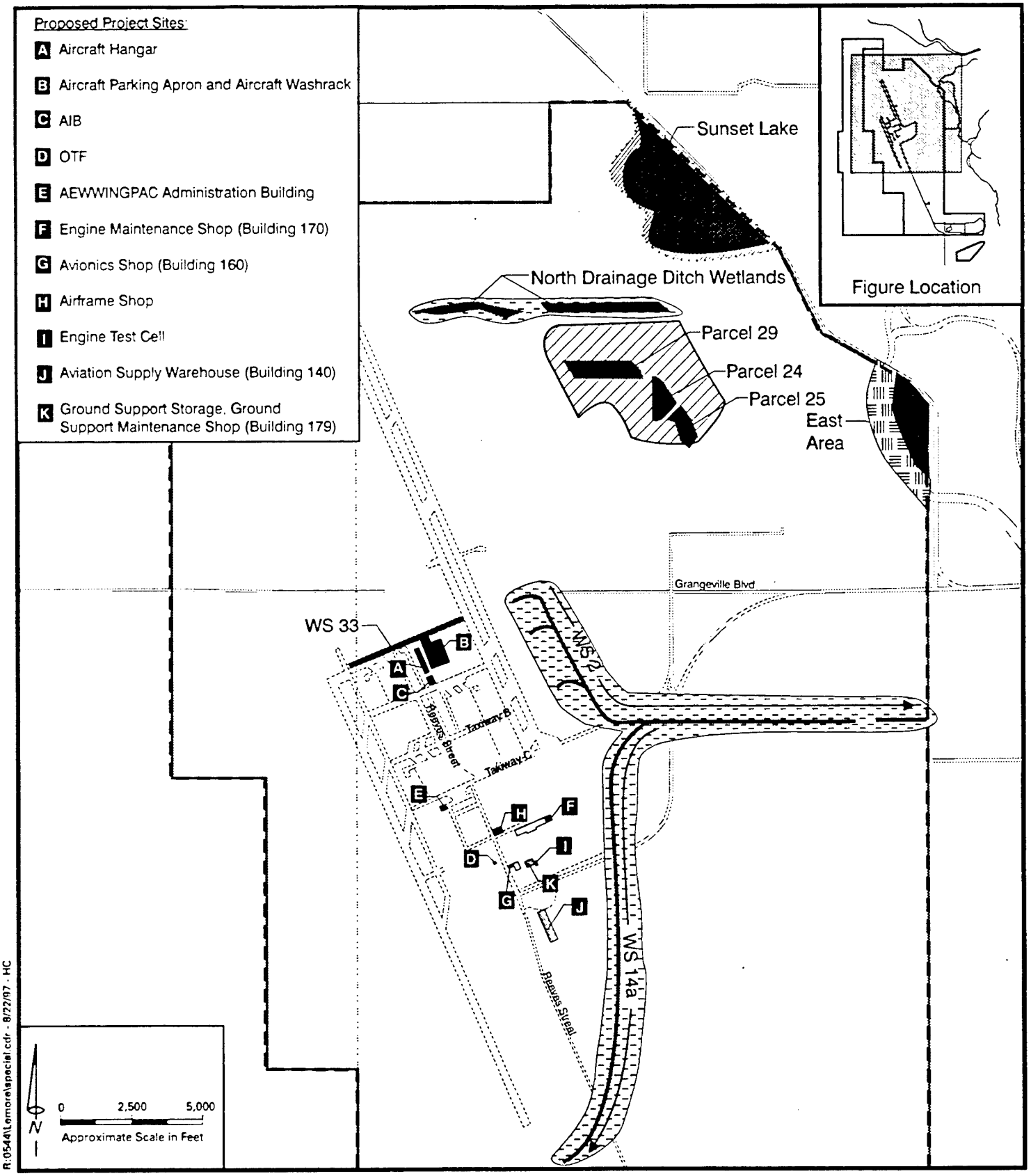
Notes:

Federal Status
- E = Endangered
- T = Threatened
- PE = Proposed endangered
- PT = Proposed threatened
- C = Candidate
- SC= Species of concern, presumed extinct

State/CDFG Status
- E = Endangered
- T = Threatened
- R = Rare
- CSC = California species of special concern

CNPS Status
- 1B = Rare and endangered in California and elsewhere
- 4 = Limited distribution

Present?
- C = Confirmed
- P = Possible
- U = Unlikely



R:\0544\Lemoore\special.cdr - 8/22/97 - HC

Habitat for special status species occurs to the north and east of the proposed construction sites.

LEGEND:

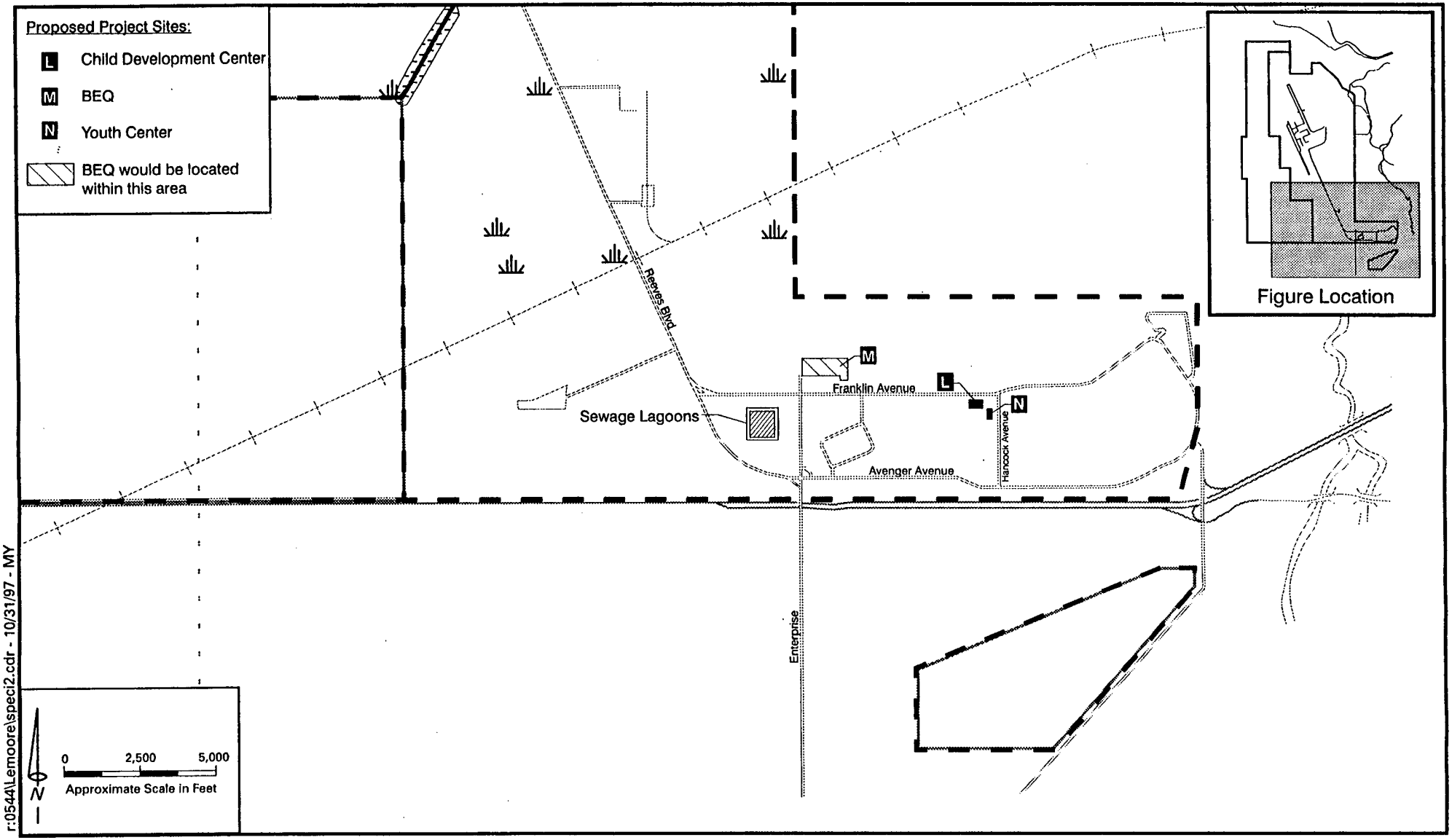
- Other wetland areas
- Giant garter snake potential habitat
- Valley elderberry long horn beetle potential habitat
- Tipton/Fresno kangaroo rat habitat (Tumbleweed Park)
- California least tern and potential western snowy plover habitat
- Installation Boundary
- Construction/Expansion
- Renovation

Source: US Navy GIS Data; Crane 1997; Donn 1997.

NAS Lemoore Habitat for Special Status Species: Operations Area

E-2 Aircraft Squadrons Realignment EIS
NAS Lemoore, California

Figure 3-5



Potential habitat for the giant garter snake occurs northwest of the proposed BEQ site and the habitat for the California Least tern occurs south and west of proposed construction sites.

LEGEND:

- Wetland areas
- Other wetland areas
- Construction/Expansion
- Potential giant garter snake habitat
- California least tern and western snowy plover habitat
- Installation Boundary

NAS Lemoore Habitat for Special Status Species: Administration/Housing Area

E-2 Aircraft Squadrons Realignment EIS
Lemoore, California

Figure 3-6

Source: US Navy GIS Data; Crane, 1997; Donn, 1997.

r:0544\Lemoore\speci2.cdr - 10/31/97 - MY

Other areas have been graded or plowed to reduce the fire hazard while still other areas are in agricultural production. The character of remaining disturbed plant communities is strongly influenced by the sparseness and unpredictability of rainfall and soil alkalinity.

Developed and landscaped areas. This habitat type includes buildings, parking areas, and landscaped areas within NAF El Centro. Common plant species found include eucalyptus, Brazilian pepper tree (*Schinus terebinthifolius*), and oleander. Few native plants are found in these areas.

Disturbed grassland. These areas include dirt roads, bare soil, and disturbed lands with vegetation. Wildlife diversity is low due to human disturbance and the absence or scarcity of vegetation. Weedy species, such as telegraph weed (*Heterotheca grandiflora*), black mustard, and Bermuda grass tend to exist in undeveloped areas, such as between taxiways and runways, and many of the large bare soil areas.

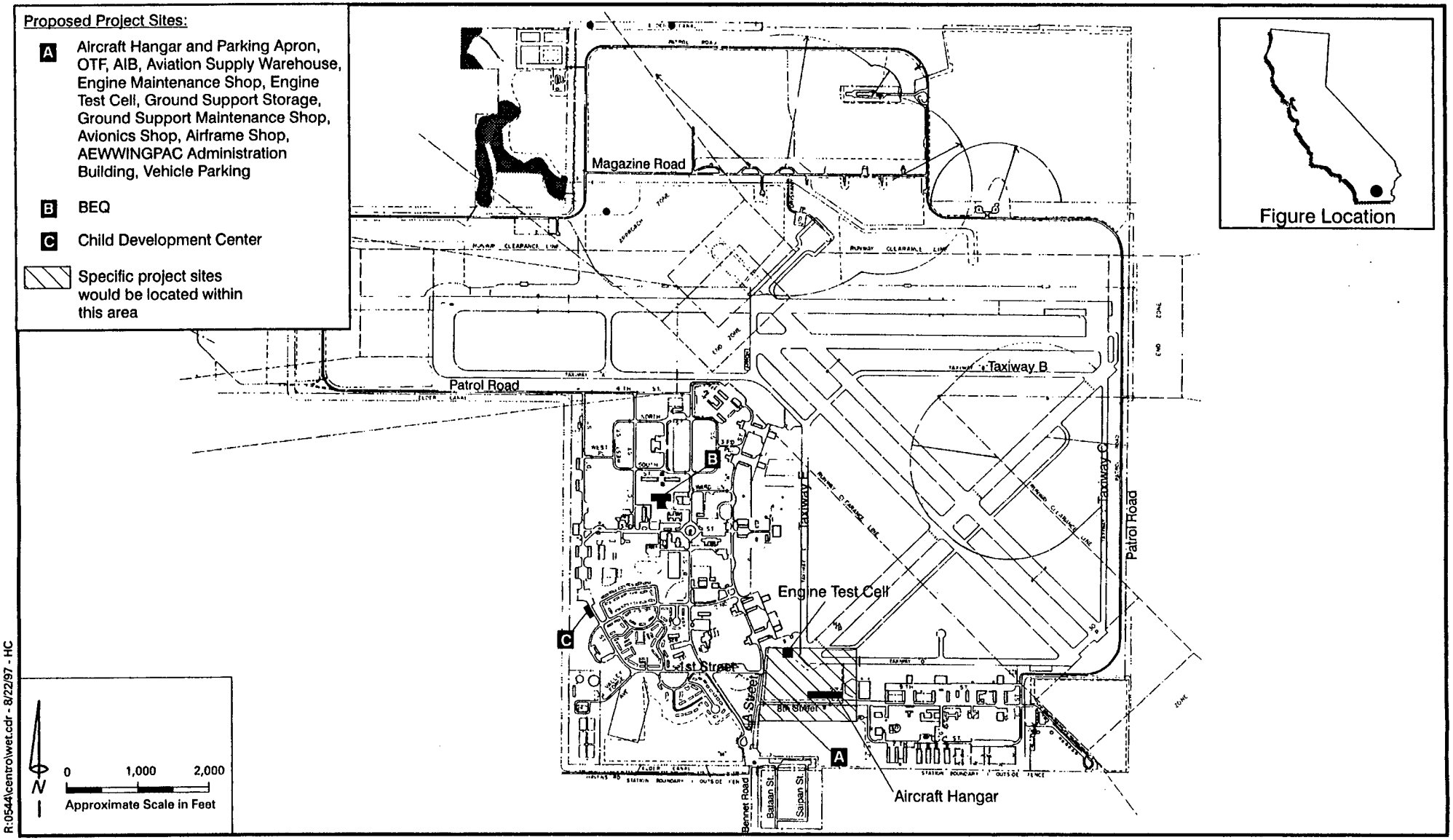
Agricultural. Crops currently being grown on the agricultural lands leased to farmers by NAF El Centro include alfalfa and Bermuda grass for seed. Many of the same species found in the disturbed grassland areas are found on field edges or near irrigation ditches.

Wetlands. The Natural Resources Conservation Service completed a jurisdictional wetland delineation of NAF El Centro on November 1996. Figure 3-7 shows the location of jurisdictional wetlands found on NAF El Centro. The only jurisdictional wetland that was identified is in the northeast corner of the base in an old riverbed of New River. There are no other jurisdictional wetlands found on the base. There are several irrigation ditches on the base which were examined during a field visit on July 31, 1997 and there is no indication of hydric soils or sufficient hydrologic conditions to support a wetland.

Wildlife

Developed and landscaped areas. Wildlife associated with the developed portions of NAF El Centro include mice, ground squirrels, bats, and opossums. Birds commonly found in this habitat type include rock dove, mourning dove, common grackle (*Quiscalis quiscula*), Brewer's blackbird, house finch, and house sparrow.

Disturbed grassland. The disturbed grasslands support black-tailed jack rabbits, ground squirrels, kangaroo rats (*Dipodomys* sp.), and skunk. Bird species include killdeer (*Charadrius vociferus*), lesser nighthawk (*Chordeiles acutipennis*), western burrowing owl, and American kestrel. Reptiles found in the disturbed grassland areas at NAF El Centro include side-blotched lizards, desert horned lizard (*Phrynosoma platyrhinos*), and desert spiny lizards (*Sceloporus magister*).



Wetland areas occur well north of proposed construction sites.

LEGEND:

- Wetland area
- Construction/Expansion

NAF El Centro Wetland Areas

E-2 Aircraft Squadrons Realignment EIS
NAF El Centro, California

Source: US Navy 1997.

Figure 3-7

R:\0544\centrolwet.cdr - 8/22/97 - HC

Agricultural lands. The agricultural lands, with monotypic planting, provide temporary habitat for a limited number of wildlife species that tolerate human activities. Coyotes (*Canis latrans*), raccoons (*Procyon lotor*), skunks, and a variety of small rodents can be found associated with the agricultural lands. Bird species sighted on agricultural lands on the base include great blue herons (*Ardea herodias*), burrowing owls, northern harriers (*Circus cyaneus*), white-faced ibis (*Plegadis chichi*), great egrets, snowy egrets, and red-winged blackbirds. The Salton Sea and Pacific Flyway located to the north of NAF El Centro, attract many species of birds, including migratory waterfowl that use the agricultural fields as resting areas.

Special Status Species

Special status species in the vicinity of NAF El Centro are listed in Table 3-3. Three federally listed endangered species, two species of federal concern, two state listed endangered species, and three state species of special concern potentially could be present at NAF El Centro. Table 3-3 describes status and presence at NAF El Centro for threatened and endangered species that were identified by the USFWS (Appendix B). Figure 3-8 depicts special status species habitat.

Table 3-3
Sensitive Species Known to Inhabit or Potentially Inhabit the Vicinity of NAF El Centro

Scientific Name	Common Name	Federal/State/ CNPS Status	Present on Project Site?
Birds			
Athene cunicularia hypugea	Western burrowing owl	SC/CSC/-	C
Empidonax trailii extimus	southwestern willow flycatcher	E/E/-	U
Falco peregrinus anatum	peregrine falcon	E/E/-	P
Reptiles			
Gopherus agassizii	desert tortoise	T/T/-	P
Phrynosoma mcalli	flat-tailed horned lizard	SC/CSC/-	P
Uma notata	Colorado desert fringe-toed lizard	-/CSC/-	P
Fish			
Cyprinodon macularius	desert pupfish	E/-/-	U
Plants			
Astragalus magdalenae var. *peirsonii*	Pierson's milkvetch	PE/-/1B	P
Pilostyles thurberi	Thurber's pilostyles	-/-/4	C
Pholisma sonorae	sand food	-/-/1B	C

Source: USFWS 1997c, US Navy 1997f

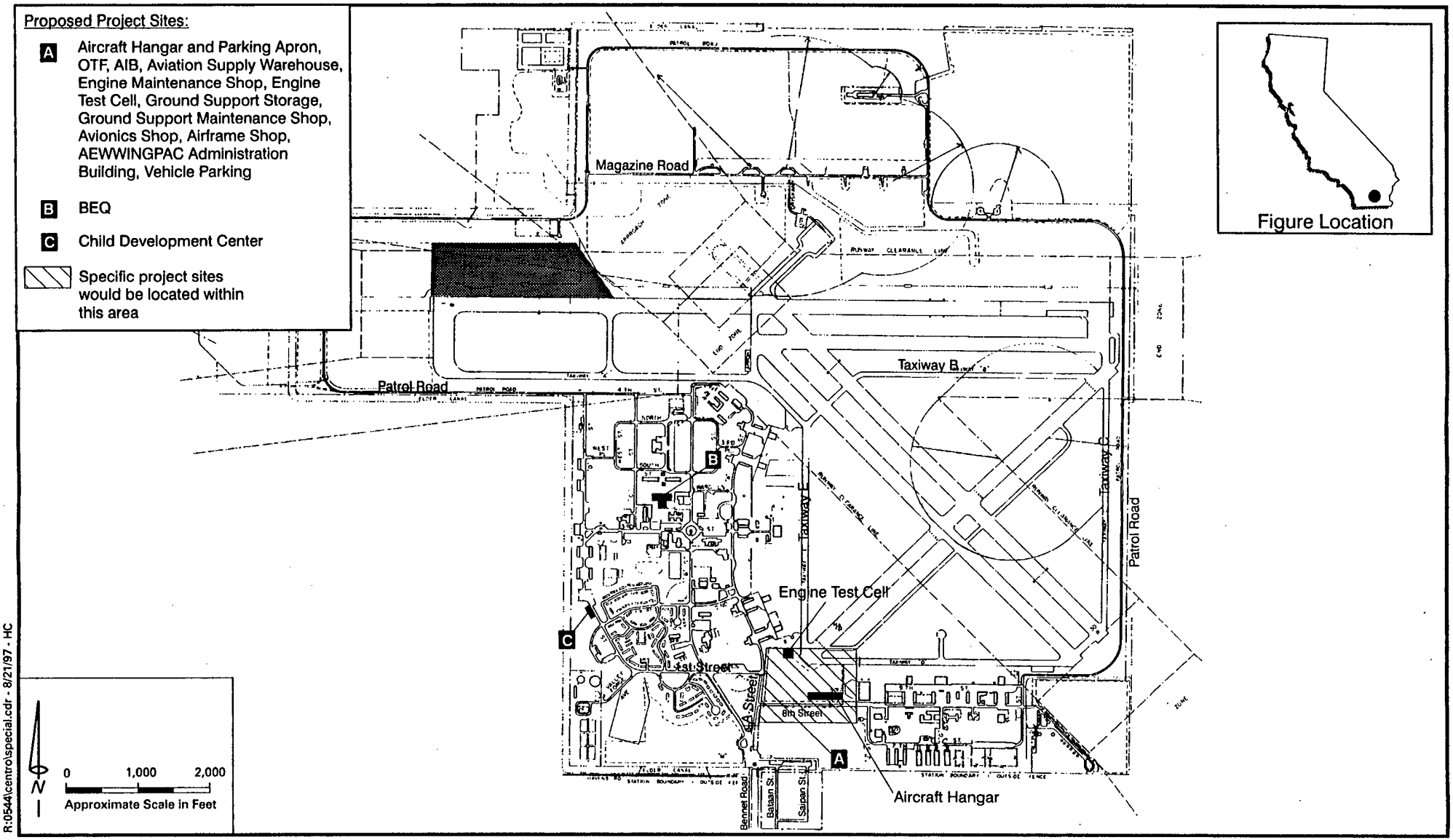
Notes:

Federal Status
E = Endangered
T = Threatened
PE = Proposed endangered
PT = Proposed threatened
C = Candidate
SC = Species of Concern

State/CDFG Status
E = Endangered
T = Threatened
R = Rare
CSC = California species of special concern

CNPS Status
1B = Rare and endangered in California and elsewhere
4 = Limited distribution

Present?
C = Confirmed
P = Possible
U = Unlikely



R:\0544\centro\special.cdr - 8/21/97 - HC

Habitat for the burrowing owl occurs north of proposed construction sites.

LEGEND:

- Burrowing owl habitat
- Construction/Expansion

NAF El Centro Habitat for Special Status Species

E-2 Aircraft Squadrons Realignment EIS
NAF El Centro, California

Source: US Navy 1997.

Figure 3-8

3.2 HYDROLOGY/SURFACE WATER QUALITY

This section describes the hydrology/surface water quality for the three alternative bases, including the occurrence, beneficial uses, quality, and flood hazards associated with water resources.

Definition of Resource

Hydrology addresses the quantity, circulation, and distribution of water. For the purposes of this analysis, hydrology is evaluated with respect to changes in runoff volumes, drainage patterns, and flood potential.

Water quality involves the chemical and physical composition of water as affected by natural conditions and human activities. For the purposes of this analysis, surface water quality is evaluated primarily with respect to possible release of petroleum hydrocarbon products from aircraft and motor vehicles; herbicides, pesticides, and fertilizers associated with landscaping and agricultural practices; spills of contaminants; sewage disposal activities; sedimentation resulting from earthwork and other construction activities; and other contaminant sources.

Regulatory Overview

Water resource regulations focus on the right to use water, protection from flood hazards, and protection of water quality. As a rule, each state regulates the use of the water within its boundaries (except for interstate water resources). The California Department of Water Resources (DWR) is responsible for the allocation of state water resources.

The principal federal laws protecting water quality are the Clean Water Act and the Safe Drinking Water Act. Both laws are enforced by the US Environmental Protection Agency (USEPA 1995). The Clean Water Act provides protection of surface water quality and preservation of wetlands. The Safe Drinking Water Act is directed at protection of drinking water supplies.

At the state level, the Porter-Cologne Water Quality Control Act gives the State Water Resources Control Board (SWRCB) and nine Regional Water Quality Control Boards (RWQCB) responsibility for protecting surface and ground water quality. As such, the RWQCBs prepare Water Quality Control Plans (WQCP) defining the beneficial uses and standards for protection of the waters within their regions. The regional boards also are responsible for implementing provisions of the Clean Water Act (CWA) delegated to states, such as the National Pollutant Discharge Elimination System (NPDES), which regulates point (industrial) and non-point (storm water) sources of pollutants. All of the bases assessed in this analysis are required to comply with NPDES permit requirements through compliance with statewide construction and industrial stormwater permits, and obtaining individual permits for point-source municipal and industrial discharges.

The Federal Emergency Management Agency (FEMA), in support of local flood management agencies, performs studies to identify flood zones under the National

Flood Insurance Program (NFIP). A product of these studies is Flood Insurance Rate Maps (FIRMs), which delineate the regions that would be inundated by floods with average recurrence intervals of 100 and 500 years. FEMA flood insurance programs do not apply to federal lands such as the three alternative bases.

3.2.1 Preferred Alternative: NAWS Point Mugu

Region of Influence

The region of influence for NAWS Point Mugu includes the base, adjacent saltmarsh wetlands, the lower reaches of Calleguas Creek, and adjacent receiving waters of Mugu Lagoon and the Pacific Ocean.

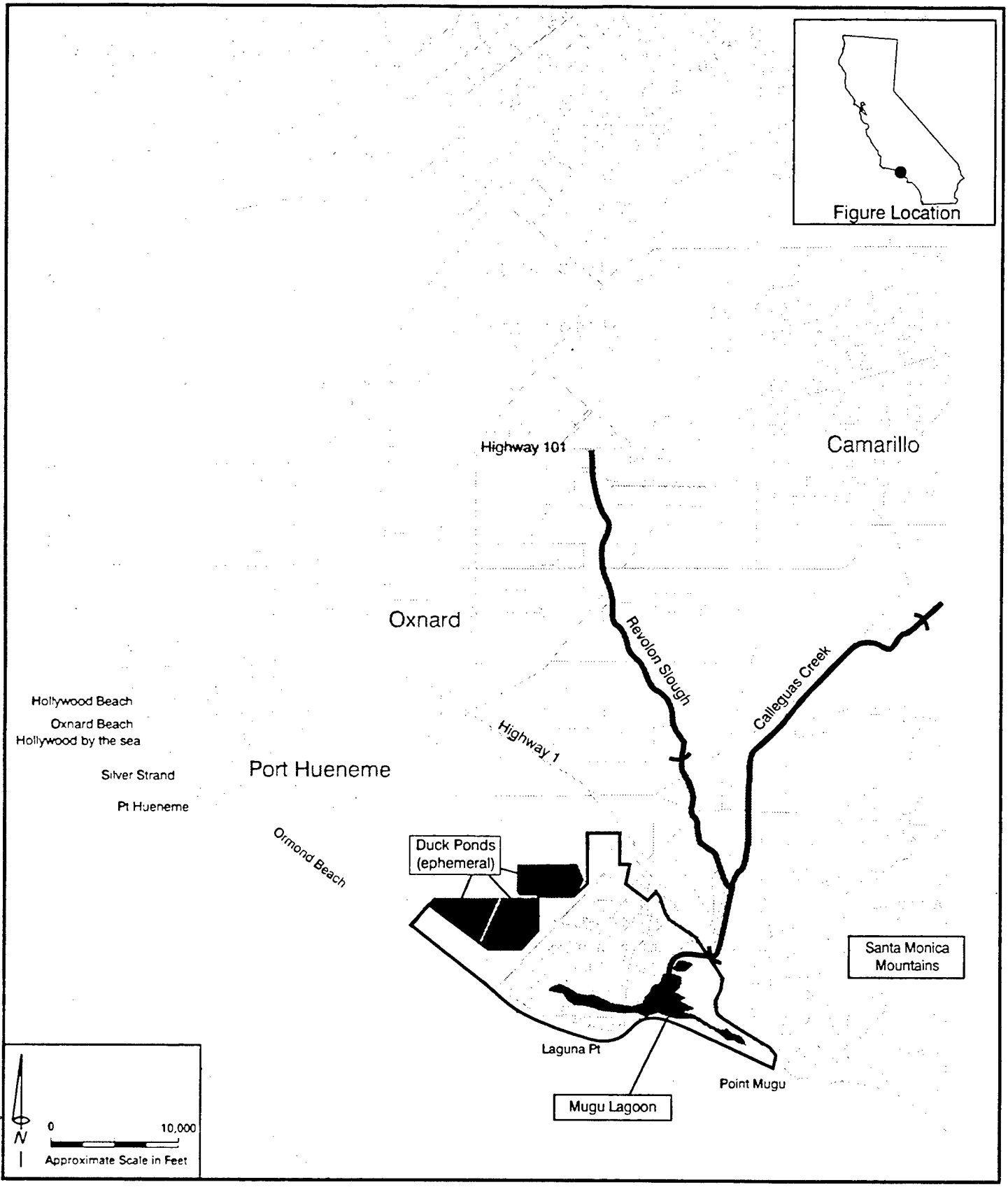
Surface Water Hydrology and Drainage

NAWS Point Mugu is located on a broad coastal plain adjacent to the Pacific Ocean and the Mugu Lagoon. The base is located in the southern end of the Santa Clara River Valley sub-basin of the Ventura Central Ground Water Basin of the South Coastal Hydrologic Region (DWR 1994; DWR 1980). The long-term ground water draw or pumping exceeds the long-term recharge in the Santa Clara River Valley (DWR 1980). Rainfall at NAWS Point Mugu averages approximately 12 inches (29 centimeters) per year.

The base is generally level and slopes gently southward from the residential area in the north to the tidal flats surrounding Mugu Lagoon. Upland elevations range from about seven to 12 feet (two to four meters) above mean sea level (MSL), with most of the base below 10 feet (three meters) MSL. All of the improved portions of the base are located above the elevation of mean high water.

About two-thirds of the region's water supply comes from surface water imports. Ground water supplies about 25 percent of the basin's water demand, and local surface water and reclaimed water supply the remaining eight percent (DWR 1994). With the exception of one well used for golf course irrigation, ground water beneath the base is not used as a water supply source. Urban demand for water in the Santa Clara River Valley sub-basin is about 183,000 acre-feet (22,573 hectare-meters) per year, or about 42 percent of sub-basin's the total demand. Urban water demand is expected to increase to about 345,000 acre-feet (42,556 hectare-meters) per year by the year 2020 due to the projected population increase, while agricultural water demand is expected to decrease to about 138,000 acre-feet (17,022 hectare-meters) per year (DWR 1994).

The principal stream draining NAWS Point Mugu is Calleguas Creek (Figure 3-9). Calleguas Creek flows approximately 37 miles (60 kilometers) from its source in the Santa Susana Mountains to Mugu Lagoon, which eventually discharges into the Pacific Ocean. Runoff to the creek from upstream areas includes treated sewage effluent and agricultural return flows potentially contaminated by pesticides.



r:0544\mugulmsurf.cdr - 10/31/97 - MY

Mugu Lagoon and adjacent off-base ephemeral Duck Ponds are the principal surface water features at NAWS Point Mugu.

LEGEND:

- Water
- Installation Boundary
- Levee

NAWS Point Mugu
Principal Surface Water Features

E-2 Aircraft Squadrons Realignment EIS
NAWS Point Mugu, California

Source: USGS Santa Barbara 1:100,000-scale topographic map 1982.

Figure 3-9

Mugu Lagoon, associated marsh areas, the lower reaches of Calleguas Creek, and a stretch of ocean beaches and dunes are located along the southern portion of the base.

Twenty-four storm water drainage areas have been delineated at NAWS Point Mugu. Many of these drainage areas have multiple outfalls that discharge to the Mugu Lagoon, wetlands surrounding the base, and the Oxnard Drainage Ditch (ODD) system.

At least two drainage ditches that are part of the ODD system and cross the base have the potential for conveying contaminants from upstream of the base to Mugu Lagoon. One of these ditches collects agricultural drainage from an area of approximately 18 square miles (47 square kilometers). The other ditch drains the narrow coastal strip between the western arm of Mugu Lagoon and the adjacent Southern California Edison (SCE) Ormand Beach Generating Station.

With the exception of the proposed vehicle parking lots, all of the proposed project sites are in paved or developed areas of NAWS Point Mugu.

Ground Water Hydrology

Ground water underlying the site is shallow and is influenced by seasonal precipitation, flows in Calleguas Creek, and, nearest the coast, by tidal action.

Flooding

The generally level topography and soil conditions at NAWS Point Mugu are contributing factors to the serious flooding and drainage problems that affect the siting and construction of new facilities. Approximately one-half of the base is located within the flood zone of Calleguas Creek. Historically, flooding has caused drainage problems and damage to structures. A flood event characterized as being equal to a 50-year flood caused significant damage to the base in the winter of 1980 to 1981 (US Army Corps of Engineers [COE] 1981). The family housing area was most affected by this flooding. Due to the damage, several improvements have been constructed to mitigate flood damage, including a system of retaining walls and berms located around the north and east perimeters of the base to divert flood waters. Additional improvements; however, are necessary for flood protection on the northwest side of the base (US Navy 1986a). No proposed project sites are located within the 50-year flood zone shown in the 1986 master plan.

Tsunami runup at NAWS Point Mugu is approximately four feet (1.2 meters) during a 100-year flood event and five feet (1.5 meters) during a 500-year flood event (COE 1980); waves of this magnitude would not reach any of the proposed project sites. The USEPA projects a 50 percent probability of a rise in sea level of about 0.75 feet (0.2 meters) by the year 2050 (USEPA 1995). This would increase the runup of tsunamis and high tides; however, with this projected increase, waves would not reach the proposed project sites.

Water Quality

Water quality in Calleguas Creek is below drinking water standards due to upstream sources of agricultural chemicals and treated sanitary wastewater effluent.

3.2.2 NAS Lemoore Alternative

Region of Influence

The region of influence for NAS Lemoore includes the base and drainages located immediately downstream from the base.

Surface Water Hydrology and Drainage

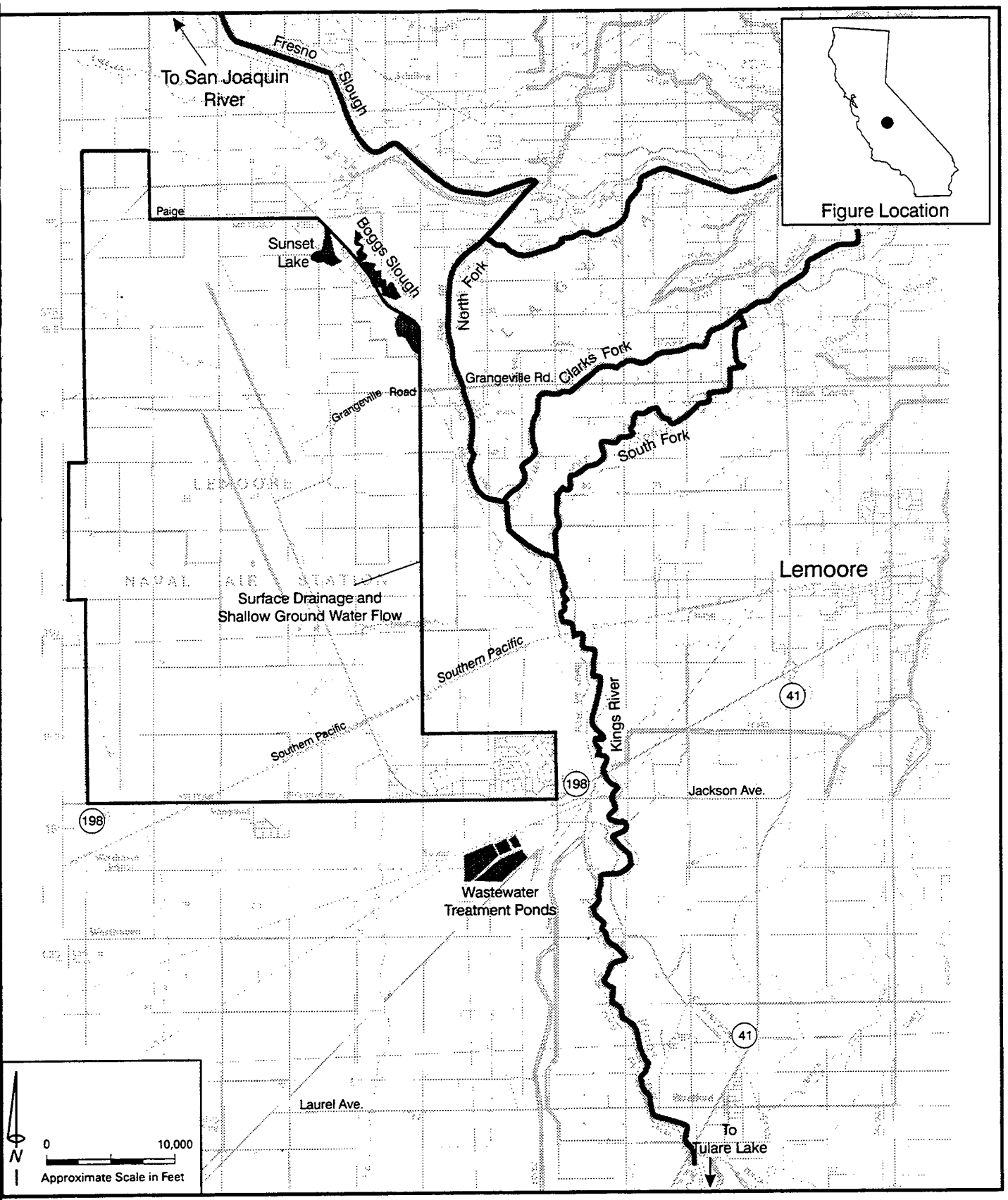
NAS Lemoore is located mainly within the Westside Basin, adjacent to the Kings and Tulare Lake basins of the Tulare Lake Hydrologic Region. The base is located on the alluvial fan of the Kings River, near the divergence of the River's north and south forks (Figure 3-10). The north fork flows north into the San Joaquin River drainage. The south fork flows south near the eastern boundary of the base and drains to Tulare Lake, which has no outlets. Flows in the Kings River are depleted by upstream irrigation diversions, so that during most of the year, there is little flow in the river as it passes NAS Lemoore. Average precipitation within the Tulare Lake hydrologic region is 15.4 inches (39 centimeters) per year (DWR 1994); however, in the vicinity of NAS Lemoore, the average annual rainfall is only six to eight inches.

Elevations at the base range from approximately 210 feet to 265 feet (64 to 81 meters) above MSL. The land surface in the vicinity of the base is relatively level and slopes towards the northeast at a rate of approximately eight feet (2.4 meters) per mile (1.6 kilometers). In the past, surface runoff from the alluvial fan of the Arroyo Pasajero, which collects drainage from the hills west of Coalinga, has sometimes flowed across the base into the Kings River; however, construction of the California Aqueduct created a barrier to this flow.

Surface drainage at NAS Lemoore is generally to the northeast, towards the Kings River. Drainage is poor in some areas, occasionally resulting in ponding. Wetland areas in the northeast part of the base that lie along the North Fork of the Kings River are fed in part by storm water runoff from the base and agricultural drainage. Approximately 400 acres (162 hectares) of sewage treatment ponds used for treatment of sanitary wastewater from NAS Lemoore are south of Highway 198.

Ground Water Hydrology

The Tulare Lake Basin is underlain by a thick sequence of clay sediments deposited in the large lakes that have covered the region in recent geologic time. The clay deposits overlie and confine several fresh water aquifers at relatively great depths. The confined ground water has been highly exploited for



Kings River is a major surface water feature near NAS Lemoore.

LEGEND:

Water

Installation Boundary

NAS Lemoore
Principal Surface Water Features

E-2 Aircraft Squadrons Realignment EIS
NAS Lemoore, California

Source: USGS Fresno 1:100,000-scale topographic map 1982.

Figure 3-10

agriculture, resulting in overdraft conditions, where net ground water withdrawal exceeds recharge. Ground water overdrafts led to 4 to 12 feet of land subsidence (settling) by the 1960s in the immediate vicinity of NAS Lemoore. Subsidence of more than 20 feet (6 meters) occurred further to the west (Poland and Evenson 1966).

Importation of surface water from the state and federal water projects has significantly reduced dependence on ground water except during drought periods. Ground water use during an average water year in the Tulare Lake Basin is estimated to be about 915,000 acre-feet (112,865 hectare-meters). During drought conditions, annual ground water use increases nearly four-fold to 3,773,000 acre-feet (465,400 hectare-meters) (DWR 1994).

The thick, extensive, shallow clay sediments underlying the region, limit local recharge of the deeper aquifers. Instead, water used for irrigation of crops tends to contribute to the shallow perched water table. The shallow water table in agricultural outlease areas ranges in depth from approximately 5 to 10 feet (1.5 to 3 meters) below the surface and flows generally toward the northeast (CSU Fresno 1990). Drainage sumps and canals have been constructed to prevent water logging of shallow soils and maintain the water table below the root zone of crops.

Flooding

Flooding potential exists at NAS Lemoore due to the potential overflow of streams to the west. The natural floodplain for these streams lies north of the town of Huron and crosses Highway 198 immediately west of NAS Lemoore. Floodwaters drain to the Kings River by crossing NAS Lemoore. None of the proposed project sites associated with this alternative are located within areas historically subject to flooding or ponding.

Water Quality

In portions of Kings County, elevated concentrations of boron, arsenic, and selenium occur in ground water, affecting drinking water supplies. Boron concentrations also impair crop yields. Shallow ground water is of generally poor quality due to the accumulation of salts in irrigation water. The total dissolved solids (TDS) concentration of shallow ground water in the vicinity of NAS Lemoore is reported to be in the range of 500 to 1,500 milligrams per liter (mg/L). By comparison, the primary drinking water standard for TDS is 1,000 mg/L.

Ground water and local surface water are not a primary source of potable water for NAS Lemoore or the surrounding communities. Good quality ground water is available from wells that are 1,500 to 2,000 feet (457 to 610 meters) deep (CSU Fresno 1990), which are used only as an emergency water supply. Domestic and agricultural water is supplied by the Westlands Water District through the California Aqueduct.

3.2.3 NAF El Centro Alternative

Region of Influence

The region of influence for NAF El Centro includes the base and immediate downstream areas of the New River, as well as canals crossing or draining the base.

Surface Water Hydrology and Drainage

NAF El Centro is located within the Imperial Valley basin of the Colorado River hydrologic region. With an average annual precipitation of 5.5 inches (14 centimeters) per year, the Colorado River Basin is characterized as arid (DWR 1994). Drainage in the 1,870 square mile (3,010 square kilometer) Imperial Valley is provided by the New River, the Alamo River, and irrigation drainage ditches that discharge to the Salton Sea, which has no outlets. The Salton Sea watershed, which extends into Mexico, has an area of about 7,700 square miles (12,390 square kilometers), with an average precipitation of only 1 to 3 inches per year (Iwanaga Seidel Associates 1987).

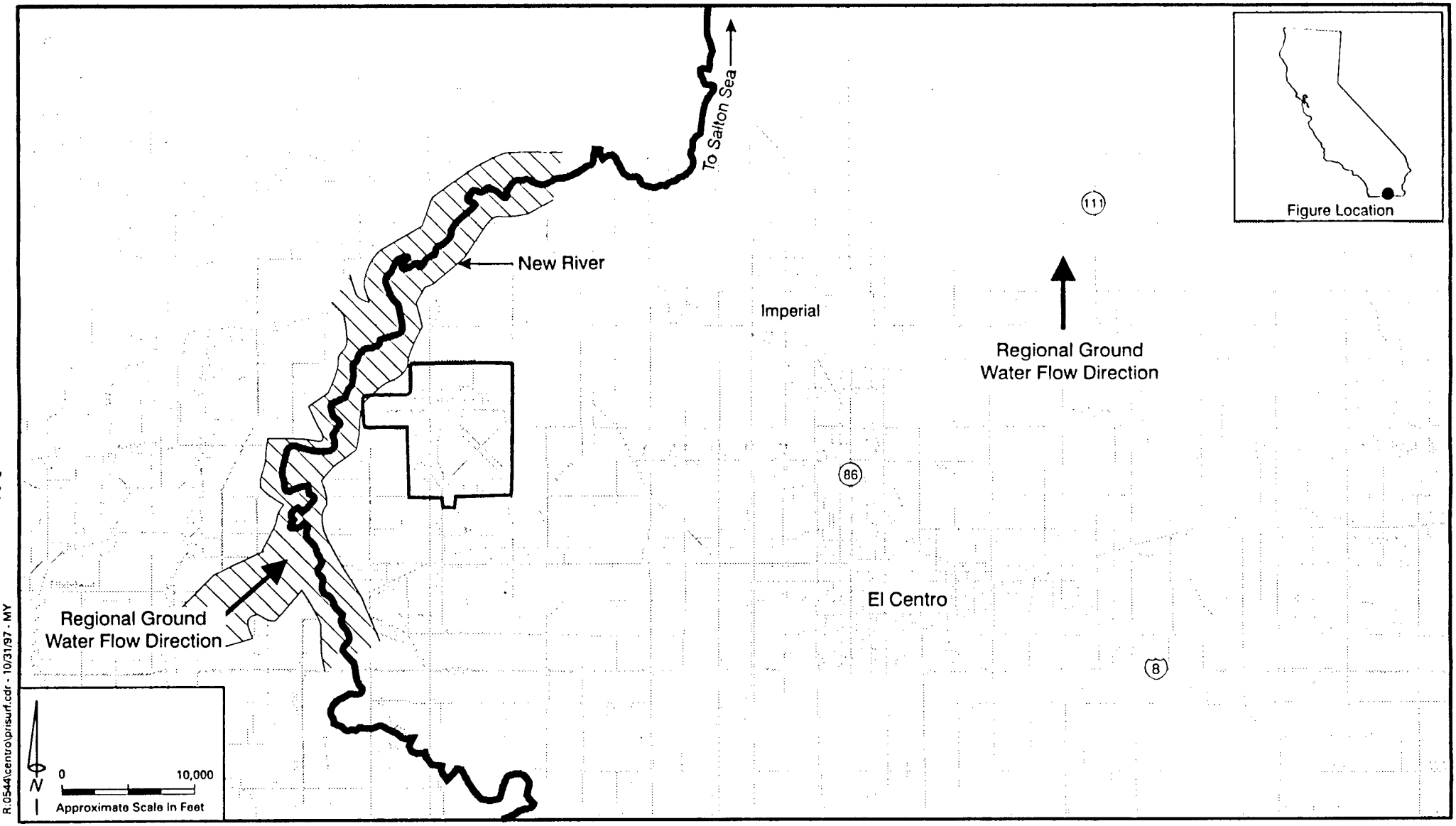
Most of the water used within the Colorado River Basin comes from the Colorado River, and is used for agriculture. Irrigation water from the Colorado River is delivered to water users by a network of canals operated by the Imperial Irrigation District (IID). Total agricultural water demand in the Colorado River Basin is about 3,705,000 acre-feet (457,011 hectare-meters) per year, while annual urban water demand is about 301,000 acre-feet (37,128 hectare-meters) (DWR 1994). Colorado River water is allocated by interstate and international agreements. The amount of ground water used annually within the Colorado River Basin is independent of rainfall and averages about 80,000 acre-feet (9,868 hectare-meters) per year. NAF El Centro receives two acre-feet (0.25 hectare-meters) per day of raw water from the IID/Colorado River and treats this water on base.

The topography at NAF El Centro is generally flat. Elevations range from 52 feet (16 meters) below MSL to 42 feet (13 meters) below MSL. Surface drainage from NAF El Centro is to the New River, which originates in Baja California, Mexico, and runs near the western boundary of NAF El Centro (Figure 3-11).

Runoff from the base generally flows to the northwest. All runoff and treated wastewater from the base discharges to the New River. All of the proposed project sites would be constructed in portions of the base that are currently unpaved.

Ground Water Hydrology

Shallow, perched ground water occurs at depths of as little as 3 to 5 feet (1 to 1.5 meters) below the ground surface in the vicinity of NAF El Centro (US Department of Agriculture 1981). Several confined aquifer units exist below the perched aquifer. Wells drilled to depths of 1,000 to 8,000 feet (300 to 2,440 meters) encounter hydrothermal brines, which are used to produce geothermal energy



The New River is the principal surface water feature near NAF El Centro.

LEGEND:

- Water
- Approximate New River Flood Plain
- Installation Boundary

NAF El Centro
Principal Surface Water Features

E-2 Aircraft Squadrons Realignment EIS
NAF El Centro, California

Source: USGS El Centro 1:100,000-scale topographic map 1989.

Figure 3-11

R:\0544\centro\prisurf.cdr - 10/31/97 - MY

(Hely et al. 1966). The main source of ground water recharge in the Imperial Valley is from the Colorado River and leakage from canals (Loeltz et al. 1975). Regional ground water flow moves toward the axis of the Imperial Valley, which roughly corresponds with the channel of the Alamo River, and then northwest toward the Salton Sea (Bechtel 1996; Morton 1977; Loeltz et al. 1975).

Flooding

The floodplain of the New River extends approximately 1,200 feet (366 meters) onto the westernmost portion of the base. No proposed project sites are located within this area. No flooding has occurred outside this floodplain since the completion of Hoover Dam and the All American Canal, which prevented flooding of the region by the Colorado River (US Navy 1988a). Moderate to severe flash flooding during storms is reportedly restricted to areas within and along stream channels or dry washes having a width of 200 feet (60 meters) or more (Iwanaga Seidel Associates 1987).

Water Quality

The New River is used primarily for drainage of agricultural return flows and treated municipal wastewater, which are not suitable for domestic or agricultural use. The Salton Sea water quality is poor. Ground water in the Imperial Valley contains mineral concentrations in excess of primary drinking water standards, with sulfate concentrations in the range of 80 to 4,000 milligrams per liter (mg/L), chloride concentrations of 500 to 8,500 mg/L, and TDS concentrations of 1,480 to 15,700 mg/L (Bechtel 1996; Iwanaga Seidel Associates 1987). The base receives all of its water from the IID, which diverts the water from the Colorado River at the Imperial Dam. The quality and quantity of this water has steadily declined during recent years due to increased upstream use and reduced allocations.

3.3 LAND USE AND AIRSPACE

This section describes surrounding and on-base land uses at each alternative base. Because the proposed action would introduce additional aircraft at the receiving base, airspace as well as on-the-ground facilities are part of the project area. Airspace designations identifying allowable uses are therefore described in this section. Land use and airspace compatibility guidelines and recommendations related to noise and safety contained in the Air Installation Compatible Use Zone (AICUZ) program and imaginary surface requirements regulated by Federal Aviation Administration (FAA) are also described.

Definition of Resource

Land Use Designations

Land use encompasses undeveloped and developed land on base and in the immediately surrounding area. Undeveloped land is commonly classified as open space, while developed land uses range from residential and commercial to recreational and agricultural. Land use is regulated by plans and policies that identify the type and extent of uses allowed in specific areas.

Airspace Designations

Airspace is also designated to accommodate certain types of uses, including federal airways, military training routes (MTRs), restricted use airspace, military operations areas (MOAs), and air traffic control authorized airspace (ATCAA). Airspace designations throughout the United States are controlled by the FAA and are applicable to all aircraft. No changes in the FAA airspace designations are proposed as part of this action.

Federal airways. Federal airways are corridors for civilian air traffic. These civilian airways are designated with a "V" or a "J" and a number. "V" denotes vector corridors that cover elevations up to 18,000 feet (5,486 meters) above mean sea level (MSL), while "J" denotes jet corridors that cover elevations over 18,000 feet (5,486 meters) above MSL.

Military training routes. MTRs are military airways and are often low altitude routes used for access to or from MOAs or for cross-country flight practice. MTRs are designated as a visual route (VR) or instrument route (IR). Visual routes are flown by maintaining a visual reference to the ground at all times with periodic instrument checks of altitude, engine status, and other aircraft conditions. Regulations governing visual flight are called visual flight rules (VFR). Instrument routes are flown using instrument flight rules (IFR), which enable the pilot to fly without visual reference to the ground.

Restricted use airspace. Restricted use airspace is used for military flight training and not usually accessed by civilian or commercial aircraft for safety reasons.

Military operations areas. MOAs accommodate aircraft maneuvering in airspace adjacent to the restricted areas and are broader and higher than the restricted areas. MOAs can extend up to 18,000 feet (5,486 meters) above MSL, but not beyond. Non-hazardous military training activities, such as air combat maneuvers, air intercepts, and aerobatics, are conducted in the MOAs. Civilian aircraft flying by VFR can use the airspace within MOAs at any time, while aircraft using IFR, such as commercial carriers, cannot access MOAs, unless cleared by air traffic control.

Air traffic control assigned airspace. ATCAAs are similar to MOAs in that they accommodate aircraft maneuvering in airspace adjacent to the restricted areas and are broader and higher than the restricted areas. ATCAAs afford military aircraft the opportunity for flight above 18,000 feet (5,486 meters) MSL, under direct control by an FAA ARTCC. All aircraft in an ATCAA must fly IFR. ATCAAs are made available when their use will not interfere with other air traffic in that airspace. Most ATCAA military air activity is the same as MOA air activity, with the exception of air-to-air combat training, which is usually not permissible in an ATCAA.

Plans and Policies

Land use on military bases is planned and documented in base Master Plans to provide a framework to guide future growth. One of the primary land use issues addressed in Master Plans for naval air facilities is the protection of airspace for aircraft operations conducted at an airfield or in a special use airspace. Preservation of unobstructed runway approach paths and other navigable airspace near airfields is an important factor when discussing land use compatibility. Land surrounding military bases is regulated by local and regional land use planning requirements, which are described below.

Master Plans. A master plan is used in the short-term to site new construction projects, but also serves as a guide for achieving long-term development objectives. Each of the Navy bases evaluated in this Environmental Impact Statement (EIS) has a Master Plan that identifies land uses and recommends construction projects to achieve development objectives. The recommendations help to optimize the use of Navy resources and allow increases in operational capabilities. The AICUZ program is a component of Master Plans.

Air Installation Compatibility Use Zones Program. The purpose of the AICUZ program is to prevent incompatible development in areas of high noise, in areas that would expose the public to potential health and safety hazards associated with aircraft operations, and in areas that would jeopardize pilot safety and the operational capability of the air installation. The AICUZ establishes guidelines and provides recommendations for land use planning and policies that affect military installations and surrounding communities. On-base land use compatibility is a combination of two factors: noise and aircraft safety. The Navy requires that an AICUZ program address noise levels and accident potential zones.

The AICUZ program identifies land uses that would be compatible with certain noise levels, accident potential, and flight clearance requirements associated with military airfield operations. Noise levels are measured as community noise equivalent levels (CNELs) and are shown as noise contour lines on AICUZ maps. Compatible land uses within given noise contours are described in the AICUZ. Additional considerations associated with noise are discussed in Section 3.7, Noise.

Similarly, accident potential zones (APZs) defined in the AICUZ limit the types of land uses that may occur in a particular zone. APZs identify areas that would most likely be affected by an accident. The purpose of defining APZs is to restrict surrounding land uses for the protection of pilots as well as persons and property on the ground. Three types of APZs are identified: the Clear Zone, APZ I and APZ II. The dimensions and applications of these zones are described below.

- *The Clear Zone*—The Clear Zone lies immediately beyond the end of the runway and outward along the extended runway centerline for a distance of 3,000 feet (914 meters). The fan-shaped Clear Zone is 1,500 feet (457 meters) wide at the end of the runway and 2,284 feet (696 meters) wide at 3,000 feet (914 meters) from the end of the runway. The Clear Zone should have no obstructions, since it has the highest probability of being affected by accidents.

- *Accident Potential Zone I*—APZ I is the rectangular area beyond the Clear Zone that possesses a significant potential for accidents. This zone is normally provided under flight paths that experience 5,000 or more annual operations. Typically, the APZ I is 3,000 feet (914 meters) wide by 5,000 feet (1,524 meters) long and may be curved to conform to the shape of the flight paths. The accident potential would be less in this zone than in the Clear Zone.

- *Accident Potential Zone II*—APZ II extends beyond APZ I and has a lower potential for accidents than APZ I. APZ II is normally provided under a flight path whenever an APZ I is required. Dimensions of the APZ II are usually 3,000 feet (914 meters) wide by 7,000 feet (2,133 meters) long and they are curved to conform to the shape of the flight paths (US Navy 1993).

Imaginary surfaces. Another land use compatibility issue associated with airfield operations is the proximity of structures to imaginary surfaces. An imaginary surface is the slope or angle at which an aircraft departs or arrives from an airfield. Imaginary surfaces are another way to describe clearances for air navigation. FAA Regulations specify a series of imaginary height restriction surfaces surrounding an airport to prevent conflicts with aircraft approach and departure paths.

The FAA considers any terrain or man-made objects that extend above the imaginary surface an obstruction. All obstructions are reviewed by the FAA to

determine if they represent a hazard to air navigation. All new development should take place below the surfaces if physically and economically possible. Imaginary surfaces can affect on-base and regional land use planning. Specific imaginary surfaces for airfields are defined below (US Navy 1993). Similar surfaces also exist for helicopter pads, although they are much smaller.

- *The primary surface*—The primary surface is centered on the runway. It is 1,500 feet (457 meters) wide and extends 200 feet (61 meters) beyond each end of the runway. Unless required for safe navigation, nothing within the primary surface is acceptable above the runway elevation.

- *The approach-departure clearance surface*—This imaginary surface flares outward and upward from the primary surface. The surface extends horizontally and vertically at a 50:1 slope until it is 500 feet (152 meters) above the airfield. At this point, it extends horizontally to a point 50,000 feet (15,240 meters) from its beginning. At its beginning, the approach-departure clearance surface is 1,500 feet (457 meters) wide. It broadens uniformly at approximately 7.5 degrees to an outer width of 16,000 feet (4,877 meters).

- *The inner horizontal surface*—This imaginary surface is an oval shaped plane located 150 feet (46 meters) above the airfield with an outer edge located 7,500 feet (2,287 meters) from the runway.

- *The conical surface*—This imaginary surface extends horizontally and vertically at a 20:1 slope from the outer edge of the inner horizontal surface. The conical surface stretches 500 feet (152 meters) vertically above the airfield and 7,000 feet (2,134 meters) horizontally from the outer edge of the inner horizontal surface.

- *The outer horizontal surface*—This imaginary surface begins at the outer edge of the conical surface, 500 feet (152 meters) above the airfield, and extends horizontally for 30,000 feet (9,146 meters).

- *The transitional surface*—Another imaginary surface is the transitional surface, which is an inclined plane that connects the primary surface and the approach-departure surface. The slope ratio for this surface is 7:1, horizontal to vertical, and falls in upward and outward right angles to the runway centerline and the extended centerline. If any objects penetrate these surfaces, a waiver must be obtained from NAVAIR. These restrictions and regulations are considered during construction activities and planning of military air installations.

California Coastal Management Program. Coastal states are provided the authority to evaluate projects conducted, funded, or permitted by the federal government through the Coastal Zone Management Act (CZMA) of 1972, as amended. Under

CZMA, any federal project or activity affecting the coastal zone must be consistent to the maximum extent practicable with the provisions of federally approved state coastal plans.

The 1,100-mile (1,770-kilometer) California coastal zone is regulated by the California Coastal Act (CCA) of 1976, as amended, and the federal CZMA. The CCA sets a number of goals, including protecting, maintaining, and enhancing the beauty of the coastal zone environment; balancing the use of coastal zone resources with the social and economic needs of the state; maximizing public access and recreational activities along the coast; and encouraging coastal-dependent development over other types of development. Each county or city incorporates the policies of the CCA into a Local Coastal Program (LCP). The LCPs are specific long-term management plans that consist of zoning ordinances, land use plans, and implementing actions.

The CCA also established the California Coastal Commission (CCC), the state agency responsible for implementing the CZMA. The CCC developed the California Coastal Management Program (CCMP) pursuant to the requirements of the CZMA, and the CCC is responsible for reviewing proposed federal and federally authorized activities affecting the state's coastal resources to assess their consistency with the federally approved CCMP.

Federal or federally approved actions that could potentially affect the coastal zone must be consistent with the CCMP to the maximum extent practicable. The federal entity proposing the action must submit a coastal consistency determination (CCD) to the CCC documenting how the action complies with the policies of the CCA. Implementation of the proposed action at NAWS Point Mugu would require preparation of a CCD and formal approval from the CCC.

3.3.1 Preferred Alternative: NAWS Point Mugu

Region of Influence

Land uses can be affected by development plans for the base and the surrounding area, as well as by aircraft operations associated with the base. The ROI for land use includes the base and immediately surrounding area. The ROI for airspace use includes any military airspace associated with the base. The imaginary surface restrictions associated with aircraft operations at a base can extend up to 10 miles (16 kilometers) from the base's airfield. Consequently, the ROI also includes land uses below imaginary surface restrictions, usually within 10 miles (16 kilometers) of any base airfield.

Setting

NAWS Point Mugu encompasses approximately 4,575 acres (1,851 hectares) of land and marsh area in the southern portion of Ventura County, along the coast of the Pacific Ocean. Approximately 4,568 acres (1,849 hectares) are held in fee title, 393 acres (159 hectares) are held in easements, and 173 acres (70 hectares) are

leased. Mugu Lagoon encompasses approximately 2,000 acres (809 hectares) of the total area of the base (US Navy 1986a). The base is approximately 50 miles (80 kilometers) northwest of Los Angeles, with the city of Oxnard located six miles (nine kilometers) to the northwest. Other communities near NAWS Point Mugu include Camarillo, located 7 miles (11 kilometers) to the northeast, and Port Hueneme, located 6 miles (9 kilometers) to the northwest.

Regional Land Uses

Land uses immediately surrounding the base are primarily agricultural and recreational. Agricultural lands extend north and northeast of the base. More urbanized land uses are located beyond the agricultural uses in the communities of Port Hueneme and Camarillo (Figure 3-12). Recreational uses include the Ventura County Game Reserve to the immediate northwest, Point Mugu State Park to the east, and the Santa Monica Mountains National Recreation Area to the northeast. The Camarillo and Oxnard airports are located north and northwest, respectively, of NAWS Point Mugu.

Other government agencies having jurisdiction within the Point Mugu area are the State Coastal Commission and Santa Monica Mountains National Recreation Area. The State Coastal Commission administers the Coastal Zone that runs along the coast adjacent to NAWS Point Mugu. The Santa Monica Mountains National Recreational Area, a portion of which is located on NAWS Point Mugu, is administered by the National Park Service.

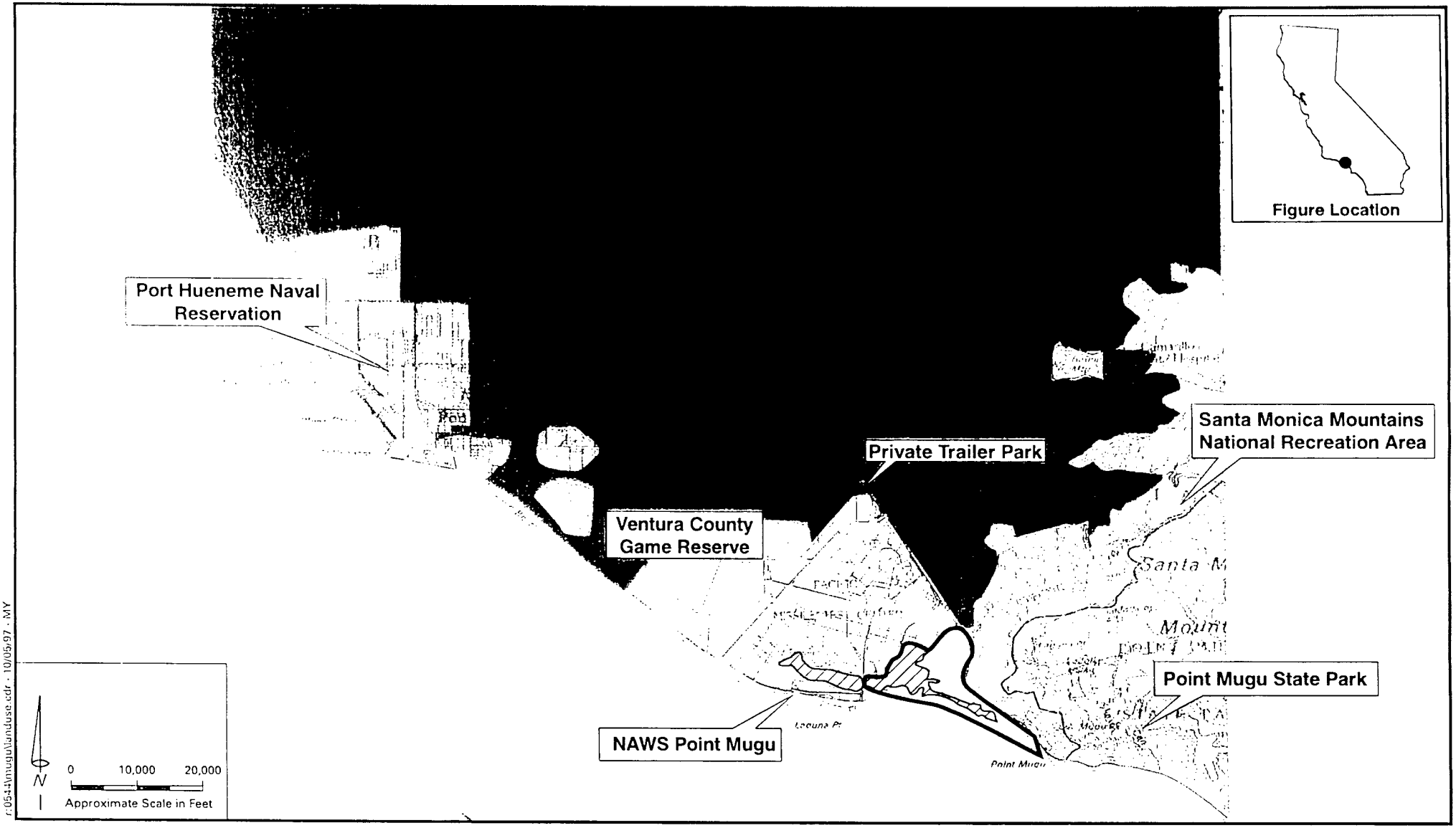
On-base Land Uses

Land uses at NAWS Point Mugu include developed and undeveloped land. Developed areas are located primarily in the northern portion of the base, with the southern portion of the base predominantly open space. Training operations are located in the runway areas with maintenance facilities adjacent to the runways. The administration area is centrally located near training/operations and maintenance areas. Testing, supply, and public works facilities are provided at several locations on the base. Housing and personnel support facilities are located along the northeastern edge of the base. Existing land uses and proposed locations of the E-2 facilities are depicted in Figure 3-13.

The landing field at NAWS Point Mugu consists of two runways: 03/21 and 09/27. Runway 03/21 is 200 feet (61 meters) wide and 11,100 feet (3,383 meters) long. Runway 09/27 is 200 feet (61 meters) wide and 5,500 feet (1,676 meters) long. Runway 03/21 is the main runway used for most takeoffs and landings, with Runway 09/27 as the secondary runway (US Navy 1992b).

Airspace Designations

The NAWS Point Mugu airfield is located within the control area boundary of the Los Angeles ARTCC, which has delegated responsibility for air operations to the NAWS Point Mugu radar air traffic control facility (RATCF). The NAWS Point



r:\0544\mugu\landuse.cdr - 10/05/97 - MY

Most of the land around NAWS Point Mugu is used for agriculture.

LEGEND:

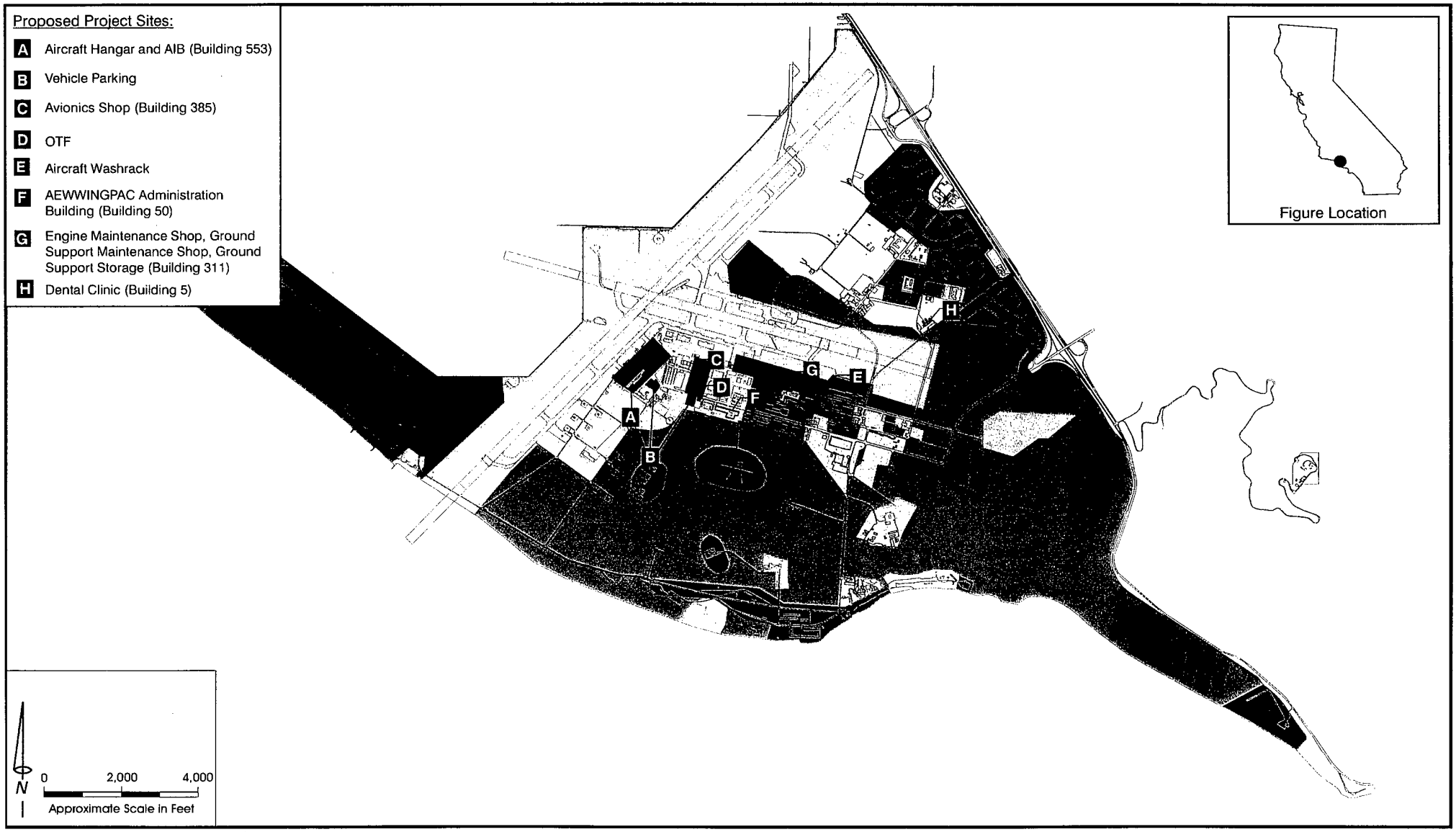
- Open Space/Agriculture
- Commercial/Industrial
- Institutional
- Military
- Recreation
- Off-base Residential
- Mugu Lagoon
- Overlapping Area of NAWS Point Mugu and National Recreation Area

Source: US Navy 1986a.

NAWS Point Mugu Regional Land Uses

E-2 Aircraft Squadrons Realignment EIS
NAWS Point Mugu, California

Figure 3-12



Most of the land at NAWS Point Mugu is used for training and operations, and open space.

LEGEND:

- Administration
- BOQ/BEQ/Family Housing
- Maintenance
- Open Space/Agriculture
- Ordnance
- Personnel Support
- Public Works
- Supply
- Training/Operations
- Test/Evaluation
- Construction/Expansion
- Renovation

Source: US Navy 1986a.

NAWS Point Mugu Existing Land Uses

E-2 Aircraft Squadrons Realignment EIS
NAWS Point Mugu, California

Figure 3-13

Mugu RATCF has responsibility for the control of all civilian and military aircraft operating on IFR air traffic control clearances within its designated airspace (US Navy 1992b).

Figure 3-14 shows the airspace environment surrounding NAWS Point Mugu. The base is located below restricted airspace R-2519 and several low-altitude federal airways traverse the area. Oxnard Airport is located 7 miles (11 kilometers) to the northwest, and Camarillo Airport is located 6 miles (10 kilometers) north of NAWS Point Mugu. Factors influencing air traffic flow in the area are described below:

- VFR traffic flow along the coastline is heavy, but does not present a conflict with NAWS Point Mugu air traffic operations because of altitude separation.

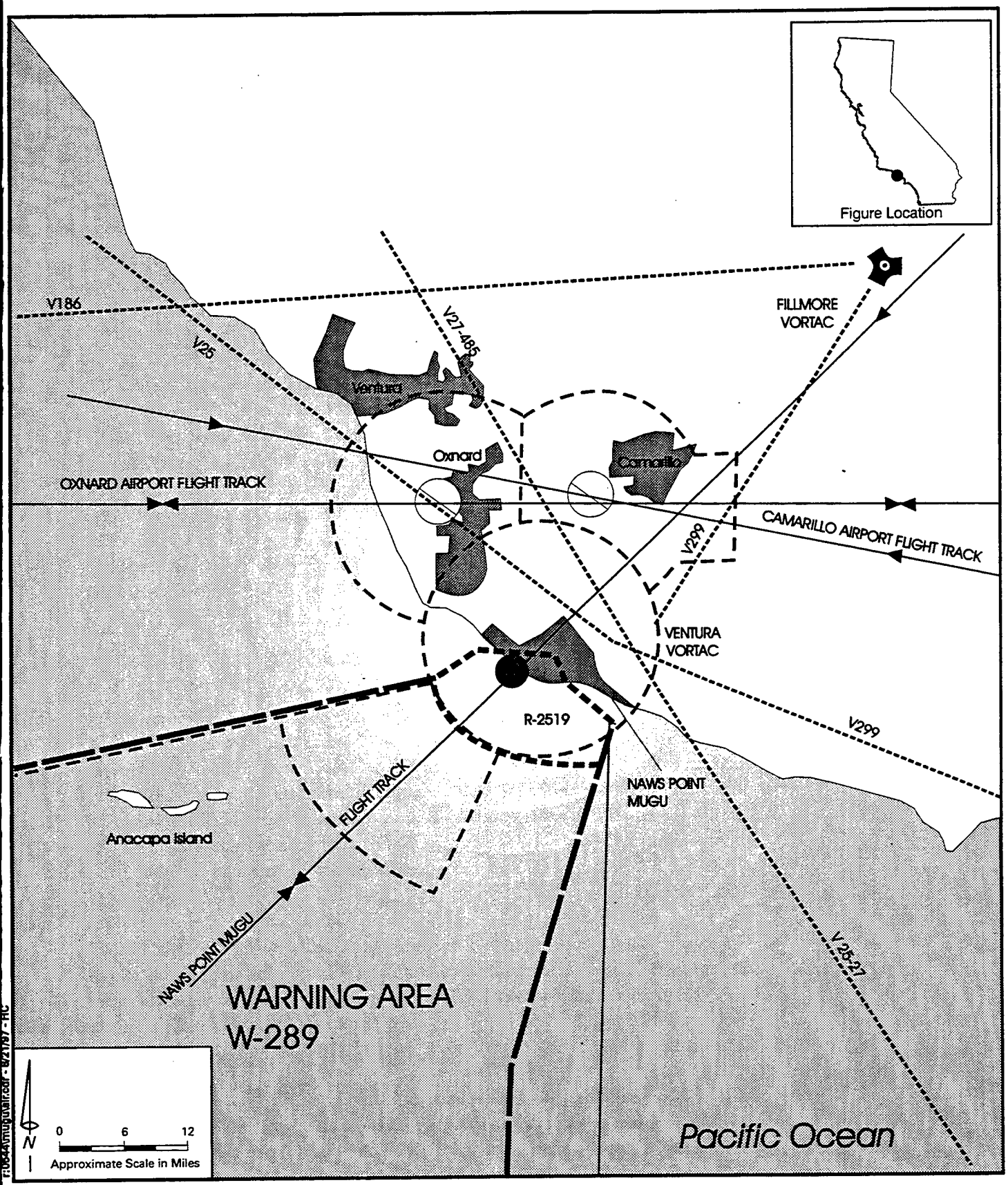
- The altitude of traffic on federal airways V25, V27, and V299 is high enough so as not to cause a conflict with NAWS Point Mugu. V107, located to the east, is used to descend traffic during the early morning hours for the noise abatement approaches into Los Angeles.

- VFR operations at Oxnard Airport, Camarillo Airport, and NAWS Point Mugu operate independently.

- IFR operations at the airports conflict under certain conditions and result in either a one-for-one sharing of the airspace or circuitous routing procedures. Specific conflicts include instrument approaches to NAWS Point Mugu Runway 21, Oxnard Airport Runway 25, and Camarillo Airport Runway 26; and instrument departures from NAWS Point Mugu Runway 3, Oxnard Airport Runway 7, and Camarillo Airport Runway 8.

Aircraft using VFR traffic patterns at Camarillo Airport may cause further congestion in the area due to conflicts with IFR traffic at all three other airports. These conflicts are publicized through user safety bulletins and air traffic safety bulletins. Communication between aircraft at Camarillo and the NAWS Point Mugu air traffic control facility is provided by two VHF transmitters/receivers.

An aircraft on an instrument approach to NAWS Point Mugu will cross the Oxnard Airport final approach course at 6.5 nautical miles (12 kilometers) from NAWS Point Mugu and 9.5 nautical miles (17.6 kilometers) from Oxnard Airport. The vertical separation of the two approach paths at the crossing point is approximately 860 feet (262 meters). As a result, a one-for-one sharing of the airspace, or circuitous routing, is required during IFR conditions. The separation between aircraft in the local pattern at Camarillo Airport and aircraft on an instrument landing system's final approach to Oxnard Airport is approximately 800 feet (244 meters). The FAA has established an Oxnard control zone extension over Camarillo (US Navy 1992b).



Airspace above NAWS Point Mugu is used by commercial and military aircraft.

LEGEND:

- Restricted Area
- Airport Control Zone
- V25 Victor Airway
- Warning Area
- Municipal Airport

Source: US Navy 1992b.

NAWS Point Mugu Airspace Use

E-2 Aircraft Squadrons Realignment EIS
NAWS Point Mugu, California

Figure 3-14

The Point Mugu Regional Airport Authority (PMRAA) has proposed joint use of NAWS Point Mugu by commercial and military aircraft. This proposal is the result of ongoing discussion between the Navy, the FAA, the Southern California Association of Governments (SCAG) and the cities and County of Ventura that began in March 1993. This proposal has not been enacted nor would its enactment affect the proposed E-2 realignment because one of the Navy's conditions for approval is that it not impact the Navy's ability to conduct operations (Parisi 1997b).

Regional AICUZ and Imaginary Surfaces

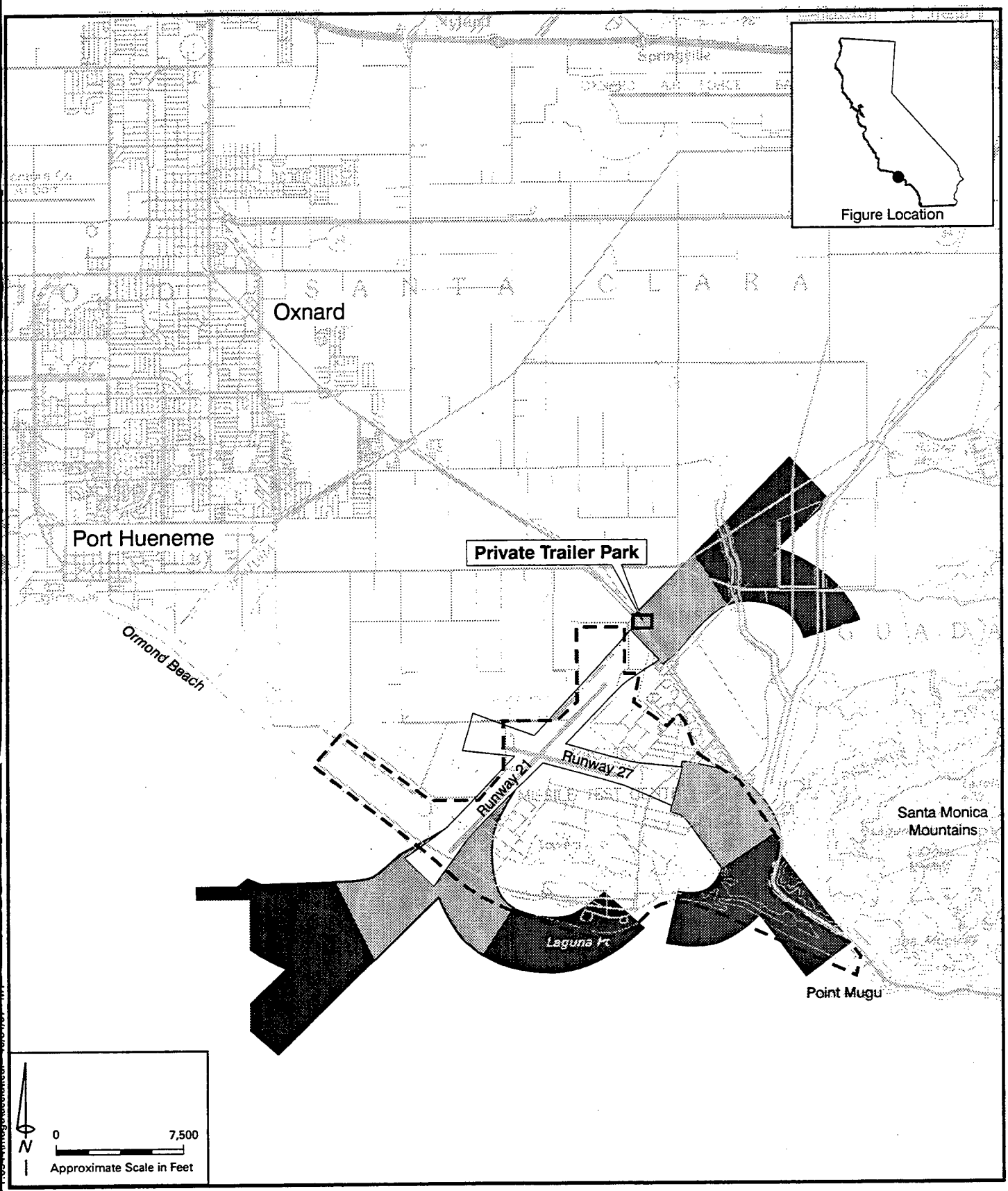
Some existing regional land uses conflict with the requirements of the NAWS Point Mugu 1986 AICUZ. A portion of the Ventura County Game Reserve is located in the Clear Zone associated with Runway 09, the Naval Air Mobile Home Park is located in APZ I associated with Runway 21. APZ zones are shown on Figure 3-15. Nine acres (4 hectares) of residences adjacent to the northwest boundary of the base are located inside the 75 CNEL noise contour, and 49 acres (20 hectares) of residences are scattered throughout the 65 to 75 CNEL noise contour (US Navy 1992b). No off-base structures currently penetrate imaginary surfaces. The cities of Oxnard, Port Hueneme, Camarillo, and Ventura, as well as the Oxnard and Camarillo airports, are located below the outer horizontal surface (US Navy 1992b).

On-base AICUZ and Imaginary Surfaces

Some existing on-base land uses are located in incompatible noise environments. A 4 acre (2 hectare) portion of the Capehart 2 Housing Complex in the northern portion of NAWS Point Mugu is within the 75 CNEL noise contour. In addition, various housing, administration facilities, and personnel support facilities are within the 65 CNEL noise contour. Because relocating these facilities would be impractical, the NAWS Point Mugu AICUZ recommends, independent of the proposed E-2 realignment, insulating these buildings to attenuate noise impacts (US Navy 1992b).

There are also three existing land use incompatibilities within APZs at NAWS Point Mugu. A 3 acre (1 hectare) portion of the family housing area extends within APZ I associated with Runway 27. The gate and sentry house for Gate 3 also are within the Runway 27 APZ I. Finally, a recreational lodge is within the Runway 27 APZ II.

Six on-base buildings along the sides of Runway 09/27 penetrate imaginary surfaces and operate under airfield safety waivers granted by NAVAIR. The base is attempting to resolve these incompatibilities through long-term, comprehensive base planning since it is economically infeasible to relocate these structures in the short term (US Navy 1986a). The foothills of the Santa Monica Mountains penetrate the imaginary surfaces to the west of the station, thereby creating flight hazards and prohibiting straight-in approaches to Runway 27 and straight-out departures from Runway 09.



The APZs for NAWS Point Mugu extend beyond the base boundaries into the Pacific Ocean and northeast.

LEGEND:

- Clear Zone
- Accident Potential Zone I
- Accident Potential Zone II
- NAWS Point Mugu

NAWS Point Mugu Accident Potential Zones

E-2 Aircraft Squadrons Realignment EIS
NAWS Point Mugu, California

Figure 3-15

Source: US Navy 1992b.

3.3.2 NAS Lemoore Alternative

Region of Influence

Land uses can be affected by development plans for the base and the surrounding area, as well as by aircraft operations associated with the base. The ROI for land uses includes the base and immediately surrounding area. The ROI for airspace use includes any military airspace associated with the base. The imaginary surface restrictions associated with aircraft operations at a base can extend up to 10 miles (16 kilometers) from the base's airfield. Consequently, the ROI includes land uses below imaginary surface restrictions, usually within 10 miles (16 kilometers) of any base airfield.

Setting

NAS Lemoore is in the central portion of the San Joaquin Valley, located approximately 80 miles (129 kilometers) east of the Pacific Ocean in Fresno and Kings counties. Approximately 15,744 acres (6,372 hectares) of Navy-owned land are within Kings County and 3,040 acres (1,230 hectares) are within Fresno County. Fresno and Kings counties administer and regulate land uses within their respective boundaries. As a federal property, NAS Lemoore is not within the jurisdiction of either of these counties. When NAS Lemoore was first developed, the counties zoned approximately 108 square miles (280 square kilometers) of land surrounding the base as agriculture to prevent encroachment of residential development and other land uses that may pose a conflict to the base's mission (US Navy 1994d). In addition, the Navy holds flight easements over 11,020 acres (4,460 hectares) of land over both counties.

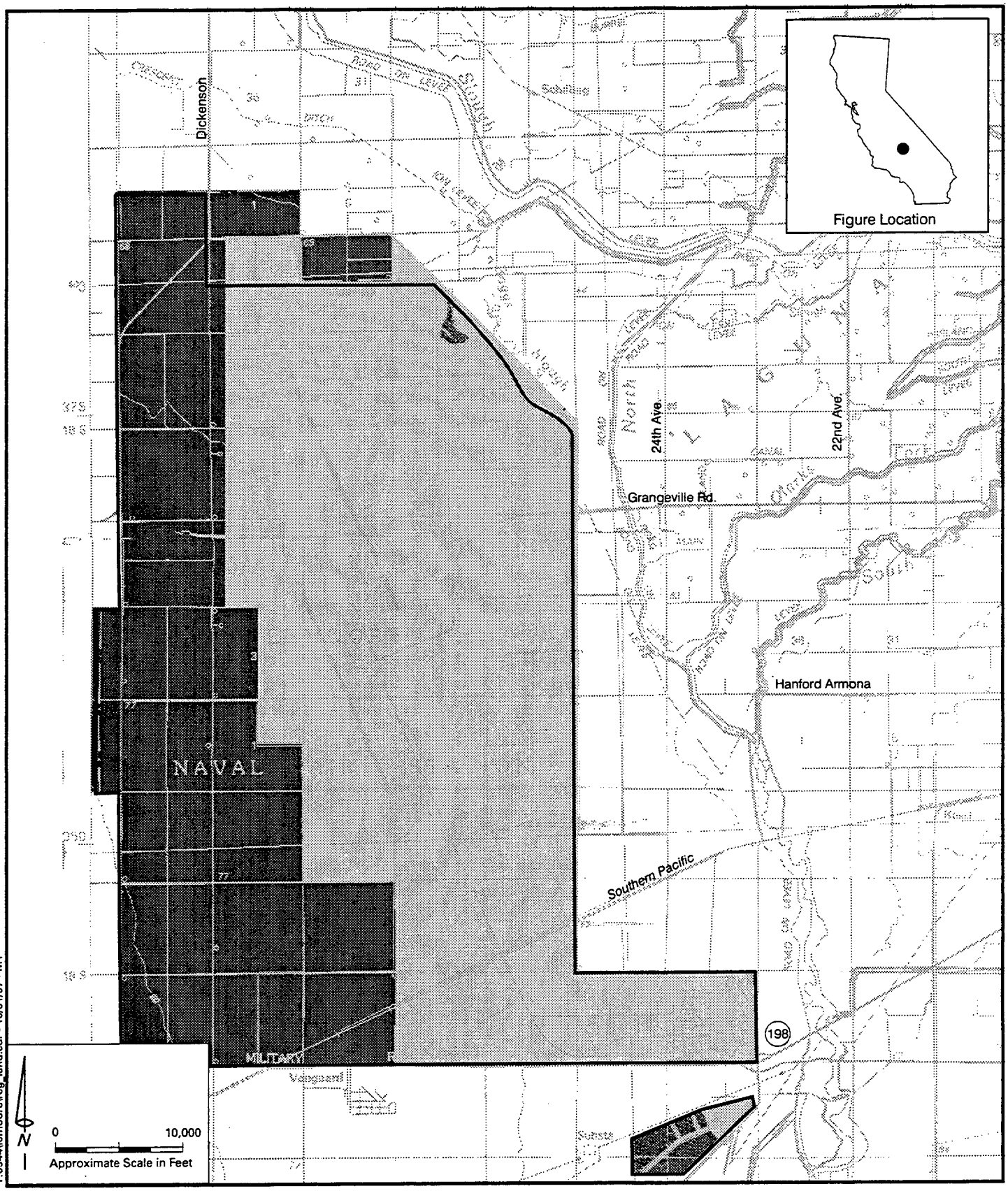
The closest urban center is Fresno, located 35 miles (56 kilometers) north of NAS Lemoore in Fresno County. Other nearby cities in Kings County include Lemoore, located 7 miles (11 kilometers) to the east, Hanford, located 17 miles (27 kilometers) to the east, and Stratford, located 6 miles (9 kilometers) to the southeast (US Navy 1993).

Regional Land Uses

The primary land use surrounding the base is agriculture, with common crops being cotton, safflower, tomatoes, and various types of hay (Figure 3-16). Off-base land within approximately 4 miles (6 kilometers) of the base airfield is zoned by both Fresno and Kings counties as agriculture for farms with a minimum of 40 acres (16 hectares). Off-base land between 4 to 10 miles (6 to 16 kilometers) of the base airfield is zoned by both counties as agriculture for farms with a minimum of 20 acres (eight hectares).

On-base Land Uses

Land uses at NAS Lemoore include developed and undeveloped land. Developed areas are used primarily for operations, administration and housing. The operations area is located in the central part of the base and includes



Agriculture is the primary use surrounding NAS Lemoore.

LEGEND:

- Open Space/Agriculture
- Military (Navy Property)
- Military (Private Property - Navy Easement)
- Installation Boundary

Source: US Navy 1992c.

NAS Lemoore Regional Land Uses

E-2 Aircraft Squadrons Realignment EIS
NAS Lemoore, California

Figure 3-16

training/operations, public works, maintenance, administration, and supply facilities. The landing field at NAS Lemoore consists of two runways, 14R/32L and 14L/32R, which are both 13,500 feet (4,114 meters) long. The operations area is bordered by open space.

The administration/housing area is located at the southern end of the base and is separated from the operational area by approximately 3 to 4 miles. It provides a range of facilities supporting the base operations and training functions. Housing and personnel support facilities and recreation facilities make up the largest area of land use, with some training operations and administration facilities also located in this area. Land currently not in use for base operations is leased for agricultural use. Existing land uses and the proposed location of the E-2 facilities at NAS Lemoore are shown on Figures 3-17 and 3-18.

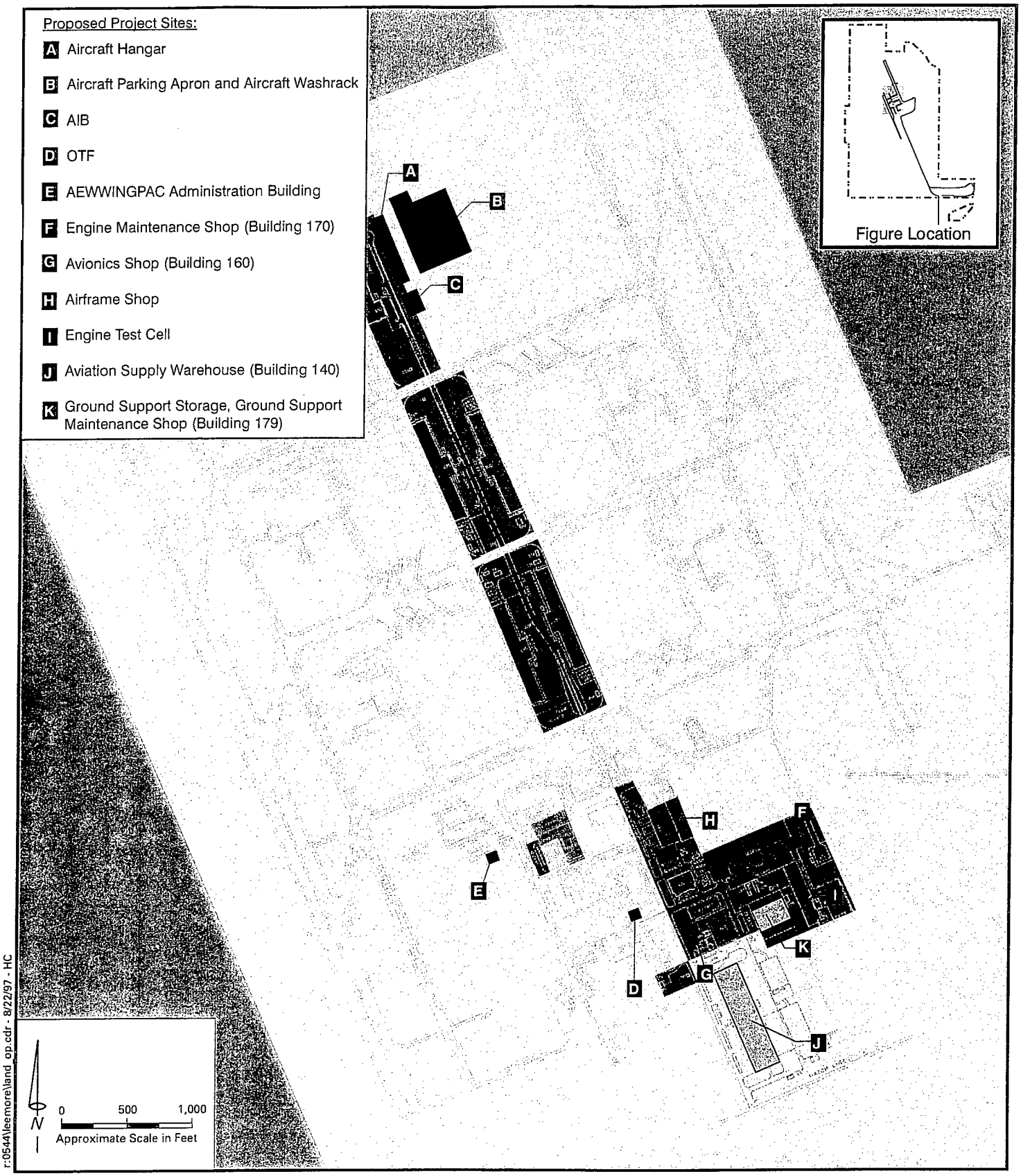
Airspace Designations

The NAS Lemoore airfield is located within the control area boundary of the Oakland ARTCC. NAS Lemoore maintains a RATCF that controls aircraft traversing the NAS Lemoore airspace. The RATCF at NAS Lemoore controls airspace in two areas: Alpha and Bravo. RATCF control extends from the ground surface to 15,000 feet (4,572 meters) above MSL in the Alpha area and from the ground surface to 10,000 feet (3,048 meters) above MSL in the Bravo area. Neighboring RATCFs include the City of Fresno Airport and Castle Air Force Base (now closed). There are other smaller commercial and private airports in the area. The southern border of the NAS Lemoore RATCF is also the border between the Oakland ARTCC and Los Angeles ARTCC. NAS Lemoore coordinates air traffic with the Oakland and Los Angeles ARTCCs and neighboring air traffic control facilities (US Navy 1994d).

Figure 3-19 shows the airspace environment surrounding NAS Lemoore. There is no military airspace associated with NAS Lemoore. Current flight operations require NAS Lemoore aircraft to use the MOA above Fort Hunter Ligett on the coast. Several federal airways are located in the area. Commercial jet corridors connecting northwestern and southern California are some of the busiest flight corridors in the country. Local carriers to Bakersfield and Fresno routinely descend through the NAS Lemoore RATCF (US Navy 1994d).

Regional AICUZ and Imaginary Surfaces

Existing regional land uses are predominantly agriculture, which, according to the requirements of the NAS Lemoore 1993 AICUZ, is a compatible land use in areas where noise levels are above 85 CNEL and within the APZs. APZ zones are shown on Figure 3-20. The western portion of the City of Lemoore is below the outer horizontal imaginary surface (US Navy 1993).



r:0544\leemore\land op.cdr - 8/22/97 - HC

The operations area is the site where airfield, training/ administration, and AIMD facilities would be located.

LEGEND:

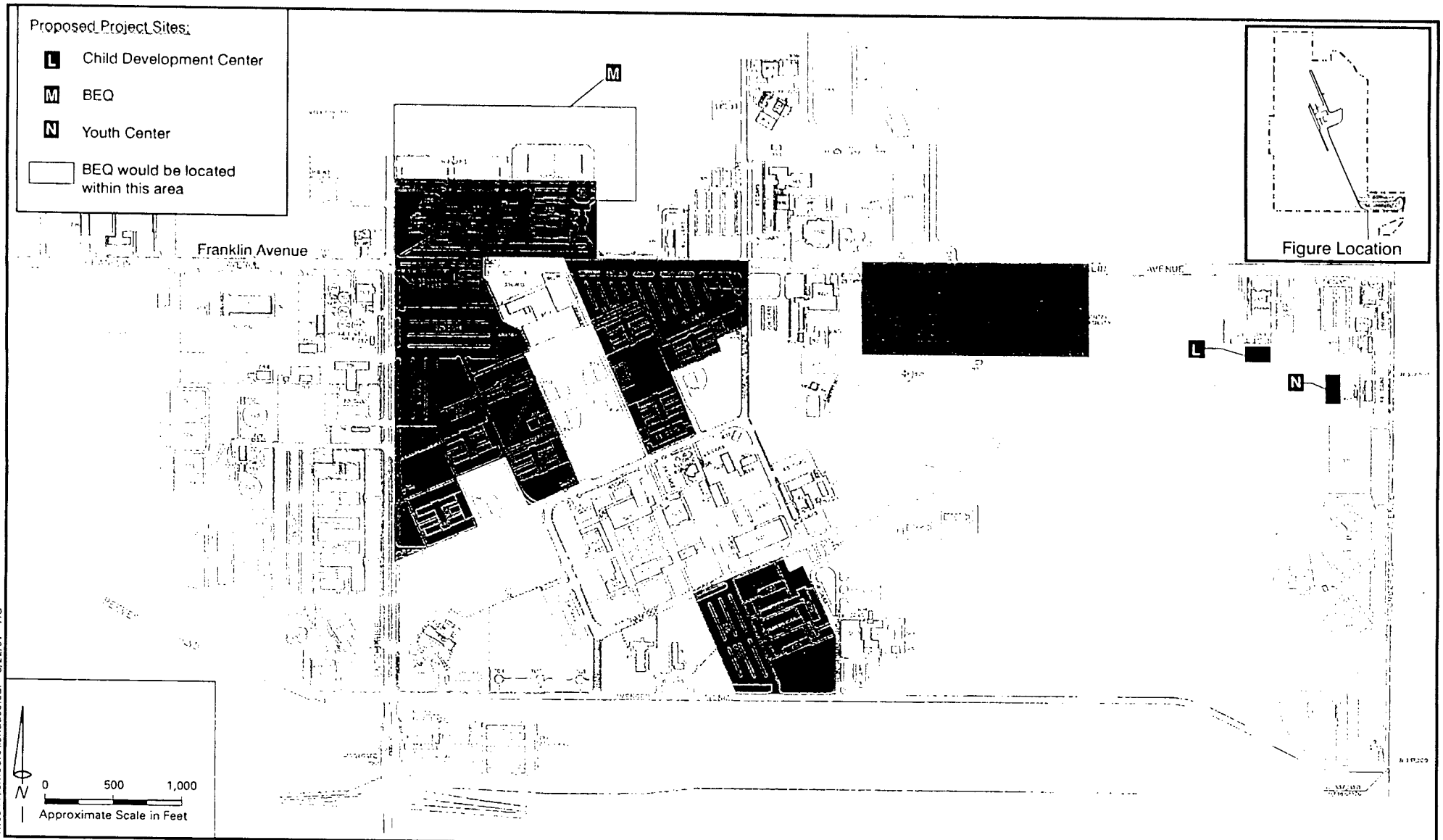
- Administration
- Maintenance
- Medical
- Open Space/ Agriculture
- Personnel Support
- Public Works
- Supply
- Training/Operations
- Construction/Expansion
- Renovation

NAS Lemoore Existing Land Uses: Operations Area

E-2 Aircraft Squadrons Realignment EIS
NAS Lemoore, California

Source: US Navy 1992c.

Figure 3-17



Support facilities and housing would be located in the NAS Lemoore administration/housing area.

LEGEND:

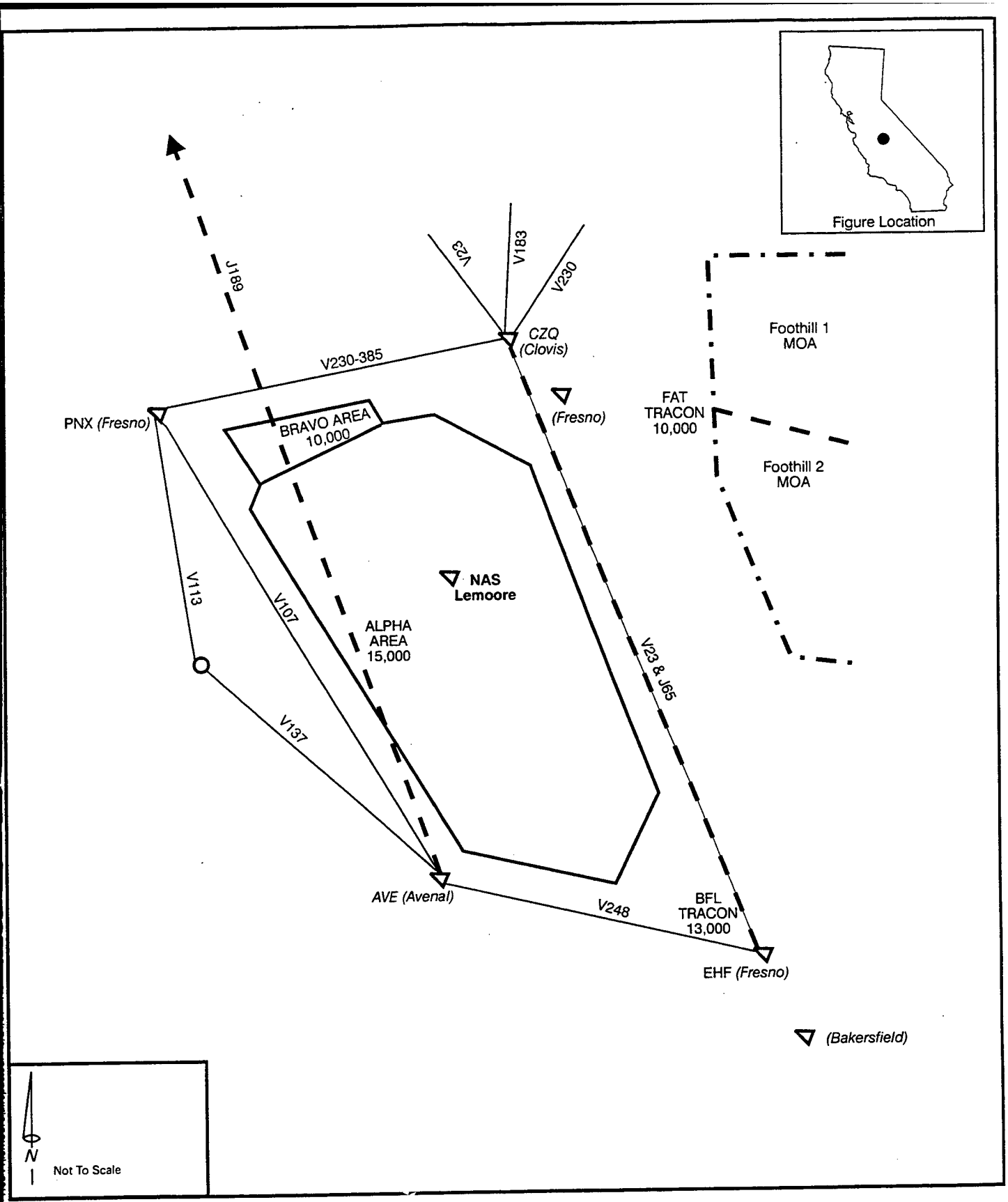
- Administration
- BOQ/BEQ/Family Housing
- Medical
- Personnel Support
- Public Works
- Recreation
- Supply
- Training/Operations
- Construction/Expansion

Source: US Navy 1992c.

