FINAL ENVIRONMENTAL IMPACT STATEMENT
US NAVY F-35C WEST COAST HOMEBASING

VOLUME I

CHAPTERS 1 – 10

MAY 2014

Prepared by:
Department of the Navy

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VOLUME I

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In accordance with Department of the Navy NEPA Regulations (32 CFR 775)
Pursuant to National Environmental Policy Act Section 102(2) (C)

FINAL ENVIRONMENTAL IMPACT STATEMENT
US NAVY F-35C WEST COAST HOMEBASING
MAY 2014

Lead Agency:	Department of the Navy
Title of Proposed Action:	US Navy F-35C West Coast Homebasing
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Prepared by:	United States Fleet Forces, Department of the Navy
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Abstract

The proposed action addressed in this Environmental Impact Statement (EIS) is to provide facilities and functions on the West Coast of the United States (US) to support homebasing F-35C aircraft in the Navy Pacific Fleet. The purpose of the proposed action is to replace aging Navy Pacific Fleet FA-18 Hornet aircraft with F-35C aircraft while meeting pilot training and readiness requirements. Facility development needed to support F-35C homebasing may begin as early as 2015. Seven Pacific Fleet FA-18 squadrons (70 total aircraft) currently based at Naval Air Station (NAS) Lemoore would progressively transition to the new F-35C aircraft beginning in 2015 with the transition to be complete by 2028. The plan would also involve the establishment no earlier than 2017 of an F-35C Fleet Replacement Squadron consisting of approximately 30 F-35C aircraft to meet the requirements for training Navy pilots. This EIS reviews and assesses two action alternatives and the No Action Alternative. The two installations that best meet Navy requirements for homebasing the F-35C on the West Coast are Naval Air Facility (NAF) El Centro and NAS Lemoore. Under the No Action Alternative, the Navy would not provide facilities and functions on the West Coast to support homebasing the F-35C in the Navy Pacific Fleet. Alternative 2, Homebasing the F-35C at NAS Lemoore, is the preferred alternative. The environmental analysis in this EIS for the West Coast homebasing of the F-35C focuses on the facilities and functions of the proposed action: aircraft replacement and transition, facility and infrastructure requirements, personnel requirements, and aircraft operations in the airfield environment of NAF El Centro and NAS Lemoore and in Special Use Airspace within the vicinity of each installation. Environmental resource topics evaluated include: airfields and airspace, noise, air quality, safety, land use, infrastructure and utilities, socioeconomics, community services, ground traffic and transportation, biological resources, topography and soils, water resources, cultural and traditional resources, and hazardous materials and waste. This EIS has been prepared by the US Department of the Navy in compliance with the National Environmental Policy Act (NEPA) of 1969 (42 United States Code 4321 *et seq*.); the Council on Environmental Quality regulations implementing NEPA (40 Code of Federal Regulations Parts 1500-1508); and Department of the Navy Procedures for Implementing NEPA (32 Code of Federal Regulations 775).

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EXECUTIVE SUMMARY

The United States Department of the Navy has prepared this Environmental Impact Statement (EIS) to evaluate the potential environmental impacts that may result from providing facilities and functions on the West Coast of the United States (US) to support homebasing F-35C aircraft in the Navy Pacific Fleet. The F-35C Lightning II Joint Strike Fighter is a technologically advanced fifth-generation strike fighter designed to operate from conventional runways and nuclear-powered aircraft carriers. The F-35C is a single-engine aircraft, equipped with state-of-the art technology that makes it more difficult to detect on radar, and capable of greater communication with other airborne and ground-based units.

This EIS has been prepared in accordance with the requirements of the National Environmental Policy Act (NEPA) of 1969; Council on Environmental Quality regulations implementing NEPA (40 Code of Federal Regulations Parts 1500-1508); and Procedures for Implementing NEPA (32 Code of Federal Regulations 775). The environmental analysis in this EIS for the West Coast Homebasing of the F-35C focuses on the facilities and functions of the proposed action: aircraft replacement and transition; facility and infrastructure renovation, construction, and demolition; personnel changes; and aircraft operations at proposed airfields and in Special Use Airspace (SUA) within the vicinity of the airfields.

The Navy intends to base all its West Coast F-35C at one location in order to maximize the efficiency of support facilities, simulation devices, and on-site support personnel. More than 100 Department of Defense airfields were examined in a three-level screening process to identify potentially suitable F-35C homebase locations. After reviewing the geographic considerations, airfield characteristics, and operational mission compatibility factors, the two installations that best met Navy requirements are Naval Air Facility (NAF) El Centro, Imperial County, California and Naval Air Station (NAS) Lemoore, Kings and Fresno counties, California. As a result, the two proposed action alternatives analyzed in this EIS for providing facilities and functions on the West Coast to support the homebasing of F-35C aircraft in the Navy Pacific Fleet are: Alternative 1 – NAF El Centro Homebasing and Alternative 2 – NAS Lemoore Homebasing.

ES.1 PURPOSE AND NEED

The purpose of the proposed action is to replace aging Navy Pacific Fleet FA-18 Hornet aircraft with F-35C aircraft while meeting pilot training and readiness requirements. The F-35C is the congressionally approved long-term replacement for the Navy's aging FA-18 aircraft. The advanced features of the F-35C are designed to enable the Navy to succeed in fulfilling maritime capability missions in sophisticated air defense environments. As older models of the FA-18 are approaching the end of their service life, the Navy must replace them efficiently and expeditiously. To do so, the Navy intends to maximize the use of existing Navy installations, manpower, and support functions to the greatest extent possible.

ES.2 PROPOSED ACTION

The proposed action is to provide facilities and functions on the West Coast of the United States to support homebasing F-35C aircraft in the Navy Pacific Fleet. Providing the facilities and functions of the proposed action is described below in terms of aircraft replacement and transition, facility and infrastructure requirements, personnel requirements, and aircraft operations.

Seven Pacific Fleet FA-18 fleet squadrons (operating 70 aircraft in total) currently based at NAS Lemoore would progressively transition to the new F-35C aircraft beginning in 2015 with the transition to be complete by 2028. The plan would also involve the establishment no earlier than 2017 of a Fleet Replacement Squadron (FRS) consisting of approximately 30 aircraft to meet the requirements for training Navy pilots to operate the F-35C.

Facility development needed to support F-35C homebasing may begin as early as 2015. The homebase location would require facilities and infrastructure for training, operations and maintenance, and personnel support. F-35C training for Navy pilots, instructors, administrators, and support personnel requires adequate space in a configuration that supports training in classrooms; independent study at interactive workstations; and training in flight simulators, on various aircraft component mock-ups, and on maintenance devices. F-35C operations and maintenance would require airfield pavement, aircraft maintenance hangars, supply and storage facilities, and adequate utilities to accommodate aircraft movement and parking, ordnance handling, aircraft maintenance/repair, and aircraft servicing, as well as secure spaces for pre- and post-mission activities. Other facilities, such as bachelor quarters, are needed to support Navy personnel.

The proposed action requires military, civilian, and contractor personnel to perform F-35C operational, maintenance, and training functions. The Navy would not need to add any additional personnel to its overall force structure to implement the proposed action. Instead, existing Navy personnel, most of whom are currently supporting aging FA-18 aircraft, would transition and potentially relocate to provide support for F-35C squadrons.

F-35C aircraft would conduct departure, arrival, and pattern operations at the selected homebase airfield. F-35C operations in SUA and Military Training Routes (MTRs) within the vicinity of the selected homebase airfield would include air combat maneuvers and training, air-to-air refueling, and basic fighter maneuvers. F-35C flight training operations would be very similar to existing FA-18 training in quality and quantity, using the same weapons. The Navy would use its existing training ranges and SUA in the same manner they are used currently.

ES.3 ALTERNATIVE 1 – NAF EL CENTRO HOMEBASING

NAF El Centro is located in south-central California, approximately 7 miles northwest of the City of El Centro, in the Imperial Valley. Originally established in 1942, El Centro was commissioned as a Naval Air Facility in 1946. NAF El Centro has ideal flying weather throughout the year, which makes it an alternative training location for other Navy and Marine Corps aviation units when there is adverse weather at their home stations. From January through March, NAF El Centro is the winter home for the Blue Angels, the US Navy Flight Demonstration Squadron. The predominant aircraft conducting detachment training at NAF El Centro are Navy and Marine Corps FA-18C/D/E/F Hornets and Super Hornets, T-45 Goshawks, with some AV-8B Harriers, EA-6B Prowlers, MV-22 Osprey, and a variety of helicopters.

ES.3.1 Alternative 1 – NAF El Centro Aircraft Replacement and Transition

Under Alternative 1 in 2028, a total of 100 F-35C aircraft would be homebased at NAF El Centro to replace 70 aging FA-18 aircraft currently based at NAS Lemoore. This homebasing would consist of 70 F-35C aircraft for fleet squadrons (7 fleet squadrons with 10 aircraft per squadron) and 30 F-35C aircraft for the FRS. Alternative 1 would result in an increase of 100 F-35C aircraft at NAF El Centro and a decrease of 70 FA-18 aircraft at NAS Lemoore. Currently, there are no permanently based fleet squadrons at NAF El Centro. Instead, NAF El Centro is used for detachment training by various aviation units. Detachment training refers to training conducted away from a homebase at non-local training ranges.

ES.3.2 Alternative 1 – NAF El Centro Facility and Infrastructure Requirements

Homebasing the F-35C at NAF El Centro would require a variety of additional facilities and infrastructure for training, operations and maintenance, and personnel support, as well as the demolition of existing facilities. To accommodate facility and infrastructure needed to support the F-35C, the Navy would need to acquire interest in property not currently owned by the Navy. Alternative 1 would not require any changes to facilities and infrastructure at NAS Lemoore.

Under Alternative 1, proposed construction at NAF El Centro includes 41 projects: 3 training facilities, 26 operations and maintenance facilities, and 12 personnel support facilities. Approximately 6.6 million square feet of construction, expansion, and modification projects would be required. Twenty-nine existing facilities and some concrete/asphalt areas with a total size of nearly 189,000 square feet would be demolished to accommodate the layout of new facilities. The total cost for construction projects, demolition projects, and land acquisition at NAF El Centro is estimated to be $793 million. Proposed construction and demolition would be phased over multiple years with several projects beginning in 2015 and the last project starting around 2025. The total area that would be disturbed by construction and demolition is approximately 196 acres.

ES.3.3 Alternative 1 – NAF El Centro Personnel Requirements

Alternative 1 would result in an increase of 2,975 military and contractor/civilian personnel at NAF El Centro and a corresponding decrease of 1,539 military personnel at NAS Lemoore. The decrease in number of personnel at NAS Lemoore under Alternative 1 would occur when personnel who are currently supporting aging FA-18 squadrons at NAS Lemoore transition to supporting F-35C squadrons at NAF El Centro. Based on the increase of military and contractor/civilian personnel, there would be an increase of approximately 6,154 dependents (5,075 military dependents and 1,079 contractor/civilian dependents). Overall, Alternative 1 would result in an increase of approximately 9,129 persons (2,975 military, contractor/civilian personnel and 6,154 dependents) in the El Centro area by 2028.

ES.3.4 Alternative 1 – F-35C Aircraft Operations at NAF El Centro

Under Alternative 1, F-35C operations would be conducted at the NAF El Centro airfield and in SUA and MTRs in the vicinity of NAF El Centro. **Table ES-1** shows the baseline (2015) and proposed (2028) annual airfield operations at NAF El Centro and NAS Lemoore under Alternative 1. At an airfield, an operation

consists of a single aircraft movement such as a landing or takeoff. Therefore, one training flight normally involves at least two airfield operations – a takeoff and a landing.

Homebasing the F-35C at NAF El Centro would result in an increase of approximately 99,400 operations at the NAF El Centro airfield and a decrease of approximately 33,600 operations at NAS Lemoore. The proposed decrease in operations at NAS Lemoore under Alternative 1 would be due to the reduction of operations by aging FA-18 squadrons, which would relocate to NAF El Centro as F-35C squadrons.

Table ES-1. Changes in Annual Airfield Operations at NAF El Centro and NAS Lemoore under Alternative 1

Aircraft	*Number of Operations*[1]		*Change*
	Baseline (2015)	*Proposed (2028)*[3]	
NAF El Centro			
F-35C Fleet Squadrons	0	23,900	+23,900
F-35C FRS	0	74,300	+74,300
Detachment/Transient[2]	65,800	67,000	+1,200
Total	**65,800**	**165,200**	**+99,400**
NAS Lemoore			
FA-18C Fleet Squadrons	11,400	0	-11,400
FA-18E/F Fleet Squadrons	75,300	53,200	-22,100
FA-18E/F FRS	62,200	62,200	0
Transient	10,500	10,500	0
Total	**159,400**	**125,900**	**-33,500**

Source: Department of the Navy (DoN) 2011a, 2012a.
Notes: 1. Number of operations rounded to the nearest hundred.
2. Detachment/Transient aircraft include FA-18, AV-8B, EA-6B, T-45, and a variety of helicopters.
3. Numbers of operations are estimated projections for typical annual operations, which may increase or decrease depending upon circumstances.

Under Alternative 1, F-35C operations would take place in the following SUA within the vicinity of NAF El Centro: Restricted Areas R-2301 West (Barry M. Goldwater Range-West); R-2306/R-2308 and R-2507 (Yuma Range Complex); Kane/Abel Military Operations Areas (MOAs); R-2510 and R-2512 (El Centro Range Complex), as well as numerous MTRs, such as IR-211 and VR-296. However, because of capacity concerns and the high demand for use of R-2507, much of the F-35C training requirement in SUA would need to be accomplished in W-291 off the coast of southern California.

Table ES-2 shows estimated annual operations in SUA in the vicinity of NAF El Centro for the baseline (2015) and proposed end state (2028) under Alternative 1. In SUA, an operation involves one aircraft using an SUA, such as a Restricted Area or MOA. Each time a single aircraft flies in a different SUA, one operation is counted for that SUA. Homebasing the F-35C at NAF El Centro would potentially result in an increase of approximately 2,209 Navy operations in SUA in the vicinity of NAF El Centro. The majority of training events would occur in W-291, which would have a net increase of roughly 17,000 airspace operations under Alternative 1 (see Appendix B – *F-35C Training Operations*).

Table ES-2. Changes in Annual Operations in Special Use Airspace under Alternative 1

SUA	Number of Operations[1,2]				
	Navy Baseline (2015)	Proposed Navy F-35C	Navy Legacy FA-18 Eliminated	Proposed End State (2028)	Change
R-2301 West	1,600	960	-804	1,756	+156
R-2306/R-2308	0	1,080	0	1,080	+1,080
R-2507/Abel/Kane MOAs	2,820	2,879	-2,134	3,565	+745
R-2512	1,264	388	-360	1,292	+28
R-2510	552	922	-722	752	+200
Subtotal in Local SUA	**6,236**	**6,229**	**-4,020**	**8,445**	**+2,209**
W-291	N/A[3]	17,571	N/A[3]	17,571	+17,571
Total	**6,236**	**23,800**	**-4,020**	**26,016**	**+19,780**

Sources: ATAC 2012a, 2012b, 2012c; DoN 2009, 2010, 2013.
Notes: 1. The number of operations shown in this table differs from the number of operations shown in the USMC F-35B West Coast Basing EIS (DoN 2010) because the baseline only includes Navy operations.
2. Flights to a particular range are based on range availability and weather. Flights may be distributed between the ranges listed. Numbers of operations are estimated projections for typical annual operations, which may increase or decrease depending upon circumstances.
3. N/A – not applicable.

Table ES-3 shows annual operations in MTRs in the vicinity of NAF El Centro for the baseline (2015) and proposed end state (2028). Under Alternative 1, there would be an increase of approximately 213 operations in MTRs in the vicinity of NAF El Centro. Proposed F-35C operations in MTRs are expected to be conducted during daytime hours.

Table ES-3. Changes in Annual Operations in Military Training Routes under Alternative 1

MTR	Number of Operations		Change
	Baseline (2015) [1]	Proposed (2028) [2]	
IR-211	48	56	+8
IR-212	36	42	+6
IR-213	12	14	+2
IR-216	156	183	+27
IR-217	168	197	+29
IR-218	24	28	+4
IR-250	36	42	+6
VR-296	144	169	+25
VR-1211	108	126	+18
VR-1257	156	183	+27
VR-1266	1,512	1,555	+43
VR-1267	72	84	+12
VR-1268	36	42	+6
Total	**2,508**	**2,721**	**+213**

Source: DoN 2010.
Notes: 1. The number of operations shown in this table differs from the number of operations shown in the USMC F-35B West Coast Basing EIS (DoN 2010) because the baseline years are different.
2. Numbers of operations are estimated projections for typical annual operations, which may increase or decrease depending upon circumstances.

ES.4 ALTERNATIVE 2 – NAS LEMOORE HOMEBASING

NAS Lemoore was established in 1961 and is located in the central portion of the San Joaquin Valley, approximately 80 miles east of the Pacific Ocean, in Kings County and Fresno County, California. The mission of NAS Lemoore is to support Navy fleet carrier strike fighter squadrons. NAS Lemoore hosts more than 40 aviation tenants, including Commander Strike Fighter Wing, US Pacific Fleet.

ES.4.1 Alternative 2 – NAS Lemoore Aircraft Replacement and Transition

Under Alternative 2 in 2028, a total of 100 F-35C aircraft would be homebased at NAS Lemoore to replace 70 aging FA-18 aircraft currently based at NAS Lemoore. This homebasing would consist of 70 F-35C aircraft for fleet squadrons (7 fleet squadrons with 10 aircraft per squadron) and 30 F-35C aircraft for the FRS. Alternative 2 would result in an increase of 100 F-35C aircraft and a decrease of 70 FA-18 aircraft at NAS Lemoore. Aircraft loading at NAS Lemoore would increase by 30 aircraft. There would be no changes in aircraft loading at NAF El Centro under Alternative 2 because it has no permanently based fleet squadrons.

ES.4.2 Alternative 2 – NAS Lemoore Facility and Infrastructure Requirements

Homebasing the F-35C at NAS Lemoore would require additional facilities and infrastructure for training, operations and maintenance, and personnel support, as well as the demolition of one existing facility. Under Alternative 2, proposed construction at NAS Lemoore includes 16 projects: 5 training facilities, 10 operations and maintenance facilities, and 1 personnel support facility. Building 21, an operational storage facility, would be demolished to accommodate the layout of proposed new facilities and infrastructure. In addition, two projects would be required at NAF El Centro to accommodate F-35C squadrons from NAS Lemoore conducting detachment training operations at NAF El Centro: interior hangar renovations and a Special Access Program Facility. Approximately 1.6 million square feet of construction, expansion, and modification projects would be required. The total cost for all the projects at NAS Lemoore and the two projects at NAF El Centro is estimated to be $242 million. Proposed construction would be phased over multiple years, with several projects beginning in 2015 and the last project starting around 2025. The total area that would be disturbed by construction at NAS Lemoore is approximately 58 acres.

ES.4.3 Alternative 2 – NAS Lemoore Personnel Requirements

Alternative 2 would result in an increase of 751 military and contractor/civilian personnel at NAS Lemoore. Unlike Alternative 1, Alternative 2 would not require any changes in personnel at NAF El Centro because there would be no change in the mission or the number of aircraft supported at NAF El Centro. Personnel who are currently supporting aging FA-18 squadrons at NAS Lemoore would remain at NAS Lemoore while transitioning to F-35C squadrons. Based on this increase of military and contractor/civilian personnel, there would be an increase of approximately 1,569 dependents (1,145 military dependents and 424 contractor/civilian dependents). Overall, Alternative 2 would result in an increase of approximately 2,320 persons (751 military, contractor/civilian personnel and 1,569 dependents) in the Lemoore area by 2028.

ES.4.4 Alternative 2 – F-35C Aircraft Operations at NAS Lemoore

Under Alternative 2, F-35C operations would be conducted at the NAS Lemoore airfield and in SUA and MTRs in the vicinity of NAS Lemoore. In addition, F-35C aircraft homebased at NAS Lemoore would conduct detachment training operations at NAF El Centro in much the same way that FA-18 squadrons currently operate at NAF El Centro. **Table ES-4** shows the baseline (2015) and proposed (2028) annual airfield operations at NAS Lemoore and NAF El Centro under Alternative 2. At an airfield, an operation consists of a single aircraft movement such as a landing or takeoff. Therefore, one training flight normally involves at least two airfield operations – a takeoff and a landing. Homebasing the F-35C at NAS Lemoore would result in an increase of approximately 68,400 operations at the NAS Lemoore airfield and an increase of approximately 800 operations at the NAF El Centro airfield.

Table ES-4. Changes in Annual Airfield Operations at NAS Lemoore and NAF El Centro under Alternative 2

Aircraft	*Number of Operations*[1]		*Change*
	Baseline (2015)	*Proposed (2028)*[2]	
NAS Lemoore			
F-35C Fleet Squadrons	0	25,200	+25,200
F-35C FRS	0	76,700	+76,700
FA-18C Fleet Squadrons	11,400	0	-11,400
FA-18E/F Fleet Squadrons	75,300	53,200	-22,100
FA-18E/F FRS	62,200	62,200	0
Transient	10,500	10,500	0
Total	**159,400**	**227,800**	**+68,400**
NAF El Centro			
Detachment/Transient	65,800	66,600	+800
Total	**65,800**	**66,600**	**+800**

Sources: DoN 2011b, 2012b.
Notes: 1. Number of operations rounded to the nearest hundred.
2. Numbers of operations are estimated projections for typical annual operations, which may increase or decrease depending upon circumstances.

Under Alternative 2, F-35C operations would take place in the following SUA in the vicinity of NAS Lemoore: R-2508 Complex, R-2524 (Superior Valley Range), Lemoore MOA, R-2513/Hunter MOA, as well as numerous MTRs, such as VR-201 and VR-1255. **Table ES-5** shows the baseline (2015) and proposed (2028) annual operations in SUA in the vicinity of NAS Lemoore under Alternative 2. In SUA, an operation involves one aircraft using an SUA, such as a Restricted Area or MOA. Each time a single aircraft flies in a different SUA, one operation is counted for that SUA. Homebasing the F-35C at NAS Lemoore would potentially result in an increase of approximately 3,394 Navy operations in SUA in the vicinity of NAS Lemoore. A net increase of approximately 830 operations would occur in the Fallon Range Training Complex, which would see its Lemoore-based transient operations increase from a baseline of 17,022 operations to 17,852 operations (see Appendix B – *F-35C Training Operations*). **Table ES-6** shows annual operations in MTRs in the vicinity of NAS Lemoore for the baseline (2015) and proposed end state (2028). Under Alternative 2, there would be an increase of approximately 54 operations in MTRs in the vicinity of NAS Lemoore. Proposed F-35C operations in MTRs are expected to be conducted during daytime hours.