NAS Lemoore Existing Land Uses: Administration/Housing Area

E-2 Aircraft Squadrons Realignment EIS
NAS Lemoore, California

Figure 3-18



There is no dedicated military airspace above NAS Lemoore.

LEGEND:

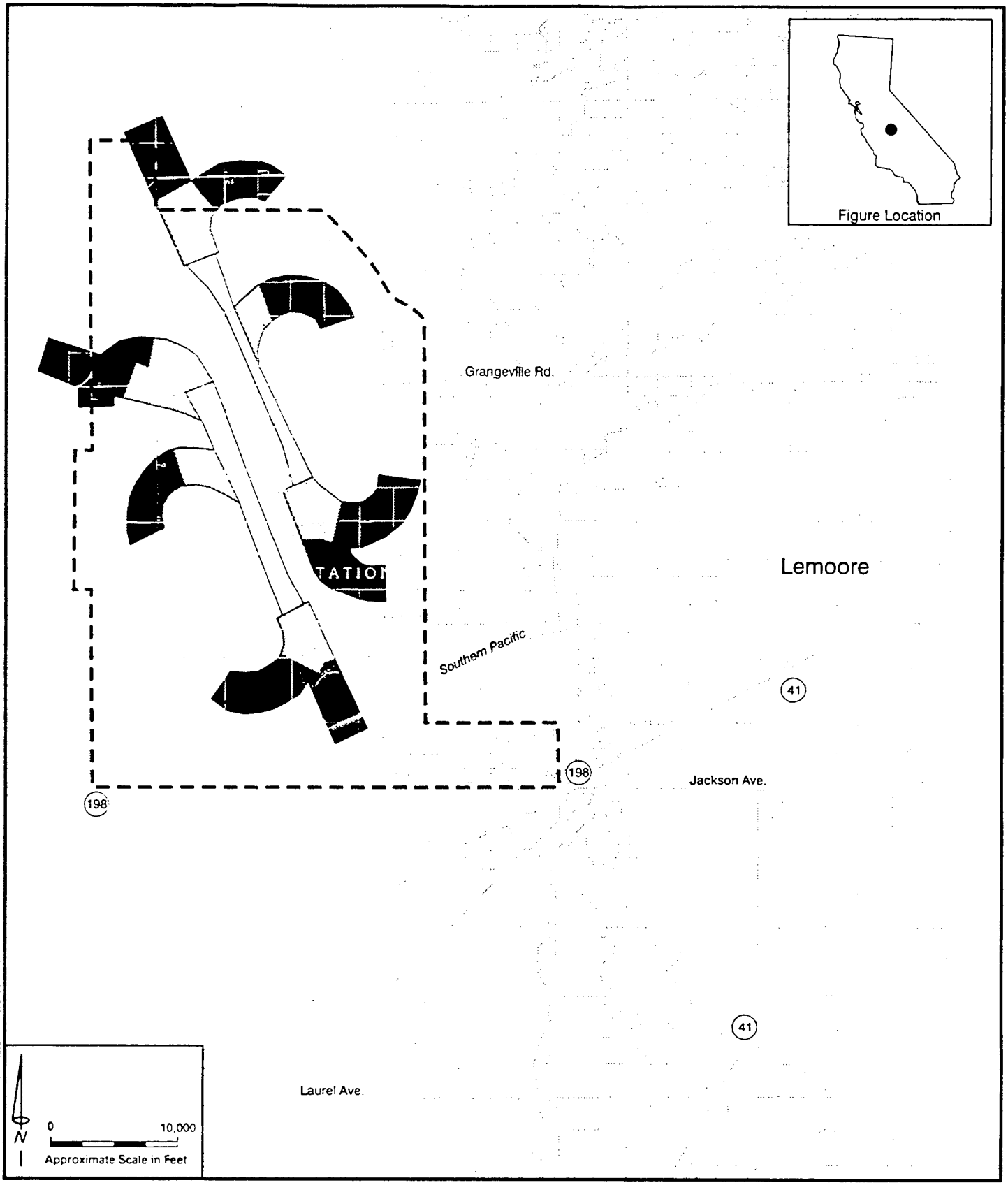
- NLC TRACON (NAS Lemoore Control)
- Military Operations Area (MOA)
- 18,000 feet msl and above
- 17,999 feet msl and below
- J Jet
- V Victor

NAS Lemoore Airspace Use

E-2 Aircraft Squadrons Realignment EIS
NAS Lemoore, California

Figure 3-19

Source: US Navy 1994d.



r:\0544\lemoore\accidnt2.cdr - 10/31/97 - MY

The APZs for NAS Lemoore extend beyond the northern boundaries of the base.

LEGEND:

- Clear Zone
- Accident Potential Zone I
- Accident Potential Zone II
- NAS Lemoore

NAS Lemoore Accident Potential Zones

E-2 Aircraft Squadrons Realignment EIS
NAS Lemoore, California

Source: US Navy 1993b.

Figure 3-20

On-base AICUZ and Imaginary Surfaces

In general, on-base land uses at NAS Lemoore are compatible with the AICUZ except for noise impacts within the administration area. Some residential uses occur within the 65 CNEL noise contour, and some administration offices are located within the 70 CNEL noise contour. A corner of the APZ I associated with Runway 32R is over two underground storage tanks containing fuel, however, these tanks have been constructed to make them compatible with APZ requirements (US Navy 1993).

There are a number of imaginary surfaces associated with NAS Lemoore that restrict or limit the structure height for safety purposes. There are currently no violations of imaginary surface restrictions at NAS Lemoore other than those necessary for safe air navigation (US Navy 1993).

3.3.3 NAF El Centro Alternative

Region of Influence

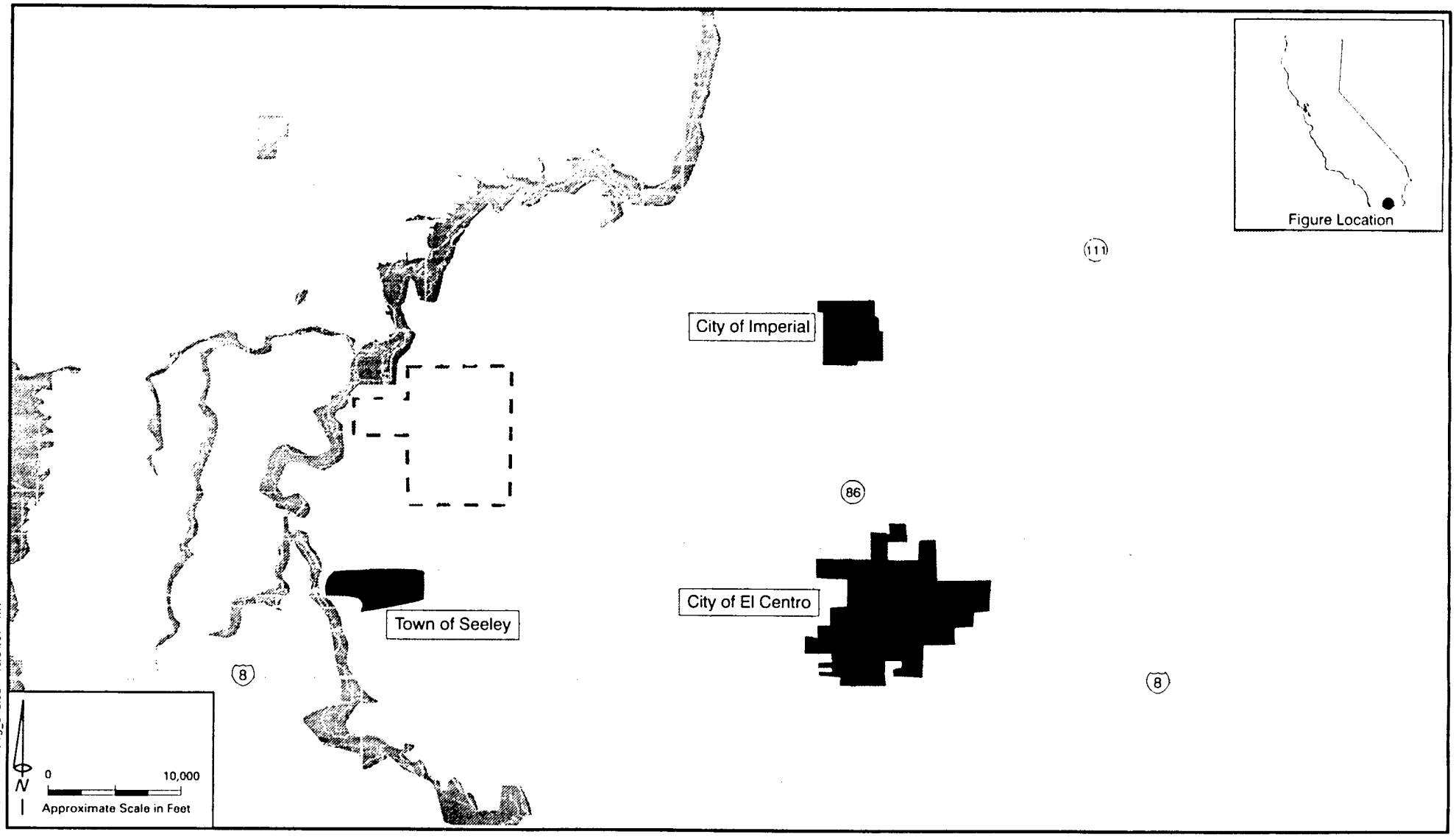
Land uses can be affected by development plans for the base and the surrounding area, as well as by aircraft operations associated with the base. The ROI for land use includes the base and immediately surrounding area. The ROI for airspace use includes any military airspace associated with the base. The imaginary surface restrictions associated with aircraft operations at a base can extend up to 10 miles (16 kilometers) from the base's airfield. Consequently, the ROI includes land uses below imaginary surface restrictions, usually within 10 miles (16 kilometers) of any base airfield.

Setting

NAF El Centro is located in the southeastern part of California in Imperial County and is comprised of 2,640 acres (1,069 hectares). The Navy holds the majority of this acreage in fee simple title with some lands leased under an agricultural outlease program and others are granted in easements. The base is approximately 120 miles (193 kilometers) east of San Diego and 65 miles (104 kilometers) west of Yuma, Arizona. The closest population centers to the base are the City of El Centro, located 7 miles (11 kilometers) to the southeast; Imperial, located 6 miles (9 kilometers) to the east; and Seeley, located 1 mile (1.6 kilometers) to the south (US Navy 1990a). The Naval Air Facility is 12 miles (19 kilometers) from the Mexican border.

Regional Land Uses

NAF El Centro is generally surrounded by unincorporated land in Imperial County. Regional land uses surrounding the base are almost entirely agricultural, as shown on Figure 3-21, and are zoned as general agricultural by Imperial County. Residential units in the vicinity of the base are primarily rural farmhouses, and the closest residential community is the town of Seeley, about 1 mile (1.6 kilometers) to the south (US Navy 1990a). Open space and recreational



R:\0544.centro\reg_and.cdr - 10/31/97 - MY

3-52

Most of the land surrounding NAF El Centro is used for agriculture.

LEGEND:

- City/Town
- Military
- Open Space/Agriculture
- Recreation

NAF El Centro Regional Land Uses

E-2 Aircraft Squadrons Realignment EIS
NAF El Centro, California

Source: US Navy 1988a.

Figure 3-21

uses occur along the New River, west of the base. The Imperial County Airport is located approximately 5 miles (8 kilometers) east of NAF El Centro.

On-base Land Uses

Training/operations uses comprise the major land use area at NAF El Centro. Other developed areas border the training/operations area to the south, while open space is located to the west, north, and east. Other land uses supporting aircraft and training activities at the base include on-base housing, medical facilities, maintenance and public works facilities. Personnel support uses such as the commissary and gymnasium, along with recreation areas, are located close to the housing facilities. A portion of the base is leased under an agricultural outlease program, which allows for growing of commercial crops (US Navy1990a). Existing land uses and the proposed location of the E-2 facilities are shown on Figure 3-22.

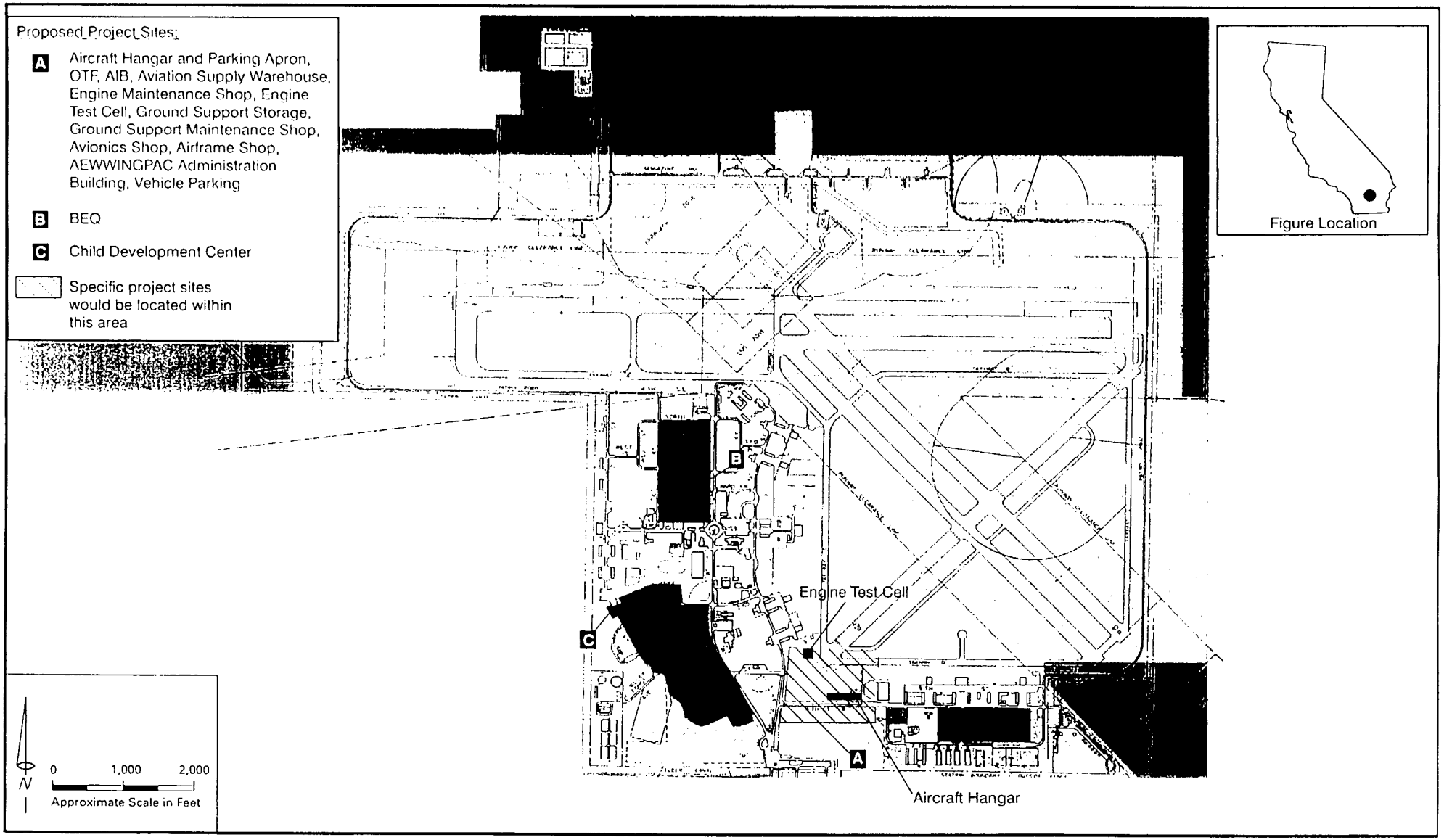
The landing field at NAF El Centro consists of three runways: 8/26, 12/30, and 3. Runway 8/26 is 9,500 feet (2,896 meters) long, and Runway 12/30 is 6,823 feet (2,080 meters) long. Runway 8/26 is the primary runway and is used for most takeoffs and landings, Runway 12/30 is the secondary runway, and Runway 3 is closed to fixed-wing aircraft and is used only by helicopters (US Navy 1988a).

Airspace Designations

The NAF El Centro airfield is located within the control area boundary of the Los Angeles ARTCC. When restricted airspace, MOAs, or MTRs are in use, the FAA transfers control of this airspace to the military. When not in use, the Los Angeles ARTCC has jurisdiction over flights in the area (US Navy 1990b). Figure 3-23 shows the airspace environment surrounding NAF El Centro. Nearby restricted areas include R-2510, which is in the Kane MOA, and R-2512, R-2507N, and R-207S, which are in the Able MOA. Federal airways in the area provide access to San Diego, Los Angeles, and Yuma. There are several MTRs in the airspace above NAF El Centro (US Navy 1990b).

An airport control zone is normally a circle with a 5 mile radius (8 kilometer radius) centered on the airport. However, because the airfields at NAF El Centro and Imperial County Airport are located 5 miles (8 kilometers) apart, their control zones overlap. Coordination between the two airports has resulted in well-defined airspace boundaries and control procedures for overlapping airport control zones (US Navy 1990b).

Figure 3-24 shows the airport traffic pattern interface between NAF El Centro and Imperial County Airport. Imperial County Runway 8/26 is on the same alignment as NAF El Centro Runway 8/26. Along with the overlapping control zones, operation of these runways requires special procedures for approaches and departures. An arbitrary low-altitude airport traffic boundary line has been established midway between NAF El Centro and the Imperial County Airport.



3-54

R:\0544\centro\landuse.cdr - 8/22/97 - HC

Most of NAF El Centro is used for training and operations.

LEGEND:

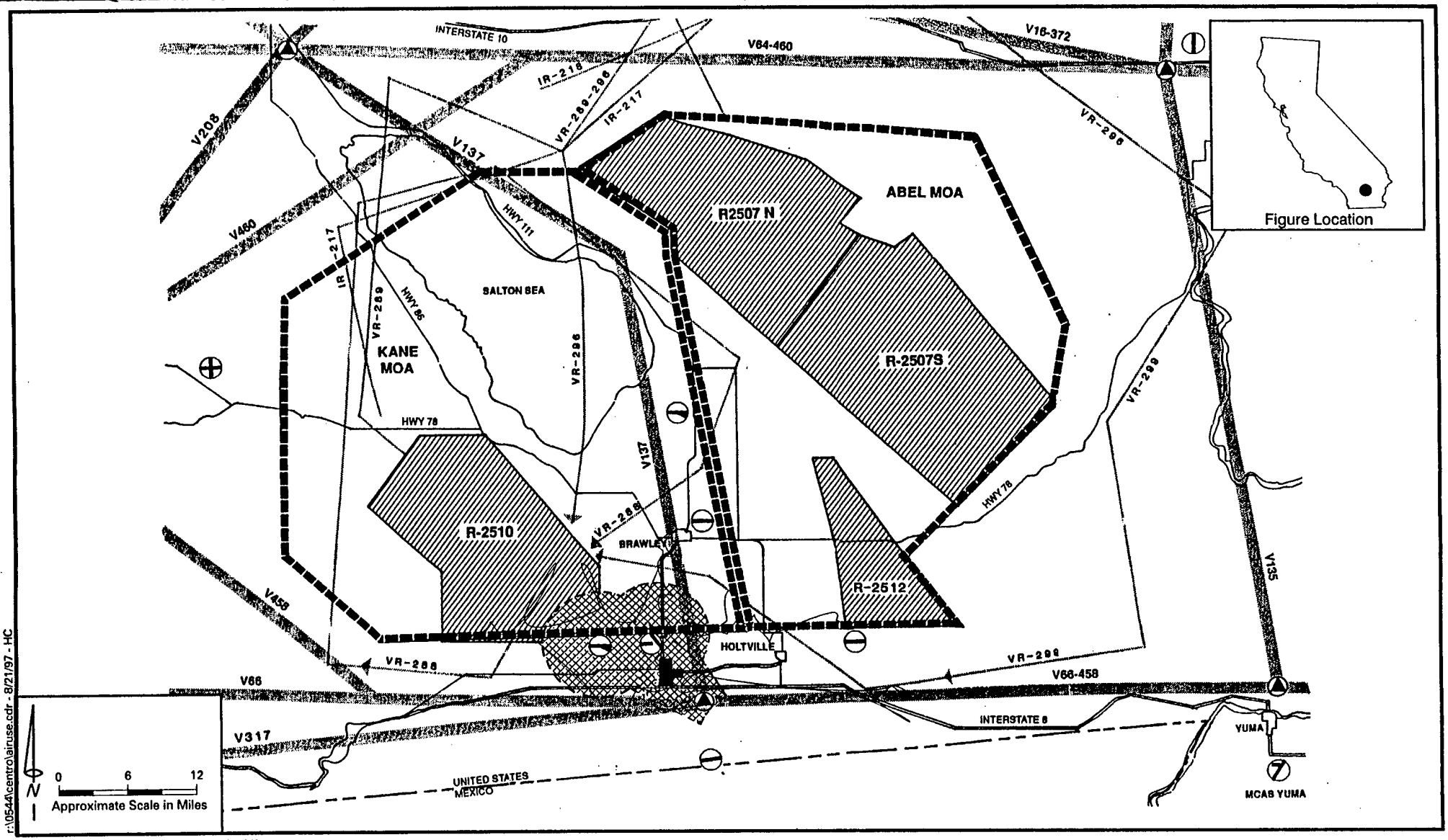
- Administration
- BOQ/BEQ/Family Housing
- Maintenance
- Medical
- Open Space/Agriculture
- Ordnance
- Personnel Support
- Public Works
- Recreation
- Supply
- Training/Operations
- Construction/Expansion

Source: US Navy 1988a.

NAF El Centro Existing Land Uses

E-2 Aircraft Squadrons Realignment EIS
NAF El Centro, California

Figure 3-22



r:\0544\centro\airuse.cdr - 8/21/97 - HC

Several restricted airspace areas are near NAF El Centro.

LEGEND:

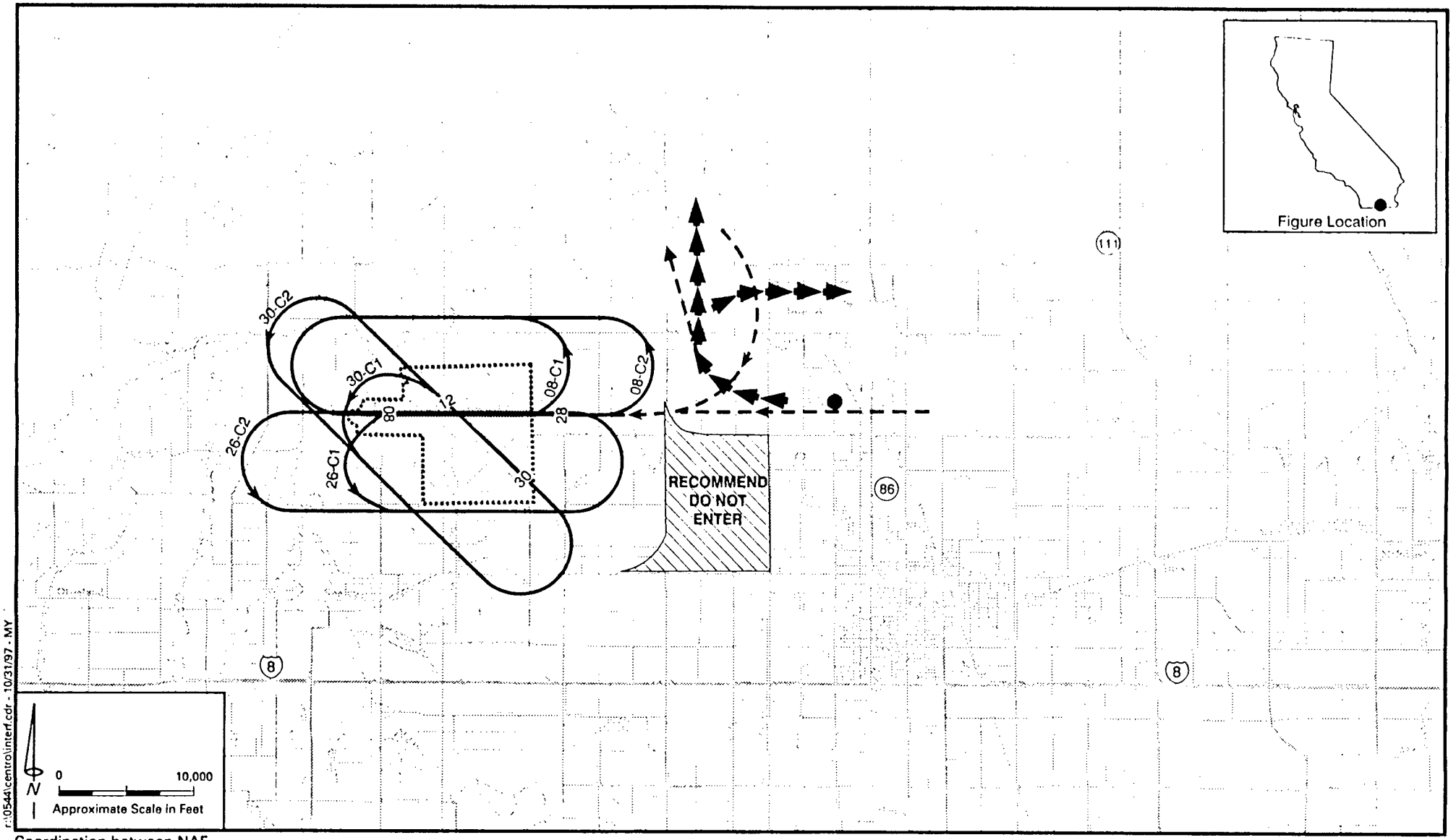
- Federal Airway
- Military Training Routes
- Military Operations Area
- Airport Control Zones
- Airport Location (Runway orientation in dark line)
- Radio Aid to Navigation
- Restricted Airspace
- NAF El Centro

NAF El Centro Airspace Use

E-2 Aircraft Squadrons Realignment EIS
NAF El Centro, California

Figure 3-23

Source: US Navy 1988a; 1990b.



r:\0544\centro\interf.cdr - 10/31/97 - MY

Coordination between NAF El Centro and the county airport is necessary during flight operation.

LEGEND:

- NAF El Centro Low Altitude Flight Track
- NAF El Centro High Altitude Flight Track
- 26-C1 NAF El Centro Flight Track Number
- Low Altitude Clearance Area
- NAF El Centro Low Altitude Flight Track
- Imperial County Airport Minimum Departure Heading - 310 Degrees
- Imperial County Airport
- NAF El Centro

Source: US Navy 1988a; 1990b.

NAF El Centro and Imperial County Airport Traffic Interface

E-2 Aircraft Squadrons Realignment EIS
NAF El Centro, California

Figure 3-24

Military aircraft that approach NAF El Centro Runway 8/26 from the north must hold their altitude above 3,000 feet (914 meters) over the Imperial County Airport and then descend rapidly to 1,500 feet (457 meters) to enter the circling approach (US Navy 1990b).

This airport traffic boundary line has forced NAF El Centro to shorten standard Field Carrier Landing Practices (FCLP) patterns to the east. Normally, the FCLP pattern would lengthen on approach to the runway when several aircraft are in the FCLP pattern. However, the pattern on NAF El Centro Runway 8/26 must lengthen on departure (US Navy 1990b).

Additionally, civilian aircraft that depart from Imperial County Airport must avoid flying into the NAF El Centro airport control zone. NAF El Centro has agreed to provide advisory service, to the extent possible, for Imperial County Airport traffic. The FAA has recommended several flight safety procedures at the Imperial County Airport to reduce the risk to aircraft safety:

- Traffic patterns for Runway 26 should be established as right-hand traffic; traffic patterns for Runway 8 should be established as left-hand traffic and traffic pattern altitude should be established at 800 feet (244 meters) for both patterns.

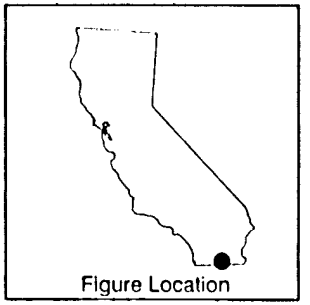
- Departure procedures for Runway 26 should be established restricting all turns to be right turns only after takeoff. All aircraft departing Runway 26 should be required to fly a minimum heading of 310 degrees after takeoff. A traffic pattern indicator should be installed indicating right traffic for Runway 26.

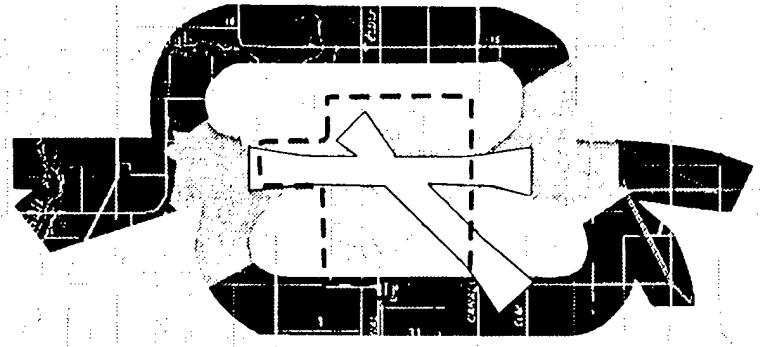
- The Imperial County Airport manager should conduct pilot briefings to fixed base operators and provide briefing sheets for all pilots using Imperial County Airport. The briefing should explain in detail the procedures to be used for Runway 8/26.

- All special operating procedures should be published in the Airport Facility Directory. Signs should be erected in conspicuous places on Imperial County Airport grounds advising pilots of the location of NAF El Centro and the special procedures that are recommended (US Navy 1990b).

Regional AICUZ and Imaginary Surfaces

Regional land uses are limited to agriculture and recreation, which, according to the NAF El Centro 1990 AICUZ, are allowable uses under existing APZ and noise designations. APZ zones are shown on Figure 3-25. Currently, no off-base structures are known to penetrate the imaginary surfaces; however, the Imperial County Airport is located under the approach-departure clearance surface, and





Imperial

111

86

El Centro

8

N

0 10,000

Approximate Scale in Feet

R:\0544\centro\acidnt.cdr - 10/31/97 - MY

3-58

The APZs for NAF El Centro extend beyond the boundaries of the base in all directions.

LEGEND:

- Clear Zone and Setback
- Accident Potential Zone I
- Accident Potential Zone II
- NAF El Centro

Source: US Navy 1990b.

NAF El Centro Accident Potential Zones

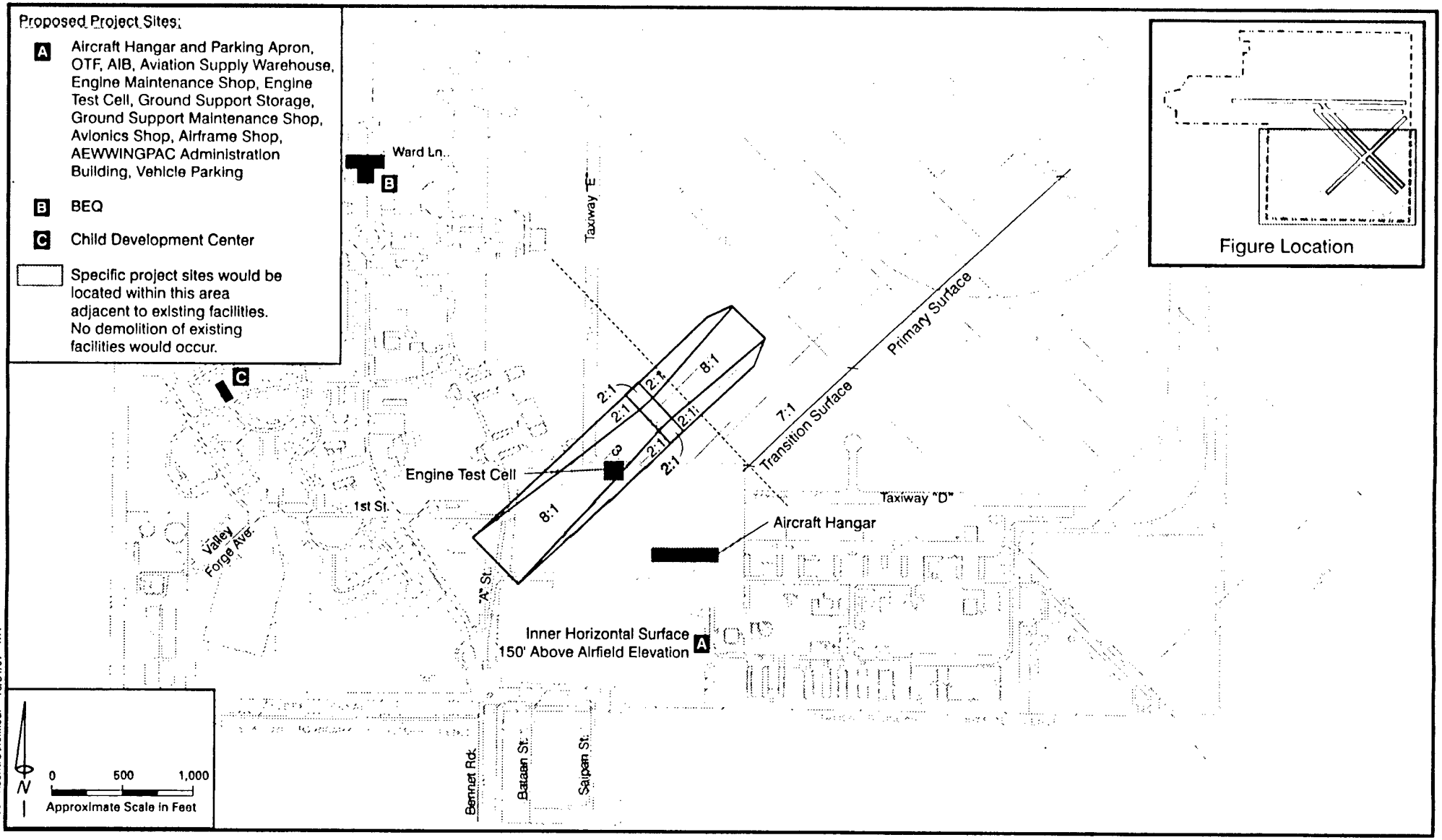
E-2 Aircraft Squadrons Realignment EIS
NAF El Centro, California

Figure 3-25

portions of the cities of Imperial and El Centro are located below the approach-departure clearance surface or the outer horizontal imaginary surface. The community of Seeley is located below the conical surface (US Navy 1990b).

On-base AICUZ and Imaginary Surfaces

The majority of NAF El Centro is within the 80 CNEL noise contour specified in the AICUZ for the base. Existing land uses not compatible with these noise levels include the medical and dental clinic, administration facilities, housing, and personnel support facilities. Because relocating these facilities would be impractical, the NAF El Centro AICUZ recommends insulating the buildings to attenuate noise impacts (US Navy 1990b). NAF El Centro has imaginary surfaces for helicopters that are different from those associated with planes (Figure 3-26) (US Navy 1988a). Currently, no structures, other than those necessary for safe aircraft operation, violate imaginary surface restrictions (US Navy 1990b).



No existing structures at NAF El Centro intrude into an imaginary helicopter surface.

NAF El Centro Imaginary Helicopter Surfaces

E-2 Aircraft Squadrons Realignment EIS
NAF El Centro, California

Source: US Navy 1990b.

Figure 3-26

R:\0544\centro\helli.cdr - 10/31/97 - MY

3.4 SOCIOECONOMICS

This section describes recent socioeconomic trends in the region surrounding the three alternative bases. To ensure data comparability of population, employment, income, housing, business volume, and government revenue among all affected bases, the same sources of data were used when available.

Socioeconomics includes data on population, employment, income, housing, business volume, and government revenue. Population data includes the number of residents in the area. Employment data include labor sectors, labor force, and statistics on unemployment. Income information is provided as an annual total by county and as per capita income. Housing data includes numbers of multifamily units, single-family homes, and mobile homes and their vacancy rate. Business volume is the total business activity or sales. Government revenues are total sources.

The ROI described for each alternative includes the area in which principal direct and secondary socioeconomic effects of site actions are likely to occur and are expected to be of the most consequence for local jurisdictions. Distribution of residences and of commuting and spending patterns for current military and civilian personnel employed at each base is an aid in determining where the greatest effects of relocation would occur.

ROIs addressed in this section may vary as appropriate from one socioeconomic issue to another. Most demands associated with regional population and economic (employment and income) effects of base relocation are anticipated to be concentrated within the surrounding county or counties.

3.4.1 Preferred Alternative: NAWS Point Mugu

Region of Influence

The ROI for NAWS Point Mugu, the preferred alternative, is Ventura County, California. The ROI was selected based on the assumption that most base personnel commute to work from and spend dollars in Ventura County. Ventura County is surrounded by Los Angeles County to the south and east, Kern County to the north, Santa Barbara County to the west, and the Pacific Ocean to the south and west. Ventura County includes 11 incorporated cities: Camarillo, Fillmore, Moorpark, Ojai, Oxnard, Port Hueneme, Thousand Oaks, Ventura, Santa Paula, Simi Valley, and Thousand Oaks. The county seat is the City of Ventura (Economic Forecast Project 1997).

Population

The population in the ROI (Table 3-4) totaled approximately 670,300 in 1990 and grew 4.8 percent to 702,700 in 1994. Population density in 1994 was 381 people per square mile.

Table 3-4
Population, Ventura County

	Population (1,000s)	Change from 1990 (percent)
1990	670.3	0.0
1992	686.7	2.4
1994	702.7	4.8

Source: Bureau of Economic Analysis 1996m; 1996n.

Employment

Ventura County experienced the greatest decreases in construction (24.3 percent) and mining sectors (16.9 percent) and the greatest increase in the agricultural services, which includes fisheries (18.4 percent), and services sectors (17.9 percent). Military sector employment decreased 7.7 percent from 1990 to 1994.

Federal civilian and military sector employment has declined as downsizing continues at Point Mugu and Port Hueneme. The largest downsizings recently occurred at NAWS Point Mugu (720 positions) and the Naval Construction Battalion Center and all tenant commands at Port Hueneme (680 positions). The oil and gas industry continues to consolidate or leave the county.

Crop production and sales have soared recently in Ventura County. Farmers have replanted agricultural land with products that yield higher values per acre, such as strawberries, lettuce, avocados, and flowers. As a result, value per acre has soared, and total agricultural crop sales are now at record levels, resulting in the 18.4 percent employment growth in that sector. Services sector employment rose 17.9 percent from 1990 to 1994. The principal service sectors are health, business, and education services. Statewide, the entertainment industry is the leading growth industry, particularly motion picture production (Economic Forecast Project 1997). Employment in the ROI is detailed in Table 3-5.

The County of Ventura had a labor force of 384,414 in 1994, a 4.8 percent increase from 1990. Although still higher than the 1990 unemployment rate of 5.6 percent, the unemployment rate in 1994 decreased slightly to 7.9 percent, reflecting an increase in employment opportunities as the economy attempts to stabilize (Table 3-6). The top employers in Ventura County include the Naval Construction Battalion Center at Port Hueneme, NAWS Point Mugu, the County of Ventura, and Amgen, a biotechnical research company in Thousand Oaks (Economic Forecast Project 1997).

Sources for civilian employment at NAWS Point Mugu include federal civil service positions; non-federal civil service positions, such as the Navy Exchange and the Morale, Welfare, and Recreation Department; and contractors and subcontractors. The workforce at NAWS Point Mugu consists of approximately 8,167 personnel.

Table 3-5
Sector Employment, Ventura County

Sector	1990	1992	1994	Change 1990 to 1994 (percent)
Farm	10,597	10,110	10,596	0.0
Nonfarm	320,606	317,856	327,871	2.3
Private	269,642	266,946	278,749	3.4
Agricultural Services	9,897	10,920	11,715	18.4
Mining	3,011	2,744	2,503	-16.9
Construction	23,020	17,226	17,430	-24.3
Manufacturing	35,568	34,465	32,532	-8.5
Transportation and Public Utilities	13,392	11,564	12,651	-5.5
Wholesale Trade	13,313	13,465	14,123	6.1
Retail Trade	54,832	54,017	55,154	0.6
Finance, Insurance, and Real Estate	24,947	24,219	24,579	-1.5
Services	91,662	98,326	108,062	17.9
Government and Government Enterprises	50,964	50,910	49,122	-3.6
Federal, Civilian	12,568	12,265	11,369	-9.5
Military	8,110	7,959	7,482	-7.7
State and Local	30,286	30,686	30,271	0.0
Total	331,203	327,966	338,467	2.2

Source: Bureau of Economic Analysis 1996o; 1996p.

Table 3-6
Labor Force and Unemployment, Ventura County

	Labor Force	Unemployed	Unemployment Rate (percent)
1990	366,769	20,573	5.6
1992	372,470	32,730	8.8
1994	384,414	30,281	7.9

Source: US Bureau of Labor Statistics 1996e.

Income

In 1994, the per capita income for Ventura County was $22,625, an increase over the 1992 figure of $21,837 (Table 3-7). The average income of NAWS Point Mugu civilian personnel is $37,932 (US Navy 1997b) and the average income of NAWS Point Mugu military personnel is $27,331.

Table 3-7
Income by Place of Residence, Ventura County

	Total Personal Income ($1,000s)	Per Capita Income
1990	$14,162,477	$21,127
1992	$14,995,194	$21,837
1994	$15,899,444	$22,625

Source: Bureau of Economic Analysis 1996m; 1996n.

Housing

In 1994, there were 237,747 housing units in the ROI, with 11,764 vacant units (Table 3-8). The vacancy rate of 4.9 percent is at a level generally indicating that there is high demand for housing in the area.

Table 3-8
Housing Stock and Vacancy Rate, Ventura County

	1990	1992	1994
Single-Family Units	167,412	170,583	173,263
Multifamily Units	48,865	50,873	52,237
Mobile Homes	12,201	12,220	12,247
Total Housing Units	**228,478**	**233,676**	**237,747**
Vacant	11,180	11,430	11,764
Percent Vacant	4.9	4.9	4.9

Source: California Department of Finance 1990.

The NAWS Point Mugu area is considered a high-cost area, and the waiting lists for government quarters can be long. For married personnel, two housing areas with 983 units are utilized, one at NAWS Point Mugu, the other in the City of Camarillo, which is located 8 miles from NAWS Point Mugu. Personnel must meet family size and age criteria, and waiting lists vary throughout the year. There are no temporary government quarters in this area (SITES 1997c).

Family housing on the main base accommodates 464 enlisted families, 18 junior officer families, 66 field officer families, 19 senior officer families, and 1 flag officer family. A total of 568 military families is accommodated on the main base. Bachelor Enlisted Quarters (BEQs) on the base house 807 enlisted personnel. The Bachelor Officers Quarters (BOQ) in Building 6 houses 27 transient officers (Grades W-1 through O-2), but is inadequate for higher grades because of the small size of the suites. Buildings 166 through 171 are BOQs that presently house 48 officers, Grades O-3 and above. Designed for Grades W-1 through O-2, these BOQs also are inadequate for the grades currently housed in them (US Navy 1986a). Family housing in the City of Camarillo contains 315 housing units, 9 of which are for officers (Connor 1997).

Business Volume

Business volume is defined as local business activity or sales and is the sum of total retail and wholesale trade sales, total service receipts, and value added by manufacturing. Business volume in Ventura County (Table 3-9) has steadily risen from almost $7 million in 1990 to over $8 million in 1994.

Table 3-9
Business Volume ($1,000s), Ventura County

Sector	1990	1992	1994
Manufacturing	$1,174,323	$1,247,518	$1,239,518
Transportation and Public Utilities	$468,146	$454,069	$514,980
Wholesale Trade	$417,197	$448,408	$508,218
Retail Trade	$885,515	$912,824	$986,671
Finance, Insurance, and Real Estate	$394,045	$516,862	$552,383
Services	$2,072,861	$2,511,553	$2,826,155
Government and Government Enterprises	$1,477,030	$1,665,581	$1,700,923
Total	**$6,889,117**	**$7,756,815**	**$8,328,848**

Sources: Bureau of Economic Analysis 1996m; 1996n.

Net Government Revenues

Net government revenues are total financing sources and transfers in less total financing uses and transfers out. Net government revenues in Ventura County (Table 3-10) have fluctuated through the past few years from a low of approximately $1,729,000 to a high of $15,098,000.

Table 3-10
Net Government Revenues, Ventura County

	Fiscal Years		
	1990/1991	1992/1993	1994/1995
Sources	$421,891,263	$474,499,374	$513,351,461
Uses	$417,057,395	$459,401,263	$511,622,009
Net Revenues	$4,833,868	$15,098,111	$1,729,452

Sources: California State Controller 1993a; 1995b; 1997a.

3.4.2 NAS Lemoore Alternative

Region of Influence

The ROI for NAS Lemoore includes Kings and Fresno Counties, California. The ROI was selected based on the assumption that most base personnel commute to work from and spend money in one or both of the counties. Kings County is surrounded by Fresno County to the north and west, Tulare County to the east, Kern County to the south, and Monterey County to the west. Four incorporated cities, Avenal, Corocoran, Hanford (the county seat), and Lemoore, are located in Kings County (Crown Economic Development Corporation 1997).

Fresno County is surrounded by Kings County and Tulare County to the south, Madera County, Mono County, and Merced County to the north, San Benito County and Monterey County to the west, and Inyo County to the east. There are 12 incorporated cities: Clovis, Coalinga, Firebaugh, Fowler, Fresno (the county seat), Huron, Kerman, Kingsburg, Mendota, Reedley, Sanger, and Selma (Fresno County 1997).

Population

The population in the ROI totaled approximately 839,800 in 1994, representing an increase of 8.5 percent from the 1990 population (Table 3-11). Each county had similar population growth rates: Kings County was 8.2 percent and Fresno County was 8.6 percent. In 1994, population density was 79 persons per square mile in Kings County and 122 in Fresno County.

Table 3-11
Population, Kings and Fresno Counties

	Kings County (1,000s)	Fresno County (1,000s)	Total
1990	101.8	671.9	773.7
1992	106.8	706.0	812.8
1994	110.1	729.7	839.8
Change 1990 to 1994 (percent)	8.2	8.6	8.5

Source: Bureau of Economic Analysis 1996a; 1996b; 1996e; 1996f.

Employment

Between 1990 and 1994, total employment in Kings and Fresno counties increased by 4.8 percent (Table 3-12). The greatest increase at 30.9 percent was in the agricultural services sector; however, this was offset by decreases in mining (22.5 percent) and construction (10.5 percent). Military employment decreased 4.5 percent in Kings and Fresno counties from 1990 to 1994.

In 1994, the civilian labor force for Kings County totaled 42,056 with 5,741 people unemployed (Table 3-13). The unemployment rate was 13.7 percent for 1994, up 3.5 percent from 1990. In Fresno County, the civilian labor force totaled 366,223 in 1994, with 49,670 persons unemployed (13.6 percent unemployment rate). The combined unemployment rate for the ROI was 13.6 percent.

The major employers in Kings County are Kings County Schools, Corcoran State Prison, and Kings County. NAS Lemoore is the eighth largest employer in the county (Crown Economic Development Corporation 1997). Major employers in Fresno County are Fresno County, NAS Lemoore, and Fresno Unified School District (The Business Journal 1997).

Table 3-12
Sector Employment, Kings and Fresno Counties

Sector	1990	1992	1994	Change 1990 to 1994 (percent)
Farm	35,565	32,108	34,358	-3.4
Nonfarm	351,329	355,833	371,146	5.6
Private	284,169	288,360	300,240	5.7
Agricultural Services	28,766	28,891	37,655	30.9
Mining	901	930	698	-22.5
Construction	20,454	18,285	18,311	-10.5
Manufacturing	31,156	29,500	30,428	-2.3
Transportation and Public Utilities	15,529	15,662	15,500	-0.2
Wholesale Trade	17,261	17,414	16,932	-1.9
Retail Trade	61,835	60,931	63,072	2.0
Finance, Insurance, and Real Estate	24,317	24,656	24,195	-0.5
Services	83,950	92,091	93,449	11.3
Government and Government Enterprises	67,160	67,473	70,906	5.6
Federal, Civilian	12,105	12,149	12,149	0.4
Military	7,039	6,895	6,720	-4.5
State and Local	48,016	48,429	52,037	8.4
Total	386,894	387,941	405,504	4.8

Source: Bureau of Economic Analysis 1996c; 1996d; 1996g; 1996h.

Table 3-13
Labor Force and Unemployment, Kings and Fresno Counties

	Labor Force	Unemployed	Unemployment Rate (percent)
Kings County			
1990	38,176	3,882	10.2
1992	39,408	5,904	15.0
1994	42,056	5,741	13.7
Fresno County			
1990	330,999	34,447	10.4
1992	355,324	51,948	14.6
1994	366,223	49,670	13.6
Total			
1990	369,175	38,329	10.4
1992	394,732	57,852	14.7
1994	408,279	55,411	13.6

Source: Bureau of Labor Statistics 1996a; 1996b.

There are four main sources of civilian employment at NAS Lemoore. These include federal civil service positions, non-federal civil service positions, contractors and subcontractors, and McDonalds Restaurant. Approximately 900 people are employed in federal civil service at the base. Non-federal civil service (non-appropriated funds) includes the Navy Exchange and the Department of Morale, Welfare, and Recreation. The Navy Exchange employs roughly 220 personnel, and Department of Morale, Welfare, and Recreation employs about 200. The McDonalds restaurant on the base presently employs from 40 to 45 people. NAS Lemoore supports a workforce of 4,518 military and 1,805 civilian personnel for a total workforce of 6,323.

Income

In 1994, the per capita personal income for the ROI was $16,918, an increase of 7.7 percent over the 1990 income. In Kings County the per capita income was $13,622 in 1994. In Fresno County, the per capital personal income was $17,406 in 1994. The average income for military personnel is $37,230, while civilian personnel at NAS Lemoore earn an average of $30,861. Table 3-14 lists the income in the ROI.

Table 3-14
Income by Place of Residence, Kings and Fresno Counties

	Total Personal Income ($1,000s)	Per Capita Income
Kings County		
1990	$1,286,215	$12,631
1992	$1,408,748	$13,186
1994	$1,499,612	$13,622
Fresno County		
1990	$10,864,187	$16,170
1992	$11,898,823	$16,855
1994	$12,701,465	$17,406
Total		
1990	**$12,150,402**	**$15,704**
1992	**$13,168,980**	**$16,198**
1994	**$14,201,077**	**$16,918**

Source: Bureau of Economic Analysis 1996a; 1996b; 1996e; 1996f.

Housing

The ROI had 270,713 housing units in 1994 (Table 3-15). There were 32,966 units in Kings County and 237,747 units in Fresno County. In each county, the composition of housing units is roughly 73 percent single-family units, 21 percent multifamily units, and 5 percent mobile homes. Kings County has a slightly lower percentage of multifamily units and higher percentage of mobile homes.

The vacancy rate ranges between 4.9 percent in Fresno County to 6.1 percent in Kings County for a combined vacancy rate of 5.1 percent in 1994.

Table 3-15
Housing Stock and Vacancy Rates, Kings and Fresno Counties

	Single-Family Units	Multifamily Units	Mobile Homes	Total Housing Units	Vacant	Percent Vacant
Kings County						
1990	22,506	6,314	2,023	30,843	1,761	5.7
1992	23,300	6,437	2,110	31,847	1,818	5.7
1994	24,277	6,495	2,194	32,966	2,016	6.1
Fresno County						
1990	167,412	48,865	12,201	228,478	11,180	4.9
1992	170,583	50,873	12,220	233,676	11,430	4.9
1994	173,263	52,237	12,247	237,747	11,764	4.9
Total						
1990	**189,918**	**55,179**	**14,224**	**259,321**	**12,941**	**5.0**
1992	**193,883**	**57,310**	**14,330**	**265,523**	**13,248**	**5.0**
1994	**197,540**	**58,732**	**14,441**	**270,713**	**13,780**	**5.1**

Source: California Department of Finance 1990.

Housing is available to all pay grades. There are 1,589 family housing units consisting of 90 officer and 1,499 enlisted units. The waiting list varies depending on the size of the family and pay grade. Certain areas of housing are being renovated, and plans are being finalized to build new houses. The BEQ has 3,057 beds, and BOQ has 165 rooms (SITES 1997b).

Business Volume

Business volume in Kings and Fresno Counties has steadily risen from almost $7 million in 1990 to slightly over $8 million in 1994 (Table 3-16).

Table 3-16
Business Volume ($1,000s), Kings and Fresno Counties

Sector	1990	1992	1994
Manufacturing	$853,059	$852,705	$937,603
Transportation and Public Utilities	$505,107	$557,771	$576,243
Wholesale Trade	$518,452	$556,483	$562,149
Retail Trade	$1,019,866	$983,333	$1,073,880
Finance, Insurance, and Real Estate	$380,532	$481,599	$491,374
Services	$1,785,265	$2,090,256	$2,287,695
Government and Government Enterprises	$1,769,542	$1,991,525	$2,179,121
Total	**$6,831,823**	**$7,513,672**	**$8,108,065**

Sources: Bureau of Economic Analysis 1996a; 1996b; 1996e; 1996f.

Net Government Revenues

Net government revenues in Kings County have fluctuated through the past few years from a low of approximately negative $1,412,000 to a high of $1,532,000 (Table 3-17). In Fresno County, net government revenues ranged from a low of negative $5,845,000 in fiscal year 1992/1993 to a high of $14,973,758 in fiscal year 1990/1991.

Table 3-17
Net Government Revenues, Kings and Fresno Counties

	Fiscal Years		
	1990/1991	1992/1993	1994/1995
Kings County			
Sources	$84,955,639	$90,926,174	$98,213,648
Uses	$86,367,957	$89,394,025	$98,440,899
Net Revenues	($1,412,318)	$1,532,149	($227,251)
Fresno County			
Sources	$610,450,607	$676,938,979	$734,626,849
Uses	$595,476,849	$682,784,235	$732,131,119
Net Revenues	$14,973,758	($5,845,256)	$2,495,730

Sources: California State Controller 1993a; 1995b; 1997a.

3.4.3 NAF El Centro Alternative

Region of Influence

The ROI for NAF El Centro is Imperial County, California. The ROI was selected based on the assumption that most base personnel commute to work from and spend dollars in Imperial County. Imperial County is surrounded by Riverside County to the north, San Diego County to the west, the country of Mexico to the south, and Arizona to the east. There are seven incorporated cities in Imperial County: Brawley, Calexico, Calipatria, El Centro, Holtville, Imperial, Westmoreland, and El Centro, the county seat (Valley of Imperial Development Alliance 1994).

Population

The population in Imperial County totaled approximately 137,100 persons in 1994, which represents a 23.5 percent increase over the 1990 population (Table 3-18). Population density in 1994 was approximately 39 people per square mile.

Employment

Employment by sector for Imperial County is detailed in Table 3-19. Substantial percentage changes from 1990 to 1994 occurred throughout the sectors, illustrating an economy in flux. Decreases included mining (34.9 percent), agricultural services (13.3 percent), and wholesale trade (13.1 percent). Increases included state and local government (29.7 percent), transportation and public

Table 3-18
Population, Imperial County

	Population (1,000s)	Change from 1990 (percent)
1990	111.0	0.0
1992	128.7	15.9
1994	137.1	23.5

Source: Bureau of Economic Analysis 1996i; 1996j.

utilities (28.5 percent), manufacturing (27.7 percent), retail trade (22.1 percent), finance, insurance, and real estate (11.4 percent), and services (10.6 percent). Military sector employment increased by 1.1 percent.

Table 3-19
Sectors Employment, Imperial County

Sectors	1990	1992	1994	Change 1990 to 1994 (percent)
Farm	5,038	4,293	4,978	-1.2
Nonfarm	47,858	48,369	52,373	9.4
Private	37,758	36,883	39,677	5.1
Agricultural Services	10,269	7,648	8,904	-13.3
Mining	748	741	487	-34.9
Construction	2,101	2,051	2,037	-3.0
Manufacturing	1,616	1,687	2,064	27.7
Transportation and Public Utilities	1,826	2,032	2,347	28.5
Wholesale Trade	2,424	2,274	2,107	-13.1
Retail Trade	8,296	9,342	10,132	22.1
Finance, Insurance, and Real Estate	1,806	1,836	2,011	11.4
Services	8,672	9,272	9,588	10.6
Government and Government Enterprises	10,100	11,486	12,696	25.7
Federal, Civilian	1,143	1,208	1,241	8.6
Military	567	618	573	1.1
State and Local	8,390	9,660	10,882	29.7
Total	**52,896**	**52,662**	**57,351**	**8.4**

Source: Bureau of Economic Analysis 1996k; 1996l.

The total civilian labor force in 1994 for Imperial County was 57,467 (Table 3-20). There is a 24.9 percent unemployment rate in this ROI. According to the US Bureau of Census (1994), Imperial County has the tenth highest unemployment rate in the nation and is the only California county that appears on the list of the top 25 counties with the highest unemployment rate.

Table 3-20
Labor Force and Unemployment, Imperial County

	Labor Force	Unemployed	Unemployment Rate (percent)
1990	48,026	10,228	21.3
1992	54,220	15,313	28.2
1994	57,467	14,317	24.9

Source: Bureau of Labor Statistics 1996c.

Top Imperial County employers in descending order include the Centinela State Prison, County of Imperial, Imperial Irrigation District, and NAF El Centro (Valley of Imperial Development Alliance 1994). Sources for civilian employment at NAF El Centro include federal civil service positions, non-federal civil service positions, and contractor and subcontractors. The base is staffed with a permanent workforce of approximately 863 people (343 military and 530 civilian personnel).

Income

In 1994 the per capita income for Imperial County was $14,302 (Table 3-21). Although between 1990 and 1994 total personal income in the county increased by 15.7 percent, the population change was such that per capita income actually decreased 6.2 percent.

Table 3-21
Income by Place of Residence, Imperial County

	Total Personal Income ($1,000s)	Per Capita Income
1990	$1,693,858	$15,255
1992	$1,800,184	$13,986
1994	$1,960,178	$14,302

Source: Bureau of Economic Analysis 1996i; 1996j.

Housing

There were 40,323 housing units in Imperial County in 1994, of which 3,982 units were vacant, constituting a 9.9 percent vacancy rate (Table 3-22). Over half the housing units are single-family, approximately one quarter are multifamily units, and the rest are mobile homes.

Table 3-22
Housing Stock and Vacancy Rate, Imperial County (1990, 1992, and 1994)

	1990	1992	1994
Single Units	21,749	22,627	24,011
Multifamily Units	7,987	8,799	9,121
Mobile Homes	6,823	7,131	7,191
Total Housing Units	**36,559**	**38,557**	**40,323**
Vacant Units	3,717	3,882	3,982
Percent Vacant	10.2	10.1	9.9

Source: California Department of Finance 1990.

The family housing area at NAF El Centro contains 172 single-family houses, of which 170 are used for family housing and 2 are used for a child development center. All housing units are occupied. BOQ and BEQ units are in separate complexes dispersed throughout the southern portion of the base. Transient BOQs are housed in three units. Transient BEQs are housed in five units, and permanent BEQs are in three units (US Navy 1986a).

Business Volume

Business volume is defined as local business activity or sales and is the sum of total retail and wholesale trade sales, total service receipts, and value added by manufacturing. Business volume in Imperial County (Table 3-23) dipped slightly in 1992 but has remained at approximately $1 million.

Table 3-23
Business Volume ($1,000s), Imperial County

Sector	1990	1992	1994
Manufacturing	$35,602	$41,788	$55,054
Transportation and Public Utilities	$52,547	$66,640	$84,303
Wholesale Trade	$60,006	$64,839	$66,161
Retail Trade	$126,907	$147,623	$170,152
Finance, Insurance, and Real Estate	$380,532	$18,972	$31,040
Services	$172,435	$200,719	$215,164
Government and Government Enterprises	$282,107	$365,847	$422,873
Total	**$1,110,136**	**$906,428**	**$1,044,747**

Sources: Bureau of Economic Analysis 1996i; 1996j.

Net Government Revenues

Net government revenues in Imperial County have shifted from a low of approximately negative $344,000 to a high of $4,495,000. Table 3-24 provides more detail on net government revenues for Imperial County.

Table 3-24
Net Government Revenues, Imperial County

	Fiscal Years		
	1990/1991	1992/1993	1994/1995
Sources	$102,090,654	$113,881,660	$124,124,779
Uses	$99,152,211	$109,386,268	$124,468,581
Net Revenues	$2,938,443	$4,495,392	($343,802)

Sources: California State Controller 1993a; 1995b; 1997a.

3.5 TRAFFIC AND CIRCULATION

This section describes the existing street system, intersection operating conditions, and roadway operating conditions for each alternative base and the surrounding areas. A full traffic study was prepared to determine and evaluate the potential traffic impacts of the proposed alternatives on the surrounding circulation systems. This study is available upon request (Linscott, Law & Greenspan 1997). The technical analyses are summarized in this section.

Definition of Resource

Traffic and circulation refers to the movement of vehicles on local and regional street networks. The local street network is described as a hierarchy of streets classified by function. For example, arterial streets are typically four or more lanes that provide the connection from limited access highways to the local collector streets, which "collect" traffic from the local neighborhood-serving streets.

Operating conditions and the adequacy of the existing and future roadway system are described in terms of the level of service (LOS). The LOS measure for intersections and roadways is an indicator of a roadway's ability to accommodate vehicular movement. LOS describes operational conditions as influenced by speed, travel time, freedom to maneuver, safety, driving comfort, and convenience. LOS measures range from good conditions (LOS A) through gridlock conditions (LOS F). LOS A reflects free, unobstructed flow conditions, while LOS D indicates unstable traffic flow and significant travel delays during the peak travel hours. The LOS for intersections is based on the delay at the intersection, while the LOS for roadway segments is based on the volume-to-capacity (V/C) ratio. The levels of service are defined in Table 3-25 for intersections and in Table 3-26 for street segments.

Table 3-25
Intersections Level of Service Definitions

Level of Service (LOS)	Expected Delay	Signalized Intersection Vehicle Delay (Seconds)	Unsignalized Intersection Vehicle Delay (Seconds)
A	Little or no delay	$\leq$ 5.0	$\leq$ 5.0
B	Short traffic delays	5.1 - 15.0	5.1 - 10.0
C	Average traffic delays	15.1 - 25.0	10.1 - 20.0
D	Long traffic delays	25.1 - 40.0	20.1 - 30.0
E	Very long traffic delays	40.1 - 60.0	30.1 - 45.0
F	Extreme delays potentially affecting other traffic movements in the intersection	> 60.0	> 45.0

Source: Transportation Research Board 1994

Table 3-26
Street Segments Level of Service Definitions

Level of Service (LOS)	Volume-to-Capacity (V/C)
A	< 30.1
B	30.1 - 50.0
C	50.1 - 75.0
D	75.1 - 90.0
E	90.1 – 100
F	> 100

Source: Caltrans Standards.

Peak hours correspond to the periods of the day with the highest traffic volumes on the street network. The morning (or AM) peak hour reflects the morning commute to work. For this analysis, the AM peak hour is assumed to be between the hours of seven and eight in the morning. The evening (or PM) peak hour reflects the commute from work to home. For this analysis, the PM peak hour is assumed to be between the hours of four and five in the afternoon. Traffic generated during AM and PM peak hours has the greatest potential to affect intersection and roadway LOS.

For the traffic analysis, 1999 was used as the realignment year for each alternative site. The 1999 projected traffic volumes were developed by applying a two percent per year growth factor to 1996 traffic volumes. For the purposes of this analysis, "projected" refers to a 1999 condition, while "existing" refers to existing 1996 conditions. The level of service analysis and the volumes shown in this section are 1999 projected conditions.

3.5.1 Preferred Alternative: NAWS Point Mugu

Region of Influence

The traffic analysis evaluates portions of both the regional and local roadways and the major intersections serving NAWS Point Mugu. The ROI for the traffic analysis includes the Pacific Coast Highway (State Route (SR)-1) near NAWS Point Mugu as well as local access routes including Wood Road and Las Posas Road from Camarillo and Navalair/Frontage Road. The major intersections along these roadways near NAWS Point Mugu are included in the traffic analysis. The ROI was determined based on the location of NAWS Point Mugu and circulation patterns of traffic accessing the site on the surrounding transportation system. The ROI does not include roadways and intersections on base.

Road Network

Access to NAWS Point Mugu is via Highway 101 from Las Posas Road and Wood Road. Pacific Coast Highway also provides access to NAWS Point Mugu via Las

Posas Road and Wood Road interchanges. The gates at North Mugu Road and Las Posas Road accommodate the vast majority of base traffic. A description of key roadway network components is presented below.

Pacific Coast Highway (SR-1). SR-1 is a four-lane highway oriented east-west in the vicinity of the base but running north-south along the southern coast. SR-1 provides a connection to numerous communities along the California Coast and intersects Highway 101 in the City of Oxnard.

Wood Road. Wood Road is a two-lane, north-south rural roadway that extends northward from Frontage Road to the City of Camarillo. It serves base traffic by providing access between Frontage Road and SR-1.

Las Posas Road. Los Posas Road is a north-south arterial extending from NAWS Point Mugu to the city of Camarillo. In the vicinity of the naval base, Las Posas Road provides four lanes south of SR-1 and two-lanes north of SR-1. It provides direct access to the naval base from SR-1, Highway 101, and the City of Camarillo.

Frontage Road/Navalair Road. Frontage Road/Navalair Road lies adjacent to the eastern perimeter of NAWS Point Mugu, and provides direct access to the entry gates via Las Posas Road, Main Road, and North Mugu Road. In the vicinity of the base, Frontage Road is two lanes north of Wood Road, four lanes between Wood Road and just south of Main Road, and two lanes between Main Road and Las Posas Road. Frontage Road becomes Navalair Road at Wood Road.

Traffic Volumes

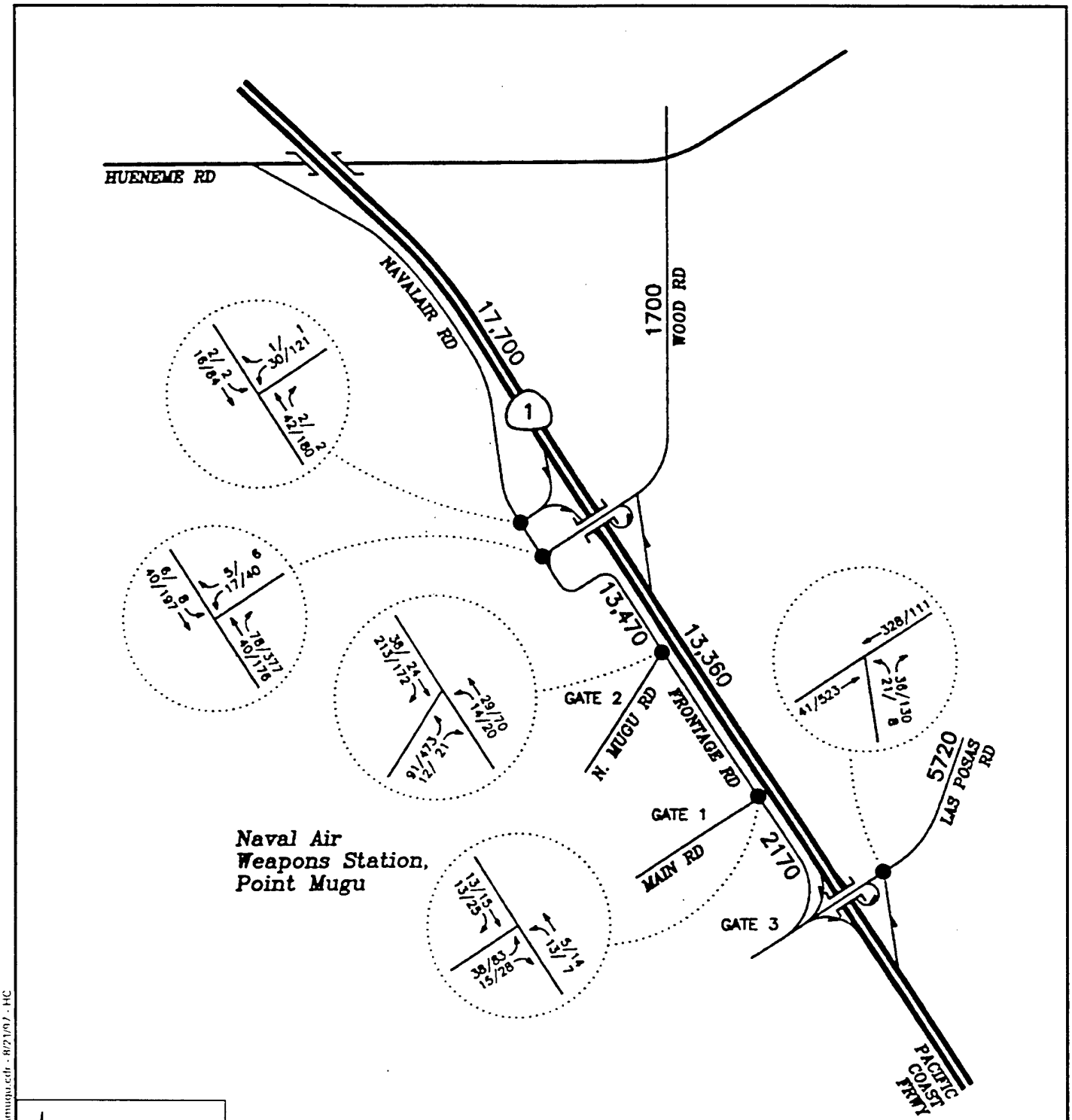
Figure 3-27 shows the calculated 1999 on-street average daily trips (ADTs) and AM/PM peak hour intersection traffic volumes. The AM/PM peak hour turning movement counts were conducted in June 1996 at the following five intersections near the base:

- Navalair Road/Pacific Coast Highway southbound ramps;
- Navalair Road/Wood Road;
- Frontage Road/North Mugu Road;
- Frontage Road/Main Road; and
- Las Posas Road/Pacific Coast Highway northbound off-ramp.

The projected 1999 volumes in Figure 3-27 reflect a two percent per year growth that has been applied to the 1996 volumes.

Levels of Service

Intersections. As shown in Table 3-27, all movements at each of the key unsignalized intersections (two-way and all-way stop sign-controlled) in the project area are expected to operate at LOS C or better in 1999 without implementation of the proposed action. Most intersections are expected to operate at LOS A



NOTE:
- ADTs are shown midblock
- AM/PM peak hour volumes are shown at the intersections
- A two percent per year growth factor was applied to 1996 volumes up to year 1999 (opening year)
- "E" indicates estimated volume

The majority of the base's existing traffic uses Gate 2 (N. Mugu Rd.) and Gate 3 (Los Posas Rd.)

LEGEND:

- Analysis Intersections
- AM/PM Peak Hour Volumes
- 1,000 Average Daily Trips

NAWS Point Mugu Traffic Volumes AM/PM Hours & ADTs

E-2 Aircraft Squadrons Realignment EIS
NAWS Point Mugu, California

Source: Linscott, Law & Greenspan 1996

Figure 3-27

Table 3-27
NAWS Point Mugu Unsignalized Intersection Operations

Intersection	Movement		Peak Hour	Projected 1999 Conditions Delay (Seconds)	LOS
Navalair Road/Pacific Coast Highway SB ramp	NB	T	AM	3.7	A
	SB	R		2.6	A
	SB	L/T		3.6	A
	WB	L		2.1	A
	NB	T	PM	5.9	B
		R		2.6	A
	SB	L/T		5.0	A
	WB	L		2.3	A
Navalair Road/Wood Road	WB	L/R	AM	4.0	A
	SB	L		2.5	A
	WB	L/R	PM	9.2	B
	SB	L		4.5	A
North Mugu Road/Frontage Road*	-	-	AM	4.5	A
	-	-	PM	11.9	C
Main Road/Frontage Road*	-	-	AM	1.4	A
	-	-	PM	1.8	A
Las Posas Road/Pacific Coast Highway SB ramp	NB	L/R	AM	4.2	A
	NB	L/R	PM	7.1	B

Notes: *Denotes all-way STOP intersections
L = Left-turn
R = Right-turn
T = Through movement
EB = Eastbound
WB = Westbound
NB = Northbound
SB = Southbound

Source: Linscott, Law & Greenspan 1997.

or LOS B with the exception of the North Mugu Road/Frontage Road intersection, which is expected to operate at LOS C during the PM peak hour.

Roadways. As shown in Table 3-28, each street segment in the ROI is expected to operate at LOS B or better on a daily basis.

Transit Services

NAWS Point Mugu is currently not served by any public transit. Area bus service was discontinued in July 1996.

3.5.2 NAS Lemoore Alternative

Region of Influence

The traffic analysis evaluates portions of both the regional and local roadways and the major intersections serving NAS Lemoore. The ROI for the traffic analysis includes State Route 198 and State Route 41 near NAS Lemoore as well as several local access routes. Local access to NAS Lemoore includes Grangeville Road,

Table 3-28
NAWS Point Mugu Daily Street Segment Operations

Street Segment	Capacity* (LOS E)	Projected 1999 Conditions Volume	V/C	LOS
Pacific Coast Highway				
n/o Wood Road	43,000	17,700	0.41	B
s/o Wood Road	43,000	13,360	0.31	B
Frontage Road				
s/o Wood Road	31,000	13,470	0.43	B
s/o Main Road	14,000	2,170	0.16	A
Wood Road				
s/o Hueneme Road	14,000	1,700	0.12	A
Las Posas Road				
e/o Pacific Coast Highway	14,000	5,720	0.41	B

Notes: * Capacities and V/C ratio thresholds based on Caltrans Standards
e/o = east of
w/o = west of
s/o = south of
n/o = north of

Source: Linscott, Law & Greenspan 1997.

which provides direct access to the Operations Gate from the Cities of Hanford and Lemoore, Avenal Cutoff Road from Interstate (I)-5, and Jackson Avenue from State Route 41. The major intersections along these roadways near NAS Lemoore are included in the traffic analysis. The ROI was determined based on the location of NAS Lemoore and circulation patters of traffic accessing the site on the surrounding transportation system. The ROI does not include roadways and intersections on base.

Road Network

NAS Lemoore is accessed by traveling eastbound on State Route 198 from Interstate 5 near Coalinga or westbound on State Route 198 from Highway 99 through the cities of Hanford and Lemoore. The main gate for NAS Lemoore takes direct access from a signalized intersection at State Route 198. A description of key roadway network components is presented below.

State Route 198 (SR-198). SR-198 is generally a four-lane, east-west highway, which connects I-5 and Highway 99 and provides direct access to Lemoore, Hanford, and other communities. In the immediate vicinity of the naval base, SR-198 is four lanes between the main gate and SR-41 and two lanes west of the main gate.

State Route 41 (SR-41). SR-41 is generally a four-lane, north-south highway providing access to Lemoore in the base vicinity and direct access to Fresno, 35 miles (56 kilometers) to the north. SR-41 forms a full diamond interchange at SR-198 and is signalized at Grangeville Boulevard. Caltrans has plans to begin widening 2.8 miles (4.5 kilometers) of SR-41 in a section of existing two-lane

highway to a four-lane divided expressway. The footprint of the project is from 0.7 miles (1.1 kilometers) south of SR-198 to 0.3 miles (0.5 kilometers) north of Hanford-Armona Road. Construction should be completed by 1999.

Grangeville Boulevard. Grangeville Boulevard is a two-lane, east-west road that provides direct access to the naval base. Currently, it is classified as an arterial roadway with no curbside parking. Grangeville Boulevard is signalized at the interchange with SR-41.

Avenal Cutoff Road. Avenal Cutoff Road is a two-lane, north-south roadway. It is currently classified as an arterial roadway and forms an interchange with SR-198.

Jackson Street. Jackson Street is a two-lane, east-west roadway providing access between SR-41 and SR-198. It is currently classified as a major collector roadway.

Traffic Volumes

Figure 3-28 shows the calculated 1999 on-street average daily trips (ADTs) and AM/PM peak hour intersection volumes. The ADTs were obtained from the California Department of Transportation (Caltrans). The peak hour turning movement volumes were obtained from the traffic study prepared for the NAS Lemoore Base Realignment. (TJKM 1994). A peak hour analysis was conducted at the following four intersections near the base:

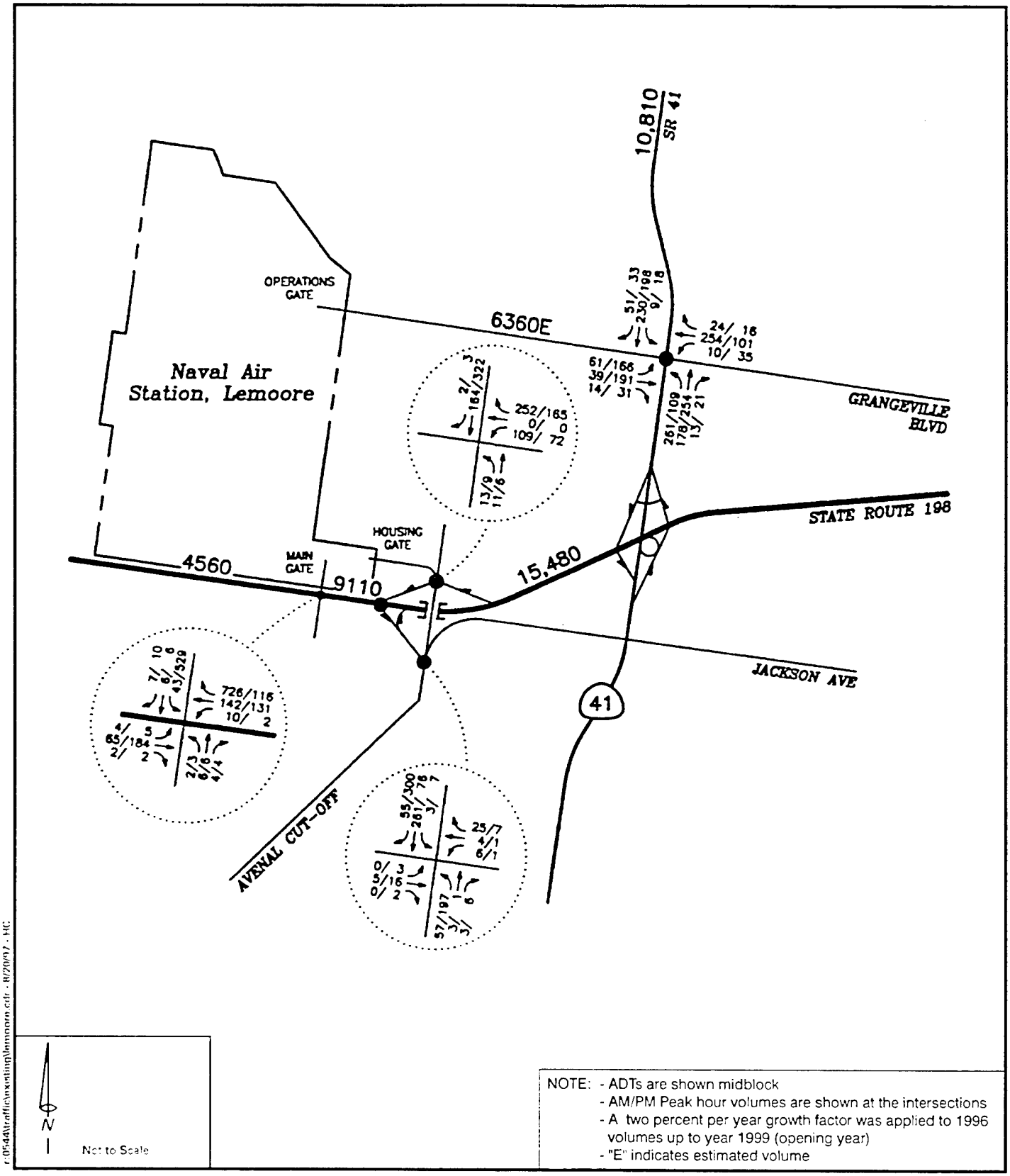
- SR-198/NAS Lemoore Main Gate;
- Avenal Cutoff Road/SR-198 westbound ramps;
- Avenal Cutoff Road/SR-198 eastbound ramps; and
- SR-41/Grangeville Boulevard.

The projected 1999 volumes in Figure 3-28 reflect a two percent per year growth that has been applied to the 1996 volumes.

Levels of Service

Intersections. Tables 3-29 and 3-30 summarize the LOS analysis for the signalized and unsignalized intersections, respectively. The Grangeville Road/SR-41 intersection is expected to operate at LOS B during both the AM and PM peak hours. The SR-198/Main Gate intersection also is expected to operate at LOS B during both the AM and PM peak hours. As shown in Table 3-30 all movements at the key unsignalized intersections were evaluated and both Avenal Cutoff Road intersections with SR-198 are expected to operate at LOS B or better.

Roadways. As indicated in Table 3-31, each street segment in the ROI is expected to operate at LOS B or better on a daily basis.



NOTE:
- ADTs are shown midblock
- AM/PM Peak hour volumes are shown at the intersections
- A two percent per year growth factor was applied to 1996 volumes up to year 1999 (opening year)
- "E" indicates estimated volume

The majority of the base's existing traffic uses the Main Gate on State Route 198, and the remainder uses primarily the Operations Gate via Grangeville Blvd

LEGEND:

- Analysis Intersections
- AM/PM Peak Hour Volumes
- 1,000 Average Daily Trips

Source: Linscott Law & Greenspan 1996

NAS Lemoore Traffic Volumes AM/PM Hours & ADTs

E-2 Aircraft Squadrons Realignment EIS
NAS Lemoore, California

Figure 3-28

Table 3-29
NAS Lemoore Signalized Intersection Operations

Intersection	Peak Hour	Projected 1999 Conditions Delay (Seconds)	LOS
Grangeville Road/SR-41	AM	13.5	B
	PM	13.6	B
SR-198/Main Gate	AM	5.4	B
	PM	13.7	B

Source: Linscott, Law & Greenspan 1997.

Table 3-30
NAS Lemoore Unsignalized Intersections Operations

Intersection	Peak Hour	Movement		Projected 1999 Conditions Delay (Seconds)	LOS
Avenal Cutoff Road/EB SR-198 ramps	AM	EB	L/T	5.6	B
		EB	R	3.7	A
		WB	L/T	6.0	B
		WB	R	2.7	A
		NB	L	3.3	A
		SB	L	2.1	A
	PM	EB	L/T	6.8	B
		EB	R	2.9	A
		WB	L/T	7.9	B
		WB	R	2.6	A
		NB	L	4.3	A
		SB	L	2.1	A
Avenal Cutoff/WB SR-198 ramps	AM	WB	L	5.5	B
		WB	R	3.6	A
		NB	L	2.6	A
	PM	WB	L	6.6	B
		WB	R	3.1	A
		NB	L	3.1	A

Notes: LOS = Level of Service
L = Left-turn
R = Right-turn
T = Through movement
EB = Eastbound
NB = Northbound
SB = Southbound
WB = Westbound

Source: Linscott, Law & Greenspan 1997.

Table 3-31
NAS Lemoore Daily Street Segment Operations

Street Segment	Capacity*	Projected 1999 Conditions		
		Volume	V/C	LOS
SR-198				
w/o Main Gate	14,000	4,560	0.33	B
e/o Main Gate	31,000	9,110	0.29	A
Grangeville Boulevard				
w/o SR-41	14,000	6,360	0.45	B
SR-41				
n/o Grangeville Boulevard	43,000	10,810	0.25	A

Notes: *Capacities and V/C ratio thresholds based on Caltrans Standards
e/o = east of
w/o = west of
s/o = south of
n/o = north of

Source: Linscott, Law & Greenspan 1997.

Transit Services

NAS Lemoore is served by Kings Area Rural Transit. Bus access directly to the base is provided from neighboring cities including Hanford and Lemoore. According to NAS Lemoore planning staff, transit is rarely used by base personnel.

3.5.3 NAF El Centro Alternative

Region of Influence

The traffic analysis evaluates portions of both the regional and local roadways and the major intersections serving NAF El Centro. The ROI for the traffic analysis includes Evan Hewes Highway (County Highway 80), which is the main east-west route from El Centro to NAF El Centro. Local north-south access to NAF El Centro includes Drew Road, Bennett Road, and Forrester Road. The gate to NAF El Centro is located at the north end of Bennett Road. Major intersections along these roadways near NAF El Centro are included in the traffic analysis. The ROI was determined based on the location of NAF El Centro and circulation patterns of traffic accessing the site on the surrounding transportation system. The ROI does not include roadways and intersections on base.

Road Network

Regional access to NAF El Centro is from Interstate 8 via interchanges with local roadways. Evan Hewes Highway runs parallel to Interstate 8 to the north providing access between the city of El Centro and the base. Local access to the Main Gate is along Bennett Road.

Interstate 8 (I-8). I-8 is a four-lane, divided freeway in the project vicinity, which provides east-west access within southern Imperial County between the San Diego county border and Yuma, Arizona. I-8 is constructed with complete grade separation at all interchanges.

State Route 111 (SR-111). SR-111 is a north-south highway providing access to Calexico and Mexico from the cities of El Centro and Brawley. SR-111 is a four-lane, divided roadway south of I-8 and a two-lane, undivided roadway north of I-8.

Evan Hewes Highway (S-80). S-80 is a two- to four-lane road that runs parallel to I-8 from the cities of Ocotillo to Holtville and provides access to NAF El Centro via Bennett Road. S-80 is classified as a collector roadway. Evan Hewes Highway is stop sign controlled at Drew Road, Bennett Road, and Forrester Road and is signalized at Imperial Avenue.

Drew Road. Drew Road is a north-south roadway classified as a collector. Drew Road is a two-lane, undivided roadway and provides access to I-8 via a full diamond interchange with stop sign controls at the east and westbound off ramps.

Bennett Road. Bennett Road. is a north-south, two-lane undivided roadway classified as a local street. It provides direct access to the Main Gate at NAF El Centro via Evan Hewes Highway, where it is stop sign controlled.

Forrester Road. Forrester Road is a north-south, two-lane undivided roadway classified as a collector. It provides a connection between The city of Brawley and I-8 west of El Centro. It has an interchange at I-8 and is stop sign controlled at both the eastbound and westbound off ramps.

Traffic Volumes

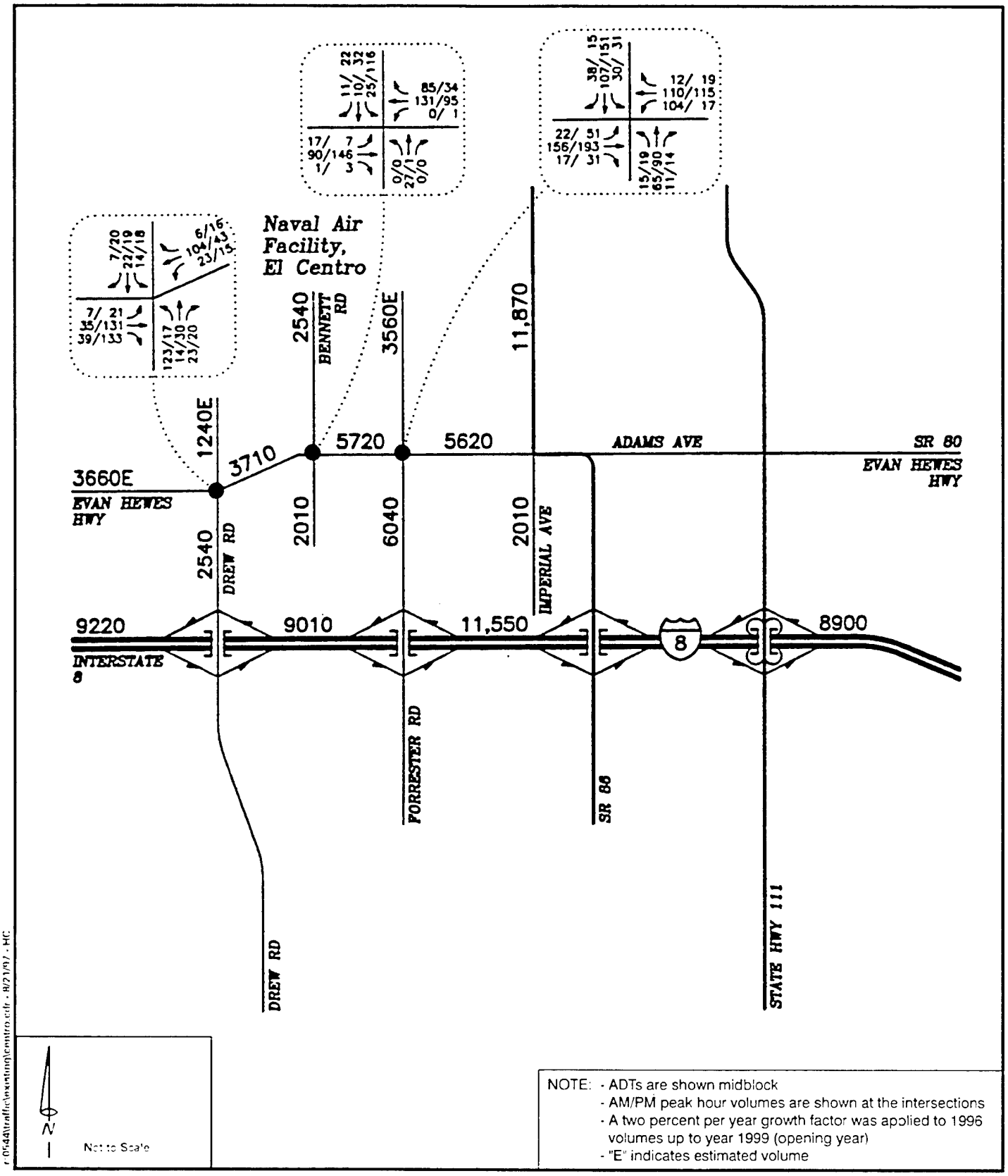
Figure 3-29 shows the calculated 1999 on-street ADTs and morning (AM) and evening (PM) peak hour intersection traffic volumes. The ADTs were obtained from Caltrans and Imperial County records. The AM/PM peak hour turning movement counts were conducted in June 1996 at the following three intersections near the base:

- Evan Hewes Highway (S-80)/Drew Road;
- Evan Hewes Highway (S-80)/Bennett Road; and
- Evan Hewes Highway (S-80)/Forrester Road.

The projected 1999 volumes in Figure 3-29 reflect a two percent per year growth that has been applied to the 1996 volumes.

Levels of Service

Intersections. As shown in Table 3-32, all three key unsignalized intersections are expected to operate at LOS A during both the AM and PM peak hours.



The base's Main Gate is located at the north end of Bennett Road and all of the project's traffic is assumed to use this access to the site

LEGEND:

- Analysis Intersections
- AM/PM Peak Hour Volumes
- 1,000 Average Daily Trips

Source: Linscott, Law & Greenspan 1996

NAF El Centro Traffic Volumes AM/PM Hours & ADTs

E-2 Aircraft Squadrons Realignment EIS
NAF El Centro, California

Figure 3-29

Table 3-32
NAF El Centro Unsignalized Intersection Operations

Intersection	Peak Hour	Projected 1999 Conditions Delay (Seconds)	LOS
Evan Hewes/Drew Road	AM	3.0	A
	PM	3.0	A
Evan Hewes/Bennett Road	AM	2.5	A
	PM	2.8	A
Evan Hewes/Forrester Road	AM	4.9	A
	PM	4.9	A

Notes: Each of these intersections are all-way stop sign-controlled.

Source: Linscott, Law & Greenspan 1997.

Roadways. As shown in Table 3-33, each street segment in the ROI is expected to operate at LOS B or better on a daily basis.

Transit Services

Bus transportation is provided to NAF El Centro from the El Centro area 365 days per year. The Liberty Shuttle provides service between NAF El Centro and several locations in the surrounding community during the hours of 7:00 PM and 2:15 AM. Cab services also are provided when necessary.

Table 3-33
NAF El Centro Daily Street Segment Operations

Street Segment	Capacity* (LOS E)	Projected 1999 Conditions Volume	V/C	LOS
Evan Hewes (S-80)				
w/o Drew Road	14,000	3,660	0.26	A
e/o Forrester Road	14,000	5,620	0.40	B
Drew Road				
n/o Evan Hewes	14,000	1,240	0.09	A
s/o Evan Hewes	14,000	2,540	0.18	A
Bennett Road				
s/o Evan Hewes	14,000	2,010	0.14	A
Forrester Road				
n/o Evan Hewes	14,000	3,560	0.25	A
s/o Evan Hewes	14,000	6,040	0.43	B

Notes: * Capacities and V/C ratio thresholds based on Caltrans Standards
e/o = east of
w/o = west of
s/o = south of
n/o = north of

Source: Linscott, Law & Greenspan, 1997.

3.6 AIR QUALITY

This section describes air quality conditions for the alternatives being considered for realignment of the four E-2 squadrons and associated personnel. The discussion of air quality addresses air quality terminology, air quality conditions, and regulatory situations applicable to the E-2 realignment.

Definition of Resource

Air pollution discussions require an understanding of terms that have a technical meaning. At a general level it is important to understand the distinction between air pollutant emissions and ambient air quality. Other important terms include primary pollutants, secondary pollutants, and pollutant precursors.

Emissions and Ambient Air Quality

The term "pollutant emissions" refers to the amount (usually stated as a weight) of one or more specific compounds introduced into the atmosphere by a source or group of sources. In practice, most pollutant emissions data are presented as "emission rates": the amount of pollutants emitted during a specified increment of time or during a specified increment of emission source activity. Typical measurement units for emission rates on a time basis include pounds per hour, pounds per day, or tons per year. Typical measurement units for emission rates on a source activity basis include pounds per thousand gallons of fuel burned, pounds per ton of material processed, and grams per vehicle mile of travel.

The term "ambient air quality" refers to the atmospheric concentration of a specific compound (amount of pollutants in a specified volume of air) actually experienced at a particular geographic location that may be some distance from the source of the relevant pollutant emissions. The ambient air quality levels actually measured at a particular location are determined by the interactions among three groups of factors: emissions, meteorology, and chemistry. Emission considerations include the types, amounts, and locations of pollutants emitted into the atmosphere. Meteorological considerations include wind and precipitation patterns affecting the distribution, dilution, and removal of pollutant emissions. Chemical considerations are important when chemical reactions occur that transform pollutant emissions into other chemical substances.

Ambient air quality data are generally reported as a mass-per-unit volume (e.g., micrograms per cubic meter of air) or as a volume fraction (e.g., parts per million by volume). Measurements of particulate matter concentrations normally are reported in units of micrograms per cubic meter.

Primary Pollutants, Secondary Pollutants, and Pollutant Precursors

Air pollutants are often characterized as being "primary" or "secondary" pollutants. Primary pollutants are those emitted directly into the atmosphere, such as carbon monoxide (CO), sulfur dioxide (SO_2), lead particulates, and hydrogen sulfide. Secondary pollutants are those formed through chemical reactions in the atmosphere, such as ozone (O_3), nitrogen dioxide (NO_2), and

sulfate particles. Atmospheric chemical reactions usually involve primary pollutants, normal constituents of the atmosphere, and other secondary pollutants. Meteorological conditions such as temperature, humidity, and the intensity of ultraviolet light can also play an important role in atmospheric chemistry.

Those compounds that react to form secondary pollutants are often referred to as reactive pollutants, pollutant precursors, or precursor emission products. Some air pollutants, such as many organic gases and suspended particulate matter, are a combination of primary and secondary pollutants.

Ozone precursor emissions. Ozone, a major component of photochemical smog, is the secondary pollutant of greatest concern in most portions of California. The pollutant emissions generally categorized as ozone precursors fall into two broad groups of chemicals: nitrogen oxides and organic compounds. Many different terms are used to refer to these groups of ozone precursors.

The terms "nitrogen oxides" and "oxides of nitrogen" are often used interchangeably to refer to the combination of nitric oxide and nitrogen dioxide. This combination of nitrogen oxides is often designated by the symbol NOx. Nitrogen dioxide is itself a secondary pollutant, generally formed from nitric oxide.

Organic compound precursors of ozone are routinely described by a large number of different terms. The phrase "reactive organic compounds" is the most accurate terminology for describing organic compound precursors of ozone, but the acronym for that phrase is not widely used. The closest widely used acronym is ROG (reactive organic gases). To avoid inventing a new acronym, ROG will be used in this document to mean reactive organic compounds.

Particulate matter precursors. Inhalable particulate matter (PM_{10}) can be generated as a primary pollutant by abrasion or erosion processes. PM_{10} can also form as a secondary pollutant through chemical reactions or by condensation of gaseous pollutants into fine aerosols. Major gaseous precursors of PM_{10} include reactive organic gases, sulfur oxides, and nitrogen oxides. Additional precursors of PM_{10} can include ammonia, hydrogen sulfide, sulfuric acid, and nitric acid.

Ambient Air Quality Standards

Both the State of California and the federal government have established ambient air quality standards for several different pollutants (Table 3-34), which are often referred to as criteria pollutants. Ambient standards for some of these pollutants have been set for both short and long time periods. Federal ambient air quality standards are based on evidence of acute and chronic health effects. Most state ambient air quality standards are based primarily on health effects data, but can reflect other considerations, such as protection of crops, protection of materials, or avoidance of nuisance conditions (i.e., odors).

Table 3-34
Ambient Air Quality Standards

Pollutant	Symbol	Averaging Time	Standard, as parts per million		Standard, as micrograms per cubic meter		Violation Criteria	
			California	Federal	California	Federal	California	Federal
Ozone	O_3	1 Hour	0.09	0.12	180	235	If exceeded	If exceeded on more than 3 days in 3 years
		8 hours	—	0.08	—	160	—	If exceeded by 4th highest value during a 3-year period.
Carbon Monoxide	CO	8 Hours	9.0	9	10,000	10,000	If exceeded	If exceeded on more than 1 day per year
		1 Hour	20	35	23,000	40,000	If exceeded	If exceeded on more than 1 day per year
(Lake Tahoe only)		8 Hours	6	—	7,000	—	If exceeded	
Inhalable Particulate Matter	PM_{10}	Annual Geometric Mean	—	—	30	—	If exceeded	
		Annual Arithmetic Mean	—	—	—	50		If exceeded
		24 Hours	—	—	50	150	If exceeded	If exceeded on more than 1 day per year
Fine Particulate Matter	$PM_{2.5}$	Annual Arithmetic Mean	—	—	—	15	—	If exceeded
		24 Hours	—	—	—	65	—	If exceeded by 98th percentile over 3 years
Nitrogen Dioxide	NO_2	Annual Average	—	0.053	—	100		If exceeded
		1 Hour	0.25	—	470	—	If exceeded	
Sulfur Dioxide	SO_2	Annual Average	—	0.03	—	80		If exceeded
		24 Hours	0.04	0.14	105	365	If exceeded	If exceeded on more than 1 day per year
		1 Hour	0.25	—	655	—	If exceeded	
Lead Particles	Pb	Calendar Quarter	—	—	—	1.5		If exceeded
		30 Days	—	—	1.5	—	If equaled or exceeded	
Sulfate Particles	SO_4	24 Hours	—	—	25	—	If equaled or exceeded	
Hydrogen Sulfide	H_2S	1 Hour	0.03	—	42	—	If equaled or exceeded	
Vinyl Chloride	C_2H_3Cl	24 Hours	0.010	—	26	—	If equaled or exceeded	

Notes: All standards are based on measurements corrected to 25 degrees C and 1 atmosphere pressure
Decimal places shown for standards reflect the rounding precision used for evaluating compliance
National standards shown are the primary (health effects) standards
Regulations implementing the national 8-hour ozone standard will not become effective until the 1-hour standard has been achieved.
Regulations implementing the national PM2.5 standards will not be developed until 2005.

Source: California Air Resources Board 1997b; 40 CFR Part 50.

The USEPA adopted new ozone and particulate matter standards in July 1997, but implementation of the new standards will not occur for several years. Requirements related to the new ozone standard (an 8-hour average of 0.08 ppm) will not become effective until the current ozone standard (a 1-hour average of 0.12 ppm) is met. EPA has adopted new $PM_{2.5}$ standards (15 micrograms per cubic meter as an annual average and 65 micrograms per cubic meter as a 24-hour average) that will supplement, but not replace, the current PM_{10} standards. Implementation of the new $PM_{2.5}$ standards will not occur prior to 2005.

Areas that violate a federal air quality standard are designated as nonattainment areas. Nonattainment designations for ozone, carbon monoxide, and PM_{10} include subcategories indicating the severity of the air quality problem. Areas that comply with federal air quality standards are designated as attainment areas. Areas that have been reclassified from nonattainment to attainment are designated as attainment/maintenance areas. Areas that lack monitoring data to demonstrate attainment or nonattainment status are designated as unclassified areas, and are treated as attainment areas for various regulatory purposes.

Table 3-35 summarizes the federal and state attainment status designations for each of the alternative receiving installations. NAWS Point Mugu is nonattainment for the federal ozone standard, the state ozone standard, and the state PM_{10} standard. NAS Lemoore is nonattainment for both the federal and state ozone standards, as well as for both the federal and state PM_{10} standards. NAF El Centro is also nonattainment for these standards.

Permit Programs

Air pollution control programs were established in California prior to the enactment of federal requirements. Responsibility for air quality management programs in California is divided between California Air Resources Board (CARB) as the primary state air quality management agency and air pollution control districts as the primary local air quality management agencies. Federal Clean Air Act (CAA) legislation in the 1970s resulted in a gradual merger of local and federal air quality programs, particularly stationary source air quality permit programs.

Many types of industrial and commercial facilities require air quality permits for their equipment and operations. Local air pollution control districts are responsible for air quality permit programs in California. Permit authority is derived from a combination of state and federal legislation. In general, federally required air quality permit programs have been integrated into the pre-existing state and local permit program. This results in a two-step permit process for new stationary emission sources: an initial authority to construct (ATC) permit and a subsequent permit to operate (PTO).