Table ES-5. Changes in Annual Operations in Special Use Airspace under Alternative 2

SUA	Number of Operations[1]				
	Baseline (2015) [2]	Proposed Navy F-35C	Navy FA-18 Legacy Eliminated	Proposed (2028)	Change
R-2508 Complex	4,776	4,580	-2,200	7,156	+2,380
R-2524 Superior Valley Range	3,128	1,188	-1,076	3,240	+112
Lemoore MOA	1,264	1,721	-895	2,090	+826
R-2513/Hunter MOA	82	112	-36	158	+76
Subtotal in Local SUA	**9,250**	**7,601**	**-4,207**	**12,644**	**+3,394**
W-283	1,164	1,474	-414	2,224	+1,060
W-285	348	114	-118	344	-4
W-532	340	212	-136	416	+76
Fallon Range Training Complex	17,022	9,476	-8,646	17,852	+830
Total	**28,124**	**18,877**	**-13,521**	**33,480**	**+5,356**

Source: DoN 2012b, ATAC 2014.
Note: 1. Flights to a particular range are based on range availability and weather. Flights may be distributed between the ranges listed. Numbers of operations are estimated projections for typical annual operations, which may increase or decrease depending upon circumstances.
2. Includes NAS Lemoore based FA-18 aircraft.

Table ES-6. Changes in Annual Operations in Military Training Routes under Alternative 2

MTR[1]	Number of Operations		Change
	Baseline (2015)	Proposed (2028) [2]	
IR-203	8	8	0
IR-207	129	129	0
VR-201	237	246	9
VR-202	251	254	3
VR-208	23	23	0
VR-209	51	51	0
VR-1250	61	63	2
VR-1251	22	25	3
VR-1252	1	1	0
VR-1253	17	17	0
VR-1254	6	6	0
VR-1255	255	284	29
VR-1256	2	2	0
VR-1257	95	98	3
VR-1259	4	4	0
VR-1260	2	2	0
VR-1261	24	26	2
VR-1262	38	41	3
VR-1264	1	1	0
Total	**1,227**	**1,281**	**+54**

Source: US Fleet Forces Command 2011.
Notes: 1. Includes all users of the MTRs.
2. Numbers of operations are estimated projections for typical annual operations, which may increase or decrease depending upon circumstances.

ES.5 NO ACTION ALTERNATIVE

Under the No Action Alternative, the Navy would not provide facilities and functions on the West Coast to support homebasing the F-35C in the Navy Pacific Fleet. Under the No Action Alternative, the Navy would not renovate, expand, or construct new facilities or infrastructure. Consequently, there would be no increase in functional capacity at any alternative homebasing site. Moreover, there would be no changes in personnel or aircraft operations related to the F-35C at potential homebase locations.

The No Action Alternative does not meet the purpose of or the need for the proposed action. However, the conditions associated with the No Action Alternative serve as reference points for describing and quantifying the potential impacts associated with proposed homebasing alternatives. In this case, the 2015 aircraft loading, facility and infrastructure assets, personnel levels, and number of aircraft operations at potential homebasing alternatives provide the baseline to compare the proposed requirements necessary to accommodate homebasing the F-35C.

ES.6 PREFERRED ALTERNATIVE

Alternative 2, Homebasing the F-35C at NAS Lemoore, is the preferred alternative because it best meets mission requirements; optimizes operational efficiencies related to personnel, training, and logistics support functions; maximizes the reuse of existing facilities and minimizes the need for new construction; and preserves NAF El Centro as a valuable Fleet training asset.

Specifically, Alternative 2, Homebasing at NAS Lemoore:

- **Maximizes the use of existing infrastructure and minimizes the need for military construction.** In accordance with the Naval Aviation Enterprise Global Infrastructure Plan (DoN 2008), reuse of existing facilities should be the first priority when considering infrastructure for new platforms. NAS Lemoore is the current home base for the seven fleet squadrons that will transition to the F-35C. Relocating those squadrons to NAF El Centro would leave useful maintenance, logistics, operations and administrative facilities at NAS Lemoore vacant and require construction to duplicate those facilities at NAF El Centro. The proposed 1,597,500 square feet of construction at NAS Lemoore associated with Alternative 2 is less than the proposed 6,600,000 square feet of construction at NAF El Centro under Alternative 1 and complies with the priority to reuse existing facilities.

- **Maximizes operational synergies associated with concentration of the Pacific Fleet strike-fighter community at one location**. The F-35C and the FA-18E/F are strike-fighters with complementary capabilities designed to maximize warfighting capability in the Navy strike warfare mission set. Co-locating the F-35C Lightning II FRS and fleet squadrons with the Pacific Fleet FA-18E/F Super Hornet community facilitates daily interaction in operational training, mutual adversary support, and face-to-face collaboration in secure environments. Furthermore, F-35C, FA-18E/F and their associated FRS fall under the administrative control of Commander, Strike Fighter Wing Pacific, which is located at NAS Lemoore. Selection of Alternative 2/Homebasing at NAS Lemoore avoids the duplication of strike-fighter community personnel while the selection of Alternative 1/Homebasing at NAF El Centro would split the Pacific Fleet

strike-fighter community to two locations, requiring additional type wing and weapon school personnel and equipment to provide administrative oversight, training, and operational security.

- **Minimizes the risk of exceeding special use airspace and training range capacity.** In particular, NAS Lemoore has access to available air-to-ground and air-to-air training range with the capacity to meet the full requirements of the F-35C training syllabus. Alternative 2/Homebasing at NAS Lemoore represents a manageable increase in operations in the special-use airspace and nearby available ranges. Selection of Alternative 1/Homebasing at NAF El Centro would represent a significant increase in training airspace requirements in the Southern California/Arizona area where competition for training range time amongst the Services is high. This strain on capacity along with the minimal utility of certain overland training ranges to support F-35C training flights (i.e., R-2510 and R-2512) forces more than 80 percent of Navy F-35C training operations to the overwater training ranges (i.e., W-291 and the Shore Bombardment Area in the Southern California Offshore Complex).
- **Preserves NAF El Centro as a valuable training asset.** NAF El Centro is a valuable training asset for rotary-wing and undergraduate training squadrons as well as the Navy Flight Demonstration Squadron all of whom depend on El Centro's current capabilities and continued availability. The predominant visual meteorological conditions (VMC) combined with multiple small air-to-ground training ranges in very close proximity to the airfield make NAF El Centro ideally suited for visual weapons deliveries and visual navigation training in rotary wing and undergraduate pilot training syllabi. The F-35C's only visual weapon delivery capability, the gun, represents a very small portion of training (i.e., one training event in the fleet training syllabus); therefore, these small training ranges are of little utility for F-35C training beyond basic FRS sorties like Familiarization and Formation. Under Alternative 1/Homebasing at El Centro, F-35C FRS and fleet squadrons would consume airfield facilities and services, reducing availability of the El Centro training complex to its current users, and disrupting proven training practices.
- **Minimizes the increase in flight operations at both sites**. Alternative 2 increases flight operations by approximately 43 percent at NAS Lemoore, while Alternative 1 represents a 150 percent increase in airfield operations at NAF El Centro.
- **Minimizes the changes to the baseline installation missions, functions and tasks of NAS Lemoore and NAF El Centro**. NAS Lemoore is a naval air station resourced to provide all personnel, logistics and training support functions as well as facilities associated with home basing a concentration of fleet squadrons. NAF El Centro is resourced to provide temporary training detachment support with limited capability to provide personnel support functions. As such, Alternative 2/Homebasing at NAS Lemoore is consistent with current installation resourcing and avoids the costs associated with relocation of personnel and equipment for six squadrons currently located at NAS Lemoore. Selection of Alternative 1/Homebasing at NAF El Centro requires significant base operating support investment, expansion of Navy shore installation management resources and costs associated with relocation of personnel and equipment to NAF El Centro.

Ultimately, the Secretary of the Navy makes final homebasing decisions based on statutory mission requirements, economic and technical considerations, and environmental considerations as presented in this EIS.

ES.7 PUBLIC INVOLVEMENT

The Navy published notices of its intent to prepare an EIS and invited public participation in identifying the scope and issues related to the proposed action. The 45-day public scoping period for this EIS officially began on January 28, 2011 and closed on March 14, 2011. Public scoping meetings were announced on January 28, 2011 when the Navy published a Notice of Intent in the *Federal Register.* The Navy also published a series of display advertisements in four newspapers (three English and one Spanish) serving the communities in the vicinity of NAF El Centro and NAS Lemoore announcing its intent to prepare an EIS; the dates, times, and locations for two scoping meetings; and four ways for the public to provide comments.

Notification and coordination letters were sent to federal, state, and local agencies; Native American tribes; elected officials; and various interest groups most likely to be interested in the proposed action. A project website (http://www.navyf35cwestcoasteis.com) was made available to the public on January 27, 2011, 3:00 p.m. Pacific time, and was updated periodically throughout the scoping process. Information on the website was provided in both English and Spanish. Additionally, the public website contained webpages that allowed the public to submit written comments online in both English and Spanish. During the scoping period, the website was visited approximately 320 times. The link to the project website was listed in all other scoping notification materials. Press releases were issued on January 27, 2011 to the local media (i.e., television, radio, and online news sources) in the vicinity of NAF El Centro and NAS Lemoore, and also to the San Diego regional media where Commander Navy Region Southwest is headquartered. Media organizations were also invited to participate in media events held one day prior to each of the scoping meetings.

In February 2011, the Navy held public scoping meetings in the cities of El Centro and Lemoore. The scoping meetings were conducted in an open-house format designed to enhance public understanding of the project and NEPA process and to allow the public to identify to Navy representatives issues and concerns they would like to see addressed in the EIS. During the scoping meetings, attendees could speak individually with Navy representatives and submit written and oral comments. Several Spanish-speaking Navy representatives and an independent Spanish interpreter were available to aid in discussions with Spanish-speaking community members. A stenographer was available to record and transcribe oral comments. A total of 187 individuals signed in at the two meetings (46 at El Centro and 141 at Lemoore), including federal and state elected officials, the media, city government agencies, local community planning groups, and local school representatives.

A total of 253 comments addressing multiple issues were received through the four methods made available to the public: written comments at the scoping meetings, oral comments to a stenographer at the scoping meetings, written comments on the project website, and written comments mailed to the Navy. Primary issues raised during scoping related to socioeconomics, community facilities and services, infrastructure and utilities, and land use. To a lesser extent, scoping comments focused on airfields and

airspace, noise, and the evaluation of cumulative effects. Overall, the public at both Lemoore and El Centro generally expressed support for the proposed homebasing of the Navy F-35C in their communities, with more than 85 percent commenting in favor of the proposed action. Comments provided by elected officials were also positive in nature and supported homebasing the F-35C in their respective areas.

Beginning February 15, 2013, the availability of the Draft EIS and schedule of public meetings was announced in the *Federal Register* and in local daily and weekly newspapers. The Navy also mailed notification letters and postcards, issued press releases, and distributed flyers at community events. The initial deadline for public comment on the Draft EIS was April 22, 2013. However, due to requests from the public and elected officials, the public comment period was extended to May 7, 2013. An announcement of the extension of the public comment period was published April 19, 2013 in the *Federal Register* and local newspapers, and a press release was issued. In total, the public comment period comprised 82 days. The project website was updated with electronic copies of the Draft EIS and other public involvement materials. Between February 15 and May 7, 2013, the website was visited 3,332 times. Printed copies of the Draft EIS were made available for public review during the comment period at 10 local libraries. Throughout the Draft EIS public comment period, comments were received and compiled for consideration during the preparation of the Final EIS.

On March 19 and 21, 2013, the Navy held open house public meetings in the cities of Lemoore and El Centro, respectively. During the public meetings, attendees could speak individually with Navy representatives and submit written and oral comments. An independent Spanish interpreter was available to aid in discussions with Spanish-speaking community members. A stenographer was available to record and transcribe oral comments. A total of 191 individuals signed in at the two meetings (103 at El Centro and 88 at Lemoore), including federal and state elected officials, the media, city government agencies, local community planning groups, and local school representatives.

During the Draft EIS public comment period, 641 comment letters and forms were received from individual members of the public, elected officials (i.e., federal, state, and local), federal regulatory and state resource agencies, local agencies, businesses, and community groups. Comments were submitted at the public meetings, on the project website, or were mailed. Many community members support the project and want the project in their community. The primary topics that were commented upon during the public comment period related to the proposed action and alternatives, socioeconomics, noise, purpose and need, and air quality.

ES.8 SUMMARY OF POTENTIAL ENVIRONMENTAL EFFECTS

Table ES-7 provides a summary of potential environmental effects from Alternative 1 – NAF El Centro Homebasing and Alternative 2 – NAS Lemoore Homebasing. For each alternative, there would be changes at both NAF El Centro and NAS Lemoore. As a result, potential environmental effects from each alternative are summarized in terms of effects at NAF El Centro and effects at NAS Lemoore.

No mitigation measures were identified during the development of this EIS. As the NEPA process progresses, mitigation measures may emerge and management actions may be altered based on comments received during public and regulatory agency review of the Final EIS. If mitigation measures

were identified for the selected alternative, they would be identified in the Record of Decision. These measures would be funded, and efforts to ensure their successful completion or implementation are treated as compliance requirements.

Table ES-7. Summary of Potential Environmental Effects at NAF El Centro and NAS Lemoore

Resource	Alternative 1 – NAF El Centro Homebasing	Alternative 2 – NAS Lemoore Homebasing
Airfields and Airspace	*Effects at NAF El Centro* • No significant impact from increase of 99,400 aircraft operations at NAF El Centro airfield and a net increase of 2,209 aircraft operations in SUA and 213 in MTRs in the vicinity of NAF El Centro. • Changes in approach and departure patterns for new 9,500-foot runway and extension of primary runway. • Structure of Controlled Airspace around NAF El Centro unchanged. • Management and control of air traffic modified to include operations at new runway. • May be less opportunity for civil aviation to transit existing SUA.	*Effects at NAS Lemoore* • No significant impact from increase of 68,400 aircraft operations at NAS Lemoore airfield and increase of 3,448 aircraft operations in SUA and MTRs in the vicinity of NAS Lemoore. • Use and structure of approach and departure patterns unchanged. • Management and structure of Controlled Airspace around NAS Lemoore, as well as air traffic control, unchanged. • May be less opportunity for civil aviation to transit existing SUA.
	Effects at NAS Lemoore • No significant impact from decrease of 33,500 aircraft operations at NAS Lemoore airfield from reduction in FA-18 squadrons currently based at NAS Lemoore.	*Effects at NAF El Centro* • No significant impact from increase of 800 aircraft operations at NAF El Centro airfield from NAS Lemoore F-35C squadrons conducting detachment training at NAF El Centro.
Noise	*Effects at NAF El Centro* • **Significant noise impacts** from proposed F-35C operations at the NAF El Centro airfield. • No significant noise impacts from proposed F-35C operations in SUA and MTRs in the vicinity of NAF El Centro.	*Effects at NAS Lemoore* • No significant noise impacts from proposed F-35C operations at the NAS Lemoore airfield. • No significant noise impacts from proposed F-35C operations in SUA and MTRs in the vicinity of NAS Lemoore.
	Effects at NAS Lemoore • No significant noise impacts from decreased aircraft operations at the NAS Lemoore airfield.	*Effects at NAF El Centro* • No significant noise impacts from proposed F-35C operations at the NAF El Centro airfield.

Table ES-7. Summary of Potential Environmental Effects at NAF El Centro and NAS Lemoore

Resource	Alternative 1 – NAF El Centro Homebasing	Alternative 2 – NAS Lemoore Homebasing
Air Quality	*Effects at NAF El Centro* • No significant impacts to air quality. • Emissions from airfield operations, construction, and commuting vehicles would conform to the Imperial County Air Pollution Control District (APCD) Final 8-Hour Ozone Air Quality Management Plan budgets for nitrogen oxide (NOx) through 2023. The Imperial County APCD is committed to working with NAF El Centro and US Environmental Protection Agency (USEPA) to establish budgets for future years beyond 2023. • The estimated cumulative CO_2e emissions for Alternative 1 at both installations represent an increase of 35% over the baseline and are less than a hundredth of 1 percent of the total CO_2e emissions generated by the United States in 2010.	*Effects at NAS Lemoore* • No significant impacts to air quality. • Emissions from airfield operations, construction, and commuting vehicles would conform to the USEPA-approved 2007 Ozone Plan, with NOx emissions accounted for through 2025. The San Joaquin Valley APCD is committed to working with NAS Lemoore and USEPA to establish budgets for future years beyond 2025. • The estimated cumulative CO_2e emissions for Alternative 2 at both installations represents an increase of 24% over the baseline and are less than a hundredth of 1 percent of the total CO_2e emissions generated by the United States in 2010.
	Effects at NAS Lemoore • No significant impacts to air quality as operational emissions would decrease and therefore not exceed *de minimis* thresholds. • The estimated cumulative CO_2e emissions for Alternative 1 at both installations represent an increase of 35% over the baseline and are less than a hundredth of 1 percent of the total CO_2e emissions generated by the United States in 2010.	*Effects at NAF El Centro* • No significant impacts to air quality from construction of one facility and interior hangar renovations at NAF El Centro. • The calculated and compared results indicate that the small increase in emissions in the period 2016-2028 would not be anticipated to exceed *de minimis* thresholds, and emissions would have negligible impacts on regional air quality. • The estimated cumulative CO_2e emissions for Alternative 2 at both installations represents an increase of 24% over the baseline and are less than a hundredth of 1 percent of the total CO_2e emissions generated by the United States in 2010.
Safety	*Effects at NAF El Centro* • No significant safety impacts from F-35C operational training at the NAF El Centro airfield or within SUA, and from changes to Explosive Safety Quantity Distance (ESQD) arcs. • Extensive use of flight simulators would minimize risk associated with aircraft mishaps due to pilot error. • Increased aircraft operations would result in increased bird/animal aircraft strike hazard (BASH) potential; however, limits may be placed on low altitude flights and pilots would have special briefings during periods of increased BASH potential.	*Effects at NAS Lemoore* • No significant safety impacts from F-35C operational training at the NAS Lemoore airfield or within SUA. • Extensive use of flight simulators would minimize risk associated with aircraft mishaps due to pilot error. • Increased aircraft operations would result in increased BASH potential; however, limits may be placed on low altitude flights and pilots would have special briefings during periods of increased BASH potential.

Table ES-7. Summary of Potential Environmental Effects at NAF El Centro and NAS Lemoore

Resource	Alternative 1 – NAF El Centro Homebasing	Alternative 2 – NAS Lemoore Homebasing
Safety, continued	*Effects at NAS Lemoore* • No significant safety impacts from decreased aircraft operations at the NAS Lemoore airfield.	*Effects at NAF El Centro* • No significant safety impacts from increased aircraft operations at the NAF El Centro airfield.
Land Use	*Effects at NAF El Centro* • **Significant impacts to land use from noise** because designated residential land uses would be incompatible with proposed noise levels. • Changes in land use for some privately owned properties proposed for acquisition by the Navy. • Need for additional housing and services may alter existing local and regional land uses. • No significant impacts to National Parks from proposed F-35C aircraft overflights.	*Effects at NAS Lemoore* • No significant impacts to NAS Lemoore land use and local and regional land use. • No significant impacts to National Parks from proposed F-35C aircraft overflights.
	Effects at NAS Lemoore • No significant impacts to NAS Lemoore land use from decreased aircraft operations and personnel levels.	*Effects at NAF El Centro* • No significant impacts to NAF El Centro land use from increased aircraft operations and from construction of one facility and interior hangar renovations.
Infrastructure and Utilities	*Effects at NAF El Centro* • No significant impacts to infrastructure and utilities from facility development and personnel increases. • Increase demand for water of 1,266 acre feet per year by 2028 met by Imperial Irrigation District water supply. • Temporary and intermittent increase in demand for water at NAF El Centro during demolition and construction. • Increase in demand for treatment of wastewater of 0.21 million gallons per day (mgd) at NAF El Centro met by construction of new wastewater treatment facility with capacity to treat 0.6 mgd; increase in demand for treatment of wastewater in the City of El Centro of 0.58 mgd met by existing municipal wastewater treatment facility.	*Effects at NAS Lemoore* • No significant impacts to infrastructure and utilities from facility development and personnel increases. • Increase demand for water of 0.28 mgd in region by 2028 met by Westlands Water District water supply. • Increase in demand for water at NAS Lemoore of 0.09 mgd met by NAS Lemoore water treatment capacity to treat. • Temporary and intermittent increase in demand for water at NAS Lemoore during construction. • Increase in demand for treatment of wastewater of 0.05 mgd at NAS Lemoore met by NAS Lemoore wastewater treatment facility; increase in demand for treatment of wastewater in City of Lemoore of 0.16 mgd met by existing municipal wastewater treatment facility.