Table 3-35
Federal and State Attainment Status for Alternative Receiving Installations

Installation	County	Pollutant	Federal Status	State Status
NAWS Point Mugu	Ventura County	Ozone	Nonattainment	Nonattainment
		Carbon Monoxide	Attainment	Attainment
		Nitrogen Dioxide	Attainment	Attainment
		PM_{10}[1]	Unclassified	Nonattainment
		Sulfur Dioxide	Attainment	Attainment
		Lead	Not classified[2]	Attainment
NAS Lemoore	Fresno and Kings Counties	Ozone	Nonattainment	Nonattainment
		Carbon Monoxide	Attainment	Attainment
		Nitrogen Dioxide	Attainment	Attainment
		PM_{10}[1]	Nonattainment	Nonattainment
		Sulfur Dioxide	Unclassified	Attainment
		Lead	Not classified[2]	Attainment
NAF El Centro	Imperial County	Ozone	Nonattainment	Nonattainment
		Carbon Monoxide	Attainment	Attainment
		Nitrogen Dioxide	Attainment	Attainment
		PM_{10}[1]	Nonattainment	Nonattainment
		Sulfur Dioxide	Attainment	Attainment
		Lead	Not classified[2]	Attainment

Notes: [1]PM_{10} = inhalable particulate matter
[2]Only nonattainment designations are made for the federal lead standard; formal attainment designations are made only for redesignation purposes. A "not classified" designation for the federal lead standard implies attainment status.

Sources: 40 CFR 81.305; California Air Resources Board 1997a.

Air Quality Planning

Federal requirements. The federal Clean Air Act requires each state to develop, adopt, and implement a state implementation plan (SIP) to achieve, maintain, and enforce federal air quality standards throughout the state. Deadlines for achieving the federal air quality standards vary according to air pollutant and the severity of existing air quality problems. SIP documents are developed on a pollutant-by-pollutant basis whenever one or more air quality standards are being violated, and must be submitted to and approved by EPA. In California, the SIP consists of separate documents for different pollutants in different regions of the state. Local councils of governments and air pollution control districts have had the primary responsibility for developing and adopting the regional elements of the California SIP.

Federal Clean Air Act conformity process. Section 176(c) of the Clean Air Act (CAA) requires federal agencies to ensure that actions undertaken in nonattainment or maintenance areas are consistent with the Clean Air Act and with federally enforceable air quality management plans. EPA has promulgated

separate rules that establish conformity analysis procedures for transportation-related actions and for other (general) federal agency actions. Transportation conformity requirements apply to highway and mass transit projects funded or approved by the Federal Highway Administration (FHWA) or the Federal Transit Administration (FTA). General conformity requirements are potentially applicable to most other federal agency actions, but apply only to those aspects of an action that involve on-going federal agency responsibility and control over direct or indirect sources of air pollutant emissions.

The EPA general conformity rule applies to federal actions occurring in nonattainment or maintenance areas when the total direct and indirect emissions of nonattainment pollutants (or their precursors) exceed specified thresholds. The emission thresholds that trigger requirements for a conformity analysis are called *de minimis* levels.

Table 3-36 identifies the federal nonattainment pollutants and the relevant *de minimis* emission thresholds for each of the alternative receiving installations considered for the E-2 squadrons. Also shown in Table 3-36 are the deadlines for achieving the federal air quality standards. All of the alternative receiving sites are located in federal ozone nonattainment areas. NAWS Point Mugu has no other federal nonattainment designations. NAS Lemoore and NAF El Centro are in areas that are nonattainment for both ozone and PM_{10}.

The EPA conformity rule establishes a process that is intended to demonstrate that the proposed federal action:

- Would be consistent with plans for achieving federal air quality standards;
- Would not cause or contribute to new violations of federal air quality standards;
- Would not increase the frequency or severity of existing violations of federal air quality standards; and
- Would not delay the timely attainment of federal air quality standards.

Compliance with the conformity rule can be demonstrated in several ways. Compliance is presumed if the net increase in direct and indirect emissions from a federal action would be less than the relevant *de minimis* level.

If the emissions increase for a nonattainment pollutant exceeds the relevant *de minimis* value, a formal conformity determination process must be followed. A conformity determination includes a demonstration of consistency with the SIP through one of five mechanisms:

Table 3-36
Nonattainment Pollutants and *De Minimis* Levels for Alternative E-2 Realignment Sites

Installation	Air District Jurisdiction	Federal Nonattainment Pollutants	*De Minimis* Levels[1] (Tons/Year)	Precursors	Attainment Deadline
NAWS Point Mugu	Ventura County APCD	Ozone - Severe	25	ROG, NO_x	2005
NAS Lemoore	San Joaquin Valley Unified APCD	Ozone - Serious	50	ROG, NO_x	1999
		PM_{10} - Serious	70	PM_{10}, ROG, NO_x, SO_x	2001
NAF El Centro	Imperial County APCD	Ozone - Transitional [2]	100	ROG, NO_x	NA
		PM_{10} - Moderate[3]	100	PM_{10}, ROG, NO_x, SO_x	1994+

Notes: APCD = Air Pollution Control District
ROG = reactive organic compounds
NO_x = oxides of nitrogen
SO_x = oxides of sulfur
PM_{10} = inhalable particulate matter
CO = carbon monoxide
NA = not applicable
[1]*De minimis* thresholds apply to individual pollutants and precursors, not to the combination of precursors Ventura County nonattainment designations also apply to San Nicolas Island (California Air Resources Board 1997).
[2]Transitional ozone nonattainment areas are defined by Section 185A of the Clean Air Act as nonattainment areas having no violations of the ozone standard between 1987 and 1990. Transitional areas were to be redesignated as attainment/maintenance or as the appropriate nonattainment category by June 1992. As of July 1997, 40 CFR 81.305 still shows Imperial County as having a nonattainment - transitional designation for ozone
[3]Moderate PM_{10} nonattainment areas that failed to reach attainment within Clean Air Act deadlines are reclassified by operation of law as serious nonattainment areas (Clean Air Act, Section 188(b)(2)(A)). As of July 1997, 40 CFR 81.305 still shows Imperial County as having a nonattainment - moderate designation for PM_{10}

Sources: 40 CFR 81.305; 40 CFR 93.153; 42 USC 7401 et seq.; California Air Resources Board 1997a.

- By showing that direct and indirect emissions from the activity are specifically identified and accounted for in the SIP;
- By showing that direct and indirect emissions associated with the federal agency action are accommodated within emissions allowances contained in an approved SIP;
- By showing that emissions associated with future conditions will not exceed emissions that would occur from a continuation of historical activity levels;
- By arranging emission offsets to fully compensate for the net emissions increase associated with the action; or

- By obtaining a commitment from the relevant air quality management agency to amend the SIP to account for direct and indirect emissions from the federal agency action.

State requirements. The California Clean Air Act (CCAA) of 1988 requires air pollution control districts and air quality management districts to develop air quality management plans for meeting state ambient air quality standards for ozone, carbon monoxide, sulfur dioxide, and nitrogen dioxide. CARB is responsible for developing a plan for meeting state PM_{10} standards.

The CCAA does not set specific deadlines for achieving state air quality standards. Instead, attainment is required "as expeditiously as practicable", with various emission control program requirements based on the attainment status for ozone and carbon monoxide standards.

California ambient air quality standards (CAAQS) generally are somewhat more stringent than the comparable federal standards. The greatest difference between federal and state ambient air quality standards is for PM_{10}.

3.6.1 Preferred Alternative: NAWS Point Mugu

Region of Influence

The ROI for NAWS Point Mugu varies according to the type of air pollutant being discussed. Primary pollutants, such as carbon monoxide, have a localized ROI that is generally limited to less than 2,000 feet (610 meters) from the source of the emissions. The time required for the formation of secondary pollutants, such as ozone and secondary particulate matter, allow precursor emissions to be transported and mixed over relatively large areas while being converted into the pollutant of concern. Consequently, the ROI for secondary pollutants includes all of the South Central Coast Air Basin.

Air Quality Conditions

Table 3-37 summarizes air quality monitoring data for the NAWS Point Mugu vicinity. The closest air quality monitoring station (in the community of El Rio) is generally representative of air quality conditions in the coastal portion of Ventura County. Ventura County is designated as a severe nonattainment area for the federal ozone standard. Federal ozone standards are exceeded only occasionally in the NAWS Point Mugu vicinity, while the more stringent state ozone standards are exceeded several times each year. Ventura County's federal designation as a severe ozone nonattainment area is based on the higher ozone pollution levels that occur in the southeastern portion of the county (Simi Valley and Thousand Oaks).

Emission sources at NAWS Point Mugu include various stationary sources, aircraft flight activity, and motor vehicle use. Stationary sources include aircraft

Table 3-37
Air Quality Monitoring Data for the NAWS Point Mugu Vicinity (1991-1995)

Monitoring Station	Air Quality Indicator	1991	1992	1993	1994	1995
	OZONE					
El Rio - Mesa School	Peak 1-hour value (ppm)	0.12	0.14	0.14	0.12	0.12
	Days above federal standard (0.12 ppm)	0	3	1	0	0
	Days above state standard (0.09 ppm)	12	17	8	7	7
	CARBON MONOXIDE					
El Rio - Mesa School	Peak 1-hour value (ppm)	3	2	5	3	3
	Peak 8-hour value (ppm)	2.3	1.3	2.7	2.0	2.5
	Days above federal standard (9 ppm)	0	0	0	0	0
	Days above state standard (9.0 ppm)	0	0	0	0	0
	INHALABLE PARTICULATE MATTER, PM_{10}					
El Rio - Mesa School	Peak 24-hour value ($\mu g/m^3$)	59	55	63	54	62
	Annual geometric mean ($\mu g/m^3$)	29.5	27.8	25.4	26.3	22.2
	Annual arithmetic mean ($\mu g/m^3$)	32.1	3.1	28.5	29.2	26.2
	Number of 24-hour samples	57	47	59	57	60
	% of samples above federal standard (150 $\mu g/m^3$)	0.0%	0.0%	0.0%	0.0%	0.0%
	% of samples above state standard (50 $\mu g/m^3$)	7.0%	4.3%	6.8%	3.5%	5.0%

Notes: ppm = parts per million by volume
$\mu g/m^3$ = micrograms per cubic meter
Federal 1-hour ozone standard is 0.12 ppm; state 1-hour ozone standard is 0.09 ppm
Federal 1-hour carbon monoxide standard is 35 ppm; state 1-hour carbon monoxide standard is 20 ppm
Federal 8-hour carbon monoxide standard is 9 ppm; state 8-hour carbon monoxide standard is 9.0 ppm
Federal PM_{10} standards: 50 $\mu g/m^3$, annual arithmetic mean; 150 $\mu g/m^3$, 24-hour average
State PM_{10} standards: 30 $\mu g/m^3$, annual geometric mean; 50 $\mu g/m^3$, 24-hour average
24-hour PM_{10} samples are collected approximately once every six days. Other pollutants are monitored continuously (except for instrument calibration and maintenance periods)

Source: California Air Resources Board 1995.

engine test cells, stationary engines used for generators and compressors, fuel storage and handling facilities, boilers, solvent use and coating operations, and gasoline stations.

Emission forecasts contained in the ozone SIP (1991 revision) assume that NAWS Point Mugu will have a constant level of aircraft and other activity from 1990 through 2005. In actuality, aircraft and other activity levels at NAWS Point Mugu declined between 1990 and 1996. NAWS Point Mugu Environmental Division staff estimate the resulting emission reductions to be 72 tons per year of reactive organic compounds, 90 tons per year of nitrogen oxides, 25.5 tons per year of PM_{10}, and 26 tons per year of sulfur oxides.

3.6.2 NAS Lemoore Alternative

Region of Influence

The ROI for NAS Lemoore varies according to the type of air pollutant being discussed. Primary pollutants, such as carbon monoxide, have a localized ROI that is generally limited to less than 2,000 feet (610 meters) from the source of the emissions. The time required for the formation of secondary pollutants, such as ozone and secondary particulate matter, allow precursor emissions to be transported and mixed over relatively large areas while being converted into the pollutant of concern. Consequently, the ROI for secondary pollutants includes all of San Joaquin Valley Air Basin.

Air Quality Conditions

Table 3-38 summarizes air quality monitoring data for the NAS Lemoore vicinity. The closest air quality monitoring stations are in the community of Hanford and Visalia. The entire San Joaquin Valley, including the NAS Lemoore vicinity, is designated a serious nonattainment area for the federal ozone standard, and a serious nonattainment area for the federal PM_{10} standard. Ozone concentrations recorded in Hanford are lower than those recorded at monitoring stations in adjacent counties.

Emission sources at NAS Lemoore include various stationary sources, aircraft flight activity, and motor vehicle use. Stationary sources include aircraft engine test cells, portable engines for generators and compressors, fuel storage and handling facilities, boilers, solvent and coating use from aircraft maintenance operations, and gasoline stations.

Emission forecasts contained in the ozone SIP (1995 revision) assume that aircraft emissions from NAS Lemoore would increase by 14.6 tons per year for reactive organic compounds and by 65.7 tons per year for nitrogen oxides between 1990 and 1996, with emissions holding constant beyond 1996 (San Joaquin Valley Unified Air Pollution Control District 1995).

3.6.3 NAF El Centro Alternative

Region of Influence

The ROI for NAF El Centro varies according to the type of air pollutant being discussed. Primary pollutants, such as carbon monoxide, have a localized ROI that is generally limited to less than 2,000 feet (610 meters) from the source of the emissions. The time required for the formation of secondary pollutants, such as ozone and secondary particulate matter, allow precursor emissions to be transported and mixed over relatively large areas while being converted into the pollutant of concern. Consequently, the ROI for secondary pollutants includes all of the Salton Sea Air Basin.

Table 3-38
Air Quality Monitoring Data for the NAS Lemoore Vicinity (1991-1995)

Monitoring Station	Air Quality Indicator	1991	1992	1993	1994	1995
	OZONE					
Hanford - Health Dept	Peak 1-hour value (ppm)	0.11	0.10	0.11		
	Days above federal standard (0.12 ppm)	0	0	0		
	Days above state standard (0.09 ppm)	15	1	2		
Hanford - S. Irwin	Peak 1-hour value (ppm)				0.12	0.10
	Days above federal standard (0.12 ppm)				0	0
	Days above state standard (0.09 ppm)				9	2
	CARBON MONOXIDE					
Visalia - Church St.	Peak 1-hour value (ppm)	14	10	7	9	9
	Peak 8-hour value (ppm)	6.1	4.8	4.0	4.6	4.4
	Days above federal standard (9 ppm)	0	0	0	0	0
	Days above state standard (9.0 ppm)	0	0	0	0	0
	INHALABLE PARTICULATE MATTER, PM_{10}					
Hanford - Health Dept	Peak 24-hour value ($\mu g/m^3$)	164	147	67		
	Annual geometric mean ($\mu g/m^3$)	55.0	48.6	31.4		
	Annual arithmetic mean ($\mu g/m^3$)	70.0	55.9	36.3		
	Number of 24-hour samples	56	57	38		
	% of samples above federal standard (150 $\mu g/m^3$)	5.4%	0.0%	0.0%		
	% of samples above state standard (50 $\mu g/m^3$)	53.6%	43.9%	28.9%		
Hanford - S. Irwin	Peak 24-hour value ($\mu g/m^3$)			192	116	185
	Annual geometric mean ($\mu g/m^3$)			69.8	44.3	43.6
	Annual arithmetic mean ($\mu g/m^3$)			85.9	50.1	53.8
	Number of 24-hour samples			9	55	59
	% of samples above federal standard (150 $\mu g/m^3$)			11.1%	0.0%	1.7%
	% of samples above state standard (50 $\mu g/m^3$)			66.7%	47.3%	42.4%

Notes: ppm = parts per million by volume
$\mu g/m^3$ = micrograms per cubic meter
Federal 1-hour ozone standard is 0.12 ppm; state 1-hour ozone standard is 0.09 ppm
Federal 1-hour carbon monoxide standard is 35 ppm; state 1-hour carbon monoxide standard is 20 ppm
Federal 8-hour carbon monoxide standard is 9 ppm; state 8-hour carbon monoxide standard is 9.0 ppm
Federal PM_{10} standards: 50 $\mu g/m^3$, annual arithmetic mean; 150 ug/m^3, 24-hour average
State PM_{10} standards: 30 $\mu g/m^3$, annual geometric mean; 50 ug/m^3, 24-hour average
24-hour PM_{10} samples are collected approximately once every six days. Other pollutants are monitored continuously (except for instrument calibration and maintenance periods)

Source: California Air Resources Board 1995.

Air Quality Conditions

Table 3-39 summarizes air quality monitoring data for the NAF El Centro vicinity. Imperial County is designated a transitional nonattainment area for the federal ozone standard, and a moderate nonattainment area for federal PM_{10} standard. Ozone levels in Imperial County are due in part to pollutant transport from other portions of Southern California and from Mexico.

Table 3-39
Air Quality Monitoring Data for the NAF El Centro Vicinity (1991-1995)

Monitoring Station	Air Quality Indicator	1991	1992	1993	1994	1995
	OZONE					
El Centro - 9th St.	Peak 1-hour value (ppm)	0.11	0.12	0.15	0.13	0.15
	Days above federal standard (0.12 ppm)	0	0	3	1	9
	Days above state standard (0.09 ppm)	3	10	25	29	31
	INHALABLE PARTICULATE MATTER, PM_{10}					
El Centro - 9th St.	Peak 24-hour value ($\mu g/m^3$)	243	80	166	119	130
	Annual geometric mean ($\mu g/m^3$)	50.3	38.5	42.5	40.3	36.7
	Annual arithmetic mean ($\mu g/m^3$)	36.6	41.4	48.0	45.3	41.5
	Number of 24-hour samples	62	46	53	57	60
	% of samples above federal standard (150 $\mu g/m^3$)	1.6%	0.0%	1.9%	0.0%	0.0%
	% of samples above state standard (50 $\mu g/m^3$)	50.0%	30.4%	39.6%	29.8%	25.0%

Notes: ppm = parts per million by volume
$\mu g/m^3$ = micrograms per cubic meter
Federal 1-hour ozone standard is 0.12 ppm; state 1-hour ozone standard is 0.09 ppm
Federal 1-hour carbon monoxide standard is 35 ppm; state 1-hour carbon monoxide standard is 20 ppm
Federal 8-hour carbon monoxide standard is 9 ppm; state 8-hour carbon monoxide standard is 9.0 ppm
Federal PM10 standards: 50 $\mu g/m^3$, annual arithmetic mean; 150 $\mu g/m^3$, 24-hour average
State PM10 standards: 30 $\mu g/m^3$, annual geometric mean; 50 $\mu g/m^3$, 24-hour average
24-hour PM10 samples are collected approximately once every six days. Other pollutants are monitored continuously (except for instrument calibration and maintenance periods)

Source: California Air Resources Board 1995.

Emission sources at NAF El Centro include various stationary sources, aircraft flight activity, and motor vehicle use. Stationary sources include stationary engines used for generators and compressors, fuel storage and handling facilities, boilers, and solvent and coating use from aircraft maintenance operations. The 1997 ozone SIP emission forecasts have not anticipated any change in activity levels for NAF El Centro.

3.7 NOISE

This section describes noise conditions for the alternative bases being considered for the realignment of the four E-2 squadrons and associated personnel. Noise terminology, noise level criteria, and existing noise conditions are discussed in this section.

Definition of Resource

Sound travels through the air as waves of small pressure fluctuations caused by some type of vibration. In general, sound waves travel away from the noise source as an expanding spherical surface. The energy contained in a sound wave is consequently spread over an increasing area as it travels away from the source. This results in a decrease in loudness at greater distances from the noise source.

Sound level meters measure the actual air pressure fluctuations caused by sound waves, with separate measurements made for different vibrational frequency ranges. These measurements are reported using a decibel (dB) scale. Decibel scales are a logarithmic index based on a ratio of the actual pressure fluctuations generated by sound waves compared to a standard reference pressure value.

Noise Terminology

Most sounds consist of a broad range of sound frequencies. Because the human ear is not equally sensitive to all frequencies, a large number of frequency weighting schemes have been used to develop composite decibel scales that approximate the way the human ear responds to noise levels. The "A-weighted" decibel scale (dBA) is the most widely used for this purpose. The A-weighted scale significantly reduces the measured pressure level for low frequency sounds while slightly increasing the measured pressure level for some high frequency sounds.

Varying noise levels are often described in terms of the equivalent constant decibel level. Equivalent noise levels (Leq) are used to develop single-value descriptions of average noise exposure over various periods of time. Such average noise exposure ratings often include additional weighting factors for potential annoyance due to time of day or other considerations. The Leq data used for these average noise exposure descriptors are generally based on A-weighted sound level measurements.

Average noise exposure over a 24-hour period is often presented as a day-night average sound level (L_{dn}) or as a CNEL. L_{dn} values are calculated from hourly Leq values, with the Leq values for the nighttime period (10 PM - 7 AM) increased by 10 dB to reflect the greater disturbance potential from nighttime noises. CNEL values are very similar to L_{dn} values, but include a 5-dB annoyance adjustment for evening (7:00 PM to 10:00 PM) Leq values in addition to the 10-dB adjustment for nighttime Leq values. Unless specifically noted otherwise, L_{dn} and CNEL values are assumed to be based on dBA measurements. Because CNEL and L_{dn} values for the same noise condition seldom differ by more than 1 dB, they are often used interchangeably when interpreting noise level criteria and standards.

Noise Level Criteria and Standards

Various federal, state, and local agencies have developed guidelines for evaluating land use compatibility under different noise level ranges. Residential, educational, religious, and health care land uses are generally recognized as being noise-sensitive.

Federal agency guidelines. The federal Noise Control Act of 1972 (Public Law 92-574) established a requirement that all federal agencies must comply with applicable federal, state, interstate, and local noise control regulations. Local and state agencies have no applicable authority over military aircraft operations. Federal agencies also were directed to administer their programs in a manner that promotes an environment free from noise that jeopardized public health or welfare. The recently issued Executive Order 13045 establishes a requirement that federal agencies identify, assess, and address the extent to which agency programs and activities create disproportionate environmental health and safety risks for children.

Noise levels on military bases are generally evaluated as part of base compatible use zone studies. When military airfields are present, these studies are called AICUZ studies. An AICUZ study categorizes different portions of the installation for both noise exposure conditions and safety hazard conditions. Safety hazard conditions are indicated as accident potential zones (discussed in Section 3.3, Land Use and Airspace and 3.11, Public Health and Safety). Noise levels are mapped according to three general noise exposure zones:

- Zone 1: areas exposed to CNEL levels below 65 dB;
- Zone 2: areas exposed to CNEL levels of 65-75 dB; and
- Zone 3: areas exposed to CNEL levels above 75 dB.

Figure 3-30 summarizes the general approach used in AICUZ studies to determine the compatibility between on-base land uses and accident potential/noise zone conditions. Most development is not compatible with accident potential zones. Outside accident potential zones, land use compatibility determinations are based primarily on noise conditions.

All on-base land uses are compatible with Zone 1 noise levels. Industrial, administrative, and personnel support uses are generally compatible with Zone 2 noise levels. Educational and residential land uses generally are not compatible with Zone 2 noise levels unless special acoustic treatments and designs are used to ensure acceptable interior noise levels. Administrative, residential, and personnel support land uses are not compatible with Zone 3 noise levels. Industrial and manufacturing land uses may be acceptable in Zone 3 areas if special building designs and other measures are implemented.

FACILITY TYPE	CLEAR ZONE	APZ 1			APZ 2			NO APZ	
	NOISE ZONE 3	NOISE ZONE 3	NOISE ZONE 2	NOISE ZONE 1	NOISE ZONE 3	NOISE ZONE 2	NOISE ZONE 1	NOISE ZONE 3	NOISE ZONE 2
AIRCRAFT OPERATIONS									
OTHER OPERATIONS									
TRAINING									
AIRCRAFT MAINTENANCE									
OTHER MAINTENANCE									
T & E									
SUPPLY/ STORAGE									
ADMINISTRATION									
PERSONNEL SUPPORT									
HOUSING									

Noise Zone 3= CNEL above 75 dB

Noise Zone 2= CNEL of 65-75 dB

Noise Zone 1= CNEL below 65 dB

r:\0544\chart.cdr - 10/13/97 - KP

The AICUZ determines the land uses compatible with existing noise zones and accident potential zones (APZs).

LEGEND:

- Clearly Compatible
- Normally Compatible
- Normally Incompatible
- Clearly Incompatible

Land Use Compatibility within AICUZ Zones

E-2 Aircraft Squadrons Realignment EIS

Source: OPNAVINST 11010.36A, Air Installations Compatible Use Zones (AICUZ) Program April 1988.

Figure 3-30

State agency guidelines. State noise standards and guidelines include airport noise standards; guidelines for noise elements of general plans; and noise insulation standards for hotels, motels, and new multi-unit residential construction.

The California Department of Aeronautics has adopted airport noise standards (CCR Title 21, Section 5012) which define an airport noise impact zone as the area within the 65-dB CNEL contour around an airport. Construction of new noise-sensitive land uses (public and private schools, hospitals, convalescent homes, churches, and residences) are prohibited or discouraged within the noise impact zone around an airport.

The California Department of Health Services (1987) has published guidelines for the noise element of local general plans. These guidelines include a noise level/land use compatibility chart that categorizes outdoor CNEL or L_{dn} levels into as many as four compatibility categories (normally acceptable, conditionally acceptable, normally unacceptable, and clearly unacceptable), depending on land use.

The chart in the state noise element guidelines identifies normally acceptable noise levels for low-density residential uses as CNEL values below 60 dB. The normally acceptable range for high-density residential uses is identified as CNEL values below 65 dB. For educational and medical facilities, CNEL values of 60 to 70 dB are identified as conditionally acceptable. For office and commercial land uses, CNEL values of 67.5 to 77.5 dB are categorized as conditionally acceptable. Local cities and counties are free to adopt different land use compatibility guidelines as part of the noise element of their general plan.

The California Department of Housing and Community Development has adopted noise insulation performance standards for new hotels, motels, and dwellings other than detached single-family structures. These standards (California Code of Regulations [CCR] Title 24, Part 6, Section T25-28) require that hotels, motels, and multiple-unit dwellings be constructed so that outdoor noise sources will not cause interior noise levels to exceed an annual average CNEL value of 45 dB with the windows closed.

Local guidelines and criteria. Cities and counties in California are required to adopt noise elements as part of the local general plan. Noise elements identify existing and anticipated noise problems, programs to remedy these problems when feasible, and programs to minimize the creation of future noise problems. Some cities and counties also adopt noise ordinances to establish limitations and enforcement procedures for various categories of fixed noise sources. State and federal law preempts most direct local regulation of noise from motor vehicles, locomotives, ships, and aircraft.

3.7.1 Preferred Alternative: NAWS Point Mugu

Region of Influence

The decrease in noise levels with increasing distance away from the noise source results in a fairly limited ROI for noise issues. The ROI for fixed-site noise sources (such as industrial equipment or construction sites) is generally less than 0.5 mile (0.8 kilometers) from the site. The ROI for aircraft noise is generally within 2 or 3 miles (3 or 5 kilometers) of the airfield, and within 1 mile (1.6 kilometers) on either side of major flight track corridors where flight altitudes will be below 10,000 feet (3,050 meters). The ROI for traffic noise sources is generally less than 1,000 feet (305 meters) from roadways experiencing significant changes in traffic volumes.

Local Community Noise Level Criteria

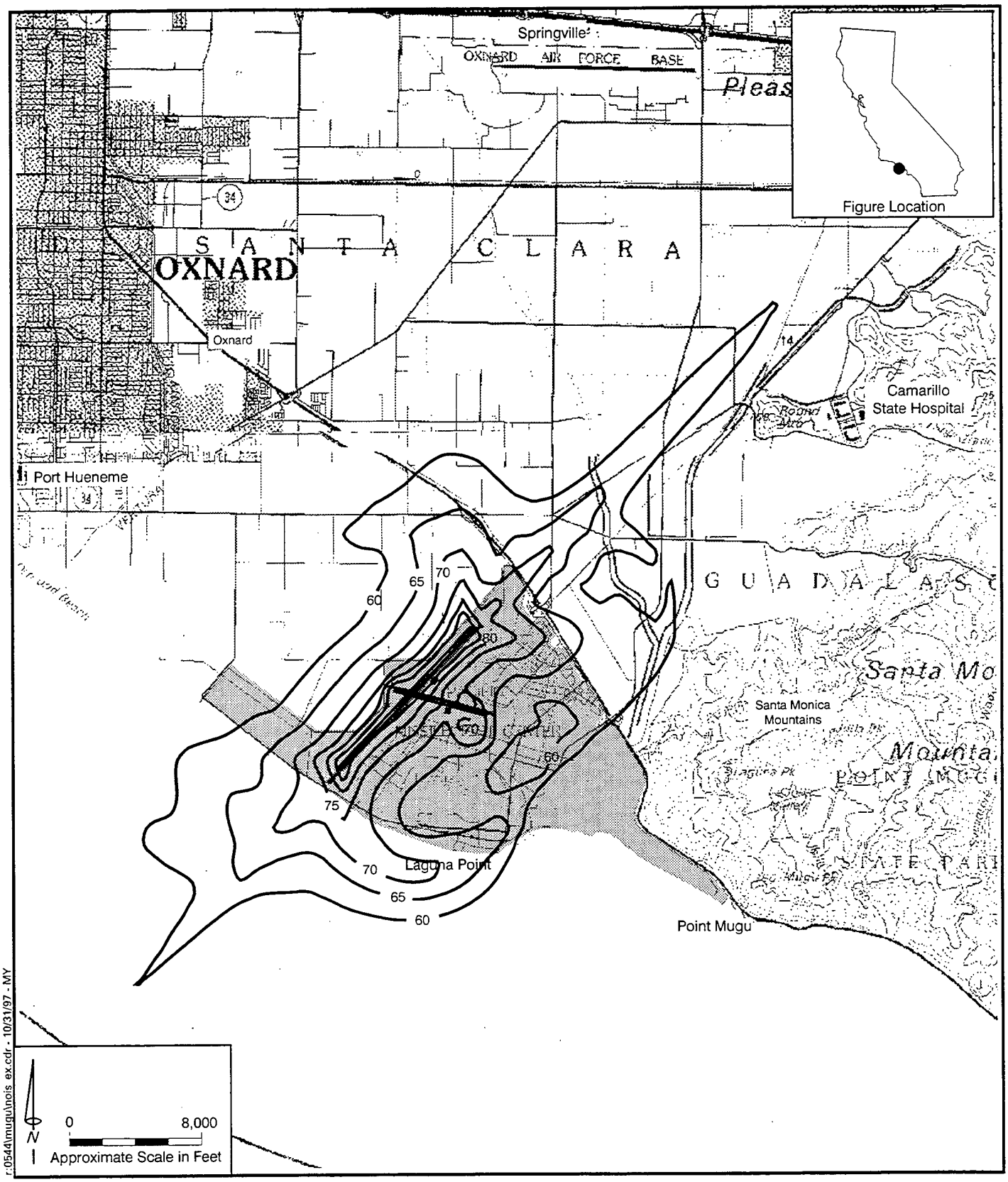
Airports and highway traffic are major contributors to noise conditions in Ventura County. Aircraft flight operations from Oxnard Airport, Camarillo Airport, and NAWS Point Mugu all affect noise conditions in the Oxnard, Port Hueneme, and Point Mugu areas. Pacific Coast Highway and local arterial roadways are major traffic noise sources in the Point Mugu area.

The noise element of the Ventura County general plan sets a CNEL level of 65 dB as the normally acceptable limit for residential and other noise-sensitive land uses. Proposals for new noise-sensitive development are generally reviewed to ensure that designs provide an acceptable interior noise environment when outdoor noise exposure is expected to exceed a CNEL of 60 dB.

Existing Aircraft Noise

Figure 3-31 illustrates 1990 aircraft noise conditions around the airfield at NAWS Point Mugu. The 65-dB CNEL contour covers about 8,910 acres (3,609 hectares), including offshore areas. The immediate airfield vicinity is exposed to CNEL conditions above 75 dB (Zone 1 conditions). A 4-acre (2-hectare) portion of the Capehart 2 Housing Complex in the northern portion of NAWS Point Mugu is within the 75-dB contour. Most on-base housing, administrative facilities, and personnel support facilities at NAWS Point Mugu are exposed to CNEL conditions above 65 dB (Zone 2 conditions). Because relocating these facilities is not practical, the 1992 AICUZ study (US Navy 1992b) recommends, independent of the E-2 realignment, building design and acoustic insulation measures to achieve acceptable interior noise levels.

Land uses surrounding NAWS Point Mugu include scattered semi-rural residences, agricultural lands, Point Mugu State Park, and a private game reserve. Approximately 49 acres (20 hectares) of off-base residential land use is within the 65-dB CNEL contour, including 9 acres (4 hectares) within the 75-dB contour. There are no schools within the 65-dB CNEL contour.



r:\0544\mugu\nois_ex.cdr - 10/31/97 - MY

Most on-base housing, administrative facilities, and personnel support facilities at NAWS Point Mugu are exposed to CNEL conditions above 65 dB.

LEGEND:

— 75 — Community Noise Equivalent Level (CNEL)

NAWS Point Mugu

NAWS Point Mugu Existing Noise Contours

E-2 Aircraft Squadrons Realignment EIS
NAWS Point Mugu, California

Source: Wyle 1997.

Figure 3-31

Noise complaints from off-base areas are generally infrequent. Most noise complaints come from areas outside the 60-dB CNEL contour, and are triggered by unusual individual flight events rather than by routine airport noise conditions. The greatest number of noise complaints come from the Camarillo area northeast of the base. A few complaints come from the Port Hueneme and Oxnard areas.

Existing Traffic Noise

Table 3-40 summarizes traffic noise levels along major roadways near NAWS Point Mugu. The highest traffic noise levels occur along Pacific Coast Highway. A perimeter wall along Navalair Road shields on-base housing from traffic noise generated along Navalair Road and Pacific Coast Highway.

Table 3-40
Existing Roadway Noise Levels Near NAWS Point Mugu

Location	CNEL at 100 feet to Centerline (dB[A])	Distance to 65 dB CNEL Contour (feet)
SR-1/PCH		
North of Wood Road	73.5	370
Wood - Las Posas	72.3	300
Navalair Road		
Wood Road – Gate 2	66.3	120
Gate 1 – Gate 3	58.4	<50
Wood Road		
North of SR-1	62.3	70
Los Posas Road		
North of SR – 1	67.6	150

Source: Giroux & Associates 1996

3.7.2 NAS Lemoore Alternative

Region of Influence

The decrease in noise levels with increasing distance away from the noise source results in a fairly limited ROI for noise issues. The ROI for fixed-site noise sources (such as industrial equipment or construction sites) is generally less than 0.5 mile (0.8 kilometers) from the site. The ROI for aircraft noise is generally within 2 or 3 miles (3 or 5 kilometers) of the airfield, and within 1 mile (1.6 kilometers) on either side of major flight track corridors where flight altitudes will be below 10,000 feet (3,050 meters). The ROI for traffic noise sources is generally less than 1,000 feet (305 meters) from roadways experiencing significant changes in traffic volumes.

Local Community Noise Level Criteria

Aircraft operations from NAS Lemoore, crop dusting operations, and highway traffic are the major contributors to noise conditions in Kings County. NAS Lemoore is the major airfield in Kings County. Hanford Municipal Airport and Corcoran Airport are minor sources of aircraft noise. State Routes 198 and 41 are the major state highways near NAS Lemoore.

The noise element of the Kings County general plan sets a CNEL level of 60 dB as the marginally acceptable limit for residential and other noise-sensitive land uses. The Kings County general plan discourages development of any sort within 3 miles (5 kilometers) of NAS Lemoore.

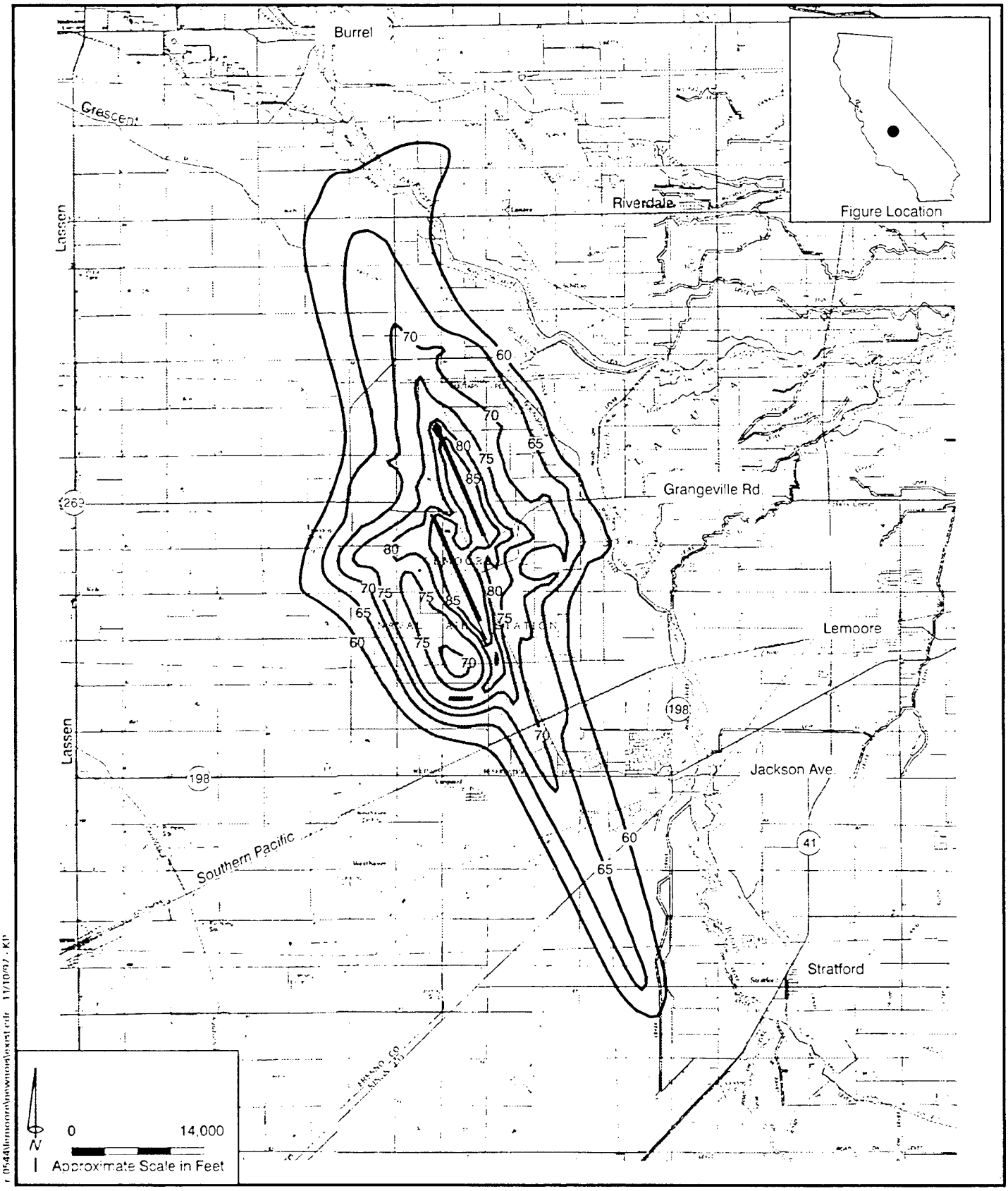
The noise element of the Fresno County general plan uses an L_{dn} of 60 dB to define land uses affected by noise. In addition, the noise element of the Fresno County general plan uses a median noise level (L_{50}, or the noise level exceeded 50 percent of the time) measure to identify general land use compatibility conditions. An L_{50} of 50 dBA is the acceptable noise limit for rural residential development, while an L_{50} of 55 dBA is identified as the acceptable limit for urban residential and other noise-sensitive land uses.

Existing Aircraft Noise

Figure 3-32 illustrates 1993 aircraft noise conditions around the airfield at NAS Lemoore. The 65-dB CNEL contour encompasses about 34,250 acres (13,700 hectares), mostly within NAS Lemoore boundaries. The 65-dB CNEL contour extends off-base along major approach and departure flight paths.

On-base land uses at NAS Lemoore are separated into an operations area, an administrative area, and a housing area. The operations area is separated from the housing/administration area by about 3-4 miles. Some bachelor housing facilities are located in the administrative area. Some portions of the administrative area, including BEQ and BOQ facilities, fall within the 65-dB CNEL contour (Zone 2). Family housing areas and on-base schools are generally exposed to CNEL conditions below 60 dB. The 1993 AICUZ study (US Navy 1993) recommends, independent of the E-2 realignment, building design and acoustic insulation measures to achieve acceptable interior noise levels for buildings within the 65-dB contour.

NAS Lemoore is surrounded by agricultural land uses. The closest residential developments are located in Lemoore (7 miles [11 kilometers] to the east), Stratford (6 miles [10 kilometers] to the southeast), and Hanford (17 miles [27 kilometers] to the east). Noise complaints from off-base areas are generally infrequent, averaging about seven per year (US Navy 1993).



The 65-dB CNEL contour extends off-base along major approach and departure flight paths

LEGEND

—75— Community Noise Equivalent Level (CNEL)

NAS Lemoore

NAS Lemoore
Existing Noise Contours

E-2 Aircraft Squadrons Realignment EIS
NAS Lemoore, California

Source: Wyle 1997

Figure 3-32

Existing Traffic Noise

Table 3-41 summarizes traffic noise levels along off-base major roadways near NAS Lemoore. The highest traffic noise levels occur along State Route 198. Any noise-sensitive developments along major roadways in Kings and Fresno Counties are required to use setbacks, perimeter walls, or other measures to mitigate noise exposure conditions.

Table 3-41
Existing Traffic Noise Levels Near NAS Lemoore

Location	CNEL at 100 feet to C/L (dBA)	Distance to 65 dB CNEL Contour (feet)
Grangeville Road		
West of SR-41	66.8	130
SR-41		
North of Grangeville	69.1	190
SR-198/Jackson Avenue		
SR-41 – Avenal Cutoff	70.6	240
East of Main Gate	68.3	170
West of Main Gate	65.3	100

Source: Giroux & Associates 1996.

3.7.3 NAF El Centro Alternative

Region of Influence

The decrease in noise levels with increasing distance away from the noise source results in a fairly limited ROI for noise issues. The ROI for fixed-site noise sources (such as industrial equipment or construction sites) is generally less than 0.5 mile (0.8 kilometers) from the site. The ROI for aircraft noise is generally within 2 or 3 miles (3 or 5 kilometers) of the airfield, and within 1 mile (1.6 kilometer) on either side of major flight track corridors where flight altitudes will be below 10,000 feet (3,050 meters). The ROI for traffic noise sources is generally less than 1,000 feet (305 meters) from roadways experiencing significant changes in traffic volumes.

Local Community Noise Level Criteria

Aircraft operations associated with NAF El Centro and adjacent MOAs are major contributors to noise conditions in the southern part of Imperial County. Additional aircraft noise is contributed by crop dusting activity and aircraft operations from Imperial County Airport and Brawley Municipal Airport.

The noise element of the Imperial County general plan sets a CNEL level of 65 dB as the acceptable limit for residential and professional office uses. A noise impact analysis is required for proposed developments that would be exposed to CNEL values above 60 dB.

Existing Aircraft Noise

Figure 3-33 illustrates 1990 aircraft noise conditions around the airfield at NAF El Centro. The 65-dB CNEL contour extends approximately 1.5 miles south and north and 4 miles east and west beyond the boundaries of NAF El Centro. Noise levels are generally higher than indicated in Figure 3-33 during winter months when the Blue Angels are at NAF El Centro. Noise levels are lower than indicated in Figure 3-33 during the hottest summer months, when flight activity is reduced.

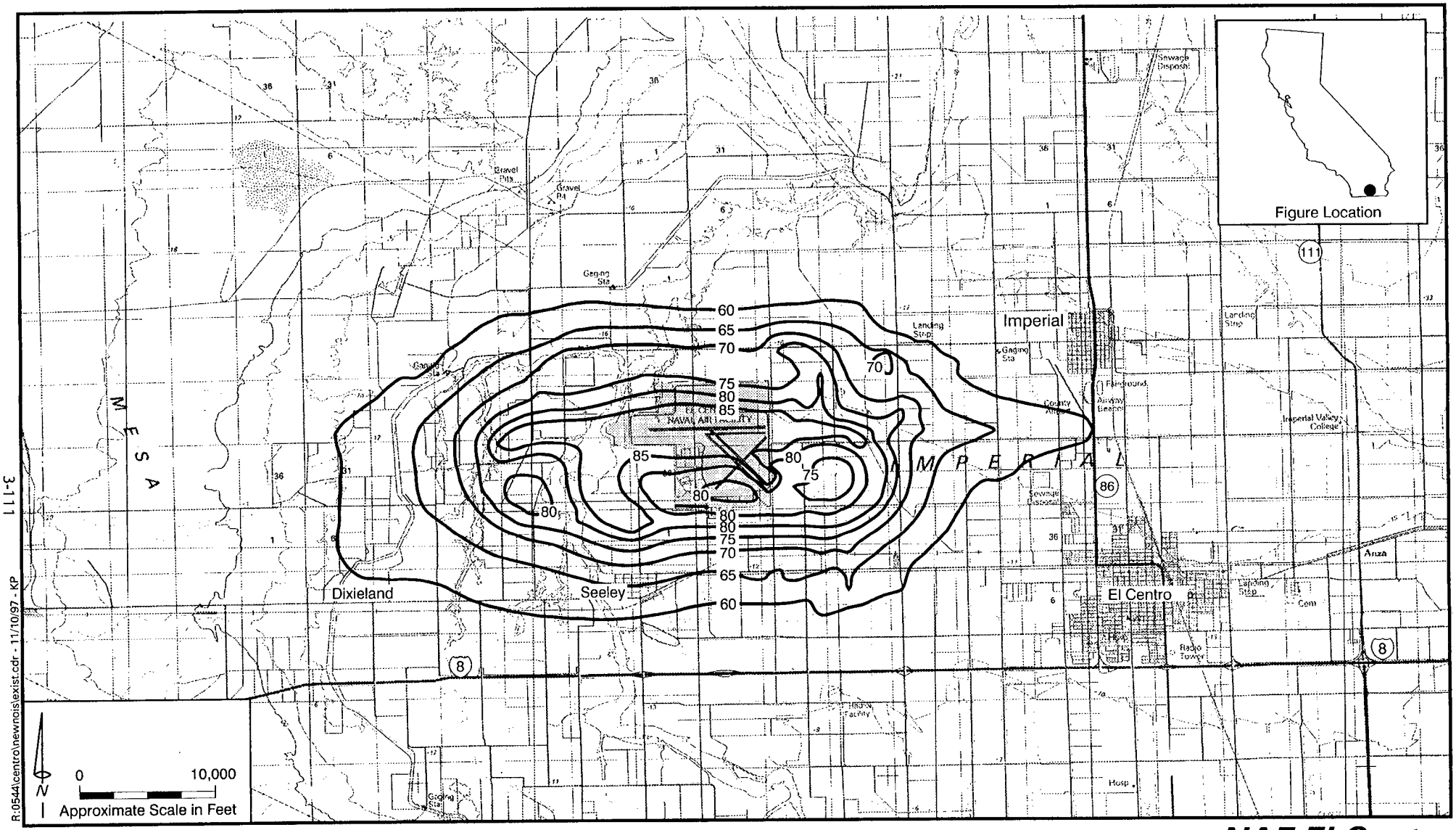
All on-base land uses at NAF El Centro, including family housing areas and BOQs, are exposed to CNEL conditions above 65 dB (Zone 2). Some administrative uses and several BEQs are exposed to CNEL conditions above 75 dB (Zone 1). Because relocating these facilities is not practical, the 1990 AICUZ study (US Navy 1990b) recommends, independent of the E-2 realignment, building design and acoustic insulation measures to achieve acceptable interior noise levels.

NAF El Centro is surrounded by agricultural and open space land uses, with scattered rural residences. The closest residential developments are located in Seeley (1 mile south), Imperial (6 miles east), and El Centro (7 miles southeast). One school in the town of Seeley is exposed to CNEL conditions above 65 dB. Schools in El Centro and Imperial are outside the 65-dB CNEL contour.

Noise complaints from off-base areas come mostly from El Centro. Most noise complaints are triggered by unusual individual flight events rather than by routine airport noise conditions. Flight patterns at NAF El Centro are modified from standard operations to minimize overflights of populated areas and recognized noise-sensitive areas.

Existing Traffic Noise

Table 3-42 summarizes traffic noise levels along off-base major roadways providing access to NAF El Centro. The highest traffic noise levels occur along Imperial Avenue.



R:\0544\centro\newnois\exist.cdr - 11/10/97 - KP

3-111

Existing noise contours exceed levels associated with most noise-sensitive land uses.

LEGEND:

—75— Community Noise Equivalent Level (CNEL) in decibels (dB)

NAF El Centro

NAF El Centro
Existing Noise Contours

E-2 Aircraft Squadrons Realignment EIS
NAF El Centro, California

Source: US Navy 1997.

Figure 3-33

Table 3-42
Existing Traffic Noise Levels Near NAF El Centro

Location	CNEL at 100 feet to Centerline (dBA)	Distance to 65 dB CNEL Contour (feet)
Evan Hewes Highway		
West of Drew	64.4	90
Drew - Bennett	64.4	90
Bennett - Forester	66.3	120
Forrester - Imperial	66.2	120
Drew Road		
North of Evan Hewes	59.7	<50
South of Evan Hewes	62.8	70
Bennett Road		
North of Evan Hewes	62.8	70
South of Evan Hewes	61.8	60
Forrester Road		
North of Evan Hewes	64.3	90
South of Evan Hewes	66.6	130
Imperial Avenue		
North of Evan Hewes	69.5	200
South of Evan Hewes	61.8	60

Source: Giroux & Associates 1996

3.8 AESTHETICS AND VISUAL RESOURCES

This section describes the aesthetics and visual resources for each alternative base. Visual character, existing views, and plans and policies are discussed. This description is guided by the concepts used by the US Forest Service for assessing visual resources (US Department of Agriculture 1973).

Definition of Resource

Visual resources are defined as the natural and man-made features that constitute aesthetic qualities and values of an area. These features contribute to the overall impression that an observer receives when viewing an area. Landforms, water surfaces, vegetation, and structures are considered distinctive elements of an area's visual character.

The visual importance or sensitivity associated with the visual resources of an area determines whether a change in character would be considered a significant effect. Visual sensitivity is determined by the overall visual character and quality of an area, number of viewers with access to the resources, and view duration.

High visual sensitivity areas with high visual quality have views that are rare, unique, or in other ways special, such as in remote or pristine environments or in areas of historic significance with unique architecture. High sensitivity views could include landscapes that consist of structures, landforms, vegetative patterns, water bodies, or rock formations of unusual or outstanding quality. High visual sensitivity localities could also include natural coastlines, streams, river corridors, designated historic districts, and designated scenic vistas.

Medium visual sensitivity areas with moderate visual quality are more developed than those areas of high sensitivity. Human influence is more apparent in these areas, and the presence of motorized vehicles and other evidence of modern civilization are common. These landscapes would include built and natural features containing varieties in form, line, color, and texture, but tend to be more common than high visual sensitivity areas.

Low visual sensitivity areas with low visual quality tend to have minimal landscape features and common building types, with little change in form, line, color, and texture. Low sensitivity views could include typical urban or suburban areas, agricultural and farming areas, industrial or commercial developments, and other areas that do not contain unique or historic resources typical of medium or high visual sensitivity areas.

Observers are typically considered sensitive visual receptors when perceptible changes in visual character would contrast and detract from a scenic natural or built landscape. Certain activities tend to heighten viewer awareness of scenic resources, while others tend to be distracting. For example, people who are camping, picnicking, or driving along a formally recognized scenic roadway are

more likely to notice changes in the surrounding character than commuters traveling at high speeds on an interstate highway.

The Navy identifies the visual character or quality of each base in Base Exterior and Architecture Plans (BEAPs). The BEAPs for the alternative base locations contain design guidelines for all new development, replacement, repair, and maintenance projects. The BEAPs recommend architectural guidelines, color palettes, furnishings, signage, and lighting that are consistent with the aesthetic values or themes of the natural and man-made environment.

The state policies that guide coastal zone conservation and development decisions (described in Section 3.3, Land Use and Airspace) include protecting the scenic beauty of the coastal landscape.

The visual character of each project site was identified through in-field observations and a review of visual resources documented in the BEAPs and Master Plans for each alternative base.

3.8.1 Preferred Alternative: NAWS Point Mugu

Region of Influence

The ROI for visual resources includes a generalized viewshed extending from the boundaries of each base to a maximum of five miles (eight kilometers) beyond; this may be limited in places by terrain and structures.

Visual Character

NAWS Point Mugu can be characterized as a highly scenic area due to its presence adjacent to the Pacific Ocean and state parks, and high proportion of open space associated with Mugu Lagoon and its tributaries. Topographically, the base is situated on a broad coastal plain with elevations generally less than 10 feet (three meters) above MSL. This relatively flat terrain is representative of areas north and northwest of the base. Areas to the southeast encompass the steep terrain of Laguna Peak (1,457 feet [444 meters] above MSL) and the northern edge of the Santa Monica Mountain Range. The base has over 15 miles (24 kilometers) of boundaries, including six miles (9.6 kilometers) of coastline and nine miles (14.5 kilometers) of inland frontage that are visually accessible to the public.

The proposed aircraft hangar and Applied Instruction Building (AIB) would occupy an existing structure, which would be expanded by 7,000 square feet for the E-2 squadrons. Building 553, a hangar, is a 30-foot-high (nine-meter-high) tan structure adjacent to the taxiway and runways.

Proposed Aircraft Intermediate Maintenance Department (AIMD) facilities would occupy some of the existing on-base structures. The proposed Operational Trainer Facility (OTF) and vehicle parking lot would be located in a vacant area. Visually, the parking lot site features low-growing vegetation. Nearby test and evaluation

buildings are either one-story trailers or two-story, concrete block and glass structures. These sites have low visual quality because of their disturbed nature.

Existing Views

Short- and long-range views from the base include the agricultural lands of the Oxnard Plain to the north, northern slopes of the Santa Monica Mountains to the east, and coastal waters of the Pacific Ocean to the south and west. Highway 1 traverses the northeastern boundary of the base and is designated a Scenic Highway. Mature eucalyptus trees form a windbreak (and visual barrier) along portions of the highway approaching the base from the north. Point Mugu State Park is located immediately east of the base and occupies three miles (five kilometers) of ocean frontage and several thousand acres (several hundred hectares) of inland mountain areas used for outdoor recreation. Marinas in the cities of Ventura, Port Hueneme, and Oxnard provide offshore recreational boating in the area.

The closest points at which public views of on-base functions and structures are available are from Navalair/Frontage Road along the eastern perimeter of the base, from the Ventura County and Point Mugu game reserves to the northwest, and from limited segments of Highway 1 to the east. Long-range views of base operations are available from recreational boaters using offshore waters to the south and west, and to a limited degree, state park users to the east. From these locations, there are limited views of landscaped entries, military housing, and peripheral base structures. In general, the operations area, located in the central portion of the base, is farthest from these views. Military housing is near the outer northeast corner, and administrative/personnel support facilities are located throughout the base. The air traffic control tower is visible from greater distances because of its height and the limited topographic variation of surrounding areas. The proposed project sites would be located in interior developed areas and generally would not be visible from the base perimeter or gates or from surrounding waters.

Plans and Policies

The NAWS Point Mugu BEAP is a comprehensive plan that addresses the design of new facilities, including architectural guidelines, landscaping themes, signage styles, and parking lot characteristics among other planning issues. Uniform use of colors and materials and consistency with the character of adjacent structures are recommended for new construction (US Navy 1983).

3.8.2 NAS Lemoore Alternative

Region of Influence

The ROI for visual resources includes a generalized viewshed extending from the boundaries of each base to a maximum of five miles (eight kilometers) beyond; this may be limited in places by terrain and structures.

Visual Character

The topography at NAS Lemoore is relatively flat with no visual relief. On-base elevations range from a low of 210 feet (64 meters) above MSL at the southwest corner of the base to 265 feet (81 meters) above MSL in the northeast/southeast corners. NAS Lemoore is in an agriculturally dominated region of the San Joaquin Valley and maintains extensive fields in active cultivation. The operations area at NAS Lemoore is separated from the administration and housing complex by nearly five miles (eight kilometers). The lands between the operations and administration areas are agricultural outleases planted with row crops, particularly cotton. These two areas are visually distinct from one another, but surrounded by similar landscapes. The operations area is industrial in appearance due to the presence of hangar complexes, training facilities, maintenance areas, and other support structures. The southerly administrative area is suburban in character, with landscaped areas, smaller structures, a variety of recreational amenities, and housing facilities. Planted trees serve as windbreaks in landscaped portions of NAS Lemoore. Dominant visual elements include base structures, such as aircraft hangars, the control tower, housing structures, offices, and other buildings.

The administration area is suburban in character compared to the operations area and contains landscaped lawns, trees, recreation fields, and one- to three-story concrete block structures. There are also low-rise operations/training facilities in the southwest and northeast corners of the administration area (US Navy 1992c). Agricultural outleases are visible to the west and north. Single-story family housing units dominate the landscape to the east. The proposed BEQ site would be located on vacant land adjacent to other barracks. The proposed child development center would be located near future housing on a grassy lot among other public support facilities. Existing structures near the sites of these proposed facilities are typical of architecture found in other parts of the base. Visual character would be considered moderate due to the presence of mature landscaping.

Existing Views

Short- and long-range views from the base include agriculture and the foothills of the Coastal Range to the west and Sierra Nevada Mountains to the north and east. No scenic highways, national parks, or state parks are located near the base. The closest public views of on-base functions and structures are from SR-198 along the southern edge of the base. Due to the limited topographic relief, off-base views are restricted to the control tower, taller buildings, and perimeter structures. The base facilities cannot be seen from Interstate 5, which is over 20 miles (32 kilometers) west of the base. From the Main Gate, the landscaped entryway, flag circle, and administration buildings are visible. Perimeter landscaping along the highway conceals much of the housing and recreation areas from freeway view.

All of the proposed project sites would be visible from on-base circulation routes. None of these sites would be visible from outside the base perimeter.

Plans and Policies

Design guidelines in the NAS Lemoore BEAP are implemented for future development on the base. The BEAP recommends implementation of a coordinated color scheme for new building exteriors using natural colors that complement the surrounding desert landscape, such as shades of red, brown, and gray, and planting trees to provide an overall sense of order, structure, and direction for the base (US Navy 1989).

3.8.3 NAF El Centro Alternative

Region of Influence

The ROI for visual resources includes a generalized viewshed extending from the boundaries of each base to a maximum of five miles (eight kilometers) beyond; this may be limited in places by terrain and structures.

Visual Character

The topography at NAF El Centro is flat with no visual relief. Elevations vary from 52 feet (16 meters) to 42 feet (13 meters) below MSL. Land surrounding the base is leased to farmers for agricultural purposes. This land feature low-lying herbaceous growth and regularly spaced open irrigation channels.

With the exception of the proposed BEQ and child development center, all of the proposed project sites would be situated in an agricultural outlease identified as Field N and Field O in the NAF El Centro Master Plan (US Navy 1988b). The site is completely level with no landforms and is planted with Bermuda grass. Portions of the site near Eighth Street and A Street are surrounded by security fencing. The only structure on the site is a small, one-story sewer pump station (Building 554) on Field O. Adjacent to the site is a tan-colored metal hangar building (Building 524) measuring approximately 30 feet (nine meters) in height with sliding side doors for aircraft access. The project area can be characterized as industrial, having minimal visual resources and low visual quality because of the generally absent landforms, simple architectural styles, and nondistinctive landscaping.

The proposed BEQ would be situated on a vacant lot adjacent to two existing BEQ structures near the center of base. The child development center would be constructed on a vacant lot near the outskirts of the family housing area. These proposed project sites are not within any unified historic or scenic areas and visual quality in these areas is considered low.

Existing Views

Short-range views from the base are of the agriculturally dominated landscape. Long-range views from the base include the eastern slopes of the Peninsular Range to the west, Chocolate Mountains to the northeast, and Mount Signal to the south near the international border. There are no scenic highways near NAF El Centro. Generally, the operational functions are located in the southeastern corner of the

base, and family housing is in the southwestern corner. Administrative, recreational, and personnel support facilities are located directly north of family housing. The closest point from which public views of on-base functions and structures are available is from the Main Gate on Bennett Drive at the southern edge of the base. From this gate, views are limited to the landscaped entry and perimeter buildings, including hangars and engineering support buildings. The centrally located parachute tower is visible from longer distances because of its height and limited topographic relief.

All proposed project sites would be located in developed or disturbed areas in the operational, family housing, and administrative/support areas. The proposed hangar and operations sites would be visible from the Main Gate. Other project sites would be visible from off base because local roadways are approximately 0.5 miles (0.8 kilometers) from the base boundary and nearly 1.5 miles (2.4 kilometers) from the closest military structures.

Plans and Policies

The BEAP theme at NAF El Centro is "rural desert." The design guidelines recommend color palettes, furnishings, signage, and lighting consistent with the theme established for each on-base district (US Navy 1988b). All proposed project sites would be designed and built in accordance with BEAP guidelines.

3.9 UTILITIES AND SERVICES

This section describes the utility systems and public services at each alternative base. Water supply systems, wastewater treatment and disposal, solid waste collection and disposal, storm water collection, natural gas and electric services, schools, child care services, health services, recreation and community facilities, police services, and fire services are discussed.

Definition of Resource

The service providers, applicable supplies and/or capacities, constraints to service provision, and other relevant information pertaining to public services and utilities are described below for each alternative base. Relevant state and federal laws and regulations are also discussed. Information was collected from master plans of the alternative bases, relevant NEPA documents, and personal communications with facility planners and service agencies.

Plans and Policies

No regulations govern utilities and public services as a single entity; utilities and public services are subject to different federal, state, or local regulations. These may be municipal codes, permitting requirements, legislation, or federal, state, or local agency requirements. The regulations applicable to the various utilities and public services at each base are discussed below.

Water supply. Sampling for lead and copper in drinking water is outlined in the Safe Drinking Water Act. The Navy's Environmental and Natural Resource Program Manual identifies requirements and responsibilities for protecting drinking water supplies at Navy bases.

Wastewater and storm water collection and treatment system. The RWQCB implements provisions of the Clean Water Act delegated to states, such as the NPDES permits, which regulates point (industrial) and nonpoint (stormwater) sources of pollutants. NPDES permit requirements apply to the discharge of wastewater into sanitary sewers. The stormwater systems operate under NPDES Statewide General Industrial Stormwater Discharge Permits. In California, the Navy is complying with the SWRCB general permit requirements instead of applying for individual permits for each facility. However, Navy facilities in California submit a Notice of Intent (NOI) to comply with the general permit requirements to the SWRCB.

Solid waste collection and disposal. The Solid Waste Disposal Act of 1965, as amended by the Resource Conservation and Recovery Act (RCRA) in 1976, requires that federal facilities comply with all federal, state, interstate, and local requirements for managing and disposing of solid waste. RCRA establishes public safety and health standards for disposing of solid waste, including requirements for landfill liners and leachate collection and treatment systems. RCRA and the Military Construction Codification Act of 1982 also provide for various means of

recovering value from solid waste, which may be recycled, reclaimed, used as a fuel supplement, or sold for profit.

California Assembly Bill (AB) 939 requires California cities to divert 25 percent of their solid waste from landfills by 1995 and 50 percent by 2000. California Senate Bill (SB) 1223 establishes state programs designed to increase recycling and to encourage the development of commercial markets for recyclable materials. In general, the state places the burden of action and responsibility on cities to meet the these requirements.

Schools. In July 1996, legislation was passed in California that provides schools with incentive funding to reduce class size (thereby increasing the number of classrooms and/or teachers) in the primary grades. Each participating school must reduce class size to 20 students or less, first in grade one, then in grade two, and then in either kindergarten or grade three, at a school's discretion. By law the program is an ongoing part of participating districts' revenues and is part of a larger effort to improve instruction and student performance (Education Data Partnership 1997). There are a number of funding mechanisms used by the public school systems to offset the cost of educating children of federal government employees. The Improving America's Schools Act of 1994 mandates that the Department of Education appropriate funds to schools attended by military family members. This funding can be applied for by local school districts on a per-child basis. Once received, the funds can be used at the district's discretion for supplementing operating costs or for facilitating construction projects.

Under Section 8003 of this Act, school districts receive funding for students whose parents work and live on federal property, and for students whose parents are in the uniformed service and live off station. School districts, however, may not receive funding or the funding may be at a reduced amount for civilian students whose parents work at federal facilities but reside off station. The exact funding amounts and subsequent impacts of the new legislation are uncertain.

Section 8006 of the Act provides additional funding for schools that experience a sudden and substantial increase in attendance of military family members. A school district can qualify for this funding if the number of incoming military children is at least 10 percent or 100 more than the number of children in average daily attendance for the preceding school year.

Some school districts also receive DOD funding under Title II of Public Law 102-368 and Section 386 of Public Law 102-484 (DOD Authorization Bill). For a school district to receive this funding, 30 percent of its enrollment must consist of military children. The US Department of Education supplies federal funds to the school board based on the number of students whose parents work and live on federal property (US Navy 1994d).

3.9.1 Preferred Alternative: NAWS Point Mugu

Region of Influence

The ROI for the NAWS Point Mugu Alternative includes the entire base and the surrounding local service areas that would provide off-site utilities and public services, such as wastewater treatment and landfill disposal, and supplementary services, such as health care, fire protection, and police.

Water Supply Systems

Potable water at NAWS Point Mugu, US Naval Construction Battalion Center (USNCBC) Port Hueneme, Port Hueneme and the Channel Islands Beach community is contracted from the Port Hueneme Water Agency (PHWA). The other local communities of Oxnard, Camarillo, and Ventura are served by municipal water districts that obtain water through a combination of groundwater or surface water sources, or from local water suppliers (Muro 1997; Smith 1997; Bauer 1997). PHWA purchases untreated ground water from the United Water Conservation District (UWCD) and treats the water at a desalination plant. UWCD provides approximately 65 percent of the PHWA water supply. PHWA obtains the remaining 35 percent of its required water from the Calleguas Municipal Water District (CMWD), which provides treated water (Passanisi 1997). In cases of emergency, NAWS Point Mugu also relies on three standby wells that provide water for drinking and fire suppression (Bentley 1997). The base has a water treatment plant with 500,000-gallon (1.9 million liters per day [mLd]) 200,000-gallon (758,000-liter), and 50,000-gallon (189,500-liter) tanks, sand filters, and chlorination and pumping equipment (US Navy 1986a; Bentley 1997). The plant filters all well water and softens all water used in the housing and administration areas. The water distribution system primarily consists of an 18-inch (46-centimeter) main loop terminating at two 500,000-gallon (1,895,000-liter) water storage tanks. Smaller connecting pipes are composed of spiral-welded steel, PVC, and cement pipe. NAWS Point Mugu consumes approximately 1.48 million gallons per day (mgd) (5.56 mLd) of potable water and the water system is in good condition (Hovde 1997).

Wastewater Treatment and Disposal

NAWS Point Mugu pretreats wastewater generated at the main base and three housing areas. The effluent is then transferred to the Oxnard Wastewater Treatment Plant 8 miles (13 kilometers) away through a 10-inch (25-centimeter) force main for further treatment (US Navy 1986a). The base treats approximately 0.35 mgd (1.06 mLd) and is allocated 0.5 mgd (1.9 mLd) by the Oxnard Wastewater Treatment Plant (Hovde 1997; Moise 1997). The wastewater system is in good condition and does not require any major repairs or upgrades (Hovde 1997).

The treatment plant in Oxnard processes wastewater from NAWS Point Mugu, California Air National Guard Facility, USNCBC Port Hueneme, and the City of Port Hueneme. Wastewater receives secondary treatment before being discharged

into the Pacific Ocean. Although the design capacity of the treatment plant is 32 mgd (120 mLd), it presently treats only 19 mgd (72 mLd) (Moise 1997).

The surrounding cities of Camarillo, Port Hueneme, and Ventura have their own wastewater treatment facilities. All of these facilities are currently operating well below their capacities (Westdike 1997; Finley 1997; Simmons 1997).

Storm Water Collection

On-base storm drains at NAWS Point Mugu collect storm water into several large drainage ditches that traverse the base and that are part of a system that drains the surrounding agricultural land. The ditches terminate in Mugu Lagoon or Calleguas Creek and discharge into the ocean. A system of berms and walls along the northern perimeter of the station divert flood water from the housing area (US Navy 1986a; Cervantes 1997). The storm water system at the base is in good condition and does not require any major repairs or upgrades (Cervantes 1997). Storm water quality is monitored by the base and conforms to the standards of its NPDES permit.

Solid Waste Collection and Disposal

Solid waste from NAWS Point Mugu and surrounding communities is collected by a private contractor and is taken to an off-base transfer station before being delivered to a landfill. The base generates approximately 415 tons (374 tonnes) of solid waste per month, which is taken to the Del Norte Regional Recycling and Transfer Station in Oxnard (Granade 1997). Solid waste from the base is disposed of at the Toland Road Landfill, approximately 15 miles (24 kilometers) from the base. This is a 161-acre (65-hectare) municipal waste facility operated by the Ventura Regional Sanitation District and serves the communities of Fillmore, Santa Paula, and Piru. It is expected that the landfill will operate for another 30 years at the present waste generation rate, with an estimated remaining capacity of 30 million cubic yards (4 million cubic meters) (Ventura County 1994).

NAWS Point Mugu coordinates collection and sorting of recyclable material from the solid waste stream. Materials gathered include fluorescent tubes, metals, cardboard, glass, plastic, paper, and wood (Morales 1997; Granade 1997).

Natural Gas and Electric Services

Natural gas is provided to NAWS Point Mugu and to the surrounding communities by Southern California Gas Company (SCGC) for housing core services; natural gas used for commercial purposes is transported by the Defense Fuel Supply Center. The base consumes approximately 89,000 cubic feet per day (cfd) (2,500 cubic meters per day (cmd)) of natural gas, and the distribution system is in good condition (Hovde 1997).

Electricity is provided to the base and local areas by Southern California Edison (SCE). NAWS Point Mugu receives 66-kilovolt (KV) transmission service at Switching Station No. 17 (near gate 2). Service consists of one normal feeder and

one standby feeder with manual transfer (US Navy 1986a). The base consumes approximately 271 megawatts (MW) of electricity per day, and the electrical system is in good condition (Hovde 1997).

Schools

Twenty school districts, which consist of one K-6, ten K-8, seven K-12, and two 9-12 school districts, serve Ventura County (California County Offices of Education 1996d). The two school districts near NAWS Point Mugu that serve most of its students are Ocean View School District and Oxnard Union High School.

Ocean View School District provides grades K-8 public education for students residing within a portion of the County of Ventura and the City of Oxnard. The district operates three elementary schools and one junior high school. The elementary schools can adequately accommodate 1,869 students, while the junior high school can serve 540 students. Fall enrollment for school year 1996-1997 was 2,417 (David Taussig and Associates 1997) and was 2,398 as of March 3, 1997 (Kadi 1997). All schools are operating over capacity. In three schools the teacher' lunchroom has been converted to a classroom, and in one school a library has been eliminated to create a classroom. The capacities of the schools are changing because of the class size reduction program (Kadi 1997).

Oxnard Union High School District operates all six area high schools. Current enrollment for the district is 13,083 students, which is 1,640 students over capacity. Many of the schools are using portable classrooms to help meet demand. The district has expansion plans to build a new school. The land has been purchased, and facilities have been designed. However, funding to construct the school has not yet been secured (Cunningham 1997).

There are no schools on the base. All school-aged children are bused either from Point Mugu or from the Camarillo Housing to schools in the district.

Child Care Services

NAWS Point Mugu provides child care services for 150 children of its personnel. The child development center is operating at its capacity of 120 children. In addition, child care is provided by family home care, a program that certifies on-base residences to provide child care for up to six children each. The family home care program at NAWS Point Mugu provides an additional 30 children with child care services.

Health Services

The main clinic located at NAWS Point Mugu serves about 550 patients per month. This clinic is divided into service departments that include aviation medicine, occupational health, immunization, and optometry. Only the optometry department treats family members when appointments cannot be filled with active military personnel. The branch medical clinic also provides women's health exams, minor surgical procedures, laboratory, pharmacy, x-ray, and after-

hours ambulance service (Willis 1997). The clinic staffs three full-time physicians, one independent duty corpsman (IDC), and one physician's assistant (PA) to provide medical services. The clinic also maintains three administrative support personnel (Willis 1997). Dental care is also available at the NAWS Point Mugu dental clinic. The clinic provides routine dental care, such as fillings and cleanings. Health care for military family members is available from the Naval Medical Clinic Port Hueneme which provides services in dermatology, podiatry, orthopedics, psychiatry, pediatrics, primary care, and physical therapy (Willis 1997).

Within Ventura County, health services are available from 12 hospitals, three of which are within the immediate vicinity of the base (US Navy 1986a). These include Saint John's Regional Medical Center in Oxnard, Saint John's Pleasant Valley Hospital in Camarillo, and Community Memorial Hospital in Ventura. Most of the hospitals provide emergency services.

Recreation and Community Facilities

NAWS Point Mugu's Morale, Welfare, and Recreation (MWR) Department provides information and activities on base and recreation trips off base on weekends. Outdoor recreation facilities include tennis courts, basketball courts, playing fields, and a golf course. On-base indoor facilities include a complete gymnasium with weight room and aerobic facilities (SITES 1997c).

Recreation areas surrounding the base include Los Padres National Forest, Emma Wood Beach County Park, Mount Pinos Recreation Area, Point Mugu State Park, Santa Monica Mountains National Recreation Area, beaches, and campgrounds. There are also several private and public golf courses in the county. Ventura County provides several recreation and community events, including craft shows, fairs, and rodeos. Information on these activities is available through the MWR Department and the chambers of commerce (SITES 1997c).

The NAWS Point Mugu Chapel of Faith has both Catholic and Protestant services. The area surrounding the base has places of worship for many denominations (SITES 1997c).

Police Services

Police services within the boundaries of the base are the responsibility of NAWS Point Mugu Security Department. Security for the site consists of daily base patrols, building security, traffic control, monitoring the three base entrance gates, and responses to service calls. The department staffs 13 military personnel and 29 civilian sworn officers for security duties, one civilian kennel master for the four police dogs, and six civilian employees for clerical duties. The department also employs a private contractor to provide 33 additional personnel to monitor the three access gates to the base. The department maintains ten registered patrol vehicles, one four-wheel-drive truck, and one van for transporting prisoners. The NAWS Point Mugu Security Department does not maintain any memorandums

of understanding (MOU) with the other law enforcement agencies in the county (Boner 1997).

The Ventura County Sheriff's Department provides police services to the other communities and has jurisdiction over all unincorporated areas in the county (Parks 1997). The cities of Oxnard, Port Hueneme, and Ventura maintain their own police departments and provide police services within their city limits.

Fire Services

The NAWS Point Mugu Fire Department provides fire protection services at the base and also is a first respondent to all emergency calls. The department has a staffing level of 69 firefighters; however only 16 firefighters are on duty daily. All firefighters are certified emergency medical technicians (EMTs). The department maintains seven 1,000-gallon-capacity (3,800-liter) fire engines. The department uses three engines for structural fire suppression, four for aircraft crash-fire response, and one engine is maintained in reserve. Two structural fire engines and two crash fire engines are on duty at all times. The department also maintains a single truck for fighting brushfires. (Hair 1997). The NAWS Point Mugu Fire Department has mutual aid agreements with the Ventura County Fire Department, the City of Oxnard Fire Department, and the City of Ventura Fire Department (Hair 1997).

The Ventura County Fire Department provides fire protection to all of Ventura County. The department operates 30 fire stations, and has a total staff of approximately 350 firefighters, with about 100 on duty at any time. The department maintains 30 fire engines, 1 rescue engine, 10 brush-fire engines, 2 ladder trucks, and 10 patrol units (Sanchez 1997). The Cities of Oxnard and Ventura have their own fire departments and operate six fire stations each (Rodriguez 1997; Lavery 1997).

3.9.2 NAS Lemoore Alternative

Region of Influence

The ROI for the NAS Lemoore Alternative is the entire base and the surrounding local service areas that would provide off-site utilities and public services, such as wastewater treatment and landfill disposal, and supplementary services, such as health care, fire protection, and police.

Water Supply Systems

NAS Lemoore purchases water from Westlands Water District (Westlands), which in turn receives water from the US Bureau of Reclamation's Central Valley Project (CVP). All water at NAS Lemoore is treated on base before use. Water is piped from the San Luis Canal to the station treatment plant, which can treat 7.5 mgd (28.4 mLd). Storage facilities consist of six 600,000-gallon (2,271,000-liter) tanks. NAS Lemoore also has six wells that were the station's source of water before it was connected to the San Luis Canal in 1974. Although water from these wells is

generally of poor quality because of high chemical content, one well is used to irrigate windbreak trees in a remote area (US Navy 1994d). The water supply system at the base is in good condition and does not need any major repairs or upgrades at this time (Stewart 1997). NAS Lemoore's current annual contract with Westlands guarantees 977 million gallons per year (mgy) (3,698 million liters per year [mLy]). The average consumption by the base over the last seven years has been 945 mgy (3,577 mLy) (O'Donnell 1997).

The cities of Lemoore and Hanford are served by their own water departments and are operating below their capacities (Pereira 1997; Haley 1997). The City of Lemoore Public Works Department water system consists of five production wells, two stand-by wells, and two one-million-gallon (3.8 million-liter) storage tanks. The City of Hanford Public Works Department water systems consists of 18 wells and 4 975,000-gallon (3.7 million-liter) storage tanks.

Wastewater Treatment and Disposal

NAS Lemoore treats a combination of sanitary wastewater, industrial wastewater, and storm water at an on-base sewage pump station. The pump station has an average flow capacity of 2 mgd (8 mLd) but can accommodate a peak flow of 4 mgd (15 mLd). The average flow to the pump station is 1.7 mgd (6.4 mLd), and peak flows are 2.8 mgd (10.6 mLd) (O'Donnell 1997). A network of facultative, waste stabilization, and evaporation ponds connected by force mains on approximately 340 acres (138 hectares) provides physical screening and shredding, primary treatment via biological processes, and final processing. The wastewater treatment system at the base is in good condition and does not need any major repairs or upgrades (Stewart 1997). Effluent is monitored daily for volume and quality in compliance with RWQCB requirements (US Navy 1994d).

The cities of Lemoore and Hanford have their own wastewater treatment facilities. All of these facilities are currently operating well below their capacities (Pereira 1997; Sisneroz 1997).

Storm Water Collection

The storm water collection system at NAS Lemoore consists of a network of underground drains in the operations and administration areas and a series of ditches in the undeveloped areas. These drains and ditches transport storm water runoff to a wet well and storm water pumping station, where it is mixed with wastewater when the discharge rate of the wastewater system is low. Wet weather runoff is discharged into the Kings River from an open channel if the flow cannot be accommodated by the pump station. In the undeveloped areas, storm water normally dissipates by evaporation and percolation. The storm water collection system at the base is in good condition and does not need any major repairs or upgrades (Stewart 1997). NAS Lemoore maintains an NPDES permit regulating its storm water discharges from industrial activities.

Solid Waste Collection and Disposal

Approximately 4,500 tons (4,050 tonnes) of solid waste were generated at NAS Lemoore in 1993 (US Navy 1994d). Solid waste produced by the base and in local areas is removed weekly by a private contractor and is delivered to different locations, depending on the waste type. Most solid waste is transported to the Kings County Waste Management Authority (KCWMA) Landfill in Hanford. This landfill is projected to close in mid-1997 due to limited capacity; however, KCWMA will be opening a new 300-ton per day (272-tonnes per day) facility in Kettleman Hills. The new landfill is scheduled to open by late 1997 and has a projected lifetime of at least 40 years.

Solid waste from industrial activities at NAS Lemoore is disposed of at the City of Avenal Landfill, which is 22 miles (35 kilometers) from NAS Lemoore. Avenal Landfill has a 50-ton per day (45-tonne per day) capacity and is projected to close in the year 2012 (US Navy 1994d).

Green waste from the base, such as grass clippings, is hauled by the waste contractor to the NAS Lemoore composting facility. The base also manages the Earth Care Recycling Center, which picks up curbside recyclables from the housing area once per week (US Navy 1994d).

Natural Gas and Electric Services

Natural gas is provided to NAS Lemoore and local residents by SCGC. The base also rents natural gas storage facilities from SCGC (US Navy 1994d). In 1996, NAS Lemoore consumed an average of approximately 730,000 cfd (20,400 cmd) of natural gas for cooking and heating in base facilities (Stewart 1997). The natural gas supply system at the base is in good condition and does not need any major repairs or upgrades (Stewart 1997).

The Western Area Power Administration (WAPA) and Pacific Gas and Electric (PG&E) furnish the base with electricity transmitted over PG&E power lines. WAPA allocates a maximum of 18 MW of power per month (Stewart 1997). PG&E provides electricity to the surrounding communities and supplements NAS Lemoore's power needs in the summer when air conditioner use is high. NAS Lemoore consumed approximately 79.8 million KWH of electricity in 1996 (Stewart 1997). The electrical system at the base is in good condition and does not need any major repairs or upgrades (Stewart 1997).

Schools

Kings County has 14 school districts, and Fresno County has 35 school districts (California County Offices of Education 1996a; 1996b). The six school districts near NAS Lemoore are: Lemoore Union School District, Lemoore Union Elementary School district, Hanford Joint Union High School District, Hanford Elementary School District, Central Union School District, and Island Union School District.

Lemoore Union High School District consists of Lemoore High School and Lemoore Continuation School. High school age children residing on the base are bused to Lemoore High School (SITES 1997b). The current enrollment is approximately 1,700 students, which is near capacity. There is a project planned to increase the district capacity, but currently there is no funding for the proposed project (Mayer 1997).

Lemoore Union Elementary School District has 2,815 students enrolled in classes. Several portable classrooms have been added to each school site. Students from on and off the base attend schools within the district (Richwine 1997).

Hanford Joint Union High School District consists of one school with two campuses within the City of Hanford. Currently, the enrollment is approximately 2,700 students, which is 200 students over the capacity of 2,500 students. No expansion plans are in process because a recent bond measure that would have provided the district with funds to increase the number of classrooms did not pass. However, the district is considering a bond issue to be placed before the public in March 1998, which would allow for campus expansion (Martinez 1997).

Hanford Elementary School District is made up of seven elementary schools (K-6) and two junior high schools (7-8) with 4,960 students enrolled in the 1996-1997 school year. The district is leasing an additional 18 portable classrooms for the 1997-1998 school year (Simas 1997).

Central Union School District consists of four elementary schools, including the two schools on the base, and two smaller schools in rural areas. Currently, the two on-base schools have 1,926 students, but they have had as many as 2,600 students. The maximum student population is estimated at approximately 3,000 students. There are no plans for expansion at this time. Occasionally, children who live off base may attend one of the on-base schools (Akers or Neutra Elementary Schools) via an interdistrict transfer. Elementary school children living off base, however, usually attend schools in the Lemoore Union Elementary School District (Boogard 1997).

Child Care Services

NAS Lemoore provides child care services for military families. The base provides child care services for approximately 300 children on a full-time and part-time care basis. The child development center is capable of handling up to 216 children on a full-time basis. Child care is also provided by Family Child Care, a program that certifies on-base residences to provide child care for up to six children each. Additionally, the base sponsors a School-age Care Program that currently serves 125 children on a part-time basis.

Health Services

The full-service hospital at NAS Lemoore provides services to all military families and their children, and also provides access to emergency care and after-hours services. Naval Hospital Lemoore provides primary care and physical exams for personnel, and specialty services such as laboratory, pharmacy, radiology, and audiology (Crosby 1997). Naval Hospital Lemoore staffs 15 primary care providers, 1 flight surgeon, 1 nurse practitioner, 2 physician's assistants, 1 IDC, and 4 specialty care providers (Ormsbee 1997). The hospital serves approximately 10,000 patients per month, of which about 6,500 are military family members (O'Donnell 1997). The complex will be expanded, with construction scheduled for completion by mid-1999 (Ormsbee 1997). The hospital also coordinates health services with local area hospitals off-base.

Off base, there are three hospitals within a 60-mile (97-kilometer) radius of the base. These include Central Valley General Hospital in Hanford, Hanford Community Medical Center in Hanford, and Kaweah Delta District Hospital in Visalia. All of these hospitals provide a full range of services, including emergency care.

Recreation and Community Facilities

NAS Lemoore's craft center provides recreation services for all personnel. The craft center has a discount ticket center for attractions in California and houses an outdoor adventure center where outdoor equipment can be rented and assistance in planning weekend trips to go skiing, white water rafting, and hiking is provided.

NAS Lemoore has a variety of recreation facilities available to the personnel. Outdoor facilities include a running track, football and baseball fields, tennis and basketball courts, a miniature golf course, and picnic areas. Indoor facilities include a gym, bowling alley, volleyball court, swimming pool, and weight room. There are various wildlife and recreation areas, including the federal and state parks in the Sierra Nevada mountains and the coastal open space parks along the nearby Pacific coast. All off-base opportunities are within a two-hour drive from the base (US Navy 1994d).

Religious services are provided by the NAS Lemoore Chaplain's Office. These include two Catholic Masses and one Protestant service each week. Many other denominations provide services in the surrounding communities, including a Jewish Temple in Visalia.

Police Services

Police services within the boundaries of the base are the responsibility of NAS Lemoore Security. Security for the site consists of drive-by patrols and responses to service calls. Two to four patrols are on duty at all times. The department is staffed by 88 military personnel and 12 civilian employees and maintains a 60-

member Auxiliary Security Force. Civilians arrested at NAS Lemoore are transferred to the Kings County jail (Billick 1997).

The NAS Lemoore Security Department maintains a memorandum of understanding (MOU) with the Kings County Sheriff's Department. Through the MOU, the Sheriff's Department, staffed by 73 sworn officers, supplies resources not available at NAS Lemoore, such as a special weapons and tactics (SWAT) team and mobile command center. Assistance also is provided in cases of natural disaster or any incident that exceeds NAS Lemoore's capabilities. The cities of Lemoore and Hanford also have their own police departments, staffed by 24 and 44 sworn officers, respectively (Billick 1997).

Fire Services

The NAS Lemoore Fire Department has a staffing level of 52 firefighters; with 22 firefighters on duty daily. The department maintains six fire engines—three for structural fires and three for crash-fire response at the airport. Two structural fire engines and two crash fire engines are on duty at all times. The department also maintains a single truck for fighting brushfires. (US Navy 1994d). The NAS Lemoore Fire Department has mutual aid agreements with the Kings County Fire Department in Hanford, the City of Lemoore Fire Department, and the City of Hanford Fire Department (US Navy 1994d).

The Kings County Fire Department operates 11 fire stations in the County, with the Lemoore and Island stations located closest to NAS Lemoore. The department has 42 firefighters, 22 structural-fire engines, 13 wildland squads, and 1 water truck. The City of Lemoore Fire Department has a volunteer fire fighting staff of 35 and maintains 6 fire engines, 1 rescue truck, and 1 medical truck. The City of Hanford Fire Department operates 2 stations, has 23 firefighters, and maintains 4 fire engines, 1 wildland squad, and 1 light-utility vehicle (US Navy 1994d).

3.9.3 NAF El Centro Alternative

Region of Influence

The ROI for the NAF El Centro Alternative is the entire base and the surrounding local service areas that would provide off-site utilities and public services, such as wastewater treatment and landfill disposal, and supplementary services, such as health care, fire protection, and police.

Water Supply Systems

NAF El Centro and local communities, including El Centro, Brawley, and Holtville, purchase water from IID. The base treats the water before distribution for domestic and aircraft-related uses. Agricultural fields are irrigated with raw water from supply canals. IID is the principal supplier of water to the Imperial Valley and distributes approximately 2.6 million acre-feet (0.3 hectare-meters) of Colorado River water to over 500,000 acres (202,350 hectares) of farmland and to nine incorporated communities (US Navy 1990a). NAF El Centro obtains

approximately 650,000 gallons per day (gpd) (250,000 liters per day [Lpd]) of raw water from IID's Elder Canal and transports it to the water treatment plant in the southwestern area of the base (Sewester 1997a). The treatment plant currently treats an average of approximately 440,000 gpd (1.66 mLd) and has a capacity of 2.5 mgd (9.5 mLd) (Sewester 1997a). The existing infrastructure is in good condition (Weller 1997).

Wastewater Treatment and Disposal

NAF El Centro operates its own wastewater treatment plant in the northwestern area of the base. A modified activated sludge system uses bacteria and natural processes to provide primary, secondary, and tertiary wastewater treatment. The treatment plant has a capacity of 300,000 gpd (1.14 mLd) of wastewater per day and presently treats approximately 130,000 gpd (490,000 Lpd) (Bay 1997a). The plant also has an 8-million-gallon (30-million-liter) storage pond that can store wastewater for up to 30 days in cases of emergency. Effluent generated by the treatment process is monitored by the RWQCB. Treated effluent from the plant is piped and released directly into the New River, which lies immediately northwest of the base. Discharge from the plant into the New River is quantified by a NPDES permit that allows a peak-week average flow of 200,000 gpd (760,000 Lpd) and the wastewater infrastructure is in good condition and does not require any major repairs (Bay 1997a).

The cities of El Centro, Brawley, and Holtville have their own wastewater treatment facilities; all of which are operating well below their capacities (Hines 1997; Smith 1997; Garcia 1997).

Storm Water Collection

On-base storm drains at NAF El Centro collect storm water into several drainage ditches that traverse the base and the surrounding agricultural land. The system eventually discharges into the Salton Sea from eight outfalls surrounding the base. The storm water system at the base is in good condition and does not require any major repairs or upgrades (Flowers 1997). Storm water quality is monitored by the base and conforms to the standards of its NPDES permit

Solid Waste Collection and Disposal

Solid waste collection and disposal at the base and for local communities is performed by a private contractor, Imperial County Sanitation (ICS). The waste is disposed of at a private landfill managed by ICS in Imperial, California. Approximately 1,090 tons (989 tonnes) of solid waste were generated at NAF El Centro in 1995, with average monthly waste generation amounting to 90 tons (82 tonnes). The expected closure date of the landfill is 2016 (Curiel 1997).

The Pollution Prevention and Management Program at NAF El Centro collects and sorts recyclable material from the solid waste stream. Materials gathered include metals, cardboard, glass, plastic, paper, and wood. The program at NAF

El Centro also coordinates the direct sales of these recycled items to local processing organizations (Curiel 1997).

Natural Gas and Electric Services

SCGC provides natural gas to NAF El Centro and Imperial County. Natural gas is piped through 8- and 10-inch- (20- and 25-centimeter) diameter gas lines that follow the San Diego and Arizona Eastern Railroads and the Evans Hewes Highway. Natural gas then enters the base through a 3-inch-(8-centimeter) diameter main (US Navy 1990a). NAF El Centro's gas distribution systems are in adequate condition, and recent usage averaged 5,034 cfd (468 cmd). The existing infrastructure is in good condition (Kear 1997).

Electrical power for NAF El Centro and local residents is provided by the IID, which produces 23 percent of its power by burning oil and natural gas and 20 percent by hydroelectric power. The remaining amount is purchased from Arizona Public Service and El Paso Electric (US Navy 1990a). Recent usage at the facility averaged 50,000 KWH per day, and the electrical system is in good condition (Kear 1997).

Schools

Imperial County is served by 16 school districts consisting of 9 K-8, 2 9-12, and 5 K-12 school districts (California County Offices of Education 1996b). The school districts serving NAF El Centro are Seeley Union School District, Central Union High School District, and El Centro School District.

Seeley Union School District is composed of one K-8 school, Seeley Elementary School. All children living on the base attend this school unless a request is made to move to another district. Current enrollment is 480 students, and the capacity is 620. Expansion plans for the district include portable classrooms, which are on order (Anderson 1997).

Central Union High School District is made up of two comprehensive high schools and one alternative high school. Current enrollment is 3,411 students, which is below capacity. The district recently opened the second high school in February 1996, and there are no plans to expand (Preciado 1997).

El Centro School District is composed of 10 schools providing K-8 education. At present, there are 6,469 students enrolled in the district, which could accommodate up to 6,600 students. A new school was completed in August 1996, and one school will be expanded in the future. No students attending the El Centro School District reside at NAF El Centro (Taylor 1997).

Child Care Services

NAF El Centro provides child care services for military personnel. The base presently provides child care services for 57 children. The child development center is operating above its maximum capacity of 40 children. Additionally, child

care is provided by family home care, a program that certifies on-base residences to provide child care for up to six children each. Family home care at NAF El Centro provides an additional 17 children with child care services. NAF El Centro is planning to convert a former furniture store and barber shop into classrooms for children, which will provide child care services for an additional 20 children in 1999 (Sewester 1997a).

Health Services

NAF El Centro has a combined medical and dental clinic on base. This clinic provides only primary care services to active duty base personnel and their family members, and to retired military personnel in the community. The clinic does not provide hospitalization services. Approximately 85 active duty personnel are served per month. Two physicians, and one physician's assistant are assigned to the clinic, and two personnel provide administrative support (Rodriguez 1997). Patients requiring medical services beyond what the on-site clinic can provide are referred to civilian medical doctors or to local hospitals. For emergency room or hospitalization during business hours, the clinic transports patients to the Balboa Naval Hospital in San Diego. For after-hours medical care, patients use the two major hospitals in Imperial County—El Centro Regional Medical Center in El Centro or Pioneers Memorial Hospital in Brawley (US Navy 1990a). All hospitals in Imperial County provide 24-hour emergency service.

Recreation and Community Facilities

Outdoor recreation areas at NAF El Centro include two tennis courts, two pools, a baseball diamond, a softball field, a football field, shuffleboard courts, handball/racquetball courts, a picnic area, and some grassy play areas near the baseball field. Indoor recreation areas include a bowling alley, hobby/arts and crafts shop, auto hobby shop, youth center, theater, enlisted club, officers club, racquetball court, weight room, and aerobics facility. An aerobics area and indoor basketball court were recently expanded and modernized (Sewester 1997a).

Recreation areas surrounding NAF El Centro include mountains and desert parks in San Diego County, sand dunes to the north and east; the Colorado River in Yuma, Arizona, and Mexico to the south. All areas are easily accessible, and transportation can be provided by the base (Sewester1997). NAF El Centro also has a full-time chaplain on base.

Police Services

Police services at NAF El Centro are provided by approximately 24 military personnel and are coordinated through an on-base police station (Stammreich 1997). The department will be supplemented by additional personnel to monitor the base entrance gate later this year, and by four additional personnel in September of 1998 (Stammreich 1997). Military security patrols the base 24 hours a day and the surrounding desert in the evening. NAF El Centro is presently negotiating a memorandum of understanding with the City of El Centro (US Navy 1990a).

Police services for El Centro are provided by the City of El Centro Police Department. The department operates 1 police station and employs 44 sworn officers and 22 non-sworn personnel (US Navy 1990a). Additionally, the cities of Holtville and Brawley maintain their own police departments and the remainder of Imperial County is served by the South Coast Operations Division of the Imperial County Sheriff's Department (Jordan 1997; Graham 1997; Hackett 1997). The Sheriff's department operates 4 stations and employs 191 personnel, 113 of which are police officers (US Navy 1990a).

Fire Services

NAF El Centro maintains a fire and rescue station in an aircraft hangar on base. The station has a total staffing level of 37 civilian firefighters, with a minimum of 34 firefighters on duty daily (Zurn 1997). Additionally, the department has five administrative personnel and is equipped with two structural-fire engines, one crash-fire engine, and three fire engines in reserve. The department is not a first respondent for medical emergencies but eight of its firefighters are trained EMTs. The base maintains mutual aid agreements with the City of El Centro Fire Department and the City and County of Imperial Fire Department for additional fire protection services (Zurn 1997).

The City of El Centro Fire Department operates 2 stations and employs 37 firefighters. The department maintains three fire engines for active service and two other fire engines as reserves. The Imperial City and County Fire Department provides secondary fire response to the City of El Centro. This department is staffed by 24 volunteer firefighters, operates 2 stations, and maintains fire engines at 14 fire stations throughout the county (US Navy 1990a). The cities of Brawley and Holtville also have their own respective fire departments (Zendejas 1997; Gronstedt 1997).

3.10 CULTURAL RESOURCES

This section describes existing cultural resources at each of the alternative bases. The discussion for each alternative addresses cultural resources studies and known resources. The setting discussions, including prehistoric, ethnohistoric, and historic background, for all three bases are presented in Appendix F.

Definition of Resource

Cultural resources include prehistoric resources, traditional cultural properties, and historic resources. Prehistoric resources are physical properties resulting from human activities that predate written records and are generally identified as archaeological sites. Prehistoric resources can include village sites, temporary camps, lithic scatters, roasting pits/hearths, milling features, petroglyphs, rock features, and burials.

Traditional cultural properties are sites, locations, or features that are eligible for inclusion in the National Register of Historic Places (NRHP) because of their association with cultural practices or beliefs of a living community that (a) are rooted in that community's history, and (b) are important in maintaining the continuing cultural identity of the community. Examples include:

- A location associated with the traditional beliefs of a Native American group about its origins, its cultural history, or the nature of the world;
- A neighborhood that is the traditional home of a particular cultural group, and that reflects its beliefs and practices;
- A location where Native American religious practitioners have historically gone, and are known to go today, to perform ceremonial activities in accordance with traditional cultural rules of practice; and
- A location where a community has traditionally carried out economic, artistic, or other cultural practices important in maintaining its historical identity (Parker and King 1992).

Historic resources consist of physical properties, structures, or built items resulting from human activities that post-date written records and are at least 50 years old. Historic resources can include archaeological remains and architectural structures. Historic archaeological site types include townsites, homesteads, agricultural or ranching features, mining-related features, refuse concentrations, and features or artifacts associated with early military use of the land. Historic architectural resources can include houses; cabins; barns; lighthouses; local structures, such as churches, post offices, and meeting halls; and early military structures such as hangars, administration buildings, barracks, officers' quarters, warehouses, and guardhouses.

Additional cultural resources may include some properties that are less than 50 years old that may be listed on the NRHP if they are of exceptional importance in our nation's history, or if they are integral parts of districts that are eligible for the NRHP. On Department of Defense (DOD) facilities, these resources typically include properties associated with World War II or the Cold War.

Regulations

Cultural resources are protected primarily through the National Historic Preservation Act (NHPA) of 1966, the Archaeological and Historic Preservation Act of 1974, the Archaeological Resources Protection Act (ARPA) of 1979, and implementing regulations, Protection of Historic Properties (36 CFR 800). Section 106 of the NHPA (16 USC 470), as amended (PL 89-515), and its implementing regulations (36 CFR Part 800), require federal agencies to consider the effects of their actions on properties listed, or eligible for listing, in the NRHP. Criteria for inclusion in the NRHP (36 CFR 60.4) are as follows:

a) Association with events that have made a significant contribution to the broad patterns of our history;

b) Association with the lives of persons significant to our past;

c) Resources that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

d) Resources that have yielded or may be likely to yield information important in prehistory or history.

In addition to historic significance, a property must have integrity to be eligible to the NRHP. Integrity is the property's ability to convey its demonstrated historical significance. Seven individual elements comprise integrity: location, design, setting, materials, workmanship, feeling, and association.

To assess the effects of an undertaking on cultural resources, the area of potential effects (APE) must be defined. The regulations define APE as the geographic area within which the undertaking may cause changes in the character or use of historic properties, if any such properties exist (36 CFR 800.2 [c]). It is important that the APE include the full range of possible impacts, both those that will be direct results of the project and those that could be indirect consequences.

3.10.1 Preferred Alternative: NAWS Point Mugu

Region of Influence

The ROI for cultural resources includes the entire NAWS Point Mugu facility. The APE; however, is limited to those areas where construction and building modification would occur as a result of the E-2 Realignment at NAWS Point Mugu.

Cultural Resources Studies

Literature review. Extensive archival research of the history of NAWS Point Mugu and the historical resources located on the station was conducted in 1994 in support of a historical overview of the station (Swanson 1994). An additional records search was conducted in 1997 with the South Central Information Center in support of a cultural resources inventory of 10 acres (four hectares) at NAWS Point Mugu. Resources examined consisted of archaeological site records, inventory and excavation reports, properties listed on the NRHP, California Historical Landmarks, California Inventory of Historic Resources, and California Points of Historical Interest (Gallegos and Associates 1997a).

Previous studies. Seventeen cultural resource surveys and/or excavations have been conducted within a one-mile-radius (1.6-kilometer-radius) of the APE; however, only four of these were located within or adjacent to the APE (Peak and Neuenschwander 1989; Bissell 1991; Schwartz 1991; Gallegos and Associates 1997a). The most recent inventory intensively surveyed the entire APE, totaling 10 acres (four hectares) in nine survey areas, using pedestrian survey intervals of five meters or less (Gallegos and Associates 1997a). An inventory and evaluation of National Register Eligibility under the Cold War Theme for eight buildings at NAWS Point Mugu was conducted in 1997.

Known Resources

Prehistoric sites. Four prehistoric resources have been recorded within a one-mile (1.6-kilometer) radius of the project area. Three of these sites are Chumash cemeteries with habitation areas/shell middens. However, none of these three sites are located within the APE. The fourth site is an unverified and undocumented prehistoric resource reported to be within the northwestern section of the APE (Gallegos and Associates 1997a).

Traditional cultural properties. Consultation with local Chumash groups is routinely conducted by NAWS Point Mugu as needed. An ethnohistoric study is currently in preparation; several descendants of the Chumash village, Mugu, have been identified (Schwartz 1997). No traditional cultural properties have been identified within NAWS Point Mugu (Schwartz 1997).

Historic archaeological sites. Historic archaeological sites in the vicinity of NAWS Point Mugu include homesites, shipwreck debris, pier remains and pilings, historic refuse concentrations, remains of hunting club buildings, a World War II military

camp, the location of a 1938 movie set, and the Mugu Fish Camp (Swanson 1994). However, no historic archaeological sites have been identified within the APE.

Historic architectural resources. A historic context for evaluating the significance of Cold War-era buildings and structures at NAWS Point Mugu has been prepared. This document includes information on the year of construction, architect, builder, and historic and current functions for all Cold War-era structures on the facility (Wee and Byrd 1997). The main launch pad (Building 55) is considered eligible for the NRHP as an example of a launching facility and blockhouse complex (Mikesell 1996). The Navy has agreed with this finding; however, the results of the evaluation have not yet been forwarded to the California SHPO for concurrence.

Buildings and structures to be used or modified for the E-2 realignment include a hangar (Building 553), the engine maintenance shop (Building 311), ground support storage (Building 311), ground support maintenance shop (Building 311), the avionics shop (Building 385), the dental clinic (Building 5), the aviation supply warehouse (Building 65), Building 50, and a concrete pad between Buildings 758 and 759 for the engine test cell. These facilities are associated with the Cold War (Wee and Byrd 1997). Formal evaluation of these structures has determined that none of them are eligible for the NRHP under the Cold War theme.

Subsurface deposits. There is a potential for buried prehistoric deposits to exist at NAWS Point Mugu. Mugu Lagoon was heavily occupied in prehistoric times. The lagoon was dredged in the early 1950s and dredged soils were used as fill for approximately 1,000 acres in the central portion of the base during construction of the runways and industrial complex. Fill material varies in depth from 1 meter (3 feet) to over 4 meters (12 feet), depending on the original topography of the area. The fill material is likely to have buried some archaeological sites. At least one prehistoric archaeological site (CA-VEN-187/256) was found on base under 0.6 meter (two feet) of deposited fill material (Schwartz 1992). Additional buried prehistoric deposits may exist on NAWS Point Mugu.

Due to the relative lack of historic archaeological sites on NAWS Point Mugu and the limited use of the Mugu Lagoon area in historic times, the potential for subsurface historic deposits to exist is considered low.

3.10.2 NAS Lemoore Alternative

Region of Influence

The ROI for cultural resources includes the entire NAS Lemoore facility. The APE; however, is limited to those areas where construction and building modifications would occur as a result of the E-2 Realignment at NAS Lemoore.

Cultural Resources Studies

Literature review. Two records searches have recently been conducted at the Southern San Joaquin Valley Information Center. The first was conducted in 1993 in support of the EIS for the base realignment of NAS Lemoore. The second was conducted in 1997 as part of the cultural resource inventory for the E-2 realignment. Resources examined consisted of archaeological site records, inventory and excavation reports, properties listed on NRHP, California Historical Landmarks, California Inventory of Historic Resources, and California Points of Historical Interest (Gallegos and Associates 1997b; US Navy 1994d).

Previous studies. Five archaeological surveys, comprising 430 acres, have been conducted on NAS Lemoore (Office of Environmental Quality 1983; Sutton 1989; Yohe 1991; Woodward-Clyde 1993; Gallegos and Associates 1997b). In addition, a Historic and Archeological Resources Protection Plan has been prepared for NAS Lemoore (Milliken and Mikesell 1997). This document describes high sensitivity and low sensitivity zones on NAS Lemoore for cultural resources. The station has four high sensitivity zones, totaling 760 acres, for surface archaeological sites. The remaining 17,611 acres of the installation are considered a low sensitivity zone for surface sites (Milliken and Mikesell 1997). This document is currently under review by the California Office of Historic Preservation. Seven proposed project areas, totaling 88 acres (36 hectares), associated with the E-2 realignment were surveyed in 1997 (Gallegos and Associates 1997b).

Known Resources

Prehistoric sites. Sixteen prehistoric sites have been recorded within a five-mile (eight-kilometers) radius of the APE that include lithic concentrations, habitation/occupation sites, and human burials. However, no prehistoric sites have been recorded within NAS Lemoore (US Navy 1994d). The majority of NAS Lemoore, 17,611 acres of the total 18,371-acre installation, has been identified as a low sensitivity zone for surface prehistoric archeological sites.

Traditional cultural properties. In 1994, in an attempt to identify Native American traditional cultural properties on NAS Lemoore, the Navy contacted all Native American groups with historical ties to the San Joaquin Valley, as identified by the California Native American Heritage Commission. The contacted groups included the Tule River Indian Tribe, Santa Rosa Indian Community, Central Valley and Mountain Reinternment Association, Big Sandy Rancheria of Mono Indians, Cold Springs Rancheria of Mono Indians, and the Table Mountain Rancheria. These groups were provided an opportunity to comment on noise levels associated with NAS Lemoore and the much larger Lemoore Military Flight Operating Area (Wall 1994a). None of the contacted groups raised any concerns regarding properties of traditional religious or cultural importance on NAS Lemoore (Milliken and Mikesell 1997).

No traditional cultural properties or other Native American resources have been identified within NAS Lemoore. No concerns have been raised by Native

American groups or representatives concerning flight and other mission operations at NAS Lemoore.

Historic archaeological sites. Historic archaeological sites in the vicinity of NAS Lemoore include homesites/farmstead locations, historic refuse concentrations, and granite quarries and associated construction refuse from quarrying activities (US Navy 1994d). However, no historic archaeological sites have been identified within the APE.

Historic architectural resources. No historic structures have been identified on NAS Lemoore. The installation was constructed between 1957 and 1961; therefore, there are no standing structures on NAS Lemoore that are 50 years old or older that qualify as historic structures. However, the Neutra Elementary School in the Family Housing Area has the potential for inclusion in the NRHP. Although the school was built in the late 1950s, the plans were drafted in the 1920s by well-known Los Angeles architect, Richard Neutra. The potential for the school's NRHP-eligibility has been established through Thomas Hines, the principal biographer of Neutra who believes that the school "will qualify for inclusion in the National Register, if not today, when it reaches 50 years of age" (Wall 1994b). The Historic and Archeological Resources Protection Plan for the years 1997 to 2002 for NAS Lemoore recommends that Neutra Elementary School should be managed as though it were eligible for the NRHP until a formal determination is made (Milliken and Mikesell 1997).

NAS Lemoore was established during the Cold War era (from 1946 to 1989); however, the facilities and structures do not qualify for inclusion in the NRHP under a Cold War context because they do not meet the "exceptionally significant" criterion for properties that are less than 50 years old. NAS Lemoore does not appear to have made an exceptional contribution to the national Cold War program, but rather functioned as part of the vast support complex. The mission and accomplishments at NAS Lemoore during the Cold War era were routine, rather than exceptional; therefore, the structures and facilities on the installation are unlikely to be eligible for the NRHP as Cold War properties (Milliken and Mikesell 1997).

Buildings and structures to be used or modified for this E-2 Realignment include the aviation supply warehouse (Building 140), the engine maintenance shop (Building 170), ground support maintenance shop (Building 179), fitness center (Building 941), and the avionics shop (Building 160). These facilities do not qualify for inclusion in the NRHP as Cold War properties.

Subsurface deposits. Prehistoric archeological sites from early chronological periods may be buried anywhere on the Los Gatos alluvial fan upon which NAS Lemoore sits. Components of site CA-KER-116, located outside NAS Lemoore on the shore of Buenavista Lake, have been discovered at depths up to four meters (12 feet) below the ground surface. Similar buried sites might exist anywhere at NAS

Lemoore (Milliken and Mikesell 1997); however, over the last 100 years, NAS Lemoore has routinely been raked and tilled (2 to 3 times per year) to depths up to 2 meters (6 feet) below the ground surface. Therefore, intact deposits are unlikely to exist to these depths. Subsurface archeological deposits are only likely to exist at depths between 2 meters (6 feet) and 4 meters (12 feet) below the ground surface at NAS Lemoore (Wall 1997).

Due to the relative lack of historic archaeological sites on NAS Lemoore and the extent of raking and tilling of the land in the last 100 years, the potential for intact subsurface historic deposits to exist is considered low.

3.10.3 NAF El Centro Alternative

Region of Influence

The ROI for cultural resources includes the entire NAF El Centro facility. The APE; however, is limited to those areas where construction and building modifications would occur as a result of the E-2 realignment at NAF El Centro.

Cultural Resources Studies

Literature review. Archival research, including a review of the Navy Plan Files was completed as part of a cultural resources survey of NAF El Centro (Apple *et al.* 1994). A records and literature search was also conducted with the Southeast Information Center in support of the EIS for the proposed closure of NAF El Centro (US Navy 1990a).

Previous studies. An intensive pedestrian survey of the main NAF El Centro installation and an architectural survey of all existing pre-1946 structures within the main NAF El Centro installation was conducted in 1994 (Apple *et al.* 1994).

Known Resources

Prehistoric sites. One prehistoric site, a lithic scatter, has been identified on NAF El Centro. This site is not considered eligible to the NRHP (Apple *et al.* 1994).

Traditional Cultural Properties. Procedures for Native American consultation have been specified for the discovery of Native American burial remains or items of cultural patrimony, and several Native American groups have been identified with cultural affiliations to NAF El Centro (Apple *et al.* 1994).

No traditional cultural properties or other Native American resources have been identified within NAF El Centro. No concerns have been raised by Native American groups or representatives concerning flight and other mission operations at NAF El Centro.

Historic archaeological sites. Seven historic archaeological sites have been recorded on NAF El Centro; they consist of a foundation and associated debris (4-IMP-6451H), an early to mid-1900s trash dump with 1940s military debris (4-IMP-

6989H), and five scatters of historic domestic debris dating from the 1920s to the 1940s (Apple *et al.* 1994). The potential for subsurface deposits on two historic sites (4-IMP-6451H and 4-IMP-6989H) was good, and these sites were considered potentially eligible for the NRHP. The remaining five refuse scatters are considered not likely to be eligible for the NRHP (Apple *et al.* 1994).

Sites 4-IMP-6451H and 4-IMP-6989H were evaluated for eligibility to the NRHP in 1996 (Dolan and Allen 1996). Both sites were highly disturbed and lacked physical integrity. These two sites did not contain sufficient archaeological information to satisfy any of the four NRHP criteria and were recommended not eligible for the NRHP (Dolan and Allen 1996).

Historic architectural resources. An architectural inventory of NAF El Centro resulted in the identification of 113 historic buildings and structures on the installation. All of these were constructed between 1942 and 1945 during World War II.

None of these 113 structures at NAF El Centro were recommended as eligible for the NRHP because they lack integrity, architectural or engineering distinction, or association with important persons or events. Structural alterations, destruction of older buildings, and construction of new facilities at NAF EL Centro have compromised the integrity of the structures and the facility as a whole so that it no longer represents "the distinct characteristics of a type, period, or method of construction," and does not retain any sense of time and place reflective of its role during World War II. Although the base is currently strongly associated with the Navy's Blue Angels, this association is recent, beginning in 1967 (Apple *et al.* 1994).

Subsurface deposits. Subsurface deposits were considered likely for two historic sites on NAF El Centro; however, formal evaluation of these sites determined that they were not eligible for the NRHP (Dolan and Allen 1996). Subsurface prehistoric or historic deposits may exist on NAF El Centro; however, given the low frequency of archaeological sites in the general vicinity and the elevation of the base below the ancient shoreline of Lake Cahuilla, the potential for subsurface deposits is considered low (US Navy 1987a).

3.11 PUBLIC HEALTH AND SAFETY

This section describes the public health and safety of persons for each alternative base proposed for the realignment of the four E-2 squadrons and associated personnel. Hazards associated with airspace safety, accident potential zones, explosive safety quantity distance arcs, and electromagnetic radiation hazards are discussed.

Definition of Resource

Airspace Safety

Each base operates an airfield to fulfill its mission. Aircraft operations may be conducted within airspace above and surrounding the base or in special use airspace (i.e., restricted areas, MOAs, warning areas). Airspace operations and coordination with surrounding air facilities are conducted according to FAA and Navy regulations. Although alterations in aircraft activity at naval bases do not constitute an environmental impact, the results of aircraft operations and related facilities can have direct and indirect impacts on public health and safety.

Accident Potential Zones

The Navy established the AICUZ Program to effectively plan for land use compatibility in areas surrounding military air bases. The purpose of the AICUZ program is to designate appropriate land uses based on noise and safety concerns. Noise contours and accident potential zones are identified through the AICUZ, and suitable land uses are determined accordingly. Section 3.3, Land Use and Airspace, and Section 3.7, Noise, provide complete discussions of land use compatibility and noise concerns. An AICUZ program identifies APZs. Rather than addressing the probability of accidents occurring, an APZ defines the areas that most likely would be affected if an accident were to occur. Three types of APZs are identified: the Clear Zone, APZ I, and APZ II. The dimensions and applications of these zones have been described previously in Section 3.3, Land Use and Airspace.

Explosive Safety Quantity Distance Arcs

Operations at bases may require the storage and handling of ordnance. Explosive Safety Quantity Distance (ESQD) arcs are developed to protect humans from the possible sabotage or accidental detonation of explosives or ammunition. ESQD arcs surround each magazine and facility used for the storage or handling of ordnance, and the distance that the ESQD arc extends from the magazine or facility is dependent on the type and quantity of explosives authorized for storage or handling. ESQD arcs prohibit the placement of inhabited buildings within unsafe distances from ordnance storage facilities.

Electromagnetic Radiation

Radar and other high-energy electromagnetic emissions can constitute a hazard to personnel exposed to radiation above a maximum power density. These effects are managed under the regulations of the Navy Hazards of Electromagnetic Radiation

to Personnel (HERP) program. Ordnance and fuel are also susceptible to the hazards of electromagnetic radiation. These effects are managed under Navy regulations for Hazards of Electromagnetic Radiation to Ordnance (HERO) and Fuel (HERF). Arcs defining a safe distance for the storage of these substances in relation to communication and radar equipment have been established at each base, as necessary.

An electromagnetic radiation hazard occurs when civilian or military transmitting equipment generate an electromagnetic field sufficient to:

- Induce or couple currents or voltages with sufficient magnitudes to initiate electro-explosive devices in ordnance;
- Cause harmful/or injurious effects to humans or to wildlife; or
- Create sparks having sufficient magnitude to ignite flammable materials.

A minimum distance must be maintained between ordnance and communication equipment for the safety of all personnel. An ordnance item is defined as HERO-unsafe when its internal wiring is physically exposed; when tests are being conducted on the item that result in additional electrical connections; when electro-explosive devices with exposed wire leads are present, handled, or loaded; when the item is being assembled or disassembled; or when it is in a disassembled condition. A HERO-susceptible ordnance system is any tested ordnance system proven to contain electro-explosive devices that can be adversely affected by radio frequency energy so that the safety and/or reliability of the system is jeopardized when the system is employed.

HERP is defined in terms of power density or watts of power flowing through a given unit of area. For a HERP condition to exist, personnel would have to be within close proximity to an emitting antenna directing the power into a concentrated area. Therefore, HERP zones are not considered as construction exclusion zones for habitable facilities, but rather as zones where a heightened awareness of the potential hazard should exist. The distances for HERP zones are designated on a case-by-case basis during the initial siting process and involve the Frequency Management Division at each base, which provides guidance concerning hazards of electromagnetic radiation to personnel. HERF zones are also handled on a case-by-case basis. No distance guidelines are defined for HERF arc zones.

3.11.1 Preferred Alternative: NAWS Point Mugu

Region of Influence

The region of influence for public health and safety includes airspace above and surrounding NAWS Point Mugu, special use airspace, and areas within the APZs, ESQD arcs, and electromagnetic radiation arcs.

Airspace Safety

NAWS Point Mugu maintains close coordination with Oxnard and Camarillo airports through a Letter of Agreement, which establishes procedures to prevent conflict in airspace traffic. NAWS Point Mugu has designated overhead entry patterns to separate slower civilian arrival traffic from the military high-speed carrier aircraft that must descend in elevation to enter the NAWS Point Mugu landing pattern. Oxnard Airport is located 7 miles (11 kilometers) to the northwest and Camarillo Airport, utilized solely by propeller type aircraft, is located 6 miles (10 kilometers) to the north of NAWS Point Mugu. In addition, several low-altitude airways traverse the overall area. Communications between aircraft on the ground and NAWS Point Mugu Approach Control is provided by two VHF transmitters/receivers located on La Jolla Peak (elevation 1,567 feet [474 meters]) east of Point Mugu. Camarillo Airport is a full instrument-approved facility for both departures and arrivals, and is likely to expand operations throughout the rest of the century (US Navy 1992b).

Numerous standard operating procedures have been established in the interest of airspace near NAWS Point Mugu. A few of these include altitude separation in heavily used areas along the coast, IFR departure procedures, separation of control zones, and very strict flight patterns (US Navy 1992b).

VFR air traffic along the coastline is heavy but does not usually present any problems to NAWS Point Mugu because of altitude separation. IFR traffic on local airways and published preferred routes conflicts with arriving and departing NAWS Point Mugu terminal traffic and causes traffic separation problems that result in delayed climbs and descents until prescribed traffic separation occurs. These potential conflicts and other terminal problems, such as high terrain to the east, create a complex traffic system.

VFR operations at Oxnard, Camarillo, and NAWS Point Mugu airports operate independently of one another. Aircraft arriving and departing on Camarillo Airport's VFR traffic patterns conflict with IFR traffic at all three airports, particularly if the arriving or departing aircraft is a high-performance jet or turboprop that operates with extended patterns and requires a large turning radius. These conflicts have been widely publicized through user safety presentations and air traffic control safety bulletins.

Accident Potential Zones

The Clear Zone extends outward along the extended runway centerline for a distance of 3,000 feet (914 meters). The width of the Clear Zone at the end nearest the runway is 1,500 feet (457 meters); the width of the outer end is 2,284 feet (696 meters). The Clear Zone at NAWS Point Mugu is contained within the base boundaries, except for approximately 105 acres (43 hectares) of Ventura County Game Preserve (a private duck hunting club) duck ponds west of Runway 09/27 (US Navy 1992b). APZ I is 3,000 feet (914 meters) wide by 5,000 feet (1,524 meters) long. APZ II is 3,000 feet (914 meters) wide by 7,000 feet (2,134 meters)

long. At NAWS Point Mugu, APZs have been developed for all runways, except Runway 09. Runway 09 handles about 3 percent of all operations at Point Mugu, and the number of annual operations (less than 5,000) does not require an APZ. Figure 3-15 in Section 3.3, Land Use and Airspace identifies the APZs for the base airfield.

APZs have been developed for Runways 03, 21, and 27. Runway 27 supports two flight paths; therefore, the APZs have been modified to take this into account. APZs associated with Runway 21 include one APZ set for seven separate flight tracks straight under the approach to Runway 21 with a combined total of over 5,000 annual operations. There are also separate APZs for the flight patterns associated with "touch-and-go" exercises. Runway 03 has two sets of APZs. The first is the one associated with the "touch-and-go" exercises similar to those described for Runway 21. The second APZ is located straight under the approach to Runway 03 and is the result of three separate flight tracks combined to total over 5,000 annual operations (US Navy 1992b).

At NAWS Point Mugu, APZ I and II zones extend beyond the station boundaries to the northeast, east, west, and southwest. These areas are associated with the arrival flight tracks for Runways 21 and 27, and with the departure flight track for Runway 27. Although this departure track does not average more than 5,000 operations per year, analysis of aircraft accidents indicates that this is an area of significant accident potential (US Navy 1986a).

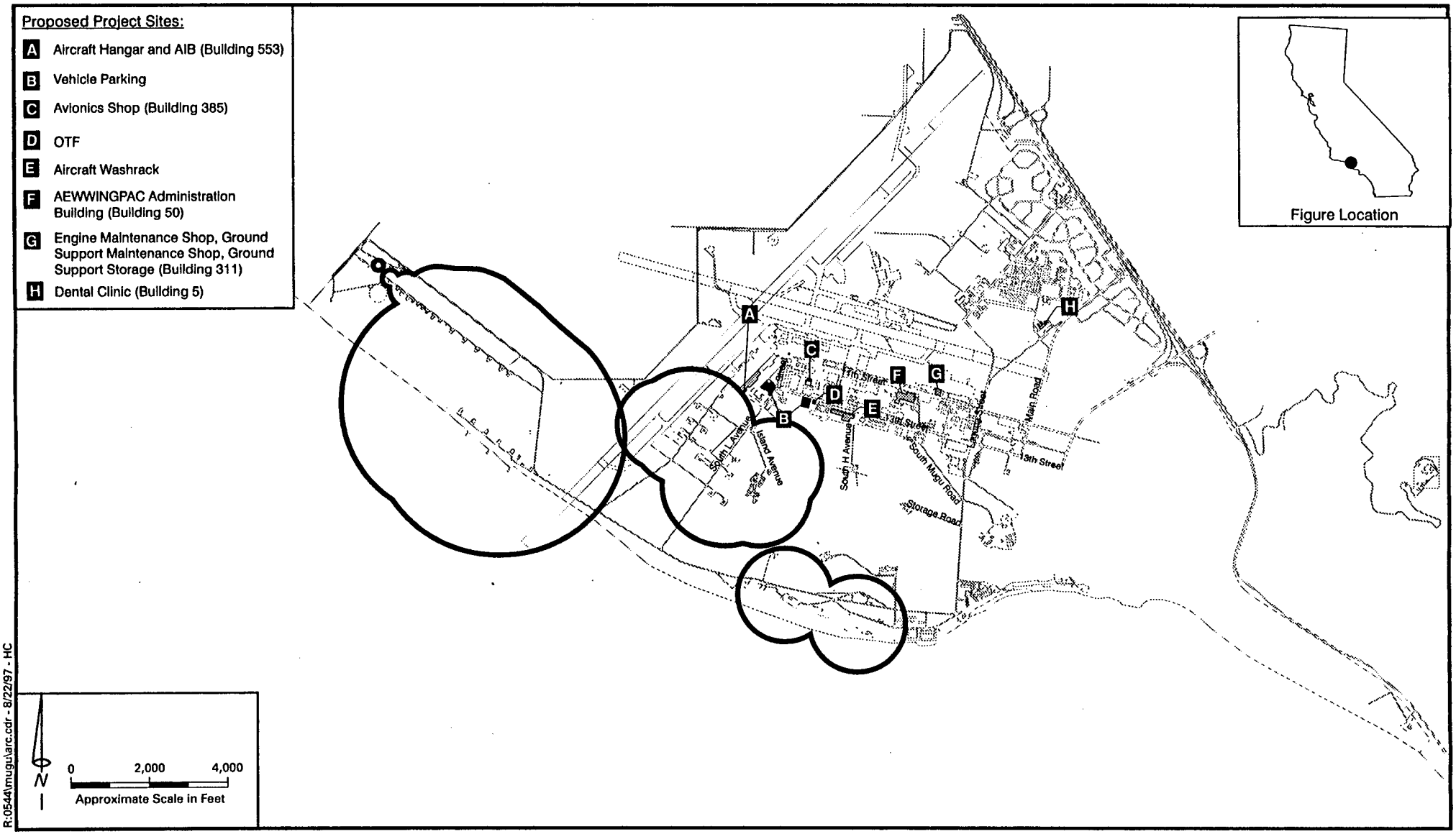
Explosive Safety Quantity Distance Arcs

At NAWS Point Mugu, the ordnance storage magazines, located in the western panhandle of the base, warrant ESQD arcs. These ESQD arcs include the missile and ordnance assembly facilities along South M Avenue and east of South L Avenue, and areas by the airfield arm/de-arm pads near Building 56, by the Ejection Launcher Test Stand (Building 707), and by the Jet Assisted Take-off (JATO) Test Pit (Building 722) (US Navy 1986a). Figure 3-34 shows the ESQD arcs located on base. None of the proposed project sites are located within an ESQD arc.

Electromagnetic Radiation

The NAWS Point Mugu Master Plan states that there are hundreds of sources of electromagnetic radiation on base (US Navy 1986a). The Master Plan indicates the location and limits of the areas of the base, which are subject to HERP and HERO constraints. HERF constraints were considered to be negligible and were not identified in the Master Plan.

The Master Plan identified several hundred radio frequency emitters that exceed HERP limits from less than one foot to hundreds of feet. In every case, there are no areas in which personnel are exposed to hazardous conditions caused by radio frequency as long as personnel stay clear of restricted areas (US Navy 1986a).



None of the proposed project sites would be located within an ESQD arc.

LEGEND:

- ESQD Arc
- Construction/Expansion
- Renovation

NAWS Point Mugu ESQD Arcs

E-2 Aircraft Squadrons Realignment EIS
NAWS Point Mugu, California

Source: US Navy 1986a.

Figure 3-34

R:\0544\mugu\arc.cdr - 8/22/97 - HC

The Master Plan also depicts the location and extent of the HERO arcs created by various emitting sources found on base. The existing HERO arcs encompass all of the proposed project sites, with the exception of the dental clinic (Figure 3-35).

3.11.2 NAS Lemoore Alternative

Region of Influence

The region of influence for public health and safety includes airspace above and surrounding NAS Lemoore, special use airspace, and areas within the APZs, ESQD arcs, and electromagnetic radiation arcs.

Airspace Safety

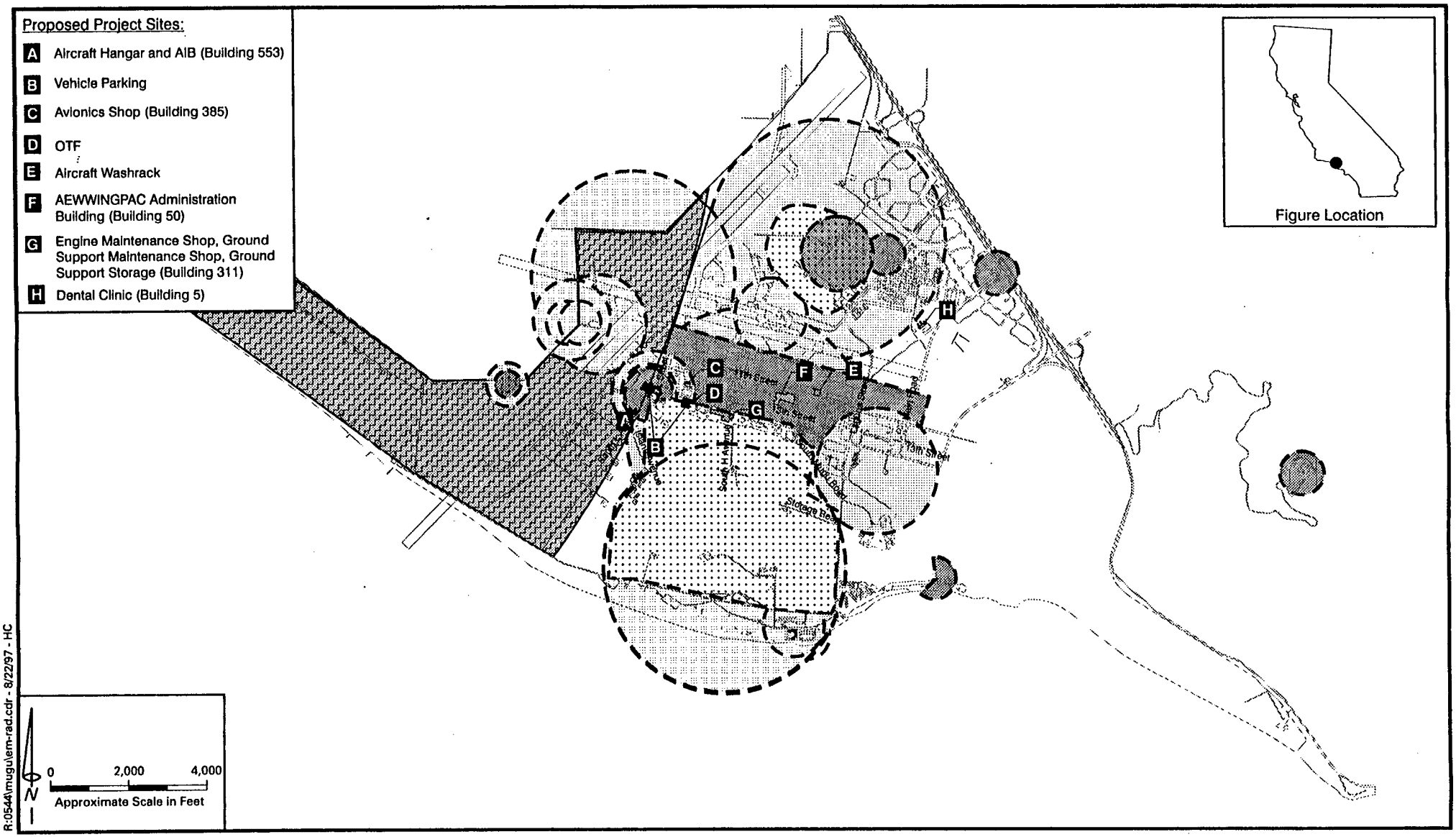
The region or airspace surrounding NAS Lemoore supports high-altitude regional commercial carriers, low-altitude local commercial carriers, small private jets, crop dusters, and military jet fighter aircraft. The main air corridor, west of NAS Lemoore, carries commercial and military aircraft in a northwest-southwest direction along the western edge of the San Joaquin Valley (US Navy 1993b). Commercial air carrier flight corridors traverse the Central Valley at 27,000 feet (8,230 meters) above MSL. These flight corridors connect northern and southern California (between Los Angeles, Sacramento, and Fresno) and are some of the busiest in the country. The flight corridors are located approximately 20 miles (32 kilometers) on either side of the base.

Private and commercial air traffic is frequent in the region near NAS Lemoore. Commercial and private aircraft routinely descend through the NAS Lemoore terminal radar approach control air traffic facility to land at one of the several private or commercial airports. Neighboring radar air traffic control facilities include Bakersfield to the south, Visalia to the east and Fresno to the north. Twelve private airports and three commercial airports (Harris Ranch, Hanford Municipal, and Corcoran Farms) surround the NAS Lemoore airspace.

Low-altitude propeller aircraft such as crop dusters and light civilian aircraft generally use the private airports. Air traffic from these local private and commercial airports may receive air traffic control service from NAS Lemoore upon request.

Accident Potential Zones

At NAS Lemoore, most portions of the Clear Zone and APZs I and II fall within the boundaries of the base (Figure 3-20 in Section 3.3, Land Use and Airspace). There is one section of APZ II that extends beyond the northern and western boundary of the base, but there are no permanent structures located in this area. The area surrounding the base is agricultural land. All inhabitable Navy structures are located outside of the Clear Zone and APZ I and II (US Navy 1993b). None of the proposed project sites are located within the APZs.



With the exception of the dental clinic, all of the proposed project sites would be located within EMR arcs.

LEGEND:

- Potential Electromagnetic Sensitive Zone (HERP)
- Potential HERO Area
- Radio Frequency Field (EMI) (Conditional Constraint To Structures)
- Potential HERO For AN/FPS-16 Radars
- Construction/Expansion
- Renovation

NAWS Point Mugu EMR Arcs

E-2 Aircraft Squadrons Realignment EIS
NAWS Point Mugu, California

Source: US Navy 1986a.

Figure 3-35

ESQD Arcs

There are five ESQD arcs at NAS Lemoore. Figure 3-36 shows the ESQD arcs located on base. None of the proposed project sites are located within an ESQD arc.

Electromagnetic Radiation

The NAS Lemoore Master Plan has identified 12 HERO susceptible areas generated by on-base equipment (US Navy 1992c). No ordnance classified as HERO-unsafe is allowed within the specified distances. A transmitter in the air traffic control tower (Transmitter AN/URT 23) affects many facilities in the NAS Lemoore operations area (Figure 3-37). According to the Master Plan, an alternate site for this transmitter has been investigated, and in 1992 there were plans to relocate it (US Navy 1992c). The status of the relocation is unknown. None of the proposed project sites would be located within an EMR arc.

3.11.3 NAF El Centro Alternative

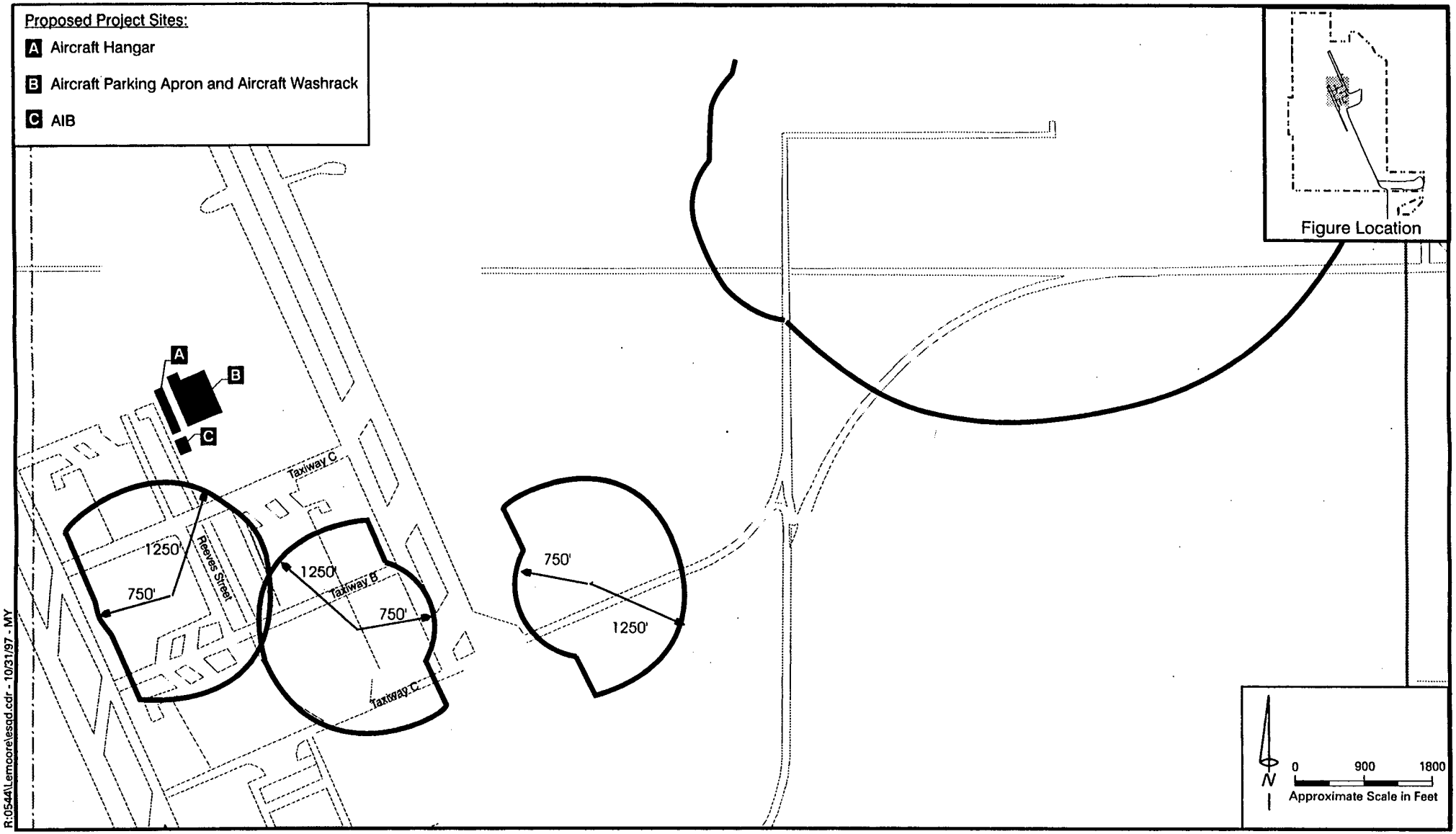
Region of Influence

The region of influence for public health and safety includes airspace above and surrounding NAF El Centro, special use airspace, and areas within the APZs, ESQD arcs, and electromagnetic radiation arcs.

Airspace Safety

The control zone for airspace granted by the FAA for NAF El Centro is combined with that of the Imperial County Airport. Airspace allocated to Imperial County Airport abuts NAF El Centro airspace to the east. Imperial County Airport handles limited commercial passenger service (to and from San Diego and Los Angeles), mail, light cargo, and general aviation aircraft. Tower coordination between the NAF El Centro airfield and Imperial County Airport permits operational flexibility without hazard at either airfield (US Navy 1988a). NAF El Centro aircraft typically operate at 2,500 feet (742 meters) above MSL, while the pattern altitude for Imperial County Airport is 1,500 feet (457 meters) above MSL.

The airspace controlled by NAF El Centro extends approximately 2.5 miles (4 kilometers) eastward before encountering Imperial County Airport airspace. This truncated airspace necessitates some additional procedures in support of aircraft operations. First, military aircraft approaching runway 26 from the north must hold to a 3,000-foot (914-meter) altitude over Imperial County Airport airspace, descending rapidly thereafter to 1,500 feet (457 meters) over NAF El Centro airspace. Second, the airspace boundary also prevents elongation of the downwind leg on Runway 08 patterns.



None of the proposed project sites would be located within an ESQD arc.

LEGEND:

ESQD Arcs

Construction/Expansion

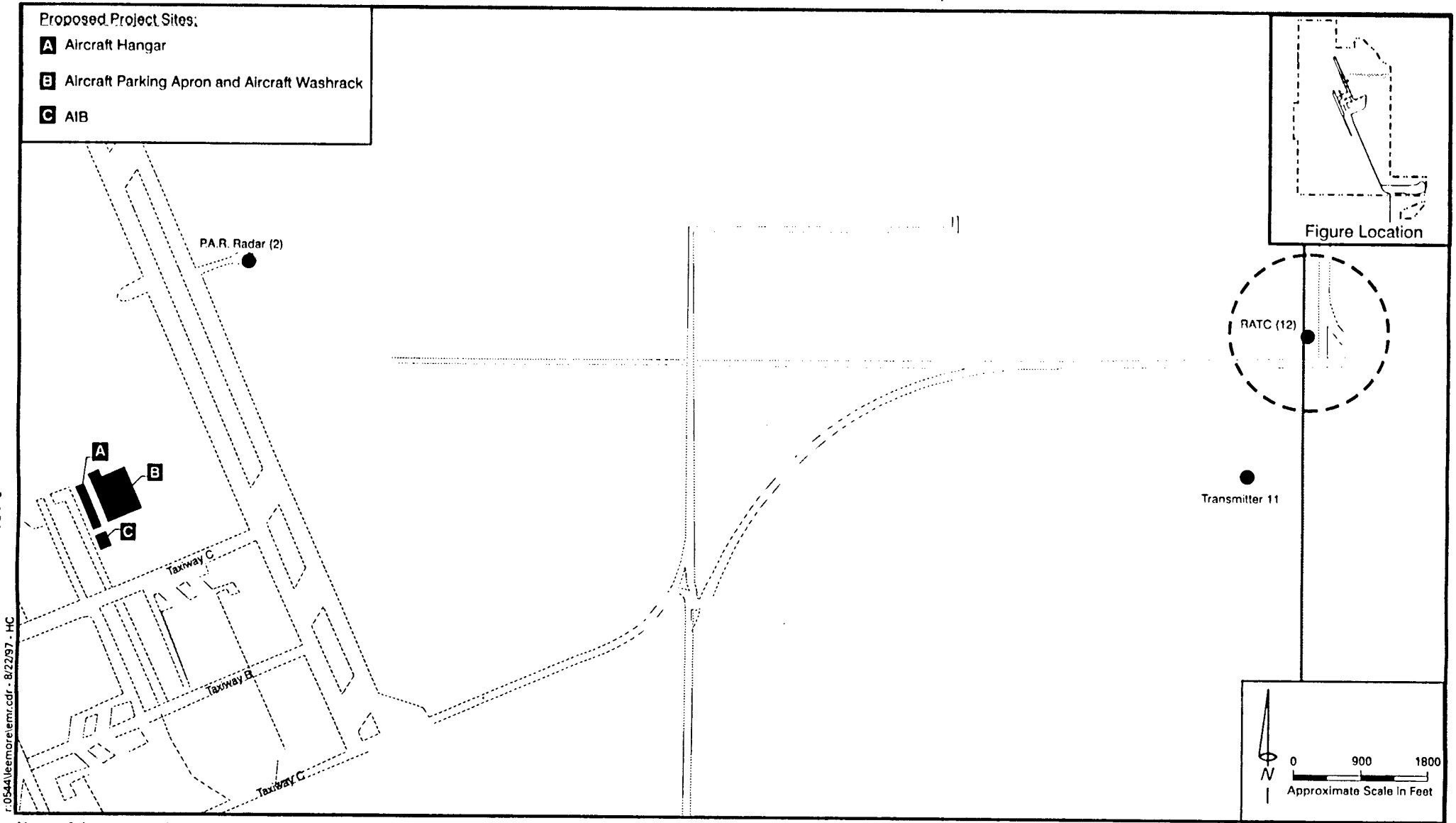
NAS Lemoore ESQD Arcs

E-2 Aircraft Squadrons Realignment EIS
NAS Lemoore, California

Source: US Navy 1992c.

Figure 3-36

R:\0544\Lemoore\esqd.cdr - 10/31/97 - MY



None of the proposed project sites would be located within an EMR arc.

LEGEND:

- Electromagnetic Radiation (EMR) Generator Site
- EMR Arcs
- Construction/Expansion

Source: US Navy 1992c.

NAS Lemoore EMR Arcs

E-2 Aircraft Squadrons Realignment EIS
NAS Lemoore, California

Figure 3-37

r:\0544\lemoore\emr.cdr - 8/22/97 - HC

Accident Potential Zones

The Clear Zones for NAF El Centro lie immediately beyond the end of each runway and outward along the extended runway centerline for a distance of 3,000 feet (914 meters). Clear Zones for NAF El Centro generally are located within the boundaries of the naval base except those for Runways 26 and 30, which extend nearly 3,000 feet (914 meters) beyond the eastern boundary of the base to lands currently devoted to agricultural uses with no habitable structures. The same condition exists to the west at the end of Runway 08, although much less land area is affected. This area also includes agricultural land with no habitable structures. Figure 3-25 in Section 3.3, Land Use and Airspace identifies the different zones on the base.

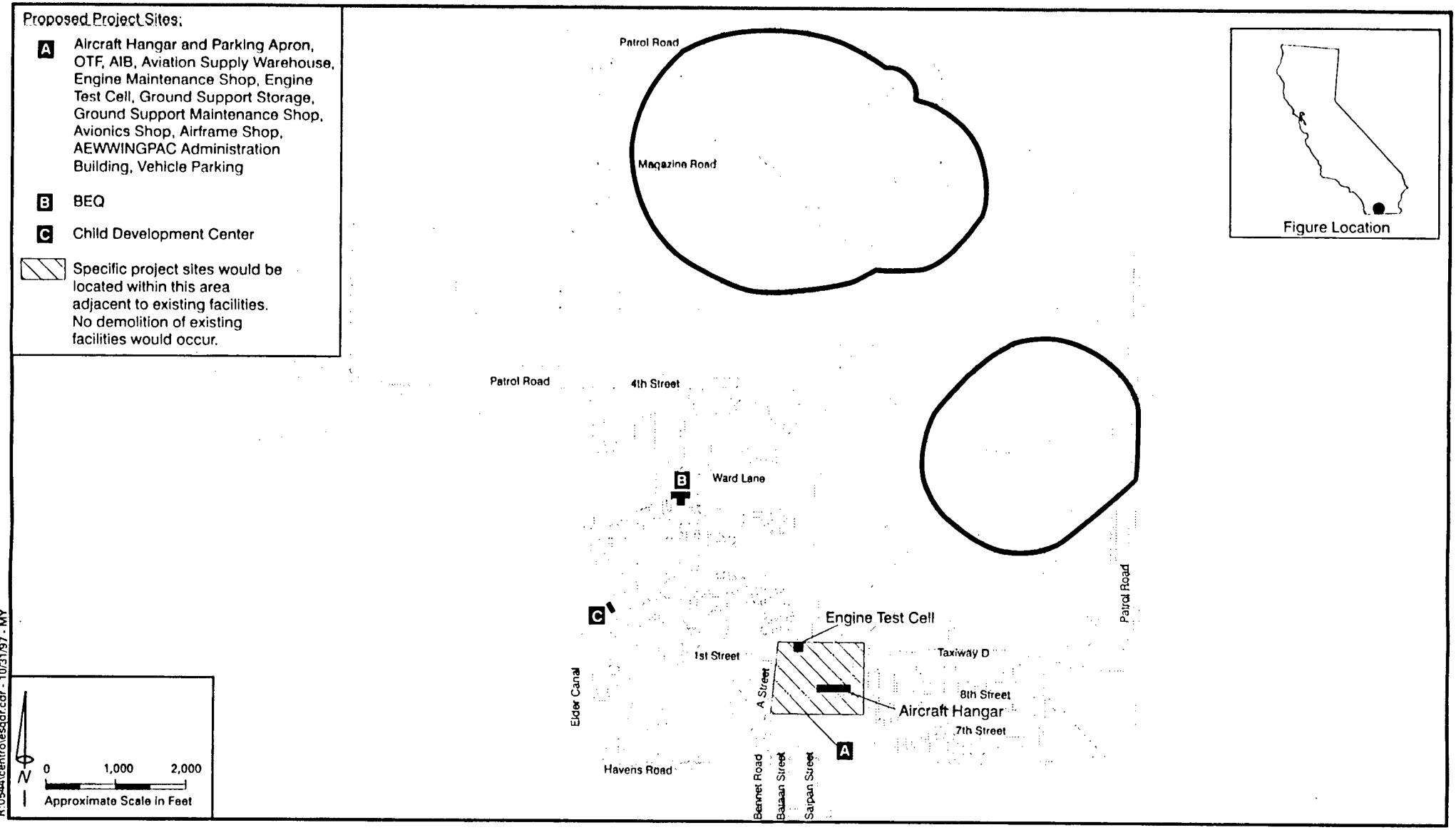
Due to the existing runway configuration at NAF El Centro, APZs I and II extend beyond the station boundaries in nearly all directions, particularly to the northwest, west, east, and southeast. These areas are associated with the arrival and departure flight tracks for Runways 08, 26, and 30. APZ I at NAF El Centro is a rectangular area beyond the Clear Zone, which extends straight under the approaches and curves under the departure patterns for Runways 08 and 26. APZ II at NAF El Centro is curved because its centerline follows the flight paths of departing and arriving aircraft. It also extends beneath the entire length of the FCLP pattern. Although FCLPs are not the primary activity at NAF El Centro, the operations levels on Runways 08 and 26 justify an APZ II. None of the proposed project sites would be located within the APZs.

Explosive Safety Quantity Distance Arcs

The ESQD arcs at NAF El Centro are used to cover the maximum amount of ordnance authorized for storage or handling at each magazine or facility (US Navy 1988a). There are two groups of ESQD arcs at NAF El Centro surrounding ordnance areas and ordnance loading pads adjoining the airfields (Figure 3-38). None of the proposed project sites would be located within an ESQD arc.

Electromagnetic Radiation

The NAF El Centro Master Plan has identified one electromagnetic radiation concern, which may affect ordnance, fuel, or personnel at NAF El Centro (US Navy 1988a). The Air Traffic Control Tower, (Building 130) generates a 500-foot (152-meter) electromagnetic radiation arc (Figure 3-39). None of the proposed project sites would be within an EMR arc.



None of the proposed project sites would be located within an ESQD arc.

LEGEND:

ESQD Arcs

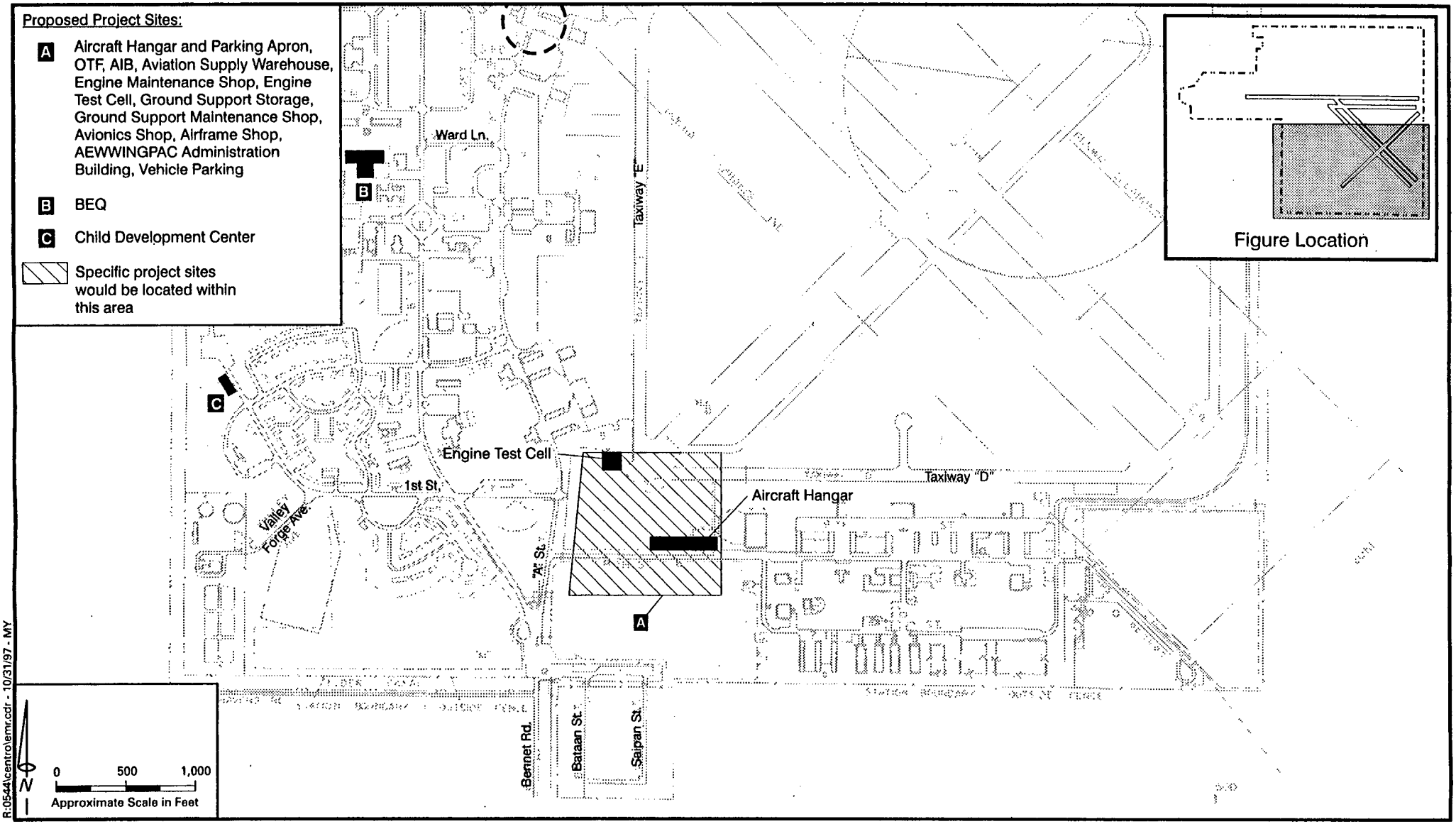
Construction/Expansion

NAF El Centro ESQD Arcs

E-2 Aircraft Squadrons Realignment EIS
NAF El Centro, California

Source: US Navy 1988a.

Figure 3-38



None of the proposed project sites would be located within an EMR arc.

LEGEND:

EMR Arcs

Construction/Expansion

NAF El Centro EMR Arcs

E-2 Aircraft Squadrons Realignment EIS
NAF El Centro, California

Source: US Navy 1988a.

Figure 3-39

R:0544\centro\emr.cdr - 10/31/97 - MY

3.12 HAZARDOUS MATERIALS AND WASTES

This section describes the hazardous materials and wastes for each alternative base. Hazardous materials management, hazardous waste management, installation restoration program sites, asbestos, polychlorinated biphenyls, storage tanks and oil/water separators, pesticides, lead, ordnance, and radon are discussed.

Hazardous Materials

As defined by the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980, (42USC 9601 Parts 14 and 33), and the Superfund Amendments and Reauthorization Act (SARA) of 1986, a hazardous material is a substance, pollutant, or contaminant that, due to its quantity, concentration, or physical and chemical characteristics, poses a potential hazard to human health and safety or to the environment if released into the workplace or the environment. The Navy's Environmental and Natural Resources Program Manual (Office of the Chief of Naval Operations Instruction [OPNAVINST] 5090.1B) (US Navy 1994h) states that hazardous materials include but are not limited to hazardous substances, hazardous waste, and any material that a handler or administering agent has a reasonable basis for believing would be injurious to the health and safety of persons or harmful to the environment if released into the workplace or the environment.

Hazardous Wastes

The Resource Conservation and Recovery Act (RCRA) of 1976, Title 40 CFR Parts 240-280, and the Hazardous and Solid Waste Amendments (HSWA) of 1984 define a hazardous waste as a solid waste, or combination of wastes, which due to its quantity, concentration, or physical, chemical, or infectious characteristics, may cause, or significantly contribute to, an increase in mortality or an increase in serious irreversible, or incapacitating reversible illness; or pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, disposed of, or otherwise managed. A solid waste is a hazardous waste if it is not excluded from regulation as a hazardous waste (40 CFR 261.4(b)); exhibits any ignitable, corrosive, reactive, or toxic characteristic; or is listed in Subpart D of RCRA.

RCRA requires cradle-to-grave management of hazardous wastes through a record-keeping system that requires the manifesting of properly labeled hazardous waste shipments from point of generation to ultimate disposal. Also required by federal and California law are proper labeling, storage, containerization, training, and emergency procedures for hazardous waste.

Each base presently conducts industrial operations in support of its mission to maintain and operate aviation activities and other operational forces of the Navy. These operations generate waste materials, which include hazardous wastes. Hazardous wastes generated at each base must be containerized, labeled, stored, and transported off the base in accordance with USEPA, State, and Navy requirements for hazardous waste storage and disposal (US Navy 1994h).

Installation Restoration Program

OPNAVINST 5090.1B provides Navy policy for the restoration of contaminated sites (US Navy 1994h). The purpose of the Installation Restoration Program (IRP) is to identify, investigate, and clean up or control releases of hazardous substances from past waste disposal operations and hazardous material spills at Navy facilities.

The IRP provides for compliance with the procedural and substantive requirements of CERCLA, as amended by SARA, as well as regulations issued under these acts or by State law. Although the IRP is primarily intended to clean up past releases of hazardous waste, it may address the cleanup of past releases of any pollutant and/or contaminant that endangers public health, welfare, or the environment, including petroleum, oil, and lubricant products. Cleanup of past contamination from underground storage tanks (USTs) and corrective action for past contamination at RCRA sites may be part of the IRP (US Navy 1994h).

CERCLA requires that all federal facilities comply with state and federal laws with regard to the remediation process. The IRP follows this process and includes the following phases:

- Site discovery (SD) and notification;
- Preliminary assessment (PA);
- Site inspection (SI);
- Hazard ranking system (HRS);
- Remedial investigation (RI)/feasibility study (FS);
- Record of decision (ROD);
- Remedial design (RD)/remedial action (RA);
- Long-term monitoring; and
- Site closure.

Asbestos

The USEPA, the Occupational Safety and Health Administration (OSHA), and the State of California regulate asbestos-containing material (ACM) remediation. Asbestos fiber emissions into the ambient air are regulated in accordance with Section 112 of the Clean Air Act, which established the National Emissions Standards for Hazardous Air Pollutants (NESHAP). NESHAP regulations address the demolition or renovation of buildings with ACM. The Toxic Substances Control Act (TSCA) and the Asbestos Hazardous Emergency Response Act (AHERA) provide the regulatory basis for handling ACM in school buildings. AHERA and OSHA regulations provide protection for employees who encounter or remediate ACM.

Renovating or demolishing buildings with ACM can release asbestos fibers into the air by disturbing/damaging various building materials, such as pipe and boiler insulation, acoustical ceilings, sprayed-on fireproofing, and other materials used for soundproofing or insulating. Only friable ACM, such as those listed above, is considered a health risk. Nonfriable ACM, such as transite piping, shingles, or floor tile, is not a health risk unless it is mechanically abraded to produce dust.

Polychlorinated Biphenyls

Polychlorinated biphenyls (PCBs), which are electrically nonconductive and stable at high temperatures, may be found in the dielectric fluids of electrical equipment, including transformers and capacitors, particularly if such equipment was manufactured before the early 1970s. PCBs are also found in other manufactured items, including light fixtures, ballasts, hydraulic systems, and as plasticizers and fire retardants in many solid materials.

The USEPA regulates the disposal of equipment containing PCBs in concentrations of 50 parts per million (ppm) or greater under TSCA, which bans the manufacture, processing, and distribution in commerce of PCBs, with limited, specific exceptions for some PCBs used in totally enclosed systems. USEPA disposal regulations distinguish between PCB-contaminated electrical equipment, defined as that containing PCBs in concentrations 50 ppm or greater, but less than 500 ppm, and electrical equipment, such as a PCB transformer, in which the concentration of PCBs is at least 500 ppm. Primary federal regulations for controlling existing PCBs are found in 40 CFR Part 761. California regulations, however, are more stringent than their federal equivalents and are found in Title 22 of the California Code of Regulations (CCR). Within California, a waste fluid containing 5 ppm PCBs or more is regulated as hazardous waste.

In accordance with Navy procedures and applicable federal and state regulations, all Navy shore activities must inventory annually all PCB waste that they generate, treat, store, or dispose. The California Environmental Protection Agency's Department of Toxic Substances Control (DTSC) regulates PCBs as a non-RCRA hazardous waste. OPNAVINST 5090.1B specifies eliminating all transformers containing 500 ppm or more PCBs by October 1998 and eliminating all transformers containing 50 ppm or more PCBs by October 2003.

Storage Tanks and Oil/Water Separators

Both underground storage tanks (UST) and aboveground storage tanks (AST) are used to store hazardous substances and petroleum products at locations throughout the Navy bases. Because oil/water separators (OWS) are often below ground and can create environmental issues similar to USTs, they are included in this discussion.

USTs are subject to federal regulations of RCRA (40 CFR 280), as mandated by the Hazardous and Solid Waste Amendments of 1984. The State of California has adopted regulations under Title 23, Division 3, Chapter 16 of the CCR. California

regulations are more stringent than the federal regulations and require secondary containment on both the tank and piping systems installed after January 1, 1984.

ASTs are regulated under California Health and Safety Code (CH&SC), Division 20, Section 6.7, the Uniform Fire Code, and the National Fire Protection Association regulations. The mechanism used for cleanup and prevention of spills is SB 1050 of January 1990.

Fuel is transported and stored according to USEPA and Navy regulations at each naval base. Each naval base has a fuel storage area, identified as a fuel farm. Fuels stored at the fuel farm may include jet fuel (JP-5 or JP-8), automotive motor gas, diesel fuel, used oil, and propane. Fuel is transported to the fuel farm by underground pipelines from off-base sources or delivered by tanker trucks to a receiving island at the fuel farm. The fuels are stored in aboveground or underground storage tanks equipped with visible and audible high-level tank alarms for leak detection. Each naval base with air operations has aircraft refueling stations, which dispense JP-5 or JP-8 to aircraft.

Pesticides

The registration and use of pesticides are regulated under the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) of 1972, as amended (7 USC 136 et seq.). Pest Management activities are subject to federal regulations contained in 40 CFR 162, 165, 166, 170, and 171, and California regulations contained in CCR Title 3, Chapter 4.

Lead

Lead was a major ingredient in house paint used throughout the country and at naval bases for many years. In 1978, the maximum lead content was reduced to 0.06 percent of newly applied dry paint. Lead-based paint use was discontinued in 1980.

Lead-based paints (LBPs) are defined by the US Department of Housing and Urban Development (HUD) as paints containing lead in concentrations either greater than or equal to 5 percent by weight, or greater than or equal to 1.0 milligrams per square centimeter. Lead-based paints, which are nonadhering to the substrate, must be removed prior to demolition. If adhering to the substrate, LBPs can be left on the structures, or removed only in localized areas depending on the type of demolition practices.

The California Division of OSHA Construction Lead Standard regulates the exposure of employees to lead during construction work (28 CCR 1532.1). Although paints may be below the HUD definition for "lead-based paints," these paints may contain some lead and may result in lead exposure to workers if demolition practices, such as torching and power-cutting, are utilized. Employees must be notified of lead hazards in the surroundings or in working conditions, and

appropriate dust control and personal protective demolition procedures must be followed.

The TSCA (15 USC 2682) addresses lead-based paint hazards, and protects the general public from exposure to lead hazards.

Radon

Radon is a colorless and odorless radioactive gas produced by radioactive decay of naturally occurring uranium to radium. Radium, of which radon gas is a by-product, is found in high concentration in rocks containing uranium, granite, shale, phosphate, and pitchblende. Atmospheric radon is diluted to insignificant concentrations. Radon present in soil; however, can enter a building through small spaces and openings, accumulating in enclosed areas, such as basements. The cancer risk caused by inhaling radon is currently a topic of concern.

The amount of radon is measured in picocuries per liter of air (pCi/L). The average indoor level is estimated to be 1.3 pCi/L, and about 0.4 pCi/L of radon is usually found in the outside air (US Public Health Service 1989). There are no laws that require testing and remediating for radon, but the USEPA has made recommendations for both housing and schools. For short-term testing (two to 90 days), "charcoal canister," "alpha-track," "electret ion chamber," "continuous monitor," and "charcoal liquid scintillation" detectors are the most commonly used. For long-term testing (more than 90 days), alpha-track and electret ion detectors are commonly used. Long-term testing more accurately provides a year-round average radon level (US Public Health Service 1989).

The *Application of Radon Reduction Methods* (USEPA 1988) summarizes the USEPA recommended action level of 4 pCi/L. It also provides guidance for action and recommends the following action schedule.

- For radon concentrations greater than 200 pCi/L, action shall be initiated within a few weeks.
- For radon concentrations in the range of 20 to 200 pCi/L, action shall be initiated within several months.
- For radon concentrations in the range of 4 to 20 pCi/L, action shall be initiated within a few years (the higher the radon level, the more urgent the need for action).
- For radon concentrations less than 4 pCi/L, no action is specifically recommended; however, many individuals may elect to further reduce radon concentrations in the range of 1 to 4 pCi/L.

3.12.1 Preferred Alternative: NAWS Point Mugu

Region of Influence

The ROI at NAWS Point Mugu includes the proposed project sites and operations areas for the E-2 squadrons realignment.

Hazardous Materials Management

Hazardous materials are used for various operations throughout the base and are managed under the NAWS Point Mugu Instruction 4110.1, Hazardous Materials Control and Management (US Navy 1997a). NAWS Point Mugu has submitted chemical lists in compliance with Section 311 of the Emergency Planning and Community Right-to-Know Act (EPCRA), and emergency planning information in accordance with Sections 302 and 312 of EPCRA. Toxic chemical reports, Section 313, were not submitted because the base did not exceed the minimum threshold use requirements (Hudson 1997).

Hazardous materials used on the base include batteries, lubricants, paints, gasoline components, adhesives, and sealing compounds. Most of the hazardous materials are used for aviation activities and other facility operations. These materials are used and properly stored at the Building 383 compound (Environmental Materials Management Division), fuel farm, aircraft squadron hangars, maintenance buildings, and vehicle maintenance areas. Hazardous materials are also used and stored for cleaning and other maintenance operations throughout the base.

Hazardous materials intended for immediate use are stored at virtually all the industrial and shop areas located at the proposed project sites. These materials are properly stored in hazardous materials storage lockers (Hudson 1997).

Hazardous Waste Management

The Hazardous Waste Annual Report indicates that NAWS Point Mugu produced approximately 826,000 pounds (375,000 kilograms) of hazardous waste in 1996. These wastes consist primarily of contaminated jet fuel, waste paint, spill residues, ethylene glycol, batteries, antifreeze, hydraulic fluid, photo processing waste materials, and waste cleaning compounds. Much of these wastes were recycled off base, including 525,000 pounds of waste oil and fuel (Hudson 1997). NAWS Point Mugu implements a Hazardous Waste Management Plan for the base (US Navy 1996d).

Hazardous wastes generated at NAWS Point Mugu are presently accumulated at satellite areas at or near the point of generation. The wastes are routinely picked up by representatives of the Environmental Materials Management Division and taken to a temporary central storage area where they are stored for less than 90 days. Hazardous wastes are manifested and transported off the base by a commercial waste hauler, contracted by the Defense Reutilization and Marketing Office (DRMO), to a USEPA-permitted storage, treatment, and disposal facility (Shide 1997a).

Installation Restoration Program Sites

The initial assessment study (IAS) for the IRP at NAWS Point Mugu identified 11 potentially contaminated sites, which were evaluated with regard to contamination characteristics, migration pathways, and pollutant receptors (US Navy 1986a). Twenty-six additional sites have been identified, for a total of 37 IRP sites. These sites are undergoing remedial investigation, removal action, site inspection, or remediation (Granade 1997).

There are two IRP sites located within a proposed project location. Site 6, Building 311 yard, is located within the proposed engine maintenance shop, ground support maintenance shop, and ground support storage locations. Site 6 is also approximately 1,000 feet (305 meters) southwest of the proposed aircraft washrack location. Site 6 is a former dumping area and oil/water separator location site. This site is undergoing remedial investigation. IRP site UST #6 is located at Building 553. Site UST #6 is undergoing remedial investigation.

There are two potential hazardous waste sites within a 0.25-mile (0.4 kilometers) radius of the proposed project sites for this alternative. Site 7, the Electric Substation 680, is located approximately 600 feet (183 meters) southeast of the proposed aircraft washrack location (US Navy 1986a). IRP site 24, the former Ground Support Equipment Area, is located approximately 100 feet (31 meters) north of Building 385.

Under the IRP, remedial actions are completed in consultation with the California DTSC.

Asbestos

An asbestos survey was conducted on 134 buildings at NAWS Point Mugu, Laguna Peak, San Nicolas Island, Camarillo Airport (CAMAIR), and Port Hueneme in 1995 and 1996. The survey included a field survey, sampling, and testing of suspected ACM. Based on the laboratory results, ACM was found in various building materials, including floor and ceiling tiles, insulation, and mastic (Le 1997). All identified ACM that presented a potential health and safety concern was abated. ACM present at the proposed project sites and that remaining at other locations will be abated, if it presents a potential health and safety concern, during renovation projects (Le 1997).

Polychlorinated Biphenyls

There are 12 PCB equipment (500 ppm or above) and 35 PCB-contaminated (at or above 50, but below 500 ppm) transformers located on the base. Several other transformers containing PCB concentrations below 50 ppm are also located on base. PCB equipment transformers are scheduled for replacement in 1998, and PCB-contaminated transformers are scheduled for replacement in 2003 (Le 1997).

PCB equipment and PCB-contaminated equipment are not present at any of the proposed project sites. In addition, there are no records of any PCB equipment or

PCB-contaminated equipment ever being present at any of these sites. PCB-containing electrical equipment, such as light fixtures and ballasts may be present at the proposed project sites.

There have been no known releases of dielectric fluid or transformer explosions at any of the proposed project sites.

Storage Tanks and Oil/Water Separators

Both USTs and ASTs are used to store hazardous substances and petroleum products throughout the base. There are 18 USTs and 83 ASTs located on the base. Sixty-six UST facilities have had releases; 49 of the facilities have been closed. Cleanup has been completed at one site and closure is pending. One site is undergoing cleanup, and six have been transferred to the IRP. The remaining nine sites have been assessed and are awaiting closure (Granade 1997).

JP-5 is transported to NAWS Point Mugu by bulk fuel transport trucks from the Defense Fuel Supply Point in San Pedro. The fuel is stored at the fuel farm in three ASTs with a capacity of 334,500 gallons (1,266,216 liters) each and three ASTs with a capacity of 121,800 gallons (461,062 liters) each, providing a total capacity of 1,368,900 gallons (5,181,834 liters). Current throughput is approximately one million gallons per month (Granade 1997). The fuel storage tanks are presently being upgraded to meet environmental requirements, and modern control systems (high level alarms, etc.) are being installed. Jet fuel JP-8 is stored in the remaining available tanks. When the upgrade project is complete, the excess tank capacity will be available for storage of JP-5 (Norris 1997).

Aircraft fueling occurs on the aircraft parking apron and in the ammunition loading revetment. The fuel is transported from the fuel storage facility by designated trucks identified as airplane side refueling vehicles. There are three refueling vehicles and one fueler/defueler presently in operation. Because JP-5 and JP-8 fuels are compatible, purging tanks between loads is not required (Parisi 1997a).

An Oil and Hazardous Substance Spill Prevention, Control, and Countermeasure Plan (SPCC) plan is implemented for the base (US Navy 1995e). Spill response equipment is stored at each fuel storage area, and the Fire Department responds to any spills over 5 gallons (19 liters) on pavement and any spills to soil or water.

There are 17 active OWSs located in the operations area of the base that receive a variety of oil and wastewater mixtures from the wash rack (Granade 1997). Most of the OWSs are below ground. Water collected in four of the units is discharged to an oily waste treatment unit at the fuel farm for pretreatment. Once the oil is removed from the wastewater, the remaining effluent is discharged to the sanitary sewer. The remaining 13 OWSs discharge directly to the sanitary sewer.

There is one OWS present at the proposed engine maintenance shop, ground support storage and ground support maintenance shop location (Building 311). One OWS is located at Building 759, which is adjacent to the proposed engine test cell pad (Granade 1997).

Pesticides

Pesticides are applied on an as-needed basis throughout the base by a contractor. The contractor supplies the pesticides and there is no storage at NAWS Point Mugu (Casuga 1997). Past usage included common pesticides such as chlordane and dichlorodiphenyltrichloroethane (DDT), which were banned in 1988 and 1971, respectively. NAWS Point Mugu implements a pest management plan which specifies the terrain to be treated, the type of pest, pesticide product name and USEPA registration number, and the mixing concentration or rate of application.

Soil samples were collected throughout approximately 2,500 acres of wetland and former wetland areas at NAWS Point Mugu as part of the IRP. Analysis included pesticides due to the past usage of pesticides in the area. Analytical results indicated that pesticides were present in the samples collected. Although NAWS Point Mugu historically applied pesticides in the area, the wetland area is potentially affected by over 100 square miles (160 square kilometers) of farmland upgradient of the base. The affected area is still under investigation, and remediation will be conducted based on the investigation results (Granade 1997).

Lead

A lead-based paint (LBP) survey of NAWS Point Mugu residential buildings was conducted in 1994. LBP has been removed from various buildings as part of refurbishing and upgrading projects (Le 1997). DOD regulations do not require surveying nonresidential structures for LBP, but LBP is likely to be present in buildings constructed before 1978.

Ordnance

Although no known manufacture or disposal of ordnance has been conducted at any of the proposed project sites, ordnance is loaded aboard aircraft at the outboard areas of the aircraft parking aprons in the combat aircraft ordnance area. This practice requires parked aircraft to be towed out of the ordnance area and portions of maintenance hangars evacuated during loading procedures. Because ordnance is not manufactured or disposed, an unexploded ordnance/explosive ordnance disposal (UXO/EOD) survey has not been conducted on the base (Shide 1997b).

Radon

The Navy conducted a radon facility screening survey of buildings and housing at the installation in 1993. No radon concentrations above the action level of 4 pCi/L were detected, and no further action is planned based on these results (Le 1997).

3.12.2 NAS Lemoore Alternative

Region of Influence

The ROI at NAS Lemoore includes the proposed project sites and operations areas for the E-2 squadrons realignment.

Hazardous Materials Management

Hazardous materials are used in various operations throughout the base and are managed in accordance with NAS Lemoore Instruction (NASLEMINST) 4110.2. NAS Lemoore has submitted a list of chemicals in compliance with Section 311 of EPCRA, and emergency planning information in accordance with Section 302 of EPCRA (US Navy 1994d).

Hazardous materials used on the base include lubricants, degreasers, cleaners, paint strippers, solvents, acids, and pesticides (US Navy 1994d). Most of the hazardous materials are used for airfield operations and industrial support. These materials are used at the following locations:

- Buildings 217, 218, 247, 248, 277, 278, 307, 308, 337, and 338 High Speed Refuelers;
- Building 170 Jet Maintenance Shop (aircraft paint, plating, and cleaning);
- Buildings 173, 174, and 175 Turbo-Jet Engine Test Cells;
- Building 179 Ground Equipment Maintenance Facilities;
- Building 188 Air Frames Shop; and
- Building 722 Drinking Water Treatment Plant.

Buildings 774 and 775 house the flammable storage area. This is a supply storage area for flammable liquids, gases, and solids used throughout NAS Lemoore. A separate paint storage area used by the Department of Public Works is also located within the warehouse (US Navy 1994d). Small quantities of hazardous materials are used for cleaning and other maintenance operations throughout the base.

Hazardous materials are not stored at any of the proposed project sites. Hazardous materials are delivered and picked-up daily for transfer to the satellite accumulation area (Mora 1997b).

Hazardous Waste Management

NAS Lemoore possesses an active USEPA generator number and generated approximately 280 tons (254 metric tons) of hazardous waste in 1993. Hazardous wastes are generated from aircraft-related activities and consist primarily of asbestos, contaminated soil, empty containers, waste asphalt, waste paint, contaminated jet fuel, spill residues, ethylene glycol, waste methyl alcohol, and waste cleaning compounds (US Navy 1994d). The only extremely hazardous

wastes generated on a regular basis are PCB-containing ballast fluids and waste mercury (US Navy 1994d).

Hazardous wastes are collected from satellite accumulation areas throughout the base on a daily basis, and transferred to the Department of Public Works hazardous waste less than 90-day storage compound (Building 748). Hazardous wastes are stored at this facility for up to 90 days. The wastes are then manifested and transported off the base by Laidlaw Environmental Services under contract with the DRMO. The wastes are transported to Laidlaw treatment, storage, and disposal facilities on the East Coast (Smith 1997a; 1997b).

Hazardous wastes are not stored at any of the proposed project sites. Hazardous wastes are picked-up daily for transfer to the satellite accumulation area (Mora 1997b).

Installation Restoration Program Sites

Based upon results of a 1984 IAS, a 1986 Verification Phase/Confirmation Study, and California DHS and NAS Lemoore recommendations, a total of 17 potentially contaminated sites were identified for inclusion in the IRP. An RI/FS Final Work Plan was completed for the hazardous waste disposal sites and contaminated areas caused by past hazardous waste storage, handling, or disposal practices at NAS Lemoore. Two of the sites have been combined for the purpose of further investigation due to their proximity (US Navy 1994d). Table 3-43 identifies sites within a 0.25-mile (0.4-kilometer) radius of the proposed project sites for this alternative. There are no IRP sites located within a proposed project location.

All identified IRP sites are being investigated under CERCLA and will be remediated if determined to be necessary by the regulatory agencies. Remedial action is completed according to the requirements of the Central Valley RWQCB, Kings County, and the California DTSC.

Asbestos

Asbestos surveys of existing facilities were conducted in two phases; the initial phase was conducted in October through December 1992 and the follow-up second phase was conducted in September through November 1993. Friable or damaged ACM identified in this survey were abated. As renovation of buildings is conducted, ACM will be abated if it presents a potential health and safety concern. Although ACM remains in buildings on the base, it is nonfriable and does not represent a threat to persons working in these areas (Mora 1997b).

Polychlorinated Biphenyls

There are three transformers on the base containing PCB concentrations less than 5 ppm. Transformers that were determined to contain PCB concentrations above 5 ppm have had the dielectric fluid replaced with non-PCB fluid (Smith 1997c).

No PCB equipment or PCB-contaminated equipment is present at any of the proposed project locations. In addition, there is no record of any PCB equipment or PCB-contaminated equipment at any of these locations. PCB-containing electrical equipment, such as light fixtures and ballasts, may be present at the proposed project locations.

Table 3-43
IRP Sites at NAS Lemoore within One Quarter Mile of the Proposed Project Sites

Site #	Site Name	Approximate Location
2	Pesticide rinse area (Building 752)	1,300 feet (396 meters) southwest of the proposed BEQ site
3	Pesticide rinse area (Building 50)	300 feet (91 meters) southwest of the proposed avionics shop (Building 160) site
		400 feet (122 meters) southeast of the proposed OTF site
		600 feet (183 meters) northwest of the proposed aviation supply warehouse (Building 140) site
		700 feet (213 meters) south of the proposed airframe shop site
		900 feet (274 meters) west of the proposed ground support storage and maintenance shop (Building 179) site
		1,100 feet (335 meters) west of the proposed engine test cell site
		1,200 feet (366 meters) southwest of the proposed engine maintenance shop (Building 170) site
5/9	Fire fighting school /industrial treatment sludge ponds	750 feet (229 meters) southwest of the proposed OTF site
		900 feet (274 meters) southwest of the proposed avionics shop (Building 160) site
		1,000 feet (305 meters) southwest of the proposed airframe shop site
		1,100 feet (335 meters) west of the proposed aviation supply warehouse (Building 140) site
		1,250 feet (381 meters) southeast of the proposed AEWWINGPAC administration building site
10	Landing strip	1,200 feet (366 meters) northeast of the proposed BEQ site
11	PCB-contaminated soil (Building 3)	500 feet (152 meters) north of the proposed AEWWINGPAC administration building site
		1,000 feet (305 meters) northwest of the proposed OTF site

Table 3-43
IRP Sites at NAS Lemoore within One Quarter Mile of the Proposed Project Sites *(continued)*

Site #	Site Name	Approximate Location
13	Transformer storage area (Building 50)	200 feet (61 meters) southeast of the proposed OTF site
		300 feet (91 meters) west of the proposed avionics shop (Building 160) site
		600 feet (183 meters) southwest of the proposed airframe shop site
		700 feet (213 meters) northwest of the proposed aviation supply warehouse (Building 140) site
		800 feet (244 meters) west of the proposed ground support storage and maintenance shop (Building 179) site
		1,000 feet (305 meters) west of the proposed engine test cell site
		1,100 feet (335 meters) southwest of the proposed engine maintenance shop (Building 170) site
		1,300 feet (396 meters) southeast of the proposed AEWWINGPAC administration building site
14	UST fuel spills (Building 173 and 174)	200 feet (61 meters) northwest of the proposed ground support storage and maintenance shop (Building 179) site
		400 feet (122 meters) northwest of the proposed engine test cell site
		400 feet (122 meters) southwest of the proposed engine maintenance shop (Building 170) site
		500 feet (152 meters) northeast of the proposed avionics shop (Building 160) site
		600 feet (183 meters) north of the proposed aviation supply warehouse (Building 140) site
		700 feet (213 meters) southeast of the proposed airframe shop site
		1,000 feet (305 meters) east of the proposed OTF site
16	Sludge drying beds and pond (north of Building 65)	900 feet (274 meters) southeast of the proposed AEWWINGPAC administration building site
		800 feet (244 meters) southwest of the proposed OTF site
		1,100 feet (335 meters) west of the proposed avionics shop (Building 160) site
		1,200 feet (366 meters) southwest of the proposed airframe shop site

Source: US Navy 1994d.

There have been no known releases of dielectric fluid or transformer explosions at any of the proposed project locations.

Storage Tanks and Oil/Water Separators

Both USTs and ASTs are used to store hazardous substances and petroleum products throughout the base. There are 30 USTs ranging in capacities from 4,122 gallons (15,603 liters) to 596,262 gallons (2,257,090 liters), and 44 ASTs ranging from 10 gallons (31 liters) to 8,000 gallons (30,283 liters) in capacity on the base (US Navy 1997b, US Navy 1997c). These tanks store waste oil and fuel for generator, vehicle, and aircraft operations at the base.

JP-5 jet fuel is transported to NAS Lemoore via a pipeline from Fresno. The pipeline terminates at the fuel farm in the south Operations Area where six JP-5 USTs have a combined total capacity of 2,624,000 gallons (9,932,890 liters). From these receiving tanks, jet fuel is distributed by pipeline to five 119,478-gallon (452,260-liter) USTs, each adjacent to the aircraft parking aprons and hangars on the base. These tanks in turn supply ten high-speed aircraft refueling stations in the operations area of the base, two at each of the five hangars (US Navy 1994d).

The refueling stations are at Buildings 217, 218, 247, 248, 277, 278, 307, 308, 337, and 338. Each station includes a 125,000-gallon (473,175-liter), single-walled UST for JP-5 equipped with high/low-level alarms and high-level shut-off valves. The tanks and piping are wrapped and have cathodic protection. Fuel supplied to the refueling stations passes through filters in a filter room near each UST (US Navy 1994d).

Jet engine test cell 3 (Building 175) is served by one 20,000-gallon (75,703-liter) JP-5 UST, and test cell 2 (Building 174) is served by a partially excavated 10,000-gallon (37,854-liter) JP-5 UST. There is a 500-gallon (1,837-liter) AST outside of Building 175 that stores preservation oil. A starting engine test cell and AST (less than 500 gallons) (less than 1,873 liters) in the storage yard of Building 175 have no secondary containment (US Navy 1994d).

Fifty USTs have been removed from the base and five USTs are in the process of closure and await removal. Fifteen of these removed USTs have been reported as leaking, and monitoring of the sites is being conducted under RWQCB oversight (Ike 1997).

NAS Lemoore has implemented a SPCC plan for the base (NASLEMINST 5090). Spill response equipment is stored at each fuel storage area, and the Fire Department responds to any spills over 5 gallons on pavement and any spills to soil or water (US Navy 1994d).

There are three active OWSs at NAS Lemoore. One is located at Building 765 (Public Works Transportation), one at the MRW car wash, and one at Building 945 (Hobby Shop). Water collected in the units is discharged to the sanitary

sewer. There are no OWSs present at any of the proposed project locations (Mora 1997b).

Pesticides

Pesticides are applied throughout the base by certified station or contracted personnel. Past usage includes common pesticides, such as chlordane and DDT, which were banned in 1988 and 1971, respectively. NAS Lemoore implements a pest management plan which specifies the area to be treated, the type of pest, the frequency of application, pesticide product name and USEPA registration number, mixing concentration, and any special precautions or remarks (US Navy 1997d).

Soil samples were collected from potential sources of pesticide contamination in June 1997. Storm water drainage ditches, Building 752, Building 50, the former landing strip used by crop dusting aircraft, and west of Public Works Transportation (PWT) (contractor rinse area) were sampled to determine the presence of residual pesticides. The sampling program was part of the IR environmental investigation conducted through the IRP (Crane 1997). Although analytical results indicated that pesticides and their constituents were detected in the samples, a human health risk assessment and ecological risk assessment determined that these sites do not pose an unacceptable risk to human health or the environment (US Navy 1997d).

Lead

NAS Lemoore has not conducted a LBP survey of the residential buildings on the base (Rathbun 1997). DOD regulations do not require surveying nonresidential structures for LBP, but LBP is likely to be present in buildings constructed before 1978.

Ordnance

Ordnance is loaded aboard aircraft at the outboard areas of the aircraft parking aprons at four temporary combat aircraft loading areas, authorized by CNO waiver. No known ordnance manufacture, storage, or disposal have been conducted at any of the proposed project locations (Winckelmann 1997).

Radon

The Navy conducted a radon facility screening survey of all buildings and housing at the installation in November 1989. No radon concentration above the action level of 4 pCi/L was detected at base facilities or housing units and no further action is planned based on these results (Hudson 1997).

3.12.3 NAF El Centro Alternative

Region of Influence

The ROI at NAF El Centro includes the proposed project sites and operations areas for the E-2 squadrons realignment.

Hazardous Materials Management

Hazardous materials are used in various operations throughout the base and are managed in accordance with the Hazardous Materials Management Plan of September 26, 1997. NAF El Centro has submitted a list of chemicals in compliance with Section 311 of EPCRA, and emergency planning information in accordance with Section 302 of EPCRA (Bay 1997c).

Hazardous materials used by divisions, departments, and tenants on the base are listed on the authorized user list, which is submitted to the Hazardous Materials Division. Most of the hazardous materials are used at operation and shop areas. Each department has their own hazardous materials storage locker, but the Hazardous Materials Center stores the reusable hazardous materials. Small quantities of hazardous materials are also used for cleaning and other maintenance operations throughout the base.

Hazardous Waste Management

Hazardous wastes are generated by NAF El Centro operations and by tenant activities. According to the NAF El Centro Hazardous Waste Annual Report, the total amount of hazardous waste generated in 1988 was approximately 140 tons (127 metric tons), and approximately 110 tons (100 metric tons) of hazardous waste were generated in 1989. The wastes consisted primarily of asbestos, contaminated soil, empty containers, waste asphalt, waste paint, contaminated jet fuel, spill residues, ethylene glycol, waste methyl alcohol, and waste cleaning compounds (US Navy1990a).

Hazardous wastes generated at NAF El Centro are collected, packaged, and transferred from user/work areas to 29 temporary storage areas approved for less than 90 days of accumulation. The hazardous wastes are then transferred to the central hazardous waste storage area (also limited to 90 days of accumulation), from which they are manifested and transported off the base (Bay 1997c). ELTEX Chemical, under contract with the DRMO, transports the hazardous wastes to their processing facility in Houston, Texas (Tousseau 1997).

Installation Restoration Program Sites

In accordance with the IRP, preliminary assessments were conducted at NAF El Centro to identify potentially hazardous waste disposal sites and contaminated areas caused by past hazardous waste storage, handling, or disposal practices. Seventeen potentially contaminated sites were identified, and recommendations have been made for further investigation of 15 of the 17 sites (US Navy 1990a). Two additional sites were closed by the DTSC in August 1997.

IRP Site 14, a potassium ferricyanide spill area, is located approximately 800 feet (244 meters) southeast of the proposed aircraft hangar, aircraft parking apron, OTF, AIB, engine maintenance shop, engine test cell, ground support storage, ground support maintenance shop, avionics shop, airframe shop, Airborne Early Warning Wing Pacific (AEWWINGPAC) administration building, aviation supply

warehouse, and vehicle parking locations. This site is located next to the photo lab and covers a 15-foot by 15-foot (4.6-meter by 4.6-meter) area. Spent potassium ferricyanide, kept in a 130-gallon (492-liter) tank outside the photo lab, spilled on the ground when the tank ruptured in 1981. Removing contaminated soil reportedly cleaned the site, but a bluish-green discoloration of the soil is still visible (US Navy 1990a). The DTSC approved the site for closure on August 20, 1997.

Under the IRP, all remaining 13 sites are being investigated and, if deemed necessary, will be remediated. In addition to the site investigations, the Colorado River Basin RWQCB has required hydrogeological assessment reports at sites 10 and 17, and solid waste assessment tests at sites 1,2,and 3 in accordance with the Toxic Pits Cleanup Act (US Navy 1990a). Remedial action will be completed according to the requirements of the Colorado River Basin RWQCB, Imperial County, and the California DTSC.

There are no IRP sites identified within the proposed project sites.

Asbestos

An asbestos survey has been conducted at NAF El Centro and 221 buildings were inspected for ACM by the Navy industrial hygienist. Suspected ACM was sampled and analyzed by a Navy laboratory. Of the 221 buildings, 174 reportedly contain ACM. ACM that could potentially become friable was removed during the inspection. Family housing was not included in the survey as ACM had been removed prior to the inventory. Approximately 25 building have not been surveyed for ACM, and are scheduled for inspection in fiscal year 1998 (Bay 1997c).

ACM present at the proposed project sites and that remaining at other locations will be abated, if it presents a potential health and safety concern, during renovation activities.

Polychlorinated Biphenyls

There are approximately 58 PCB-containing transformers (PCB concentrations less than 50 ppm) located on the base. These transformers are scheduled for removal and replacement with non-PCB transformers in October 1997 (Bay 1997c). No PCB equipment or PCB-contaminated equipment is present at any of the proposed project sites. PCB-containing electrical equipment, such as light fixtures and ballasts, may be present at the proposed project sites, but are scheduled for removal in October 1997.

There have been no known releases of dielectric fluid or transformer explosions at any of the proposed project sites.

Storage Tanks and Oil/Water Separators

NAF El Centro is surveying the status of all abandoned and removed USTs and assessing regulatory compliance of all operational USTs. The base is also aggressively implementing a program to replace all USTs with ASTs when this option is the most feasible method of obtaining or maintaining compliance. The Underground Storage Tank Management Plan (US Navy 1995a) provides NAF El Centro with guidance on effective management approaches for achieving and maintaining compliance with all UST requirements and implementing preventive measures to avoid an unauthorized release from a UST.

JP-5 is transported to NAF El Centro by pipeline from a fuel storage facility operated by Southern Pacific Pipeline near the City of Imperial. The pipeline is located along Aten Road and delivers jet fuel at a rate of 155 barrels per hour. Jet fuel is also delivered to NAF El Centro by truck transportation. The pipeline terminates at the fuel farm located in the southeastern section of the base where three JP-5 storage tanks have a combined total capacity of 1,174,000 gallons (4,444,060 liters) (US Navy 1995a).

Two active JP-5 jet fuel USTs located at the fuel farm are owned and operated by NAF El Centro. One 567,000-gallon (2,146,322-liter) UST is present at H-13, and one 40,000-gallon (15,416-liter) UST is present at H-14 (Sewester 1997b). An additional active 500-gallon (1,893-liter) JP-5 UST is present on the base at I-15, but is owned and operated by Santa Fe Pacific Pipeline (US Navy 1995a).

Although 89 USTs are documented as having been removed, there are approximately 72 suspected UST locations on the base (Bay 1997c). USTs are considered "suspect" either when information indicates that a tank may be present, but the presence cannot be confirmed; or when information indicates that a UST has been removed or abandoned, but no documentation is available (US Navy 1995a).

Fifty-three ASTs are present on NAF El Centro, and a SPCC plan has been implemented for the base. Spill response equipment is stored at each fuel storage area, and the Fire Department responds to any spills over 5 gallons (19 liters) on pavement and any spills to soil or water. Fuel releases at the base have been remediated and the sites approved for closure (Bay 1997c).

There is one closed-loop system located at the car wash, and the wastewater is recycled. No engine cleaning, radiator draining, or any activity that will contaminate the system is allowed. An aircraft wash area is also available and collects wastewater. Samples collected of this water have indicated the presence of less than 1-percent oil. Because oil or any POL contaminated water is allowed to be dumped in this area, and the hazardous waste concentration is below regulatory limits, no permits have been issued for these systems.

Pesticides

A contractor applies pesticides monthly, and on an as-needed basis, throughout the base. Past usage included common pesticides, such as chlordane and DDT, which were banned in 1988 and 1971, respectively. NAF El Centro implements a pest management plan which specifies the terrain to be treated, the type of pest, pesticide product name and USEPA registration number, and the mixing concentration or rate of application. Soil samples have not been collected to determine the presence of residual pesticides (Gallant 1997).

Lead

NAF El Centro conducted a LBP survey of the residential buildings on the base. Buildings containing LBP are being remediated systematically and on an as-needed basis (Bay 1997c).

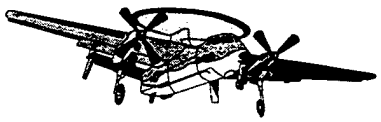
DOD regulations do not require the survey of nonresidential structures for LBP, but LBP is likely to be present in buildings constructed before 1978. A LBP survey of nonresidential buildings is scheduled for January 1998 (Bay 1997c).

Ordnance

Ordnance is loaded aboard aircraft at the outboard areas of the aircraft parking aprons in the combat aircraft ordnance area. This practice requires parked aircraft to be towed out of the ordnance area and portions of maintenance hangars evacuated during loading procedures. No known ordnance manufacture, storage, or disposal have been conducted at any of the proposed project locations (Bay 1997c).

Radon

An initial radon facility screening survey of all housing at the installation was conducted and no radon concentrations above the action level of 4 pCi/L were detected. No further action is planned at the housing units based on these results. A second radon screening at the base is in progress and is scheduled to be completed in fiscal year 1998 (Bay 1997c).



4.0 Environmental Consequences

4. ENVIRONMENTAL CONSEQUENCES 4-1

4.1 Biological Resources 4-1

4.2 Hydrology/Surface Water Quality 4-10

4.3 Land Use and Airspace 4-14

4.4 Socioeconomics 4-20

4.5 Traffic and Circulation 4-29

4.6 Air Quality 4-45

4.7 Noise 4-56

4.8 Aesthetics and Visual Resources 4-64

4.9 Utilities and Services 4-68

4.10 Cultural Resources 4-83

4.11 Public Health and Safety 4-88

4.12 Hazardous Materials and Wastes 4-92

CHAPTER 4
ENVIRONMENTAL CONSEQUENCES

This chapter describes the potential environmental consequences associated with the realignment of the E-2 aircraft squadrons to one of the following naval air bases—Naval Air Weapons Station (NAWS) Point Mugu, Naval Air Station (NAS) Lemoore, and Naval Air Facility (NAF) El Centro. The Council on Environmental Quality regulations on implementing the National Environmental Policy Act (NEPA) state that the environmental consequences discussion shall include direct effects and their significance and indirect effects and their significance (40 CFR 1502.16). Direct effects are caused by the action and occur at the same time and place (40 CFR 1508.8). Indirect effects are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable (40 CFR 1508.8).

Impacts for the resource areas described in Chapter 3 are presented for each alternative. The resource area discussions begin with an introduction that includes planning issues for the resource area and is followed by the criteria used to determine the significance of an impact. Significant impacts and mitigation measures are numbered; less than significant impacts, including those that are beneficial, are listed separately from the significant impacts and are not numbered. Unavoidable impacts that cannot be mitigated to a less than significant level are also identified. Mitigation measures are identified for any impact determined to be significant. Table 4-1 provides a summary of environmental and socioeconomic impacts associated with the proposed action.

4.1 BIOLOGICAL RESOURCES

This section identifies potential consequences to biological resources that may result from implementing the proposed action at one of the alternative bases. The impact analysis compares projected conditions after realignment to the affected environments and ROIs described in Section 3.1, Biological Resources. The biological resources analysis is a qualitative evaluation of the nature and extent of

Table 4-1
Summary of Potential Environmental and Socioeconomic Impacts

IMPACT ISSUES	REALIGNMENT ALTERNATIVES NAWS Point Mugu (Preferred Alternative)	NAS Lemoore	NAF El Centro
Biological Resources			
Jurisdictional wetlands	○	○	○
Special status species	◐	○	◑
Vegetation and wildlife	◐	◐	◐
Birds protected by the Migratory Bird Treaty Act	◐	◐	◐
Marine resources	◐	○	○
Hydrology/Surface Water Quality			
Exposure to flood hazards	◐	○	○
Exceedence of storm water drainage capacity	◐	◐	◐
Surface water quality degradation	◐	◐	◐
Land Use and Airspace			
Compatibility with on-base land uses	◐	◐	◐
Consistency with AICUZ compatibility guidelines: safety	○	○	◐
Consistency with AICUZ compatibility guidelines: noise	◐	◐	◑
Exceedance of imaginary surface restrictions	○	◐	◑
Compatibility with regional land uses	◐	◐	◐
Impacts to airspace operations	◐	◐	◐
Consistency with coastal zone policies	◐	○	○
Socioeconomics			
Population	◐	◐	◐
Employment	◐	◐	◐
Income	◐	◐	◐
Housing	◐	◐	◐
Business volume	◐	◐	◐
Net government revenues	◐	◐	◐
Traffic and Circulation			
Intersection operations	◐	◐	◐
Roadway segment operations	◐	◐	◐
Construction traffic	◐	◐	◐
Parking	◐	◐	◐

LEGEND:

● = Significant and not mitigable impact

◑ = Significant and mitigable impact

◐ = Less than significant impact

○ = No impact

Table 4-1
Summary of Potential Environmental and Socioeconomic Impacts *(continued)*

IMPACT ISSUES	REALIGNMENT ALTERNATIVES NAWS Point Mugu (Preferred Alternative)	NAS Lemoore	NAF El Centro
Air Quality			
Clean Air Act conformity	◑	◑	⊖
Emissions of nonattainment pollutants	◑	◑	⊖
Intersection carbon monoxide concentrations	⊖	⊖	⊖
Noise			
Construction noise	⊖	⊖	⊖
Aircraft noise	⊖	⊖	⊖
Traffic noise	⊖	⊖	⊖
Aesthetics and Visual Resources			
Visual character	⊖	⊖	⊖
Sensitive views	⊖	⊖	⊖
Consistency with plans and policies	⊖	⊖	⊖
Utilities and Services			
Water supply	⊖	⊖	⊖
Wastewater collection and treatment	⊖	⊖	⊖
Storm water collection and treatment	⊖	⊖	⊖
Solid waste collection and disposal	⊖	⊖	⊖
Natural gas and electric services	⊖	⊖	⊖
Schools	◑	◑	⊖
Child care	⊖	⊖	⊖
Health services	⊖	⊖	⊖
Recreational and community facilities	⊖	⊖	⊖
Police services	⊖	⊖	⊖
Fire protection	⊖	⊖	⊖
Cultural Resources			
Prehistoric resources	○	○	○
Traditional cultural properties	○	○	○
Historic archaeological resources	○	○	○
Historic architectural resources	○	○	○
Prehistoric subsurface deposits	◑	○	○
Historic subsurface deposits	○	○	○
Public Health and Safety			
Airspace safety	⊖	⊖	⊖
Accident potential zones	⊖	⊖	⊖
Explosive safety quantity distance arcs	○	○	○
Electromagnetic radiation	○	○	○

LEGEND:

● = Significant and not mitigable impact
◑ = Significant and mitigable impact
⊖ = Less than significant impact
○ = No impact

Table 4-1
Summary of Potential Environmental and Socioeconomic Impacts *(continued)*

IMPACT ISSUES	REALIGNMENT ALTERNATIVES NAWS Point Mugu (Preferred Alternative)	NAS Lemoore	NAF El Centro
Hazardous Materials and Wastes			
Hazardous materials management	⊕	⊕	⊕
Hazardous wastes management	⊕	⊕	⊕
Installation restoration program sites	⊕	⊕	⊕
Asbestos	⊕	⊕	⊕
PCBs	○	○	○
Storage tanks and OWSs	⊕	⊕	⊕
Pesticides	○	○	○
Lead	⊕	⊕	⊕
Ordnance	○	○	○
Radon	○	○	○

LEGEND:

● - Significant and not mitigable impact
◑ - Significant and mitigable impact
⊕ - Less than significant impact
○ - No impact

change to existing biological resources that would occur with the proposed action at one of the alternative bases.

Significance Criteria

The significance of a biological impact can be assessed at various geographical scales. Resources that are considered sensitive by federal, state, and/or local agencies for each base are the focus of this assessment. Implementation of the proposed action would have a significant impact if it would:

- Substantially affect species listed as threatened or endangered by state and/or federal resource agencies and other species specifically protected by applicable laws (i.e. Marine Mammal Protection Act [MMPA]);

- Substantially affect sensitive habitats, including a) habitats that are restricted at a regional scale; b) habitats that serve as concentrated breeding or foraging areas and are limited in availability; and/or c) habitats that support substantial concentrations of one or more special status species; or

- substantially affect resources considered to be significant by federal, state, or local agencies or authorities.

Each alternative base was evaluated for impacts to 1) highly productive, rare, and/or protected plant communities; 2) federally threatened and endangered species and state listed species of special concern; 3) significant undisturbed vegetation and/or wildlife; and 4) birds protected by the Migratory Bird Treaty Act.

Table 4-2 summarizes the potential impacts to biological resources identified in this analysis.

Table 4-2
Summary of Biological Resources Impacts

	REALIGNMENT ALTERNATIVES		
IMPACT ISSUES	NAWS Point Mugu (Preferred Alternative)	NAS Lemoore	NAF El Centro
Jurisdictional wetlands	○	○	○
Special status species	⊕	○	◑
Vegetation and wildlife	⊕	⊕	⊕
Birds protected by the Migratory Bird Treaty Act	⊕	⊕	⊕
Marine resources	⊕	○	○

LEGEND:

● - Significant and not mitigable impact
◑ - Significant and mitigable impact
⊕ - Less than significant impact
○ - No impact

4.1.1 Preferred Alternative: NAWS Point Mugu

The engine maintenance shop, ground support storage, ground support maintenance shop, airframe shop, dental clinic, and family service center would all be in renovated or rehabilitated existing facilities located in areas of existing development. The aircraft hangar and avionics shop would include the expansion of existing facilities. The aircraft hangar would also include the Applied Instruction Building (AIB) and would be renovated. The Operational Trainer Facility (OTF) and associated parking lot would be new construction on existing paved areas, and the vehicle parking adjacent to 13th Street would be new construction on disturbed upland areas. Most of the proposed development would not affect any sensitive biological resources.

Less than Significant Impacts

Jurisdictional wetlands. There would be no impacts to jurisdictional wetlands due to construction or expansion of the proposed facilities at NAWS Point Mugu. No mitigation is required.

Special status species. Light-footed clapper rails have been documented in the southern, coastal portion of NAWS Point Mugu in an area near the engine test cell. Clapper rails are known to leave marsh areas during high tides when the

marshlands are completely inundated and when individuals disperse to other habitat areas. There is a slight possibility that increased traffic generated by the operation of the test cell could result in an individual being killed by a passing vehicle. However it is unlikely that this would increase the potential for mortality since traffic is estimated to increase by an average of one vehicle per day on Laguna Road over the existing 5,370 vehicles per day. To further reduce the potential for mortality to the light-footed clapper rail signs would be posted along the roads in the vicinity of the engine test cell to advise motorists of the potential for light-footed clapper rail to cross the road. Temporary signs would be placed along the road near the clapper rail habitat during high tides.

Vegetation and wildlife. Construction and operations in support of the proposed action at NAWS Point Mugu would have a less than significant impact on vegetation and wildlife species. Approximately seven to 10 arroyo willows (*Salix lasiolepis*) would be affected by the proposed construction of a 375-space vehicle parking lot (0.5 acres or 0.2 hectares), and 1.3 acres (0.5 hectares) of landscaped and disturbed/ruderal habitat would be lost due to construction of the rest of the proposed facilities. This vegetation is used by species commonly found in urban environments. Because of the abundance of suitable landscaped areas on the nearby developed portions of the base and the creation of additional landscaping associated with the new construction, this impact is considered less than significant. No mitigation would be required.

Birds protected by the Migratory Bird Treaty Act. Development and operations in support of the proposed action at NAWS Point Mugu would have a less than significant impact on birds protected under the federal Migratory Bird Treaty Act. Virtually all bird species that migrate through NAWS Point Mugu are protected by the Act, and the base ensures that operations do not interfere with these species' nesting/breeding areas. Each naval air base has established a Bird Air Strike Hazard (BASH) Plan to reduce potential accidents from bird collisions, which also protects birds covered by the Migratory Bird Treaty. The BASH Plan uses several strategies to reduce the birdstrike potential, such as awareness of avoidance procedures, monitoring bird activity, and actively controlling bird populations and movements through habitat manipulation and land use planning (US Navy 1996b). No mitigation would be required.

Marine resources. No significant impacts to any marine species are expected. The "touch-and-go" exercises and field carrier landing practices (FCLP's) associated with flight operations would not have any effect on subsurface marine biota. Based on information on the abundance and distribution of marine mammals in the proposed project areas, and information on the ranges for the species involved, the proposed action does not pose a significant impact to marine mammals. There are no impacts expected from noise levels produced by the aircraft. Fixed-wing aircraft produce very low noise levels. Natural background (ambient) noise is often relatively high in the ROI.

No significant impacts to the harbor seal (*Phoca vitulina*) population are expected since noise levels and overflight distance would be within the standard for already existing operations. Aircraft routinely fly below 1,000 feet (305 meters) while transitioning NAWS Point Mugu. The harbor seal population at NAWS Point Mugu is habituated to the noise and to the visual presence of the aircraft. They have continued to pup successfully in the vicinity of these air operations. Any impact to an individual pinniped would most likely be a short-term startle response to noise (i.e., if the aircraft happened to approach suddenly or at an altitude below 500 feet). The air traffic control pattern for fixed-wing approaches is long, and not over the central basin. Generally, the only time aircraft are below 500 feet is when they are approaching runway 03/21 from the south for landing. In this event, an individual animal might experience a temporal behavioral response, most likely indicated by a sudden dive. Runway 09/27 would be used for most of the FCLP maneuvers. Overall, this population is acclimated to aircraft maneuvers that occur at Point Mugu.

No impacts are expected for other inshore, or offshore marine mammals. Flight operations would not occur below 500 feet at the offshore zones. There would be no long-term or cumulative impact and no effect on the overall population

4.1.2 NAS Lemoore Alternative

All proposed construction within NAS Lemoore would occur in areas of current development and/or disturbed landscaped areas. The OTF, applied instruction building (AIB), Aircraft Intermediate Maintenance Department (AIMD) facilities, gymnasium, and portions of the Bachelor Enlisted Quarters (BEQ) would all be located in areas of current development. The proposed aircraft hangar, aircraft parking apron, Airborne Early Warning Wing Pacific (AEWWINGPAC) administration building, child development center, youth center, and aircraft washrack and portions of the BEQ would be located in areas of disturbed and/or landscaped grasses. These areas are frequently mowed and irrigated. The proposed construction projects would not have any significant impacts to biological resources.

Less than Significant Impacts

Jurisdictional wetlands. There would be no impacts to jurisdictional wetlands due to construction or expansion of the proposed facilities. Three wetlands occur near the operations area of the NAS Lemoore site; however, none occurs in or directly adjacent to proposed project locations. No wetlands occur within the Administration/Housing area of the NAS Lemoore site. No mitigation is required.

Special status species. There would be no impacts to special status species due to construction or expansion of the proposed facilities. No special status plants and/or animals have been documented within the proposed project sites on NAS Lemoore.

Vegetation and wildlife. Approximately 6.7 acres (2.7 hectares) of disturbed/ruderal habitat and landscaped area would be lost due to construction or expansion of the proposed facilities. This vegetation is used by species commonly found in urban environments. Because of the abundance of suitable landscaped areas on the nearby developed portions of the base, the creation of additional landscaping associated with the new construction, and the abundance of nearby agricultural and open areas, this impact is considered less than significant, and no mitigation would be required.

Birds protected by the Migratory Bird Treaty Act. Potential impacts to birds protected by the Migratory Bird Treaty Act would be similar to those discussed for the NAWS Point Mugu Alternative. There would be no significant impacts to special status species and no mitigation would be required.