Table ES-7. Summary of Potential Environmental Effects at NAF El Centro and NAS Lemoore

Resource	Alternative 1 – NAF El Centro Homebasing	Alternative 2 – NAS Lemoore Homebasing
Infrastructure and Utilities, continued	• Stormwater runoff from demolition and construction activities at NAF El Centro minimized with Stormwater Pollution Prevention (SWPP) Plan and Best Management Practices (BMPs). • Increase in demand for electricity and natural gas at NAF El Centro and region met by available capacity. • Increase in solid waste met by adequate capacity at Allied Imperial Landfill.	• Stormwater runoff from construction activities at NAS Lemoore minimized with SWPP Plan and BMP. • Increase in demand for electricity and natural gas at NAS Lemoore and region met by available capacity. • Increase in solid waste met by adequate capacity at Avenal Municipal Landfill.
	Effects at NAS Lemoore • No significant impacts to infrastructure and utilities from decreases in demand for potable water, wastewater treatment, electricity, natural gas and solid waste.	*Effects at NAF El Centro* • No significant impacts to infrastructure and utilities from increased aircraft operations and from construction of one facility and interior hangar renovations.
Socioeconomics	*Effects at NAF El Centro* • **Significant impacts to socioeconomic characteristics** from disproportionate effects to children from noise and from impact to local housing market from 5 percent increase in demand for community housing in Imperial County. • Approximate 5 percent increase in projected 2020 population • Industry resources likely able to accommodate employment demand associated with proposed construction and demolition activities at NAF El Centro. • Short-term economic benefit to region from military construction and demolition and construction projects at NAF El Centro (peak annual impact of 2,755 jobs, $156 million in labor income). • Long-term economic benefit from increase in personnel and dependents at NAF El Centro ($141.2 million in direct annual income for additional NAF El Centro personnel; secondary impacts of 1,139 jobs and $64.2 million in labor income). • Based on the analysis in this EIS, Navy concludes that Alternative 1 would not result in disproportionately high and adverse human health or environmental effects on minority populations and low-income populations in the NAF El Centro area. • Based on the analysis in this EIS, Navy concludes Alternative 1 would result in environmental health risks and safety risks that may disproportionately affect children.	*Effects at NAS Lemoore* • No significant impacts to socioeconomic characteristics from increased personnel levels. • Less than 1 percent increase in projected 2020 population. • Industry resources likely able to accommodate the employment demand associated with proposed construction activities at NAS Lemoore. • Short-term economic benefit to region from military construction and demolition projects at NAS Lemoore (peak annual impact of 661 jobs, $36 million in labor income). • Long-term economic benefit as a result of an increase of personnel and dependents at NAS Lemoore ($36.5 million in direct annual income for additional NAS Lemoore personnel; secondary impacts of 471 jobs and $25.2 million in labor income). • Less than 1 percent increase in demand for community housing in Kings and Fresno counties. • Based on the analysis in this EIS, Navy concludes that Alternative 2 not would result in disproportionately high and adverse human health or environmental effects on minority populations and low-income populations in the NAS Lemoore area. • Based on the analysis in this EIS, Navy concludes Alternative 2 would not result in environmental health risks and safety risks that may disproportionately affect children.

Table ES-7. Summary of Potential Environmental Effects at NAF El Centro and NAS Lemoore

Resource	Alternative 1 – NAF El Centro Homebasing	Alternative 2 – NAS Lemoore Homebasing
Socioeconomics, continued	*Effects at NAS Lemoore* • No significant impacts to socioeconomic characteristics from decreased personnel levels. • Population reduction of 4,653 (less than 1 percent) at NAS Lemoore would result in an estimated loss of direct annual income of $70.7 million that would affect regional spending. • Estimated 787 lost jobs and a reduction of $38.7 million in labor income in the NAS Lemoore region. • Minor increase in NAS Lemoore regional unemployment rate (Kings and Fresno counties). • Short-term impacts to local housing market expected to recover.	*Effects at NAF El Centro* • No significant impacts to socioeconomic characteristics from increased aircraft operations and from construction of one facility and interior hangar renovations.
Community Services	*Effects at NAF El Centro* • No significant impacts to community services from increase of 2,975 personnel and 6,154 dependents. • Increase in school age children; adequate capacity exists. • Existing child care facility, the child home care program, and the proposed child care facilities able to accommodate additional children in all age groups. • Additional police officers required in the City of El Centro and surrounding region. • A new aircraft and structural fire station would be constructed at NAF El Centro; fire protection services within the City of El Centro and the City of Imperial plan to develop new fire stations to accommodate anticipated population growth. • Increase in demand for dental and urgent care in El Centro region. • Recreational opportunities on and off the installation continue to be available. • Religious services able to accommodate needs of increased personnel.	*Effects at NAS Lemoore* • No significant impacts to community services from increase of 751 personnel and 1,569 dependents. • Minimal impact to school services as influx of dependents and school age children would occur over a 13-year period; adequate capacity exists in Kings County; Fresno County schools operating near or over their designated capacity and could be impacted. • Existing child care facility and home care program has adequate capacity. • Additional police officers required in surrounding municipalities or counties. • Additional fire protection services on the installation not required; fire protection services off the installation continue to focus on fire-safe development. • Health services on the installation expected to meet increased demand. • Recreational opportunities on and off the installation continue to be available. • Religious services able to accommodate needs of increased personnel.

Table ES-7. Summary of Potential Environmental Effects at NAF El Centro and NAS Lemoore

Resource	Alternative 1 – NAF El Centro Homebasing	Alternative 2 – NAS Lemoore Homebasing
Community Services, continued	*Effects at NAS Lemoore* • No significant impacts to community services from decreased personnel levels at NAS Lemoore.	*Effects at NAF El Centro* • No significant impacts to community services from increased aircraft operations and from construction of one facility and interior hangar renovations.
Ground Traffic and Transportation	*Effects at NAF El Centro* • **Significant impacts to traffic and transportation** from increase of 2,975 personnel at NAF El Centro and increased traffic on local roads. • End state traffic conditions would result in several intersections with failing levels of service; several measures would need to be taken to reduce impacts to levels of service, such as providing signalization and additional turning lanes and through lanes. • Improvements to roadway infrastructure such as additional turning lanes, travel lanes, and access improvements have been recommended to off-set impacts to traffic. • Temporary increases in traffic associated with construction and demolition activities.	*Effects at NAS Lemoore* • No significant impacts to traffic and transportation from increase of 751 personnel at NAS Lemoore and increased traffic on local roads. • Temporary increases in traffic associated with construction activities. • No significant impacts to levels of service are anticipated.
	Effects at NAS Lemoore • No significant impacts to traffic and transportation from reduction of 1,539 personnel at NAS Lemoore and reduction in traffic on roadways near NAS Lemoore.	*Effects at NAF El Centro* • No significant impacts to traffic and transportation from temporary increases in traffic associated with construction of one facility and interior hangar renovations.
Biological Resources	*Effects at NAF El Centro* • No significant impact to biological resources. • Proposed demolition and construction activities would impact 196 acres of previously disturbed or actively managed areas, with 151 acres of new impervious surface; no significant impacts to vegetation. • Proposed construction and demolition activities would cause short-term increases in noise levels within project areas, temporarily displacing wildlife and migratory birds; avoidance measures would be implemented to avoid and minimize potential impacts to burrowing owls from construction activities.	*Effects at NAS Lemoore* • No significant impact to biological resources. • Proposed construction activities would impact 58 acres of previously disturbed and actively managed areas, with 36 acres of new impervious surfaces; no significant impacts to vegetation. • Proposed construction activities would cause short-term increases in noise levels within project areas, temporarily displacing wildlife and migratory birds; avoidance measures would be implemented to avoid and minimize potential impacts to burrowing owls from construction activities.

Table ES-7. Summary of Potential Environmental Effects at NAF El Centro and NAS Lemoore

Resource	Alternative 1 – NAF El Centro Homebasing	Alternative 2 – NAS Lemoore Homebasing
Biological Resources, continued	• Noise levels associated with the proposed increase in aircraft operations would not result in significant impacts to wildlife and migratory birds because of existing high ambient noise levels within the airfield environment. • Continued low BASH potential with implementation of NAF El Centro BASH reduction measures in accordance with the installation BASH Plan. • No significant impacts to special-status species and no effect on Endangered Species Act (ESA)-listed species.	• Noise levels associated with the proposed increase in aircraft operations would not result in significant impacts to wildlife and migratory birds because of existing high ambient noise levels within the airfield environment. • Continued low BASH potential with implementation of NAS Lemoore BASH reduction measures in accordance with the installation BASH Plan. • No significant impact to special status species and no effect on ESA-listed species.
	Effects at NAS Lemoore • No significant impact to biological resources due to no facility development at NAS Lemoore and decrease in aircraft operations and personnel at NAS Lemoore.	*Effects at NAF El Centro* • No significant impact to biological resources from construction of one facility at NAF El Centro within a previously disturbed area, from interior hangar renovations, and from noise levels from proposed aircraft operations at NAF El Centro. • Increased noise levels not expected to impact wildlife and migratory birds in the area because they are likely accustomed to current noise levels associated with ongoing aircraft operations at NAF El Centro. • No significant impacts to wildlife and special-status species and no effect to ESA-listed species.
Topography and Soils	*Effects at NAF El Centro* • No significant impacts to soils or topography at NAF El Centro. • Short-term impacts to soils from construction and demolition activities on 196 acres of predominantly previously disturbed land, with the addition of 151 acres of new impervious surfaces. • A SWPP Plan would be prepared and BMPs would be implemented to avoid and minimize erosion and sedimentation.	*Effects at NAS Lemoore* • No significant impacts to soils or topography at NAS Lemoore. • Short-term impacts to soils from construction activities on 58 acres of previously disturbed/managed land, with the addition of 36 acres of new impervious surfaces. • A SWPP Plan would be prepared and BMPs would be implemented to avoid and minimize erosion and sedimentation.
	Effects at NAS Lemoore • No significant impacts to topography and soils due to no facility development at NAS Lemoore.	*Effects at NAF El Centro* • No significant impacts to soils or topography at NAF El Centro from construction of one facility on a previously disturbed area and interior hangar renovations.

Table ES-7. Summary of Potential Environmental Effects at NAF El Centro and NAS Lemoore

Resource	Alternative 1 – NAF El Centro Homebasing	Alternative 2 – NAS Lemoore Homebasing
Topography and Soils, continued		• BMPs would be implemented to avoid and minimize erosion and sedimentation.
Water Resources	*Effects at NAF El Centro* • No significant impacts to water resources. • No impacts to groundwater. • No impacts to water quality; construction activities performed in compliance with California's General Construction Stormwater Permit. • Demolition and construction activities at NAF El Centro require preparation of a SWPP Plan and implementation of BMPs to limit erosion and runoff. • No impacts to wetlands and floodplains.	*Effects at NAS Lemoore* • No significant impacts to water resources. • No impacts to groundwater. • No impacts to water quality; increase in surface water runoff from construction managed in compliance with California's General Construction Stormwater Permit; new project sites require preparation of a SWPP Plan and implementation of BMPs to limit erosion and runoff. • No impacts to wetlands or floodplain.
	Effects at NAS Lemoore • No significant impacts to water resources due to no facility development at NAS Lemoore.	*Effects at NAF El Centro* • No significant impacts to water resources from construction of one facility and interior hangar renovations.
Cultural and Traditional Resources	*Effects at NAF El Centro* • No significant impacts to cultural and traditional resources. • Buildings and structures to be demolished are not eligible for the National Register. • No impacts to archaeological sites or traditional cultural properties. • Navy would follow Integrated Cultural Resources Management Plan (ICRMP) procedures should any inadvertent discoveries be made during construction and demolition activities. • Programmatic Agreement between Navy and California State Historic Preservation Officer would cover Section 106 compliance for any future actions involving properties proposed for acquisition or restrictive easement.	*Effects at NAS Lemoore* • No significant impacts to cultural and traditional resources. • Existing buildings to be modified or demolished are not eligible for the National Register. • No impacts to archaeological sites or traditional cultural properties. • Navy would follow ICRMP procedures should any inadvertent discoveries be made during construction activities.
	Effects at NAS Lemoore • No significant impacts to cultural and traditional resources due to no facility development and decrease in aircraft operations at NAS Lemoore.	*Effects at NAF El Centro* • No significant impacts to cultural and traditional resources. • Navy would follow ICRMP procedures should any inadvertent discoveries be made during construction.