4.1.3 NAF El Centro Alternative

All proposed construction, including an aircraft hangar, aircraft parking apron, OTF, AIB, AIMD facilities, AEWWINGPAC administration building, aviation supply warehouse, vehicle parking area, engine test cell, BEQ, and child development center, would occur in areas that are currently developed, disturbed, or landscaped. The proposed construction projects would not have any significant impacts to biological resources.

Significant Impacts

Impact 1: Special status species. Potentially significant and mitigable impacts would occur to one state and federal species of concern (the Western burrowing owl). The Western burrowing owl, a California and federal Species of Concern, was observed at the intersection of Taxiway D and Taxiway E during the July 29, 1997 site visit. This area is adjacent to the proposed site for the majority of new construction at NAF El Centro, including the construction of the hangar, engine test cell, and supply warehouse.

Mitigation 1. To avoid impacts to Western burrowing owls, a biologist would conduct a pre-construction survey within the disturbed habitat to ensure that no burrowing owls are nesting in the area and to determine if the site is burrowing owl habitat. If burrowing owls were found at the site, they would be relocated elsewhere on the base. Implementation of these mitigation measures would reduce the impact to a less than significant level. No Section 7 consultation would be required under the Endangered Species Act.

Less than Significant Impacts

Jurisdictional wetlands. There would be no impacts to jurisdictional wetlands due to construction or expansion of the proposed facilities. No mitigation is required.

Vegetation and wildlife. Approximately 17.1 acres (6.9 hectares) of disturbed/ruderal habitat and agricultural habitat would be lost due to construction or expansion of the proposed facilities. This vegetation is used by

species commonly found in urban environments. Because of the abundance of suitable landscaped areas on the nearby developed portions of the base, the creation of additional landscaping associated with the new construction, and the abundance of nearby agricultural lands and open space, this impact is considered less than significant, and no mitigation would be required.

Birds protected by the Migratory Bird Treaty Act. Potential impacts to birds protected by the Migratory Bird Treaty Act would be similar to impacts discussed for the NAWS Point Mugu Alternative, and no mitigation would be required.

4.2 HYDROLOGY/SURFACE WATER QUALITY

This section identifies potential consequences to hydrology and surface water quality that may result from implementing the proposed action at one of the alternative bases. The impact analysis compares projected conditions after realignment to the affected environments and the regions of influence described in Section 3.2, Hydrology/Surface Water Quality.

Significance Criteria

Implementation of the proposed action would have a significant hydrology/surface water quality impact if it would:

- Substantially degrade the quality of surface or groundwater;
- Increase flooding on or off site, or subject project components to the 100-year recurrence flood; or
- Increase runoff so as to exceed existing storm drainage capacity.

Table 4-3 summarizes the potential hydrology/surface water quality impacts identified in this analysis.

Table 4-3
Summary of Hydrology/Surface Water Quality Impacts

	REALIGNMENT ALTERNATIVES		
IMPACT ISSUES	NAWS Point Mugu (Preferred Alternative)	NAS Lemoore	NAF El Centro
Exposure to flood hazards	ⓘ	○	○
Exceedence of storm water drainage capacity	ⓘ	ⓘ	ⓘ
Surface water quality degradation	ⓘ	ⓘ	ⓘ

LEGEND:

● - Significant and not mitigable impact
◑ - Significant and mitigable impact
ⓘ - Less than significant impact
○ - No impact

4.2.1 Preferred Alternative: NAWS Point Mugu

Less than Significant Impacts

Exposure to flood hazards. Although much of the base is mapped by the US Army Corps of Engineers as subject to 100-year flood hazards, the portion of the base where project improvements are proposed have been protected from flooding by a system of retaining walls and berms. None of the proposed new or expanded sites would be located within the base's flood hazard areas as mapped on the Master

Plan Environmental Constraints map. Therefore, no significant impacts are expected and no mitigation is required.

Exceedence of storm water drainage capacity. The increase in the rate and volume of storm water runoff at NAWS Point Mugu from this alternative would not significantly affect the collection and treatment system. The volume and rate of storm water runoff at NAWS Point Mugu would increase slightly because impervious surfaces would increase by approximately 3 acres (1.2 hectares) from the proposed development and expansion of current facilities at NAWS Point Mugu. The storm water collection system would be adequate to accommodate the construction, and minor upgrades would be designed to accommodate the projected increase in storm water flows (Cervantes 1997). No mitigation would be required.

Surface water quality degradation. Implementation of the proposed action at NAWS Point Mugu could significantly alter surface water quality. Development of the 375 new parking spaces could result in the generation of substantial quantities of oil and grease, which could be washed into the storm drain system and contaminate the receiving waters of Mugu Lagoon. Engine cleaning of the E-2 aircraft has been shown to result in discharges of cadmium into the wash water. If this water were allowed to enter the storm drain system, it could result in significant contamination. In addition, site preparation for new construction could increase erosion and the potential for mobilizing existing soil contaminants, if present, or contaminants from accidental spills.

The Navy would be required to comply with the requirements of the Clean Water Act (CWA) that limit non-point source discharges of pollutants and sediments. New construction would be performed in compliance with the State of California's General Construction Storm Water Permit and the proposed project sites would be included in the base's Storm Water Pollution Prevention Plan (SWPPP), in compliance with the State's General Industrial Storm Water Permit. Parking lot storm drains would be fitted with oil and grease traps or would drain into sand filters or other structural or nonstructural filters (i.e., grassy swale detention areas). Structural filters or traps would be cleaned as necessary to facilitate optimum effectiveness. Erosion control plans would be developed and implemented for any proposed project sites to be graded or left bare during the October-through-April rainy season. The Navy would confine E-2 engine cleaning to areas where wash water can be collected and treated. This water would not be directed to storm drains. Therefore, these impacts would be less than significant.

4.2.2 NAS Lemoore Alternative

Less than Significant Impacts

Exposure to flood hazards. Implementation of the proposed action at NAS Lemoore would not result in any flooding impacts because the proposed project

sites would not be located in areas subject to flooding. No impact would occur and no mitigation would be required.

Exceedence of storm water drainage capacity. The increase in storm water generated at NAS Lemoore from this alternative would not significantly affect the storm water infrastructure. The volume and rate of storm water runoff would increase slightly at NAS Lemoore because impermeable surfaces would increase by approximately 7 acres (2.8 hectares) from the proposed development and expansion of current facilities. The storm water collection system is in good condition and can withstand most storm events. It would be adequate to accommodate the new construction, and minor upgrades would be designed to accommodate the projected increase in storm water flows (Stewart 1997). No mitigation would be required.

Surface water quality degradation. Implementation of the proposed action at NAS Lemoore would not result in the significant degradation of surface water quality. Construction and operation of the new project facilities would increase the potential for non-point source discharges of pollutants. Engine cleaning of the E-2 aircraft has been shown to result in discharges of cadmium into the wash water. If this water were allowed to enter the storm drain system, it could result in significant contamination. The Navy would confine E-2 engine cleaning to areas where wash water can be collected and treated. This water would not be directed to storm drains. The Navy would be required to comply with the requirements of the CWA that limit non-point source discharges of pollutants and sediments. New construction would be performed in compliance with the State of California's General Construction Storm Water Permit and the proposed project sites would be included in the base's SWPPP, in compliance with the State's General Industrial Storm Water Permit. Therefore, no mitigation would be required.

4.2.3 NAF El Centro Alternative

Less than Significant Impacts

Exposure to flood hazards. Implementation of the proposed action at NAF El Centro would not result in any flooding impacts because the proposed facilities would not be located in areas subject to flooding. No impact would occur and no mitigation would be required.

Exceedence of storm water drainage capacity. The increase in storm water generated at NAF El Centro from this alternative would not significantly affect the storm water infrastructure. The volume and rate of storm water runoff would increase slightly because impermeable surfaces would increase by approximately 13.2 acres (5.28 hectares) from the proposed development and expansion of current facilities at NAF El Centro. The storm water collection system would be adequate to accommodate the construction, and minor upgrades would be designed to

accommodate the projected increase in storm water flows (Flowers 1997). No mitigation would be required.

Surface water quality degradation. Implementation of the proposed action at NAF El Centro would not result in the significant degradation of surface water quality. Construction and operation of the new project facilities would increase the potential for non-point source discharges of pollutants. Engine cleaning of the E-2 aircraft has been shown to result in discharges of cadmium into the wash water. If this water were allowed to enter the storm drain system, it could result in significant contamination. The Navy would confine E-2 engine cleaning to areas where wash water can be collected and treated. This water would not be directed to storm drains. The Navy would be required to comply with the requirements of the CWA that limit non-point source discharges of pollutants and sediments. New construction would be performed in compliance with the State of California's General Construction Storm Water Permit and the proposed project sites would be included in the base's SWPPP, in compliance with the State's General Industrial Storm Water Permit. Therefore, no mitigation would be required.

4.3 LAND USE AND AIRSPACE

This section identifies potential consequences to land use and airspace that may result from implementing the proposed action at one of the alternative bases. The impact analysis compares projected conditions after realignment to the affected environments and regions of influence described in 3.3, Land Use and Airspace. The analysis evaluates changes to existing land uses, compatibility of land use changes with the Air Installation Compatible Use Zone (AICUZ) program standards, and impacts upon existing air operations resulting from implementation of the proposed action at each alternative base.

Significance Criteria

Within a Navy facility, the base Master Plan and AICUZ identify land use designations and standards for land use compatibility based on noise and safety conditions. County master plans designate land uses off base, however, consistency with AICUZ recommendations is also encouraged. An impact associated with siting of the E-2 aircraft or associated structures, whether it be on base or off base, is significant if it is incompatible with existing land uses, existing noise conditions, or accident potential zones as established in these documents. Impacts to airspace operations occur if the proposed action affects the way airspace is being used.

Table 4-4 summarizes the potential land use and airspace impacts identified in this analysis.

Table 4-4
Summary of Land Use and Airspace Impacts

	REALIGNMENT ALTERNATIVES		
IMPACT ISSUES	NAWS Point Mugu (Preferred Alternative)	NAS Lemoore	NAF El Centro
Compatibility with on-base land uses	◐	◐	◐
Consistency with AICUZ land use compatibility guidelines: safety	○	○	◐
Consistency with AICUZ land use compatibility guidelines: noise	◐	◐	◑
Exceedance of imaginary surface restrictions	○	◐	◑
Compatibility with regional land uses	◐	◐	◐
Impacts to airspace operations	◐	◐	◐
Consistency with coastal zone policies	◐	○	○

LEGEND:
● - Significant and not mitigable impact
◑ - Significant and mitigable impact
◐ - Less than significant impact
○ - No impact

4.3.1 Preferred Alternative: NAWS Point Mugu

Less than Significant Impacts

Compatibility with on-base land uses. Implementation of the proposed action at NAWS Point Mugu would not significantly affect existing land uses where new

structures are compatible with these uses. Several projects associated with the E-2 realignment are consistent with existing land uses as described below.

Expansion and renovation of an existing aircraft hangar (Building 553) currently used to house an F-14 squadron is proposed as the E-2 aircraft hangar. There would be no significant impacts to on-base land uses associated with implementation of this project, and no mitigation would be required.

The proposed OTF site is located immediately east of Building 553 in the training/operations land use area and is within an existing concrete paved area. The proposed project site for the avionics shop is the aircraft maintenance area adjacent to Building 385. There would be no significant impacts to on-base land uses associated with implementation of this project, and no mitigation would be required.

An existing engine test cell site on the peninsula of the base in the test/evaluation land use area would be used to test E-2 engines. The site contains damaged pavement and gravel-covered ground. The proposed use would be consistent with the designation for this area and would not affect open space or recreation land uses. No mitigation would be required.

Consistency with AICUZ land use compatibility guidelines: safety. The proposed E-2 facilities would not conflict with AICUZ safety guidelines. All facilities would be located outside of accident potential zones (APZs). There would be no impacts from safety restriction violations and no mitigation would be required.

Consistency with AICUZ land use compatibility guidelines: noise. All proposed E-2 facilities, except the OTF, would be compatible with AICUZ noise restrictions. Due to the type of training functions conducted at the OTF, standard construction practices would be adequate to attenuate noise to levels that would comply with the adopted goals and objectives of the AICUZ program. There would be no significant impacts associated with AICUZ noise restrictions from implementation of this project, and no mitigation would be required.

Exceedance of imaginary surface restrictions. All proposed E-2 facilities would be below imaginary surface restrictions. There would be no impacts to aircraft navigation from these structures. No mitigation would be required.

Compatibility with regional land uses. Airfield operations at NAWS Point Mugu are protected from encroachment by agricultural land, game reserves, and Point Mugu State Park. There would be no significant impacts associated with regional land uses. No mitigation would be required.

Impacts to airspace operations. The increased number of flights at NAWS Point Mugu from the realigned aircraft would not significantly affect flight operations. The addition of the E-2 aircraft would increase airfield use as well as flight operations in the airspace above the airfield by approximately 27 to 31 percent.

Consultation with an air traffic control specialist at NAWS Point Mugu indicates that this could be accommodated within established operational procedures and flight patterns (Garcia 1997). The FAA also concurs that the relatively small number of E-2 aircraft flights in and near the Los Angeles ARTCC could be absorbed without impact (Spada 1997). No mitigation would be required.

Consistency with coastal zone policies. Pursuant to the Coastal Zone Management Act (CZMA), federal activities that could affect land, water, or natural resources in the coastal zone must be consistent with the enforceable policies of the approved state coastal zone program to the maximum extent practicable. Because the proposed action at NAWS Point Mugu would affect the coastal zone, the Navy has prepared a Coastal Consistency Determination (CCD), which has been submitted to the Coastal Commission.

4.3.2 NAS Lemoore Alternative

Less than Significant Impacts

Compatibility with on-base land uses. Implementation of the proposed action at NAS Lemoore would not significantly affect existing land uses where new structures are compatible with these uses. Several projects associated with the E-2 realignment are consistent with existing land uses as described below.

The proposed project sites for the aircraft hangar, aircraft parking apron, aircraft washrack, OTF, AEWWINGPAC administration building, AIB and the AIMD facilities are within the operations area of the base. The proposed location for the aircraft hangar and aircraft parking apron is adjacent to a runway in an area designated for training and operations. The site does not contain any structures and has a large maintained open space and concrete paved area. A vacant area south of Building 43 designated for training and operations is the proposed site for the OTF. The proposed site for the AEWWINGPAC administration building is an area designated for training and operations and does not currently contain any structures. AIMD facilities are proposed within a portion of the base designated for maintenance (US Navy 1992a). These proposed uses would be consistent with the function of the area and other existing land uses in the area. No mitigation would be required.

Construction for the child development center and youth center would occur within the housing area in an area designated for personnel support. The new BEQ would also be built in the administration area in a portion of the base designated for housing (US Navy 1992a). There would be no significant impacts to on-base land uses associated with implementation of this project, and no mitigation would be required.

It is unlikely that the removal of approximately 3 acres (5 hectares) of agricultural outlease land that is on base and in a predominantly developed area would constitute a significant impact to agricultural production. The Farmland Protection Policy Act (FPPA) would not apply because §658.3 of the legislation

would exempt conversion of farmland for purposes of national defense (Bunter 1997). No mitigation would be required.

Consistency with AICUZ land use compatibility guidelines: safety. The proposed E-2 facilities would not conflict with AICUZ safety guidelines. The facilities proposed in the operations area (aircraft hangars, aircraft parking apron, aircraft washrack, AIB, OTF, AIMD facilities and the AEWWINGPAC administration building) would all be located outside of an APZ. The child development center and youth center would be constructed in the housing area, which is located outside the AICUZ. There would be no impacts from safety restriction violations. No mitigation would be required.

Consistency with AICUZ land use compatibility guidelines: noise. Several proposed facilities, including the AEWWINGPAC administration building, the AIB, the OTF, and the BEQ, would be incompatible or normally incompatible land uses according to AICUZ noise restrictions. Standard construction practices for these facilities would attenuate noise to levels that would comply with the adopted goals and objectives of the AICUZ program. There would be no significant impacts associated with AICUZ noise restrictions from implementation of this project, and no mitigation would be required.

Exceedance of imaginary surface restrictions. Proposed E-2 facilities would not penetrate imaginary surfaces. Facilities proposed for the operations area would be located between two runways but outside the primary surface of each. However, they would be in the inner horizontal surface and accordingly, should be less than 150 feet (46 meters) in height. However, the likelihood of any structure exceeding 150 feet (46 meters) is extremely low. The facilities in the housing and administration areas would be located in the approach-departure clearance surface. It is very unlikely that any building would be tall enough to exceed height restrictions for these imaginary surfaces. No mitigation would be required.

Compatibility with regional land uses. Implementation of the proposed action at NAS Lemoore would not significantly affect regional land uses. Airfield operations at NAS Lemoore are protected from encroachment by Fresno and Kings counties. Both counties have policies in their respective General Plans that encourage agricultural production and limit building heights near the base. There would be no significant impacts associated with regional land uses, and no mitigation would be required.

Impacts to airspace operations. The increase in numbers of flights at NAS Lemoore from the realignment action would not significantly affect flight operations. The addition of the E-2 aircraft would increase airfield use as well as flight operations in the airspace above the airfield by approximately 6 to 7 percent. Consultation with an air traffic control specialist at NAS Lemoore indicates that this could be accommodated within established operational procedures and flight patterns (Craig, 1997). No changes in airfield operations or airspace designations would be

necessary to operate and train the E-2 aircraft squadrons. There would be no significant impacts to airspace designations, and no mitigation would be required.

4.3.3 NAF El Centro Alternative

Significant Impacts

Impact 1: Consistency with AICUZ land use compatibility guidelines: noise. A significant and mitigable impact would occur at NAF El Centro from locating the BEQ, the child development center, and the AEWWINGPAC administration building in areas incompatible with AICUZ noise restrictions. No other feasible sites have been identified for these buildings. These facilities would be in areas of 75-dB CNEL or greater and would be clearly incompatible land uses.

Mitigation 1. Incorporation of noise attenuation measures into facility design would bring these uses into compliance with the adopted goals and objectives of the AICUZ program. Implementation of this mitigation would reduce the impact to a less than significant level.

Impact 2: Exceedance of imaginary surface restrictions. A significant and mitigable impact would occur at NAF El Centro from locating E-2 facilities within the helicopter imaginary surface restrictions. The proposed aircraft hangar, aircraft parking apron, OTF, AIB, AIMD facilities, and AEWWINGPAC administration building would exceed the helicopter imaginary surface at the end of Runway 3. No other feasible sites have been identified for these buildings.

Mitigation 2. The only suitable location to construct these facilities is in the helicopter approach; therefore, the Navy would modify the approach-departure path of the helicopter pad to avoid the new structures. Implementation of this mitigation would reduce the impact to a less than significant level.

Less than Significant Impacts

Compatibility with on-base land uses. Implementation of the proposed action at NAF El Centro would not significantly affect existing land uses where new structures are compatible with these uses. Several projects associated with the E-2 realignment are consistent with existing land use patterns as described below.

The proposed aircraft hangar, aircraft parking apron, OTF, AIB, AIMD facilities, AEWWINGPAC administration building, and engine test cell sites are located in an area designated for aircraft training and operations. It is unlikely that the removal of approximately 12 acres (5 hectares) of agricultural outlease land that is on base and in a predominantly developed area would constitute a significant impact to agricultural production. The Farmland Protection Policy Act (FPPA) would not apply because Section 658.3 of the legislation would exempt conversion of farmland for purposes of national defense (Bunter 1997). No mitigation would be required.

The proposed site for the BEQ is a vacant lot located between C Street and B Street, north of Building 410, in a housing land use area. The proposed child development center site is located in a vacant area adjacent to existing housing, designated for personnel support (US Navy 1988a).

Consistency with AICUZ land use compatibility guidelines: safety. One group of proposed operational facilities (OTF, AIMD facilities, AEWWINGPAC administration building, and vehicle parking areas) would extend south of 8th Street into an APZ II. The AICUZ discourages, but does not preclude, inhabitable structures from being located in an APZ II. No other facilities would be located within a Clear Zone or APZ. Therefore, there would be no significant impacts to Clear Zones or APZs and no mitigation would be required.

Consistency with AICUZ land use compatibility guidelines: noise. Other than the BEQ, Child development center, and AEWWINGPAC Administration Building, all other facilities would be clearly compatible or normally compatible with the AICUZ noise guidelines. The OTF would be located in a 75-dB CNEL where it would be a normally incompatible use. Due to the type of training functions conducted at this facility, standard construction practices would be adequate to attenuate noise to levels that would comply with the adopted goals and objectives of the AICUZ program. No mitigation would be required.

Exceedance of imaginary surface restrictions. Other than exceedances associated with the helicopter imaginary surfaces, no aircraft imaginary surface restriction exceedances would result from the proposed construction activities. No mitigation would be required.

Compatibility with regional land uses. Implementation of the proposed action at NAF El Centro would not significantly affect regional land uses. Conversion of approximately 12 acres (5 hectares) of land out of agricultural production would not be a significant impact. Airfield operations at NAF El Centro are protected from encroachment by Imperial County General Plan policies that encourage agricultural production and limit building heights near the base. No mitigation would be required.

Impacts to airspace operations. The addition of the E-2 aircraft would increase airfield use as well as flight operations in the airspace above the airfield by approximately 10 to 12 percent. Consultation with an air traffic control specialist at NAF El Centro indicates that this could be accommodated within established operational procedures and flight patterns. There may be an increase in conflicts between the NAF El Centro airfield and the Imperial County Airfield, but air traffic control at NAF El Centro does not believe any new agreements between the facilities would be necessary (Friel 1997). No changes in airfield operations or airspace designations would be necessary to operate and train the E-2 aircraft squadrons. No mitigation would be required.

4.4 SOCIOECONOMICS

This section describes potential consequences to socioeconomic indicators that may result from implementing one of the realignment alternatives. The socioeconomic indicators for this study include population, employment, income, housing, business volume, and net government revenues. The impact analysis compares projected conditions after realignment to the affected environments and ROIs described in Section 3.4, Socioeconomics.

Significance Criteria

Implementation of the proposed action would have a significant socioeconomic effect if it would:

- Fall outside the Economic Information Forecast System (EIFS) model Rational Threshold Values (RTV) boundaries for population, employment, personal income, or business volume;
- Substantially affect the local housing market and vacancy rates; or
- Substantially decrease net government revenues.

Economic Impact Forecast System (EIFS) is a computerized economic base model, which includes an RTV standard that determines whether the expected change generated by a proposed action is significant. The RTV is calculated on the basis of yearly historical fluctuations in population, employment, income, and business volume within the ROI (county or counties). For a change to be significant, it must exceed the computed positive or negative RTV. Appendix C contains complete RTV tables for all three bases and EIFS Model results for the proposed project.

Two types of models were run within the EIFS modeling system to take into consideration the effects of operations and construction. The operations effects (the change in E-2 aircraft personnel and procurement) are described by the standard model, and the construction phase effects are described by the construction model. In both cases, any change entered into the model affecting a sector of the economy causes a change in payrolls and employment of local firms. Further, the change in payrolls and employment for the export sector is transmitted to the local service sector as a multiple of the original change. In addition to this multiplier effect, EIFS converts the direct and indirect effects of business volume, employment, and income into other economic and social impacts by a series of county-specific equations.

Table 4-5 summarizes the potential socioeconomic impacts that have been identified in this analysis. In the following analysis of impacts, the year with the most change is discussed, which in all cases is 1999.

Table 4-5
Summary of Socioeconomic Impacts

IMPACT ISSUES	REALIGNMENT ALTERNATIVES		
	NAWS Point Mugu (Preferred Alternative)	NAS Lemoore	NAF El Centro
Population	◐	◐	◐
Employment	◐	◐	◐
Income	◐	◐	◐
Housing	◐	◐	◐
Business volume	◐	◐	◐
Net government revenues	◐	◐	◐

LEGEND:
● - Significant and not mitigable impact
◑ - Significant and mitigable impact
◐ - Less than significant impact
○ - No impact

Approach to the Analysis

Some assumptions were made with respect to realignment activities pertaining to operations and construction. Table 4-6 lists aircraft squadron and support personnel. As described in Chapter 2, realignment of the four E-2 aircraft squadrons would precipitate the relocation of 988 military and civilian personnel to the receiving base. The 988 squadron and support personnel would consist of 130 officers, 818 enlisted, and 40 civilians.

Table 4-6
Realignment Personnel

Unit	Officers	Enlisted	Civilians	Total
AEWWINGPAC	11	21	8	40
VAW112	29	124	0	153
VAW 113	29	124	0	153
VAW 116	29	124	0	153
VAW 117	29	124	0	153
SEAOPDET	0	71	0	71
AIMD	0	146	4	150
ANS	3	48	14	65
NAMTRAGRU	0	34	0	34
NAESU	0	2	14	16
Total	**130**	**818**	**40**	**988**

Source: Linscott, Law & Greenspan 1997.

The realignment of personnel would take place between July 1998 and December 1999. It is assumed that half the personnel would be assigned immediately to the selected base in July 1998, and the other half would be assigned in January 1999. Because most economic activity would remain at the selected base (income would

be sent back to the home base), deployment of personnel has not been considered in this study. Table 4-7 describes the initial build-up of personnel. For the year 1999 and beyond, it is assumed that a steady level of personnel would be maintained.

Table 4-7
Estimated Personnel Build-Up

	NAWS Point Mugu (Preferred Alternative)	NAS Lemoore	NAF El Centro
1998*			
Military	474	474	474
Civilian	20	20	20
Civilian Auxiliary	4	0	32
1999			
Military	948	948	948
Civilian	40	40	40
Civilian Auxiliary	8	0	65

*Half the total military, civilian, and civilian auxiliary personnel are anticipated to be assigned to the new base.

To generate extra support needed at some bases, it is anticipated that auxiliary civilian personnel would be hired. For the purpose of this study, the additional support personnel are assumed to be clerical or semi-skilled and easily hired from the local area.

The construction phase would involve the construction/expansion or renovation/rehabilitation of facilities. The amount of construction activity is dependent upon which base is chosen for the project; therefore, the dollar costs of construction vary from base to base (Table 4-8). The construction phase would begin in July 1998 and end in March 2000. No major construction activities are anticipated to occur in 2001 or beyond.

Table 4-8
Estimated Annual Construction Costs

	NAWS Point Mugu	NAS Lemoore	NAF El Centro
1998	$10,156,000	$22,625,000	$27,329,000
1999	$15,696,000	$31,383,000	$37,450,000
2000	$2,770,000	$4,379,000	$5,061,000
Total*	$28,622,000	$58,387,000	$69,840,000

*No construction activities are anticipated to occur in 2001.

It is estimated that annual procurement for the E-2 squadrons would approach approximately $1.4 million. A portion of these dollars would be injected into the local economy of each potential realignment ROI.

4.4.1 Preferred Alternative: NAWS Point Mugu

With the NAWS Point Mugu Alternative, many of the facility requirements could be met through existing facilities. The total cost to implement the proposed action at NAWS Point Mugu would be approximately $28.6 million. In addition to the 988 military and civilian personnel required as discussed in the introduction to this section, NAWS Point Mugu would require a supplement of eight civilian personnel.

Less than Significant Impacts

Population. Implementation of the proposed action at NAWS Point Mugu would result in a less than significant population impact. The proposed realignment would increase the Ventura County population in 1999 by 2,548 (Table 4-9), a less than one percent change. This change would be within the historic RTV range and would not be considered significant. No mitigation would be required.

Table 4-9
Socioeconomic Effects at NAWS Point Mugu (Preferred Alternative)

	Population	Employment	Income ($1,000)	Housing		Business Volume ($1,000)	Net Government Revenues ($1,000)
				Rental	Owner-Occupied		
1998							
Operations	619	306	$8,048	105	64	$8,973	$248
Construction	45	467	$4,203	20	0	$15,144	$13
Total	664	465	$12,251	125	64	$24,117	$261
1999							
Operations	2,478	1,210	$31,886	420	255	$33,445	$996
Construction	70	249	$6,496	31	0	$23,405	$20
Total	2,548	1,459	$38,382	451	255	$56,850	$1,016
2000							
Operations	2,478	1,210	$31,886	420	255	$33,445	$996
Construction	12	44	$1,146	5	0	$4,130	$4
Total	2,490	1,254	$33,032	425	255	$37,575	$1,000
2001							
Operations	2,478	1,210	$31,886	420	255	$33,445	$996
Construction*	0	0	$0	0	0	$0	$0
Total	2,478	1,210	$31,886	420	255	$33,445	$996

*No construction activities are anticipated to occur in 2001.

Source: EIFS Model.

Employment. Implementation of the proposed action at NAWS Point Mugu would result in a less than significant impact on employment. Employment changes include both direct and indirect changes. The direct change in local employment is that produced by the proposed realignment. Indirect change is the subsequent increase in employment produced by the multiplier effect resulting from increased spending by project workers. In 1999, direct and indirect

employment in the county would increase by 1,459, the largest annual increase in employment with this alternative, but still a little above a half percent change over the baseline. This change would be within the historic RTV range and would not be considered significant. No mitigation would be required.

Income. Implementation of the proposed action at NAWS Point Mugu would result in a less than significant impact to income. Changes in income represent the wage and salary payments made to construction workers, to employees in the local trade and service industry whose jobs are dependent on local realignment-related expenditures, and to the resident workforce. The potential realignment to NAWS Point Mugu would increase total income of Ventura County in 1999 by $38,382,000, a change of almost a third of one percent. This change would be within the historic RTV range and would not be considered significant. No mitigation would be required.

Housing. Implementation of the proposed action at NAWS Point Mugu would result in a less than significant impact on housing. The E-2 realignment to NAWS Point Mugu would create a demand for 451 rental units and 255 owner-occupied units. The vacancy rate is low (4.9 percent) in Ventura County, indicating a high demand for housing. In 1994, 11,764 housing units were available in Ventura County, and it is estimated to be similar in 1999. The available housing stock would more than adequately accommodate the demand for housing. No mitigation would be required.

Business volume. Implementation of the proposed action at NAWS Point Mugu would result in a less than significant impact to business volume. Changes in local business activity resulting from the realignment include two components: direct business volume and induced business volume. Direct business volume is the change in the dollar value of sales in the retail and wholesale trade sector and receipts in the service sector resulting from local purchases by civilian and military personnel, as well as construction and procurement expenditures. Induced business volume is the additional business activity generated as a result of the direct change in sales. Business volume related to the E-2 realignment would be the highest in 1999, at $56,850,000, which would be a little over half of one percent change over the baseline. This change would be within the historic RTV range and would not be considered significant. No mitigation would be required.

Net government revenues. Implementation of the proposed action at NAWS Point Mugu would result in a less than significant impact to net government revenues. Net government revenues are the total government revenues that would be attributable to the realignment. The 1999 government revenues for this alternative would be $996,000. This represents a change of less than a quarter percent of the baseline total revenues. This change would not be considered substantial and no mitigation would be required.

4.4.2 NAS Lemoore Alternative

Implementation of the proposed action at NAS Lemoore would require new construction, modification of existing facilities, and new equipment in support of the realignment of the E-2 squadrons and associated personnel. The total construction costs would be approximately $58.4 million. NAS Lemoore would not require any additional civilian personnel, above the 988 military and civilian personnel required at any of the receiving bases, to support the E-2 squadron.

Less than Significant Impacts

In terms of absolute value, implementation of the proposed action at NAS Lemoore would result in the greatest change in population, employment, income, rental units required, and business volume. However, all impacts would be considered less than significant with total annual increases over the baseline of a percent or less.

Population. Implementation of the proposed action at NAS Lemoore would result in a less than significant population impact. The aggregated population of Kings and Fresno counties would increase by 2,617 in 1999 with this alternative (Table 4-10). This population increase would be less than one percent more than the baseline population. This change would be within the historic RTV range and would not be considered significant. No mitigation would be required.

Table 4-10
Socioeconomic Effects at NAS Lemoore

	Population	Employment	Income ($1,000)	Housing		Business Volume ($1,000)	Net Government Revenues ($1,000)
				Rental	Owner-Occupied		
1998							
Operations	619	328	$10,530	106	63	$10,417	$610
Construction	102	381	$9,274	45	0	$30,459	$37
Total	721	709	$19,804	151	63	$40,876	$647
1999							
Operations	2,476	1,294	$41,809	425	250	$39,458	$2,448
Construction	141	528	$12,864	62	0	$42,249	$52
Total	2,617	1,822	$54,673	487	250	$51,707	$2,500
2000							
Operations	2,476	1,294	$41,809	425	250	$39,458	$2,448
Construction	20	74	$1,795	9	0	$5,895	$7
Total	2,496	1,368	$43,604	434	250	$45,353	$2,455
2001							
Operations	2,476	1,294	$41,809	425	250	$39,458	$2,448
Construction*	0	0	$0	0	0	$0	$0
Total	2,476	1,294	$41,809	425	250	$39,458	$2,448

*No construction activities are anticipated to occur in 2001.

Source: EIFS Model.

Employment. Implementation of the proposed action at NAS Lemoore would result in a less than significant impact on employment. The largest increase in employment (a little above a half percent over the baseline) would be 1,822

workers associated with construction and operations activities in 1999. This change would be within the historic RTV range and would not be considered significant. No mitigation would be required.

Income. Implementation of the proposed action at NAS Lemoore would result in a less than significant impact to income. In 1999 the E-2 realignment would increase the aggregate income by $54,673,000, the largest increase during the first four years of activities. This change would be within the historic RTV range and would not be considered significant. No mitigation would be required.

Housing. Implementation of the proposed action at NAS Lemoore would result in a less than significant impact on housing. In the year with the most activity (1999), 487 rental units and 250 owner-occupied units would be needed for re-aligned E-2 personnel and family members. In 1994, 13,780 units were vacant, and the ROI had a vacancy rate of 5.1 percent. The vacancy rate is estimated to be similar in 1999. The required units could be accommodated with this alternative. This demand would not be considered substantial given the availability of housing in the ROI. No mitigation would be required.

Business volume. Implementation of the proposed action at NAS Lemoore would result in a less than significant impact to business volume. Business volume for the ROI would increase by $81,707,000 in 1999, the year with the greatest change. This reflects an increase of less than one percent over the baseline. This change would be within the historic RTV range and would not be considered significant. No mitigation would be required.

Net government revenues. Implementation of the proposed action at NAS Lemoore would result in a less than significant impact to net government revenues. Government revenues would increase by $2,500,000 in 1999, which would be less one percent of Kings and Fresno Counties' total revenues. This change would not be considered substantial and no mitigation would be required.

4.4.3 NAF El Centro Alternative

Implementation of the proposed action at NAF El Centro would require new construction of facilities to support the E-2 squadrons and associated personnel. Construction of new E-2 facilities would cost approximately $69.8 million. In addition to the 988 military and civilian personnel, NAF El Centro would require 65 additional civilian employees to support the E-2 squadrons.

Less than Significant Impacts

Population. Implementation of the proposed action at NAF El Centro would result in a less than significant population impact. The direct and indirect population increase ascribed to the realignment activities would be the largest in 1999 at 2,594 (Table 4-11), which would be almost two percent over the baseline

population. This change would be within the historic RTV ranges and would not be considered significant. No mitigation would be required.

Employment. Implementation of the proposed action at NAF El Centro would result in a less than significant impact on employment. Employment increases in the ROI would be 1,536 in 1999, or almost three percent above the baseline. Employment increases in other years would be less because of less construction activity and (in 1998) less operations build-up (half the personnel would be relocated). This change would be within the historic RTV range and would not be considered significant. No mitigation would be required.

Table 4-11
Socioeconomic Effects at NAF El Centro

	Population	Employment	Income ($1,000)	Housing		Business Volume ($1,000)	Net Government. Revenues ($1,000)
				Rental	Owner-Occupied		
1998							
Operations	620	304	$7,827	106	63	$5,477	$1,221
Construction	83	238	$5,968	37	0	$15,847	$619
Total	703	542	$13,795	143	63	$21,324	$1,840
1999							
Operations	2,480	1,210	$31,218	423	252	$20,989	$4,879
Construction	114	326	$8,178	50	0	$21,715	$848
Total	2,594	1,536	$39,396	473	252	$42,704	$5,727
2000							
Operations	2,480	1,210	$31,218	423	252	$20,989	$4,879
Construction	15	44	$1,105	7	0	$2,935	$115
Total	2,495	1,254	$32,323	430	252	$23,924	$4,994
2001							
Operations	2,480	1,210	$31,218	423	252	$20,989	$4,879
Construction*	0	0	$0	0	0	$0	$0
Total	2,480	1,210	$31,218	423	252	$20,989	$4,879

*No construction activities are anticipated to occur in 2001.
Source: EIFS Model.

Income. Implementation of the proposed action at NAF El Centro would result in a less than significant impact to income. Income would increase two percent over the baseline income ($39,396,000 in 1999.) This change would be within the historic RTV range and would not be considered significant. No mitigation would be required.

Housing. Implementation of the proposed action at NAF El Centro would result in a less than significant impact on housing. The E-2 realignment to NAF El Centro would create a demand for 473 rental and 252 owner-occupied units in the year of greatest activity (1999). In 1994, almost 4,000 units were available in the ROI, and availability is estimated to be similar in 1999. The E-2 realignment demand would not be considered substantial when compared to the available housing units, and no mitigation would be required.

Business volume. Implementation of the proposed action at NAF El Centro would result in a less than significant impact to business volume. Realignment activities would directly and indirectly create an additional $42,704,000 in business volume, or around four percent over the baseline. This change would be within the historic RTV range and would not be considered significant. No mitigation would be required.

Net government revenues. Implementation of the proposed action at NAF El Centro would result in a less than significant impact to net government revenues. Revenues are projected to increase by $5,727,000 in 1999. This would result in a 4.6 percent increase in revenues over the baseline. This change would not be considered substantial and no mitigation is required.

4.5 TRAFFIC AND CIRCULATION

This section identifies potential consequences to traffic and circulation that may result from implementing the proposed action at one of the alternative bases. The traffic and circulation analysis is an evaluation of the nature and extent of change to existing traffic generation and levels of service through implementation of the proposed action at the three alternative bases. This section summarizes the traffic impact analysis for the E-2 squadrons realignment. The full traffic analysis is available upon request for review (Linscott, Law & Greenspan 1997).

Significance Criteria

The significance criteria are based on local standards for traffic operations, where available. The Ventura County General Plan has established minimum level of service (LOS) standards for the streets and roadways in the unincorporated areas of the County. These standards differ by roadway classification. A LOS D is the minimum acceptable LOS on County thoroughfares and federal and state highways, which includes the Pacific Coast Highway, Wood Road, and Las Posas Road; and a LOS C is the minimum acceptable LOS on local road, such as Navalair and Frontage Roads. Any impacts would require mitigation measures to reduce the impact to a less than significant level.

The California State Department of Transportation (CalTrans) District 6, which includes NAS Lemoore, has significance criteria in its April 1993 publication *A Guide For Traffic Impact Studies*. The guide states that LOS C is the minimum acceptable level of service, except where the existing traffic condition is LOS D or worse; in this case, the existing LOS and volume-to-capacity ratio (V/C) should be maintained through mitigation.

For the purposes of this analysis, significance criteria for the NAS Lemoore and NAF El Centro alternatives was based on the more stringent CalTrans District 6 LOS C standard. Traffic impact analyses are typically performed using the most probable "worst case" land use assumptions and traffic generation rates for those land uses that represent the likely traffic levels on an average day of the year. These criteria for intersections and roadway segments are described as follows.

For all NAS Lemoore and NAF El Centro intersections and the NAWS Point Mugu intersections along Navalair and Frontage Roads, the following criteria were used:

- For intersections currently operating at LOS A, B, or C, the impact would be significant if the LOS changes to LOS D or worse with the addition of project traffic.

- For intersections currently operating at LOS D or worse, the impact would be significant if any change to a worse LOS occurs with the addition of project traffic.

For the NAWS Point Mugu intersection on Las Posas Road, the following criteria were used:

- For intersections currently operating at LOS A, B, C, or D, the impact would be significant if the LOS changes to LOS E or worse with the addition of project traffic.

- For intersections currently operating at LOS E or worse, the impact would be significant if any change to a worse LOS occurs with the addition of project traffic.

For all NAS Lemoore and NAF El Centro street segments and the NAWS Point Mugu street segments along Navalair and Frontage Roads, the following criteria were used:

- For street segments currently operating at LOS A, B, or C, the impact would be significant if the LOS changes to LOS D or worse with the addition of project traffic.

- For street segments currently operating at LOS D or E, the impact would be significant if a) any change to a worse LOS occurs with the addition of project traffic; or b) any increase in the V/C ratio occurs with the addition of project traffic.

For the NAWS Point Mugu street segments along the Pacific Coast Highway, Wood Road, and Las Posas Road, the following criteria were used:

- For street segments currently operating at LOS A, B, C, or D, the impact would be significant if the LOS changes to LOS E or worse with the addition of project traffic.

- For street segments currently operating at LOS E or worse, the impact would be significant if a) any change to a worse LOS occurs with the addition of project traffic; or b) any increase in the volume-to-capacity (V/C) ratio occurs with the addition of project traffic.

Table 4-12 summarizes the potential traffic and circulation impacts that have been identified in this analysis.

Approach to the Analysis

The traffic analysis does not include the impacts of the realignment of family members, except to the extent that some of the personal travel assumed to occur off base during the day may be attributed to family members. Since most family members are assumed to be housed off base, these impacts would be dispersed throughout the surrounding communities. The travel generated by family

Table 4-12
Summary of Traffic and Circulation Impacts

IMPACT ISSUES	REALIGNMENT ALTERNATIVES		
	NAWS Point Mugu (Preferred Alternative)	NAS Lemoore	NAF El Centro
Intersection operations	◐	◐	◐
Roadway segment operations	◐	◐	◐
Construction traffic	◐	◐	◐
Parking	◐	◐	◐

LEGEND:

● = Significant and not mitigable impact
◑ = Significant and mitigable impact
◐ = Less than significant impact
○ = No impact

members is assumed to be part of the two percent growth in background traffic used in the estimation of baseline year traffic volumes.

The morning and afternoon peak hours are addressed in the analysis of this draft environmental impact statement (DEIS). It is likely that the PM peak hour analyzed is the highest hour of traffic activity for the entire afternoon and evening period. The following assumptions were made to analyze the impacts to traffic and circulation associated with the proposed action:

- 311 additional personnel would reside on base in the BEQ;
- 25 percent of squadron personnel would be deployed at any one time;
- 20 percent of personnel would drive off base once during the day;
- Vehicle occupancy rate of 1.33 people per car;
- Nominal increased traffic due to deliveries, visitors, and other periodic activities; and
- Varying amounts of additional support personnel (e.g., galley, gymnasium, child development center) at each base.

Impacts were compared to projected 1999 traffic at each alternative site, since that is the year in which relocation is expected to be complete. The 1999 traffic volumes were developed by applying a growth factor of two percent per year to existing traffic volumes. The 1999 conditions are described in greater detail in Section 3.5, Traffic and Circulation.

4.5.1 Preferred Alternative: NAWS Point Mugu

Realignment of the E-2 squadrons to NAWS Point Mugu would include the 988 personnel associated with the realignment and eight additional support personnel. Table 4-13 shows the projected traffic generation calculations at NAWS Point Mugu with the proposed action. Realignment of the E-2 squadrons to NAWS Point Mugu would add 1,024 average daily trips (ADTs).

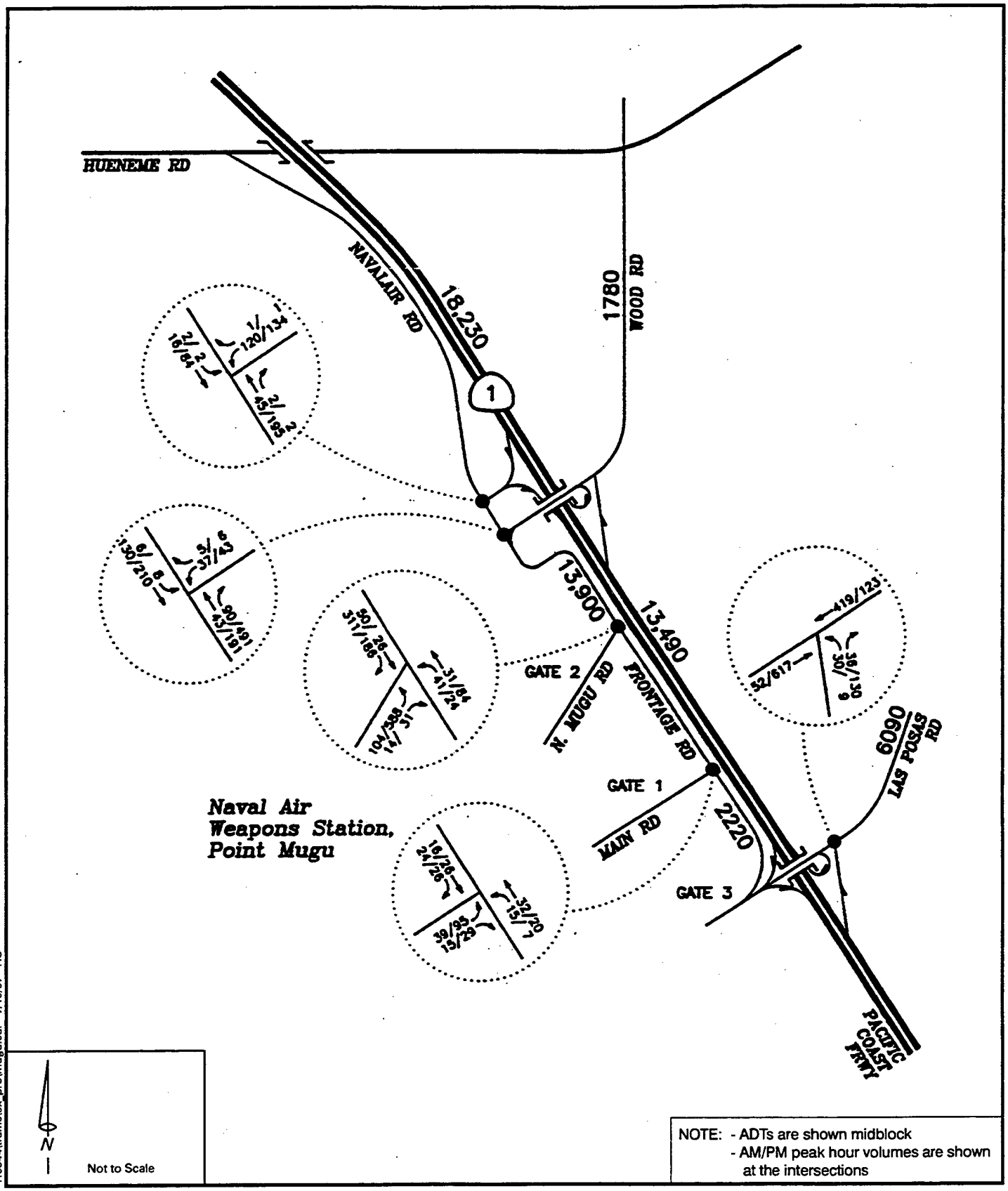
Table 4-13
NAWS Point Mugu Projected Traffic Generation

	Personnel Grouping[1]	Daily Trip-ends (ADT)	AM Peak Hour (7-8 AM) In	AM Peak Hour (7-8 AM) Out	PM Peak Hour (4-5 PM) In	PM Peak Hour (4-5 PM) Out
A	425 Personnel (Commuter shift, Reside off base)	576	240	5	5	240
B	252 Personnel (Off peak shift, Reside off base)	340	0	20	20	0
C	311 Personnel (Reside on base)	94	5	5	10	10
D	Additional Support Personnel (8)	14	5	0	0	5
TOTAL: 996 Personnel		1,024	250	30	35	255

Notes: [1]At NAWS Point Mugu, eight-additional support personnel would be required in addition to the 988 personnel associated with the E-2 realignment.
[2]ADT = Average Daily Trips

For the purpose of this analysis, projected traffic was distributed to the street system based on existing gate usage, existing traffic counts, locations of residential developments, and conversations with base planning and engineering staff. The majority of projected traffic would be expected to access the base via the Pacific Coast Highway from the north (52 percent) and Las Posas Road (36 percent). Of the remaining traffic, 8 percent access via Wood Road and 4 percent access via the Pacific Coast Highway from the south. Gates 1 and 3 accommodate 50 and 45 percent of NAWS Point Mugu traffic and would continue to in the future (Madison 1997). Figure 4-1 shows 1999 projected traffic plus projected E-2 traffic volumes.

The impacts of these additional trips to the street and roadway network were analyzed at five unsignalized intersections and six roadway segments. The results are summarized in Tables 4-14 and 4-15.



The project's added traffic would not result in significant increased delay and existing levels of service, which would all be in the acceptable range, would continue.

NAWS Point Mugu 1999+Project Traffic Volumes AM/PM Hours & ADTs

LEGEND:

- Analysis Intersections
- AM/PM Peak Hour Volumes

E-2 Aircraft Squadrons Realignment EIS
NAWS Point Mugu, California

Source: Linscott, Law & Greenspan 1996.

Figure 4-1

r:\0544\traffic\ex_pro\mugu.cdr - 7/19/97 - HC

Table 4-14
NAWS Point Mugu Unsignalized Intersection Operations

Intersection	Movement		Peak Hour	1999 Delay (seconds)	1999 LOS	1999+Project Delay (seconds)	1999+Project LOS
Navalair Road/Pacific Coast Highway SB ramp	NB	T	AM	3.7	A	4.6	A
	SB	R		2.6	A	2.6	A
	SB	L/T		3.6	A	4.5	A
	WB	L		2.1	A	2.3	A
	NB	T	PM	5.9	B	6.3	B
		R		2.6	A	2.6	A
	SB	L/T		5.0	A	5.2	B
	WB	L		2.3	A	2.3	A
Navalair Road/Wood Road	WB	L/R	AM	4.0	A	5.0	A
	SB	L		2.5	A	2.5	A
	WB	L/R	PM	9.2	B	11.0	C
	SB	L		4.5	A	5.4	B
North Mugu Road/Frontage Road*	–		AM	4.5	A	11.3	C
	–		PM	11.9	C	17.7	C
Main Road/Frontage Road*	–		AM	1.4	A	1.4	A
	–		PM	1.8	A	1.9	A
Las Posas Road/Pacific Coast Highway SB ramp	NB	L/R	AM	4.2	A	5.1	B
	NB	L/R	PM	7.1	B	8.5	B

Notes: *Denotes all-way stop sign controlled intersections
L = Left-turn
R = Right-turn
T = Through movement
WB = Westbound
NB = Northbound
SB = Southbound

Source: Linscott, Law & Greenspan 1997.

Less than Significant Impacts

Intersection operations. Table 4-15 shows that the addition of projected E-2 traffic results in continued LOS C or better operations for all movements at each key intersection.

The project would add two to six percent to the existing traffic at the key intersections analyzed herein. As the distance from the base increases, the added percentage would be progressively smaller. No new traffic patterns would be caused by the project's added traffic and only marginal increases in existing traffic volumes would occur. To the extent that there are any identifiable effects to pedestrians due to the project's added traffic, the degree of those impacts would be proportional to the project's percentage increase in traffic volume levels.

Table 4-15
NAWS Point Mugu Daily Street Segment Operations

Street Segment	Capacity* (LOS E)	1999 Volume	1999 V/C	1999 LOS	1999+Project Volume	1999+Project V/C	1999+Project LOS
Pacific Coast Highway							
n/o Wood Road	43,000	17,700	0.41	B	18,230	0.42	B
s/o Wood Road	43,000	13,360	0.31	B	13,490	0.31	B
Frontage Road							
s/o Wood Road	31,000	13,470	0.43	B	13,900	0.45	B
s/o Main Road	14,000	2,170	0.16	A	2,220	0.16	A
Wood Road							
s/o Hueneme Road	14,000	1,700	0.12	A	1,780	0.13	A
Las Posas Road							
e/o Pacific Coast Highway	14,000	5,720	0.41	B	6,090	0.44	B

Notes: * Capacities and V/C ratio thresholds based on CalTrans Standards.
e/o = east of
s/o = south of
n/o = north of

Source: Linscott, Law & Greenspan 1997.

Roadway segment operations. The addition of project traffic would not decrease the LOS on any of the street segments in the project area (see Table 4-16). LOS B or better is maintained. This impact would not be significant. No mitigation is required.

Construction traffic. The construction associated with the proposed action would generate additional traffic from worker vehicles and trucks. However, the construction traffic would not be expected to exceed the amount of traffic generated by E-2 personnel once the construction is complete and the realignment occurs. Estimates prepared by the Navy of equipment utilization for construction indicate that during the month with the greatest construction activity, no more than 16 trucks would be hauling equipment or material to or from the base during any one day.

To minimize traffic impacts to the surrounding community during construction, a construction traffic management program would be implemented. The program would include staggered work hours to reduce impacts from construction workers during the morning and afternoon peak hours, identified truck routes to limit truck traffic to major streets, and designated parking for construction workers. Since project traffic does not significantly affect operations at the intersections and street segments in the area surrounding the base and traffic is generally free flowing, the interim construction worker traffic impacts would not be significant.

Parking. NAWS Point Mugu currently has about 9,000 parking spaces on base, which is more than adequate to meet the current overall demand for parking (Hovde 1997; US Navy 1986a). However, the existing building densities at NAWS Point Mugu are such that parking demand is concentrated in certain areas. Some parking lots are overflowing, while other remote lots remain empty or less than half occupied. At high parking demand locations, the incidence of illegally parked vehicles increases. The project would not affect parking in the surrounding community.

Through the Navy facilities planning process, the amount of additional parking on base needed to meet the expected demand with the E-2 realignment would be determined. In particular with the operations training facility planned for one of the existing parking lots, replacement parking spaces as well as new parking spaces for the E-2 personnel would be required. The project would include construction of 375 parking spaces in addition to the 125 existing spaces for E-2 personnel. These 500 total spaces are divided between two parking lots—one adjacent to the OTF and one located southwest of 13th Street.

4.5.2 NAS Lemoore Alternative

Trip generation was calculated at NAS Lemoore, assuming realignment of the 988 E-2 personnel. No additional support staff would be anticipated at NAS Lemoore. Projected traffic generation at NAS Lemoore from implementation of the proposed action is indicated in Table 4-16. Realignment of the E-2 squadrons to Lemoore would add 1,010 ADTs.

Table 4-16
NAS Lemoore Projected Traffic Generation

Personnel Grouping	Daily Trip-ends (ADT)	AM Peak Hour (7-8 AM) In	AM Peak Hour (7-8 AM) Out	PM Peak Hour (4-5 PM) In	PM Peak Hour (4-5 PM) Out
A 425 Personnel (Commuter shift, Reside off base)	576	240	5	5	240
B 252 Personnel (Off peak shift, Reside off base)	340	0	20	20	0
C 311 Personnel (Reside on base)	94	5	5	10	10
D Additional Support Personnel (0)[1]	0	0	0	0	0
TOTAL: 988 Personnel	**1,010**	**245**	**30**	**35**	**250**

Notes: [1]No additional support staff are anticipated at NAS Lemoore.

Projected traffic was distributed to the street system based on existing gate usage, existing traffic counts, the locations of local residential developments, and conversations with base planning and engineering staff. The majority (46 percent) of project traffic would be expected to use State Route (SR)-198 (from the east) to access the base; 43 percent would use the operations gate; and the balance of the traffic (11 percent) would use the housing gate. This pattern is expected to continue in the future (O'Donnell 1997). Of the traffic utilizing the main and housing gates, 52 percent would utilize SR-198 to the east, while 4 percent would travel south on Avenal Cutoff and 1 percent would travel west on SR-198. The traffic utilizing the operations gate would utilize Grangeville Road to the east (20 percent) SR-41 to the north (10 percent) and SR-41 to the south (13 percent). Figure 4-2 shows the baseline plus projected traffic volumes.

Impacts of resulting trips to the street and roadway network were evaluated at two signalized and two unsignalized intersections and four potentially affected roadway segments. Results of the LOS analysis are shown in Tables 4-17 through 4-19.

Table 4-17
NAS Lemoore Signalized Intersection Operations

Intersection	Peak Hour	1999 Delay (seconds)	1999 LOS	1999+Project Delay (seconds)	1999+Project LOS
Grangeville Road/SR-41	AM	13.5	B	13.9	B
	PM	13.6	B	16.4	C
SR-198/Main Gate	AM	5.4	B	6.4	B
	PM	13.7	B	16.6	C

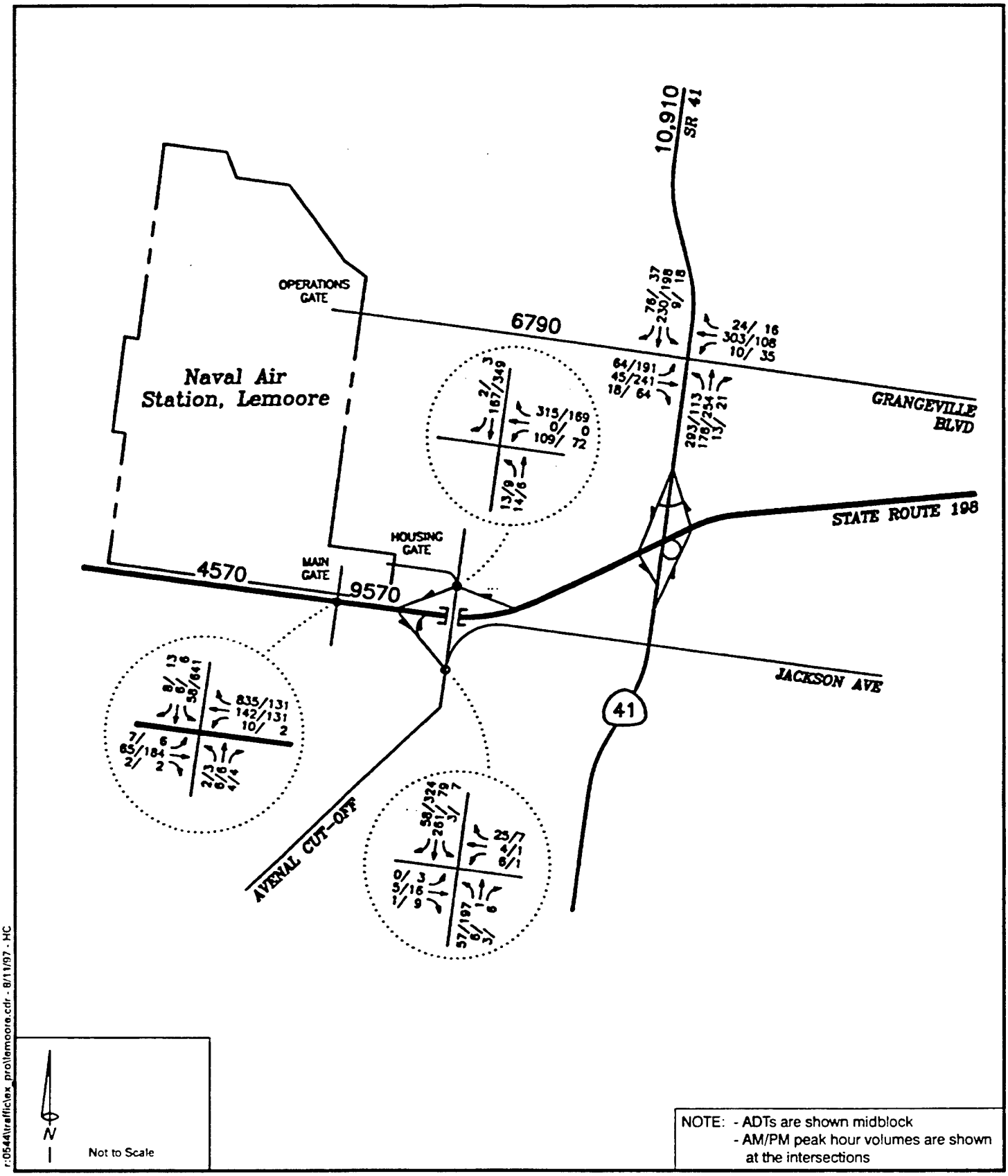
Notes: LOS = Level of Service

DELAY			LOS
0.0	≤	5.0	A
5.1	to	15.0	B
15.1	to	25.0	C
25.1	to	40.0	D
40.1	to	60.0	E
	>	60.0	F

Source: Linscott, Law & Greenspan 1997.

Less than Significant Impacts

Intersection operations. At NAS Lemoore, addition of traffic to the key signalized intersections would result in continued LOS C or better operation during both the AM and PM peak hours (Table 4-17). The addition of projected traffic would change the PM peak hour LOS of both the Grangeville Road/SR-41 and the SR-198/Main Gate intersections from LOS B to LOS C. However, only 2.8 and 2.9 seconds of additional delay are calculated, which would result in delays just over the lower limit of the LOS C range. Impacts to traffic and circulation at the signalized intersections of Grangeville Road/SR-41 and SR-198/Main Gate would be less than significant. No mitigation would be required.



r:\0544\traffic\ex_prot\lemoore.cdr - 8/11/97 - HC

The project's added traffic would not result in significant increased delay and existing levels of service, which would all be in the acceptable range, would continue.

NAS Lemoore 1999+Project Traffic Volumes AM/PM Hours & ADTs

E-2 Aircraft Squadrons Realignment EIS
NAS Lemoore, California

LEGEND:

- Analysis Intersections
- AM/PM Peak Hour Volumes
- 1,000 Average Daily Trips

Source: Linscott, Law & Greenspan 1996.

Figure 4-2

Table 4-18
NAS Lemoore Unsignalized Intersections Operations

Intersection	Peak Hour	Movement		1999 Delay (seconds)	1999 LOS	1999+Project Delay (seconds)	1999+Project LOS
Avenal Cutoff/EB SR-198 ramps	AM	EB	L/T	5.6	B	5.7	B
		EB	R	3.7	A	3.7	A
		WB	L/T	6.0	B	6.0	B
		WB	R	2.7	A	2.7	A
		NB	L	3.3	A	3.3	A
		SB	L	2.1	A	2.1	A
	PM	EB	L/T	6.8	B	6.9	B
		EB	R	2.9	A	2.9	A
		WB	L/T	7.9	B	8.3	B
		WB	R	2.6	A	2.6	A
		NB	L	4.3	A	4.5	A
		SB	L	2.1	A	2.1	A
Avenal Cutoff/WB SR-198 ramps	AM	WB	L	5.5	B	5.5	B
		WB	R	3.6	A	3.7	A
		NB	L	2.6	A	2.6	A
	PM	WB	L	6.6	B	6.9	B
		WB	R	3.1	A	3.1	A
		NB	L	3.1	A	3.3	A

Notes:
- LOS = Level of Service
- L = Left-turn
- R = Right-turn
- T = Through movement

EB = Eastbound
NB = Northbound
SB = Southbound
WB = Westbound

DELAY			LOS
0.0	≤	5.0	A
5.1	to	10.0	B
10.1	to	20.0	C
20.1	to	45.0	D
30.1	to	45.0	E
	>	45.0	F

Source: Linscott, Law & Greenspan 1997.

Table 4-19
NAS Lemoore Daily Street Segment Operations

Street Segment	Capacity* (LOS E)	1999 Volume	1999 V/C	1999 LOS	1999+Project Volume	1999+Project V/C	1999+Project LOS
SR-198							
w/o Main Gate	14,000	4,560	0.33	B	4,570	0.33	B
e/o Main Gate	31,000	9,110	0.29	A	9,570	0.31	A
Grangeville Boulevard							
w/o SR-41	14,000	6,360	0.45	B	6,790	0.49	B
SR-41							
n/o Grangeville Boulevard	43,000	10,810	0.25	A	10,910	0.25	A

Notes: * Capacities and V/C ratio thresholds based on CalTrans Standards.
- LOS = level of service
- V/C = volume/capacity
- e/o = east of
- n/o = north of
- w/o = west of

V/C RATIO			LOS
0.00	-	0.30	A
0.31	-	0.50	B
0.51	-	0.75	C
0.76	-	0.90	D
0.91	-	1.00	E
	>	1.00	F

Addition of project traffic would result in continued LOS B or better operations for all movements at the unsignalized intersections at Avenal Cutoff/EB SR-198 ramps and Avenal Cutoff/WB SR-198 (Table 4-18) during both the AM and PM peak hours. These impacts to traffic and circulation at the unsignalized intersections would be less than significant. No mitigation is required.

Roadway segment operations. The addition of projected traffic would result in continued LOS B or better operations on each key road segment on a daily basis (Table 4-19). These impacts would be less than significant. No mitigation is required.

Construction traffic. The construction associated with the proposed action would generate additional traffic from worker vehicles and trucks. However, the construction traffic is not expected to exceed the amount of traffic generated by E-2 personnel once the construction is complete and the realignment occurs. Estimates prepared by the Navy of equipment utilization for construction indicate that during the month with the greatest construction activity, no more than 16 trucks would be hauling equipment or material to or from the base during any one day and any effects would be temporary in nature.

To minimize traffic impacts to the surrounding community during construction, a construction traffic management program would be implemented. The program would include staggered work hours to reduce impacts from construction workers during the morning and afternoon peak hours, identified truck routes to limit truck traffic to major streets, and designated parking for construction workers. Since project traffic does not significantly affect operations at the intersections and street segments in the area surrounding the base and traffic is generally free flowing, the interim construction worker traffic impacts would not be significant.

Parking. Through the Navy facilities planning process, the amount of additional parking on base needed to meet the expected demand with the E-2 realignment would be determined. The project includes construction of 500 additional parking spaces for E-2 personnel. It is expected that necessary additional parking would be adequately provided as the project is implemented (Sparlin 1997). The parking situation on base would not affect the surrounding community.

4.5.3 NAF El Centro Alternative

Realignment of the E-2 squadron to NAF El Centro would include the 988 personnel associated with the realignment and 65 additional support personnel. Projected traffic generation at NAF El Centro from implementation of the proposed action are indicated in Table 4-20. Realignment of the E-2 squadrons to NAF El Centro would add 1,126 ADTs.

Table 4-20
NAF El Centro Projected Traffic Generation

Personnel Grouping	Daily Trip-Ends (ADT)	AM Peak Hour (7-8 AM) In	AM Peak Hour (7-8 AM) Out	PM Peak Hour (4-5 PM) In	PM Peak Hour (4-5 PM) Out
A 425 Personnel (Commuter shift, Reside off base)	576	240	5	5	240
B 252 Personnel (Off peak shift, Reside off base)	340	0	20	20	0
C 311 Personnel (Reside on base)	94	5	5	10	10
D Additional Support Personnel (65)	116	30	2	2	30
TOTAL: 1,053 Personnel	**1,126**	**275**	**32**	**37**	**280**

Notes: * Accounts for 25 percent of personnel which are deployed at any one time.
- An additional 988 employees would be transferred (425 + 252 +311), plus 65 additional support personnel.
-2.4 TE and 0.4 TE per employee assumes that 20 percent of the employees drive off base once during the day.
- Assumes no additional traffic due to deliveries, visitors, etc.
VOR = Vehicle Occupancy Rate = 1.33
TE = Trip Ends

Source: Linscott, Law & Greenspan 1997.

For the purpose of this analysis, projected traffic was distributed to the street system based on the existing intersection traffic counts in the area and the locations of area residential developments. Most of the project traffic (45 percent) would be expected to utilize Evan Hughes Highway from the east to access the base. The remaining traffic would be distributed to the other local roadways, with 20 percent on Bennett Road south of Evan Hewes Highway, 13 percent north on Forrester, 7 percent south on Forrester, 9 percent west on Evan Hewes, and 3 percent each north and south on Drew Road. Figure 4-3 shows the current and projected traffic volumes.

Impacts of resulting trips to the street and roadway network were evaluated at three unsignalized intersections and seven roadway segments. Results of the LOS analysis are summarized in Tables 4-21 and 4-22.

Table 4-21
NAF El Centro Unsignalized Intersection Operations

Intersection	Peak Hour	1999 Delay (seconds)	1999 LOS	1999+Project Delay (seconds)	1999+Project LOS
Drew Road/Evan Hewes	AM	3.0	A	3.5	A
	PM	3.0	A	3.0	A
Bennett Road/Evan Hewes	AM	2.5	A	6.9	B
	PM	2.8	A	6.6	B
Forrester Road/Evan Hewes	AM	4.9	A	8.8	B
	PM	4.9	A	9.1	B

Notes: Each of these intersections are all-way stop sign controlled.

DELAY			LOS
0.0	≤	5.0	A
5.1	to	10.0	B
10.1	to	20.0	C
20.1	to	30.0	D
30.1	to	45.0	E
	>	45.0	F

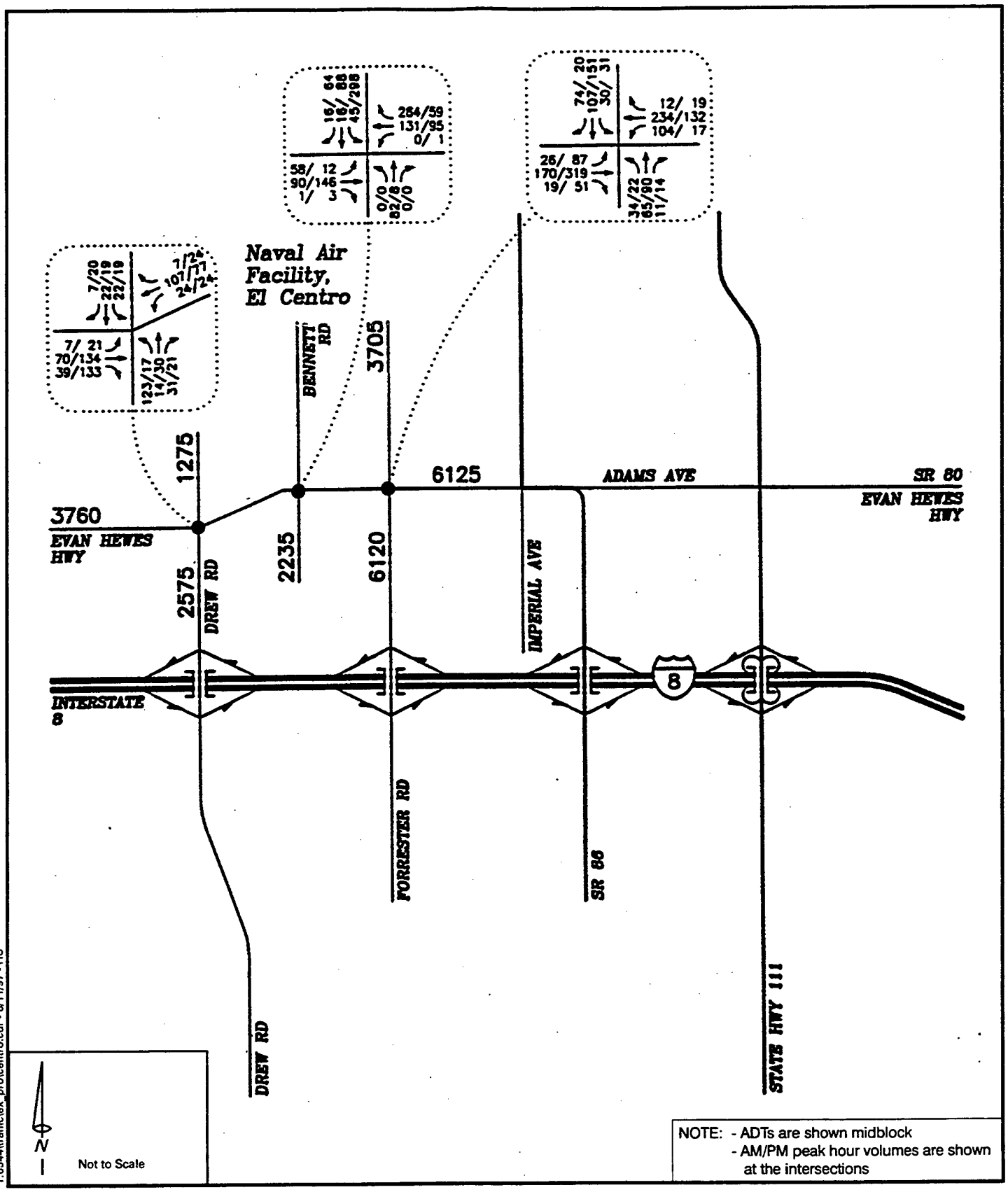
Source: Linscott, Law & Greenspan 1997.

Less than Significant Impacts

Intersection operations. The addition of projected traffic would result in a change from LOS A to LOS B at two of these intersections during both the AM and PM peak hours (Table 4-22). Since LOS would still be within acceptable levels, the change from LOS A to LOS B would not constitute a significant impact. No mitigations are required.

Roadway segment operations. The addition of projected traffic would result in continued LOS B or better operations on each key street segment on a daily basis (Table 4-22). These impacts would not be significant. No mitigation is required.

Construction traffic. The construction associated with the proposed action would generate additional traffic from worker vehicles and trucks. However, the construction traffic would not exceed the amount of traffic generated by E-2 personnel once the construction is complete and the realignment occurs. Estimates prepared by the Navy of equipment utilization for construction indicate that during the month with the greatest construction activity no more than 16 trucks would be hauling equipment or material to or from the base during any one day.



r:\0544\traffic\ex_proicentro.cdr - 8/11/97 - HC

The project's added traffic would not result in significant increased delay and existing levels of service, which would all be in the acceptable range, would continue.

NAF El Centro 1999+Project Traffic Volumes AM/PM Hours & ADTs

LEGEND:

- Analysis Intersections
- AM/PM Peak Hour Volumes
- 1,000 Average Daily Trips

E-2 Aircraft Squadrons Realignment EIS
NAF El Centro, California

Source: Linscott, Law & Greenspan 1996.

Figure 4-3

Table 4-22
NAF El Centro Daily Street Segment Operations

Street Segment	Capacity* (LOS E)	1999 Volume	1999 V/C	1999 LOS	1999+Project Volume	1999+Project V/C	1999+Project LOS
Evan Hewes (S-80)							
w/o Drew Road	14,000	3,660	0.26	A	3,760	0.27	A
e/o Forrester Road	14,000	5,620	0.40	B	6,125	0.44	B
Drew Road							
n/o Evan Hewes	14,000	1,240	0.09	A	1,275	0.09	A
s/o Evan Hewes	14,000	2,540	0.18	A	2,575	0.18	A
Bennett Road							
s/o Evan Hewes	14,000	2,010	0.14	A	2,235	0.16	A
Forrester Road							
n/o Evan Hewes	14,000	3,560	0.25	A	3,705	0.26	A
s/o Evan Hewes	14,000	6,040	0.43	B	6,120	0.44	B

Notes: * Capacities and V/C ratio thresholds based on CalTrans Standards.
LOS = Level of Service
V/C = Volume/Capacity
e/o = east of
w/o = west of
s/o = south of
n/o = north of

V/C RATIO			LOS
0.00	-	0.30	A
0.31	-	0.50	B
0.51	-	0.75	C
0.76	-	0.90	D
0.91	-	1.00	E
	>	1.00	F

Source: Linscott, Law & Greenspan 1997.

To minimize traffic impacts to the surrounding community during construction, a construction traffic management program would be implemented. The program would include staggered work hours to reduce impacts from construction workers during the morning and afternoon peak hours, identified truck routes to limit truck traffic to major streets, and designated parking for construction activities. Since project traffic does not significantly affect operations at the intersections and street segments in the area surrounding the base and traffic is generally free flowing, the interim construction worker traffic impacts would not be significant.

Parking. Vehicle parking would be provided on base for E-2 personnel. Through the Navy facilities planning process, the amount of additional parking on base needed to meet the expected demand with the E-2 realignment would be determined. The project would include construction of 375 parking spaces in addition to the 125 existing spaces for E-2 personnel. Parking would be located within the E-2 operations area. It is expected that the necessary additional parking can be adequately provided as the project is implemented, subject to any local environmental constraints for the individual project sites (Bay 1997b). The parking situation on base would not affect the surrounding community.

4.6 AIR QUALITY

This section identifies potential air quality impacts that may result from implementing one of the realignment alternatives or the no action alternative. Impact significance evaluations are based primarily on estimated direct and indirect emissions associated with alternative actions. Carbon monoxide dispersion modeling has been used to evaluate air quality impacts of added traffic on major access roads. Technical analyses supporting the impact significance evaluations and also the Clean Air Act conformity determination for the E-2 realignment are presented in Appendix D.

Significance Criteria

The significance criteria for air quality impact issues are set largely by the technical procedures used for the impact assessment. Dispersion modeling evaluations of the potential for violating air quality standards are possible only for primary pollutants such as carbon monoxide. Dispersion models are not capable of providing reliable analyses for secondary pollutants such as ozone or photochemically generated PM_{10}. Consequently, emission thresholds are used to determine impact significance for secondary pollutants. Issues related to consistency with adopted air quality plans can sometimes require generalized policy and program evaluations.

An alternative would have significant air quality impacts if its implementation would directly or indirectly:

- Produce emissions that would be the primary cause of or significantly contribute to a violation of state or federal ambient air quality standards;
- Establish land uses that would expose people to localized (as opposed to regional) air pollutant concentrations that violate state or federal ambient air quality standards;
- Cause a net increase in pollutant or pollutant precursor emissions that exceeds relevant emission significance thresholds (such as Clean Air Act conformity *de minimis* levels for nonattainment pollutants); Conflict with adopted air quality management plan policies or programs; or
- Foster or accommodate development in excess of levels assumed by the applicable air quality management plan.

Table 4-23 summarizes the air quality impacts of the alternatives.

Table 4-23
Summary of Air Quality Resource Impacts

IMPACT ISSUES	REALIGNMENT ALTERNATIVES		
	NAWS Point Mugu (Preferred Alternative)	NAS Lemoore	NAF El Centro
Clean Air Act conformity	◑	◑	ⓘ
Emissions of nonattainment pollutants	◑	◑	ⓘ
Intersection carbon monoxide concentrations	ⓘ	ⓘ	ⓘ

LEGEND:

● - Significant and not mitigable impact
◑ - Significant and mitigable impact
ⓘ - Less than significant impact
○ - No impact

4.6.1 Preferred Alternative: NAWS Point Mugu

Significant Impacts

Impact 1: Clean Air Act conformity. Significant and mitigable increases in the emissions of ozone precursors would occur under the NAWS Point Mugu Alternative. Emission sources under Navy control would result in incremental emission increases that exceed the 25-ton-per-year *de minimis* threshold for ozone precursors in Ventura County. Consequently, a conformity determination would be required for the NAWS Point Mugu Alternative. However, recent reductions in activity levels at NAWS Point Mugu more than compensate for emissions increases associated with the realignment of E-2 aircraft, and thus allow the proposed action to conform with the ozone SIP for Ventura County.

Table 4-24 summarizes emissions associated with the NAWS Point Mugu alternative. Emission estimates presented in Table 4-24 are separated into those that apply to the EPA Clean Air Act general conformity regulation, and additional emissions that should be addressed in a NEPA context. The top part of Table 4-24 addresses emission sources that fall within the scope of the EPA general conformity regulation.

Temporary construction activity would occur with projects to remodel existing facilities or build new facilities to accommodate the E-2 aircraft, required maintenance and training facilities, and associated personnel. The NAWS Point Mugu Alternative does not require extensive facility construction. The analysis presented in Table 4-24 assumes that all significant ground disturbance associated with facility construction or remodeling would occur prior to the arrival of the E-2 aircraft. Interior finishing and building renovation activities might continue into 1999, but would not generate significant emissions. Construction dust would be controlled using normal construction dust control procedures (such as periodic watering of exposed areas).

Table 4-24
Annual Emissions for E-2 Squadron Activity
NAWS Point Mugu Alternative

Year	Emissions Component	Estimated Annual Emissions, Tons Per Year: Reactive Organic Compounds	Nitrogen Oxides	Carbon Monoxide	Sulfur Oxides	PM_{10}
1998	Construction Activity	0.26	3.56	1.88	0.35	2.43
	E-2 Operations	7.24	12.30	10.08	0.57	3.57
	E-2 Engine Run-ups	0.39	1.08	0.56	0.05	0.31
	Aircraft Fuel Transfers	0.05	0.00	0.00	0.00	0.00
	Aircraft Support Equipment	0.66	0.99	12.47	0.05	0.09
	Other Permit-Exempt Equipment	0.01	0.07	0.06	0.00	0.00
	On-Base Natural Gas Use	0.00	0.02	0.02	0.00	0.00
	Added Base-Related Traffic	2.30	1.91	26.27	0.05	5.14
	1998 CAA Conformity Total	10.90	19.94	51.35	1.07	11.55
1999+	Construction Activity	0.00	0.00	0.00	0.00	0.00
	E-2 Operations	21.72	36.91	30.25	1.71	10.71
	E-2 Engine Run-Ups	1.17	3.24	1.69	0.14	0.93
	Aircraft Fuel Transfers	0.15	0.00	0.00	0.00	0.00
	Aircraft Support Equipment	1.98	2.98	37.41	0.15	0.27
	Other Permit-Exempt Equipment	0.02	0.21	0.19	0.01	0.01
	On-Base Natural Gas Use	0.00	0.07	0.05	0.00	0.01
	Added Base-Related Traffic	6.91	5.74	78.80	0.15	15.43
	1999 CAA Conformity Total	31.95	49.16	148.39	2.17	27.36
	Maximum CAA Conformity Analysis Emissions	31.95	49.16	148.39	2.17	27.36
	De Minimis Threshold	25.00	25.00	na	na	na
	Above *De Minimis* Level?	YES	YES	NO	NO	NO
	On-base Emission Reductions Not Included in SIP Forecasts	-54.34	-65.92	-111.81	-21.16	-24.89
	Conformity Emissions Change	-22.39	-16.76	36.58	-18.99	2.47
	Conformity Offset Requirements	none	none	none	none	none
1999+	Base-Related CAA Conformity Analysis Emissions	31.95	49.16	148.39	2.17	27.36
	Engine Test Cell	0.05	1.79	0.19	0.07	0.42
	Other On-Base Permit Sources	0.20	0.00	0.00	0.00	0.01
	Off-Base Natural Gas Use	0.72	9.37	3.99	0.06	1.11
	Additional Household Travel	13.97	12.38	147.99	0.33	33.89
	Total Emissions	46.89	72.69	300.55	2.63	62.80

Notes: Construction emission estimates assume 4.2 acres disturbed and 3,000 hours of heavy equipment operation in 1998; no construction projects would be initiated in 1999.
Except for construction activity, 1998 emissions are assumed to be one-third of 1999 emissions, to reflect staggered squadron arrivals between July and December.
E-2 aircraft operations assume 3,650 sorties per year with 34,100 total flight operations per year.
In-frame engine run-up emission estimates assume 51.6 30-minute engine tests plus 13 20-minute engine tests per year per aircraft (826 30-minute tests and 208 20-minute tests).
Aircraft fuel transfer emissions assume 4.1 million gallons of JP-5 fuel used per year, with two splash-loading fuel transfers; 3 months of fuel transfers at 50 degrees F, 9 months of transfers at 60 degrees F.
Aircraft support equipment includes tow tractors, portable power units, cargo loaders, and other aircraft service vehicles.
Aircraft support equipment emission estimates assume 15 minutes of gasoline-powered equipment use and 15 minutes of diesel-powered equipment use for each aircraft takeoff and each aircraft landing.
Other permit-exempt equipment includes portable or stationary diesel and JP-5 engines used for pumps, compressors, hydraulic test stands, etc.
Emission estimates for other permit-exempt equipment assume 8,000 horsepower-hours of diesel engine use and 88 hours of hydraulic test stand JP-5 engine use.
On-base natural gas use emissions assume 1.72 million cubic feet per year of natural gas use for space heating and water heating in added office, industrial, and personnel-support buildings (10 BTU/hour/square foot heating energy demand).
Base-related vehicle traffic includes only work-related trips (240 days per year).
NAWS Point Mugu emission reductions not included in the SIP include only those conformity-related emission source categories addressed for the E-2 realignment (aircraft operation, aircraft engine run-ups, aircraft refueling, on-base permit-exempt natural gas use, and base-related vehicle traffic).
Other on-base permit sources include paint, solvent, and abrasive blasting facilities at engine and airframe maintenance facilities.
Off-base natural gas use assumes 199 million cubic feet per year of natural gas use in off-base housing units (24 BTU/hour/square foot energy demand, 1,400 square feet per unit, 677 units).
Additional household travel includes shopping and other non-work trips (365 days/year).

Aircraft operations would be the largest source of long term emissions associated with the realignment action. Emissions associated with aircraft operation would come from actual flight activity plus in-frame engine run-up tests performed after engine maintenance. Additional emissions would come from the use of aircraft support equipment and permit-exempt portable or stationary equipment. Airfield facilities at NAWS Point Mugu include fixed point utility systems, thus minimizing the use of ground support equipment.

Emissions associated with base-related vehicle traffic would be the second-largest source of emissions addressed by the EPA general conformity rule. The base-related vehicle emissions presented in the top part of Table 4-24 include work-related on- base travel.

No expansion of aviation fuel handling facilities is anticipated, although annual aviation fuel use would increase by about 4.1 million gallons per year. Because JP-5 fuel has a very low volatility, resulting emission quantities would be small.

The middle portion of Table 4-24 summarizes the major components of the conformity analysis for NAWS Point Mugu. Conformity-related ozone precursor emissions would be 31.9 tons per year of reactive organic compounds and 49.2 tons per year of nitrogen oxides. These emission increases would exceed the *de minimis* threshold of 25 tons per year.

Mitigation 1. Significant reductions have occurred in activity levels at NAWS Point Mugu since 1990, resulting in fewer emissions at NAWS Point Mugu. As shown in the middle portion of Table 4-24, the emission reductions for ozone precursors (reactive organic compounds and nitrogen oxides) more than offset the emissions increases associated with the E-2 realignment action. Consequently, conformity with the ozone SIP for Ventura County can be demonstrated and this impact is mitigated.

Impact 2: Emissions of nonattainment pollutants. Significant and mitigable increases in the overall emissions of ozone precursors would occur under the NAWS Point Mugu alternative. The bottom part of Table 4-24 identifies emission sources that are excluded from conformity determination analyses, but which are still associated with the E-2 realignment. These emission sources include stationary sources operating under permits issued by the Ventura County Air Pollution Control District and indirect emission sources that the Navy can not influence or control. Emission sources operating under air quality permits include engine and airframe maintenance facilities (paint, solvent, and abrasive blasting equipment) and engine test cells. Important indirect emission sources not under Navy control include household vehicle travel for non-work purposes and natural gas use by off-base households.

Modifications to existing maintenance facilities are unlikely to require new air quality permits from the Ventura County Air Pollution Control District unless existing permits contain restrictive limitations on facility use. Modifications to the engine test cell might require minor technical amendments to the existing air quality permit. Some new or replacement equipment (such as standby generators, compressors, etc.) might require new permits from the Ventura County Air Pollution Control District. Requirements for permit modifications are not in themselves significant impacts.

As indicated by the bottom portion of Table 4-24, overall emissions of ozone precursors associated with the E-2 realignment are estimated to be 46.9 tons per year of reactive organic compounds and 72.7 tons per year of nitrogen oxides. These incremental emission increases are significant for a severe ozone nonattainment area. However, compensating emission reductions at NAWS Point Mugu adequately mitigate this impact.

Mitigation 2. As can be seen from the middle portion of Table 4-24, NAWS Point Mugu has experienced significant emission reductions since 1990. Emission reductions for ozone precursors (reactive organic compounds and nitrogen oxides) more than offset the overall emissions increases associated with the E-2 realignment action.

Less than Significant Impacts

Intersection carbon monoxide concentrations. Traffic associated with the NAWS Point Mugu Alternative would have a less than significant effect on ambient carbon monoxide concentrations at intersections along roadways providing access to NAWS Point Mugu. Dispersion modeling analyses indicate that peak 1-hour carbon monoxide concentrations at the major access gates would be less than 3.5 ppm, with peak 8-hour carbon monoxide concentrations being less than 2.5 ppm. These carbon monoxide concentrations are well below the impact significance thresholds set by federal and state ambient standards (35 ppm for the federal 1-hour standard, 20 ppm for the state 1-hour standard, and 9 ppm for the federal and state 8-hour standards).

4.6.2 NAS Lemoore Alternative

Significant Impacts

Impact 1: Clean Air Act conformity. Significant but mitigable increases in the emissions of ozone precursors would occur under the NAS Lemoore Alternative. Emission sources under Navy control would result in incremental increases in nitrogen oxide emissions that exceed the 50-ton-per-year *de minimis* threshold for the San Joaquin Valley. Consequently, a conformity determination would be required for the NAS Lemoore Alternative. Emission increases for reactive organic compounds and PM_{10} would be less than the relevant *de minimis* threshold. The ozone SIP for the San Joaquin Valley includes an emissions growth forecast for NAS Lemoore. The predicted increase in nitrogen oxide

emissions from aircraft operations at NAS Lemoore (65.7 tons per year between 1990 and 1996) exceeds the 52.3 tons per year of nitrogen oxide emissions generated by the E-2 realignment. Consequently, realignment of E-2 aircraft to NAS Lemoore would conform with the ozone SIP for the San Joaquin Valley.

Table 4-25 summarizes emissions associated with the NAS Lemoore alternative. Emission estimates presented in Table 4-25 are separated into those that apply to the EPA Clean Air Act general conformity regulation, and additional emissions that should be addressed in a NEPA context. The top part of Table 4-25 addresses emission sources that fall within the scope of the EPA general conformity regulation.

Temporary construction activity would occur with projects to remodel existing facilities or build new facilities to accommodate the E-2 aircraft, required maintenance and training facilities, and associated personnel. The NAS Lemoore Alternative requires considerably more facility construction than would be required at NAWS Point Mugu. Most aircraft-related facilities would have construction started in 1998. Housing and personnel-related facilities would have construction initiated in 1999. Some interior finishing and building renovation activities might continue into 2000, but would not generate significant emissions. Construction dust would be controlled using normal construction dust control procedures (such as periodic watering of exposed areas).

Aircraft operations would be the largest source of long term emissions associated with the realignment action. Emissions associated with aircraft operation would come from actual flight activity plus in-frame engine run-up tests performed after engine maintenance. Additional emissions would come from the use of aircraft support equipment and permit-exempt portable or stationary equipment. Airfield facilities constructed at NAS Lemoore would include fixed point utility systems, thus minimizing the use of ground support equipment.

Emissions associated with base-related vehicle traffic would be the second-largest source of emissions addressed by the EPA general conformity rule. The base-related vehicle emissions presented in the top part of Table 4-25 include work-related on-base travel.

No expansion of aviation fuel handling facilities is anticipated, although annual aviation fuel use would increase by about 4.1 million gallons per year. Because JP-5 fuel has a very low volatility, resulting emission quantities would be small.

The middle portion of Table 4-25 summarizes the major components of the conformity analysis for NAS Lemoore. Conformity-related ozone precursor emissions would be 31.4 tons per year of reactive organic compounds and 52.3 tons per year of nitrogen oxides. PM_{10} emissions would increase by 31.6 tons per

Table 4-25
Annual Emissions for E-2 Squadron Activity
NAS Lemoore Alternative

Year	Emissions Component	Estimated Annual Emissions, Tons Per Year: Reactive Organic Compounds	Nitrogen Oxides	Carbon Monoxide	Sulfur Oxides	PM_{10}
1998	Construction Activity	1.07	17.23	7.90	1.78	16.73
	E-2 Operations	7.24	12.30	10.08	0.57	3.57
	E-2 Engine Run-ups	0.39	1.08	0.56	0.05	0.31
	Aircraft Fuel Transfers	0.06	0.00	0.00	0.00	0.00
	Aircraft Support Equipment	0.66	0.99	12.47	0.05	0.09
	Other Permit-Exempt Equipment	0.01	0.07	0.06	0.00	0.00
	On-Base Natural Gas Use	0.01	0.13	0.10	0.00	0.02
	Added Base-Related Traffic	2.06	1.95	29.02	0.06	5.71
	1998 CAA Conformity Total	11.49	33.75	60.19	2.51	26.43
1999	Construction Activity	0.17	2.70	1.35	0.27	2.49
	E-2 Operations	21.72	36.91	30.25	1.71	10.71
	E-2 Engine Run-Ups	1.17	3.24	1.69	0.14	0.93
	Aircraft Fuel Transfers	0.17	0.00	0.00	0.00	0.00
	Aircraft Support Equipment	1.98	2.98	37.41	0.15	0.27
	Other Permit-Exempt Equipment	0.02	0.21	0.19	0.01	0.01
	On-Base Natural Gas Use	0.02	0.38	0.29	0.00	0.06
	Added Base-Related Traffic	6.19	5.84	87.06	0.17	17.14
	1999 CAA Conformity Total	31.42	52.27	158.23	2.46	31.61
2000+	E-2 Operations	21.72	36.91	30.25	1.71	10.71
	E-2 Engine Run-Ups	1.17	3.24	1.69	0.14	0.93
	Aircraft Fuel Transfers	0.17	0.00	0.00	0.00	0.00
	Aircraft Support Equipment	1.98	2.98	37.41	0.15	0.27
	Other Permit-Exempt Equipment	0.02	0.21	0.19	0.01	0.01
	On-Base Natural Gas Use	0.02	0.38	0.29	0.00	0.06
	Added Base-Related Traffic	6.19	5.84	87.06	0.17	17.14
	2000+ CAA Conformity Total	31.26	49.56	156.88	2.19	29.12
	Maximum CAA Conformity Analysis Emissions	31.42	52.27	158.23	2.51	31.61
	De Minimis Threshold	50.00	50.00	na	na	70.00
	Above *De Minimis* Level?	NO	YES	NO	NO	NO
	NAS Lemoore Activity Increase Forecast in SIP	14.60	65.70	0.00	0.00	0.00
	Conformity Emissions Change	16.82	-13.43	158.23	2.51	31.61
	Conformity Offset Requirements	none	none	none	none	none
2000+	Base-Related CAA Conformity Analysis Emissions	31.26	49.56	156.88	2.19	29.12
	Engine Test Cell	0.05	1.79	0.19	0.07	0.42
	Other On-Base Permit Sources	0.36	3.39	2.55	0.03	0.51
	Off-Base Natural Gas Use	0.72	9.37	3.99	0.06	1.11
	Additional Household Travel	10.53	9.74	126.81	0.29	30.34
	Total Emissions	42.93	73.84	290.41	2.64	61.51

Notes: Except for the following items, assumptions regarding aircraft operations, equipment use, and vehicle travel are the same as those presented in the footnotes to Table 4-24.
Construction emission estimates assume 21 acres disturbed and 12,180 hours of heavy equipment operation in 1998, 4.5 acres disturbed and 1,990 hours of heavy equipment operation in 1999.
Aircraft fuel transfer emission estimates assume 4.1 million gallons of JP-5 fuel used per year, with two splash-loading fuel transfers; 1 month of fuel transfers at 40 degrees F, 4 months of transfers at 50 degrees F, 1 month of fuel transfers at 60 degrees F, 4 months of fuel transfers at 70 degrees F, and 2 months of fuel transfers at 80 degrees F.
On-base natural gas use emissions assume 9.37 million cubic feet per year of natural gas use for space heating and water heating in added office, industrial, and personnel-support buildings (10 BTU/hour/square foot heating energy demand).
The ozone SIP for the San Joaquin Valley anticipated increased aircraft emissions at NAS Lemoore between 1990 and 1996.
Other on-base permit sources include boilers for the added hangar and BEQ facilities plus paint, solvent, and abrasive blasting equipment at engine and airframe maintenance facilities.

year. The nitrogen oxide emissions increase would exceed the *de minimis* threshold of 50 tons per year. Emission increases for reactive organic compounds and PM_{10} would be less than the relevant *de minimis* threshold, and consequently are less than significant.

Mitigation 1. The ozone SIP for the San Joaquin Valley anticipated increases in aircraft activity at NAS Lemoore, which have not occurred. As shown in the middle portion of Table 4-25, the forecasted increase in nitrogen oxide emissions (65.7 tons per year) exceeds the increase in nitrogen oxide emissions associated with the E-2 realignment action (52.3 tons per year). Consequently, conformity with the ozone SIP for the San Joaquin Valley can be demonstrated and this impact is mitigated.

Impact 2: Emissions of nonattainment pollutants. Significant and mitigable increases in the overall emissions of ozone precursors would occur under the NAS Lemoore Alternative. The bottom part of Table 4-25 identifies emission sources that are excluded from conformity determination analyses, but which are still associated with the E-2 realignment. These emission sources include stationary sources operating under permits issued by the San Joaquin Valley Unified Air Pollution Control District and indirect emission sources that the Navy can not influence or control. Emission sources operating under air quality permits include engine and airframe maintenance facilities (paint, solvent, and abrasive blasting equipment), central boilers for hangars and BEQ facilities, and engine test cells. Important indirect emission sources not under Navy control include household vehicle travel for non-work purposes and natural gas use by off-base households.

Modifications to existing maintenance facilities are unlikely to require new air quality permits unless the existing permits contain restrictive limitations on facility use. New central boilers and the new engine test cell would require air quality permits. Some new or replacement equipment (such as standby generators, compressors, etc.) might require new permits from the San Joaquin Valley Unified Air Pollution Control District. Requirements for permits or permit modifications are not in themselves significant impacts.

As indicated by the bottom portion of Table 4-25, overall emissions of ozone and PM_{10} precursors associated with the E-2 realignment are estimated to be 42.9 tons per year of reactive organic compounds, 73.8 tons per year of nitrogen oxides, and 61.5 tons per year of PM_{10}. The overall emission increases for reactive organic compounds and PM_{10} are below the relevant conformity *de minimis* levels, and thus are less than significant. The incremental emissions increase for nitrogen oxides exceeds the relevant *de minimis* level, and is a significant impact for a serious ozone nonattainment area. However, most of this increase is already accounted for in the ozone SIP for the San Joaquin Valley, and is thus adequately mitigated.

Mitigation 2. As can be seen from the middle portion of Table 4-25, the ozone SIP for the San Joaquin Valley already accounts for most of the nitrogen oxide emissions increase that would occur under the NAS Lemoore Alternative. Part of the remaining emissions increase would be accounted for when SIP emission forecasts are updated to include all stationary sources with permits from the APCD. At least a portion of the remaining increment is accounted for within the SIP's generalized population growth forecasts (and associated vehicle travel and household emission sources). Thus, this impact is adequately mitigated by being largely taken into account by current SIP emission forecasts.

Less than Significant Impacts

Intersection carbon monoxide concentrations. Traffic associated with the NAS Lemoore Alternative would have a less than significant effect on ambient carbon monoxide concentrations at the main gate and Grangeville access points to NAS Lemoore. Dispersion modeling analyses indicate that peak 1-hour carbon monoxide concentrations at the major access gates would be less than 3 ppm, with peak 8-hour carbon monoxide concentrations being about 2 ppm. These carbon monoxide concentrations are well below the impact significance thresholds set by federal and state ambient standards (35 ppm for the federal 1-hour standard, 20 ppm for the state 1-hour standard, and 9 ppm for the federal and state 8-hour standards).

4.6.3 NAF El Centro Alternative

Less than Significant Impacts

Clean Air Act conformity. The NAF El Centro Alternative would have a less than significant impact on conformity-related emissions for the Salton Sea Air Basin. Table 4-26 summarizes emissions associated with the NAF El Centro Alternative. Emission estimates presented in Table 4-26 are separated into those that apply to the EPA Clean Air Act general conformity regulation, and additional emissions that should be addressed in a NEPA context. The top part of Table 4-26 addresses emission sources that fall within the scope of the EPA general conformity regulation. Emission sources associated with the NAF El Centro Alternative would be similar to those discussed for the NAS Lemoore Alternative.

As indicated in Table 4-26, emission sources under Navy control would result in incremental emission increases of 31.1 tons per year for reactive organic compounds, 51.8 tons per year for nitrogen oxides, and 29.1 tons per year for PM_{10}. These emission quantities are less than the relevant *de minimis* thresholds for ozone and PM_{10} precursors (100 tons per year for each pollutant). Consequently, a record of nonapplicability (RONA), rather than a conformity determination, would be required for the NAF El Centro Alternative.

Emissions of nonattainment pollutants. Less than significant increases in the overall emissions of ozone and PM_{10} precursors would occur under the NAF El

Table 4-26
Annual Emissions for E-2 Squadron Activity
NAF El Centro Alternative

Year	Emissions Component	Estimated Annual Emissions, Tons Per Year				
		Reactive Organic Compounds	Nitrogen Oxides	Carbon Monoxide	Sulfur Oxides	PM_{10}
1998	Construction Activity	1.13	18.20	8.33	1.88	17.73
	E-2 Operations	7.24	12.30	10.08	0.57	3.57
	E-2 Engine Run-ups	0.39	1.08	0.56	0.05	0.31
	Aircraft Fuel Transfers	0.08	0.00	0.00	0.00	0.00
	Aircraft Support Equipment	0.66	0.99	12.47	0.05	0.09
	Other Permit-Exempt Equipment	0.01	0.07	0.06	0.00	0.00
	On-Base Natural Gas Use	0.01	0.19	0.15	0.00	0.03
	Added Base-Related Traffic	1.92	1.72	20.35	0.05	4.91
	1998 CAA Conformity Total	11.44	34.56	52.00	2.60	26.65
1999	Construction Activity	0.17	2.70	1.35	0.27	2.36
	E-2 Operations	21.72	36.91	30.25	1.71	10.71
	E-2 Engine Run-Ups	1.17	3.24	1.69	0.14	0.93
	Aircraft Fuel Transfers	0.25	0.00	0.00	0.00	0.00
	Aircraft Support Equipment	1.98	2.98	37.41	0.15	0.27
	Other Permit-Exempt Equipment	0.02	0.21	0.19	0.01	0.01
	On-Base Natural Gas Use	0.03	0.58	0.44	0.00	0.09
	Added Base-Related Traffic	5.77	5.15	61.05	0.14	14.74
	1999 CAA Conformity Total	31.10	51.79	132.37	2.44	29.11
2000+	E-2 Operations	21.72	36.91	30.25	1.71	10.71
	E-2 Engine Run-Ups	1.17	3.24	1.69	0.14	0.93
	Aircraft Fuel Transfers	0.25	0.00	0.00	0.00	0.00
	Aircraft Support Equipment	1.98	2.98	37.41	0.15	0.27
	Other Permit-Exempt Equipment	0.02	0.21	0.19	0.01	0.01
	On-Base Natural Gas Use	0.03	0.58	0.44	0.00	0.09
	Added Base-Related Traffic	5.77	5.15	61.05	0.14	14.74
	2000+ CAA Conformity Total	30.93	49.08	131.02	2.16	26.75
	Maximum CAA Conformity Analysis Emissions	31.10	51.79	132.37	2.60	29.11
	De Minimis Threshold	100.00	100.00	na	na	100.00
	Above *De Minimis* Level?	NO	NO	NO	NO	NO
	NAF El Centro Activity Increase Forecast in SIP	0.00	0.00	0.00	0.00	0.00
	Conformity Emissions Change	31.10	51.79	132.37	2.60	29.11
	Conformity Offset Requirements	none	none	none	none	none
2000+	Base-Related CAA Conformity Analysis Emissions	30.93	49.08	131.02	2.16	26.75
	Engine Test Cell	0.05	1.79	0.19	0.07	0.42
	Other On-Base Permit Sources	0.36	3.39	2.55	0.03	0.51
	Off-Base Natural Gas Use	0.72	9.37	3.99	0.06	1.11
	Additional Household Travel	13.96	12.51	129.07	0.38	39.32
	Total Emissions	46.03	76.13	266.82	2.70	68.11

Notes: Except for the following items, assumptions regarding aircraft operations, equipment use, and vehicle travel are the same as those presented in the footnotes to Table 4-24.

Construction emission estimates assume 21.5 acres disturbed and 12,875 hours of heavy equipment operation in 1998, 4.3 acres disturbed and 1,990 hours of heavy equipment operation in 1999.

Aircraft fuel transfer emission estimates assume 4.1 million gallons of JP-5 fuel used per year, with two splash-loading fuel transfers; 5 months of transfers at 60 degrees F, 1 month of fuel transfers at 70 degrees F, 2 months of fuel transfers at 80 degrees F, and 4 months of fuel transfers at 90 degrees F.

On-base natural gas use emissions assume 9.37 million cubic feet per year of natural gas use for space heating and water heating in added office, industrial, and personnel-support buildings (10 BTU/hour/square foot heating energy demand).

Other on-base permit sources include boilers for the added hangar and BEQ facilities plus paint, solvent, and abrasive blasting equipment at engine and airframe maintenance facilities.

Centro Alternative. The bottom part of Table 4-26 identifies emission sources that are excluded from conformity analysis, but which are still associated with the E-2 realignment. These emission sources include stationary sources operating under permits issued by the Imperial County Air Pollution Control District and indirect emission sources that the Navy can not influence or control. Emission sources operating under air quality permits include engine and airframe maintenance facilities (paint, solvent, and abrasive blasting equipment), central boilers for hangars and BEQ facilities, and engine test cells. Important indirect emission sources not under Navy control include household vehicle travel for non-work purposes and natural gas use by off-base households.

Modifications to existing maintenance facilities are unlikely to require new air quality permits unless the existing permits contain restrictive limitations on facility use. New central boilers and the new engine test cell would require air quality permits. Some new or replacement equipment (such as standby generators, compressors, etc.) might require new permits from the Imperial County Air Pollution Control District. Requirements for permits or permit modifications are not in themselves significant impacts.

As indicated by the bottom portion of Table 4-26, overall emissions of ozone and PM_{10} precursors associated with the E-2 realignment are estimated to be 46.0 tons per year of reactive organic compounds, 76.1 tons per year of nitrogen oxides, and 68.1 tons per year of PM_{10}. The overall emission increases for reactive organic compounds and PM_{10} are below the relevant conformity *de minimis* levels (100 tons per year for each pollutant), and thus are less than significant.

Intersection carbon monoxide concentrations. Traffic associated with the NAF El Centro Alternative would have a less than significant effect on ambient carbon monoxide concentrations access points to NAF El Centro. Dispersion modeling analyses indicate that peak 1-hour carbon monoxide concentrations along the major access roadways would be about 3 ppm, with peak 8-hour carbon monoxide concentrations being about 2.2 ppm. These carbon monoxide concentrations are well below the impact significance thresholds set by federal and state ambient standards (35 ppm for the federal 1-hour standard, 20 ppm for the state 1-hour standard, and 9 ppm for the federal and state 8-hour standards).

4.7 NOISE

This section identifies potential noise impacts that may result from implementing one of the realignment alternatives. Impact significance evaluations are based on estimated noise levels from direct and indirect noise sources associated with alternative actions. Noise modeling analyses have been used to evaluate noise impacts of construction activities, aircraft operations, and added traffic on major access roads. Technical analyses supporting the impact significance evaluations are presented in Appendix E.

Significance Criteria

Annoyance effects are the primary consideration for most noise impact assessments. Because the reaction to noise level changes involves both physiological and psychological factors, the magnitude of a noise level change can be as important as the resulting overall noise level. A readily noticeable increase in noise levels would often be considered a significant effect by local residents even if the overall noise level is still within land use compatibility guidelines. On the other hand, noise level increases that are not noticeable to most people generally are not considered a significant change, even if the overall noise level is close to or somewhat above land use compatibility guidelines.

A variety of factors related to the nature of a noise source can also affect people's reaction to it. Most people find evening and nighttime noise the most objectionable, and are more willing to accept noise sources that operate only during daytime hours. Similarly, temporary noise sources are generally tolerated more than permanent noise sources. Depending on the repetition pattern, intermittent noise sources can be either more or less objectionable than continuous noise sources.

A proposed action can have significant noise impacts through two different mechanisms: creating new sources of noise in an area, or establishing noise-sensitive land uses in locations that would be exposed to high noise levels. Both situations must be addressed by significance criteria for noise impacts.

Land use compatibility guidelines (Department of Defense [DOD] criteria for on-base land uses, general plan noise element criteria for off-base land uses) are the most common source of criteria used to define impact significance for noise issues. Regulatory thresholds established by state and local codes (i.e., state airport noise regulations) provide additional criteria for some categories of noise sources or affected land uses.

An alternative would have significant noise impacts if its implementation would directly or indirectly:

- Establish noise-sensitive land uses (residential, educational, and health care uses) in areas exposed to ambient noise levels that are higher than

the applicable land use compatibility criterion (typically 60 or 65 dB CNEL); or

- Increase ambient CNEL levels at noise-sensitive land uses beyond the "normally acceptable" land use compatibility criterion (typically 60 or 65 dB CNEL for residential, educational, and health care land uses). As noted in Chapter 3, California law uses the 65-dB CNEL contour to define "airport noise impact zones" for schools and other noise-sensitive land uses.

Temporary noise sources that are restricted to daytime hours (such as most construction and demolition activities) would be considered a significant impact only if they affect noise-sensitive land uses and result in CNEL levels more than 10 dB above the land use compatibility criterion for the affected noise-sensitive land use.

Table 4-27 summarizes the potential noise impacts identified in this analysis.

Table 4-27
Summary of Noise Impacts

	REALIGNMENT ALTERNATIVES		
IMPACT ISSUES	NAWS Point Mugu (Preferred Alternative)	NAS Lemoore	NAF El Centro
Construction noise	◐	◐	◐
Aircraft noise	◐	◐	◐
Traffic noise	◐	◐	◐

LEGEND:
● = Significant and not mitigable impact
◑ = Significant and mitigable impact
◐ = Less than significant impact
○ = No impact

4.7.1 Preferred Alternative: NAWS Point Mugu

Less than Significant Impacts

Construction noise. A less than significant noise impact would result from construction and remodeling activities associated with the NAWS Point Mugu Alternative. Temporary construction activity would occur with projects to remodel existing facilities or build new facilities to accommodate the E-2 aircraft, required maintenance and training facilities, and associated personnel. Most facility construction or remodeling would occur prior to the arrival of the E-2 aircraft. Construction projects would be small in scale, and most would not be located near noise-sensitive land uses.

Table 4-28 summarizes typical noise levels during various phases of construction projects. There would be little heavy grading and only limited foundation excavation during most of the anticipated construction projects. Noise levels during building erection and finishing would be lower than those during site and foundation preparation stages. Construction noise near existing housing areas would be minimized by restricting construction activity to normal daytime periods.

Table 4-28
Typical Construction Noise Impacts

Distance From Site (feet)	CNEL Increments (dBA) from Typical Construction Phases			
	Heavy Grading	Site Preparation	Foundation Excavation	Paving
50	85.8	84.7	85.7	82.7
100	79.7	78.6	79.6	76.7
200	73.5	72.5	73.5	70.5
400	67.2	66.2	67.2	64.1
600	63.4	62.3	63.4	60.2
800	60.5	59.6	60.6	57.3
1,000	58.3	57.3	58.4	55.0
1,500	54.0	53.1	54.1	50.6
2,000	50.7	49.9	50.9	47.2
2,500	48.0	47.3	48.3	44.4
3,000	45.7	45.1	46.1	42.0
4,000	41.8	41.3	42.3	37.9
5,280	37.6	37.3	38.3	33.5
7,500	31.8	31.6	32.7	27.4
9,000	28.5	28.4	29.5	23.9
10,560	25.4	25.3	26.5	20.6

Notes: dBA = A-weighted decibels
CNEL = community noise equivalent level
Noise calculations incorporate both distance attenuation and atmospheric absorption effects.
Noise estimates assume variable equipment use over a 10-hour work day with no nighttime construction activity, but with equipment items concentrated in a limited area.
Heavy grading assumed to require two scrapers, one grader, two heavy trucks, two front-end loader, one compactor, and one water truck. Site preparation assumed to require one bulldozer, one backhoe, one front-end loader, two heavy trucks, and one water truck. Foundation excavation assumed to require one power shovel, one front-end loader, two heavy trucks, and one water truck. Paving operations assumed to require one grader, one heavy truck, one roller, one paver, and one water truck.

Sources: US Environmental Protection Agency 1971.
Gharabegian, et al. 1985.
Acoustical Society of America 1978.

Aircraft noise. Noise associated with E-2 aircraft operations would have a less than significant impact on land uses in the NAWS Point Mugu vicinity because noise levels generated by E-2 aircraft are significantly lower than noise levels from existing flight operations. Aircraft flight activity would be the dominant

component of noise contributed by E-2 aircraft. Testing of E-2 engines after maintenance work would be an additional localized source of noise at engine test cell facilities and runway apron power check pads. Noise from testing of E-2 aircraft engines would not produce any significant impacts because noise barriers and enclosures are used at engine test cells and at any power check pads near noise-sensitive land uses.

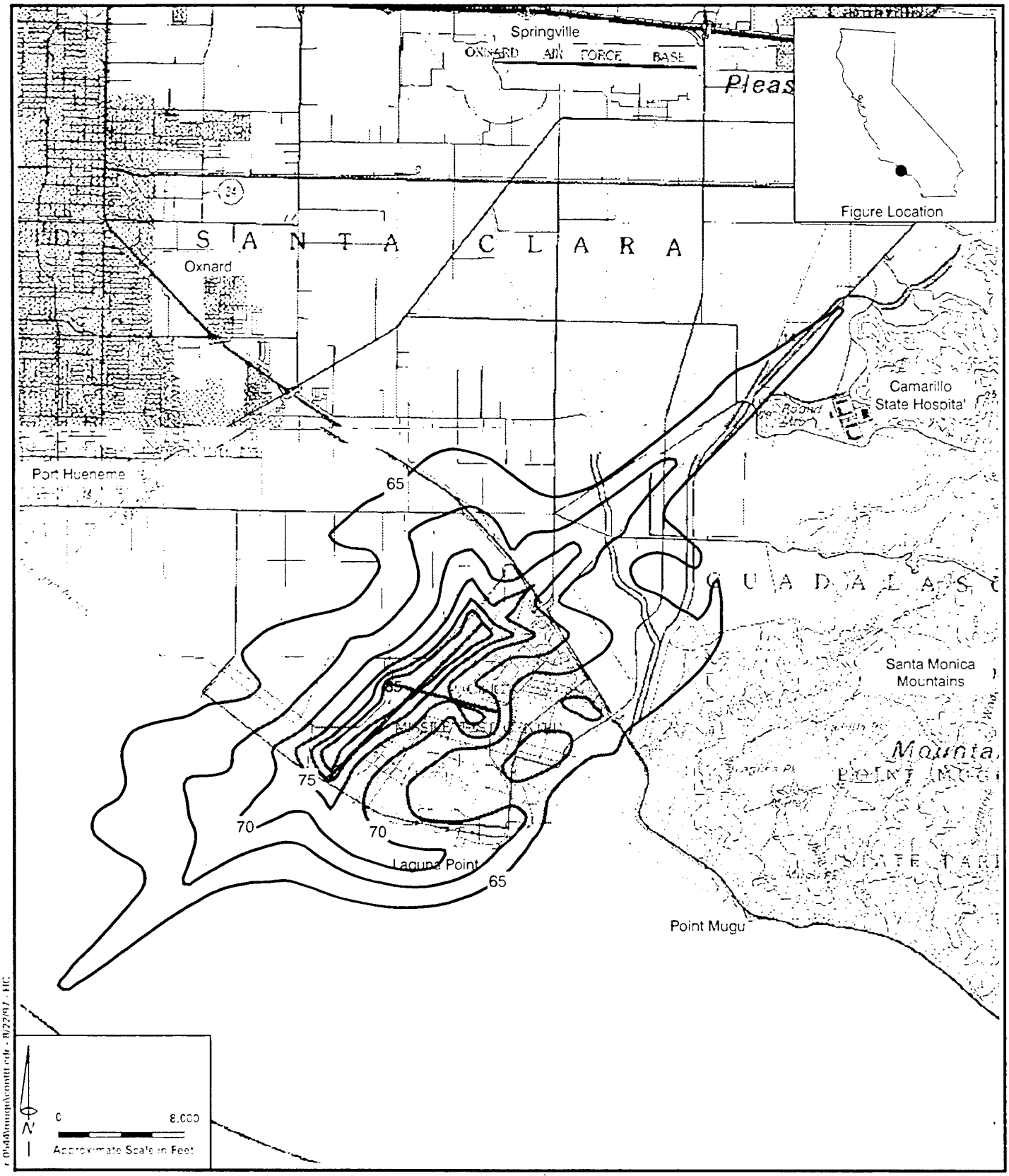
Noise levels produced by E-2 aircraft are at least 10 A-weighted decibel scale (dBA) lower than those produced by fighter jet aircraft. Consequently, the introduction of E-2 aircraft at NAWS Point Mugu would not cause any meaningful change in overall aircraft noise contours around the airfield. Figure 4-4 illustrates anticipated CNEL contours around NAWS Point Mugu after the arrival of the E-2 squadrons. As can be seen by comparison to Figure 3-31 (in Section 3.7, Noise), the added flight activity produced by the introduction of E-2 squadrons would cause only minor alterations in the shapes of existing noise contours north, south, or west of NAWS Point Mugu. Noise contours would expand somewhat to the east due to additional low altitude landing practice patterns by E-2 aircraft. The off-base acreage exposed to CNEL values above 65 dB would increase from about 1,623 acres to 1,800 acres (Wyle 1997).

E-2 aircraft flight events would be heard as additional discrete noise events, but the resulting noise levels would be much less than those generated by jet aircraft. Table 4-29 summarizes estimated peak noise levels from E-2 takeoffs, high power level flights, and landing approaches. Noise levels are primarily a function of power setting and distance from the aircraft flight path. Noise levels are typically 7 to 10 dBA lower for approach power settings than for high power settings (i.e., takeoffs and normal cruising speeds).

Peak flyover noise levels for nearby off-base land uses would almost always be less than 75 dBA. Flyovers of more distant populated areas (such as Oxnard, Port Hueneme, or Camarillo) would typically happen with the aircraft at an altitude of 1,500 to 2,500 feet. Peak flyover noise levels in these areas would generally be about 70 dBA. As a point of comparison, a typical 2-axle delivery truck driving by at 35 mph produces a peak noise level of about 75 dBA at a distance of 50 feet, while a 3-axle truck produces a peak noise level of about 83 dBA at that distance. Average noise levels for individual flyover events would be 4 to 5 dBA lower than the peak noise levels listed in Table 4-29.

Because individual flyover events would last only about 1.5 minutes, noise levels for these events cannot be compared to the 24-hour average noise levels used for land use compatibility criteria.

Traffic noise. Additional traffic associated with the NAWS Point Mugu Alternative would have a less than significant effect on ambient noise levels along



The noise contours over off base lands resulting from realignment of the E-2 squadrons would change little compared to existing noise conditions (Figure 3-38

LEGEND

—75— Community Noise Equivalent Level (CNEL)

NAWS Point Mugu

NAWS Point Mugu Proposed E-2 Realignment Noise Contours

E-2 Aircraft Squadrons Realignment EIS
NAWS Point Mugu, California

Source: Wyle 1997.

Figure 4-4

Table 4-29
Peak Noise Levels From E-2 Aircraft Flyover Events

Aircraft Flyover Height (feet)	Distance Offset from Round Track (feet)	Slant Distance from Flight Path (feet)	Peak Noise Level (dBA) During Flyover Events for Various Power Settings and Air Speeds					
			Takeoff Power		Cruise Power		Approach Power	
			144 mph	173 mph	184 mph	230 mph	138 mph	150 mph
50	0	50	98.5	99.5	99.4	100.5	89.0	89.4
100	0	100	93.3	94.2	94.0	95.1	84.1	84.5
300	0	300	84.9	85.8	85.3	86.5	76.3	76.7
300	200	361	83.5	84.4	83.9	85.0	75.0	75.4
500	200	539	80.4	81.3	80.7	81.9	72.1	72.5
300	500	583	79.8	80.7	80.1	81.2	71.6	72.0
300	750	707	78.3	79.3	78.5	79.7	70.2	70.6
300	750	808	77.3	78.2	77.4	78.6	69.2	69.6
500	750	901	76.4	77.4	76.6	77.7	68.4	68.8
1000	200	1020	75.5	76.4	75.5	76.7	67.5	67.9
1500	200	1513	72.4	73.3	72.3	73.5	64.7	65.1
2000	100	2002	70.1	71.1	70.0	71.1	62.6	63.0
2500	100	2502	68.3	69.2	68.1	69.2	60.9	61.3
3000	100	3002	66.8	67.7	66.5	67.6	59.6	60.0
3000	4000	5000	62.5	63.4	61.8	63.0	55.6	56.0
7500	0	7500	58.8	59.7	57.8	59.0	52.3	52.7
10560	0	10560	55.4	56.4	54.1	55.3	49.3	49.7

Notes: Noise levels were estimated by converting flyover event single event noise level (SEL) data into an equivalent time history pattern, assuming event durations based on a 4 nautical mile (7,408 meters)audible flight path at appropriate air speeds.
The duration of the approach leg of the flight path was reduced to account for the difference between the speed of sound (about 771 mph) and the speed of the aircraft. This results in a slightly asymmetrical event time history for the air speeds typical of turboprop aircraft.
Speed of sound calculations were based on data from Weast (1980).
SEL data for P-3 aircraft (US Navy 1984) were used to construct simulated time history flyover event noise profiles.
The simulated dBA time histories for 2-engine E-2 aircraft were assumed to be 3 dBA lower than those for the 4-engine P-3 aircraft; P-3 and E-2 aircraft use the same engine model.
Peak noise levels from the simulated time histories were used as input to a distance attenuation model, with drop-off rates and atmospheric absorption rates calibrated to match the distance attenuation profile for the SEL data presented in US Navy 1984.
Average noise levels for a 4-nautical mile (7,408 meters) flyover event would be 4-5 dBA lower than the peak dBA value.
As a point of comparison, the peak noise level for a single heavy truck driving by at 35 mph is typically about 80 dBA at a distance of 50 feet (15 meters).

roadways providing access to NAWS Point Mugu. It generally takes a doubling of traffic volumes to cause a 3 dB noise level increase. Daily traffic volumes on SR-1 and Frontage Road would increase by one to three percent after arrival of the E-2 squadrons, resulting in noise level changes of 0.2 to 0.3 dB. Such small noise level changes would not be noticeable.

4.7.2 NAS Lemoore Alternative

Less than Significant Impacts

Construction noise. A less than significant noise impact would result from construction and remodeling activities associated with the NAS Lemoore Alternative. Construction-related noise conditions would be similar to those shown in Table 4-28 and discussed for the NAWS Point Mugu Alternative. Construction noise near existing housing areas would be minimized by restricting construction activity to normal daytime periods.

Aircraft noise. Noise associated with E-2 aircraft operations would have a less than significant impact on land uses in the NAS Lemoore vicinity. Noise levels produced by E-2 aircraft are at least 10 dBA lower than those produced by jet aircraft currently operating at NAS Lemoore. Because NAS Lemoore has a large number of jet aircraft flight operations, the introduction of E-2 aircraft would not cause any change in overall aircraft noise contours around the airfield. Noise impacts from engine testing would not be significant at NAS Lemoore because the operations area is located about 4 miles from administration and housing areas. Noise from individual E-2 overflights would be the same as described under the NAWS Point Mugu alternative (see Table 4-29).

Testing of E-2 engines after maintenance work would be an additional localized source of noise at engine test cell facilities and runway apron power check pads. Noise from testing of E-2 aircraft engines would not produce any significant impacts because noise barriers and enclosures are used at engine test cells and at any power check pads near noise-sensitive land uses.

Traffic noise. Additional traffic associated with the NAS Lemoore Alternative would have a less than significant effect on ambient noise levels along major access roadways. Daily traffic volumes on SR-198 and Grangeville Boulevard would increase by five to seven percent after arrival of the E-2 squadrons, resulting in noise level changes of 0.2 to 0.3 dBA. Such small noise level changes would not be noticeable. Traffic volume changes on SR-41 would be too small to change existing traffic noise levels.

4.7.3 NAF El Centro Alternative

Less than Significant Impacts

Construction noise. A less than significant noise impact would result from construction and remodeling activities associated with the NAF El Centro

Alternative. Construction-related noise conditions would be similar to those shown in Table 4-28 and discussed for the NAWS Point Mugu Alternative. Construction noise near existing housing areas would be minimized by restricting construction activity to normal daytime periods.

Aircraft noise. Noise associated with E-2 aircraft operations would have a less than significant impact on land uses in the NAF El Centro vicinity. Noise levels produced by E-2 aircraft are at least 10 dBA lower than those produced by combat jet aircraft. Consequently, the introduction of E-2 aircraft at NAF El Centro would not cause any meaningful change in overall aircraft noise contours around the airfield. Existing high noise level conditions would remain unchanged for on-base and nearby off-base areas. Testing of E-2 engines after maintenance work would be an additional localized source of noise at engine test cell facilities and runway apron power check pads. Noise barriers or enclosures would be necessary at engine test cells and at any power check pads located near noise-sensitive land uses. Noise from individual E-2 overflight events would be the same as described under the NAWS Point Mugu alternative (see Table 4-29).

Traffic noise. Additional traffic associated with the NAF El Centro Alternative would have a less than significant effect on ambient noise levels along major access roadways. Daily traffic volumes on Bennett Road would increase by 11 percent after arrival of the E-2 squadrons, resulting in a noise level change of 0.5 dBA. Traffic volumes would increase nine percent on Evans Hewes Road east of Forrester Road, resulting in an noise level change of 0.4 dBA. Other roadways would experience traffic increases resulting in noise level changes of less than 0.2 dBA. In all cases, these small noise level changes would not be noticeable.

4.8 AESTHETICS AND VISUAL RESOURCES

This section identifies potential consequences to aesthetics and visual resources that may result from implementing the proposed action at one of the alternative bases. The impact analysis compares projected conditions after realignment to the affected environments and regions of influence described in Section 3.8, Aesthetics and Visual Resources. The aesthetics and visual resources analysis is a qualitative evaluation of the nature and extent of change to the existing landscape and man-made visual character and views through implementation of the proposed action at each of the alternative bases.

Significance Criteria

Implementation of the proposed action would have a significant impact on the aesthetic or visual environment if it would:

- Substantially contrast with the character and scale of the existing community;
- Degrade views from any formally recognized scenic viewshed or roadway; or
- Dominate views of a visually unique structure or landform.

Table 4-30 summarizes the potential aesthetics and visual resources impacts that have been identified in this analysis.

Table 4-30
Summary of Aesthetics and Visual Resources Impacts

	REALIGNMENT ALTERNATIVES		
IMPACT ISSUES	NAWS Point Mugu (Preferred Alternative)	NAS Lemoore	NAF El Centro
Visual character	◐	◐	◐
Sensitive views	◐	◐	◐
Consistency with plans and policies	◐	◐	◐

LEGEND:
● = Significant and not mitigable impact
◑ = Significant and mitigable impact
◐ = Less than significant impact
○ = No impact

4.8.1 Preferred Alternative: NAWS Point Mugu

Less than Significant Impacts

Visual character. Proposed development and operations at NAWS Point Mugu would have a less than significant impact on visual character at or near the base.

Development of airfield, AIMD and training facilities would require construction of several new buildings at NAWS Point Mugu. The new structures would be located in an already developed area consistent with existing structures in terms of scale and architectural treatments based on the Base Exterior Architecture Plan (BEAP) guidelines. The only exception would be a portion of the proposed vehicle parking lot near the periphery of the open space surrounding Mugu Lagoon. Site development would contrast with the adjacent open space, but would be compatible in character with surrounding nearby developments, such as Building 514. Rehabilitation and renovation of the aircraft hangar would require internal modifications, and approximately expansion of 7,000 square feet. The hangar is located in an already developed area, and changes would be similar in scale and character. There would be visible changes from the aircraft parking apron pavement expansion, simulated aircraft carrier deck lighting on the runway, and support utilities associated with airfield improvements. These changes would not be visible from off-base nor from many of the on-base structures. Therefore, impacts to visual quality and character from the proposed development associated with the NAWS Point Mugu Alternative would be less than significant. No mitigation would be required.

The E-2s would fly within the same areas as current flight activity and operations. Visually sensitive land uses are limited within the base's airfield flight path. Furthermore, topographic constraints limit aircraft flights over the nearby Santa Monica National Recreation Area and State Park. Therefore, the operational impacts to visual character would be less than significant. No mitigation would be required.

Sensitive views. The proposed action would have a less than significant impact on nearby views. Although the proposed development would be visible from on-base residential areas, no new structures would be visible from outside the base perimeter. Therefore, impacts to existing views from implementing the proposed action at NAWS Point Mugu would be less than significant. No mitigation would be required.

Consistency with plans and policies. Pursuant to the Coastal Zone Management Act, federal activities that could affect land, water, or natural resources in the coastal zone must be consistent with the enforceable policies of the approved state coastal zone program to the maximum extent practicable. Because the proposed action at NAWS Point Mugu would affect the coastal zone, the Navy has prepared a Coastal Consistency Determination, which has been submitted to the Coastal Commission. In addition, all new construction would comply with the NAWS Point Mugu Base Exterior and Architecture Plan (BEAP) design guidelines.

4.8.2 NAS Lemoore Alternative

Less than Significant Impacts

Visual character. Proposed development and operations at NAS Lemoore would have a less than significant impact on visual character at or near the base. Development of the aircraft hangar, AIMD, training, and personnel support facilities would require new construction at NAS Lemoore. Many of these structures would be infill projects consistent with existing structures in terms of scale and architectural treatments based on the BEAP guidelines. The new buildings are proposed among structures that are similar in scale and character. The proposed personnel support facilities would also be constructed among administration buildings with similar architecture and scale (i.e., recreation and housing areas). No unique landforms or scenic attributes would be affected by this alternative. Because the new structures would integrate architectural treatments required by the BEAP, the proposed development would have a less than significant impact on visual character. No mitigation would be required.

The increase in flight activity would not substantially change the perceived character of existing operations, because there are no visually sensitive land uses beneath the airfield flight path. Therefore, operations associated with the NAS Lemoore Alternative would have a less than significant impact on the visual environment. No mitigation would be required.

Sensitive views. With the NAS Lemoore Alternative, there would be a less than significant impact to nearby views. The interior location of the proposed structures would restrict their visibility to internal base operations, including on-base residential areas. None of the structures would be visible from outside the base perimeter. Therefore, impacts to existing views from implementing the proposed action at NAS Lemoore would be less than significant. No mitigation would be required.

Consistency with plans and policies. Implementation of the proposed action at NAS Lemoore would be consistent with relevant plans and regulations, such as the NAS Lemoore BEAP. All new construction would comply with NAS Lemoore BEAP design guidelines.

4.8.3 NAF El Centro Alternative

Less than Significant Impacts

Visual character. With the NAF El Centro Alternative, there would be less than significant impacts on visual character at or near the base. Development of the airfield, AIMD, training, and personnel support facilities would require new construction at NAF El Centro. The proposed airfield, AIMD, training, and personnel support facilities would be clustered in a complex within 800 feet (244 meters) of the Main Gate. Although there is only one nearby hangar structure, the buildings would be comparable in scale to other similar on-base facilities. The

visually detectable change from agricultural land to operational area would contrast with the surrounding agricultural character of the site, but would remain consistent with adjacent hangar and other military airfield facilities. The personnel support facilities would be constructed among structures similar in scale and character as the proposed buildings (i.e., recreation and housing areas). No unique landforms or scenic attributes would be removed with the NAF El Centro Alternative. Landscaping and architectural treatments required in the BEAP would serve to integrate the proposed structures into the visual theme established at the base. Therefore, the impact to visual character associated with the NAF El Centro Alternative would be less than significant. No mitigation would be required.

The E-2s would fly within the same areas as current flight activity and operations. The increase in flights and FCLPs would not substantially change the perceived character of the existing flight activity. Therefore, the impact of operations associated with the NAF El Centro Alternative to the visual environment would be less than significant. No mitigation would be required.

Sensitive views. With the proposed action, there would be a less than significant impact on nearby views. Although the new operational structures would be visible from the perimeter of the base and Main Gate, no sensitive viewsheds exist outside the base perimeter. No personnel support structures would be visible from outside the base perimeter or Main Gate because of distance and intervening structures which block views to internal areas. Overall, views of each project site within NAF El Centro have low visual quality because there is minimal variation in scenery, topography, and architecture. Therefore, impacts to existing views associated with the NAF El Centro Alternative would be less than significant. No mitigation would be required.

Consistency with plans and policies. Implementation of the proposed action at NAF El Centro would be consistent with relevant plans and regulations such as the NAF El Centro BEAP. All new construction would comply with the NAF El Centro BEAP design guidelines.

4.9 UTILITIES AND SERVICES

This section identifies potential impacts to utilities and services that may result from implementing the proposed action at one of the alternative bases. The impact analysis compares projected conditions after realignment to the affected environments and regions of influence described in Section 3.9, Utilities and Services. The utilities and services analyses are qualitative evaluations of the nature and extent of changes to existing utilities and services through the implementation of proposed action at each of the alternative bases.

Significance Criteria

Implementing the proposed action may have significant impacts on a utility or service if it would:

- Increase demand in excess of the utility system or service capacity to the point that substantial expansion, additional facilities, or increased staffing levels would be necessary, or

- Violate federal, state, or local standards or requirements regulating a public utility system.

Table 4-31 summarizes the potential impacts to utilities and services that have been identified in this analysis.

Table 4-31
Summary of Utilities and Services Impacts

	REALIGNMENT ALTERNATIVES		
IMPACT ISSUES	NAWS Point Mugu (Preferred Alternative)	NAS Lemoore	NAF El Centro
Water supply	◐	◐	◐
Wastewater collection and treatment	◐	◐	◐
Storm water collection and treatment	◐	◐	◐
Solid waste collection and disposal	◐	◐	◐
Natural gas and electric services	◐	◐	◐
Schools	◑	◑	◐
Child care	◐	◐	◐
Health services	◐	◐	◐
Recreational and community facilities	◐	◐	◐
Police services	◐	◐	◐
Fire protection	◐	◐	◐

LEGEND:
● - Significant and not mitigable impact
◑ - Significant and mitigable impact
◐ - Less than significant impact
○ - No impact

Approach to the Analysis

For the purpose of this analysis, utility demand projections for each facility are based on an ICF Kaiser study that determined utility usage associated with the 1993 Defense Base Closure and Realignment Commission (BRAC) recommendations (US Navy 1994f). Utility usage by family members housed on each facility was also incorporated into the utility demand projections. Based on these assumptions, projected utility demand at each Navy facility from realignment of E-2 aircraft and associated personnel and equipment would be:

- water = 163,170 gallons per day (gpd) (617,600 liters per day [Lpd]);
- wastewater = 129,400 average gpd (489,800 Lpd);
- solid waste generation = 4.2 tons per day (3.8 tonnes);
- electricity = 58,268 kilowatt hour (KWH) per day; and
- natural gas = 50,070 cubic feet per day (cfd) (1,400 cubic meters per day [cmd]).

Families that would not reside at Navy facilities were assumed to be distributed in surrounding communities and therefore would affect local provider utility demand. Additionally, families residing off base are projected to be absorbed by existing housing and development (see Section 4.4, Socioeconomics).

Projected demands for public services are based on population increases, including military and civilian personnel and their families. All personnel are assumed to use health services and recreation and community facilities in the ROI for each alternative. In the case of fire protection and police services, the additional personnel and family members that would work and reside at a Navy facility would generate the increased demand at the base. Families that would reside in surrounding ROIs would require fire protection and police services from local providers.

The EIFS model was used to account for the effects of realignment operations and construction on local schools. Appendix C contains complete model outputs. The EIFS standard and construction models were used to analyze operations effects, which include changes in E-2 squadron personnel and procurement, and construction phase effects, respectively. The EIFS model projects increases in the number of school children for each alternative, ranging from 429 to 445 in the year of greatest impact (1999).

4.9.1 Preferred Alternative: NAWS Point Mugu

Significant Impacts

Impact 1: Schools. A potential impact to schools would occur due to the action at NAWS Point Mugu, but would be mitigated by federal payments to eligible school districts. Federal agencies affect local schools districts either through federal ownership of property in the district (federal property is tax-exempt and may decrease funds available for education), or by adding "federally connected children" to the number of students that would ordinarily need to be educated by local school districts. Federally connected children include those who (1) live and have parents who work on federal property and (2) those who either live on federal property or have parents who work on federal property.

With the NAWS Point Mugu Alternative, the highest demand on the local school system would occur in 1999 (due to constructions and operations occurring simultaneously at their peak) when an additional 429 students would attend schools in the vicinity of the base. In the year 2001 and beyond, it is expected that approximately 417 students would attend schools in the vicinity of the base. All affected schools in Ventura County are operating over design and expansion capacity.

Mitigation 1. School districts may be eligible for compensation for the addition of federally connected students by impact aid, which is intended to compensate local school districts for burdens placed on their resources by federal activity. Schools must apply for impact aid through a competitive process and funds are paid directly by the Department of Education (US Department of Education 1995). The Navy would assist, to the extent practicable, affected schools in their pursuit for federal impact aid. Implementation of this mitigation would reduce the level of impact to one that is less than significant.

Less than Significant Impacts

Water supply. The increased demand for water would not significantly affect water supply of NAWS Point Mugu. The increased population and operations at NAWS Point Mugu would increase total demand to 1.6 million gallons per day (mgd) (6.2 million Liters per day [mLd]), an 11 percent increase over the current demand of 1.48 mgd (Lpd) (5.56 mLd). The infrastructure is in adequate condition and has the capacity to accommodate the water supply increase (Hovde 1997). Additionally, the Port Hueneme Water Agency (PHWA) and the United Water Conservation District (UWCD) have sufficient capacity to serve the base's increased water needs (Passanisi 1997; Gientke 1997). The impact to water supply at NAWS Point Mugu would be less than significant. No mitigation would be required.

The families that would reside in the surrounding communities within the ROI would require approximately 187,980 gpd (530,000 Lpd) of potable water. The municipal water departments and local water suppliers have the capacity to accommodate the increased water requirements of these communities (Passanisi

1997; Gientke 1997; Muro 1997; Smith 1997; Bauer 1997). The impact to water supply within the ROI would not be significant. No mitigation would be required.

Wastewater collection and treatment. The increase in wastewater generated at NAWS Point Mugu from this alternative would not significantly affect the wastewater collection and treatment system. The population and operations increase at NAWS Point Mugu would increase total wastewater generated to 0.48 mgd (1.82 mLd), a 37 percent increase over the current generation of 0.35 gpd (1.32 mLd). The infrastructure is in adequate condition and has the capacity to accommodate the wastewater increase (Hovde 1997). The increase would not exceed the base's 500,000-gpd (1,890,000-Lpd) allotment from the City of Oxnard wastewater treatment plant. Additionally, the Oxnard Wastewater Treatment Plant has approximately 12.7 mgd (48 mLd) in excess capacity and could further increase NAWS Point Mugu's wastewater allotment should the need arise (Moise 1997). The impact to wastewater collection and treatment at NAWS Point Mugu would be less than significant. No mitigation would be required.

The families that would reside in the surrounding communities within the ROI would generate approximately 140,985 gpd (53,360 Lpd) of wastewater. Wastewater treatment agencies in the surrounding cities of Oxnard, Camarillo, Ventura, and Port Hueneme have sufficient capacity to accommodate the increased wastewater requirements of the incoming families (Connor 1997; Westdike 1997; Finley 1997; Simmons 1997). The impact to wastewater collection and treatment within the ROI would be less than significant. No mitigation would be required.

Storm water collection and treatment. The increase in the rate and volume of storm water runoff at NAWS Point Mugu from this alternative would not significantly affect the collection and treatment system. The volume and rate of storm water runoff at NAWS Point Mugu would increase slightly because impervious surfaces would increase by approximately 3 acres (1.2 hectares) from the proposed development and expansion of current facilities at NAWS Point Mugu. The storm water collection system has the capacity to accommodate the increase in storm water flow from development and expansion (Cervantes 1997). Minor upgrades would be designed to accommodate the projected increase in storm water flows during buildout of this alternative progresses. The impact to storm water collection and treatment at NAWS Point Mugu would be less than significant. No mitigation would be required.

Solid waste collection and disposal. The increase in solid waste generation at NAWS Point Mugu from this alternative would not significantly affect the collection and disposal system. The population and operations increase at NAWS Point Mugu would increase total solid waste generation to approximately 18 tons (16 tonnes) per day, a 30 percent increase over the current generation of 13.8 tons (12.4 tonnes) per day. Professional Waste Management and the Del Norte Regional Recycling and Transfer Station have the capacity to accommodate this amount of solid waste, and the Toland Road Landfill life expectancy is approximately 30 years (Perry 1997;

Conaway 1997). Additionally, the base would be able to meet its solid waste diversion goals outlined by AB 939 (Granade 1997). The impact to solid waste collection and disposal at NAWS Point Mugu would be less than significant. No mitigation would be required.

The families that would reside in the surrounding communities within the ROI would generate approximately 2.4 tons (2.2 tonnes) per day of solid waste. Local waste collection and disposal agencies could accommodate the increased solid waste generation (Perry 1997; Conaway 1997). The impact to solid waste collection and disposal within the ROI would be less than significant. No mitigation would be required.

Natural gas and electric services. The increase in natural gas and electric consumption at NAWS Point Mugu from this alternative would not significantly affect the gas and electric systems. The population and operations increase at NAWS Point Mugu would increase total natural gas consumption to 139,040 cfd (39,370 cmd) a 56 percent increase over the current usage of 89,000 cfd (2,520 cmd). Total electricity requirements would increase to about 329,068 KWH per day, 21 percent more than the current usage of 271,000 KWH. The base's natural gas and electrical systems are in adequate condition and have the capacity to accept the additional natural gas and electricity needed (Hovde 1997). Southern California Gas Company (SCGC) and SCE could provide the base with the additional natural gas required (Rees 1997; Wiggins 1997). The impact to natural gas and electric services at NAWS Point Mugu would be less than significant. No mitigation would be required.

The additional families that would reside in the surrounding communities within the ROI would receive energy from the same local natural gas and electricity providers at NAWS Point Mugu. These providers have the capacity to service these areas (Rees 1997; Wiggins 1997). The impact to natural gas and electric services within the ROI would be less than significant. No mitigation would be required.

Child care. The increased number of children at NAWS Point Mugu from this alternative could not be accommodated by the existing child care facilities. Expansion of the Family Services Center would accommodate the additional children. The impact to child care would be less than significant. No mitigation would be required.

Health services. The increase in personnel at NAWS Point Mugu from this alternative could not be accommodated by the existing branch medical and dental clinic. The additional operations and maintenance personnel at NAWS Point Mugu from the E-2 squadron realignment would exceed the current capacity of the medical and dental clinic and the current staff of three physicians, one independent duty corpsman, and one physician's assistant. This alternative provides for the additional staffing and facilities to maintain adequate levels of health care. Health services would be scaled up as required during buildout of the alternative. The

impact to health services at NAWS Point Mugu would be less than significant. No mitigation would be required.

The Naval Medical Clinic at Port Hueneme and the 12 surrounding area hospitals would accommodate the additional demand for health services from military family members residing in surrounding communities. Demand for health care would be distributed among these facilities and would be minimal. The impact to health services within the ROI would be less than significant. No mitigation would be required.

Recreational and community facilities. The additional demand for recreation and community facilities at NAWS Point Mugu and within the ROI from this alternative would not significantly affect these facilities. Increased demand and usage of these facilities would be distributed among facilities on base and in the surrounding communities. The impact to recreational and community facilities would be less than significant. No mitigation would be required.

Police services. The additional demand for police services at NAWS Point Mugu from this alternative would not significantly affect the NAWS Point Mugu Security Department. The current staffing levels, facilities, and equipment have the capacity to accommodate the increased police services requirements of the increased operations and personnel and maintain the existing level of service (Boner 1997). The impact to police services at NAWS Point Mugu would be less than significant. No mitigation would be required.

The families that would reside in the surrounding communities within the ROI would require police services. The Ventura County Sheriff's Department and Police Departments in the surrounding cities of Oxnard, Camarillo, Ventura, and Port Hueneme have sufficient capacity to accommodate the security requirements of the incoming families (Parks 1997; Nishihara 1997; Tennessen 1997; Tracy 1997; Dobbe 1997). Demand for police services would be distributed among these local agencies. The impact to police services within the ROI would be less than significant. No mitigation would be required.

Fire protection. The additional demand for fire services at NAWS Point Mugu from this alternative would not significantly affect the NAWS Point Mugu Fire Department. The current staffing levels, facilities, and equipment have the capacity to accommodate the increased fire protection requirements of the increased operations and personnel and maintain the existing level of service (Hair 1997). The impact to fire protection at NAWS Point Mugu would be less than significant. No mitigation would be required.

The families that would reside in the surrounding communities within the ROI would require fire services. The Ventura County Fire Department and Fire Departments in the surrounding cities of Oxnard and Ventura have sufficient capacity to accommodate the fire protection requirements of the incoming families

(Roper 1997; Rodriguez 1997; Lavery 1997). Demand for fire protection would be distributed among these local agencies. The impact to fire protection within the ROI would be less than significant. No mitigation would be required.

4.9.2 NAS Lemoore Alternative

Significant Impacts

Impact 1: Schools. A potential impact to schools would occur due to the proposed action at NAS Lemoore, but would be mitigated by federal payments to eligible school districts. Schools in the vicinity of NAS Lemoore are either near or over capacity. In many cases portable classrooms have been added to the school sites. With the NAS Lemoore Alternative, the highest demand on the local school system would occur in 1999 (due to constructions and operations occurring simultaneously at their peak) when an addition 441 students would attend schools in the vicinity of the base. Because implementation of the proposed action at NAS Lemoore would require more construction than at NAWS Point Mugu, more construction workers would be needed, which is expected to result in more students. In the year 2001 and beyond, it is expected that approximately 416 students would attend school in the vicinity of the base.

Mitigation 1. Mitigations for schools would be similar to those under the NAWS Point Mugu Alternative. School districts may be eligible for compensation for the addition of federally connected students by direct payment of impact aid funds. Implementation of this mitigation would reduce the impact to a less than significant level.

Less than Significant Impacts

Water supply. The increased demand for water would not significantly affect the water supply of NAS Lemoore. The demand for potable water at NAS Lemoore would increase by 163,170 gpd (617,598 Lpd) or 59.56 mgy (225.43 mLy), a 6 percent increase over the current usage of 945 mgy (3,600 mLy). The base's total water demand of 1,004.56 mgy (3,802.26 mLy) would exceed its contract with the Westlands Water District (Westlands) for 977 mgy (3,700 mLy). Water demand associated with this alternative would create a water supply shortage for NAS Lemoore of approximately 27.56 mgy (104.31 mLy). Westlands has indicated that it cannot guarantee delivery of water in addition to the current contracted amount of 977 mgy (3,700 mLy) (Westlands 1996). Westlands encourages NAS Lemoore to supplement its water supplies from other sources and to decrease its reliance on Central Valley Project contract water.

To accommodate this increased demand, NAS Lemoore would revise the existing water supply contract with the Westlands Water District to increase water delivery by an additional 420,000 gpd (1.6 mld) or 150 mgy (580 mly). Should the district not be able to provide the additional water from its Central Valley Project water allocation, NAS Lemoore would purchase water from other private suppliers. A separate water supply contract with the Bureau of Reclamation would also be

pursued if necessary. Additionally, water consumption at the base could be reduced through water conservation techniques, such as using low-flow bathroom fixtures and recycling gray water for nonpotable uses. Agricultural land also could be retired, and water could be transferred for use in nonagricultural sectors. The impact to water supply at NAS Lemoore would be less than significant. No mitigation would be required.

Families that would reside in the surrounding communities of Lemoore and Hanford would require approximately 187,980 gpd or 0.69 mgy (2.6 mLy) of water. These areas receive water from municipal water suppliers and groundwater sources which have the capacity to accommodate the water requirements (Pereira 1997; Haley 1997). The impact to water supply in the surrounding communities would be less than significant. No mitigation would be required.

Wastewater collection and treatment. The increased wastewater generated would not significantly affect the wastewater collection and treatment system of NAS Lemoore. The population and operations increase at NAS Lemoore would increase total wastewater generated at the base to approximately 1.83 mgd (6.93 mLd), an 8 percent increase over the current average generation of 1.7 mgd (6.4 mLd). This amount would not exceed the base's 2.12 mgd (8 mLd) average flow capacity. The impact to wastewater collection and treatment at NAS Lemoore would be less than significant. No mitigation would be required.

The families that would reside in the surrounding communities within the ROI would generate approximately 140,985 gpd (53,360 Lpd) of wastewater. Wastewater treatment agencies in the surrounding cities of Lemoore and Hanford have sufficient capacity to accommodate the wastewater of the incoming families (Pereira 1997; Sisneroz 1997). No mitigation would be required. The impact to wastewater collection and treatment in surrounding communities within the ROI would be less than significant. No mitigation would be required.

Storm water collection and treatment. The increase in storm water generated at NAS Lemoore from this alternative would not significantly affect the storm water infrastructure. The volume and rate of storm water runoff would increase slightly at NAS Lemoore because impermeable surfaces would increase by approximately 7 acres (2.8 hectares) from the proposed development and expansion of current facilities. The storm water collection system is in good condition and can withstand most storm events. The infrastructure has the capacity to accommodate increased runoff from development and expansion (Stewart 1997). Minor upgrades would be designed to accommodate the projected increase in storm water flows as buildout of the alternative progresses. The impact to storm water collection and treatment at NAS Lemoore would be less than significant. No mitigation would be required.

Solid waste collection and disposal. The increase in solid waste generation at NAS Lemoore from this alternative would not significantly affect the collection and disposal system. The population and operations increases at NAS Lemoore would

increase total solid waste generation to approximately 16.2 tons (14.6 tonnes) per day, a 35 percent increase over the current generation of approximately 12 tons (11 tonnes) per day. The current private solid waste collector has the capacity to accommodate the total waste generated (Stewart 1997). The landfills that receive the solid waste generated at the base also have the capacity to accommodate the increase. Later this year, the Kings County Waste Management Authority is opening a new facility with a 40-year life expectancy (Adams 1997). The City of Avenal Landfill is scheduled for closure in 2012; however, it is currently expanding its industrial disposal facilities to extend the lifespan of the landfill by another 40 years (Watson 1997). Additionally, the recycling program at NAS Lemoore would be able to meet its solid waste diversion goals outlined by AB 939 (Mora 1997a). The impact to solid waste collection and treatment at NAS Lemoore would be less than significant. No mitigation would be required.

The families that would reside in the surrounding communities within the ROI would generate approximately 2.4 tons (2.2 tonnes) per day of solid waste. Local waste collection and disposal agencies could accommodate the solid waste that would be generated (Adams 1997; Watson 1997). No mitigation would be required. The impact to solid waste collection and treatment within the ROI would be less than significant. No mitigation would be required

Natural gas and electric services. The increase in natural gas and electric consumption at NAS Lemoore from this alternative would not significantly affect the gas and electric systems. The population and operations increase at NAS Lemoore would increase total natural gas consumption to approximately 780,000 cfd (22,000 cmd), a 7 percent increase over the current demand of 730,000 cfd (20,400 cmd). Total electricity requirements would increase to about 278,000 kilowatt hours (KWH) per day, a 27 percent increase over current usage of approximately 219,000 KWH per day. The base's natural gas and electric systems are in adequate condition and have the capacity to accept the additional natural gas and electricity needed (Stewart 1997). SCGC has the capacity to provide the base with the additional natural gas (Rees 1997). The 18.0 MW of electrical power from the Western Area Power Administration (WAPA) would remain the same and the increased electricity required would be acquired from PG&E. PG&E has the capacity to provide the additional required electricity to the base (Raiskup 1997). The impact to natural gas and electric services at NAS Lemoore would be less than significant. No mitigation would be required.

The additional families that would reside in the surrounding communities within the ROI would also receive energy from SCGC and PG&E. These providers have the capacity to supply the required natural gas and electricity to these areas (Rees 1997; Raiskup 1997). The impact to natural gas and electric services within the ROI would be less than significant. No mitigation would be required.

Child care. The increased number of children at NAS Lemoore from this alternative could not be accommodated by the existing child care facilities. This

alternative includes constructing a new child development center to accommodate the additional children. The impact to child care at NAS Lemoore would be less than significant. No mitigation would be required.

Health services. The additional personnel at NAS Lemoore from the E-2 squadron realignment would not significantly affect health services. The NAS Lemoore hospital and its community network have the capacity to provide a wide range of health care, including emergency services, to all members of the E-2 community. Additionally, the hospital is scheduled for expansion, with development to be completed by mid-1999 (Crosby 1997). Health services would be scaled up as required during buildout of the alternative. The impact to health services at NAS Lemoore would be less than significant. No mitigation would be required.

The three surrounding area hospitals also would accommodate the demand for health services from military family members residing in surrounding communities. Demand for health care would be distributed among these facilities. The impact to health services would be less than significant. No mitigation is required.

Recreation and community facilities. The additional demand for recreation and community facilities at NAS Lemoore and within the ROI from this alternative would not significantly affect these facilities. Increased demand and usage of these facilities would be distributed among facilities on base and in the surrounding communities. Additionally, a gymnasium addition is planned as part of this alternative to supplement existing facilities. The impact to recreation and community facilities would be less than significant. No mitigation would be required.

Police services. The additional demand for police services at NAS Lemoore from this alternative would not significantly affect the NAS Lemoore Security Department. The additional personnel and family members at the base would require the department to increase its current staff of 65 officers by 2 law enforcement officers to maintain adequate levels of security (Billick 1997). The staffing increase required represents a 3 percent increase over the current staffing level and is within the billet for 23 additional officers that the department maintains. The impact to police services at NAS Lemoore would be less than significant. No mitigation would be required.

The King's County Sheriff's Department and Police Departments in the surrounding cities of Lemoore and Hanford have sufficient capacity to accommodate the security requirements of the incoming families that would reside off base (Landis 1997; Carden 1997; Scott 1997). Demand for police services would be distributed among these local agencies. No mitigation would be required. The impact to police services within the ROI would be less than significant. No mitigation would be required.

Fire protection. The additional demand for fire protection at NAS Lemoore would not significantly affect the NAS Lemoore Fire Department. The additional operations, personnel, and family members at the base would require the department to increase its fire suppression equipment by six halon fire extinguishers to ensure adequate levels of fire protection (Rustad 1997). Funding would be appropriated for the additional equipment. Additionally, the increase in E-2 flight operations would require slight increases in the emergency responses and stand-by shifts that the department maintains. The addition of equipment and modification of current duties would ensure adequate fire protection and service for the additional operations, personnel, and family members on base (Rustad 1997). The impact to fire protection at NAS Lemoore would be less than significant. No mitigation would be required.

The King's County Fire Department and fire departments in the surrounding cities of Lemoore and Hanford have sufficient capacity to accommodate the fire protection requirements of the incoming families that would reside in the surrounding communities (Chesmore 1997; Machado 1997; Ieronimo 1997). Demand for fire protection would be distributed among these local agencies. No mitigation would be required. The impact to fire protection within the ROI would be less than significant. No mitigation would be required.

4.9.3 NAF El Centro Alternative

Less than Significant Impacts

Water supply. The increased demand for water would not significantly affect the water supply of NAF El Centro. The increased population and operations at NAF El Centro would increase total demand for potable water to approximately 813,170 gpd (3.08 mLd), a 25 percent increase over the current consumption of 650,000 gpd (250,000 Lpd). The infrastructure at NAF El Centro is in adequate condition and has the capacity to accommodate the water supply increase (Weller 1997). Additionally, Imperial Irrigation District (IID) has sufficient capacity to serve the base's increased water needs (Hale 1997). The impact to water supply at NAF El Centro would be less than significant. No mitigation would be required.

The families that would reside in the surrounding communities within the ROI would require approximately 187,980 gpd (530,000 Lpd) of potable water, and IID has the capacity to accommodate their requirements. The impact to water supply within the ROI would be less than significant. No mitigation would be required.

Wastewater collection and treatment. The increase in wastewater generated at NAF El Centro from this alternative would not significantly affect the wastewater collection and treatment system. The population and operations increase at NAF El Centro would increase total wastewater generated to approximately 259,400 gpd (982,000 Lpd), a 99 percent increase over the current generation of about 130,000 gpd (490,000 Lpd). The infrastructure is in adequate condition and has the capacity to accommodate the wastewater increase (Bay 1997). This amount would not

exceed the base's 300,000-gpd (270,000-Lpd) capacity, however it would exceed the current NPDES permit flow restriction of 200,000 gpd (760,000 Lpd). As wastewater generated at the base increases, NAF El Centro would make necessary adjustments to its NPDES permit with the Regional Water Quality Control Board. The impact to wastewater collection and treatment at NAF El Centro would be less than significant. No mitigation would be required.

The families that would reside in the surrounding communities within the ROI would generate approximately 140,985 gpd (53,360 Lpd) of wastewater. Wastewater treatment agencies in the surrounding cities of El Centro, Brawley, and Holtville have sufficient capacity to accommodate the wastewater requirements of the incoming families (Hines 1997; Smith 1997; Garcia 1997). The impact to wastewater collection and treatment within the ROI would be less than significant. No mitigation would be required.

Storm water collection and treatment. The increase in storm water generated at NAF El Centro from this alternative would not significantly affect the storm water infrastructure. The volume and rate of storm water runoff would increase slightly because impermeable surfaces would increase by approximately 13.2 acres (5.28 hectares) from the proposed development and expansion of current facilities at NAF El Centro. The storm water collection system has the capacity to accommodate the increased storm water flow due to development and expansion (Flowers 1997). Minor upgrades would be designed to accommodate the projected increase in storm water flows during buildout of this alternative (Flowers 1997). The impact to storm water collection and treatment at NAF El Centro would be less than significant. No mitigation would be required.

Solid waste collection and disposal. The increase in solid waste generation at NAF El Centro from this alternative would not significantly affect the collection and disposal system. The population and operations increase at NAF El Centro would increase total solid waste generation at the base to approximately 7.2 tons (6.5 tonnes) per day, a 140 percent increase over the current generation of 3 tons (2.7 tonnes) per day. Imperial County Sanitation (ICS) has the capacity to transport the solid waste generated, and its landfill is expected to remain open until 2016 (Lau 1997). Additionally, the Pollution Prevention Management Program would be able to meet its solid waste diversion goals outlined by AB 939 (Curiel 1997). The impact to solid waste collection and disposal at NAF El Centro would be less than significant. No mitigation would be required.

The families that would reside in the surrounding communities would generate approximately 2.42 tons (2.18 tonnes) per day of solid waste, and ICS also has the capacity to transport and dispose of the solid waste (Lau 1997). The impact to solid waste collection and disposal within the ROI would be less than significant. No mitigation would be required.

Natural gas and electric services. The increase in natural gas and electric consumption at NAF El Centro from this alternative would not significantly affect the gas and electric systems. The population and operations increases at NAF El Centro would increase total natural gas consumption to 55,100 cfd (5,120 cmd), a 900 percent increase over the current usage of 5,034 cfd (468 cmd). Total electricity requirements would increase to 108,270 KWH per day, a 115 percent increase over the current demand of 50,000 KWH. These increases would exceed the capacities of the existing infrastructure and require structural upgrades for both the natural gas and electricity distribution systems (Kear 1997). The natural gas system would require the enlargement of the central gas main and all peripheral laterals, while the electrical system would need new transformers, transmission lines, and switchgear. However, this alternative includes the required upgrades to the natural gas and electricity distribution systems to accommodate the increased energy demands. SCGC has the capacity to provide the additional natural gas to the base (Rees 1997), and IID, Arizona Public Service, and El Paso Electricity have the capacity to provide the additional electricity required by the base and the families residing off base (Coltrane 1997). The impact to natural gas and electric services at NAF El Centro would be less than significant. No mitigation would be required.

SCGC also has the capacity to provide the additional natural gas for families that would reside in the surrounding communities (Rees 1997). IID, Arizona Public Service, and El Paso Electricity also have the capacity to provide the additional electricity required by the families residing off base (Coltrane 1997). The impact to natural gas and electric services within the ROI would be less than significant. No mitigation would be required.

Schools. The affected schools near NAF El Centro are below capacity. With this alternative, approximately 445 school children would be added to local schools in 1999. The local schools have the capacity to accommodate the increase in students. School districts also may be eligible for impact aid (similar to the mitigation described for the NAWS Point Mugu alternative) because the additional students would be federally connected children. No mitigation would be required.

Child care. The child care services are not adequate at NAF El Centro for the 107 new children associated with the E-2 realignment. However, this alternative includes constructing a child development center to be completed in 1998 to accommodate the additional children. This impact would be less than significant. No mitigation would be required.

Health services. The additional personnel at NAF El Centro from the E-2 squadron realignment would not significantly affect health services. The on-base medical facilities at NAF El Centro and at Balboa Naval Hospital in San Diego have the capacity to accommodate the increase in personnel and family members (Rodriguez 1997; Leonard 1997). Additionally, the three surrounding area hospitals also would accommodate the additional demand for health services from military family

members residing in surrounding communities. Demand for health care would be distributed among these facilities. The impact to health services at NAF El Centro and within the ROI would be less than significant. No mitigation would be required.

Recreation and community facilities. The additional personnel at NAF El Centro and within the ROI for this alternative would not significantly affect recreation and community facilities. NAF El Centro has just renovated the on-base recreation facilities to meet its needs. Increased demand and usage of these facilities would be distributed among facilities on base and in the surrounding communities. The impact to recreational and community facilities would be less than significant. No mitigation would be required.

Police services. The additional demand for police services at NAF El Centro from this alternative would not significantly affect the NAF El Centro Security Department. The current staffing levels, facilities, and equipment have the capacity to accommodate the increased police services requirements of the increased operations and personnel and maintain the existing level of service (Stammreich 1997). The impact to police services at NAF El Centro would be less than significant. No mitigation would be required.

The families that would reside in the surrounding communities within the ROI would require police services. The Imperial County Sheriff's Department and Police Departments in the surrounding cities of El Centro, Holtville, and Brawley have sufficient capacity to accommodate the security requirements of the incoming families (Hackett 1997; Townsel 1997; Jordan 1997; Graham 1997;). Demand for police services would be distributed among these local agencies. The impact to police services within the ROI would be less than significant. No mitigation would be required.

Fire protection. The additional demand for fire services at NAF El Centro from this alternative would not significantly affect the NAF El Centro Fire Department. The current staffing levels, facilities, and equipment have the capacity to accommodate the increased fire protection requirements of the increased operations and personnel and maintain the existing level of service (Zurn 1997). The impact to fire protection at NAF El Centro would be less than significant. No mitigation would be required.

The families that would reside in the surrounding communities within the ROI would require fire protection. The Imperial County Fire Department and Fire Departments in the surrounding cities of El Centro, Holtville, and Brawley have sufficient capacity to accommodate the fire protection requirements of the incoming families (Nippins 1997; DuBois 1997; Gronstedt 1997; Zendejas 1997). Demand for fire protection would be distributed among these local agencies. The impact to fire protection within the ROI would be less than significant. No mitigation would be required.

4.10 CULTURAL RESOURCES

This section identifies potential consequences to cultural resources that may result from implementing the proposed action at one of the three alternative bases. The cultural resources analysis is a qualitative evaluation of the nature and extent of change to the existing cultural resources through implementation of the proposed action at each of the alternative bases.

Section 106 of the National Historic Preservation Act (NHPA) states that an undertaking has an effect on a historic property (i.e., NRHP-eligible resource) when that undertaking may alter those characteristics of the property that qualify it for inclusion in the NRHP. An undertaking is considered to have an adverse effect on a historic property when it may diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Adverse effects include, but are not limited to:

- Physical destruction, damage, or alteration of all or part of the property;
- Isolation of the property or alteration of the character of the property's setting when that character contributes to the property's qualifications for the NRHP;
- Introduction of visual, audible, or atmospheric elements that are out of character with the property, or changes that may alter its setting;
- Neglect of a property resulting in its deterioration or destruction; and
- Transfer, lease, or sale of a property, without adequate provisions to protect the property's historic integrity.

Other types of disturbance may occur that would be of concern to Native American groups. Such concerns may include inadvertent discovery of Native American remains and objects (provisions for notification and consultation identified under the Native American Graves Protection and Repatriation Act [NAGPRA] Section 3(d)).

Section 106 of the NHPA requires identification, evaluation, and assessment of effects, and implementation of appropriate mitigation measures for cultural resources in consultation with State Historic Preservation Officer (SHPO) and the Advisory Council on Historic Preservation (ACHP). Specific types of Native American resources are identified the NAGPRA.

Significance Criteria

Impact assessments for prehistoric and historic resources are based on the type of site, NRHP-eligibility status, the type of impact, and the extent of disturbance from the project. Impacts to prehistoric and historic resources are considered

significant if the project will adversely affect those sites eligible or potentially eligible for the NRHP.

Impact assessments for traditional cultural properties are based on the type of resource, its importance in the community's belief system, the type of impact and the extent of disturbance from the project. Impacts to traditional cultural properties are considered significant if the project has the potential to affect locations important to Native Americans or other communities, has the possibility to reduce access to sacred or sensitive sites, or to affect NRHP-eligible resources of historic value to a specific community.

Impact analysis. Impacts to cultural resources result from ground-disturbing activities, modification and alteration to historic structures, visual intrusion to a historic setting, and unauthorized artifact collecting. Direct impacts are those that would occur during project construction, development, and operation that would directly impinge on, or destroy cultural resources, such as all activities that entail earthmoving. Impacts can occur directly to a site by loss of all or part of the site through grading, filling, or other construction. Ground-disturbing activities may affect the physical integrity of cultural resources, destroying their research potential and subsequently, their eligibility to the NRHP or importance to Native American groups.

Modification or alteration of historic buildings may disturb their architectural integrity, which contributes to their NRHP eligibility. Increased pedestrian activity provides opportunities for unauthorized artifact collection and vandalism of cultural resources; these activities affect the integrity of sites and subsequent eligibility.

Impacts can occur indirectly through the alteration of the character of the site setting, and the introduction of visual, audible, or atmospheric elements that change the character of the site or its setting. If setting is a critical factor in the eligibility of an NRHP District, construction of incompatible architectural styles would disturb the setting and cohesiveness of the District.

Although the construction phase of the proposed project is of a relatively short duration, adverse effects to NRHP-eligible cultural resources would be long-term and permanent. Project-related activities may have an indirect impact, specifically from unauthorized artifact collecting and vandalism, on all cultural resources in the Area of Potential Effect (APE).

Table 4-32 summarizes the potential cultural resources impacts that have been identified in this analysis.

Table 4-32
Summary of Cultural Resources Impacts

IMPACT ISSUES	REALIGNMENT ALTERNATIVES		
	NAWS Point Mugu (Preferred Alternative)	NAS Lemoore	NAF El Centro
Prehistoric resources	○	○	○
Traditional cultural properties	○	○	○
Historic archaeological resources	○	○	○
Historic architectural resources	○	○	○
Prehistoric subsurface deposits	◑	○	○
Historic subsurface deposits	○	○	○

LEGEND:
● - Significant and not mitigable impact
◑ - Significant and mitigable impact
ⓘ - Less than significant impact
○ - No impact

4.10.1 Preferred Alternative: NAWS Point Mugu

Significant Impacts

Impact 1: Prehistoric subsurface deposits. A significant and mitigable impact to potentially NRHP-eligible subsurface deposits could occur during ground-disturbing activities at NAWS Point Mugu. Subsurface prehistoric deposits may exist under fill soil at depths of 1 meter (3 feet) to 4 meters (12 feet).

Mitigation 1. Any contract, lease, or permit for construction (i.e., ground-disturbing activities) at NAWS Point Mugu in conjunction with the implementation of the proposed action at NAWS Point Mugu would include a requirement to halt work in the event of a discovery of archaeological materials. In such an event, the Contracting Officer would be notified immediately, and the Base Archaeologist allowed to document and evaluate the resource before work in the discovery area continues (in compliance with Section 106 of the NHPA). Implementation of this mitigation measure would reduce the impact to a less than significant level.

Less Than Significant Impacts

Prehistoric resources. Only one potential prehistoric site has been reported within the APE. However, this site has not been documented, and its presence has not been verified. Therefore, there would be no impact to prehistoric resources as a result of implementing the proposed action. No mitigation would be required.

Traditional cultural properties. Because no traditional cultural properties have been identified at NAWS Point Mugu, there would be no impact to these types of

resources from implementation of the proposed action at NAWS Point Mugu. No mitigation would be required.

Historic archaeological resources. Because no known historic archaeological sites occur within the APE, there would be no impacts to these types of resources as a result of implementing the proposed action. No mitigation would be required.

Historic architectural resources. Because none of the buildings to be used or modified at NAWS Point Mugu were determined to be eligible for the NRHP under the Cold War theme, there would be no impacts to historical architectural resources at NAWS Point Mugu as a result of implementation of the proposed action.

Historic subsurface deposits. Because the potential for buried historic deposits to exist on Point Mugu is low, no impacts to these types of resources are anticipated as a result of implementation of the proposed action at NAWS Point Mugu. However, if buried deposits are encountered during ground-disturbing activities, all work would stop pending documentation and evaluation of the resource by the Base Archaeologist.

4.10.2 NAS Lemoore Alternative

Less Than Significant Impacts

Prehistoric and historic archaeological resources and traditional cultural properties. Because no prehistoric or historic archaeological sites or traditional cultural properties have been identified at NAS Lemoore, there would be no impact to these types of resources from implementation of the proposed action at NAS Lemoore. No mitigation would be required.

Historic architectural resources. Because no buildings scheduled for modification are likely to be considered eligible for the NRHP, there would be no impact to historic architectural resources from the implementation of the proposed action at NAS Lemoore. No mitigation would be required.

Prehistoric subsurface deposits. Because prehistoric subsurface deposits are only likely to exist at depths below 2 feet (6 meters), and because ground-disturbing activities associated with implementation of the proposed action at NAS Lemoore are not anticipated to occur at these depths, there would be no impacts to these types of resources at NAS Lemoore. However, if subsurface deposits are encountered during construction activities, all work would stop and the procedures specified in the Historic Archaeological Resources Protection Plan (Milliken and Mikesell 1997) would be followed.

Historic subsurface deposits. Because the potential for historic subsurface deposits to exist is low, no impacts to these types of resources are anticipated as a result of the implementation of the proposed action at NAS Lemoore. However, if subsurface

deposits are encountered during construction activities, all work would stop and the procedures specified in the Historic Archaeological Resources Protection Plan (Milliken and Mikesell 1997) would be followed.

4.10.3 NAF El Centro Alternative

Less Than Significant Impacts

Prehistoric resources. Because only one prehistoric site has been identified on NAF El Centro, and this site is not considered eligible to the NRHP, there would be no impacts to prehistoric resources resulting from implementation of the proposed action. No mitigation would be required.

Traditional cultural properties. Because no traditional cultural properties or other Native American resources have been identified at NAF El Centro, there would be no impact to these types of resources as a result of this alternative. No mitigation would be required.

Historic archaeological and architectural resources. No historic archaeological sites eligible for the NRHP would be affected by the proposed action. The proposed action consists of all new construction; therefore, no existing architectural sites would be affected at NAF El Centro. No mitigation would be required.

Prehistoric and historic subsurface deposits. Because the potential for subsurface deposits to occur within the APE is considered low, impacts to these resources are unlikely. If prehistoric or historic subsurface deposits are encountered, all work would stop pending documentation and evaluation of the resource by a qualified archaeologist.

4.11 PUBLIC HEALTH AND SAFETY

This section identifies the potential consequences to public health and safety that may result from implementing the proposed action at one of the alternative bases. The impact analysis compares projected conditions after realignment to the affected environments and regions of influence described in Section 3.11, Public Health and Safety. Public health and safety analyses are qualitative evaluations of the nature and extent of change to existing public health and safety through implementation of the proposed action at each of the alternative bases.

The alternative bases were evaluated for impacts to 1) airspace safety; 2) accident potential zones; 3) explosives safety; and 4) electromagnetic radiation.

Significance Criteria

Implementation of the proposed action would have a significant impact to public health and safety if it would:

- Increase hazards to airspace safety according to air traffic control specialists;
- Conflict with the safety restrictions of the AICUZ relating to accident potential zones; or
- Substantially increase hazards related explosives safety or electromagnetic radiation beyond existing levels.

Table 4-33 summarizes the public health and safety impacts identified in this analysis.

Table 4-33
Summary of Public Health and Safety Impacts

	REALIGNMENT ALTERNATIVES		
IMPACT ISSUES	NAWS Point Mugu (Preferred Alternative	NAS Lemoore	NAF El Centro
Airspace safety	◐	◐	◐
Accident potential zones	◐	◐	◐
Explosive safety quantity distance arcs	○	○	○
Electromagnetic radiation	○	○	○

LEGEND:
● = Significant and not mitigable impact
◑ = Significant and mitigable impact
◐ = Less than significant impact
○ = No impact

4.11.1 Preferred Alternative: NAWS Point Mugu

Less than Significant Impacts

Airspace safety. Implementation of the proposed action at NAWS Point Mugu would have a less than significant impact on airspace safety. Realignment of the E-2 squadrons would increase flight activity at NAWS Point Mugu by 27 to 31 percent. The increased number of aircraft would be operated within the established airspace for NAWS Point Mugu according to Federal Aviation Administration (FAA) visual flight rules (VFR) and instrument flight rules (IFR). All procedures for controlling approach/departures and flight activity would remain the same. All FCLPs would be conducted on existing Runway 9/27 designated for FCLPs at NAWS Point Mugu. The 16 E-2 aircraft could safely be accommodated within the established operational procedures and flight patterns at NAWS Point Mugu. The FAA also concurs that the relatively small number of E-2 aircraft flights in and near the Los Angeles ARTCC could be absorbed without impact (FAA 1997). Therefore, the increase in flight activity would not have a significant impact on airspace safety, and no mitigation would be required.

Accident potential zones. Realignment of the E-2 squadrons to NAWS Point Mugu and the resulting increase in operations would not significantly affect APZs. The E-2 aircraft operations at NAWS Point Mugu would not require any changes to designated APZs, Clear Zones, or existing runways to accommodate the FCLPs conducted by the E-2 aircraft. No proposed project sites would be located within a Clear Zone or APZ. No mitigation would be required.

Explosive safety quantity distance arcs. Realignment of the E-2 squadrons to NAWS Point Mugu would not create any new ESQD arcs, and no E-2 aircraft squadron-related facilities would be located within an existing ESQD arc. Therefore, there would be no impacts related to explosive safety, and no mitigation would be required.

Electromagnetic radiation. Realignment of the E-2 squadrons to NAWS Point Mugu would not create a significant radiation impact to personnel or fuel on or off base. Although the E-2 squadrons and related facilities would be located within the ranges of numerous hazards of electromagnetic radiation to ordnance (HERO)-susceptible facilities, E-2 aircraft do not use or transport ordnance.

E-2 standard operating procedures for the squadrons mandate that the radar is not activated below 2,000 feet (610 meters) above ground level (AGL). There would be no impacts from EMR, and no mitigation would be required.

4.11.2 NAS Lemoore Alternative

Less than Significant Impacts

Airspace safety. Realignment of the E-2 squadrons to NAS Lemoore would not significantly affect airspace safety. The E-2 squadrons would increase flight

activity at NAS Lemoore by 6 to 7 percent. The aircraft would be operated within the established airspace for NAS Lemoore according to FAA IFR and VFR. All procedures for controlling approach/departures and flight activity would remain the same. All FCLPs would be conducted on existing runways designated for FCLPs at NAS Lemoore. The 16 E-2 aircraft could safely be accommodated within the established operational procedures and flight patterns at NAS Lemoore. Therefore, the increase in flight activity with the alternative would not have a significant impact on airspace safety, and no mitigation would be required.

Accident potential zones. Realignment of the E-2 squadrons to NAS Lemoore and the resulting increase in operations would not significantly affect APZs. The E-2 aircraft operations at NAS Lemoore would not require any changes to designated APZs, Clear Zones, or existing runways to accommodate the FCLPs conducted by the E-2 aircraft. No proposed project sites would be located within a Clear Zone or APZ. No mitigation would be required.

Explosive safety quantity distance arcs. Implementation of the proposed action at NAS Lemoore would not create any new arcs. The E-2 squadrons and related facilities would not be located within existing explosive safety quantity distance (ESQD) arcs. Therefore, there would be no impact to ESQD arcs, and no mitigation would be required.

Electromagnetic radiation. Realignment of the E-2 squadrons to NAS Lemoore would not create a significant radiation impact to personnel or fuel on or off base. None of the proposed project sites would be located within an electromagnetic radiation (EMR) arc. The E-2 squadrons do not use or transport ordnance during aircraft operations.

E-2 standard operating procedures for the squadrons mandate that the radar is not activated below 2,000 feet (610 meters) AGL. There would be no impacts from EMR, and no mitigation would be required.

4.11.3 NAF El Centro Alternative

Less than Significant Impacts

Airspace safety. Realignment of the E-2 squadrons to NAF El Centro would not significantly affect airspace safety. The E-2 squadrons would increase flight activity at NAF El Centro by 10 to 12 percent. The aircraft would be operated within the established airspace for NAF El Centro according to FAA IFR and VFR. All procedures for controlling approach/departures and flight activity would remain the same. All FCLPs would be conducted on existing runways designated for FCLPs at NAF El Centro. The 16 E-2 aircraft could safely be accommodated within the established operational procedures and flight patterns. Therefore, the increase in flight activity would have no significant impact on airspace safety, and no mitigation would be required.

Accident potential zones. Realignment of the E-2 squadrons to NAF El Centro and the resulting increase in operations would not significantly affect APZs. The E-2 aircraft operations at NAF El Centro would not require any changes to a designated Clear Zone, APZs, or to existing runways to accommodate the FCLPs conducted by the E-2 aircraft. One group of proposed operational facilities (OTF, AIMD facilities, AEWWINGPAC administration building, and vehicle parking areas) would extend south of 8th Street into an APZ II. The AICUZ discourages, but does not preclude, inhabitable structures from being located in an APZ II. No other proposed facilities would be located within a Clear Zone or APZ. Therefore, no significant impacts to Clear Zones or APZs would result from E-2 realignment at NAF El Centro, and no mitigation would be required.

Explosive safety quantity distance arcs. Implementation of the proposed action at NAF El Centro would not create any new ESQD arcs, and no E-2 aircraft squadrons or related facilities would be located within an existing ESQD arc. Therefore, there would be no impact, and no mitigation would be required.

Electromagnetic radiation. Realignment of the E-2 squadrons to NAF El Centro would not create a significant radiation impact to personnel or fuel on or off base. None of the proposed project sites would be within any EMR arcs. The E-2 squadrons do not use or transport ordnance in aircraft operations.

E-2 standard operating procedures for the squadrons mandate that the radar is not activated below 2,000 feet (610 meters) AGL. There would be no impacts from EMR, and no mitigation would be required.

4.12 HAZARDOUS MATERIALS AND WASTES

This section identifies potential consequences from hazardous materials and wastes that may result from implementing the proposed action at one of the alternative bases. The impact analysis compares projected conditions after realignment to the affected environments and regions of influence described in Section 3.12, Hazardous Materials and Wastes.

In 1996, the E-2 aircraft squadrons generated a total of approximately 5 tons (4 metric tons) of hazardous waste (Graham 1997). The waste streams included waste rags, paint, solvent, absorbent materials, petroleum, oil, and lubricant, batteries, miscellaneous materials, adhesive materials, corrosion prevention compound in aerosol cans, and debris materials. The E-2 aircraft squadrons, including those at NAS Miramar and those deployed at other site and overseas, used 3.2 million gallons (12.1 million liters) of JP-5 in FY-1995 and 3.1 million gallons (11.7 million liters) in FY-1996 (Walter 1997).

Significance Criteria

Numerous federal, state, and local laws regulate the storage, disposal, and transportation of hazardous materials and wastes. The primary goal of these laws is to protect public health and the environment. The significance of impacts associated with hazardous wastes and materials is based on the toxicity, transportation risk, storage risk, and method of disposal of the substance. Generally, impacts are significant if the storage, use, transportation, or disposal of hazardous materials and wastes significantly increases risks to human health or the environment. Implementation of the proposed action would have a significant impact from hazardous materials use and waste if it would:

- Be the primary cause or substantially contribute to any release of hazardous substances, or have a negative impact on our range of response actions for the site; or

- Result in a significant threat to persons, protected species, or ecosystems due to exposure to hazardous substances.

Table 4-34 summarizes the potential hazardous materials and wastes impacts that have been identified in this analysis.

4.12.1 Preferred Alternative: NAWS Point Mugu

Less than Significant Impacts

Hazardous materials management. Realignment of the E-2 squadrons to NAWS Point Mugu would not significantly increase hazardous materials usage. Short-term impacts would be associated with construction activities at the proposed project sites. Construction-related activities would require the use of hazardous materials in excess of existing quantities. However, contract specifications control the use of hazardous materials and require compliance with federal, state, and local

requirements and with base policy on hazardous materials. Therefore, no new procedures would need to be implemented to store or use the construction-related hazardous materials. The additional quantities of hazardous materials would be removed at the completion of construction.

The increased amount of hazardous materials due to operations of the E-2 squadrons at NAWS Point Mugu would result in an increased throughput in the Supply Department. However, Environmental Materials Management Division has a model facility and would be able to handle the increased hazardous materials throughput. The increase is not significant.

Table 4-34
Summary of Hazardous Materials and Wastes Impacts

	REALIGNMENT ALTERNATIVES		
IMPACT ISSUES	NAWS Point Mugu (Preferred Alternative)	NAS Lemoore	NAF El Centro
Hazardous materials management	◐	◐	◐
Hazardous wastes management	◐	◐	◐
Installation restoration program sites	◐	◐	◐
Asbestos	◐	◐	◐
PCBs	○	○	○
Storage tanks and OWSs	◐	◐	◐
Pesticides	○	○	○
Lead	◐	◐	◐
Ordnance	○	○	○
Radon	○	○	○

LEGEND:
● - Significant and not mitigable impact
◑ - Significant and mitigable impact
◐ - Less than significant impact
○ - No impact

Hazardous materials would be handled in accordance with existing regulations and basewide protocol for hazardous materials management. A new satellite accumulation area for the E-2 squadrons would be established at the hangar area.

Hazardous wastes management. Activities related to the E-2 realignment at NAWS Point Mugu would not significantly affect hazardous waste management. Construction of facilities may result in temporary generation of small amounts of hazardous waste. Temporary hazardous waste storage areas would be designated and operated according to Resource Conservation and Recovery Act (RCRA) and state regulations. NAWS Point Mugu requires construction-related hazardous

wastes to be handled in accordance with the existing regulations and basewide protocol for hazardous waste management and disposal. Hazardous wastes associated with construction activities would cease being generated at the completion of construction.

Operational activities associated with the E-2 realignment to NAWS Point Mugu would not significantly affect hazardous waste management. NAWS Point Mugu presently has a basewide program for hazardous waste management and disposal using satellite accumulation areas and centralized less-than-90-day areas. The E-2 aircraft squadrons would be required to manage and dispose of hazardous wastes generated by operations in accordance with existing regulations and basewide protocol regarding storage, use, and disposal. The E-2 aircraft squadrons generated 4.7865 tons (4.342 metric tons) of hazardous waste in 1996 (Graham 1997). The projected quantities of hazardous waste generated by the E-2 aircraft squadrons would result in an approximate 1.1 percent increase in hazardous waste at the base. The additional hazardous wastes generated by the E-2 aircraft squadrons would not result in a significant increase to the total amount of hazardous wastes managed and disposed from the base. Therefore, there would be no significant operational impacts, and no mitigation would be required.

Installation restoration program sites. Construction and operational activities associated with the E-2 squadrons realignment to NAWS Point Mugu would not affect IRP sites. There is one IRP site, Site 6 - Building 311 yard, identified within the proposed project location. Building 311 is proposed for renovation for the engine maintenance shop, ground support maintenance shop, and ground support storage occupancy. Characterization and remediation of contaminated soil and groundwater would occur at Site 6 as part of the IRP and site cleanup. Because no new construction is proposed, the renovation activities would not disturb soils or groundwater beneath the site. Therefore, activities would not expose workers to known contaminated sites or impede investigative or remedial efforts for an IRP site. Operations activities for the E-2 squadrons would include management and disposal of hazardous materials/wastes in accordance with regulations and basewide protocol. Therefore, there would be no significant impacts, and no mitigation would be required.

Asbestos. Surveys were conducted at NAWS Point Mugu in 1995 and 1996 to identify asbestos-containing material (ACM) which may be a potential health and safety concern. Any remaining ACM encountered during construction activities associated with the E-2 squadrons realignment to NAWS Point Mugu would be properly abated. Disturbance to friable ACM would be minimized per construction specifications to prevent airborne particulate and thus decrease health and safety risks to workers. No ACM would be used during construction or E-2 squadron operations, and asbestos encountered during construction would be abated in accordance with local and Navy requirements. Therefore, there would be no significant impacts, and no mitigation would be required.

Polychlorinated biphenyls. Construction and operational activities associated with the E-2 squadrons realignment to NAWS Point Mugu would not affect Polychlorinated biphenyls (PCBs). PCBs are not present at any of the sites proposed for construction or operational activities. No new PCB-containing equipment would be installed as part of this alternative. Therefore, there would be no impacts, and no mitigation would be required.

Storage tanks and oil/water separators. Activities associated with the E-2 squadrons realignment to NAWS Point Mugu would not require the construction of fuel storage facilities. The addition of the E-2 aircraft squadrons would not significantly increase the amount of JP-5 fuel transported and stored at NAWS Point Mugu, and the existing facilities for fuel transportation and storage would accommodate E-2 aircraft squadron. NAWS Point Mugu presently has a basewide program for jet fuel transportation and storage, as well as refueling facilities for naval aircraft using JP-5 fuel. Based on the 4.3 million gallons (16.3 million liters) per year requirement, the E-2 squadron would require a 10-day fuel supply of 120,000 gallons (454,248 liters). Two of the 121,800-gallon (461,062 liters) tanks would be allocated for storage of JP-5 fuel to provide flexibility in repair of pipeline/valves, maintenance, and possible supply delays or interruptions. The remaining tank capacity at NAWS Point Mugu would be adequate to meet current and anticipated requirements for JP-8 fuel. Therefore, there would be no significant impacts to storage tanks and oil/water separators, and no mitigation would be required.

Pesticides. Activities associated with the E-2 squadrons realignment to NAWS Point Mugu would not alter the use of pesticide use at the proposed project sites. Therefore, there would be no impacts from pesticides, and no mitigation would be required.

Lead. A lead-based paint (LBP) survey of NAWS Point Mugu residential buildings was conducted in 1994. LBP has been removed from various buildings as part of refurbishing and upgrading projects. Construction activities associated with the E-2 squadrons realignment to NAWS Point Mugu could involve the exposure of workers to lead at the proposed project sites. If LBP is suspected in a building, proper cautionary and abatement procedures are part of contract requirements when renovations are conducted. The manufacture and use of LBP is prohibited. Therefore, there would be no significant impacts from lead, and no mitigation would be required.

Ordnance. Construction activities associated with the E-2 squadrons realignment to NAWS Point Mugu would not occur in areas containing ordnance. No ordnance manufacture, handling, storage, or disposal activities would occur during implementation of the proposed action. Therefore, there would be no impacts from ordnance, and no mitigation would be required.

Radon. Activities associated with the E-2 squadrons realignment to NAWS Point Mugu would not have a significant radon effect. Radon hazards have not been identified at any of the proposed project sites. Therefore, there would be no impact from radon, and no mitigation would be required.

4.12.2 NAS Lemoore Alternative

Less than Significant Impacts

Hazardous materials management. Realignment of the E-2 squadrons to NAS Lemoore would not significantly increase hazardous materials usage. Construction activities would be temporary, and any additional hazardous materials would be removed once the construction was complete. Operations of the E-2 squadrons at NAS Lemoore would not significantly increase the total amount of hazardous materials at the base. The addition of the hazardous materials used by the E-2 squadrons would not result in a significant increase to the total amount of hazardous materials managed at the base. Therefore, there would be no significant impacts from hazardous materials management, and no mitigation would be required.

Hazardous wastes management. Construction activities related to the E-2 squadrons realignment to NAS Lemoore would not significantly increase hazardous waste management. Construction activities would be temporary, and any additional hazardous wastes generated would be removed once the construction was complete. Operational activities associated with the E-2 realignment to NAS Lemoore would not significantly affect hazardous waste management. The additional wastes generated by the E-2 squadrons would result in an approximate 1.7 percent increase in hazardous waste generation at the base. This would not result in a significant increase in the total amount of hazardous wastes managed and disposed from the base. Therefore, there would be no significant impacts, and no mitigation would be required.

Installation restoration program sites. Activities associated with the E-2 squadrons realignment to NAS Lemoore would not significantly affect IRP sites. There are no IRP sites identified within or adjacent to the proposed project locations. Operations activities for the E-2 squadrons would include management and disposal of hazardous materials/wastes in accordance with regulations and basewide protocol. Therefore, there would be no significant impacts, and no mitigation would be required.

Asbestos. ACM encountered during construction activities would be properly abated. Operations would not require the utilization of asbestos in their construction. Therefore, there would be no significant impacts from asbestos, and no mitigation would be required.

Polychlorinated biphenyls. PCBs are not present at any of the sites proposed for construction, and no new PCB-containing equipment would be installed as part of

the E-2 squadrons realignment. Therefore, there would be no impacts, and no mitigation would be required.

Storage tanks and oil/water separators. Activities associated with the E-2 squadrons realignment to NAS Lemoore would not significantly increase the use and storage of JP-5 fuel. The existing facilities for fuel transportation and storage would accommodate the projected quantities of JP-5 required by the E-2 squadrons. Therefore, there would be no significant impacts, and no mitigation would be required.

Pesticides. Pesticide use in the proposed project sites is not expected to change with the E-2 squadrons realignment to NAS Lemoore. Therefore, there would be no impacts from pesticides, and no mitigation would be required.

Lead. If LBP is suspected in a building due to its age (built prior to 1978), proper cautionary and abatement procedures should be implemented when renovations are conducted. Operational activities associated with the E-2 squadrons realignment to NAS Lemoore would not involve the use of lead. Therefore, there would be no significant impacts from lead, and no mitigation would be required.

Ordnance. Construction activities associated with the E-2 squadrons realignment to NAS Lemoore would not occur in areas containing ordnance. No ordnance manufacture, handling, storage, or disposal activities would occur during implementation of the proposed action. Therefore, there would be no impacts from ordnance, and no mitigation would be required.

Radon. No radon hazards have been identified at any of the proposed project locations. Therefore, there would be no impacts from radon, and no mitigation would be required.

4.12.3 NAF El Centro Alternative

Less than Significant Impacts

Hazardous materials management. Realignment of the E-2 squadrons to NAF El Centro would not significantly increase hazardous materials usage. Construction activities would be temporary, and any additional hazardous materials would be removed once the construction was complete. The addition of the hazardous materials used by the E-2 squadrons would not result in a significant increase to the total amount of hazardous materials managed at the base. Therefore, there would be no significant impacts from hazardous materials management, and no mitigation would be required.

Hazardous wastes management. Construction activities related to the E-2 squadrons realignment to NAF El Centro would not significantly increase hazardous waste management. Construction activities would be temporary, and any additional hazardous wastes generated would be removed once the

construction was complete. The additional wastes generated by the E-2 squadron operations would result in an approximate 4.3 percent increase in hazardous waste generation at the base. This would not result in a significant increase to the total amount of hazardous wastes managed and disposed from the base. Therefore, there would be no significant impacts from hazardous waste management, and no mitigation would be required.

Installation restoration program sites. There are no IRP sites identified within or adjacent to the proposed project locations. Operations activities for the E-2 squadrons would include management and disposal of hazardous materials/wastes in accordance with regulations and basewide protocol. Therefore, there would be no significant impacts to IRP sites, and no mitigation would be required.

Asbestos. ACM encountered during construction activities would be properly abated. Operations would not require the use of asbestos in their construction. Therefore, there would be no significant impacts from asbestos, and no mitigation would be required.

Polychlorinated biphenyls. PCBs are not present at any of the sites proposed for construction and no new PCB-containing equipment would be installed as part of the E-2 squadrons realignment. Therefore, there would be no impacts, and no mitigation would be required.

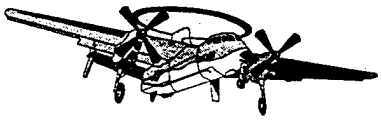
Storage tanks and oil/water separators. Activities associated with the E-2 squadrons realignment to NAF El Centro would not require additional storage capacity for jet fuel. The addition of the E-2 squadrons would not result in a significant increase to the amount of JP-5 transported and stored at NAF El Centro (Bay 1997). Therefore, there would be no significant impacts, and no mitigation would be required.

Pesticides. Pesticide use at NAF El Centro is not expected to change with the proposed action. Therefore, there would be no impacts from pesticides, and no mitigation would be required.

Lead. If LBP is suspected in a building due to its age (built prior to 1978), proper cautionary and abatement procedures should be implemented when renovations are conducted. Operational activities associated with the E-2 squadrons realignment to NAF El Centro would not involve the use of lead. Therefore, there would be no significant impacts from lead, and no mitigation would be required.

Ordnance. Construction activities associated with the E-2 squadrons realignment to NAF El Centro would not occur in areas containing ordnance. No ordnance manufacture, handling, storage, or disposal activities would occur during implementation of the proposed action. Therefore, there would be no impacts from ordnance, and no mitigation would be required.

Radon. No radon hazards have been identified at any of the proposed project locations. Therefore, there would be no impacts from radon, and no mitigation would be required.



5.0 Cumulative Impacts

5. CUMULATIVE IMPACTS 5-1

5.1 Preferred Alternative: NAWS Point Mugu 5-1
5.2 NAS Lemoore Alternative 5-6
5.3 NAF El Centro Alternative 5-16

CHAPTER 5
CUMULATIVE IMPACTS

The Council on Environmental Quality's (CEQ) regulations (40 Code of Federal Regulations (CFR) § 1500–1508) implementing the procedural provisions of the National Environmental Policy Act (NEPA) of 1969, as amended (42 US Code (USC) § 4321 *et sec.*) define cumulative effects 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 regardless of what agency (federal or non-federal) or person undertakes such other actions (40 CFR § 1508.7).

Cumulative effect analyses may be approached in a variety of ways. In this document, it is approached by identifying other projects both on base and off base that would be implemented during the period of this proposed project. In general, only cumulative effects that are significant are discussed. No significant cumulative effects were identified for biological resources, hydrology/surface water quality, land use and airspace, and aesthetics/visual resources. Cumulative effects that are potentially significant under one or more alternatives were identified and are discussed for socioeconomics, traffic and circulation, air quality, noise, cultural resources, utilities and services, public health and safety, and hazardous materials and waste.

5.1 PREFERRED ALTERNATIVE: NAWS POINT MUGU

Table 5-1 presents the projected projects for Naval Air Weapons Station (NAWS) Point Mugu and the neighboring community of Oxnard. No significant projects are proposed near the base in the City of Camarillo nor in Ventura County based on conversations with local planning department staff. The cumulative analysis does not consider impacts of F/A-18E/F squadrons and personnel at NAWS Point Mugu since this alternative base was eliminated as an alternative for relocation of the F/A-18E/F aircraft following a detailed evaluation of its capabilities to accept the relocation action.

Table 5-1
List of Cumulative Projects: NAWS Point Mugu

Project Name	Location	Description
	On Base 1997-1998	Sea Test Range action
	On Base 1998	Range Operations Center addition
Channel Island Estates (City of Oxnard)	Northwest of Channel Islands Drive/Rice Avenue (5 miles off base)	726 single-family detached homes
Rose Island Homes (City of Oxnard)	Dallas Drive/Raiders Way (5 miles off base)	50 single-family units
Vista Verde (City of Oxnard)	Northwest of Pleasant Valley Road/Highway 1 (4 miles off base)	20 single-family units
Village West (City of Oxnard)	Southeast of Hueneme Road/ Perkins Drive (6 miles off base)	143 single-family units; 208 multifamily units
Disposal and reuse of Naval Civil Engineering Laboratory (CNEL) Port Hueneme	South of Seaview Street (2 miles off base)	Proposed industrial, retail, nonresidential, and institutional uses

The Point Mugu Regional Airport Authority (PMRAA) has proposed joint use of NAWS Point Mugu by commercial and military aircraft. This proposal has not been enacted and it's status is uncertain (see Section 3.3.1 of this EIS). Therefore, it is not considered in the cumulative impacts analysis.

Socioeconomics

As identified in Table 5-1, a total of 939 single-family residences and 208 multifamily units would be constructed in the City of Oxnard. The vacancy rate is 4.9 percent in Ventura County, indicating a low vacancy rate and high demand for housing. Vacancy rates would become even lower if the E-2 were relocated to NAWS Point Mugu. However, with 11,764 units available in 1994 and additional construction of residences, it can be projected that housing units would be available for the realigned E-2 aircraft squadron personnel and their family members. No significant cumulative impacts are anticipated to occur, and no mitigation measures would be required.

Traffic and Circulation

The proposed action in conjunction with other projects and planned actions would contribute to the poor traffic conditions at one intersection near NAWS Point Mugu. The cumulative base condition at NAWS Point Mugu included several off-base projects. No on-base projects were included since information on the number of personnel was not available. The analysis of the cumulative projects was based on the traffic impact analysis prepared for the E-2 realignment (Linscott, Law & Greenspan 1997). The traffic generated by the off-base projects was extracted directly from that analysis. The off-base projects include four residential developments located between four and six miles from the base in the City of Oxnard.

The cumulative projects would generate a total of 10,955 daily trips, 855 AM peak hour trips, and 1,160 PM peak hour trips. The E-2 realignment contributes an additional 1,024 daily trips, 280 AM peak hour trips, and 290 PM peak hour trips (see Table 5-2).

Table 5-2
Cumulative Trip Generation for NAWS Point Mugu

Project	Daily	AM In	AM Out	PM In	PM Out
Off-base					
Channel Island Estates - 726 SFDU	6,935	140	400	480	255
Rose Island Homes - 50 SFDU	480	10	30	30	20
Vista Verde - 20 SFDU	190	5	10	15	5
Village West - 143 SFDU and 208 MFDU	3,350	70	190	230	125
Total - Cumulative Background	**10,955**	**225**	**630**	**755**	**405**
E-2	1,024	250	30	35	255

SFDU = single-family dwelling units; MFDU = multifamily dwelling units

Source: Linscott, Law, & Greenspan 1997; Dowling Associates 1997.

The level of service (LOS) results for cumulative conditions at intersections and roadway segments are shown in Tables 5-3 and 5-4. As shown in Table 5-3, the addition of cumulative traffic would result in a change in LOS from E to F at the intersection of North Mugu Road and Frontage Road during the PM peak hour. All other intersections would operate at acceptable levels under cumulative conditions with and without the project.

By providing a signal at the intersection of North Mugu Road and Frontage Road, the operations would improve to LOS B or better, reducing impacts to less than significant levels. The traffic volumes at this intersection would meet CalTrans peak hour signal warrants.

The impacts to the roadway segments are shown in Table 5-4. All roadway segments would operate at acceptable levels of service under cumulative conditions with and without the proposed project. The LOS does not change with the addition of the project, and no mitigation would be required.

Air Quality

Cumulative projects identified for the NAWS Point Mugu area include some on-base construction activities and various housing developments planned for the City of Oxnard. The on-base construction projects would be temporary sources of construction emissions, with some activity being concurrent with construction projects supporting the E-2 aircraft. Traffic associated with housing development projects in the City of Oxnard would contribute cumulatively to regional emissions of ozone precursors, but would have only minimal cumulative contributions to carbon monoxide levels along roadways near NAWS Point Mugu. No mitigation would be required.

Table 5-3
Unsignalized Intersection Operations at NAWS Point Mugu

Intersection	Peak Hour	Movement	Cumulative Delay (seconds)	Cumulative LOS	Cumulative plus Project Delay (seconds)	Cumulative plus Project LOS
Navalair Road/Pacific Coast Highway Southbound ramp	AM	NB - T	3.8	A	4.7	A
		NB - R	2.6	A	2.6	A
		SB - L/T	3.7	A	4.6	A
		WB - L	2.2	A	2.3	A
	PM	NB - T	5.8	B	6.2	B
		NB - R	2.6	A	2.6	A
		SB - L/T	5.0	A	5.1	B
		WB - L	2.3	A	2.3	A
Navalair Road/Wood Road	AM	WB - L/R	4.2	A	5.2	B
		SB - L	2.5	A	2.6	A
	PM	WB - L/R	9.7	B	11.6	C
		SB - L	4.7	A	5.6	B
North Mugu Road/Frontage Road	AM	---	5.3	B	12.7	C
	PM	---	31.9	E	69.6	F
Main Road/Frontage Road	AM	---	1.5	A	1.4	A
	PM	---	1.8	A	1.9	A
Las Posas Road/Pacific Coast Highway Southbound ramp	AM	NB - L/R	4.2	A	5.1	B
	PM	NB - L/R	6.9	B	8.2	B

LOS = Level of Service
L = Left-turn
R = Right-turn
T = Through movement

EB = Eastbound
WB = Westbound
NB = Northbound
SB = Southbound

Delay (seconds)	LOS
0.0 < 5.0	A
5.1 to 10.0	B
10.1 to 20.0	C
20.1 to 30.0	D
30.1 to 45.0	E
> 45.0	F

Source: Dowling Associates 1997.

Table 5-4
Daily Street Segment Operations at NAWS Point Mugu

Street Segment	Capacity*	Cumulative Volume	Cumulative V/C	Cumulative LOS	Cumulative plus Project Volume	Cumulative plus Project V/C	Cumulative plus Project LOS
Pacific Coast Highway							
North of Wood Road	43,000	19,900	0.46	B	20,430	0.48	B
South of Wood Road	43,000	15,360	0.36	B	15,490	0.36	B
Frontage Road							
South of Wood Road	31,000	13,850	0.45	B	14,280	0.46	B
South of Main Road	14,000	2,170	0.16	A	2,220	0.16	A
Wood Road							
South of Hueneme Road	14,000	1,900	0.14	A	1,980	0.14	A
Las Posas Road							
East of Pacific Coast Highway	14,000	6,060	0.43	B	6,430	0.46	B

* Capacities and Volume/Capacity ratio thresholds based on CalTrans Standards

V/C Ratio	LOS
0.00 - 0.30	A
0.31 - 0.50	B
0.51 - 0.75	C
0.76 - 0.90	D
0.91 - 1.00	E
> 1.00	F

Source: Dowling Associates 1997.

Noise

Cumulative projects identified for the NAWS Point Mugu area include some on-base construction activities and various housing developments planned for the City of Oxnard. The on-base construction projects would be temporary sources of construction noise, with some activity being concurrent with construction projects supporting the E-2 aircraft realignment. Construction noise impacts would be temporary, with little if any impact on off-base land uses. Traffic associated with housing development projects in the City of Oxnard would make only minimal cumulative contributions to cumulative noise conditions along roadways near NAWS Point Mugu.

Utilities and Services

In 1999, the year of greatest impact, 429 additional students would be generated by the project. Affected school districts may be eligible for impact aid to compensate for the additional federal students. School districts would need to apply for direct payment by the US Department of Education.

A total of 939 single-family residences and 208 multifamily units (Table 5-1) would be constructed in the City of Oxnard. New construction would contribute to the public education system as a result of developer fees that are earmarked for school construction. No significant cumulative impacts are anticipated to occur, and no mitigation measures would be required.

Cultural Resources

Cumulative projects identified for the NAWS Point Mugu area include some on-base construction activities. These projects could have an impact on prehistoric subsurface deposits at the base. These impacts considered together with potential impacts under the proposed E-2 aircraft realignment at NAWS Point Mugu, could result in a cumulative decrease in the overall amount and density of this non-renewable resource. This could result in a significant cumulative impact to prehistoric subsurface deposits on NAWS Point Mugu.

Any contract, lease, or permit for construction (i.e., ground-disturbing activities) would include a requirement to halt work in the event of a discovery of archaeological materials. In such an event, the Contracting Officer would be notified immediately, and the Base Archaeologist allowed to document and evaluate the resource before work in the discovery area continues (in compliance with Section 106 of the NHPA). Implementation of this mitigation measure would reduce the impact to a less than significant level.

Public Health and Safety

The planned cumulative projects would not result in an impact to airspace safety. E-2 aircraft operations would not require any changes to designated accident potential zones (APZs) or Clear Zones. The planned military projects (identified in Table 5-1) would not result in an increase in hazards from explosives safety and electromagnetic radiation as additional military projects would be sited according

to Navy regulations for explosive safety quantity distance (ESQD) and hazards of electromagnetic radiation to ordinance (HERO)/hazards of electromagnetic radiation to personnel (HERP)/hazards of electromagnetic radiation to fuel (HERF) arcs. No cumulatively significant impacts would occur.

Hazardous Materials and Wastes

The planned military projects (identified in Table 5-1) would result in an increase in the amount of hazardous materials and wastes used, stored, and transported at NAWS Point Mugu. The additional increase in hazardous wastes would be handled according to US Environmental Protection Agency (USEPA), California Environmental Protection Agency (CAL EPA), and Navy requirements for hazardous waste storage and disposal. The planned military projects would be constructed and operated in accordance with approved spill response plans and federal, state, and local laws to prevent on-base releases of hazardous materials and waste. No cumulatively significant impacts would occur.

5.2 NAS LEMOORE ALTERNATIVE

The Navy is planning other actions that would increase the air operations and population at Naval Air Station (NAS) Lemoore. Table 5-5 presents the projected actions for NAS Lemoore and the neighboring communities of Lemoore and unincorporated Kings County. All of these actions would involve the development of new facilities on base or housing off base. An EIS is being prepared by the Navy to evaluate the direct, indirect, and cumulative impacts of the F/A-18E/F action at NAS Lemoore, which is the preferred alternative for that action. Further analysis of cumulative impacts will be provided in that EIS.

Table 5-5
List of Cumulative Projects: NAS Lemoore

Project Name	Location	Description
P-156T	On Base 1997–1998	Wing/CVW Administration Building (99 personnel)
P-845	On Base 1997–1998	14 bed Hospital/Medical facilities
P-024	On Base 1997–1998	Explosive handling facility
P-139	On Base 1997–1998	Gym and gym addition
P-182/P-183	On Base 1997–1998	Potential for F/A-18E/F squadrons, operations, and personnel support facilities
Avalon Subdivision (City of Lemoore)	SE of Cinnamon Drive/ Highway 41 (5 miles off base)	156 single-family units, to be constructed in 3 phases
TR 567 (City of Lemoore)	Cinnamon Drive (5 miles off base)	136 single/multifamily units, to be constructed in phases
TR 739 (City of Lemoore)	East of Cinnamon Drive/ Highway 41 (5 miles off base)	367 single-family units
Highway 41 Expansion (CalTrans)	2.5 miles north of State Route (SR) 198/ Highway 41 (5 miles off base)	Expansion of 2-lane highway to 4 lanes
West Hills Community College (Kings County)	Northwest of Highway 41/ SR 198 (5 miles off base)	100-acre new campus, in planning stage

Socioeconomics

To determine cumulative impacts, socioeconomic changes were analyzed at NAS Lemoore assuming joint siting of the E-2 and F/A-18E/F aircraft. With the cumulative impacts scenario, local procurement, changes in civilian and military employment, and total construction expenditures were combined; civilian and military income; and realignment and on-base residence percentages were averaged on a weighted basis. With these inputs, the Economic Impact Forecast System (EIFS) model was run to determine the cumulative impacts for the appropriate region of influence (ROI). For a discussion of the EIFS model and its rational threshold values (RTVs), see Appendix C.