Table ES-7. Summary of Potential Environmental Effects at NAF El Centro and NAS Lemoore

Resource	Alternative 1 – NAF El Centro Homebasing	Alternative 2 – NAS Lemoore Homebasing
Hazardous Materials and Waste	*Effects at NAF El Centro* • No significant impacts to public health and safety and the environment from hazardous materials and waste. • No impact to hazardous waste management activities as existing procedures in place for safe handling, use, and disposal of hazardous substances and waste during demolition and construction. • The addition of 100 F-35C aircraft would increase use of hazardous materials and generation of hazardous waste, which would follow established hazardous material standard operating procedures and hazardous waste management plans. • No significant impact to human health and the environment from removal/relocation of aboveground storage tanks to accommodate facility development; tank removal/relocation conducted in accordance with applicable regulations and the installation Spill, Prevention, Control and Countermeasures Plan to eliminate/minimize potential adverse impacts. • Beneficial impact to hazardous materials at NAF El Centro as structures proposed for demolition would be surveyed for hazardous materials to protect public health and safety and the environment; asbestos-containing materials would be removed from structures prior to demolition; lead-based paint would be tested prior to demolition to determine appropriate handling and disposal options; polychlorinated biphenyl-containing materials would be characterized; all hazardous materials would be managed and disposed of in accordance with to applicable regulations. • Installation Restoration Sites 2, 7, 8, 4, 9, and 17 and one Military Munitions Response Program site would be disturbed during construction; construction in contaminated areas would be conducted in accordance with the requirements of CERCLA. • The hazardous materials associated with the F-35C program would not impact installation management programs at NAF El Centro.	*Effects at NAS Lemoore* • No significant impacts to public health and safety and the environment from hazardous materials and waste. • No impact to hazardous waste management activities as existing procedures in place for safe handling, use, and disposal of hazardous substances and waste during construction. • Beneficial impact to hazardous waste generation as volumes of hazardous wastes generated by aircraft operations would decrease compared to amounts currently generated in support of legacy aircraft operations. • Two Installation Restoration sites potentially affected by construction activities; construction in contaminated areas would be conducted in accordance with the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). • The hazardous materials associated with the F-35C program would not impact installation management programs at NAS Lemoore.

Table ES-7. Summary of Potential Environmental Effects at NAF El Centro and NAS Lemoore

Resource	***Alternative 1 – NAF El Centro Homebasing***	***Alternative 2 – NAS Lemoore Homebasing***
Hazardous Materials and Waste, continued	*Effects at NAS Lemoore* • No significant impacts to public health and safety and the environment from hazardous materials and waste. • Beneficial impact to hazardous material generation; reduced operations at NAS Lemoore would decrease hazardous materials use and hazardous waste generation. • No impact to the overall management of hazardous materials or hazardous waste at NAS Lemoore. • No impacts to contaminated sites.	*Effects at NAF El Centro* • No significant impacts to public health and safety and the environment from hazardous materials and waste. • No significant impacts to hazardous materials and waste NAF El Centro from construction of one facility on a previously disturbed area.

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ACRONYMS AND ABBREVIATIONS

ADT	average daily traffic
AESO	Aircraft Environmental Support Office
AFE	above field elevation
AGL	above ground level
AICUZ	Air Installations Compatible Use Zones
APCD	Air Pollution Control District
APE	area of potential effects
APZ	Accident Potential Zone
AQMP	Air Quality Management Plan
ATCAA	Air Traffic Controlled Assigned Airspace
BASH	Bird/Animal Aircraft Strike Hazard
Bldg.	Building(s)
BMP	Best Management Practice
CAA	Clean Air Act
CalEEMod	California Emissions Estimator Model
CARB	California Air Resources Board
CCR	California Code of Regulations
CDFG	California Department of Fish and Game
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
C.F.R.	Code of Federal Regulations
CH_4	methane
CNDDB	California Natural Diversity Database
CNEL	Community Noise Equivalent Level
CNIC	Commander Navy Installations Command
CO	carbon monoxide
CO_2	carbon dioxide
CVN	nuclear-powered aircraft carrier
CWA	Clean Water Act
CY	construction year
DASR	digital airport surveillance radar
dB	decibel
dBA	A-weighted decibel
DEIR	Draft Environmental Impact Report
DNL	day-night average sound level
DoD	Department of Defense
DoN	Department of the Navy
EA	Environmental Assessment
EIS	Environmental Impact Statement
EO	Executive Order
ESA	Endangered Species Act
ESQD	Explosive Safety Quantity Distance
FAA	Federal Aviation Administration
FCLP	Field Carrier Landing Practice
FEMA	Federal Emergency Management Agency
FPPA	Farmland Protection Policy Act
FRS	Fleet Replacement Squadron
ft	feet/foot
ft^2	square feet
FY	fiscal year
GCA	Ground-controlled Approach
GHG	greenhouse gas
GOV	government-owned vehicle
GSE	ground support equipment
GWP	global warming potential
HAP	hazardous air pollutant
HARP	Historic and Archaeological Resources Protection
HRMA	Housing Requirement Market Analysis
Hz	hertz
IBWC	International Boundary and Water Commission
ICRMP	Integrated Cultural Resources Management Plan
IFR	Instrument Flight Rules
INRMP	Integrated Natural Resources Management Plan
JLUS	Joint Land Use Study
JP	jet propellant
KART	Kings Area Rural Transit
kV	kilovolt
LEED	Leadership in Energy and Environmental Design
Leq	equivalent sound level
L_{max}	maximum sound level
LOS	level of service
MBTA	Migratory Bird Treaty Act
MCAS	Marine Corps Air Station
mgd	million gallons per day
mg/l	milligrams per liter

MIA	Military Influence Area
MMRP	Military Munitions Response Program
MOA	Military Operations Area
MOU	Memorandum of Understanding
MSAT	Mobile Source Air Toxic
MSL	mean sea level
MTR	Military Training Route
NA	number of events above a threshold level
NAAQS	National Ambient Air Quality Standards
NAF	Naval Air Facility
NAS	Naval Air Station
NASMOD	Military Aviation Simulation Model
NAVFAC	Naval Facilities Engineering Command
NAVSEA	Naval Sea Systems Command
NEPA	National Environmental Policy Act
NGB	National Guard Bureau
NHPA	National Historic Preservation Act
NIOSH	National Institute for Occupational Safety and Health
NIPTS	Noise Induced Permanent Threshold Shift
N_2O	nitrous oxide
NO_2	nitrogen dioxide
NOx	nitrogen oxide
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
O_3	ozone
OPNAVINST	Chief of Naval Operations Instruction
PCB	polychlorinated biphenyl
PG&E	Pacific Gas and Electric Company
$PM_{2.5}$	particulate matter with a diameter of 2.5 microns or less
PM_{10}	particulate matter with a diameter less than 10 microns
ppm	parts per million
PVC	polyvinyl chloride
R-	Restricted Area
RCRA	Resource Conservation and Recovery Act
ROD	Record of Decision
SARA	Superfund Amendments and Reauthorization Act
SEL	sound exposure level
SFO	simulated flameout
SHPO	State Historic Preservation Office
SIP	State Implementation Plan
SO_2	sulfur dioxide
SoCalGas	Southern California Gas Company
SPCC	Spill Prevention Control and Countermeasures
SUA	Special Use Airspace
SWPP	Stormwater Pollution Prevention
TCP	Traditional Cultural Property
TSCA	Toxic Substances Control Act
UFC	Unified Facilities Criteria
$\mu g/m^3$	micrograms per cubic meter
US	United States
U.S.C.	United States Code
USDOE	US Department of Energy
USEPA	US Environmental Protection Agency
USFF	US Fleet Forces Command
USFWS	US Fish and Wildlife Service
USGS	US Geological Survey
USMC	US Marine Corps
VFR	Visual Flight Rules
VOC	volatile organic compound
W-	Warning Area
WAPA	Western Area Power Administration
WWTP	wastewater treatment plant

1. INTRODUCTION

This Environmental Impact Statement (EIS) evaluates the potential direct, indirect, and cumulative environmental effects that may result from the United States (US) Department of the Navy's (DoN or Navy) proposed action, which is to provide facilities and functions on the West Coast of the United States to support homebasing F-35C aircraft in the Navy Pacific Fleet. Facility development needed to support F-35C homebasing may begin as early as 2015. Seven Pacific Fleet FA-18 squadrons (70 total aircraft) currently based at Naval Air Station (NAS) Lemoore would progressively transition to the new F-35C aircraft beginning in 2015 with the transition to be complete by 2028. The plan would also involve the establishment no earlier than 2017 of an F-35C Fleet Replacement Squadron (FRS) consisting of approximately 30 F-35C aircraft to meet the requirements for training Navy pilots.

> ***Fleet Replacement Squadron (FRS)***
> A complement of aircraft and instructors used to train pilots for fleet squadrons. The FRS is responsible for the "post-graduate" training of: newly designated Navy pilots and other pilots returning to flight status after non-flying assignments, or pilots transitioning to a new aircraft for duty in the fleet. The FRS is the "schoolhouse" for each type of aircraft, fostering professional standardization and a sense of community.

In keeping with the emphasis on threats in the Pacific region, as acknowledged in the *2010 Quadrennial Defense Review* (Department of Defense [DoD] 2010), the F-35C would be introduced first on the West Coast in order to provide the greatest strike-fighter capability available in that geographic area as soon as possible. The *2010 Quadrennial Defense Review* established key DoD priority objectives related to the emerging national security environment and recognized the low density of US basing and infrastructure in the Pacific Region. In order to maximize efficiency of support facilities, simulation devices, and on-site support personnel, the Navy intends to base all of its West Coast F-35C aircraft at one location. **Figure 1-1** shows the two potential homebase locations for the F-35C on the West Coast: Naval Air Facility (NAF) El Centro, located in Imperial County, California; and NAS Lemoore, located in Kings County and Fresno County, California.

The environmental analysis in this EIS for the West Coast homebasing of the F-35C focuses on the facilities and functions of the proposed action: aircraft replacement and transition, facility and infrastructure requirements, personnel requirements, and aircraft operations in the airfield environment of NAF El Centro and NAS Lemoore and in Special Use Airspace (SUA) within the vicinity of each installation. F-35C training operations would generally be conducted in a manner similar to FA-18 training operations and in much of the same SUA currently used by the FA-18. The Navy does not intend to establish new airspace or training ranges to support F-35C homebasing on the West Coast.

This EIS has been prepared by the US Department of the Navy in compliance with the National Environmental Policy Act (NEPA) of 1969 (42 US Code [U.S.C.] 4321 *et seq.*); Council on Environmental Quality (CEQ) regulations implementing NEPA (40 Code of Federal Regulations [C.F.R.] Parts 1500-1508); and Department of the Navy Procedures for Implementing NEPA (32 C.F.R. 775).