The ROI is defined as the area in which the principal direct and secondary socioeconomic effects of the proposed actions would be likely to occur. The ROI for the cumulative effects at NAS Lemoore is Kings and Fresno Counties, and the RTVs are listed in Appendix C.

Steady state impacts for the F/A-18E/F activities would not occur until 2004; therefore, the steady state levels for the realignment of the E-2 were extended into the year 2004 to fully capture all impacts. For all socioeconomic indicators, the year of greatest impact would be 2004, except for business volume, which would be in 2001. These are the years discussed in this section.

The realignment of the E-2 squadrons and associated personnel combined with the proposed F/A-18E/F basing at NAS Lemoore would not result in cumulatively significant impacts to population, employment, income, and business volume (Table 5-6). Changes to these socioeconomic indicators would be within the historic RTV range, and no mitigation measures would be required.

In 2004 it is projected that an additional 1,135 rental units and 650 owner-occupied units would be required. In Kings and Fresno Counties, 13,780 units were vacant in 1994, and the area vacancy rate was 5.1 percent. Approximately 523 single-family residences and 136 single/multifamily units (identified in Table 5-5) are expected to be constructed in the City of Lemoore and nearby unincorporated areas of Kings County. At NAS Lemoore, base family housing units would be constructed in 2000 and 2001 for an additional 480 units, and bachelor units would be expanded. The additional requirements for rental units and owner-occupied units would not be considered significant, and no mitigation measures would be required.

Implementation of the proposed cumulative projects at NAS Lemoore would not result in cumulatively significant impacts to net government revenues. Government revenues would increase by $7,437,000 in 2004. This change would not be considered significant, and no mitigation measures would be required.

Table 5-6
Cumulative Socioeconomic Effects, NAS Lemoore

	Population	Employment	Income ($1,000)	Housing		Business Volume ($1,000)	Net Government Revenues ($1,000)
				Rental	Owner-Occupied		
1998							
Operations	619	333	$10,629	106	63	$11,117	$609
Construction	102	381	$9,274	45	0	$30,459	$37
Total	721	714	$19,903	151	63	$41,576	$646
1999							
Operations	2,476	1,294	$41,809	425	250	$39,458	$2,448
Construction	233	874	$21,283	103	0	$69,900	$86
Total	2,709	2,168	$63,092	528	250	$109,358	$2,534
2000							
Operations	118	253	$6,598	19	22	$11,901	$51
Construction	189	710	$17,293	84	0	$56,796	$70
Total	307	963	$23,891	103	22	$68,697	$121
2001							
Operations	4,381	2,444	$78,585	709	410	$73,651	$4,535
Construction	229	858	$20,905	101	0	$68,658	$84
Total	4,610	3,302	$99,490	810	410	$142,309	$4,619
2002							
Operations	5,078	2,803	$90,359	822	474	$83,750	$5,269
Construction	126	474	$11,539	56	0	$37,896	$47
Total	5,204	3,277	$101,898	878	474	$121,646	$5,316
2003							
Operations	5,775	3,158	$102,083	920	529	$93,424	$6,017
Construction	111	417	$10,166	49	0	$33,389	$41
Total	5,886	3,575	$112,248	969	529	$126,813	$6,058
2004							
Operations	7,122	3,849	$124,819	1,135	650	$112,837	$7,437
Construction*	0	0	0	0	0	0	0
Total	7,122	3,849	$124,819	1,135	650	$112,837	$7,437

*The designated activity is not anticipated in this year.

Source: EIFS Model

Traffic and Circulation

The proposed action in conjunction with other projects and planned actions would result in poor traffic conditions at signalized intersections near NAS Lemoore. The cumulative base condition at NAS Lemoore includes several on-base and off-base projects. For the purposes of the traffic analysis, only those on-base projects that would include additional personnel were considered. The analysis of the cumulative projects was based on the traffic impact analysis prepared for the E-2 realignment (Linscott, Law & Greenspan 1997). The traffic generated by the off-base projects was extracted directly from that analysis.

The Wing/CVW Administration Building (P-156T) would require an additional 66 personnel (Shubert 1997). The potential siting of the F/A-18E/F squadron would require an additional 1,866 military personnel and 120 civilian support personnel.

The trip generation estimates, which includes F/A-18E/F personnel, family members, and support personnel, have been extracted from the EIS that is currently being prepared for the F/A-18E/F project. The off-base projects include three residential developments located about five miles from base off of SR 41 and the new 100-acre campus for West Hills Community College.

The trip generation for the cumulative projects is shown in Table 5-7. The cumulative projects would generate a total of 12,932 daily trips, 1,721 AM peak hour trips, and 2,011 PM peak hour trips. The E-2 realignment would contribute an additional 1,010 daily trips, 275 AM peak hour trips, and 285 PM peak hour trips.

Table 5-7
Cumulative Trip Generation for NAS Lemoore

Project	Daily	AM In	AM Out	PM In	PM Out
On-base					
Wing/CVW - 66 personnel	159	54	6	6	54
F/A-18E/F Squadron	2,923	724	167	187	744
Off-base					
Avalon Subdivision - 156 SFDU	1,490	30	85	105	60
TR 567 - 136 SFDU	1,300	25	75	90	50
TR 739 - 367 SFDU	3,505	70	200	240	130
West Hills Community College - 1,500 students	3,555	235	50	100	245
Total - Cumulative Background	**12,932**	**1,138**	**583**	**728**	**1,283**
E-2	**1,010**	**245**	**30**	**35**	**250**

SFDU = Single-family dwelling units
Source: Linscott, Law, & Greenspan 1997; Dowling Associates 1997.

The LOS results for cumulative conditions at intersections and roadway segments are shown in Tables 5-8 through 5-10. As shown in Table 5-8 the addition of cumulative traffic would result in unacceptable LOS at the intersections of SR-198/Main Gate during the AM peak hour and Grangeville Road/SR-41 during the PM peak hour. The intersection of Grangeville Road/SR-41 changes from LOS E to F. With or without the proposed action, this intersection would operate at an unacceptable level. The addition of project traffic at the intersection of SR-198/Main Gate results in a change from an acceptable LOS C to an unacceptable LOS E.

By increasing the signal cycle length to 120 seconds, the impacts to the intersection of SR-198 and the Main Gate would be reduced to less than significant levels. The intersection would operate at LOS C and B under cumulative with project conditions during the AM and PM peak hours, respectively.

Table 5-8
Signalized Intersection Operations at NAS Lemoore

Intersection	Peak Hour	Cumulative Delay (seconds)	Cumulative LOS	Cumulative plus Project Delay (seconds)	Cumulative plus Project LOS
Grangeville Road/SR-41	AM	17.4	C	22.3	C
	PM	51.9	E	103.0	F
SR-198/Main Gate	AM	20.8	C	47.8	E
	PM	20.6	C	40.0	D

Delay (seconds)	LOS
0.0 < 5.0	A
5.1 to 15.0	B
15.1 to 25.0	C
25.1 to 40.0	D
40.1 to 60.0	E
> 60.0	F

Source: Dowling Associates 1997.

Table 5-9
Unsignalized Intersection Operations at NAS Lemoore

Intersection	Peak Hour	Movement	Cumulative Delay (seconds)	Cumulative LOS	Cumulative plus Project Delay (seconds)	Cumulative plus Project LOS
Avenal Cutoff/EB SR-198 ramps	AM	EB - L/T	5.8	B	5.9	B
		EB – R	3.7	A	3.7	A
		WB - L/T	6.1	B	6.1	B
		WB – R	2.8	A	2.8	A
		NB – L	3.0	A	3.0	A
		SB – L	2.2	A	2.2	A
	PM	EB - L/T	6.1	B	6.1	B
		EB – R	3.0	A	3.0	A
		WB - L/T	6.2	B	6.3	B
		WB – R	2.6	A	2.6	A
		NB – L	2.7	A	2.7	A
		SB – L	2.1	A	2.1	A
Avenal Cutoff/WB SR-198 ramps	AM	WB – L	6.0	B	6.1	B
		WB – R	3.8	A	4.0	A
		NB – L	2.7	A	2.7	A
	PM	WB – L	7.7	B	8.0	B
		WB – R	3.1	A	3.1	A
		NB – L	3.5	A	3.6	A

LOS = Level of Service
L = Left-turn
R = Right-turn
T = Through movement

EB = Eastbound
WB = Westbound
NB = Northbound
SB = Southbound

Delay (seconds)	LOS
0.0 < 5.0	A
5.1 to 10.0	B
10.1 to 20.0	C
20.1 to 30.0	D
30.1 to 45.0	E
> 45.0	F

Source: Dowling Associates 1997.

Table 5-10
Daily Street Segment Operations at NAS Lemoore

Street Segment	Capacity*	Cumulative			Cumulative plus Project		
		Volume	V/C	LOS	Volume	V/C	LOS
SR-198							
West of Main Gate	14,000	4,788	0.34	B	4,798	0.34	B
East of Main Gate	31,000	10,765	0.35	B	11,225	0.36	B
Grangeville Boulevard							
West of SR-41	14,000	7,707	0.55	C	8,137	0.58	C
SR-41							
North of Grangeville Boulevard	43,000	12,604	0.29	A	12,704	0.30	A

* Capacities and Volume/Capacity ratio thresholds based on CalTrans Standards

V/C Ratio	LOS
0.00 - 0.30	A
0.31 - 0.50	B
0.51 - 0.75	C
0.76 - 0.90	D
0.91 - 1.00	E
> 1.00	F

Source: Dowling Associates 1997.

At the intersection of Grangeville Road and SR-41, widening the eastbound approach to provide a left turn lane would improve operations to LOS C and B during the AM and PM peak hours, respectively, thus reducing cumulative impacts to less than significant levels.

The addition of cumulative traffic at the unsignalized intersections would not result in any cumulatively significant impacts (see Table 5-9). All unsignalized intersections would continue to operate at acceptable levels.

Roadway segments would operate at acceptable levels with the addition of cumulative traffic (see Table 5-10). The project traffic would not result in any changes to LOS. A LOS C or better is maintained on all roadways, and no mitigation would be required.

Air Quality

Cumulative projects identified for the NAS Lemoore area include some on-base construction activities, various housing developments planned for the City of Lemoore, widening of Highway 41, development of a community college, and the potential addition of F/A-18E/F aircraft squadrons at the base. The on-base construction projects would be temporary sources of construction emissions, with some activity being concurrent with construction projects supporting the E-2 aircraft. Traffic associated with housing development projects and the community college would contribute cumulatively to regional emissions of ozone precursors, but would have only minor cumulative contributions to carbon monoxide levels along roadways near NAS Lemoore.

The potential basing of F/A-18E/F aircraft squadrons at NAS Lemoore is the most significant potential cumulative project from an air quality perspective. As noted previously, a separate EIS is being prepared for the siting of F/A-18E/F squadrons, with NAS Lemoore identified as the preferred alternative. That EIS will provide a detailed evaluation of the direct, indirect, and cumulative air quality impacts of the F/A-18E/F action. F/A-18E/F aircraft arrivals would occur in two phases. An initial phase of squadron arrivals and training would occur between 1999 and 2003, resulting in a maximum of 92 additional aircraft operating from NAS Lemoore during that time period. A second phase of squadron arrivals and training would occur after 2005. Some or all of these later aircraft arrivals might be replacements for existing NAS Lemoore squadron aircraft.

For NAS Lemoore, the F/A-18E/F action would require some new facility construction, such as new and expanded training facilities; new and expanded aircraft maintenance facilities; additional personnel support facilities; and new on-base housing facilities. Most construction activity would occur after completion of construction projects that support the E-2 aircraft. Air quality permits would likely be required for any new central boilers and for new or expanded facilities. Permits also may be required for various types of equipment, such as generators, compressors, degreasing tanks, and painting facilities.

Traffic associated with F/A-18E/F personnel and their family members would contribute cumulatively to regional emissions of ozone and PM_{10} precursors. This traffic would also add somewhat to carbon monoxide levels along roadways near NAS Lemoore, but would not result in any violations of state or federal carbon monoxide standards.

The initial phase of F/A-18E/F squadron arrivals would add about 87,400 additional flight events and associated aircraft emissions per year at NAS Lemoore. The number of aircraft would peak in the 2003 to 2005 period, then decline somewhat as some squadrons are reassigned to other facilities. The F/A-18E/F aircraft use a new engine different from that used on other versions of the F/A-18E/F. Combined emissions from F/A-18E/F flight activity, associated base-related vehicle traffic, and permit-exempt equipment operations would be about 31.4 tons (28.5 tonnes) per year of reactive organic compounds, 52.3 tons (47.4 tonnes) per year of nitrogen oxides, 31.6 tons (28.7 tonnes) per year of PM_{10}, and 2.5 tons (2.3 tonnes) per year of sulfur oxides.

Emissions associated with the basing of F/A-18E/F aircraft at NAS Lemoore would exceed the Clean Air Act (CAA) conformity rule *de minimis* thresholds for the San Joaquin Valley, thus requiring a conformity determination.

The Navy has not yet determined whether the second phase of F/A-18E/F aircraft arrivals would be replacements for existing aircraft already based at NAS Lemoore, or additional squadrons that would conduct initial training at NAS Lemoore before assignment to other bases. Emissions associated with the second

phase of F/A-18E/F arrivals will be addressed in the separate EIS that is being prepared for the F/A-18E/F action.

Noise

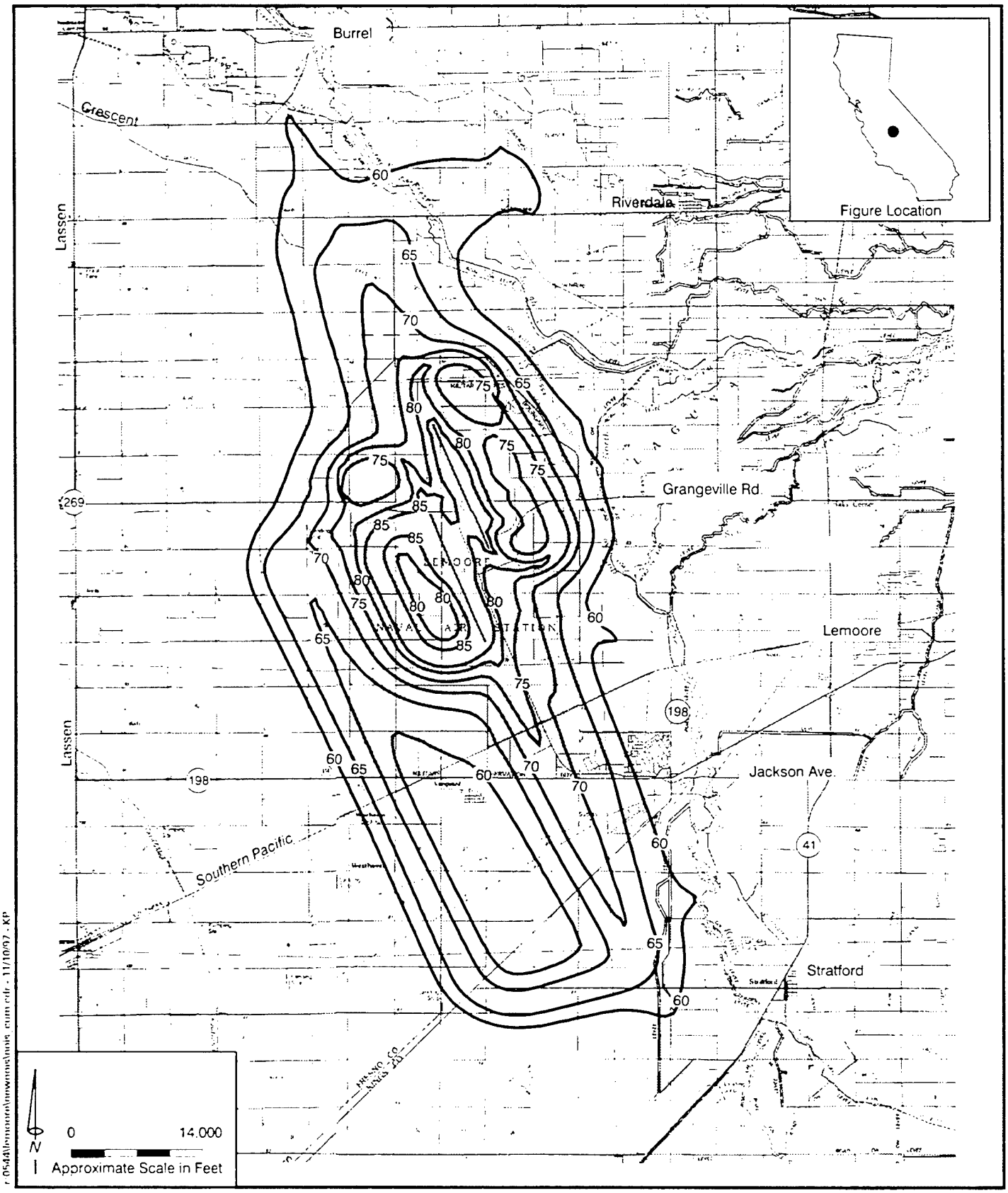
Cumulative projects identified for the NAS Lemoore area include some on-base construction activities, various housing developments planned for the City of Lemoore, widening of Highway 41, development of a community college, and the potential addition of F/A-18E/F aircraft squadrons at the base. The on-base construction projects would be temporary sources of construction noise, with some activity being concurrent with construction projects supporting the E-2 aircraft. Traffic associated with housing development projects and the community college would make only minimal cumulative contributions to cumulative noise conditions along roadways near NAS Lemoore.

The basing of F/A-18E/F aircraft squadrons at NAS Lemoore is the most significant potential cumulative project from a noise perspective. As noted previously, a separate EIS is being prepared for the siting of F/A-18E/F squadrons, with NAS Lemoore identified as the preferred alternative. That EIS will provide a detailed evaluation of the direct, indirect, and cumulative noise impacts of the F/A-18E/F action. For NAS Lemoore, the F/A-18E/F action would require some new facility construction. Most construction activity would occur after completion of construction projects that support the E-2 aircraft.

Traffic associated with F/A-18E/F personnel and their family members would contribute cumulatively to noise levels along area roadways, but the net change in noise levels would not be significant (less than 1 dBA).

Cumulative increases in aircraft noise would be an issue of potential concern. Figure 5-1 illustrates preliminary noise contours around NAS Lemoore if both the E-2 and the first phase of F/A-18E/F aircraft arrivals were to be based there. Areas exposed to noise levels above 65-dB CNEL would expand to the north, south, and west of NAS Lemoore. Affected land uses are primarily agricultural, with some rural residential areas south of the base. Although the number of noise complaints received by NAS Lemoore might increase somewhat (particularly from areas south of the base), no significant noise impacts would be expected.

The second phase of F/A-18E/F aircraft arrivals (after 2005) would result in only minor changes to aircraft noise contours around NAS Lemoore if the arriving aircraft replace existing aircraft already based at NAS Lemoore. Aircraft noise contours around NAS Lemoore would expand further if the second phase of aircraft arrivals were to train at NAS Lemoore prior to assignment to other bases.



The 65-dB CNEL contour extends off-base along major approach and departure flight paths

LEGEND:

— 75 — Community Noise Equivalent Level (CNEL)

NAS Lemoore

NAS Lemoore Cumulative Noise Contours

E-2 Aircraft Squadrons Realignment EIS
NAS Lemoore, California

Source: Wyle 1997

Figure 5-1

Utilities and Services

Water Supply Impacts - Potentially significant cumulative effects could occur to available water supply. The water that the Westlands Water District (Westlands) receives from the State Water Project is variable. Although NAS Lemoore has contracted for 3,000 acre-feet (370 hectare-meters) per year, Westlands cannot guarantee delivery of the full contract amount. The Central Valley Project Improvement Act (CVPIA) requires that an increased portion of state water project water be used to maintain environmental conditions in the Sacramento-San Joaquin Delta and tributary streams. This is expected to decrease the amount of water available to agriculture and municipal and industrial uses, particularly in low runoff years. Modifications to the state's water system are planned to offset these decreases through increasing storage. However, the net impact of these proposed changes has yet to be determined. Assuming that deliveries of state water to Westlands remain at historic levels, expansion of deliveries to municipal and industrial water users would be met by decreasing deliveries to agriculture or by exploiting other sources of water (usually at higher cost). A decrease in state water project deliveries to Westlands would increase this effect.

A range of mitigation measures are available to address the impacts of decreased state water project deliveries. Either Westlands or NAS Lemoore could identify supplemental sources of water, such as willing sellers of existing water rights. Alternatively, implementation of water conservation measures by agriculture and/or municipal and industrial users could reduce the demand for water. Increasing the unit cost of the delivered water would also have the effect of reducing demand.

School Impacts - To ascertain the number of students generated with the E-2 and F/A-18E/F projects cumulative impacts scenario, changes in civilian and military employment were combined; and civilian and military realignment and on-base residence percentages were averaged on a weighted basis. With these inputs, the EIFS model was run to determine the total number of students that would be generated. For a discussion of the EIFS model see Appendix C. The year of greatest impact would be 2004, which is when 1,204 additional students would require public education. Affected school districts may be eligible for impact aid funds, which would compensate for the addition of federal students. School districts would need to apply for direct payment by the US Department of Education.

Approximately 523 single-family residences and 136 single/multifamily units (Table 5-5) are expected to be constructed in the City of Lemoore and nearby unincorporated areas of Kings County. New construction would contribute to the public education system as a result of developer fees that are earmarked for school construction. No significant cumulative impacts are anticipated to occur, and no mitigation measures would be required.

Public Health and Safety

The F/A-18E/F aircraft would replace F/A-18C/D aircraft and operate similarly to the current operations at NAS Lemoore. The only planned increase in the use of NAS Lemoore airspace is a result of the 16 E-2 aircraft. As described in Section 4.11, Public Health and Safety of this DEIS, the addition of the E-2 aircraft would not be considered a significant impact to airspace safety. Any changes in the training procedures associated with the F/A-18E/F that could affect overlapping airspace or nonmilitary airport agreements would be addressed in the F/A-18E/F squadron EIS being prepared by the Navy. Therefore, the aircraft operations of the E-2 and other planned military projects would not result in cumulatively significant impacts to public health and safety.

The E-2 aircraft operations would not require any changes to designated APZs or Clear Zones. In addition, the E-2 aircraft operations at NAS Lemoore would not require any changes to runways to accommodate the field carrier landing practices (FCLPs) conducted by the E-2 aircraft. However, other planned military projects may result in alterations to APZs in order to accommodate the increase in aircraft operations and training. Each military action/project review process would evaluate potential impacts to APZs. Therefore, no cumulatively significant impacts related to APZs would occur. The planned military projects would not result in an increase to hazards from explosives safety and electromagnetic radiation, as additional military projects would be sited according to Navy regulations for ESQD and HERO/HERP/HERF arcs. No cumulatively significant public health and safety impacts would occur, and no mitigation would be required.

Hazardous Materials and Wastes

The planned military projects would result in an increase of hazardous materials and waste used, stored, and transported at NAS Lemoore. The additional increase in hazardous wastes would be handled according to USEPA and Navy guidelines for hazardous waste storage and disposal. The planned military projects would be constructed and operated in accordance with approved spill response plans and federal, state, and local laws to prevent on-base releases of hazardous materials/wastes. No cumulatively significant impacts associated with hazardous materials and waste would occur, and no mitigation would be required.

5.3 NAF El Centro Alternative

Table 5-11 represents the cumulative projects proposed at Naval Air Facility (NAF) El Centro. No off-base projects are planned in the vicinity of NAF El Centro as determined through conversations with local cities and Imperial County staff. An EIS is being prepared by the Navy to evaluate the direct, indirect, and cumulative impacts of introducing the F/A-18E/F program at alternative base locations, including NAF El Centro. Further analysis of the cumulative effects will be provided in that EIS.

Table 5-11
List of Cumulative Projects: NAF El Centro

Location	Description
On Base 1997–1998	Child development center (4 additional personnel)
On Base 1997–1998	BEQ and galley (8 additional personnel)
On Base 1997–1998	Gymnasium addition
On Base 1999+	Potential for F/A-18E/F squadrons, operations, and personnel support facilities

Socioeconomics

To determine cumulative impacts, socioeconomic changes were analyzed at NAF El Centro assuming joint siting of the E-2 and F/A-18E/F aircraft. With the cumulative impacts scenario, local procurement, changes in civilian and military employment, and total construction expenditures were combined; and civilian and military income were averaged on a weighted basis. With these inputs, the EIFS model was run to determine the cumulative impacts for the ROI. For a discussion of the EIFS model and its RTVs, see Appendix C.

The ROI for the cumulative effects is Imperial County; the county RTVs are listed in Appendix C. Steady state impacts for the F/A-18E/F would not occur until 2005; therefore, the steady state levels for the realignment of the E-2 was extended into the year 2005 to fully capture all impacts. In all cases the year of greatest impact was 2005, which is the year discussed in this section.

The E-2 realignment in combination with the F/A-18E/F aircraft and associated personnel would not result in cumulatively significant socioeconomic impacts (Table 5-12) for employment and business volume. Employment would increase almost 13 percent, and business volume would increase 7 percent, however, both increases would be within the historic RTV range.

The cumulative effect on population would result in a potentially significant impact. The direct and indirect population increase would be about 11 percent over the baseline conditions. This population change would not be within the historic RTV range (6.828 to -1.543) and would, therefore, be considered significant. This population change also would be accompanied by secondary impacts to the community, such as increases in employment, income, business volume, and net government revenues.

Implementing the cumulative scenario at NAF El Centro would impact income. Income would increase $176,827,000 (over 11 percent) above the baseline conditions, which is not within the historic RTV range. No mitigation would be required, however, because the impact would not be considered adverse.

Table 5-12
Cumulative Socioeconomic Effects at NAF El Centro

	Population	Employment	Income ($1,000)	Housing		Business Volume ($1,000)	Net Government Revenues ($1,000)
				Rental	Owner-Occupied		
1998							
Operations*	620	304	$7,827	106	63	$5,477	$1,221
Construction	83	238	$5,968	37	0	$15,847	$619
Total	703	542	$13,795	143	63	$21,324	$1,840
1999							
Operations	2,595	1,457	$31,239	456	270	$21,159	$4,398
Construction	177	505	$12,664	78	0	$33,625	$1,314
Total	2,772	1,962	$43,903	534	270	$54,784	$5,712
2000							
Operations	4,457	2,399	$70,197	719	418	$47,125	$11,199
Construction	131	374	$9,362	58	0	$24,858	$971
Total	4,588	2,773	$79,559	777	418	$71,983	$12,170
2001							
Operations	5,575	2,925	$88,195	886	512	$57,440	$14,300
Construction	155	445	$11,137	69	0	$29,572	$1,155
Total	5,730	3,370	$99,332	955	512	$87,012	$15,455
2002							
Operations	6,780	3,493	$107,619	1,078	620	$68,755	$17,626
Construction	86	245	$6,147	38	0	$16,323	$638
Total	6,866	3,738	$113,766	1,116	620	$85,078	$18,264
2003							
Operations	7,468	3,817	$118,696	1,188	682	$75,207	$19,522
Construction	76	216	$5,416	33	0	$14,381	$562
Total	7,544	4,033	$124,112	1,221	682	$89,588	$20,084
2004							
Operations	9,960	4,989	$158,811	1,560	891	$98,156	$26,435
Construction	0	0	$0	0	0	$0	0
Total	9,960	4,989	$158,811	1,560	891	$98,156	$26,435
2005							
Operations	11,078	5,516	$176,827	1,735	989	$108,599	$29,524
Construction	0	0	$0	0	0	$0	$0
Total	11,078	5,516	$176,827	1,735	989	$108,599	$29,524

*The designated activity is not anticipated to occur in this year.

Source: EIFS Model.

It is projected that an additional 1,735 rental units and 989 owner-occupied units would be required. However, with almost 4,000 units available in 1994 it can be projected that housing units would be available in Imperial County in 2005.

Traffic and Circulation

The proposed action in conjunction with other projects and planned actions would contribute to poor traffic conditions at two intersections near NAF El Centro. The cumulative base condition at NAF El Centro includes several on-base projects. For the purposes of the traffic analysis, only those on-base projects that would include additional personnel were considered. The analysis of the cumulative projects was based on the traffic impact analysis prepared for the E-2 realignment (Linscott, Law & Greenspan 1997). The traffic generated by the off-base projects was extracted directly from that analysis.

The potential siting of the F/A-18E/F squadron would require an additional 3,453 military personnel and 200 civilian support personnel. The trip generation estimates, which includes F/A-18E/F personnel, family members, and support

personnel, have been extracted from the separate EIS that is currently being prepared for the F/A-18E/F project.

The trip generation for the cumulative projects are shown in Table 5-13. The cumulative projects would generate a total of 5,382 daily trips, 1,626 AM peak hour trips, and 1,702 PM peak hour trips. The E-2 realignment would contribute an additional 1,126 daily trips, 307 AM peak hour trips, and 317 PM peak hour trips.

Table 5-13
Cumulative Trip Generation for NAF El Centro

Project	Daily	AM In	AM Out	PM In	PM Out
On-base					
Child Development Center - 4 personnel	10	4	0	0	4
BEQ and galley - 8 personnel	19	8	0	0	8
F/A-18E/F Squadron	5,353	1,305	309	347	1,343
Total - Cumulative Background	**5,382**	**1,317**	**309**	**347**	**1,355**
E-2	**1,126**	**275**	**32**	**37**	**280**

Source: Linscott, Law, & Greenspan 1997; Dowling Associates 1997.

LOS results for cumulative conditions at intersections and roadway segments are shown in Tables 5-14 and 5-15. As shown in Table 5-14, the addition of cumulative traffic would result in LOS F at the intersections of Bennett Road/Even Hewes Highway and Forrester Road/Even Hewes Highway during the AM and PM peak hours.

By installing a signal, providing a separate southbound left turn lane, and allowing free-right-turns for westbound traffic at the intersection of Bennett Road and Evan Hewes Highway, the cumulative impacts would be reduced and the operation would improve to LOS C during the AM and PM peak hours. This mitigation would require widening the southbound approach to provide a separate outbound left-turn lane and an inbound lane for the free-right-turns. The traffic volumes at this intersection would meet CalTrans peak hour signal warrants. Implementation of this mitigation would reduce the impact to a less than significant level.

By installing a signal at the intersection of Forrester Road and Evan Hewes Highway, the impacts of the cumulative traffic would be reduced and operations would improve to LOS C or better during the AM and PM peak hours. The intersection would meet CalTrans peak hour signal warrants. Implementation of this mitigation would reduce the impact to a less than significant level.

The intersection of Drew Road and Even Hewes would continue to operate at acceptable levels with or without the addition of cumulative traffic.

Table 5-14
Unsignalized Intersection Operations at NAF El Centro

Intersection	Peak Hour	Cumulative Delay (seconds)	Cumulative LOS	Cumulative plus Project Delay (seconds)	Cumulative plus Project LOS
Drew Road/Evan Hewes Highway	AM	6.8	B	8.3	B
	PM	3.8	A	4.1	A
Bennett Road/Evan Hewes Highway	AM	Overflow	F	Overflow	F
	PM	Overflow	F	Overflow	F
Forrester Road/Evan Hewes Highway	AM	Overflow	F	Overflow	F
	PM	Overflow	F	Overflow	F

Delay (seconds)	LOS
0.0 < 5.0	A
5.1 to 10.0	B
10.1 to 20.0	C
20.1 to 30.0	D
30.1 to 45.0	E
> 45.0	F

Source: Dowling Associates 1997.

Table 5-15
Daily Street Segment Operations at NAF El Centro

Street Segment	Capacity*	Cumulative Volume	Cumulative V/C	Cumulative LOS	Cumulative plus Project Volume	Cumulative plus Project V/C	Cumulative plus Project LOS
Evan Hewes (S-80)							
West of Drew Road	14,000	4,144	0.30	A	4,244	0.30	A
East of Forrester Road	14,000	8,040	0.57	C	8,545	0.61	C
Drew Road							
North of Evan Hewes	14,000	1,400	0.10	A	1,435	0.10	A
South of Evan Hewes	14,000	2,700	0.19	A	2,735	0.20	A
Bennett Road							
South of Evan Hewes	14,000	3,086	0.22	A	3,311	0.24	A
Forrester Road							
North of Evan Hewes	14,000	4,260	0.30	A	4,405	0.31	B
South of Evan Hewes	14,000	6,416	0.46	B	6,496	0.46	B

* Capacities and Volume/Capacity ratio thresholds based on CalTrans Standards

V/C Ratio	LOS
0.00 - 0.30	A
0.31 - 0.50	B
0.51 - 0.75	C
0.76 - 0.90	D
0.91 - 1.00	E
> 1.00	F

Source: Dowling Associates 1997.

The addition of cumulative traffic to roadway segments would not result in cumulatively significant impacts (see Table 5-15). The proposed cumulative project traffic would result in a change in LOS from A to B on Forrester Road north of Evan Hewes Highway, but it is not considered a cumulatively significant impact. All roadway segments would operate at LOS C or better with or without the cumulative projects.

Air Quality

Cumulative projects identified for the NAF El Centro area include some on-base construction activities and the potential addition of F/A-18E/F aircraft squadrons at the base. The on-base construction projects would be temporary sources of construction emissions, with some activity being concurrent with construction projects supporting the E-2 aircraft.

The basing of F/A-18E/F aircraft squadrons at NAF El Centro is the most significant potential cumulative project from an air quality perspective. As noted previously, a separate EIS is being prepared for the siting of F/A-18E/F squadrons, with NAF El Centro identified as one of two alternative sites. That EIS will provide a detailed evaluation of the direct, indirect, and cumulative air quality impacts of the F/A-18E/F action. F/A-18E/F aircraft arrivals would occur in two phases. An initial phase of squadron arrivals and training would occur between 1999 and 2003, resulting in a maximum of 92 additional aircraft operating from NAF El Centro during that time period. A second phase of squadron arrivals and training would occur after 2005, involving a maximum of 72 additional aircraft.

For NAF El Centro, the first phase of the F/A-18E/F action would require significant new facility construction, such as construction of a new parallel runway and associated facilities; new hangar space and expansion of training facilities; a new engine test cell and power check pad; new aircraft maintenance facilities; additional personnel support facilities; and new on-base housing facilities.

Most construction activity would occur after completion of construction projects that support the E-2 aircraft. Air quality permits would probably be required for the engine test cell and any new central boilers for new or expanded facilities. Permits also may be required for various types of equipment, such as generators, compressors, degreasing tanks, and painting facilities.

Traffic associated with F/A-18E/F personnel and their family members would contribute cumulatively to regional emissions of ozone and PM_{10} precursors. This traffic would also add somewhat to carbon monoxide levels along roadways near NAF El Centro, but would not result in any violations of state or federal carbon monoxide standards.

If based at NAF El Centro, the first phase of F/A-18E/F squadron arrivals would add about 87,400 additional flight events and associated aircraft emissions per year. The number of aircraft would peak by 2003, then decline somewhat as some

squadrons are reassigned to other facilities. Aircraft numbers would increase again after 2005 as the second phase of squadron arrivals occurs. Combined emissions associated with the two phases of F/A-18E/F arrivals will be addressed in the separate EIS that is being prepared for the F/A-18E/F action. Combined emissions from F/A-18E/F flight activity, associated base-related vehicle traffic, and permit-exempt equipment operations would be about 31.1 tons (28.2 tonnes) per year of reactive organic compounds, 51.8 tons (47.0 tonnes) per year of nitrogen oxides, 29.1 tons (26.4 tonnes) per year of PM_{10}, and 2.6 tons (2.4 tonnes) per year of sulfur oxides.

Emissions associated with the basing of F/A-18E/F aircraft at NAF El Centro would exceed the CAA conformity rule *de minimis* thresholds for Imperial County, and would require a conformity determination.

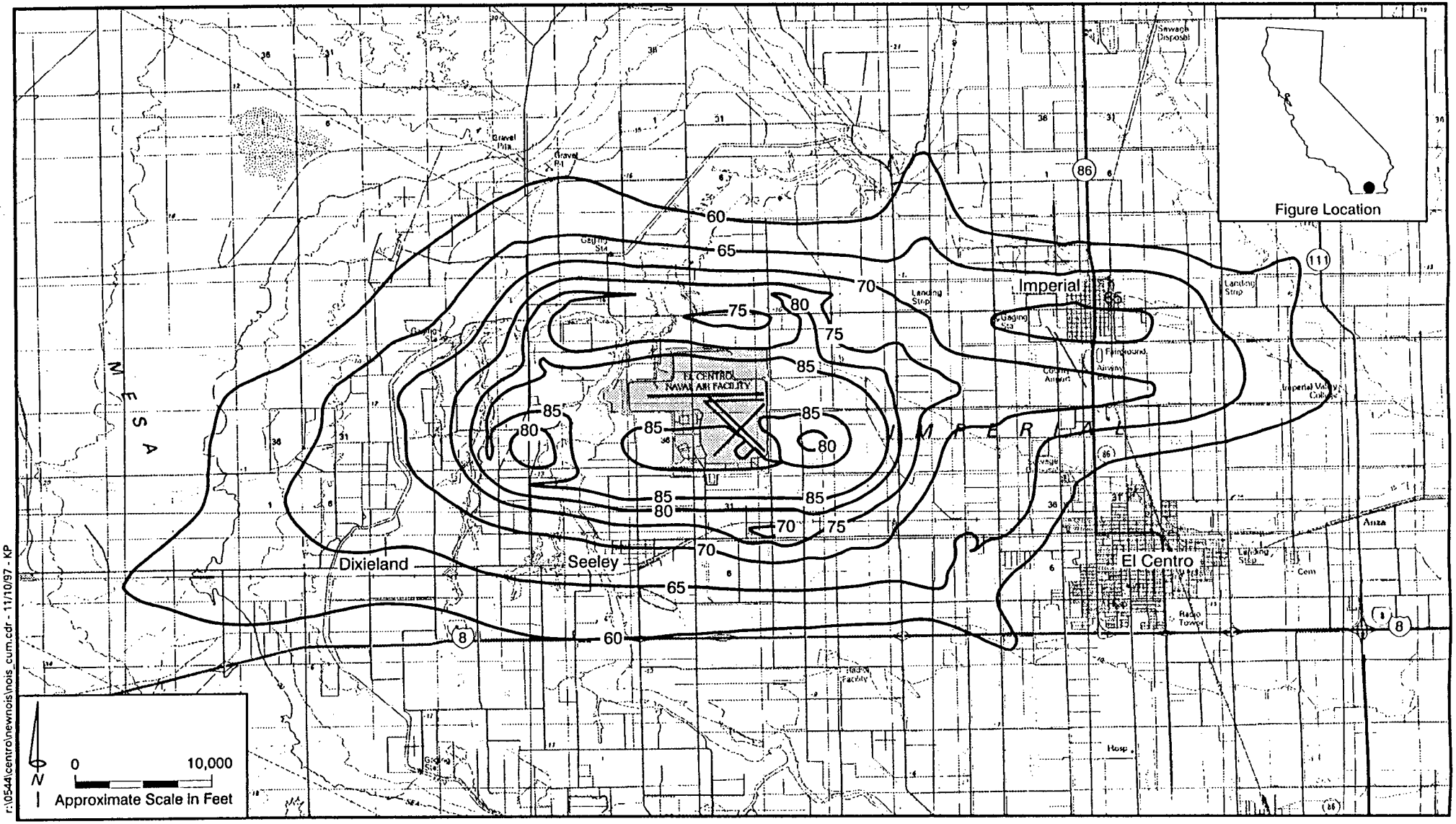
Noise

Cumulative projects identified for the NAF El Centro area include some on-base construction activities and the potential addition of F/A-18E/F aircraft squadrons at the base. The on-base construction projects would be temporary sources of construction noise, with some activity being concurrent with construction projects supporting the E-2 aircraft.

The basing of F/A-18E/F aircraft squadrons at NAF El Centro is the most significant potential cumulative project from a noise perspective. Figure 5-2 illustrates preliminary noise contours around NAS Lemoore if both the E-2 and the first phase of F/A-18E/F aircraft arrivals were to be based there. As noted previously, a separate EIS is being prepared for the siting of F/A-18E/F squadrons, with NAF El Centro identified as one of the alternative sites. That EIS will provide a detailed evaluation of the direct, indirect, and cumulative noise impacts of the F/A-18E/F action. For NAF El Centro, the F/A-18E/F action would require significant new facility construction. Most construction activity would occur after completion of construction projects that support the E-2 aircraft.

Traffic associated with F/A-18E/F personnel and their family members would contribute cumulatively to noise levels along area roadways, but the net change in noise levels would not be cumulatively significant (less than 1 dBA).

Cumulative increases in aircraft noise would be an issue of potential concern. Noise contours for combined operation of E-2 and F/A-18E/F aircraft are being developed for NAF El Centro, but are not yet available. Preliminary noise analyses for the first phase of F/A-18E/F arrivals indicate that the area exposed to noise levels above 65-dB CNEL would expand noticeably in all directions around NAF El Centro. On-base housing areas, the town of Seeley, and the City of Imperial would be affected by increased noise levels. The number of noise complaints received by NAF El Centro would also probably increase.



r:\0544\centro\newnois\nois_cum.cdr - 11/10/97 - KP

Existing noise contours exceed levels associated with most noise sensitive land uses.

LEGEND:

— 75 — Community Noise Equivalent Level (CNEL)

NAF El Centro

Source: Wyle 1997.

NAF El Centro
Cumulative Noise Contours

E-2 Aircraft Squadrons Realignment EIS
NAF El Centro, California

Figure 5-2

Utilities and Services

Water Supply Impacts - Potentially significant cumulative effects could occur to available water supply. The water supply for the Imperial Valley is limited by international and interstate agreements governing the allocation of water from the Colorado River, and the supply is not expected to increase despite future regional development. Therefore, increased municipal and industrial demand must be met by decreasing the amount of water allocated to other uses, primarily agriculture.

A range of mitigation measures are available to address the impacts of decreased regional water supply. Either Imperial Irrigation District or NAF El Centro could identify supplemental sources of water, such as willing sellers of existing water rights. Alternatively, implementation of water conservation measures by agriculture and/or municipal and industrial users could reduce the demand for water to accommodate urban growth. Increasing the unit cost of the delivered water would also have the effect of reducing demand.

School Impacts - To ascertain the number of students generated with the E-2 and F/A-18E/F cumulative project scenario, changes in civilian and military employment were combined; and civilian and military realignment and on-base residence percentages were averaged on a weighted basis. The year of greatest impact at NAF El Centro was 2005, which would be when 1,914 additional students would require public education. Eligible school districts would apply for direct payment of impact aid funds by the US Department of Education, which would compensate for the addition of federal students. No significant cumulative impacts are anticipated to occur, and no mitigation measures would be required.

Public Health and Safety

Planned military projects (identified in Table 5-11) could result in an increase of E-2 and F/A-18E/F aircraft. The resulting increase in the use of NAF El Centro airspace may result in increased hazards to airspace safety. Modifications to air traffic circulation patterns may be required to accommodate the additional aircraft operations and training. Air traffic control specialists for NAF El Centro would need to evaluate additional aircraft operations and training to evaluate the increased management of the airspace and reduce hazards to airspace safety. The implementation of any necessary modifications to overlapping airspace or agreements with nonmilitary airports would reduce hazards to airspace safety.

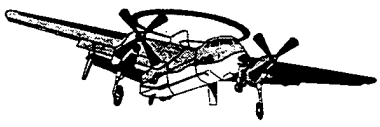
E-2 aircraft operations would not require any changes to designated APZs or Clear Zones. In addition, the E-2 aircraft operations at NAF El Centro would not require any changes to runways to accommodate the FCLPs conducted by the E-2 aircraft. However, the F/A-18E/F program may require alterations to APZs to accommodate the increase in aircraft operations and training. Potential impacts to APZs would be evaluated by the F/A-18E/F planning process and documented in the EIS that is being prepared for that project. Therefore, no cumulatively significant impacts related to APZs would occur. The planned military projects would not result in an increase to hazards from explosives safety and

electromagnetic radiation as additional military projects would be sited according to Navy regulations for ESQD and HERO/HERP/HERF arcs. No cumulatively significant public health and safety impacts would occur, and no mitigation would be required.

Hazardous Materials and Wastes

Planned military projects (identified in Table 5-11) would result in an increase in hazardous materials and wastes used, stored, and transported at NAF El Centro. The additional increase in hazardous wastes would be handled according to USEPA and Navy guidelines for hazardous waste storage and disposal. The planned military projects would be constructed and operated in accordance with approved spill response plans and federal, state, and local laws to prevent on-base releases of hazardous materials/wastes. No cumulatively significant impacts associated with hazardous materials and waste would occur, and no mitigation would be required.

This page intentionally left blank.



6.0 Other Considerations

6. OTHER CONSIDERATIONS 6-1

6.1 Environmental Justice (EO 12898) 6-1
6.1.1 Preferred Alternative: NAWS Point Mugu 6-2
6.1.2 NAS Lemoore Alternative 6-3
6.1.3 NAF El Centro Alternative 6-3
6.2 Protection of Children from Environmental Health Risks (EO 13045) 6-4
6.3 Irreversible or Irretrievable Commitment of Resources 6-5
6.4 Unavoidable Adverse Effects 6-5
6.5 Relationship Between Short-term Uses and Long-term Productivity 6-5

CHAPTER 6
OTHER CONSIDERATIONS

This chapter addresses specific topics that the National Environmental Policy Act (NEPA) requires and includes a discussion of environmental justice and the protection of children from environmental health risks. Issues related to environmental justice are presented in accordance with Executive Order 12898 and issues related to protection of children from environmental health risks are presented in accordance with Executive Order 13045. In addition, unavoidable adverse impacts, any irreversible or irretrievable commitment of resources, and the relationship between short-term uses of the environment and the maintenance and enhancement of long-term productivity are identified and analyzed.

6.1 ENVIRONMENTAL JUSTICE (EO 12898)

This section summarizes potential impacts from the E-2 squadrons realignment on issues of environmental justice. Executive Order (EO) 12898, the "Executive Order on Federal Actions to Address Environmental Justice in Minority and Low-income Populations," was issued on February 11, 1994 and requires that "each Federal agency make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations (Executive Order 12898, 59 Federal Register 7629 [Section 1-101])." On April 21, 1995, the Secretary of Defense submitted a formal environmental justice strategy and implementation plan to the US Environmental Protection Agency (USEPA). In order to comply with the executive order, the following actions have occurred concurrently with this environmental impact statement (EIS):

- Gathered economic, racial, and demographic information generated from the 1992 Bureau of Economic Analysis (BEA) to identify areas of low-income and high minority populations in the areas potentially exposed to project impacts;

- Assessed the realignment alternatives for disproportionate impacts resulting from on-site activities associated with the proposed action; and
- Encouraged community participation and input through public meetings and extensive public notification, as described in Section 1.5, Public Involvement Process of this document.

Minority populations and low-income populations would not be significantly and adversely or disproportionately affected by any environmental impact identified in this DEIS for the reasons described below for each alternative.

6.1.1 Preferred Alternative: NAWS Point Mugu

Census tracts adjacent to Naval Air Weapons Station (NAWS) Point Mugu include 46, 47.01, 47.02, 56, 57, and 73. As shown in Table 6-1, in census tract 47.01, nine percent of the population is below poverty level, approximately 4 percent higher than the countywide level of 5 percent. The percent of the population below poverty level in census tracts 46, 47.02, 56, and 73 is below the countywide percentage. Census tracts 47.01 and 47.02 have a significantly higher Hispanic population than the countywide Hispanic population (62 and 35 percent versus 26 percent) and census tracts 47.01, 47.02, and 46 have a higher Asian population than the countywide Asian population (12, 14, and 8 percent, respectively versus 5 percent). The black population in census tracts 46, 47.01, 47.02, and 56 is higher than the countywide level, and the Native American population in census tract 57 is higher than the countywide level. Implementation of the proposed action at NAWS Point Mugu would affect minority and low-income populations in census tracts 46, 47.01, 47.02, and 57. No significant adverse impacts have been identified at NAWS Point Mugu that cannot be mitigated to a less than significant level and disproportionate adverse impacts have not been identified.

Table 6-1
Racial Composition and Poverty by Census Tract Compared with Ventura County

Census Tract	Percent Below Poverty Level	Percent Hispanic	Percent Black	Percent Native American	Percent Asian	Median Family Income
Ventura County	5	26	2	<1	5	$50,091
46	<1	6	12	1	8	$26,563
47.01	9	62	3	<1	12	$35,243
47.02	4	35	7	1	14	$40,926
56	4	13	1	<1	4	$50,062
57	<1	13	13	6	2	$42,188
73	3	18	<1	1	2	$67,246

Source: 1990 Census of Population and Housing Census Tracts and BNAs, Ventura County, CA MSA. Summary of Social, Economic and Housing Characteristics - California, issued 1992.

6.1.2 NAS Lemoore Alternative

In Fresno County, census tract 78 is located adjacent to Naval Air Station (NAS) Lemoore, and adjacent census tracts in Kings County include 2, 3 and 16. In Fresno County, census tract 78 has a slightly higher percentage of its population living below the poverty level; and in Kings County, 23 percent of the population in census tract 16 is below the poverty level, representing an 8 percent increase over the countywide figure. As shown in Table 6-2 census tract 16 in Kings County and 78 in Fresno County have a significantly higher Hispanic population than the countywide total (94 percent versus 35 percent in Fresno County and 65 percent versus 34 percent in Kings County). The black population in census tract 3 in Kings County and the Native American population in census tract 16 in Kings County are higher than the county percentage. Implementation of the proposed action at NAS Lemoore would affect minority and low-income populations in census tracts 78 in Fresno County and 3 in Kings County. No significant adverse impacts have been identified at NAS Lemoore that cannot be mitigated to a less than significant level and disproportionate adverse impacts have not been identified.

Table 6-2
Racial Composition and Poverty by Census Tract Compared with Fresno and Kings Counties

Census Tract	Percent Below Poverty Level	Percent Hispanic	Percent Black	Percent Native American	Percent Asian	Median Family Income
Fresno County	17	35	9	<1	8	$29,970
78	18	94	<1	<1	<1	$19,113
Kings County	15	34	8	<1	3	$27,614
2	13	20	3	<1	<1	$32,868
3	11	7	11	<1	<1	$20,211
16	23	65	2	10	<1	$21,524

Source: 1990 Census of Population and Housing Census Tracts and BNAs, Outside Metropolitan Areas, California. Summary of Social, Economic and Housing Characteristics – California, issued 1992.

6.1.3 NAF El Centro Alternative

Census tracts adjacent to Naval Air Facility (NAF) El Centro include 110, 111, 112.01, 112.02, 113, 114, 115, 116, 117, 118.01, 118.02, and 118.03. Table 6-3 identifies racial composition and the percentage of the population below the poverty level for the identified census tracts and compares them to Imperial County. Census data identifies approximately 24 percent of the population in census tract 112.02, 23 percent in tract 113, 43 percent in census tract 114, 31 percent in census tract 115, and 28 percent in census tract 116 as below the poverty level compared with 21 percent countywide. In census tracts 112.02, 113, 114, 115, 116, the Hispanic population is higher than the countywide Hispanic population of 66 percent. In census tracts 110, 111, 112.01, 114, 115, 117, and 118.02, the black population is higher than the county percentage. The Native American populations in census tracts 112.01 is higher than the county percentage, and

Table 6-3
Racial Composition and Poverty by Census Tracts Compared with Imperial County

Census Tract	Percent Below Poverty Level	Percent Hispanic	Percent Black	Percent Native American	Percent Asian	Median Family Income
Imperial County	21	66	2	1	1	$25,147
110	10	50	3	1	1	$36,719
111	12	45	3	1	3	$27,681
112.01	12	62	4	3	2	$37,543
112.02	24	70	2	1	1	$23,474
113	23	81	2	<1	<1	$22,329
114	43	78	18	<1	<1	$15,417
115	31	77	4	<1	3	$19,317
116	28	67	1	<1	2	$25,231
117	10	60	3	<1	3	$32,301
118.01	3	38	2	0	8	$60,943
118.02	6	40	3	<1	3	$44,464
118.03	7	26	0	0	<1	$46,250

Source: 1990 Census of Population and Housing Census Tracts and BNAs, Outside Metropolitan Areas, California. Summary of Social, Economic and Housing Characteristics - California, issued 1992.

census tracts 111, 112.01, 115, 116, 117, and 118.02 have higher Asian populations than the county. With the exception of census tract 118.03, implementation of the proposed action at NAF El Centro would affect minority and low-income populations in all of the census tracts identified in this analysis. No significant adverse impacts have been identified at NAF El Centro that cannot be mitigated to a less than significant level and disproportionate adverse impacts have not been identified.

6.2 PROTECTION OF CHILDREN FROM ENVIRONMENTAL HEALTH RISKS (EO 13045)

Executive Order 13045, Protection of Children from Environmental Health Risks and Safety Risks, states that each Federal agency shall (1) make it a high priority to identify and assess environmental health risks and safety risks that may disproportionately affect children, and (2) ensure that its policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks or safety risks. Environmental health risks and safety risks mean risks to health or to safety that are attributable to products or substances that the child is likely to come in contact with or ingest (Federal Register 1997). A task force has been established to recommend to the President Federal strategies for children's environmental health and safety.

The US Navy anticipates that EO 13045 would apply to the noise environment around schools. Noise impacts would be considered significant if the proposed project would cause public schools to be located within a 65 CNEL contour that was previously not located in such an area.

With the proposed E-2 aircraft squadrons realignment, temporary construction activities would occur at each site to remodel existing facilities or build new facilities. Construction projects would be small in scale, and none would be located near schools.

Noise levels generated by E-2 aircraft are significantly lower than noise levels from existing flight operations. Off-base noise contours would be virtually the same as those for exiting aircraft operations.

The proposed project would not cause a public school to be located within a 65 CNEL contour; therefore, there are no impacts with respect to children's environmental health and safety. However, there is an existing school within the 65 CNEL that would remain irrespective of the proposed action.

6.3 Irreversible or Irretrievable Commitment of Resources

NEPA requires a discussion of any irreversible or irretrievable commitment of resources which would be involved in the proposal should it be implemented (40 CFR 1502.16). Resources that are irreversibly or irretrievable committed to a project are those that are utilized on a long-term or permanent basis. This includes the use of non-renewable resources such as metal, wood, fuel, paper, and other natural or cultural resources. Another impact that falls under the category of the irreversible and irretrievable commitment of resources is the unavoidable destruction of natural resources that could limit the range of potential uses of that particular environment.

The proposed realignment of four E-2 squadrons, related support personnel and their family members, equipment and functions, would require the construction, modification or renovation of facilities to provide space for operational, training, maintenance, and personnel support. Construction of the proposed facilities would result in an irretrievable commitment of non-renewable resources such as building materials, construction vehicles, and equipment, and other resources. Therefore, the proposed action would constitute an irreversible or irretrievable commitment of non-renewable or depletable resources.

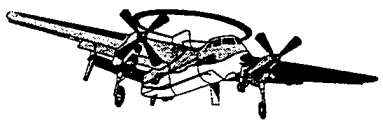
6.4 Unavoidable Adverse Effects

NEPA requires a discussion of any adverse environmental effects that cannot be avoided (40 CFR 1502.16). All potentially significant impacts of the proposed action would be mitigable to a less than significant level by the implementation of mitigation measures recommended in this document.

6.5 Relationship Between Short-term Uses and Long-term Productivity

NEPA requires a discussion of the relationship between short-term uses of the environment and the maintenance and enhancement of long-term productivity (40 CFR 1502.16). The environmental productivity of the three alternative bases considered for siting the E-2 aircraft has historically been related to their operation as naval air stations/facilities. The proposed realignment of four E-2 squadrons

would result in both short- and long-term environmental effects. Short-term effects are primarily related to construction activities. Temporary impacts would include construction-related traffic and emissions at all three bases. The proposed action's long-term benefit of providing jobs and housing at the three alternative bases, and its satisfaction of national defense requirements, would offset these environmental impacts.



7.0 References

7. REFERENCES 7-1

CHAPTER 7
REFERENCES

Acoustical Society of America. 1978. *American National Standard: Method for the Calculation of the Absorption of Sound by the Atmosphere.* ANSI S1.26-1978; ASA 23-1978. New York, New York.

Adams, Michael. 1997. Executive Director, Kings County Waste Management Agency, communication with Ed Bondoc, Tetra Tech, Inc. June 23, 1997.

Anderson, Sue. 1997. Seeley Union School District, written communication with Kim Herring, Tetra Tech, Inc. May 1997.

Apple, Rebecca McCorkle, Stephen Van Wormer, James Newland, and James H. Cleland. 1994. *Historic and Archeological Resources Protection Plan for the Naval Air Facility El Centro.* Prepared for the US Navy, Southwest Division Naval Facilities Engineering Command, San Diego, California. Prepared by KEA Environmental, Inc., San Diego, California.

Barry, T. M. and J. A. Reagan. 1978. *FHWA Highway Traffic Noise Prediction Model.* FHWA-RD-77-108. US Federal Highway Administration. Washington, DC.

Bates, Tom. 1997. Island Union School District, written communication with Kim Herring, Tetra Tech, Inc. May 8, 1997.

Bay, Manny. 1997a. Director, Environmental Division, NAF El Centro, written communication with Ed Bondoc, Tetra Tech, Inc. October 9, 1997.

_____. 1997b. Director, Environmental Division, NAF El Centro, written communication with Kevin Keck, Dowling Associates, Inc. October 8, 1997.

_____. 1997c. Director, Environmental Division, NAF El Centro, Public Works Environmental Division, written communication with Kris Kolassa, Tetra Tech, Inc. August 19, 1997 and October 24, 1997.

Bechtel. 1996. *Final Groundwater Monitoring Work Plan, Naval Air Facility El Centro, Imperial County, California.* Comprehensive Long-term Environmental Action Navy Clean II. Prepared for Southwest Division Naval Facilities Engineering Command. Bechtel National, Inc., San Diego, California.

Benson, P. E. 1989. CALINE4 - A Dispersion Model for Predicting Air Pollutant Concentrations Near Roadways. 1984 Final Report With 1986 and 1989 Revisions. (FHWA/CA/TL-84/15.) California Department of Transportation. Sacramento, California.

Bentley, Diane. 1997. Environmental Division, written communication with Ed Bondoc, Tetra Tech, Inc. October 7, 1997.

Billick, Ken. 1997. Assistant Security Officer, NAS Lemoore Security Department, written communication with Ed Bondoc, Tetra Tech, Inc. October 7, 1997.

Biosystems Analysis, Inc. 1994. *Life on the Edge: A Guide to California's Endangered Natural Resources, Wildlife.* Biosystem Books, Santa Cruz, California.

Bissell, Ronald M. 1991. *Cultural Resources Reconnaissance of Two Small Parcels on the Point Mugu Naval Air Station, Ventura County, California.* Report on file at the South Central Coastal Information Center UCLA Institute of Archaeology, Los Angeles, California.

Boner, John. 1997. Security Officer, Administration Department, NAWS Point Mugu, written communication with Ed Bondoc, Tetra Tech, Inc. October 6, 1997.

Boogaard, Jack. 1997. Central Union School District, Lemoore, written communication with Kim Herring, Tetra Tech, Inc. May 23, 1997.

Bunter, Walt. 1997. State Agronomist, USDA Natural Resource Conservation Service, written communication with Dean Amundson, Tetra Tech, Inc. October 28, 1997.

Bureau of Economic Analysis. 1996a. *Regional Economic Information for Fresno County, California,* [http://govinfo.kerr.orst.edu/cgi-bin/reis-list/05019.cac] (1990 and 1992 population and economic data). July 1996.

_____. 1996b. *Regional Economic Information for Fresno County, California*, [http://govinfo.kerr.orst.edu/cgi-bin/reis-list/05-019.cac] (1994 population and economic data). July, 1996.

_____. 1996c. *Regional Economic Information for Fresno County, California*, [http://govinfo.kerr.orst.edu/cgi-bin/reis-list/25-019.cac] (1990 and 1992 employment by sector). July, 1996.

_____. 1996d. *Regional Economic Information for Fresno County, California*, [http://govinfo.kerr.orst.edu/cgi-bin/reis-list/25-019.cac] (1994 employment by sector). July, 1996.

_____. 1996e. *Regional Economic Information for Kings County, California*, [http://govinfo.kerr.orst.edu/cgi-bin/reis-list/05-031.cac] (1990 and 1992 population and economic data). July, 1996.

_____. 1996f. *Regional Economic Information for Kings County, California*, [http://govinfo.kerr.orst.edu/cgi-bin/reis-list/05-031.cac] (1994 population and economic data). July, 1996.

_____. 1996g. *Regional Economic Information for Kings County, California*, [http://govinfo.kerr.orst.edu/cgi-bin/reis-list/25-031.cac] (1990 and 1992 employment by sector). July, 1996.

_____. 1996h. *Regional Economic Information for Kings County, California*, [http://govinfo.kerr.orst.edu/cgi-bin/reis-list/25-031.cac] (1994 employment by sector). July, 1996.

_____. 1996i. *Regional Economic Information for Imperial County, California*, [http://govinfo.kerr.orst.edu/cgi-bin/reis-list/05-025.cac] (1990 and 1992 population and economic data). July, 1996.

_____. 1996j. *Regional Economic Information for Imperial County, California*, [http://govinfo.kerr.orst.edu/cgi-bin/reis-list/05-025.cac] (1994 population and economic data). July, 1996.

_____. 1996k. *Regional Economic Information for Imperial County, California*, [http://govinfo.kerr.orst.edu/cgi-bin/reis-list/25-025.cac] (1990 and 1992 employment by sector). July, 1996.

_____. 1996l. *Regional Economic Information for Imperial County, California*, [http://govinfo.kerr.orst.edu/cgi-bin/reis-list/25-025.cac] (1994 employment by sector). July, 1996.

_____. 1996m. *Regional Economic Information for Ventura County, California*, [http://govinfo.kerr.orst.edu/cgi-bin/reis-list/05-111.cac] (1990 and 1992 population and economic data). July, 1996.

_____. 1996n. *Regional Economic Information for Ventura County, California*, [http://govinfo.kerr.orst.edu/cgi-bin/reis-list/05-111.cac] (1994 population and economic data). July, 1996.

_____. 1996o. *Regional Economic Information for Ventura County, California*, [http://govinfo.kerr.orst.edu/cgi-bin/reis-list/25-111.cac] (1990 and 1992 employment by sector). July, 1996.

_____. 1996p. *Regional Economic Information for Ventura County, California*, [http://govinfo.kerr.orst.edu/cgi-bin/reis-list/25-111.cac] (1994 employment by sector). July, 1996.

Bureau of Labor Statistics. 1996a. *Fresno County, California Labor Force, Civilian and Unemployment*, [http://govinfo.kerr.orst.edu/cgi-bin/usaco-list/20-019.cac] (1990, 1992, and 1994 labor force and unemployment data).

_____. 1996b. *Kings County, California Labor Force, Civilian and Unemployment*, [http://govinfo.kerr.orst.edu/cgi-bin/usaco-list/20-031.cac] (1990, 1992, and 1994 labor force and unemployment data).

_____. 1996c. *Imperial County, California Labor Force, Civilian and Unemployment*, [http://govinfo.kerr.orst.edu/cgi-bin/usaco-list/20-025.cac] (1990, 1992, and 1994 labor force and unemployment data).

_____. 1996d. *Ventura County, California Labor Force, Civilian and Unemployment*, [http://govinfo.kerr.orst.edu/cgi-bin/usaco-list/20-111.cac] (1990, 1992, and 1994 labor force and unemployment data).

California Air Resources Board. 1993a. *Methodology for Estimating Emissions From On-road Motor Vehicles. Volume I: EMFAC7F.* Draft Technical Support Division. Sacramento, California.

_____. 1993b. *Methodology for Estimating Emissions From On-road Motor Vehicles. Volume II: WEIGHT(E7FWT)* Draft. Technical Support Division. Sacramento, California.

_____. 1993c. *Methodology for Estimating Emissions From On-road Motor Vehicles. Volume III: BURDEN7F.* Draft. Technical Support Division. Sacramento, California.

_____. 1995. *California Air Quality Data for 1991 and 1995. Volumes XXIII-XXVII. Annual Summaries.* Aerometric Data Division. Sacramento, California.

_____. 1997a. *Maps and Tables of the Area Designations for State and National Ambient Air Quality Standards, and Expected Peak Day Concentrations and Designation Values.* Technical Support Division. Sacramento, California.

_____. 1997b. *Fact Sheet 39.*

California County Offices of Education. 1996a. Fresno County list of school districts [http://www.kern.org/fcmat/resources/state/coeinfo1.html].

_____. 1996b. Kings County and Imperial County lists of school districts [http://www.kern.org/fcmat/resources/state/coeinfo2.html].

_____. 1996c. Ventura County list of school districts [http://www.kern.org/fcmat/resources/state/coeinfo5.html].

California Department of Finance, Demographic Research Unit. 1990. *County Housing Official State Estimates*, [http://www.dof.ca.gov/html/demograp/e-5text.htm], (Housing stock and vacancy rates for all California counties).

California Department of Fish and Game. 1997. California Natural Diversity Data Base RAREFIND.

California Department of Water Resources. 1980. *Ground Water Basins in California, A Report to the Legislature in Response to Water Code Section 12924.* Bulletin 118-80.

_____. 1994. *California Water Plan Update*, Volume 1. Bulletin 160-93.

California State Controller. 1993a. *Counties of California Financial Transactions: Annual Report, 1990-91 Fiscal Year.* Sacramento, California.

_____. 1993b. *Financial Transactions Concerning School Districts of California: Annual Report, 1990-91 School Year.* Sacramento, California.

_____. 1995a. *Financial Transactions Concerning Cities of California: Annual Report, 1992-93 School Year.* Sacramento, California.

California State University (CSU), Fresno. 1990. *Natural Resources Management Plan, Naval Air Station Lemoore.*

_____. 1991. *Archaeological Assessment of Approximately 300 acres of Land on the NAS Lemoore, Kings County, California.* Report on file at California State University, Bakersfield, California.

Castro, Tim, 1997. *10-08-97 Fax, Annual Emissions From NAS Lemoore "Huffers" and TSE.* Sent by Tim Castro, Air Program Manager, NAS Lemoore.

_____. 1997. *Title V Emissions Inventory, Sep 96-Aug 97; TITVREP.XLS Printout.* Written communication from Tim Castro, Air Program Manager, NAS Lemoore. October 8, 1997.

Carden, Robert. 1997. Chief, City of Lemoore Police Department, communication with Ed Bondoc, Tetra Tech, Inc. July 30, 1997.

Casuga, Sam. 1997. NAWS Point Mugu, written communication with Kris Kolassa, Tetra Tech, Inc. November, 1997.

Cervantes, Sal. 1997. Director, Civil Engineering Group, NAWS Point Mugu, written communication with Ed Bondoc, Tetra Tech, Inc. October 9, 1997.

Chamberlain, C.W. 1997. Letter to Commander in Chief, US Pacific Fleet (N4641) (N465) regarding the effect of E-2 emissions at Point Mugu. April 3, 1997.

Chesmoore, Len. 1997. Fire Chief, King's County Fire Department, communication with Ed Bondoc, Tetra Tech, Inc. July 31, 1997.

Coffer, Lyn P. 1997. *F/A-18E/F Pilot Responses to Questionnaires and Factory Estimated GTC 36-200 APU Exhaust Emissions.* Written communication from Lyn P. Coffer, Aircraft Environmental Support Office (AESO), Naval Aviation Depot, North Island. San Diego, California. August 4, 1997.

Coltrane, John. 1997. Electrical Analyst, Imperial Irrigation District, communication with Ed Bondoc, Tetra Tech, Inc. July 8, 1997.

Conaway, John. 1997. Supervisor, Ventura Regional Sanitation District, Toland Road Landfill, written communication with Ed Bondoc, Tetra Tech, Inc. October 30, 1997.

Connor, Bill. 1997. Housing Manager, Point Mugu Housing Office, written communication with Felicia Bradfield, Tetra Tech, Inc. July 1, 1997.

Cowan, James P. 1994. *Handbook of Environmental Acoustics.* Van Nostrand Reinhold. New York, NY.

Crane, John. 1997. NAS Lemoore, written communication with Kris Kolassa, Tetra Tech, Inc. October 28, 1997.

Crosby, Florence. 1997. LCMDR, Director of Administration, NAS Lemoore Hospital, communication with Ed Bondoc, Tetra Tech, Inc. October 9, 1997.

Crown Economic Development Corporation. 1997. Kings County economic information contained in spreadsheets and fact sheets.

Cunningham, Louis. 1997. Oxnard Union High School District, written communication with Kim Herring, Tetra Tech, Inc. May 23, 1997.

Curiel, Ron. 1997. Solid Waste Specialist, Pollution Prevention Management Program, communication with Ed Bondoc, Tetra Tech, Inc. October 8, 1997.

David Taussig and Associates, Inc. 1997. Residential Development School Fee Justification Study for Ocean View School District. May 29, 1997.

Defense Base Closure and Realignment (BRAC) Commission. 1993. BRAC Commission Report.

Dobbe, Ken. 1997. Sergeant, Port Hueneme Police Department, communication with Ed Bondoc, Tetra Tech, Inc. August, 1, 1997.

Dolan, Christy C. V., and Rebecca Allen. 1996. *Archeological Investigations of Two Historic Sites for the Naval Air Facility El Centro*. Prepared for the US Navy, Southwest Division Naval Facilities Engineering Command, San Diego, California. Prepared by KEA Environmental, Inc., San Diego, California.

Dubois, William. 1997. Battalion Chief, City of El Centro Fire Department, communication with Ed Bondoc, Tetra Tech, Inc. August 4, 1997.

Economic Forecast Project. 1997. *The 1997 Ventura County Economic Outlook*, University of California at Santa Barbara.

Education Data Partnership. 1997. *EdFact: California's New Class Size Reduction Law*, [http://www.alameda-coe.k12.ca.us/ed-data/edfact_cls.html], March, 1997.

Farrand, John, (ed.) 1985 and updates. *The Audubon Society Master Guide to Birding*. Alfred A. Knopf.

Federal Aviation Administration (FAA). 1997. Communication with Chris Spada, Commander, Navy FAA Liaison, Federal Aviation Administration, Pacific Area. October 1997.

Finley, Cliff. 1997. Projects Engineer, City of Port Hueneme Public Works Department, Wastewater Treatment Facility, communication with Ed Bondoc, Tetra Tech, Inc. July 9, 1997.

Flowers, Dwight. 1997. Stormwater and Wastewater Specialist, Public Works Department, NAF El Centro, written communication with Ed Bondoc, Tetra Tech, Inc. October 21, 1997.

Fresno County. 1997a. Official Fresno County Web Site, [http://www.fresnocog.org/city/fresno_1.htm#fast facts] (Facts about Fresno County).

_____. 1997b. *Cultural Resource Inventory Report for the E-2 Aircraft Squadrons Realignment, NAS Lemoore, California.*

_____. 1997c. *Cultural Resources Inventory Report for the E-2 Aircraft Squadrons Realignment, NAWS Point Mugu, California.*

Friel, Patrick. 1997. NAF El Centro, Air Traffic Facility Officer, communication with Kim Herring, Tetra Tech, Inc. February 20, 1997.

Gallant, Joe. 1997. Base Pesticide Coordinator, NAF El Centro, written communication with Kris Kolassa, Tetra Tech, Inc. October 23, 1997.

Garcia, Debbie. 1997. NAWS Point Mugu, Deputy Air Operations Officer, written communication with John Bock, Tetra Tech, Inc. August 20, 1997.

Garcia, Frank. 1997. Wastewater Plant Operator, City of Holtville Public Works Department Wastewater Treatment Plant, communication with Ed Bondoc, Tetra Tech, Inc. July 9, 1997.

Gharabegian, A., K.M. Cosgrove, J. R. Pehrson, and. T. D. Trinh. 1985. "Forest Fire Fighters Noise Exposure," *Noise Control Engineering Journal* 25(3):96-111.

Gientke, Frank. 1997. General Manager, United Water Conservation District, communication with Ed Bondoc, Tetra Tech, Inc. July 8, 1997.

Giroux & Associates. 1996. Traffic Noise Analysis for E-2 Aircraft Squadrons Realignment. Prepared for Tetra Tech, Inc.

Graham. 1997. NAS Miramar, written communication with Kris Kolassa, Tetra Tech, Inc.

Graham, Henry. 1997. Acting Chief, City of Brawley Police Department, written communication with Ed Bondoc, Tetra Tech, Inc. August 4, 1997.

Granade, Steve. 1997a. Solid Waste Specialist, Environmental Division, NAWS Point Mugu, written communication with Kris Kolassa, Tetra Tech, Inc. July 30, 1997.

_____. 1997b. Solid Waste Specialist, Environmental Division, NAWS Point Mugu, written communication with Ed Bondoc, Tetra Tech, Inc. October 7, 1997.

Gronstedt, Carl. 1997. Fire Chief, City of Holtville Fire Department, communication with Ed Bondoc, Tetra Tech, Inc. August 4, 1997.

Hackett, Michael. 1997. Assistant Sheriff, Imperial County Sheriff's Department, communication with Ed Bondoc, Tetra Tech, Inc. August 4, 1997.

Hair, Michael. 1997. Fire Chief, NAWS Point Mugu Fire Department, written communication with Ed Bondoc, Tetra Tech, Inc. October 7, 1997.

Hale, William. 1997. Superintendent, Irrigation and Drainage, Imperial Irrigation District, communication with Ed Bondoc, Tetra Tech, Inc. June 23, 1997.

Haley, Clee. 1997. Utilities Superintendent, Public Works Department, City of Hanford, communication with Ed Bondoc, Tetra Tech, Inc. July 30, 1997.

Hanan, Doyle. 1992. *Status of the Pacific Harbor Seal Population on the Coast of California in 1992.* NOAA Fisheries/National Marine Fisheries Service, Southwest Region.

Hendriks, R. W. 1984. *California Vehicle Noise Emission Levels.* FHWA/CA/TL-84/13. California Department of Transportation, Office of Transportation Laboratory. Sacramento, CA.

Hickman, James C., ed. 1993. *The Jepson Manual: Higher Plants of California.* University of California Press, Berkeley and Los Angeles, California.

Hines, Randy. 1997. Wastewater Plant Supervisor City, El Centro Public Works Department Wastewater Facility, communication with Ed Bondoc, Tetra Tech, Inc. July 9, 1997.

Holland, Robert F. 1986. *Preliminary Descriptions of Terrestrial Natural Communities of California.* Natural Heritage Program, California Department of Fish and Game.

Hovde, Darrel. 1997. Public Works Coordinator, NAWS Point Mugu, communication with Ed Bondoc, Tetra Tech, Inc. July 23, 1997.

Hudson, Ron. 1997. Environmental Engineer, Environmental Division, NAWS Point Mugu, written communication with Kris Kolassa, Tetra Tech, Inc. July 18, 1997 and November, 1997.

Hunn, Bruce D. (ed). 1986. *Fundamentals of Building Energy Dynamics.* The MIT Press, Cambridge, Massachusetts.

Ieronimo, Tim. 1997. Fire Marshall, City of Hanford Fire Department, communication with Ed Bondoc, Tetra Tech, Inc. July 30, 1997.

Ike, Bill. 1997. Environmental Protection Specialist, NAS Lemoore, written communication with Kris Kolassa, Tetra Tech, Inc. November, 1997.

Imperial County. 1996. *Imperial County: A Geothermal Energy Oasis in California.* Division of Community Economic Development.

Ingles, Lloyd G. 1965. *Mammals of the Pacific States.* Stanford University Press.

Institute of Transportation Engineers. 1991. *Trip Generation: An Informational Report.* 5th edition. (Publication No. IR-016C.) Washington, DC.

Iwanaga Seidel Associates. 1987. *Natural Resource Management Plan, Naval Air Facility El Centro and Target Ranges R-2510 and R-2512.*

Jones, J.K., Jr., R.S. Hoffmann, D.W. Rice et al. 1992. Revised Checklist of North American Mammals North of Mexico. Occasional Papers Mus., Texas Tech University. 146:1-23.

Jordan, John. 1997. Chief, City of Holtville Police Department, communication with Ed Bondoc, Tetra Tech, Inc. August 4, 1997.

Kadi, William. 1997. Bowie, Arneson, Kadi, Wiles & Giannone, representing the Ocean View School District, written communication with Kim Herring, Tetra Tech, Inc. May 29, 1997.

Kear, Jerald. 1997. Energy Specialist, Public Works Department, NAF El Centro, communication with Ed Bondoc, Tetra Tech, Inc. August 5 and 7, 1997.

Keeney, T., D. Jaques, and C. Strong. 1996. *Brown Pelican Roosting Patterns and Response to Disturbance at Mugu Lagoon and Other Nonbreeding Sites in the Southern California Bight.* Technical Report No. 54. US Department of the Interior, National Biological Survey, Cooperative Park Studies Unit, University of Arizona.

Keeney, Tom. 1997. Natural Resource Manager, NAWS Point Mugu, written communication with George Redpath, Tetra Tech, Inc. July 30, 1997.

Landis, William. 1997. Assistant Chief, King's County Sheriff's Department, communication with Ed Bondoc, Tetra Tech, Inc. August 13, 1997.

Lau, John. 1997. Controller, Imperial County Sanitation, communication with Ed Bondoc, Tetra Tech, Inc. June 23, 1997.

Lavery, Michael. 1997. Battalion Chief, City of Ventura Fire Department, written communication with Ed Bondo , Tetra Tech, Inc. October 31, 1997.

Le, Ha. 1997. Environmental Engineer, Environmental Division, NAWS Point Mugu, written communication with Kris Kolassa, Tetra Tech, Inc. July 14 and August 18, 1997.

Leonard, Dale. 1997. Director of Branch Clinic Operations and Naval Medical Centers, US Navy, communication with Ed Bondoc, Tetra Tech, Inc. August 7, 1997.

Linscott, Law & Greenspan. 1997. Traffic Impact Analysis - E-2 Squadron Realignment August 20, 1996. Revised April 2, 1997.

Loeltz, O.J., B. Ireland, J.H. Robinson, and F.H. Olmstead. 1975. *Geohydrologic Reconnaissance of the Imperial Valley, California.* US Geological Survey Professional Paper 486-K.

Lowry, Mark. 1997. Southwest Fisheries Science Center, written communication with Ann Zoidis, Tetra Tech, Inc.

Machado, Dee. 1997. Fire Chief, City of Lemoore Fire Department, communication with Ed Bondoc, Tetra Tech, Inc. July 30, 1997.

Madison, Captain P.T. 1996. Memo regarding relocation requirements for NAF El Centro, California. February 28, 1996.

Martinez, Marina. 1997. Hanford Joint Union High School District. Written communication with Kim Herring, Tetra Tech, Inc. May 13, 1997.

Mayer, Carol. 1996. Lemoore Union School District, communication with Kim Herring, Tetra Tech, Inc.

Mikesell, Stephen. 1996. *Report on National Register Eligibility: Building 55, Naval Air Weapons Station Point Mugu, Ventura County, California.* On file, NAWS Point Mugu, California.

Milliken, Randall, and Stephen Mikesell. 1997. *Naval Air Station, Lemoore Historic and Archeological Resources Protection (HARP) Plan for the Years 1997-2002.* Prepared for Engineering Field Activity, West, Naval Facilities Engineering Command, San Bruno, California. Prepared by Far Western Anthropological Research Group, Inc., Davis, California, and JRP Historical Consulting Services, Davis, California. February, 1997.

Moise, Mark. 1997. Director of Operations, City of Oxnard Public Works Department, Wastewater Treatment Facility, written communication with Ed Bondoc, Tetra Tech, Inc. October 30, 1997.

Mora, Sue. 1997a. Solid Waste Specialist, Environmental Management Division, NAS Lemoore, communication with Ed Bondoc, Tetra Tech, Inc. August 14 and 19, 1997.

_____. 1997b. Solid Waste Specialist, Environmental Management Division, NAS Lemoore, written communication with Kris Kolassa, Tetra Tech, Inc. October 29, 1997.

Morales, Jim. 1997. Lieutenant, Director, Environmental Materials Management Division, NAWS Point Mugu, written communication with Ed Bondoc, Tetra Tech, Inc. October 8, 1997.

Morton, P.K. 1997. *Geology and Mineral Resources of Imperial County, California.* California Division of Mines and Geology, County Report No. 7.

Murphy, Rodney. 1997. Director of Airports, County of Ventura Department of Airports, written communication with John Bock, Tetra Tech, Inc. August 21, 1997.

Nippins, Fred. 1997. City of Imperial Fire Department, written communication with Ed Bondoc, Tetra Tech, Inc. August 4, 1997.

Nishihara, Ken. 1997. Watch Commander, City of Oxnard Police Department, communication with Ed Bondoc, Tetra Tech, Inc. July 31, 1997.

Nokes, W. A., and P. E. Benson. 1985. *Development of Worst Case Meteorology Criteria.* (FHWA/CA/TL-85/14.) California Department of Transportation. Sacramento, California.

Norris, Russ. 1997. NAWS Point Mugu, Public Works Department, written communication with Ted Anasis, Tetra Tech, Inc. February 25, 1997.

O'Donnell, William. 1997. NAS Lemoore, written communication with Ed Bondoc, Tetra Tech, Inc. October 20, 1997.

Office of Environmental Quality. 1983. *Class III Archeological Survey, San Luis Drain and Alternatives, Central Valley Project, San Luis Unit, California.* Limited distribution report prepared by the Office of Environmental Quality, Mid-Pacific Region, Bureau of Reclamation, Sacramento, California. Manuscript on file at the Southern San Joaquin Valley Information Center, Bakersfield, California. Excerpts on file in NAS Lemoore HARP Data Repository.

Onuf, Christopher. 1987. *The Ecology of Mugu Lagoon, California. An Estuarine Profile.* Biological Report 85 (7.15). National Wetlands Research Center, US Fish and Wildlife Service.

Ormsbee, Katherine. 1997. Administration Officer, NAS Lemoore Hospital, communication with Ed Bondoc, Tetra Tech, Inc. August 13, 1997.

Parisi, Tony. 1997a. NAWS Point Mugu, Public Works Officer, written communication with Kim Herring, Tetra Tech, Inc. March 11, 1997.

_____. 1997b. NAWS Point Mugu, Public Works Officer, written communication with Dean Amundson, Tetra Tech, Inc. October 23, 1997.

Parker, P. L., and T. F. King. 1992. *Guidelines for Evaluating and Documenting Traditional Cultural Properties.* National Register Bulletin No. 38. US Department of the Interior, National Park Service, Interagency Resources Division.

Parks, Keith. 1997. Captain, Ventura County Sheriff's Department, written communication with Ed Bondoc, Tetra Tech, Inc. October 30, 1997.

Passanisi, Jim. 1997. Water Superintendent, Port Hueneme Water Agency, written communication with Ed Bondoc, Tetra Tech, Inc. October 29, 1997.

Peak, M., and N. Neuenschwander. 1989. *Cultural Resources Survey and Clearance Report for the Proposed Oxnard Terminal to Triunfo Pass Earth Station Fiber Optic Communication Route Ventura and Los Angeles Counties.* Report on file at the South Central Coastal Information Center, UCLA Institute of Archaeology, Los Angeles, California.

Pereira, Richard. 1997. Superintendent, City of Lemoore Public Works Department, Sewer and Stormdrains Division, communication with Ed Bondoc, Tetra Tech, Inc. July 9 and August 13, 1997.

Perry, Steve. 1997. Facility Manager, Del Norte Regional Recycling and Transfer Station, communication with Ed Bondoc, Tetra Tech, Inc. June 23, 1997.

Poland, J.F., and R.E. Evenson. 1966. *Hydrogeology and Land Subsidence, Great Central Valley, California.* In E.H. Bailey, ed., *Geology of Northern California.* California Division of Mines and Geology, Bulletin 190.

Preciado, Arnold. 1997. Central Union High School District, Lemoore, written communication with Kim Herring, Tetra Tech, Inc. May 7, 1997.

Raiskup, Scott. 1997. Electrical Engineer, Pacific Gas and Electric, Co., communication with Ed Bondoc, Tetra Tech, Inc. August 18, 1997.

Rathbun, Jim. 1997. Occupational Safety and Health Department, NAS Lemoore, written communication with Kris Kolassa, Tetra Tech, Inc. November, 1997.

Rees, John. 1997. Federal Account Manager, Southern California Gas Company, communication with Ed Bondoc, Tetra Tech, Inc. July 8, 1997.

Reyes, Luis. 1997. Environmental Engineer, Naval Facilities Engineering Service Center, Port Hueneme, written communication with Kris Kolassa, Tetra Tech, Inc. August 21, 1997.

Richwine, Barbara. 1997. Lemoore Union Elementary School District, Lemoore, written communication with Kim Herring, Tetra Tech, Inc. May 9, 1997.

Rodriguez, Richard. 1997. Fire Inspector, City of Oxnard Fire Department, written communication with Ed Bondoc, Tetra Tech, Inc. October 30, 1997.

Rodriguez, Salvador. 1997. HMCS Senior Chief, NAF El Centro Medical and Dental Clinic, NAF El Centro, written communication with Ed Bondoc, Tetra Tech, Inc. October 9, 1997.

Roper, Robert. 1997. Fire Chief, Ventura County Fire Department, communication with Ed Bondoc, Tetra Tech, Inc. July 31, 1997.

Rosenberg, Ann. 1997. Southwest Fisheries Science Center, National Marine Fisheries Service, written communication with Ann Zoidis, Tetra Tech, Inc.

Rustad, Duane. 1997. Fire Chief, NAS Lemoore Fire Department, NAS Lemoore, communication with Ed Bondoc, Tetra Tech, Inc. August 12, 1997.

Saiki, Michael. 1994. *Survey of Fishes and Selected Physicochemical Variables in Mugu Lagoon and Its Tributaries, September-November 1993.* US National Biological Survey, Midwest Science Center, Field Research Station.

San Joaquin Valley Unified Air Pollution Control District. 1995. *Draft Revised Post 1996 Rate of Progress Plan.* Fresno, California.

Sanchez, Mark. 1997. Assistant Fire Chief, County of Ventura Fire Department, communication with Ed Bondoc, Tetra Tech, Inc. July 31, 1997.

Schwartz, Steve. 1992. *Historic Properties Assessment, Installation Restoration Program, Remedial Investigation/Feasibility Study, Naval Air Weapons Station, Point Mugu.* Naval Air Weapons Station, Point Mugu. September.

_____. 1997. Station Archaeologist, NAWS Point Mugu, written communication with Evelyn Chandler, Tetra Tech, Inc. October 8, 1997.

Schwartz, Stephen J. 1991. *Physical Security Improvements Project P-063 Historic Properties Assessment.* On file at NAWS Point Mugu, California.

Scott. 1997. Administrative Sergeant, City of Hanford Police Department, communication with Ed Bondoc, Tetra Tech, Inc. July 31, 1997.

Sewester, Ed, Lt. 1997a. Public Works Officer, NAF El Centro, written communication with Ed Bondoc, Tetra Tech, Inc. October 16, 1997.

_____. 1997b. Public Works Officer, NAF El Centro, written communication with Kris Kolassa, Tetra Tech, Inc. November, 1997.

Shide, Dan. 1997a. Hazardous Waste Program Manager, Environmental Division, NAWS Point Mugu, written communication with Ted Anasis, Tetra Tech, Inc. February 11 and March 7, 1997.

_____. 1997b. Hazardous Waste Program Manager, Environmental Division, NAWS Point Mugu, written communication with Kris Kolassa, Tetra Tech, Inc. July 11, 1997 and November 1997.

Simas, Liz. 1997. Hanford Elementary School District, Hanford, written communication with Kim Herring, Tetra Tech, Inc. May 23, 1997.

Simmons, Richard. 1997. Sanitation Engineer, City of Ventura Public Works Department, Wastewater Treatment Plant, communication with Ed Bondoc, Tetra Tech, Inc. July 9, 1997.

Sisneroz, Robert. 1997. Waste Disposal Manager, City of Hanford Public Works Department, communication with Ed Bondoc, Tetra Tech, Inc. July 9, 1997.

SITES. 1997a. NAS North Island Site 0580.

_____. 1997b. NAS Lemoore Site 0465.

_____. 1997c. NAWS Point Mugu Site 0595.

Skinner, M.W., and B.M. Pavlik, eds. 1994. *Inventory of Rare and Endangered Vascular Plants of California.* California Native Plant Society Special Publication No. 1 (Fifth Edition). Sacramento, California.

Smith, Alvin D. 1997. Chief Operator, City of Brawley Public Works Department, Wastewater Treatment Plant, communication with Ed Bondoc, Tetra Tech, Inc. July 9, 1997.

Smith, Bill. 1997a. NAS Lemoore, written communication with Ted Anasis, Tetra Tech, Inc. February 11, 1997.

_____. 1997b. NAS Lemoore, written communication with Kim Herring, Tetra Tech, Inc. February 12, 1997.

_____. 1997c. NAS Lemoore, written communication with Kris Kolassa, Tetra Tech, Inc. July 15, 1997 and October 29, 1997.

Sparlin, David. 1997. NAS Lemoore, Public Works Department, communication with Alice Chen, Dowling Associates.

Stammreich, John. 1997. Security Officer, NAF El Centro Security Department, communication with Ed Bondoc, Tetra Tech, Inc. October 8, 1997.

Stebbins, Robert. 1985. *A Field Guide to Western Reptiles and Amphibians.* Houghton, Mifflin, and Company.

Stewart, Jerry. 1997. Utilities Specialist, NAS Lemoore, communication with Ed Bondoc, Tetra Tech, Inc. July 7 and August 18, 1997

Sutton, Mark Q. 1989. *An Archaeological Survey of the Lemoore Oil Pipeline Route, Fresno and Kings Counties, California.* Limited distribution report prepared for Entrix, Inc., of Walnut Creek, California. Prepared by the Cultural Resource Facility, California State University, Bakersfield. Manuscript on file in NAS Lemoore HARP Data Repository.

Swanson, Mark T. 1994. *From Spanish Land Grants to World War II: An Overview of Historic Resources at Naval Air Weapons Station Point Mugu, California.* Prepared for Naval Air Weapons Station Point Mugu and the US Army Corps of Engineers Los Angeles District. Prepared by Statistical Research Tucson, Arizona.

Taylor, Everett. 1997. El Centro School District. Written communication with Kim Herring, Tetra Tech, Inc. May 14, 1997.

Taylor, Michael J. H. (ed.). 1993. *Jane's Encyclopedia of Aviation.* Crescent Books. New York, NY.

Tennessen, David. 1997. Captain, Camarillo Police Department, communication with Ed Bondoc, Tetra Tech, Inc. August 1, 1997.

TJKM. 1994. *Traffic Study for the Lemoore NAS Base Realignment.*

Tetra Tech, Inc. 1996. *Wetland Identification and Classification Report for NAS Lemoore.*

The Business Journal. 1997. *Book of Lists: A Supplement to the Business Journal.* Gordon M. Webster, Jr., Fresno, California.

Thompson, Lt. Steve. 1997a. 1997. *Memo re: Best Estimates for Time-In-Mode Values, F/A-18E/F Aircraft.* Sent by Lt. Steven Thompson, F/A-18E/F Fleet Introduction Team, NAS Lemoore. July 18, 1997.

Transportation Research Board. 1994. Highway Capacity Manual, Special Report No. 209, Third Edition, Washington, D.C.

Tousseau, Dave. 1997. NAF El Centro, written communication with Kris Kolassa, Tetra Tech, Inc. February 18, 1997 and November 1997.

Townsel, Jim. 1997. LCMDR, Investigative Division, City of El Centro Police Department, written communication with Ed Bondoc, Tetra Tech, Inc. August 4, 1997.

Tracy, Michael. 1997. Acting Chief, City of Ventura Police Department, communication with Ed Bondoc, Tetra Tech, Inc. August 13, 1997.

US Army Corps of Engineers (COE). 1981. *Special Flood Hazard Study, Point Mugu Missile Test Center.*

US Bureau of the Census. 1994. *County and City Data Book: 1994.* Washington, DC, US Government Printing Office.

US Department of Agriculture. 1981. *Soil Survey of Imperial County, California. Imperial Valley Area.* Soil Conservation Service.

US Department of Agriculture, Forest Service. 1973. *Visual Resource Management Guides.* Washington DC.

US Department of Education. 1971. *Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances.* NTID300.1. Prepared by Bolt, Beranek and Newman. US Government Printing Office. Washington, DC.

_____. 1995. Impact Aid: Maintenance and Operations [http://www.ed.gov/pubs/Biennial/109.html]. Office of the Undersecretary, Washington, D.C.

_____. 1995. *The Probability of Sea Level Rise.*

US Environmental Protection Agency. 1971. *Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances.* NTID300.1. Prepared by Bolt, Beranek and Newman. US Government Printing Office. Washington, D.C.

_____. 1985. *Compilation of Air Pollutant Emission Factors. Volume II: Mobile Sources* 4th Edition. With Supplement A (1991). (AP-42.) Office of Mobile Sources. Ann Arbor, Michigan.

_____. 1991. *Nonroad Engine and Vehicle Emission Study - Report* (21A-2001.) Office of Air Radiation. Washington, DC. [PB9212696 from National Technical Information Service, Springfield, Virginia].

_____. 1992. *Procedures for Emission Inventory Preparation. Volume IV: Mobile Sources* (EPA-450/4-81-026d [Revised].) Office of Air Quality Planning and Standards. Research Triangle Park, North Carolina.

_____. 1995. *Compilation of Air Pollutant Emission Factors. Volume I: Stationary Point and Area Sources* 5th Edition. (AP-42.) Office of Air Quality Planning and Standards. Research Triangle Park, North Carolina.

US Fish and Wildlife Service, Diane Noda, Field Supervisor. 1997a. Letter response to an inquiry by Kelly K. Knight of the Naval Facilities Engineering Command, Southwest Division, regarding special status species potentially occurring in the area of Point Mugu Naval Air Weapons Center and San Nicolas Island, Ventura County, California.

US Fish and Wildlife Service, Wayne White, Field Supervisor. 1997b. Letter response to an inquiry by Kelly K. Knight of the Naval Facilities

Engineering Command, Southwest Division, regarding special status species potentially occurring in the area of NAS Lemoore, Fresno and Kings County, California.

US Fish and Wildlife Service, Sandy Vissman. 1997c. Preliminary list of species sent in response to an inquiry by Kelly K. Knight of the Naval Facilities Engineering Command, Southwest Division, regarding special status species potentially occurring in the area of NAF El Centro, El Centro, California.

US Navy. 1983. *Base Exterior Architecture Plan, NAWS Point Mugu, California,* Western Division, Naval Facilities Engineering Command.

_____. 1984. *Catalog of Noise Levels from Navy Aircraft.* AESO Report No. 313-01-84. Aircraft Environmental Support Office, Naval Air Station San Diego. San Diego, California.

_____. 1986. *Master Plan: Pacific Missile Test Center Point Mugu, California,* Western Division, Naval Facilities Engineering Command.

_____. 1987. *Natural Resource Management Plan NAF El Centro and Target Ranges R-25 and R-2512.* Southwest Division, Naval Facilities Engineering Command.

_____. 1988a. *Master Plan: Naval Air Facility El Centro, California.* Western Division, Naval Facilities Engineering Command.

_____. 1988b. *Base Exterior Architecture Plan, NAF El Centro, California.* Western Division, Naval Facilities Engineering Command.

_____. 1989. *Base Exterior Architecture Plan, NAS Lemoore, California.* Western Division, Naval Facilities Engineering Command.

_____. 1990a. *Draft Environmental Impact Statement for Proposed Closure of the NAF El Centro, California.* Southwestern Division, Naval Facilities Engineering Command.

_____. 1990b. *AICUZ: Air Installation Compatible Use Zones Study, NAF El Centro, California.* Western Division, Naval Facilities Engineering Command.

_____. 1990c. *Natural Resources Management Plan Naval Air Station Lemoore, Lemoore, California.* Western Division, Naval Facilities Engineering Command.

_____. 1990d. *Summary Tables of Gaseous and Particulate Emissions from Aircraft Engines* (AESO Report No. 6-90). Aircraft Environmental Support Office (AESO), Naval Aviation Depot - North Island. San Diego, California.

_____. 1992a. *AICUZ: Air Installation Compatible Use Zone Study, NAWS Point Mugu.* Western Division, Naval Facilities Engineering Command.

_____. 1992b. *Master Plan, NAS Lemoore, California.* Western Division, Naval Facilities Engineering Command.

_____. 1993. *AICUZ: Air Installation Compatible Use Zones Study, NAS Lemoore, California.* Western Division, Naval Facilities Engineering Command.

_____. 1994a. *Family Housing Market Analysis for NAS Lemoore, California.* Western Division, Naval Facilities Engineering Command.

_____. 1994b. *Draft: Historic and Archeological Resources Protection Plan for Naval Air Facility El Centro.* Southwest Division, Naval Facilities Engineering Command.

_____. 1994c. *Draft: Archeological and Architectural Survey for Naval Air Facility El Centro.* Southwest Division, Naval Facilities Engineering Command.

_____. 1994d. *FEIS: Base Realignment of Naval Air Station Lemoore, California - Volumes I, II & III.* Western Division, Naval Facilities Engineering Command. Prepared by Uribe and Associates.

_____. 1994e. *Utility Upgrades P-157 T Electric and Water Supply System Upgrade, NAS Lemoore.* Western Division, Naval Facilities Engineering Command.

_____. 1994f. *Utility Upgrades, P-162 T Gas, Industrial Waste, Phones, Sewer, Storm Drain, Hazardous Waste Storage Systems, and Contaminated Fuel Storage Upgrade, NAS Lemoore.* Western Division, Naval Facilities Engineering Command.

_____. 1994g. *Wyle Research Report WR 94-17: Aircraft Noise Study for NAS Lemoore, California.* Naval Facilities Engineering Command.

_____. 1994h. *Environmental and Natural Resources Program Manual.* OPNAVINST 5090.1B. Office of the Chief of Naval Operations.

_____. 1995a. *Oil and Hazardous Substance Prevention, Control, and Countermeasure Plan for Naval Air Weapons Station, Point Mugu, California.* NAWS Point Mugu, California.

_____. 1995b. *Underground Storage Tank Management Plan, Naval Air Facility El Centro, California.* Prepared by Harding Lawson Associates.

_____. 1996a. *Airborne Early Warning Wing, US Pacific Fleet Relocation - NAWS Point Mugu Issues.* NAWS Point Mugu, California.

_____. 1996b. *NAWS Point Mugu Natural Resources Summary Report.* NAWS Point Mugu, California.

_____. 1996c. *Hazardous Waste Management Plan.* NAWS Point Mugu, California.

_____. 1997a. *Hazardous Material Control and Management.* NAWS Point Mugu, California.

_____. 1997b. Fact Finder '97, Naval Air Weapons Station, Point Mugu, California, Public Affairs Office, Code 750000E.

_____. 1997c. *Draft Integrated Natural Resources Management Plan: Naval Air Facility, El Centro and Target Ranges 2510 and 2512.* Southwest Division.

_____. 1997d. *Gaseous and Particulate Emission Indexes for the F414 Turbofan Engine - Draft - Revised* (AESO Memo Report No. 9725A). Aircraft Environmental Support Office (AESO), Naval Aviation Depot - North Island. San Diego, CA.

US Public Health Service. 1989. *Draft Toxicological Profile for Radon.* Prepared by Clement Associates, Inc. in collaboration with the US Environmental Protection Agency.

Ventura County. 1988, amended 1994. *Ventura County General Plan, Public Facilities and Services Appendix.*

Wall, Louis S. 1994a. Letter of July 14, 1994 from Louis S. Wall, Cultural Resources Coordinator, Environmental Planning Branch, Western Division, Naval Engineering Facilities Command to Tule River Indian Tribe, Porterville, California. Copies also submitted to Santa Rosa Indian Community, Central Valley and Mountain Reinterment Association, Big Sandy Rancheria of Mono Indians, Cold Springs Rancheria of Mono Indians, Table Mountain Rancheria, and the California Office of Historic Preservation.

_____. 1994b. Letter of March 30, 1994 from Louis S. Wall, Cultural Resources Coordinator, Environmental Planning Branch, Western Division, Naval Engineering Facilities Command to Cherilyn Widell, California State Historic Preservation Officer.

_____. 1997. Cultural Resources Coordinator, Environmental Planning Branch, Western Division, written communication with Evelyn Chandler, Tetra Tech, Inc. October 9, 1997.

Walter, Peter. 1997. NAS Miramar, written communication with Kris Kolassa, Tetra Tech, Inc. October 23, 1997.

Watson, Jerry. 1997. Director, City of Avenal Public Works Department, communication with Ed Bondoc, Tetra Tech, Inc. June 23, 1997.

Weast, R. C. (ed.). 1980. "Absorption and Velocity of Sound in Still Air" and "Velocity of Sound in Dry Air." Pp. E-49 - E-54 in *CRC Handbook of Chemistry and Physics*. 61st Edition. CRC Press. Boca Raton, FL.

WeatherDisc Associates. 1990a. *US Monthly Normals of Temperature and Precipitation (TD-9640). World WeatherDisc Version 2.1* WeatherDisc Associates, Inc., Seattle, Washington.

_____. 1990b. *Worldwide Airfield Summaries (TD-9647). World WeatherDisc Version 2.1* WeatherDisc Associates, Inc., Seattle, Washington.

Wee, Stephen R. and David S. Byrd. 1997. *The Navy's Pacific Guided Missile Sea Range, 1946-1991: Historic Context for Cold War-era Buildings and Structures at Naval Air Weapons Station (NAWS), Point Mugu, Ventura County, California; Draft*. Prepared for Naval Air Weapons Station, Point Mugu, California and the US Army Corps of Engineers, Los Angeles District. Prepared by JRP Historical Consulting Services, Davis, California.

Weller, Paul. 1997. Utilities Specialist, Public Works Department, NAF El Centro, communication with Ed Bondoc, Tetra Tech, Inc. August 5, 1997.

Westdike, Robert. 1997. Facility Engineer, City of Camarillo Public Works Department, Wastewater Treatment Facility, communication with Ed Bondoc, Tetra Tech, Inc. July 9, 1997.

Westlands Water District (Westlands), David Orth. 1996. Letter to Ms. Kelly Knight, US Navy Southwest Division, commenting on the status of Westlands Water District's ability to provide additional water to NAS Lemoore.

Wiggins, Diane. 1997. Federal Account Manager, Southern California Edison, communication with Ed Bondoc, Tetra Tech, Inc. July 9, 1997.

Willis, Marcie. 1997. Medical Chief, NAWS Point Mugu, communication with Ed Bondoc, Tetra Tech, Inc. August 7 and 15, 1997.

Winkelmann, Rainer. 1997. Assistant Weapons Officer, Weapons Department, NAS Lemoore, written communication with Kris Kolassa, Tetra Tech, Inc. October 23, 1997.

Woodward-Clyde. 1993. *Class III Cultural Resources Inventory for the Mojave Northward Expansion Project.* Limited distribution report prepared for Mojave Pipeline Company, Bakersfield, California. Prepared by Woodward-Clyde Consultants, Oakland, California. Manuscript on file at the Southern San Joaquin Valley Information Center, Bakersfield, California. Excerpts on file in NAS Lemoore HARP Data Repository.

Yohe, Robert 1991. *An Archaeological Assessment of Approximately 300 Acres of Land on the US Naval Air Station, Lemoore, Kings County, California.* Limited distribution report prepared for NAS Lemoore. Prepared by the Cultural Resource Facility, California State University, Bakersfield. Manuscript on file in NAS Lemoore HARP Data Repository.

Zendejas, Jesse. 1997. Fire Captain, City of Brawley Fire Department, communication with Ed Bondoc, Tetra Tech, Inc. August 4, 1997.

Zurn, Ken. 1997. Fire Chief, NAF El Centro Fire Department, communication with Ed Bondoc, Tetra Tech, Inc. July 30, 1997.