Figure 1-1
Locations of NAF El Centro and NAS Lemoore

1.1 BACKGROUND

The F-35C Lightning II Joint Strike Fighter is a technologically advanced fifth-generation strike fighter designed to operate from conventional runways and nuclear-powered aircraft carriers. The Navy F-35C aircraft is part of the larger DoD Joint Strike Fighter Program that is vital to national security. The DoD Joint Strike Fighter Program was initiated in the early 1990s in response to projections of future threat scenarios and enemy capabilities (DoN 2008). The US Congress approved the development and funding of the Joint Strike Fighter Program when it enacted defense authorization and appropriation laws for the procurement of the F-35 aircraft.

Once approved, the DoD began the effort to build a universal strike fighter aircraft that would meet the needs of all its services and international partners. By combining the capabilities of several existing fighter aircraft into one multi-role strike fighter aircraft, the Joint Strike Fighter Program implemented congressional directives to reduce tactical aviation costs, deploy fewer types of aircraft, and match fighter aircraft capabilities to real world threats. Specifically, this program focused on developing a single airframe design with three distinct variants:

- F-35A – Conventional takeoff and landing
- F-35B – Short takeoff and vertical landing
- F-35C – Carrier variant

The Navy will procure and operate the F-35C carrier variant. The other Services will base, maintain, and operate the F-35 Lightning II separately to support service-specific mission requirements and deployment schedules. Therefore, each Service will prepare its own NEPA documentation for basing and operations. The US Marine Corps prepared two EISs for basing the F-35B: Final US Marine Corps F-35B West Coast Basing EIS (DoN 2010a) and Final US Marine Corps F-35B East Coast Basing EIS (DoN 2010b).

1.1.1 History of the FA-18 Hornet Aircraft

The FA-18 Hornet aircraft was first introduced into the Navy in 1978 to fulfill the Navy's need for a multi-role fighter and attack aircraft. Early versions of the FA-18 Hornet, the FA-18A and FA-18B models, began to operate in Navy squadrons in the early 1980s. Since its introduction, the Hornet has undergone configuration updates and upgrades, while the operational concept for the aircraft remained the same. The updated FA-18C and FA-18D models became operational in the late 1980s (DoN 2009). However, even with upgrades, the FA-18 Hornet is limited in its utility against the array of modern threats due to its 1970s design elements. Operations in Iraq and Afghanistan over the past 10 years dramatically increased the use of FA-18C accelerating the need to replace the aging aircraft. The hastened retirement of the FA-18C along with delays in the F-35 program drove the Navy to replace some FA-18C aircraft with FA-18E Super Hornet aircraft temporarily until the F-35 could be introduced as a long-term replacement.

1.1.2 Comparison of FA-18C and F-35C Aircraft

Figure 1-2 is a side-by-side comparison of the FA-18C Hornet and the F-35C Lightning II (carrier variant) aircraft. Like the FA-18, the F-35C is designed to operate from conventional runways and nuclear-powered aircraft carriers and perform air-to-air and air-to-ground strike-fighter missions using a wide

variety of existing weapons. In contrast to the FA-18, the F-35C is a single-engine aircraft, equipped with state-of-the-art technology that makes it more difficult to detect on radar, and capable of greater communications with other airborne and ground-based units. Furthermore, the design of the F-35C included increased reliability, improved maintenance processes, and reduced hazardous wastes.

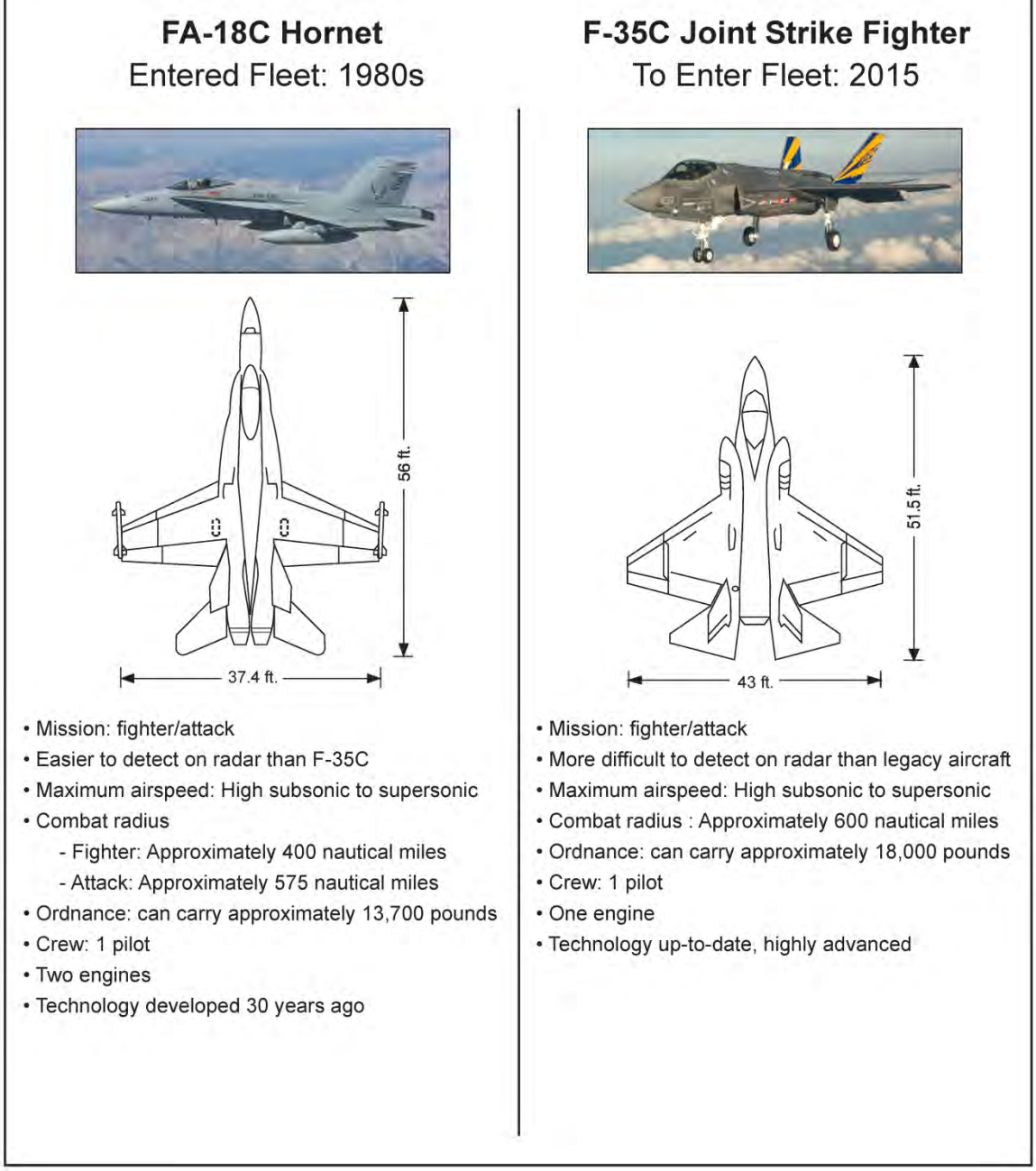


Figure 1-2. Comparison of FA-18C Hornet and F-35C Joint Strike Fighter

1.2 PURPOSE AND NEED

The purpose of the proposed action is to replace aging Navy Pacific Fleet FA-18 Hornet aircraft with F-35C aircraft while meeting pilot training and readiness requirements. Seven Navy Pacific Fleet FA-18 squadrons (70 total aircraft) currently based at NAS Lemoore would progressively transition to the new F-35C aircraft beginning in 2015 with the transition to be complete by 2028. The plan would also involve the establishment no earlier than 2017 of an F-35C FRS consisting of approximately 30 aircraft to meet the requirements for training Navy pilots. Between 2012 and 2015, many FA-18C squadrons will temporarily transition to the FA-18E/F because FA-18Cs are reaching the end of their service lives prior to the F-35C being ready to enter the Fleet. Additionally two FA-18 squadrons are moving from the East Coast to NAS Lemoore to better align forces with carrier air wing operational scheduling demand.

The F-35C is the congressionally approved long-term replacement for the Navy's aging FA-18 Hornet. Accordingly, the need for the proposed action is to support the Navy's Maritime Strategy by maintaining and modernizing strike fighter capability in the Navy Pacific Fleet with the more advanced F-35C. Overall, the F-35C program is consistent with the Navy's Maritime Strategy because the F-35C is an aviation platform capable of supporting the five core maritime capabilities outlined in *A Cooperative Strategy for 21st Century Seapower* (DoN et al. 2007), including:

- Forward Presence
- Deterrence
- Sea Control
- Power Projection
- Maritime Security

The advanced features of the F-35C are designed to enable the Navy to succeed in fulfilling these missions in sophisticated air defense environments.

As older models of the FA-18 are approaching the end of their service life, the Navy must replace them efficiently and expeditiously. To do so, the Navy intends to maximize the use of existing Navy installations, manpower, and support functions to the greatest extent possible.

1.3 PUBLIC INVOLVEMENT

The Navy would like to thank the elected officials, federal, state, and local agencies, as well as the public for taking the time to participate in the development of this EIS, attend the public meetings, and submit comments on the Draft EIS. The two opportunities for public involvement for this EIS included the scoping period and the Draft EIS review period. During the scoping period, the public was invited to participate by helping to identify issues to be studied in the EIS. During the Draft EIS review period, the public was invited to provide comments on the Draft EIS, which have been addressed in the Final EIS.

Public involvement activities during the scoping period are described in detail in the *Scoping Summary Report* located in Appendix A, *Public Involvement*. Public involvement activities during the Draft EIS review period are detailed in the *Draft EIS Public Meeting Summary Report*, also found in Appendix A. A summary of public involvement during scoping period and the Draft EIS review period is provided below.

1.3.1 Scoping Notification

Scoping is a fundamental part of the EIS development process. Scoping not only informs the public about the proposed action and alternatives but also allows the public and stakeholders to identify issues and concerns that are of particular interest to affected communities. Public input is used to assist resource specialists in data collection and analysis during development of the Draft EIS.

The 45-day public scoping period for this EIS officially began on January 28, 2011 and closed on March 14, 2011 (DoN 2011a). The Navy published notices of its intent to prepare an EIS and invited public participation in identifying the scope and issues related to the proposed action. Public notification was done through publication in the *Federal Register*, advertisements in local daily and weekly newspapers, mailing notification and coordination letters, establishing a public website, issuing press releases, and holding media events.

Public scoping meetings were announced on January 28, 2011 when the Navy published a Notice of Intent (NOI) in the *Federal Register* (DoN 2011a). The Navy also published a series of display advertisements in four newspapers (three English and one Spanish) serving the communities in the vicinity of NAF El Centro and NAS Lemoore announcing its intent to prepare an EIS. The advertisements included the dates, times, and locations for two scoping meetings and four ways for the public to provide comments. The newspaper advertisements coincided with the publication of the NOI in the *Federal Register* and were repeated in the weeks before each of the scheduled scoping meetings, as indicated in **Table 1.3-1**.