8.0 Consultation and Coordination

8. CONSULTATION AND COORDINATION 8-1

8.1 Agencies and Representatives Contacted 8-1
8.2 Scoping 8-7

CHAPTER 8
CONSULTATION AND COORDINATION

8.1 AGENCIES AND REPRESENTATIVES CONTACTED

The military representatives and agencies that were contacted during the course of preparation of this DEIS are listed below.

Military

NAWS Point Mugu

John Boner, Security Officer, Administration Department
Thomas Carr
Sam Casuga
Sal Cervantes, Director, Civil Engineering Group
Ron Dow, Environmental Division
Patrick Friel, Air Traffic Facility Officer
Debbie Garcia, Deputy Air Operations Officer
Steve Granade, Solid Waste Specialist, Environmental Division
Dick Hand, Air Operations Duty Officer
Michael Hair, Fire Chief, Fire Department
Julie Harris
Kathy Healy
Darrell Hovde, Public Works Coordinator
Ron Hudson, Environmental Engineer
Tom Keeney, Ecologist
Jan Larson, Biologist
Michael Lavery, Battalion Chief, City of Ventura Fire Department
Ha Le, Environmental Engineer
Lt. Jim Morales, Director, Environmental Materials Management Division
Ken Nishihara, Watch Commander, City of Oxnard Police Department
Russ Norris, Public Works Department
Captain Tony Parisi, Public Works Officer
Manny D. Patacsil, Public Works Environmental Division
H. V. Pearlman, LCDR

Richard Rodriguez, Fire Inspector, City of Oxnard Fire Department
Robert Roper, Fire Chief, Ventura County Fire Department
Mark Sanchez, Assistant Fire Chief, County of Ventura Fire Department
Dan Shide, Environmental Division
Captain David Tennessen, Camarillo Police Department
Dave Toussean
Lt. Jack Turner
Marcie Willis, Medical Chief

NAS Lemoore

Ken Billick, Assistant Security Officer, Security Department
Lt. Bob Craig, Air Traffic Control Facility Officer
John Crane
Florence Crosby, LCDR, Director of Administration, Hospital
Bill Ike, Environmental Protection Specialist
Teresa Mitchell
Sue Mora, Environmental Protection Specialist, Environmental Management Division
William O'Donnell
Katherine Ormsbee, Administration Officer, Hospital
Jim Rathbun, Occupational Safety and Health Department
Terry Rayback
L.N. Reith, Security Department
Duane Rustad, Fire Chief, Fire Department
Bill Smith
David Sparlin, Public Works Department
Jerry Stewart, Utilities Engineer
Jim Venturino, Environmental Protection Specialist
Rainer Winkelmann, Assistant Weapons Officer

NAF El Centro

Manny Bay, Director, Environmental Division
Lt. John Cameron, Air Operations Duty Officer
Stephen A. Covell, Public Works Environmental Division
Ron Curiel, Solid Waste Specialist, Pollution Prevention Management Program
Shawn Fitzgerald, HMCS Senior Chief, Medical and Dental Clinic
Dwight Flowers, Stormwater and Wastewater Specialist, Public Works Department
Patrick Friel, Air Traffic Facility Officer
Joe Gallant, Base Pesticide Coordinator
David Godsey, Water and Wastewater Plant Operator
Julie Harris, Morale, Welfare, and Recreation Director
Jerald Kear, Energy Specialist, Public Works Department
Dale Leonard, Director of Branch Clinic Operations/Naval Medical Centers
Manny Patacsil, Public Works Planning Division

John Stammreich, Security Officer, Security Department
Dave Tousseau, Public Works Environmental Division
Lt. Sewester, Public Works Officer
Paul Weller, Utilities Specialist, Public Works Department
Ken Zurn, Fire Chief, Fire Department

NAS Miramar
Commander Peter Walter
Chief Graham

NCBC Port Hueneme
Luis Reyes

Federal Agencies

Bureau of Indian Affairs
Tribal Listings

National Marine Fisheries Service
Mark Lowry, Southwest Fisheries Science Center
Ann Rosenberg, Southwest Fisheries Science Center

US Army Corps of Engineers
Lisa Mangione, Los Angeles District

US Federal Aviation Administration
Chris Spada, Commander, Navy FAA Liaison, Pacific Area

US Fish and Wildlife Service
John Bradley, Branch Chief, Carlsbad Field Office
Wayne White, Field Supervisor, Sacramento Field Office
Diane Noda, Field Supervisor, Ventura Field Office

US Environmental Protection Agency
Thomas Yocom, Regional 404 Permit Coordinator

State Agencies

California Department of Fish and Game
Donna Daniels, Region 4

California Historic Resources Inventory
Phyllisa J. Eisentraut, Coordinator

Local Agencies

Central Union High School District, El Centro
Marianne Terriquez

Central Union School District, Lemoore
Marilyn Lenhardt

City of Avenal
Jerry Watson, Public Works Department

City of Brawley
Jesse Zendejas, Fire Captain, Fire Department
Henry Graham, Acting Chief, Police Department
Alvin Smith, Public Works Department

City of Camarillo
Robert Westdike, Public Works Department

City of El Centro
William Dubois, Battalion Chief, Fire Department
Jim Townsel, LCMDR, Investigative Division, Police Department
Randy Hines, Public Works Department

City of Hanford
Tim Ieronimo, Fire Marshall, Fire Department
John Stowe, Planning Department
Robert Sisneroz, Public Works Department
Scott, Administrative Sergeant, Police Department
Clee Haley, Utilities Superintendent, Public Works Department

City of Holtville
Carl Gronstedt, Fire Chief, Fire Department
John Jordan, Chief, Police Department
Frank Garcia, Public Works Department

City of Imperial
Fred Nippins, Fire Department

City of Lemoore
Fire Chief Dee Machado, Fire Department
Gloria Hobbs, Planning Department
Chief Robert Carden, Police Department
Richard Pereira, Utilities Superintendent, Public Works Department

City of Oxnard
Mark Moise
Robert Montgomery
Sewage Disposal Department
Robert Montgomery, Certified Unified Program Agency/Environmental Safety Officer, Public Works Department

City of Port Hueneme
Cliff Finley, Public Works Department
Sergeant Ken Dobbe, Police Department

City of Ventura
Michael Tracy, Acting Chief, Police Department
Richard Simmons, Public Works Department

Del Norte Regional Recycling and Transfer Station
Robert Avila, Supervisor

El Centro Elementary School District, El Centro
Carla Rayon

Hanford Elementary School District, Hanford
Liz Simas

Hanford High School District, Hanford
Marina Martinez

Imperial County
John Lau, Sanitation Department
Michael Hackett, Assistant Sheriff, Sheriff's Department

Imperial Irrigation District
William Haley
John Coltrane, Electrical Analyst

Island Union School District, Lemoore
Mary Jo Bernardo

Kings County
Len Chesmore, Fire Department
Bill Zumwalt, Planning Department
William Landis, Assistant Chief, Sheriff's Department
Michael Adams, Executive Director, Waste Management Agency

Lemoore Elementary School District, Lemoore
Barbara Richwine

Lemoore School District
Bill Miguel

Lemoore Union School District, Lemoore
Carol Mayer

Ocean View School District, Oxnard
Janet Thompson

Oxnard Union High School District, Oxnard
Dr. Richard Canady

Pacific Bell
David Waugh

Pacific Gas and Electric, Co.
Scott Raiskup, Electrical Engineer

Port Hueneme Water District
Jim Passanisi
Doug Breeze, Federal Accounts Representative

Professional Waste Management, Point Mugu
Victor McCarty

San Diego Association of Governments (SANDAG)
Eunice Tanjuaquio

Seeley Elementary School District, Seeley
Sue Anderson

Southern California Association of Governments (SCAG)
Javier Manjarez

Southern California Edison
Chris Enerson
Diane Wiggins

Southern California Gas Company
John Rees

United Water Conservation District
Frank Gientke
Frank Royer

Ventura County

Rodney Murphy, Director of Airports
Ron Allen, Planning Department
Captain Keith Parks, Sheriff's Department
John Conaway, Toland Road Landfill

8.2 SCOPING

The federal and local agencies, organizations, and individuals listed below responded to the scoping request. Appendix A provides a summary of comments received during the scoping period.

Federal Agencies

Calvin Dooley, Member of Congress
Elton Gallegly, Member of Congress
Bernie Harrell, NAS Lemoore Human Resources

Local Agencies

Thomas Berg, County of Ventura, Resource Management Agency
Homer L. Bludau, City of Coronado
Robert B. Brownie, County of Ventura, Public Works
Jurg Heugerger, Imperial County Planning Department
John S. Lehn, County of Kings, Job Training Office
J. William Little, City of Camarillo
Lee Lockhart, County of Kings, Board of Supervisors
Gail Miller, County of Fresno, Public Works and Development Services Department
Bill Mount, County of Ventura, Air Pollution Control District
David Orth, Westlands Water District
Stephen H. Ottemoeller, Westlands Water District
Jan E. Reynolds, City of Hanford
Alicia Stratton, County of Ventura, Air Pollution Control District

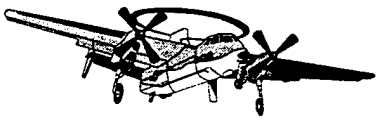
Organizations

Nancy Bendor, Simi Valley Chamber of Commerce
Kevin Bernzott, Oxnard Chamber of Commerce
Marilyn Bryant, Silver Strand Legal Defense Fund
Bobbi Courselle, Ventura Association of Realtors, Inc.
James R. Dawe, Seltzer Caplan Wilkins & McMahon, A Professional Corporation
Mario de los Cobos, Ventura County Economic Development Association
Robert R. Heft, Daley & Heft, Attorneys at Law
Laura Hunter, Environmental Health Coalition
Cathy Kennerson, El Centro Chamber of Commerce and Visitors Bureau
Kings County Board of Realtors
Steven L. Kinney, Greater Oxnard Economic Development Corporation

Jeffrey L. Levinson, Lemoore Chamber of Commerce Governmental Affairs Committee
Andrew J. Rucker, The Tri-Counties African American Chamber of Commerce of California
Lee Quaintance, BEACON

Individuals

Lindsay Barret
Larry J. Brown
David Chigos
Sonja L. Conroy
Malcom N. Danoff
Violet A. Devoe
John W. Foss
John Geddie
Sally Kaplan
Stephanie S. Kaupp
Jack Koerder
Bernadette Kuller
Linda G. Landres
Barbara Lebert
Fred Lorenzen
Tom Miller
Mr. & Mrs. James L. Packard
Dennis L. Solomon
Jan Tek
31 signatories to a statement of support for E-2 squadrons realignment to NAS Lemoore



9.0 List of Preparers

9. LIST OF PREPARERS 9-1

9.1 Navy Personnel 9-1
9.2 Prime Contractor 9-1
9.3 Subcontractors 9-4

CHAPTER 9
LIST OF PREPARERS

Individuals from Naval Facilities Engineering Command, Southwest Division (SWDIV), San Diego, California and individuals from US Pacific Fleet and several naval air stations who were involved in review of this DEIS are listed below.

9.1 NAVY PERSONNEL

US Pacific Fleet Command
Captain Tad Chamberlain, Commander Naval Air Force
Captain Michael Maurer, Commander, AEWWINGPAC
Commander Pete Walter, Maintenance Officer, AEWWINGPAC

Naval Facilities Engineering Command, Southwest Division
Kelly Knight, Planner-in-Charge
David Silverstein, Assistant Counsel

9.2 PRIME CONTRACTOR

Tetra Tech—San Francisco Office
180 Howard Street, Suite 250
San Francisco, California 94105

John E. King, CIH
MPH, Toxicology
Years of Experience: 16
(Program Director)

Karen E. Frye, AICP
BS, Political Economy of Natural Resources
Years of Experience: 10
(Project Manager)

Dean Amundson
MS, Environmental Policy
Years of Experience: 4
(Land Use and Airspace)

John Bock
BS, Environmental Toxicology
Years of Experience: 4
(Research, QA/QC)

Edmund A. Bondoc
BA, Environmental Sciences
Years of Experience: 2
(Utilities and Services)

Amy Cordle
BS, Civil Engineering
Years of Experience: 5
(QA/QC, Air Quality, Noise)

Bradley S. Hall
MS, Geological Sciences
Years of Experience: 9
(Hazardous Materials and Waste)

Rosalyn Johnson
MFS, Yale School of Forestry and Environmental Studies
Years of Experience: 9
(Biological Resources)

Kris Kolassa
BS, Biological Sciences
Years of Experience: 5
(Hazardous Materials and Waste, Public Health and Safety)

Phyllis Potter
MA, Environmental Planning
Years of Experience: 17
(Land Use and Airspace)

George Redpath
MS, Ecology
Years of Experience: 25
(Biological Resources)

Robert Sculley
MS, Ecology
Years of Experience: 22
(Air Quality, Noise)

Tom Whitehead, RG
MS, Hydrology
Years of Experience: 12
(Hydrology/Surface Water Quality)

Terry B. Witherspoon
MCP, City Planning
Years of Experience: 8
(Aesthetics and Visual Resources)

Ann M. Zoidis
MS, Physiology and Behavioral Biology
Years of Experience: 5
(Biological Resources, Marine Mammals)

Tetra Tech—San Bernardino Office
348 W. Hospitality Lane, Suite 300
San Bernardino, CA 92408

Felicia Bradfield, AICP
BS, Finance/Law
Years of Experience: 12
(Socioeconomics)

Susan Bupp
MA, Anthropology
Years of Experience: 21
(Cultural Resources)

Evelyn Chandler
BA, Anthropology/Sociology
BA, Political Science
Years of Experience: 6
(Cultural Resources)

Fred Hickman
MS, Economics
Years of Experience: 25
(Socioeconomics, QA/QC)

Becky Oldham
BS, English
Years of Experience: 5
(Technical Editor)

9.3 SUBCONTRACTORS

Cheung Environmental Consulting
829 Key Route Boulevard
Albany, CA 94706

Lori Cheung
BA, Environmental Sciences
Years of Experience: 10
(QA/QC)

Dowling and Associates
129 Palm Avenue
Ripon, California 95366

Alice Chen
MS, Transportation Engineering
Years of Experience: 6
(Traffic and Circulation)

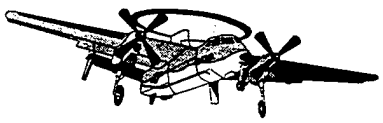
Joe Holland
BS, Electrical Engineering
Years of Experience: 24
(Traffic and Circulation)

Environmental Planning Strategies
6340 Dodds Drive
Bettendorf, Iowa 52722

Judith L. Lee
MS, Wildlife Management
Years of Experience: 20
(E-2 Operational Criteria – Appendix)

Grassetti Environmental Consulting
1536 Scenic Avenue
Berkeley, California 94708

Richard Grassetti
MA, Geography (Emphasis Water Resources)
Years of Experience: 14
(Hydrology/Surface Water Quality)



10.0 Distribution List

CHAPTER 10
DISTRIBUTION LIST

This distribution list includes elected officials, relevant federal, state, and local agencies, interested organizations and individuals, scoping meeting attendees, and libraries and media. All parties listed below will receive a notice of availability of the Draft Environmental Impact Statement (DEIS), which will identify library locations with copies of the DEIS. Parties identified in the "copies" heading will receive a complete copy of Volumes I and II of the DEIS. In most cases, individuals receiving complete copies of the DEIS attended scoping meetings or provided written comments incorporated in this document.

Copies	Title	First	Last	Organization	Branch	City	State
Federal Elected Officials							
	Honorable	George	Radanovich	US Congress	19th District	Fresno	CA
1	Honorable	Calvin	Dooley	US Congress	20th District	Hanford	CA
	Honorable	Bill	Thomas	US Congress	21st District	Visalia	CA
	Honorable	Walter	Capps	US Congress	22nd District	Santa Barbara	CA
1	Honorable	Elton	Gallegly	US Congress	23rd District	Oxnard	CA
	Honorable	Brad	Sherman	US Congress	24th District	Woodland Hills	CA
	Honorable	Henry	Waxman	US Congress	29th District	Los Angeles	CA
	Honorable	Sonny	Bono	US Congress	44th District	Palm Springs	CA
	Honorable	Bob	Filner	US Congress	50th District	Chula Vista	CA
	Honorable	Gary	Condit	US Congress	House of Representatives	Merced	CA
	Honorable	Richard	Lehman	US Congress	House of Representatives	Fresno	CA
	Senator	Barbara	Boxer	US Congress	US Senate	San Francisco	CA
	Senator	Dianne	Feinstein	US Congress	US Senate	San Francisco	CA
State Elected Officials							
	Honorable	Jim	Costa	California State Assembly	16th District	Fresno	CA
	Honorable	Cruz	Bustamante	California State Assembly	31st District	Fresno	CA
	Honorable	Brooks	Firestone	California State Assembly	35th District	Santa Barbara	CA
	Honorable	Nao	Takasugi	California State Assembly	37th District	Camarillo	CA
	Honorable	Jim	Battin	California State Assembly	80th District	Imperial	CA
	Honorable	Bill	Jones	California State Assembly		Fresno	CA
	Honorable	Margaret	Snyder	California State Assembly		Madera	CA
	Honorable	Andrea	Seastrand			Santa Barbara	CA

Copies	Title	First	Last	Organization	Branch	City	State
	Honorable	Ken	Maddy	California State Senate	14th District	Fresno	CA
	Honorable	Jack	O'Connell	California State Senate	18th District	Santa Barbara	CA
	Honorable	Cathie	Wright	California State Senate	19th District	Simi Valley	CA
	Honorable	David	Kelley	California State Senate	37th District	Palm Desert	CA
	Honorable	Phil	Wyman	California State Senate		Tehachapi	CA
	Mr.	Joe	Piechowski	Office of Assemblyman Takasugi		Camarillo	CA
	Mr.	Brian	Miller	Office of Congressman Elton Gallegly		Oxnard	CA
	Mr.	Dave	Butler	Office of Senator Cathie Wright		Simi Valley	CA
1	Executive Director	John	Roberts	Regional Water Quality Control Board	San Diego Region	San Diego	CA
	Governor	Pete	Wilson	State of California	Office of the Governor	Sacramento	CA
Local Elected Officials							
1	Mayor	Kelly	Granger	City of Avenal	Office of the Mayor	Avenal	CA
1				City of Brawley	Office of the Mayor	Brawley	CA
1	Mayor	Stanley J.	Daily	City of Camarillo	Office of the Mayor	Camarillo	CA
1	Mayor	Mary	Herron	City of Coronado	Office of the Mayor	Coronado	CA
1				City of El Centro	Office of the Mayor	El Centro	CA
1	Mayor	Jim	Patterson	City of Fresno	Office of the Mayor	Fresno	CA
1				City of Holtville	Office of the Mayor	Holtville	CA
1				City of Imperial	Office of the Mayor	Imperial	CA
1	Mayor	Michael	Bixler	City of Imperial Beach	Office of the Mayor	Imperial Beach	CA
1	Mayor	Robert	Hill	City of Hanford	Office of the Mayor	Hanford	CA
1	Mayor	Dave	Simas	City of Lemoore	Office of the Mayor	Lemoore	CA
1	Mayor	Manuel	Lopez	City of Oxnard	Office of the Mayor	Oxnard	CA
1	Mayor	Anthony	Volante	City of Port Hueneme	Office of the Mayor	Port Hueneme	CA
1				City of San Diego	Office of the Mayor	San Diego	CA
1	Mayor	Jack	Tingstrom	City of Ventura	Office of the Mayor	Ventura	CA
1				City of Westmoreland	Office of the Mayor	Westmoreland	CA
		Corliss	Christiansen	Office of Supervisor Frank Schillo		Thousand Oaks	CA
Federal Agencies							
				Advisory Council on Historic Preservation	Western Office of Project Review	Golden	CO
	Director	Ronald	Anzalone	Advisory Council on Historic Preservation		Washington	DC
				Federal Aviation Administration		Sacramento	CA
				House Interior Committee	House Annex 1	Washington	DC
	Regional Administrator	Hilda	Diaz-Soltero	National Marine Fisheries Service	Southwest Region	Long Beach	CA
	Ms.	Irma	Lagomarsino	National Marine Fisheries Service	Southwest Region, Protected Species Management Division	Long Beach	CA
	Mr.	Kenneth	Hollingshead	National Marine Fisheries Service	Office of Protected Resources	Silver Spring	MD
	Associate Director	Denis	Galvin	National Park Service	Planning and Development	Washington	DC
1	Chief	Jim	Benedict	National Park Service	Santa Monica Mountains Recreational Area	Agoura Hills	CA
	Mr.	Art	Eck	National Park Service	Santa Monica Mountains Recreational Area	Agoura Hills	CA
	Ms.	Judith	Meister	National Park Service	Santa Monica Mountains Recreational Area	Santa Monica	CA
	Ms.	Debbie	Bird	National Park Service		Three Rivers	CA
	Wilderness Coordinator	Ralph	Moore	National Park Service		Three Rivers	CA
2				US Army Corps of Engineers	Sacramento District	Sacramento	CA

Copies	Title	First	Last	Organization	Branch	City	State
	Director			US Bureau of Indian Affairs	Field Office	Palm Springs	CA
	Superintendent			US Bureau of Indian Affairs	Southern California Area Office	Riverside	CA
	District Manager			US Bureau of Land Management	California Desert District	Riverside	CA
	Area Manager			US Bureau of Land Management	El Centro District	El Centro	CA
	Assistant Director	Maitland	Sharpe	US Bureau of Land Management	Resource Assessment and Planning	Washington	DC
				US Bureau of Land Management		Sacramento	CA
	External Affairs Officer	Bob	Walsh	US Bureau of Reclamation	Lower Colorado Regional Office	Boulder City	NV
	Area Manager	Rick	Martin	US Bureau of Reclamation	Southern California Area Office	Temecula	CA
	Environmental Specialist	Judy	Troast	US Bureau of Reclamation		Washington	DC
	Chief	T.J.	Granito	US Coast Guard	Environmental Protection Branch	Washington	DC
	Mr.	Steve	Jewett	US Department of Agriculture	Natural Resource Conservation Service	Somis	CA
	Ms.	Pat	Oliver	US Department of Agriculture	Ventura County Resource Conservation District	Somis	CA
				US Department of Commerce	National Oceanic & Atmospheric Admin. San Francisco Office	San Francisco	CA
				US Department of Commerce	National Oceanic & Atmospheric Admin. Sanctuary & Reserve Division SSMCIV	Silver Spring	MD
	Acting Director	Donna	Wieting	US Department of Commerce	National Oceanic & Atmospheric Admin., Office of Policy & Strategic Planning	Washington	DC
				US Department of Defense	Defense Technical Information Center (DTIC)	Fort Belvoir	VA
2	Mr.	Paul	Ryeff	US Department of Defense	Office of Economic Adjustment	Sacramento	CA
2	Deputy	Peter	Boice	US Department of Defense	Natural Resources ODASD (E)	Arlington	VA
	Safety Manager	Richard	Green	US Department of and Health Human Services	Environmental Clearance	Los Angeles	CA
				US Department of Housing & Urban Development	Environmental Unit	Los Angeles	CA
18	Mr.	Terry	Martin	US Department of the Interior	Office of Environmental Policy & Compliance	Washington	DC
	Environmental Officer	Patricia	Port	US Department of the Interior	Office of Environmental Policy & Compliance	San Francisco	CA
	Mr.	Daniel	Leubecker	US Department of Transportation	Office of Technology Assessment	Washington	DC
				US Department of Transportation	Quality Advisory Committee	Washington	DC
	Mr.	Harvey	Riebel	US Department of Transportation		Longdale	CA
2	Chief	David	Farrel	US Environmental Protection Agency	Office of Federal Activities	San Francisco	CA
	Mr.	Bob	Pallarino	US Environmental Protection Agency	Region IX Air and Toxics Division	San Francisco	CA
	Director	Deanna	Weiman	US Environmental Protection Agency	Region IX Office of External Affairs	San Francisco	CA
	Mr.	Bob	Moyer	US Environmental Protection Agency	Region IX Office of Regional Counsel	San Francisco	CA
	Environmental Officer	Bill	Johnston	US Federal Aviation Administration	Western Pacific Region (AWP-532)	Longdale	CA
1	Navy Rep.	Chris	Spada	US Federal Aviation Administration	Western Pacific Region (AWP-532)	Los Angeles	CA
	Mr.	Sandro	Amaglio	US Federal Emergency Management Agency	Region IX	San Francisco	CA

Copies	Title	First	Last	Organization	Branch	City	State
				US Fish and Wildlife Service	Ecological Services	Sacramento	CA
1				US Fish and Wildlife Service	Fish and Wildlife Enhancement	West Carlsbad	CA
	Regional Director	Rolf	Wallerstrom	US Fish and Wildlife Service		Portland	OR
1	Assistant Field Supervisor	Ray	Bransfield	US Fish and Wildlife Service	Permits and Consultation	Ventura	CA
1				US Fish and Wildlife Service	Sacramento Office Ecological Services	Sacramento	CA
	Refuge Manager			US Fish and Wildlife Service	Salton Sea National Wildlife Refuge	Calipatria	CA
	Field Supervisor	Diane	Noda	US Fish and Wildlife Service		Ventura	CA
	Ms.	Kate	Symonds	US Fish and Wildlife Service		Ventura	CA
	Mr.	Jim	Turner	US Forest Service	Las Padres National Forest	Goleta	CA
	Ms.	Catherine	Clement	US Forest Service		San Francisco	CA
Military and Coast Guard							
	Mr.	Tad	McCullen	US Air Force	Deputy Assistant Secretary	Washington	DC
	Mr.	Philip	Lammi	US Air Force	Environmental Office Western Region	San Francisco	CA
	LTC	Sam	Rup	US Air Force		San Francisco	CA
	Mr.	Hap	Griffith	US Air National Guard	Channel Islands Air National Guard Base	Port Hueneme	CA
	Chief	David	Castanon	US Army Corps of Engineers	Los Angeles District North Coast Section	Ventura	CA
				US Army Corps of Engineers	Los Angeles District Regulatory Branch	Los Angeles	CA
	LTC		Daniels	US Coast Guard	Pollution Contingency Planner	Long Beach	CA
	LT	Rick	Sorell	US Coast Guard		Santa Barbara	CA
	COL	Louis	Van Mullem, Jr.	Vandenberg Air Force Base	Environmental Management	Vandenberg AFB	CA
	Manager	Allan	Naydol	Vandenberg Air Force Base	Natural Resources	Vandenberg AFB	CA
Tribal Agencies							
	Chair	Jearaldine	Alex	Big Sandy		Auberry	CA
	Chair	Frank	Lee	Cold Springs Rancheria		Tollhouse	CA
	Chair	Clarence	Brown	Mission Indians Viejas Group of Capitan	Grande Band Tribal Headquarters	Alpine	CA
	Executive Secretary	Larry	Myers	Native American Heritage Commission		Sacramento	CA
	Mr.	Sal	Perez	Santa Clara Valley River Chumash Turtle Clan		Ventura	CA
	Chair	Clarence	Atwell, Jr.	Santa Rosa Rancheria		Lemoore	CA
	Chair	Elaine	Schneider	Santa Ynez Chumash Reservation	Tribal Elders Council	Santa Ynez	CA
	Chair	Lewis	Barnes	Table Mountain Rancheria		Friant	CA
State Agencies							
	Chief	James	Morgester	CA Air Resources Board	Compliance Division	Sacramento	CA
				CA Air Resources Board	EIR Regional Impact Division	Sacramento	CA
1	Executive Director	Mark	Delaplaine	CA Coastal Commission		San Francisco	CA
	Analyst	Jim	Raives	CA Coastal Commission		San Francisco	CA
1	Mr.	James	Johnson	CA Coastal Commission	South Central Coast Area	Ventura	CA
				CA Coastal Conservancy		Ventura	CA
	Executive Officer	Michael	Fischer	CA Coastal Conservancy		Oakland	CA
	Mr.	David	Johnson	CA Department of Boating & Waterways		Sacramento	CA
				CA Department of Parks & Recreation	District Office	Santa Barbara	CA

Copies	Title	First	Last	Organization	Branch	City	State
	State Historic Preservation Officer	Cherilyn	Widell	CA Department of Parks and Recreation	Historic Preservation Office	Sacramento	CA
	Ms.	Karen	Collins	CA Department of Parks and Recreation	Historic Preservation Office	Sacramento	CA
	Chief	Richard	Rayburn	CA Department of Parks and Recreation	Resource Management Division	Sacramento	CA
				CA Department of Parks and Recreation	Salton Sea State Recreation Area	North Shore	CA
	Mr.	Randall	Brown	CA Department of Water Resources	Environmental Services Office	Sacramento	CA
	Director	Michael	Byrner	CA Department of Conservation		Sacramento	CA
	Mr.	John	Schmidt	CA Department of Conservation	Wildlife Conservation Board	Sacramento	CA
	Mr.	David	Hammond	CA Department of Ed., Sc, & Environ		Sacramento	CA
	Director			CA Department of Fish and Game		Sacramento	CA
1	President	Frank	Boren	CA Department of Fish and Game		Sacramento	CA
				CA Department of Fish and Game	Region 4	Fresno	CA
1	Regional Manager	Patricia	Wolf	CA Department of Fish and Game	Region 5	Long Beach	CA
	Chief	David	Spath	CA Department of Health Services	Environmental Health Division	Sacramento	CA
	Mr.	James	Stratton	CA Department of Health Services	Health Hazard Assessment	Sacramento	CA
				CA Department of Health Services	Toxic Substances Control Division Region 3	Glendale	CA
	Mr.	Steve	Treanor	CA Department of Parks and Recreation	District Office	Santa Barbara	CA
	Ms.	Karen	Collins	CA Department of Parks and Recreation	Historic Preservation Office	Sacramento	CA
	Chief	Richard	Rayburn	CA Department of Parks and Recreation	Resource Management Division	Sacramento	CA
				CA Department of Parks and Recreation	Salton Sea State Recreation Area	North Shore	CA
	Executive Director	Robert	Remen	CA Department of Transportation		Sacramento	CA
				CA Department of Transportation	District 6	Fresno	CA
				CA Department of Transportation	District 7	Los Angeles	CA
	Division Director			CA Department of Transportation	Division of Aeronautics	Sacramento	CA
	Mr.	James	Strock	CA Environmental Protection Agency		Sacramento	CA
	Mr.	Fredrick	Moss	CA Environmental Protection Agency	Department of Toxic Substances Control	Sacramento	CA
				CA Environmental Protection Agency	Public Participation and Education	Long Beach	CA
	Grants Coordinator	Terry	Rivasplata	CA Office of Planning and Research		Sacramento	CA
	Secretary	Douglas	Wheeler	CA Resources Agency		Sacramento	CA
	Director	Marsala	Tyler	California State University Northridge	Office of Public Affairs	Northridge	CA
				Regional Water Quality Control Board	Central Valley Region	Fresno	CA

Copies	Title	First	Last	Organization	Branch	City	State
	Mr.	Gerhardt	Hubner	Regional Water Quality Control Board	Los Angeles Region	Monterey Park	CA
	Mr.	Michael	Lyons	Regional Water Quality Control Board		Monterey Park	CA
1	Environmen-tal Specialist	Lauma	Jurkevics	Regional Water Quality Control Board	Surveillance Unit	Monterey Park	CA
	Mr.	Juan	Salazar	State of California	California Conservation Corps,	Porterville	CA
				State Water Resources Control Board	Division of Water Quality	Sacramento	CA
	Mr.	Harry	Schueller	Water Resources Control Board	Division of Clean Water Program	Sacramento	CA
Regional Agencies							
	Ms.	Julie	Linxwiler	Fresno County	Department of Public Works and Development Services	Fresno	CA
1	Development Services Manager	Gail	Miller	Fresno County	Department of Public Works and Development Services	Fresno	CA
	Ms.	Jan	McGhie	Greater Oxnard & Harbors Tourism Bureau	Connelly House at Heritage Square	Oxnard	CA
				Imperial County	Air Pollution Control District	El Centro	CA
	Chair			Imperial County	Board of Supervisors	El Centro	CA
	Director			Imperial County	Parks and Recreation Department	El Centro	CA
1	Planning Director	Jurg	Heuberger	Imperial County	Planning and Building Department	El Centro	CA
1	County Supervisor	Dean	Shores	Imperial County		El Centro	CA
1	Chairman	Lee	Lockhart	Kings County	Board of Supervisors	Hanford	CA
1	Mr.	John S.	Lehn	Kings County	Job Training Office	Hanford	CA
1	Ms.	Allison M.	Picard	Kings County	Office of County Administrator	Hanford	CA
1	Mr.	Ken	Marvin	Kings County	Office of the Sheriff	Hanford	CA
				Kings County	Waste Management Authority	Hanford	CA
	Mr.	Jim	Edwards	Kings County		Hanford	CA
1	County Aministrative Officer	Larry	Spikes	Kings County	County Administrative Office	Hanford	CA
	Mr.	Richard	Milhorn	San Joaquin Valley	Unified Air Pollution Control District	Fresno	CA
	Ms.	Vijaya	Jammalamata	Santa Barbara County	Air Pollution Control District	Goleta	CA
	Deputy Director	Michael	Powers	Santa Barbara County	Association of Governments, Planning Division	Santa Barbara	CA
				Santa Barbara County	Board of Supervisors	Santa Barbara	CA
	Director	Jennifer	Briggs	Santa Barbara County	Parks and Recreation Department	Santa Barbara	CA
	Deputy Director	Al	McCurdy	Santa Barbara County	Planning and Development	Santa Barbara	CA
1	C.E.O.	Nancy	Bendor	Simi Valley Chamber of Commerce		Simi Valley	CA
	Program Supervisor	Steve	Smith	South Coast Air Quality Management District		Diamond Bar	CA
	Mr.	Philip	Fernando	Southern CA Association of Governments		Los Angeles	CA
	Ms.	Maggie	Idle	Southern CA Association of Governments		Los Angeles	CA
	Executive Director	Arnold	Dowdy	Ventura Council of Governments	Local Agency Formation Commission	Ventura	CA
	Mr.	Brent	Backus	Ventura County	Air Pollution Control District	Ventura	CA
1	Supervisor	John	Flynn	Ventura County	Air Pollution Control District	Ventura	CA
1	Mr.	Bill	Mount	Ventura County	Air Pollution Control District	Ventura	CA
1	Ms.	Alicia	Stratton	Ventura County	Air Pollution Control District	Ventura	CA

Copies	Title	First	Last	Organization	Branch	City	State
				Ventura County	Board of Supervisors	Ventura	CA
	Mr.	Frank	Schillo	Ventura County	Board of Supervisors 2nd District Building Supervisor	Thousand Oaks	CA
	Mr.	Steve	Kephart	Ventura County	Department of Environmental Health	Ventura	CA
	Executive Director	Nancy	Williams	Ventura County	Economic Development Association	Oxnard	CA
				Ventura County	Environmental Health Department	Ventura	CA
1	Mr.	Kim	Hocking	Ventura County	Planning Department	Ventura	CA
	Mr.	Keith	Turner	Ventura County	Planning Department	Ventura	CA
	Mr.	Dan	Rayburn	Ventura County	Public Works	Ventura	CA
1	Mr.	Robert B.	Brownie	Ventura County	Public Works Agency Transportation Department, Traffic and Planning Administration	Ventura	CA
1	Director	Thomas	Berg	Ventura County	Resource Management Agency	Ventura	CA
	Deputy District Attorney	Mitch	Disney	Ventura County		Ventura	CA
				Ventura County Commercial Fisherman's Association		Oxnard	CA
Water Management Agencies							
	General Manager	Charles	Shreves	Imperial Irrigation District		Imperial	CA
				Lakeside Irrigation Water District		Hanford	CA
	Mr.	Frank	Royer	United Water Conservation District		Santa Paula	CA
1	General Manager	David	Orth	Westlands Water Districts		Fresno	CA
1	Chief of Operations	Steve	Ottomoeller	Westlands Water Districts		Fresno	CA
Local Agencies							
	Administrator	Gail	Pringle	CBC Port Hueneme	Point Mugu Remediation Advisory Board	Port Hueneme	CA
	Ms.	Linda	Wadley	CBC Port Hueneme	Public Affairs Office	Port Hueneme	CA
	City Manager	Melisa	Harriman	City of Avenal	Office of the City Manager	Avenal	CA
	Director	Jonathan	Demsky	City of Avenal	Utilities Department	Avenal	CA
	President			City of Brawley	Chamber of Commerce	Brawley	CA
				City of Brawley	Office of the City Manager	Brawley	CA
	President			City of Calexico	Chamber of Commerce	Calexico	CA
				City of Calexico	Office of the City Manager	Calexico	CA
	President			City of Calipatria	Chamber of Commerce	Calipatria	CA
	Mr.	James	Flournoy	City of Calipatria	City Hall	Calipatria	CA
	Ms.	Carol	Nordahl	City of Camarillo	Chamber of Commerce	Camarillo	CA
	Planning Director	Tony	Boden	City of Camarillo	Planning Department	Camarillo	CA
	Ms.	Charlotte	Craven	City of Camarillo		Camarillo	CA
				City of Corcoran		Cocoran	CA
1	Mr.	Tom	Smisek	City of Coronado	City Council	Coronado	CA
1	Mr.	Bruce	Williams	City of Coronado	City Council	Coronado	CA
1	Mr.	Homer L.	Bludau	City of Coronado	Office of the City Manager	Coronado	CA
1	Ms.	Gail	Brydges	City of Coronado		Coronado	CA
1	Ms.	Ann	McCaull	City of Coronado		Coronado	CA
1	Executive Vice President	Cathy	Kennerson	City of El Centro	Chamber of Commerce	El Centro	CA
1	Mr.	Rob	Zimmes	City of El Centro	Chamber of Commerce	El Centro	CA

Copies	Title	First	Last	Organization	Branch	City	State
		MC	Wyman	City of El Centro	Chamber of Commerce	El Centro	CA
1	Mr.	Robert	Zimmer	City of El Centro	Chamber of Commerce	El Centro	CA
	President			City of El Centro	Chamber of Commerce	El Centro	CA
				City of El Centro	Office of the City Manager	El Centro	CA
	President			City of Fresno	Chamber of Commerce	Fresno	CA
	President			City of Hanford	Chamber of Commerce	Hanford	CA
1	City Manager	Jan	Reynolds	City of Hanford	Office of the City Manager	Hanford	CA
1	Ms.	Barbara	McGurdy	City of Hanford		Hanford	CA
	President			City of Holtville	Chamber of Commerce	Holtville	CA
				City of Holtville	Office of the City Manager	Holtville	CA
	President			City of Imperial	Chamber of Commerce	Imperial	CA
				City of Imperial	Office of the City Manager	Imperial	CA
	Mr.	David	Ewing	City of Imperial Beach		Imperial Beach	CA
	President			City of Lemoore	Chamber of Commerce	Lemoore	CA
1	Ms.	Lynda	Lahodny	City of Lemoore	Chamber of Commerce, Downtown Revitalization Committee	Lemoore	CA
1	Mr.	Bobby	Lee	City of Lemoore	Chamber of Commerce, Governmental Affairs Committee	Lemoore	CA
1	Mr.	Jeffrey L.	Levinson	City of Lemoore	Chamber of Commerce, Governmental Affairs Committee	Lemoore	CA
1		Ed	Martin	City of Lemoore	City Council	Lemoore	CA
1		John W.	Luis	City of Lemoore	City Council	Lemoore	CA
	City Manager	Allen	Goodman	City of Lemoore	Office of the City Manager	Lemoore	CA
	Director	Verma	Nakul	City of Lemoore	Planning and Community Development	Lemoore	CA
1	Mr.	Bill	Bowen	City of Lemoore	Planning Commission	Lemoore	CA
	Executive Director	Doug	Yavanian	City of Oxnard	Chamber of Commerce	Oxnard	CA
1	President	Kevin	Bernzott	City of Oxnard	Chamber of Commerce	Oxnard	CA
1	Ms.	Florence	LaManno	City of Oxnard	Chamber of Commerce	Oxnard	CA
1	Director	Dennis	Scala	City of Oxnard	City Manager's Office	Oxnard	CA
	Ms.	Deanna	Walsh	City of Oxnard	Community Development Department	Oxnard	CA
	Mr.	Richard	Smith	City of Oxnard	Fire Administration Office	Oxnard	CA
	Director			City of Oxnard	Planning Department	Oxnard	CA
				City of Oxnard	Police Department	Oxnard	CA
	Director			City of Oxnard	Public Works	Oxnard	CA
	Mr.	Dick	Maggio	City of Oxnard		Oxnard	CA
	Mr.	Robert	Montgomery	City of Oxnard		Oxnard	CA
				City of Malibu	Chamber of Commerce	Malibu	Ca
	President	Tom	Henry	City of Port Hueneme	Chamber of Commerce	Port Hueneme	CA
	Director	Karen	Jackson	City of Port Hueneme	Community Development Department	Port Hueneme	CA
				City of Port Hueneme	Office of the City Manager	Port Hueneme	CA
	Mr.	Greg	Brown	City of Port Hueneme	Planning Department	Port Hueneme	CA
	Mr.	Tom	Fig	City of Port Hueneme		Port Hueneme	CA
	Executive Director	Steve	Cushman	City of Santa Barbara	Chamber of Commerce	Santa Barbara	CA
1	Mr.	Jim	Barroa	City of Ventura	Chamber of Commerce	Ventura	CA
	Executive Director	Zoe	Taylor	City of Ventura	Chamber of Commerce	Ventura	CA
1	President	John	Walters	City of Ventura	Chamber of Commerce	Ventura	CA
	Senior Planner	Karen	Bates	City of Ventura	Planning Department	Ventura	CA
1	Mr.	David	Kliebch	City of Ventura		Ventura	CA
1	City Manager	J. William	Little	County of Camarillo		Camarillo	CA

Copies	Title	First	Last	Organization	Branch	City	State
	Director	Robert	Harmuth	Port of Hueneme	Marine Operations	Port Hueneme	CA
	Mr.	Jerry	Sortomme	Santa Barbara City College		Santa Barbara	CA
	Mr.	Larry	Calderon	Ventura City College		Ventura	CA
School Districts							
1	Mr.	John	Jones	Ackers School		Lemoore	CA
	Ms.	Marianne	Terriquez	Central Union High School District	Planning Department	El Centro	CA
1	Superintendent		Carlson	Central Union School District		Lemoore	CA
	Ms.	Marilyn	Lenhardt	Central Union School District		Lemoore	CA
1	Ms.	Carla	Rayon	City of El Centro	Elementary School District	El Centro	CA
1	Mr.	Bill	Miguel	City of Hanford	High School Board	Hanford	CA
1	Mr.	Richard	Rayburn	City of Lemoore	Union Elementary School District	Lemoore	CA
1	Ms.	Cindy	Escobedo	Coronado Unified School District		Coronado	CA
1	Ms.	Liz	Simas	Hanford Elementary School District		Hanford	CA
1	Ms.	Marina	Martinez	Hanford High School District		Hanford	CA
1	Superintendent			Hueneme School District		Port Hueneme	CA
1	Superintendent			Hueneme Elementary School District		Port Huneme	CA
1	Superintendent	Thomas	Bates	Island Union School District		Lemoore	CA
1	Superintendent	Idanna	Aaron	Lemoore Elementary School District		Lemoore	CA
	Ms.	Barbara	Richwine	Lemoore Elementary School District		Lemoore	CA
1	Tri-Counties District Manager	Bill	Black	Lemoore High School		Lemoore	CA
1	Ms.	Carol	Mayer	Lemoore Union School District		Lemoore	CA
1	Superintendent			Mesa Elementary School District		Somis	CA
1	Superintendent			Mupu Elementary School District		Santa Paula	CA
1	Mr.	Bob	Marineau	Nuetra School		Lemoore	CA
	Ms.	Janet	Thompson	Ocean View School District		Oxnard	CA
	Mr.	Don	Hodes	Ocean View School District		Oxnard	CA
1	Superintendent			Oxnard Elementary School District		Oxnard	CA
1	Dr.	Richard	Canady	Oxnard Junior High School District		Oxnard	CA
1	Ms.	Jeannette	Jennett	Oxnard Union High School District		Oxnard	CA
1	Superintendent			Pleasant Valley Elementary School District		Camarillo	CA
1	Superintendent			Rio Elementary School District		Oxnard	CA
1				San Diego Unified School District		San Diego	CA
1	Superintendent			Santa Clara Elementary School District		Somis	CA
	Ms.	Sue	Anderson	Seeley Union School District		Seeley	CA
1	Superintendent	Dave	Watson	Seeley Union School District		Seeley	CA
1	Superintendent			Somis Union Elementary School District		Somis	CA
1	Superintendent			Ventura Unified School District		Ventura	CA
Organizations							
1	Mr.	Andy	Rucker	African American Chamber of Commerce		Oxnard	CA

Copies	Title	First	Last	Organization	Branch	City	State
				American Cetacean Society		San Pedro	CA
1	Mr.	Nick	Wagner	American Federation of Government Employees		NAS Lemoore	CA
1	Tri-Counties District Manager	Tom	Raftican	Associate General Contractors of California		Santa Barbara	CA
				Audubon Society	Coachella Valley	Palm Desert	CA
	Mr.	Tom	Halpin	Audubon Society	Conejo	Simi Valley	CA
	Mr	Art	Marshall	Audubon Society	Ventura Chapter	Ventura	CA
	Mr	John	Stauffer	Audubon Society	Ventura Chapter	Ventura	CA
	Ms	Peg	Stevens	Audubon Society	Ventura Chapter	Ventura	CA
1		Lee & Inez	Quaintance	BEACON		Oxnard	CA
1	Ms	Jean	Rountree	BEACON		Oxnard	CA
	President	John	Colgate	California Abalone Association		Santa Barbara	CA
	Mr.	Charles	Imbrecht	California Energy Commission		Sacramento	CA
				California Environment Trust	Hearst Building	San Francisco	CA
				California Farm Bureau Federation		Sacramento	CA
	Mr.	Tom	Keeney	California Native Plant Society	Channel Islands Chapter	Ventura	CA
		Rick & Tricia	Burgess	California Native Plant Society		Oxnard	CA
	Executive Director	Richard	Martin	Castle Joint Power Authority		Atwater	CA
	Mr.	John	Brown	Channel Islands Council of Divers		Ventura	CA
	Sanctuary Manager	Edward	Cassano	Channel Islands National Marine Sanctuary		Santa Barbara	CA
	Superintendent	Tim	Setnicka	Channel Islands National Park		Ventura	CA
	Mr.	Steve	Merritt	Chevron		Ventura	CA
	Ms	Marilyn	Bryant	CI Legal Defense		Port Hueneme	CA
	Ms.	Vickie	Finan	CIBCSD		Channel Islands Beach	CA
	Mr.	Tom	Maxwell	Coast Walk		Thousand Oaks	CA
1	Ms.	Stephanie	Knapp	Concerned Citizens of Coronado		Coronado	CA
1	Mr.	Fred	Lorenzen	Concerned Citizens of Coronado		Coronado	CA
1	Ms	Celine	Haugen	Crown Ed Corporation		Hanford	CA
1	Mr.	Robert R.	Heft	Daley and Heft		Solana Beach	CA
	Mr.	Chad	Norton	DSEIA		Ventura	CA
	Ms	Anna	Harlowe	Ecology Center of Southern California		Los Angeles	CA
	Mr.	Dan	Silver	Endangered Habitats League		Los Angeles	CA
	Mr.	Russ	Baggerly	Environmental Coalition of Ventura County		Ventura	CA
1	Chief Counsel	Mark	Chytilo	Environmental Defense Center		Santa Barbara	CA
	Mr.	John	Buse	Environmental Defense Center		Ventura	CA
1	Ms.	Laura	Hunter	Environmental Health Coalition		San Diego	CA
				Exxon Corporation	Environmental Department	Thousand Oaks	CA
	Mr.	Rex	Laird	Farm Bureau		Ventura	CA
	Ms	Edwina	Macias	Filipino American Chamber of Commerce	Funder's Mortgage	Oxnard	CA
	President	Steven	Rebuck	Fisheries Protection Institute		Summerland	CA
	Ms.	Andrea	Durbin	Friends of the Earth		Washington	DC
	Mr.	Ron	Bottorff	Friends of the Santa Clara River		Newbury Park	CA
1	Mr.	H. Edwin	Lyon	Gaviota Maintenance Services		Ventura	CA

Copies	Title	First	Last	Organization	Branch	City	State
1	President	Steven L.	Kinney	Greater Oxnard Economic Development Corporation		Oxnard	CA
	Mr.	Bradley	Angel	Greenpeace		San Francisco	CA
	Mr.	Ray	Rios	Hispanic Chamber of Commerce		Oxnard	CA
	Mr.	Manny	Vega	Inter-Neighborhood Council		Oxnard	CA
	Mr.	Jess	Kouch	Kaufman & Broad		Fresno	CA
1	Mr.	Ron	Dicken	KC Government Center	Veteran Service Office	Hanford	CA
1	Mr.	Dick	Jacques	Kings County Board of Realtors		Hanford	CA
	Ms.	Liz	Brown	Laguna Greenbelt, Inc.		Laguna Beach	CA
	Mr.	Herman	Waltzer	Leisure Village		Camarillo	CA
	Mr.	Michael	Gosliner	Marine Mammal Commission	General Counsel	Washington	DC
	Ms.	Wendy	Phillips	Mugu Lagoon Task Force		Monterey Park	CA
1	Mr.	Jay	Salyer	NAS Lemoore, Inc./Kings and Tulare Commuter Rail Committee		Lemoore	CA
	Mr.	Lou	Rogers	National Association of Government Employees (NAGE)		Point Mugu	CA
				National Audubon Society	Western Regional Office	Sacramento	CA
	Senior Attorney	Joel	Reynolds	Natural Resources Defense Council		Los Angeles	CA
	Ms.	Diane	Devine	Nature Conservancy		Santa Barbara	CA
1	National Director	David	Chigos	Navy League of the United States	San Diego Council	San Diego	CA
	President			Niland Chamber of Commerce		Niland	CA
	Associate Director	Harry	Helling	Orange County Marine Institute		Dana Point	CA
	Ms.	Roma	Armbrust	Ormond Beach Observers		Ventura	CA
				Patagonia		Ventura	CA
1	Mr.	Scott	Raiskup	PG&E		Lemoore	CA
	Mr.	Gary	Patton	Planning and Conservation League		Sacramento	CA
	Mr.	Michael	Smith	Point Mugu Wildlife Center		Port Hueneme	CA
	Mr.	Joel	Schwartz	Rand Corp.		Santa Monica	CA
	Ms.	Misty	Gay	Santa Catalina Conservancy		Avalon	CA
		Terry	Tamminen	Santa Monica Bay Keeper		Marina del Rey	CA
		Gar	Goodson	Save Our Coastline 2000		Palos Verdes	CA
	Mr.	Scott	Thomas	Sea and Sage Audubon Society		Irvine	CA
1	Mr.	James	Dawe	Seltzer Caplan Wilkins & McMahon		San Diego	CA
				Service Planning Pacific Gas & Electric		Lemoore	CA
				Sierra Club	Angeles Chapter	Los Angeles	CA
	Co-Chair	Cathy	Knight	Sierra Club	Angeles Chapter Coastal Committee	Santa Monica	CA
	Staff Attorney	Debra	Reames	Sierra Club	Legal Defense Fund	San Francisco	CA
	Chair	Rick	Skillin	Sierra Club	Los Padres Chapter Conservation	Lompoc	CA
	Director	Barbara	Boyle	Sierra Club	Northern California Chapter	Oakland	CA
				Sierra Club		Washington	DC
	Mr.	Burt	Elliott	Sierra Club Coastwalk		Thousand Oaks	CA
1	Ms.	Marilyn	Bryant	Silver Strand Legal Defense Trust Fund		Channel Islands	CA
	Mr.	Ted	Gold	Southern California Edison		West Lancaster	CA
				Southern California Edison		Ventura	CA
	Mr.	Terrance	Mack	Southern California Gas Company	M/L 722 L	Pico Rivera	CA

Copies	Title	First	Last	Organization	Branch	City	State
1	Ms	Linda	Douglass	Southern California Gas Company		Visalia	CA
	Mr	John	Rees	Southern California Gas Company		Downey	CA
1		Marty	de los Cobos	VCEDA		Oxnard	CA
	Mr.	Larry	Rose	Ventura Agricultural Land Trust		Ventura	CA
1	Ms.	Bobbi	Courselle	Ventura Association of Realtors		Ventura	CA
	Mr.	James	Colomy	Ventura County Commercial Fisherman's Assn		Summerland	CA
1	Mr.	Pierre	Tada	Ventura County Economic Development Association		Oxnard	CA
	Mr.	Michael	Saliba	Ventura County Taxpayers Association		Ventura	CA
1	Mr.	Al	Sanderlin	Ventura County Veterans Employment Committee		Ventura	CA
	President			West Shores Chamber of Commerce		Salton City	CA
	Mr	Carl	Thelander	Western Foundation of Vertebrate Zoology		Camarillo	CA
	President	Maeton	Freel	Wildlife Society	California Central Coast Chapter	Goleta	CA
					California Environment Trust	San Francisco	CA

Individuals and Residents

		Peer	Amble			Camarillo	CA
	Mr.	Jeff	Ballow			Camarillo	CA
1	Ms.	Lindsay	Barrett			Coronado	CA
		Carl & Arlene	Beller			Camarillo	CA
		Louis & Marie	Bergdhal			Camarillo	CA
	Mr	Eric	Bergh			Thousand Oaks	CA
		E	Blake			Camarillo	CA
	Ms	Penny	Bohannon			Port Hueneme	CA
	Mr	Mike	Boston			El Centro	CA
	Mr.	Roy	Bradford			Santa Barbara	CA
	Ms	Edna	Broad			Ventura	CA
1	Mr.	Larry J.	Brown			Coronado	CA
	Mr.	Frank	Budroe			Ventura	CA
		W.U.	Buenger			Camarillo	CA
	Ms.	Elizabeth	Burke			Santa Barbara	CA
		Cal	Carrera			Camarillo	CA
	Mr.	Stephen	Castillo			El Centro	CA
	Mr	Ned	Chatfield			Camarillo	CA
		Don & Connie	Clay			Thousand Oaks	CA
		Hunter & Eileen	Cohen			Camarillo	CA
1		Bob & Sonia	Conroy			Camarillo	CA
	Mr.	Marty	Coyne			El Centro	CA
	Mr.	Thomas	Crager			Ventura	CA
	Mr.	Jim	Curley			Camarillo	CA
1	Mr.	Malcolm N.	Danoff			Coronado	CA
	Mr.	Dan	Davis			Camarillo	CA
	Mr.	Larry	Davis			Camarillo	CA
1	Ms	Violet	Devoe			Coronado	CA
		Perry	Dick			Camarillo	CA
	Mr	Raymond	DiZanella			Oxnard	CA
	Mr	John	Dodson			Camarillo	CA

Copies	Title	First	Last	Organization	Branch	City	State
	Mr.	Jesse	Dunlap			Camarillo	CA
	Mr.	John	Evans			Camarillo	CA
1	Mr.	John	Foss			Oxnard	CA
	Mr.	Al	Fox			Camarillo	CA
	Ms.	Cindy	Fox			Camarillo	CA
	Mr.	Scott	Gard			Oxnard	CA
1	Mr.	John	Geddie			Albuquerque	NM
	Ms.	Dorothy	George			El Centro	CA
	Mr.	Bruce	Giannimi			Seeley	CA
	Mr.	John	Goolsby			Camarillo	CA
		Randy	Griffith			Santa Barbara	CA
	Mr.	Bob	Grossman			Camarillo	CA
	Mr.	George	His			Agoura Hills	CA
	Mr.	William	Humestract			Camarillo	CA
		Bo & Barbara	Humphrey			Camarillo	CA
1	Ms.	Sally	Kaplan			Oxnard	CA
	Mr.	Gerard	Kapusuh			Ventura	CA
1	Ms.	Stephanie S.	Kaupp			Coronado	CA
	Mr.	Bob	Kelly			Camarillo	CA
	Mr.	Michael	Kitahara			Elk	CA
		Dane	Knight			El Centro	CA
1	Mr.	Jack	Koerder			San Diego	CA
	Mr.	John	Kromka			Camarillo	CA
1	Ms.	Bernadette	Kuller			NAS Lemoore	CA
	Mr.	Robert	Lagomarsino			Ventura	CA
1	Ms.	Linda	Landres			Coronado	CA
	Ms.	Cynthia	Leake			Camarillo	CA
1	Ms.	Barbara	Lebert			Camarillo	CA
		W.A.	Lebert			Camarillo	CA
		Pat	Lofgren			El Centro	CA
	Ms.	Margaret E.	Lonning			Camarillo	CA
	Mr.	Charles	Lourance			Oxnard	CA
	Mr.	Charles	Lowrance			Oxnard	CA
	Mr.	Ed	McHale			Camarillo	CA
	Mr.	Robert	Mendens			Camarillo	CA
	Mr.	Richard	Messina			Thousand Oaks	CA
	Mr.	Glenn	Miller			Camarillo	CA
1	Mr.	Tom	Miller			Coronado	CA
	Mr.	Steve	Monteleone			El Centro	CA
	Mr.	John	Moore			Camarillo	CA
	Mr.	Clarry	Morgan			Camarillo	CA
	Mr.	Michael	Morgan			Camarillo	CA
	Mr.	Joe	Neves			Stratford	CA
	Mr.	Mike	Nix			Oxnard	CA
	Mr.	Tony	Oliveria			Lemoore	CA
1	Mr.	James L.	Packard			Coronado	CA
	Ms.	Sherry	Parks			Lemoore	CA
	Ms.	Wilda	Parks			Hanford	CA
		Alec	Pringle			Oxnard	CA
	Mr.	Bob	Quinn			Oxnard	CA
	Mr.	Bill	Radford			Camarillo	CA
		Tew	Reid			Ventura	CA
	Ms.	Mary	Robinson			Ventura	CA
	Mr.	John	Rockford			Camarillo	CA

Copies	Title	First	Last	Organization	Branch	City	State
		Ned & Charlotte	Romune			Camarillo	CA
		Sandy	Salyer			Lemoore	CA
	Mr	Al	Sanders			Port Hueneme	CA
		Rollin	Sattle			Camarillo	CA
	Ms	Florence	Sattler			Camarillo	CA
	Mr.	Mike	Schneewind			El Centro	CA
	Mr.	Ethan	Scott			El Centro	CA
	Mr.	Bob	Scudder			Camarillo	CA
	Mr.	Don	Shoemaker			Camarillo	CA
	Ms.	Faye	Snyder			Camarillo	CA
1	Mr	Dennis L.	Solomon			Camarillo	CA
	Mr	Bruce	Steele			Santa Barbara	CA
	Ms	Helen	Surge			Camarillo	CA
		Mr. & Mrs.	Swanson			Camarillo	CA
		Lib	Tioniau			Camarillo	CA
		Chris	Valenzano			Camarillo	CA
	Ms.	Virginia	Van Vorst			Camarillo	CA
	Mr.	Vance	Vasquez			Camarillo	CA
	Mr.	Karl	Volland			Camarillo	CA
		Hallen	Wagenvoord			Oakland	CA
	Mr.	Bob	Warnagieris			Ventura	CA
	Mr.	John	Williams			Camarillo	CA
	Mr.	Bill	Zumwalt			Hanford	CA
	Mr.	Dean	Shores			Imperial	CA
	Mr.	Eugene	Morgan			Lemoore	CA
	Ms	Barbara	Barrett			Oxnard	CA
	Mr.	Gordon	Birr			Oxnard	CA
	Mr	Richard	Hopkins			Lemoore	CA
		Fred & Barbara	Griffith			Lemoore	CA
	Ms	Connie	Wlaschin			Lemoore	CA
	Ms	Mary Ann	Sarrah			Lemoore	CA
	Mr.	Tony	Barba			Hanford	CA
	Mr.	Richard T.	Lee Jr.			Camarillo	Ca
	Mr.	Dennis	Scalia				

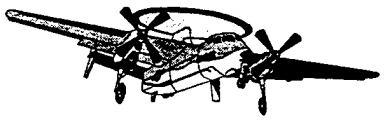
Libraries

1				City of Avenal	Public Library	Avenal	CA
1	Ms	Marie	Mello	City of Brawley	Public Library	Brawley	CA
1	Head Librarian	Sandi	Banks	City of Camarillo	Public Library	Camarillo	CA
1				City of Coronado	Public Library	Coronado	CA
1	Ms	Joann	Horne	City of El Centro	Public Library	El Centro	CA
1				City of Fresno	Public Library	Fresno	CA
1				City of Hanford	Public Library	Hanford	CA
1				City of Imperial Beach	Public Library	Imperial Beach	CA
1				City of Lemoore	Public Library	Lemoore	CA
1	Ms.	Chris	Kelley	City of Oxnard	Public Library	Oxnard	CA
1	Head Librarian	Mary	Lynch	City of Port Hueneme	Prueter Library	Port Hueneme	CA
1				City of San Diego	Public Library		
1				City of Ventura	Public Library	Ventura	CA
1	Head Librarian	Fred	Schmidt	Colorado State University	Documents Department	Fort Collins	CO
1	Ms	Carol	Keator	Santa Barbara Public Library		Santa Barbara	CA
1				Ventura City College	Library	Ventura	CA

Media

			Coronado Journal		Coronado	CA
			Fresno Bee	News Desk	Fresno	CA
Mr.	Michael	Todd	Hanford Sentinel		Hanford	CA
Editor			Holtville Tribune		Holtville	CA
Editor			Imperial Valley Press		El Centro	CA
Ms.	Chris	Chi	The Los Angeles Times	Ventura County Edition	Ventura	CA
			KABC Channel 7	Public Announcements	Los Angeles	CA
			KBBY FM 95.1/KOGO AM 1500	Public Announcements	Ventura	CA
			KDAR FM 98	Public Announcements	Oxnard	CA
			KEYT Channel 3	Public Announcements	Santa Barbara	CA
			KFSN TV Channel 30	Public Announcements	Fresno	CA
			KFTV Channel 21	Public Announcements	Fresno	CA
			KHAY FM 100-7	Public Announcements	Ventura	CA
			KJOP 1240 AM	Public Announcements	Lemoore	CA
			KOXR AM	Public Announcements	Oxnard	CA
	Noe	Diaz	KQVO Spanish Radio	Public Announcements	Calexico	CA
			KTYD FM	Public Announcements	Santa Barbara	CA
			KVEN AM 1450/KHAY FM 101	Public Announcements	Ventura	CA
			KVPR KPRX FM 89	Public Announcements	Fresno	CA
			KXBS FM 96.7	Public Announcements	Ventura	CA
			KXO AM & FM	Public Announcements	El Centro	CA
			KYMA TV Channel 11	Public Announcements	El Centro	CA
			La Opinion Newspaper		Van Nuys	CA
			Lemoore Advance	News Desk	Lemoore	CA
Ms.	Janice	Castillo	Oxnard Star-Free Press		Ventura	CA
			San Diego Union Tribune		San Diego	CA
Environmental Editor	Melinda	Burns	Santa Barbara News Press		Santa Barbara	CA
Mr.	Dan	Page	Ventura County Daily News	News Desk	Simi Valley	CA
Ms.	Cathy	Murillo	Ventura Independent		Ventura	CA
Mr.	James	Bernath	Ventura Star-Free Press		Ventura	CA

This page intentionally left blank.



11.0 Glossary and Index

CHAPTER 11
GLOSSARY AND INDEX

11.1 GLOSSARY

100-year flood zone	Land area having a one percent chance of being flooded during a given year.
Advisory Council on Historic Preservation	A 19-member body appointed, in part, by the President of the United States to advise the President and Congress, and to coordinate the actions of federal agencies on matters relating to historic preservation, to comment on the effects of such actions on historic and archaeological resources, and to perform other duties as required by law (Public Law 89-655; 16 USC 470).
Aesthetics	Referring to the perception of beauty.
Air installation compatible use zones (AICUZ)	A concept for achieving compatible land use around a military airfield. The AICUZ program recommends land uses that will be compatible with noise levels, accident potential, and flight clearance requirements associated with military airfield operations. Community noise equivalent levels (CNELs), shown as noise contour lines on AICUZ maps, prescribe what kind of land uses may occur at certain noise levels. Similarly, accident potential zones (APZs) limit the types of land uses that may occur below the zone.
Air traffic control authorized airspace (ATCAA)	ATCAAs are similar to MOAs in that they are used to accommodate aircraft maneuvering in airspace adjacent to the restricted areas and are broader and higher than the restricted areas. ATCAAs are used to afford military aircraft the opportunity for flight above 18,000 MSL.
Airfield waivers	When imaginary surface violations become necessary for safe navigation, a waiver is obtained from the NAVAIR. This allows a facility to erect structures that serve as navigational aids that extend above the imaginary surface.
Airport control zone	Normally a five-mile radius circle center on the airport.

Ambient air quality standards	Standards established on a state or federal level that define the limits for airborne concentrations of designated criteria pollutants (nitrogen dioxide, sulfur dioxide, carbon monoxide, ozone, lead), to protect public health with an adequate margin of safety (primary standards) and public welfare, including plant and animal life, visibility, and materials (secondary standards).
Aquifer	A layer of underground sand, gravel, or spongy rock in which water collects.
Archaeological site	Any location where humans have altered the terrain or discarded artifacts. The location of past cultural activity; a defined space with more or less continuous archaeological evidence.
Archaeology	A scientific approach to the study of human ecology, cultural history, and cultural process, emphasizing systematic interpretation of material remains.
Arterial	A roadway from which local routes branch.
Artifact	Any product or human cultural activity; more specifically, any tools, weapons, artworks, etc., found in archeological contexts.
Asbestos	A carcinogenic substance formerly used widely as an insulation material by the construction industry; often found in older buildings.
Assemblage	The complete inventory of artifacts from a single, defined archaeological unit (such as a stratum or component).
Attainment area	An area which meets the National Ambient Air Quality Standards for a criteria pollutant under the Clean Air Act or meets state air quality standards.
A-weighted decibel (dBA)	A number representing the sound level which is frequency weighted according to a prescribed frequency response established by the American National Standards Institute (ANSI-S1.4-1971) and accounts for the response of the human ear.
Before Present (BP)	Dating convention for cultural resources chronologies, defined as X years before present. Present is usually defined as 1950.
Best-management practices (BMPs)	Includes schedule of activities, prohibition of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States. BMPs also include treatment requirements, operating procedures, and practices to control plant site runoff spillage or leaks, sludge or waste disposal, or drainage from raw material storage.
Burial	Human remains disposed of by interment. Burials may be *simple* (containing the remains of one person) or *complex* (containing the remains of two or more individuals), *primary* (including the remains as originally interred), or *secondary* (where a reinternment follows a temporary disposal elsewhere).

Capacity (transportation)	The maximum rate of flow at which vehicles can be reasonably expected to traverse a point or uniform segment of a lane or roadway during a specified time period under prevailing roadway, traffic, and control conditions.
Capacity (utilities)	The maximum load a system is capable of carrying under existing service conditions.
Clean Air Act (CAA)	The CAA legislates that air quality standards set by federal, state, and county regulatory agencies establish maximum allowable emission rates and pollutant concentrations for sources of air pollution on federal and private property. Also regulated under this law is proper removal and safe disposal of asbestos from buildings other than schools.
Clean Water Act (CWA)	The CWA is the major federal legislation concerning improvement of the nations water resources. It provides for development of municipal and industrial wastewater treatment standards and a permitting system to control wastewater discharges to surface waters. The act contains specific provisions for regulation of ships' wastewater and disposal of dredge spoils within navigable waters. Section 404 of the act regulates disposal into waters of the United States, including wetlands.
Climate	The prevalent or characteristic meteorological conditions (and their extremes) of any given location or region.
Community Environmental Response Facilitation Act (CERFA)	A 1992 amendment to CERCLA, CERFA expedites the identification of uncontaminated real property within closing facilities which offer the greatest opportunity for reuse and redevelopment.
Community noise equivalent level	Noise compatibility level established by California Administrative Code, Title 21, Section 5000. The 24-hour average A-weighted sound level with a 5 dB weighting added to levels occurring between 10:00 PM and 7:00 AM
Comprehensive Environmental Response, Compensation, And Liability Act (CERCLA)	CERCLA, also known as Superfund, was enacted in 1980 to ensure that a source of funds is available to clean up abandoned hazardous waste dumps, compensate victims, address releases of hazardous materials, and establish liability standards for responsible parties. The act also requires creation of a National Priorities List which sets forth the sites considered to have the highest priority for cleanup under Superfund.
Contamination	The degradation of naturally occurring water, air, or soil quality either directly or indirectly as a result of human activities.
Council on Environmental Quality (CEQ)	Established by NEPA, the CEQ consists of three members appointed by the President. CEQ regulations (40 CFR 1500-1508, as of July 1, 1986) describe the process for implementing NEPA, including preparation of environmental assessments and environmental impact statements, and timing and extent of public participation.

Cultural	(1) The nonbiological and socially transmitted system of concepts, institutions, behavior, and materials by which a society adapts to its effective natural and human environment; (2) Similar or related assemblages of approximately the same age from a single locality or district, thought to represent the activities of one social group.
Cultural history	The archeological sequence of cultural activity through time, within a defined geographic space or relating to a particular group.
Cultural resources	Prehistoric and historic districts, sites, buildings, objects, or any other physical evidence of human activity considered important to a culture, subculture, or a community for scientific, traditional, religious, or any other reason. Native American resources are sites, areas, and materials important to Native Americans for religious or heritage reasons. Resources may include prehistoric sites and artifacts, contemporary sacred areas, traditional use areas (e.g., native Plant habitat), and sources for materials used in the production of sacred objects and traditional implements.
Cumulative impacts	The combined impacts resulting from the incremental impact of the proposed action when added to other past, present, and reasonably foreseeable future actions, regardless of which agency or person undertakes them.
Day-night average sound level (Ldn)	The 24-hour average-energy sound level expressed in decibels, with a 10 decibel penalty added to sound levels between 10:00 PM and 7:00 AM to account for increased annoyance due to noise during the night.
Decibel (dB)	A unit of measurement on a logarithmic scale which describes the magnitude of a particular quantity of sound pressure or power with respect to a standard reference value.
Developed	Said of land, a lot, a parcel, or an area that has been built upon, or where public services have been installed prior to residential or commercial construction.
Dredging	Removal of mud from the bottom of water bodies using a scooping machine.
Easement	An interest in land owned by another that entitles its holder to a specific limited use
Effluent	Waste material discharged into the environment.
Endangered species	A species that is threatened with extinction throughout all or a significant portion of its range.
Endangered Species Act (ESA)	The ESA requires federal agencies to determine the effects of their actions on endangered species and their critical habitats.
Environmental impact statement (EIS)	A document required of federal agencies by NEPA for major projects or legislative proposals significantly affecting the environment. A tool for decision making, the EIS describes the positive and negative effects of the undertaking and lists alternative actions.

Equivalent noise levels (Leq)	Equivalent noise levels are used to develop single-value descriptions of average noise exposure over various periods of time.
Ethnohistory	The description of indigenous human groups and their behavior prior to and during contact with Euro-Americans. Ethnohistorical data was obtained by direct observation and/or by transcription of statements by living persons in the late 1800s and early 1900s, and in some cases, projected into the past.
Fault	Fracture in earth's crust accompanied by a displacement of one side of the fracture with respect to the other and in a direction parallel to the fracture.
Feasibility study (FS)	The feasibility study identifies and evaluates all applicable site cleanup alternatives. For most sites, a long list of alternatives are possible. A risk assessment is performed as part of the study to quantify the level of risk to the public and environment posed by the site. Often, the risk assessment determines which alternative is selected for final remediation. Each alternative is evaluated for effectiveness in protecting human health and the environment, ease of implementation, and overall cost. Typically, the remedial investigation and FS are performed concurrently.
Feature	A large, complex artifact or part of a site such as a hearth, cairn, housepit, rock alignment, or activity area.
Federal airways	Federal airways are corridors for civilian air traffic. These airways are shown with a "V" or a "J" and a number designation. "V" is for vector corridors that cover elevations up to 18,000 feet above MSL, while "J" is for jet corridors that cover elevations over 18,000 feet above MSL.
Ground water	Water within the earth that supplies wells and springs.
Hazard Ranking System (HRS)	This system provides a uniform method of scoring or ranking of the potential risk of a facility site where a hazardous substance has been present. The EPA developed the HRS to prioritize their cleanup efforts. The EPA evaluates the draft HRS packages and proposes any facilities scoring over 28.5 or higher for inclusion on the National Priorities List (NPL). Facilities which are listed on the NPL receive the highest priority.
Hazardous material	A substance or mixture of substances that poses a substantial present or potential risk to human health or the environment. Any substance designated by the EPA to be reported if a designated quantity of the substance is spilled in the waters of the United States or if it is otherwise released into the environment.
Hazardous waste	A waste or combination of wastes which, because of its quantity, concentration, or physical, chemical, or infectious characteristics, may either cause or significantly contribute to an increase in mortality or an increase in serious irreversible illness; or pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, disposed of, or otherwise managed. Regulated under RCRA.

Historic district	National Register of Historic Places designation of a geographically defined area (urban or rural) possessing a significant concentration, linkage, or continuity of sites, structures, or objects united by past events or aesthetically by plan of physical development.
Historic/history	A period of time after the advent of written history dating to the time of first Euro-American contact in an area. Also refers to items primarily of Euro-American manufacture.
Holocene	The time since the end of the Pleistocene epoch, characterized by the absence of large continental or Cordilleran ice sheets and the extinction of large mammalian lifeforms. Generally considered to be the last 10,000 years.
Imaginary surfaces	The maximum safe height of buildings, towers, poles, and other possible obstructions to air navigation are defined by imaginary surfaces. Imaginary surfaces are another way to describe clearances for air navigation. These surfaces are invisible planes that radiate, at various increasing heights from the runway or helicopter pad. The FAA considers any terrain or man-made objects that extend above the imaginary surface an obstruction. Imaginary surfaces include the primary surface, the approach-departure surface, the inner horizontal surface, the conical surface, the outer horizontal surface, and transitional surfaces.
Impacts	An assessment of the meaning of changes in all attributes being studied for a given resource; an aggregation of all the adverse effects, usually measured using a qualitative and nominally subjective technique.
Infrastructure	The basic installations and facilities on which the continuance and growth of a locale depend (roads, schools, power plants, transportation, and communication systems).
Installation Restoration Program (IRP)	A program established by the Department of Defense to meet requirements of CERCLA of 1980 and SARA of 1986 which identifies, assesses, and cleans up or controls contamination from past hazardous waste disposal practices and hazardous material spills.
Level of Service (LOS)	In transportation analysis, a qualitative measure describing operational conditions within a traffic stream and how they are perceived by motorists and/or pedestrians. Usually given a letter grade from A to F, with A being free-flow; E, capacity; and F, forced-flow. Factors considered in LOS analyses include speed, travel time, traffic interruptions, freedom of maneuver, safety, driving comfort, and convenience. In public services, a measure describing the amount of public services available to community residents, generally expressed as the number of personnel providing service per 1,000 population.
Liquefaction	The transformation during an earthquake of unconsolidated, water-saturated sediment into a liquid form.

Long-term	Impacts that would occur over an extended period of time, whether they start during the construction or operations phase. Most impacts from the operations phase are expected to be long term since program operations essentially represent a steady-state condition (i.e., impacts resulting from actions that occur repeatedly over a long period of time). However, long-term impacts could also be caused by construction activities if a resource is destroyed or irreparably damaged or if the recovery rate of the resource is very slow.
Marsh	A type of wetland that does not accumulate appreciable peat deposits and is dominated by herbaceous vegetation. Marshes may be either fresh or salt water and tidal or nontidal.
Master plan	Land use on military bases is planned and documented in a Master Plan. A Master Plan is used in the short-term to site new construction projects, but also serves as a guide for achieving long-term development objectives. The purpose of a Master Plan is to provide realistic and orderly planning and to ensure logical and efficient use and development of base facilities and real estate.
Migratory Bird Treaty Act	This act prohibits the taking or harming of a migratory bird, its eggs, nests, or young without the appropriate permit.
Military operating area (MOA)	MOAs exist to accommodate aircraft maneuvering in airspace adjacent to the restricted areas and are broader and higher than the restricted areas. MOAs can extend up to 18,000 feet above MSL, but not beyond. Non-hazardous military training activities such as air combat maneuvers, air intercepts, and aerobatics are conducted in the MOAs.
Military training routes (MTRs)	MTRs are shown by a visual route (VR) or instrument route (IR) designation. MTRs are often low altitude routes and are used for access to or from MOAs or for cross-country flight practice. Essentially, MTRs are airways for military aircraft.
Mitigation	A method or action to reduce or eliminate program impacts.
Multi-family housing	Townhouse or apartment units that accommodate more than one family though each dwelling unit is only occupied by one household.
National Environmental Policy Act (NEPA)	Public Law 91-190, passed by Congress in 1969, established a national policy designed to encourage consideration of the influence of human activities on the natural environment. NEPA also established the Council on Environmental Quality. NEPA procedures require that environmental information be made available to the public before decisions are made.
National Historic Preservation Act (NHPA)	The NHPA protects cultural resources. Section 106 of the act requires a federal agency to take into account the potential effect of a proposed action on properties listed on or eligible for listing on the National Register of Historic Places.

National Pollution Discharge Elimination System (NPDES)	The NPDES is a provision of the Clean Water Act which prohibits discharge of pollutants into waters of the United States unless a special permit is issued by the EPA or state.
National Priorities List (NPL)	A list of sites (federal and state) where releases of hazardous materials may have occurred and may cause an unreasonable risk to the health and safety of individuals, property, or the environment.
National Register of Historic Places (NRHP)	A register of districts, sites, buildings, structures, and objects important in American history, architecture, archaeology, and culture, maintained by the Secretary of the Interior under the authority of Section 2(b) of the Historic Sites Act of 1935 and Section 101(a)(1) of the National Historic Preservation Act of 1966, as amended.
Native American Graves Protection and Repatriation Act (NAGPRA)	NAGPRA defines the ownership and control of Native American human remains and associated funerary objects discovered or recovered from federal or tribal land.
Native Americans	Used in the collective sense to refer to individuals, bands, or tribes who trace their ancestry to indigenous populations of North America prior to Euro-American contacts.
Native vegetation	Plant life that occurs naturally in an area without agricultural or cultivational efforts. It does not include species that have been introduced from other geographical areas and have become naturalized.
Natural gas	A natural fuel containing primarily methane and ethane that occurs in certain geologic formations.
Noncontributing resource	A resource (e.g., a building) that is located within the boundaries of a National Register District but that does not contribute to the eligibility of the district. A "non-contributing" building or structure is not eligible for the National Register of Historic Places.
Nonnative species	Species that have invaded or been introduced into an area.
Paleo-Indian	Prehistoric hunter-gatherer populations characterized by efficient adaptations to terminal Pleistocene environments in which small bands exploited megafauna such as mammoth.
PCB-contaminated equipment	Equipment which contains a concentration of PCBs from 50 to 449 ppm or greater. Disposal and removal are regulated by the EPA.
Peak hour	The hour of highest traffic volume on a given section of roadway between 7:00 AM and 9:00 AM or between 4:00 PM and 6:00 PM.
Permit	An authorization, license, or equivalent control document to implement the requirements of an environmental regulation.

Pleistocene	The last 1.6 million years of geological history, marked by repeated glaciation and the first indication of social life in human beings.
Polychlorinated biphenyls (PCBs)	Any of a family of industrial compounds produced by chlorination of biphenyl. These compounds are noted chiefly as an environmental pollutant that accumulates in organisms and concentrates in the food chain with resultant pathogenic and teratogenic effects. They also decompose very slowly.
Potable water	Water that is suitable for drinking.
Prehistoric/Prehistory	The period of time before the written record, and before Euro-Americans entered an area.
Prehistory	The archeological record of nonliterate cultures; the cultural past before the advent of written records.
Preliminary assessment (PA)	The PA identifies areas of potential contamination and evaluates each area to determine if a threat to human health or the environment exists. A PA report is developed from readily available information such as past inventory records, aerial photographs, employee interviews, existing analytical data, and a site visit. A PA may recommend no further action, additional work, or a removal action.
Radon	A colorless, naturally occurring, radioactive, inert gaseous element formed by radioactive decay of radium in soil or rocks.
Record of Decision (ROD)	The document prepared under the federal government that documents the reasoning behind the decision.
Recycling	The process of minimizing the generation of waste by recovering usable products that might otherwise become waste.
Region of influence (ROI)	For each resource, the region affected by the proposed action or alternatives and used for analysis in the affected environment and impact discussion.
Remedial action	During the remedial action (RA) phase, the selected cleanup technology is implemented. RA can be as simple as soil excavation or as complicated as a complete ground water treatment system that operates for many years. Remedial action work plans for long term remediations will include Operation and Maintenance (O&M) plans. O&M efforts continue until the cleanup is complete.
Remedial investigation (RI)	This investigation is performed to more fully define the nature and extent of the contamination at a site and evaluate possible methods of cleaning up the site. During the investigation, ground water, surface water, soil, sediment, and biological samples are collected and analyzed to determine the type and concentration of each contaminant. Samples are collected at different areas and depths to help determine the spread of contamination.

Removal actions	In the event of an immediate threat or potential threat to human health or the environment, a short term mitigating or cleanup action may be implemented. The goal of the removal action is to isolate the contamination hot spot and its source from all biological receptors. Usually, removal actions do not completely clean up a site, and additional remediation steps are required.
Resource Conservation and Recovery Act (RCRA)	RCRA was enacted in 1976 as the first step in regulating the potential health and environmental problems associated with hazardous waste disposal. RCRA and the regulations developed by EPA to implement its provisions provide the general framework of the national hazardous waste management system, including the determination of whether hazardous wastes are being generated, techniques for tracking wastes to eventual disposal, and the design and permitting of hazardous waste management facilities.
Restricted use airspace	Restricted use airspace is an area of limited dimensions wherein military activities must be confined because of their nature or wherein limitations may be imposed upon aircraft operations that are not a part of those activities.
Runoff	The noninfiltrating water entering a stream or other conveyance channel shortly after a rainfall event.
Safe Drinking Water Act (SDWA)	The SDWA establishes the amount of concentrated contaminants allowable in public drinking water. The SDWA also reviews federal agencies which maintain public water supply or contribute to groundwater contamination following all applicable requirements issued by the state.
Seismicity	Relative frequency and distribution of earthquakes.
Short-term	Transitory effects of the proposed program that are of limited duration and are generally caused by construction activities or operations start-up.
Significance	The importance of a given impact on a specific resource as defined under the Council on Environmental Quality regulations.
Single-family housing	A conventionally built house consisting oaf a single dwelling unit occupied by one household.
Site discovery	A site is an area that has or has had the potential for a hazardous substance release. A single facility may contain several sites to be studied. Potential sites are occasionally discovered by searching through records or during construction projects.
Site inspection (SI)	An inspection conducted after a preliminary assessment when additional information is needed to evaluate the site. The collection and analysis of soil, sediment, and surface or ground water samples may help determine the need for further study. The site inspection collects any information needed for hazard ranking. The SI may recommend a site for no action, further study, or an immediate removal action.

Soil	A natural body consisting of layers or horizons of mineral and/or organic constituents of variable thickness and differing from the parent material in their morphological, physical, chemical, and mineralogical properties and biological characteristics.
Soil types	A category or detailed mapping unit used for soil surveys based on phases or changes within a series (e.g. slope, salinity).
Solid waste management	Supervised handling of waste materials from their source through recovery processes to disposal.
State Historic Preservation Officer (SHPO)	The official within each state, authorized by the state at the request of the Secretary of the Interior, to act as liaison for purposes of implementing the National Historic Preservation Act.
Stratigraphy	The study of cultural and natural strata or layers in archeological and geological deposits, particularly with the aim of determining the relative age of strata.
Superfund Amendments and Reauthorization Act (SARA)	SARA was enacted in 1986 to increase the Superfund to $8.5 billion, modify contaminated site cleanup criteria scheduling, and revise settlement procedures. It also provides a fund for leaking underground storage tank cleanups and a broad, new emergency planning and community right to know program.
Surface water	All water naturally open to the atmosphere and all wells, springs, or other collectors which are directly influenced by surface water.
Threatened species	Plant and wildlife species likely to become endangered in the foreseeable future.
Toxic	Harmful to living organisms.
Toxic Substances Control Act (TSCA)	TSCA provides authority to test and regulate chemicals to protect human health. Substances regulated under TSCA include asbestos and PCBs.
Traffic, peak hour	The highest number of vehicles observed to traverse a section of roadway during 60 consecutive minutes.
Tribelet	The basic autonomous, self-governing, and independent sociopolitical group in aboriginal California; an aggregation of several villages under the authority of a single chief.
US Environmental Protection Agency	The independent federal agency established in 1970 to regulate federal environmental matters and oversees the implementation of federal environmental laws.
Visual Resources	Natural and man-made features that constitute aesthetic qualities and values.
Waters of the United States	Waters that are subject to Section 404 of the Clean Water Act. These include both deep water aquatic habitats and special aquatic sites, including wetlands.

Wetlands	Areas that are inundated or saturated with surface or groundwater at a frequency and duration sufficient to support a prevalence of vegetation typically adapted for life in saturated soil. This classification includes swamps, marshes, bogs, and similar areas. Jurisdictional wetlands are those wetlands that meet the vegetation, soils, and hydrology criteria under normal circumstances (or meet the special circumstances as described in the US Army Corps of Engineers, 1987 wetland delineation manual where one or more of these criteria may be absent) and are a subset of Waters of the United States.
Zoning	The division of a municipality into districts for the purpose of regulating land use, types of buildings, required yards, necessary off-street parking, and other prerequisites to development. Zones are generally shown on a map and the text of the zoning ordinance specifies requirement for each zoning category.

11.2 INDEX

A

Aboveground Storage Tank (AST) 3-158, 3-169
accident potential zone (APZ) 3-33, 3-34, 3-42, 3-46, 3-51, 3-57, 3-101, 3-143, 3-145, 3-146, 3-148, 3-153, 4-14, 4-15, 4-16, 4-17, 4-19, 4-87, 4-88, 4-89, 4-90, 5-5
Advisory Council on Historic Preservation (ACHP) 2-29, 4-82
air installation compatible use zone (AICUZ) 2-30, 3-32, 3-33, 3-34, 3-42, 3-46, 3-51, 3-57, 3-59, 3-101, 3-102, 3-104, 3-107, 3-110, 3-143, 4-2, 4-14, 4-15, 4-16, 4-17, 4-18, 4-19, 4-87, 4-90
Air Pollution Control District (APCD) 2-28, 2-32, 3-94, 3-97, 4-48, 4-49, 4-52, 4-53, 4-55
Air Quality Management District 2-24
air route traffic control center (ARTCC) 3-33, 3-37, 3-46, 3-53, 4-16, 4-88
air traffic control authorized airspace (ATCAA) 3-32, 3-33
Airborne Early Warning Wing Pacific (AEWWINGPAC) 1-2, 2-6, 2-10, 2-11, 2-15, 2-16, 2-21, 2-23, 2-30, 2-31, 2-30, 2-31, 3-167, 3-168, 3-171, 4-7, 4-8, 4-16, 4-17, 4-18, 4-19, 4-21, 4-90
Aircraft Intermediate Maintenance Department (AIMD) 2-5, 2-6, 2-11, 2-16, 2-21, 2-31, 3-114, 4-7, 4-8, 4-16, 4-17, 4-18, 4-19, 4-21, 4-65, 4-66, 4-90
applied instruction building (AIB) 2-6, 2-10, 2-11, 2-15, 2-16, 2-21, 2-31, 3-114, 3-171, 4-5, 4-7, 4-8, 4-16, 4-17, 4-18, 4-19
area of potential effect (APE) 3-136, 3-137, 3-138, 3-139, 3-140, 3-141, 4-83, 4-84, 4-85, 4-86
Army Corps of Engineers 3-6, 3-25, 4-10
asbestos 3-156, 3-157, 3-162, 3-165, 3-171, 3-172, 4-93, 4-95, 4-96
asbestos-containing material (ACM) 3-157, 3-162, 3-166, 3-172, 4-93, 4-95, 4-96
authority to construct (ATC) 3-91
average daily trips (ADT) 3-77, 3-81, 4-32, 4-36, 4-41
A-weighted decibel sound level (dBA) 3-100, 3-107, 3-109, 3-112, 4-58, 4-59, 4-61, 4-62, 4-63, 5-13, 5-22

B

bachelor enlisted quarters (BEQ) 2-6, 2-10, 2-11, 2-15, 2-16, 2-21, 2-30, 3-69, 3-73, 3-107, 3-116, 3-117, 3-166, 3-167, 4-7, 4-8, 4-16, 4-17, 4-18, 4-19, 4-31, 4-51, 4-52, 4-54, 4-55, 5-17, 5-19
bachelor office quarters (BOQ) 3-64, 3-69, 3-73, 3-107
Base Closure and Realignment Commission (BRAC) 1-1, 1-3, 1-5, 1-6, 1-7, 2-3, 2-5, 2-7, 2-23, 4-69
Base Exterior Architecture Plan (BEAP) 3-115, 3-117, 3-118, 4-65, 4-66, 4-67
bird air strike hazard (BASH) 4-6

C

California Air Resources Board (CARB) 2-28, 3-90, 3-91, 3-92, 3-94, 3-95, 3-96, 3-98, 3-99
California Clean Air Act (CCAA) 3-95
California Coastal Act (CCA) 2-28, 3-36
California Coastal Commission (CCC) 2-28, 3-36, 4-19
California Coastal Management Program (CCMP) 3-35, 3-36
California Code of Regulations (CCR) 3-103, 3-158, 3-159
California Department of Fish and Game (CDFG) 3-2, 3-6, 3-7, 3-15, 3-20
California Department of Toxic Substances Control 3-158, 3-162, 3-166, 3-171, 3-172
California Health and Safety Code (CH&SH) 3-159
Calleguas Municipal Water District (CMWD) 3-121
carbon monoxide (CO) 3-7, 3-88, 3-90, 3-91, 3-94, 3-95, 3-96, 3-97, 3-98, 3-99, 4-3, 4-45, 4-46, 4-49, 4-53, 4-55, 5-3, 5-12, 5-22
Castle Air Force Base 3-46
Central Valley Project Improvement Act (CVPIA) 5-15
Chief of Naval Operations (CNO) 1-1, 2-13, 3-156, 3-170
Clean Air Act (CAA) 1-3, 2-7, 2-23, 2-24, 2-28, 2-31, 3-91, 3-92, 3-94,

..... 3-95, 3-157, 4-3, 4-45, 4-46, 4-47, 4-49, 4-50, 4-51, 4-53, 4-54, 5-13, 5-22
Clean Water Act (CWA) 2-28, 3-6, 3-22, 3-119, 4-11, 4-12, 4-13
Coastal Consistency Determination (CCD) 2-28, 3-36, 4-16, 4-19, 4-65
coastal zone 3-36, 3-114, 4-2, 4-14, 4-16, 4-65
Coastal Zone Management Act (CZMA) 2-28, 3-35, 3-36, 4-16, 4-19, 4-65
Code of Federal Regulations (CFR) 1-1, 1-6, 3-6, 3-90, 3-92, 3-94, 3-136, 3-156, 3-158, 3-159, 4-1, 5-1, 6-5
Commander Naval Air Force Pacific Fleet (COMNAVAIRPAC) 2-3
community noise equivalent levels (CNEL) ..... 2-30, 3-34, 3-42, 3-46, 3-51, 3-59, 3-100, 3-101, 3-103, 3-104, ... 3-106, 3-107, 3-109, 3-110, 3-112, 4-14, 4-16, 4-18, 4-19, 4-57, 4-58, 4-59, 5-2, 5-13, 5-24, 6-4, 6-5
Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) 3-156, 3-157, 3-166
Council on Environmental Quality (CEQ) 1-1, 4-1, 5-1

D

day-night average sound level (Ldn) 3-100, 3-103, 3-107
decibel (dB) 3-2, 3-100, 3-101, 3-103, 3-104, 3-106, 3-107, 3-109, 3-110, 3-112, 4-57, 4-59, 4-62, 5-13, 5-24
Defense Base Closure and Realignment Act (DBCRA) 1-1, 2-23
Defense Base Closure and Realignment Commission 1-1, 4-69
Department of Defense (DOD) 2-20, 3-120, 3-136, 3-164, 3-170, 3-173, 4-56
Department of Health Services (DHS) 3-103, 3-165
Department of Toxic Substance Control (DTSC) 3-158, 3-162, 3-166, 3-171, 3-172
Department of Water Resources (DWR) 3-22, 3-23, 3-26, 3-28, 3-29

E

Economic Impact Forecast System (EIFS) 4-20, 4-23, 4-25, 4-27, 4-69, 5-7, 5-8, 5-15, 5-17, 5-18
electromagnetic radiation ..... 3-143, 3-144, 3-146, 3-148, 3-149, 3-150, 3-152, ... 3-153, 3-155, 4-87, 4-88, 4-89, 4-90, 5-5, 5-16, 5-25
environmental justice 6-1
Environmental Protection Agency ..... 2-24, 2-28, 3-22, 3-25, 3-91, 3-156, 3-157, 3-158, ... 3-159, 3-160, 3-163, 3-165, 3-170, 3-173, 4-58, 5-6, 5-16, 5-25, 6-1
equivalent noise level (Leq) 3-100
explosive safety quantity distance (ESQD) ..... 3-143, 3-144, 3-146, 3-147, 3-148, ... 3-150, 3-151, 3-153, 3-154, 4-88, 4-89, 4-90, 5-5, 5-16, 5-25

F

F/A-18 ..... 1-7, 2-7, 2-13, 5-6, 5-7, 5-9, 5-11, 5-12, 5-13, 5-15, 5-16, 5-17, 5-19, 5-21, 5-22, 5-24, 5-25
Feasibility Study (FS) 3-157, 3-166
Federal Aviation Administration (FAA) ..... 3-32, 3-33, 3-34, 3-40, 3-42, 3-53, 3-57, 3-143, ... 3-150, 4-7, 4-16, 4-88, 4-89
Federal Emergency Management Agency (FEMA) 3-22
Federal Highway Administration (FHWA) 3-93
field carrier landing practice (FCLP) 2-2, 2-4, 2-13, 2-24, 2-25, 3-57, 3-153, 4-6, 4-7, 5-16
flooding 3-25, 3-28, 3-31, 4-10, 4-11, 4-12

G

ground water 3-6, 3-22, 3-23, 3-26, 3-28, 3-29, 3-31, 3-121, 4-10, 4-93
ground water quality 3-22

H

HERO 3-144, 3-146, 3-148, 3-150, 4-88, 5-6, 5-16, 5-25
HERP 3-144, 3-146, 5-6, 5-16, 5-25

I

Imperial Irrigation District (IID) 3-29, 3-31, 3-72, 3-130, 3-132, 4-78, 4-80, 5-24
inhalable particulate matter (PM_{10}) 2-28, 2-31, 3-89, 3-90, 3-91, 3-92, 3-93, 3-94, 3-95, 3-96, 3-97, 3-98, 3-99, 4-45, 4-47, 4-49, 4-50, 4-51, 4-52, 4-53, 4-54, 4-55, 5-12, 5-21, 5-22
Installation Restoration Program (IRP) 3-157, 3-161, 3-162, 3-163, 3-164, 3-165, 3-166, 3-168, 3-170, 3-171, 3-172, 4-93, 4-95, 4-96
instrument flight rule (IFR) 3-32, 3-33, 3-40, 3-145, 4-88, 4-89

K

Kings County Waste Management Authority (KCWMA) 3-127, 4-76

L

lead 1-1, 3-88, 3-92, 3-119, 3-156, 3-159, 4-94, 4-96, 4-97
lead-based paint (LBP) 3-159, 3-164, 3-170, 3-173, 4-94, 4-96, 4-97
Level of Service (LOS) 3-75, 3-76, 3-77, 3-79, 3-80, 3-81, 3-83, 3-84, 3-85, 3-87, 4-29, 4-30, 4-34, 4-35, 4-37, 4-39, 4-40, 4-41, 4-42, 4-44, 5-3, 5-4, 5-9, 5-10, 5-11, 5-19, 5-20, 5-21
Local Coastal Program (LCP) 3-36
long-range views 3-115, 3-116

M

Marine Corps air station (MCAS) 1-3, 1-7, 2-7, 2-23
mean sea level (MSL) 1-2, 2-3, 2-10, 2-13, 2-20, 3-23, 3-26, 3-29, 3-32, 3-33, 3-46, 3-114, 3-116, 3-117, 3-148, 3-150
Migratory Bird Treaty Act 4-2, 4-5, 4-6, 4-8, 4-9
military operations area 3-32, 3-33, 3-46, 3-53
Morale, Welfare, and Recreation (MWR) 3-62, 3-68, 3-124

N

National Emissions Standards for Hazardous Air Pollutants (NESHAP) 3-157
National Environmental Policy Act (NEPA) 1-1, 1-5, 1-6, 1-7, 1-9, 1-10, 2-23, 2-24, 2-25, 3-119, 4-1, 4-46, 4-50, 4-53, 5-1, 6-1, 6-5
National Historic Preservation Act (NHPA) 2-29, 2-33, 3-136, 4-82, 4-84, 5-5
National Pollutant Discharge Elimination System (NPDES) 2-28, 3-22, 3-119, 3-122, 3-126, 3-131, 4-79
National Register of Historic Places (NRHP) 3-135, 3-136, 3-137, 3-138, 3-139, 3-140, 3-141, 3-142, 4-82, 4-83, 4-85, 4-86
Native American Graves Protection and Repatriation Act (NAGPRA) 4-82
Native American resources 3-139, 3-141, 4-82, 4-86
Naval Aviation Support Engineering Unit (NAESU) 2-6, 4-21
Navy hazards of electromagnetic radiation to personnel program 3-144, 3-146, 5-6, 5-16, 5-25
Navy regulations for hazards of electromagnetic radiation to ordnance 3-144, 3-146, 3-148, 3-150, 4-88, 5-6, 5-16, 5-25
Notice of Intent (NOI) 1-8, 1-9, 3-119

O

Occupational Safety and Health Administration (OSHA) 3-157, 3-159
oil/water separator (OWS) 3-156, 3-158, 3-162, 3-163, 4-94, 4-95, 4-97
operational trainer facility (OTF) 2-6, 2-10, 2-11, 2-15, 2-16, 2-21, 2-31, 3-8, 3-114, 3-167, 3-168, 3-171, 4-5, 4-7, 4-8, 4-14, 4-15, 4-16, 4-17, 4-18, 4-19, 4-36, 4-90
ordnance 3-143, 3-144, 3-146, 3-150, 3-153, 3-156, 3-164, 3-170, 3-174, 4-88, 4-89, 4-90, 4-94, 4-96, 4-97
Oxnard Drainage Ditch (ODD) 3-25
ozone (O_3) 2-28, 2-31, 2-32, 3-88, 3-89, 3-90, 3-91, 3-93, 3-94, 3-95, 3-96, 3-97, 3-98, 3-99, 4-45, 4-46, 4-48, 4-49, 4-50, 4-51, 4-52, 4-53, 4-55, 5-3, 5-12, 5-21

P

permit to operate (PTO) 3-91
pesticides 3-22, 3-23, 3-156, 3-159, 3-163, 3-164, 3-170, 3-173, 4-94, 4-95, 4-97
Point Mugu Regional Airport Authority (PMRAA) 3-42
polychlorinated biphenyls (PCBs) 3-156, 3-158, 4-4, 4-92, 4-93, 4-95, 4-97, 5-2
Port Hueneme Water Agency (PHWA) 3-121, 4-70
Preliminary Assessment (PA) 3-124, 3-157
public involvement 1-6, 1-8
public scoping 1-8
public transit 3-79

R

radar air traffic control facility (RATCF) 3-37, 3-40, 3-46
radon 3-156, 3-160, 3-164, 3-170, 3-174, 4-94, 4-96, 4-97
Record of Decision (ROD) 1-7, 1-9, 1-10, 2-24, 3-157
Record of Non-applicability (RONA) 2-28, 4-53
Region of Influence (ROI) 1-6, 3-1, 3-2, 3-23, 3-26, 3-29, 3-36, 3-44, 3-51, 3-61, 3-62, 3-64, 3-65, 3-66, 3-68, 3-70, 3-71, 3-76, 3-79, 3-80, 3-81, 3-84, 3-87, 3-95, 3-97, 3-104, 3-106, 3-109, 3-114, 3-115, 3-117, 3-121, 3-125, 3-130, 3-137, 3-138, 3-141, 3-144, 3-148, 3-150, 3-160, 3-164, 3-170, 4-6, 4-20, 4-23, 4-26, 4-27, 4-69, 4-70, 4-71, 4-72, 4-73, 4-74, 4-75, 4-76, 4-77, 4-78, 4-79, 4-80, 4-81, 5-7, 5-17
Regional Water Quality Control Board (RWQCB) 2-28, 3-22, 3-119, 3-126, 3-131, 3-166, 3-169, 3-172, 4-79
Resource Conservation and Recovery Act (RCRA) 3-119, 3-156, 3-157, 3-158, 4-92
respirable particulate matter 2-28, 2-31, 3-89, 3-90, 3-91, 3-93, 3-94, 3-95, 3-96, 3-97, 3-98, 3-99, 4-45, 4-47, 4-49, 4-50, 4-51, 4-52, 4-53, 4-54, 4-55, 5-12, 5-21, 5-22

S

San Joaquin Valley Unified Air Pollution Control District 3-97, 4-52
sensitive views 4-67
Southern California Association of Governments (SCAG) 3-42
Southern California Operations Area 2-4
special compartmented information facility (SCIF) 2-6, 2-10, 2-11, 2-15, 2-20
Spill Prevention Control and Countermeasure Plan (SPCC) 3-163, 3-169, 3-173
standard operating procedures (SOP) 1-2, 3-145, 4-88, 4-89, 4-90
State Historic Preservation Officer (SHPO) 2-29, 3-138, 4-82
State Implementation Plan (SIP) 2-31, 2-32, 3-92, 3-93, 3-94, 3-95, 3-96, 3-97, 3-99, 4-46, 4-47, 4-48, 4-49, 4-51, 4-52, 4-53, 4-54
State Water Resources Control Board (SWRCB) 3-22, 3-119
Storm Water Pollution Prevention Plan (SWPPP) 4-11, 4-12, 4-13
sulfur oxides 3-89, 3-96, 5-12, 5-22
surface water 3-1, 3-22, 3-23, 3-28, 3-121, 4-10, 4-11, 4-12, 4-13, 5-1

T

threatened species 3-7, 3-14
Toxic Substance Control Act (TSCA) 3-157, 3-158, 3-159

U

Underground Storage Tank (UST) 3-158, 3-162, 3-168, 3-169, 3-172, 3-173
US Code (USC) 3-94, 3-136, 3-159, 4-7, 5-1
US Environmental Protection Agency (USEPA) 2-24, 2-28, 3-22, 3-25, 3-91, 3-156, 3-157, 3-158, 3-159, 3-160, 3-163, 3-165, 3-170, 3-173, 4-58, 5-6, 5-16, 5-25, 6-1
US Fish and Wildlife Service (USFWS) 2-29, 3-2, 3-3, 3-6, 3-7, 3-14, 3-15, 3-20

V

Ventura County Air Pollution Control District 4-48, 4-49
Ventura County Game Reserve 3-37, 3-42
visual flight rule (VFR) 3-32, 3-33, 3-40, 3-145, 4-88, 4-89

W

wastewater 2-28, 3-26, 3-29, 3-31, 3-119, 3-121, 3-122, 3-125, 3-126, 3-130, 3-131, 3-163, 3-173, 4-69, 4-71, 4-75, 4-79
Water Quality Control Plans (WQCP) 3-22
Western Area Power Administration (WAPA) 3-127, 4-76
Westlands Water District 3-10, 3-28, 3-125, 4-74, 5-15
wetlands 3-5, 3-6, 3-10, 3-18, 3-22, 3-23, 3-25, 4-2, 4-5, 4-7, 4-8