Table 1.3-1. Newspaper Display Advertisements for Scoping Meetings

Newspaper	*City*	*Publication Dates*	*Page Number*
Imperial Valley Press	El Centro, California	January 28, 2011 February 8, 2011 February 12, 2011 February 13, 2011 February 15, 2011	A5 A2 A2 B7 A7
Adelante Valle (Spanish language weekly)	El Centro, California	February 3, 2011 February 10, 2011	5 2
The Fresno Bee	Lemoore, California	January 28, 2011 February 10, 2011 February 15, 2011 February 16, 2011 February 17, 2011	A8 A4 A4 A8 A6
The Hanford Sentinel	Lemoore, California	January 28, 2011 February 10, 2011 February 15, 2011 February 16, 2011 February 17, 2011	A9 A7 A8 A6 A4

Notification and coordination letters were sent to federal, state, and local agencies; Native American tribes; elected officials; and various interest groups most likely to be interested in the proposed action. These letters were mailed concurrently with the publication of the NOI in the *Federal Register.* Each letter provided the Navy's notification of its intent to prepare an EIS, a description of the proposed

action and alternatives, background information on the proposed action, and details on public participation opportunities.

A project website (http://www.navyf35cwestcoasteis.com) was made available to the public on January 27, 2011, 3:00 p.m. Pacific time, and was updated periodically throughout the scoping process. Information on the website was provided in both English and Spanish. The project website provided the NOI; dates, times, and locations of scoping meetings; a description of the proposed action and alternatives and the NEPA process; project schedule; and ways for the public to provide comments. Electronic versions of informational materials used during scoping meetings were available for download from the website. Additionally, the public website contained webpages that allowed the public to submit written comments online in both English and Spanish. During the scoping period, the website was visited approximately 320 times. The link to the project website was listed in all other scoping notification materials.

Press releases were issued on January 27, 2011 to the local media (e.g., television, radio, and online news sources) in the vicinity of NAF El Centro and NAS Lemoore, and also to the San Diego regional media where Commander Navy Region Southwest is headquartered. Media organizations were also invited to participate in media events held one day prior to each of the scoping meetings. Representatives from KYMA Yuma Channel 11 (NBC affiliate) and the Imperial Valley Press newspaper attended the February 14, 2011 media event at NAF El Centro. The media event held at NAS Lemoore on February 16, 2011 was attended by KGPE Fresno Channel 47 (CBS affiliate), KSEE Fresno Channel 24 (NBC affiliate), KFSN Fresno Channel 30 (ABC affiliate), and the Fresno Bee newspaper.

1.3.2 Scoping Period Meetings

In February 2011, the Navy held public scoping meetings in the cities of El Centro and Lemoore (**Table 1.3-2**). The scoping meetings were conducted in an open-house format designed to enhance public understanding of the project and NEPA process and to allow the public to identify to Navy representatives issues and concerns they would like to see addressed in the EIS. During the scoping meetings, attendees could speak individually with Navy representatives and submit written and oral comments. Several Spanish-speaking Navy representatives and an independent Spanish interpreter were available to aid in discussions with Spanish-speaking community members. A stenographer was available to record and transcribe oral comments. A total of 187 individuals signed in at the two meetings, including federal and state elected officials, the media, city government agencies, local community planning groups, and local school representatives.

Table 1.3-2. Scoping Meeting Schedule, Locations, and Number of Attendees

Date	*Time*	*Location*	*Attendees*
Tuesday, February 15, 2011	5:00 p.m. to 8:00 p.m.	Southwest High School 2001 Ocotillo Drive El Centro, California 92243	46
Thursday, February 17, 2011	5:00 p.m. to 8:00 p.m.	Lemoore Senior Center, Gene Stebbins Building 789 Lemoore Avenue (S. 18th Avenue) Lemoore, California 93245	141

1.3.3 Scoping Period Public Comments

The Navy would like to thank the elected officials, federal, state, and local agencies, as well as the public for taking the time to review the information about this proposed project, attend the public meetings, and help to identify issues to be studied in the Draft EIS. Comments were received from individual members of the public, elected officials (i.e., federal, state, and local), federal regulatory and state resource agencies, local agencies, businesses, and community groups. **Table 1.3-3** summarizes the number of comment letters and forms submitted through the four methods made available to the public during the 45-day scoping period. Many of the 253 comments submitted addressed multiple issues.

Table 1.3-3. Number of Comment Letters/Forms Received during Scoping Period

Method of Comment Submittal	*El Centro & Vicinity*	*Lemoore & Vicinity*	*General**	*Total Comments Received*
Written comments at scoping meetings	9	17	—	26
Oral comments to stenographer at scoping meetings	4	14	—	18
Written comments on project website	23	71	—	94
Written comments mailed	83	29	3	115
Total	**119**	**131**	**3**	**253**

Note: *Includes general comments related to the project but not pertaining specifically to either installation.

The primary issues that were raised during scoping related to socioeconomics, community facilities and services, infrastructure and utilities, and land use. To a lesser extent, scoping comments focused on airfields and airspace, noise, and the evaluation of cumulative effects. Specific concerns identified in the comments are summarized below:

- Need for improved land use policies regarding incompatible development adjacent to installations
- Base closure at NAS Lemoore if the F-35C is not homebased at NAS Lemoore
- Base security due to the location of NAF El Centro in relation to the United States – Mexico border
- Alternative sources of energy and fuel usage
- Impacts to airspace designations
- Minimization of cultural resource impacts to area tribes
- Increases in noise
- Evaluation of cumulative impacts

Overall, the public at both Lemoore and El Centro generally expressed support for the proposed homebasing of the Navy F-35C in their communities, with more than 85 percent commenting in favor of the proposed action. Comments provided by elected officials were also positive in nature and supported homebasing the F-35C in their respective areas.

1.3.4 Draft EIS Availability and Public Meeting Notifications

The Navy would like to thank the elected officials, federal, state, and local agencies, as well as the public for taking the time to review the Draft EIS, attend the public meetings, and submit comments on the Draft EIS. The public comment period and public meetings are an important aspect of the environmental analysis process.

The Draft EIS availability and public meetings were announced using numerous methods: publishing notices in the *Federal Register*, publishing display advertisements in local daily and weekly newspapers, mailing notification letters and postcards, issuing press releases, distributing flyers at community events, holding media events, and maintaining the project website. Throughout the Draft EIS public comment period, comments were received and compiled for consideration during the preparation of the Final EIS.

The Navy published a Notice of Public Meetings for the Draft EIS for US Navy F-35C West Coast Homebasing in the *Federal Register* on February 28, 2013 (DoN 2013b). The Navy also published a series of display advertisements with the Notice of Availability of the Draft EIS and Notice of Public Meetings in four newspapers (three English and one Spanish) that serve the potentially affected communities in the vicinity of NAF El Centro and NAS Lemoore (**Table 1.3-4**). The newspaper display advertisements provided the dates, times, and locations for two public meetings. Each newspaper determined the placement of the paid notices. Newspaper advertisements were published at the beginning of the comment period, approximately 25 days prior to the meetings, nearly two weeks before each meeting, and when possible on three consecutive days before each meeting.

Table 1.3-4. Newspaper Display Advertisements for Public Meetings

Newspaper	*Location*	*Publication Dates*	*Page Number*
Imperial Valley Press	El Centro, California	February 15, 2013 February 22, 2013 March 7, 2013 March 17, 2013 March 19, 2013 March 20, 2013	B8 A8 A8 A9 A7 A2
Adelante Valle (Spanish language weekly)	El Centro, California	February 15, 2013 February 22, 2013 March 8, 2013 March 15, 2013	A24 A8 A9 A11
The Fresno Bee	Lemoore, California	February 15, 2013 February 22, 2013 March 5, 2013 March 16, 2013 March 17, 2013 March 18, 2013	A2 A6 A4 A4 A9 A8
The Hanford Sentinel	Lemoore, California	February 15, 2013 February 22, 2013 March 5, 2013 March 15, 2013 March 16, 2013 March 18, 2013	A8 A7 A2 A8 A4 A6

The public comment period provided opportunities for government agencies, elected officials, Native American Tribes, organizations, and individuals to express their concerns regarding the analyses conducted in support of the US Navy F-35C West Coast Homebasing Draft EIS. The 60-day public comment period for the Draft EIS began on February 15, 2013 with publication of the Draft EIS Notice of Availability in the *Federal Register* (US Environmental Protection Agency [USEPA] 2013). The initial deadline for public comment was April 22, 2013. However, due to requests from the public and elected officials, the public comment period was extended to May 7, 2013. An announcement of the extension of the public comment period was published April 19, 2013 in the *Federal Register* (DoN 2013a). A press release with notification of the comment period extension was issued April 19, 2013. Display advertisements with the public notice of the comment period extension were published in the newspapers on the dates and pages shown in **Table 1.3-5**. In total, the public comment period comprised 82 days.

Table 1.3-5. Newspaper Display Advertisements for Comment Period Extension

Newspaper	*Location*	*Dates*	*Page Number*
Imperial Valley Press	El Centro, California	April 19, 2013 April 20, 2013 April 21, 2013	A7 A9 B6
Adelante Valle (Spanish language weekly)	El Centro, California	April 19, 2013	A11
The Fresno Bee	Lemoore, California	April 19, 2013 April 20, 2013 April 21, 2013	A7 A11 A7
The Hanford Sentinel	Lemoore, California	April 19, 2013 April 20, 2013	A7 A4

The Navy provided several additional notifications regarding the availability of the Draft EIS and Notice of public meetings, inviting members of the public to comment on the Draft EIS and attend public meetings. Specifically, the Navy sent more than 200 notification letters to federal, state, and local government agencies; elected officials; Native American Tribes; organizations; and individuals. Postcards were sent to more than 150 organizations and individuals that had identified themselves by submitting comments during the scoping process or by requesting notification. More than 185 CDs with electronic copies of the Draft EIS were sent to those requesting copies. On February 14, 2013, the Navy issued a three-page press release, which was made available to the local media in the vicinity of NAF El Centro and NAS Lemoore, and to the San Diego regional media where Commander Navy Region Southwest is headquartered. The Navy distributed up to 25,000 community flyers at the NAF El Centro Air Show on March 16, 2013 and up to 15,000 flyers in NAS Lemoore.

The project website (http://www.navyf35cwestcoasteis.com) was updated concurrently with the publication of the Notice of Availability of the Draft EIS in the *Federal Register.* The project website provided information such as the Notice of Availability, the Notice of Public Meetings, notice of public comment period extension, electronic copy of the Draft EIS, electronic copy of the Executive Summary in Spanish, and locations where paper copies of the Draft EIS were available locally for review. The project website also included the public meeting schedule, four ways to comment on the Draft EIS, electronic versions of informational materials used at the public meetings (e.g., English and Spanish posters and

factsheets), press releases, and newspaper advertisements. During the public comment period, the website accepted online comments on the Draft EIS in both English and Spanish. Between February 15 and May 7, 2013, the website was visited 3,332 times.

Printed copies of the Draft EIS were made available for public review during the comment period at the following 10 local libraries: City of El Centro Public Library, City of Imperial Public Library, Imperial County Free Library Holtville Branch, Imperial County Free Library Heber Branch, Imperial County Free Library Seeley (Library Services Provided at Community Church), Kings County Library Hanford Branch, Kings County Library Lemoore Branch, Fresno County Public Library-Central Library, Fresno County Public Library Riverdale Branch, and West Hills College Lemoore Library.

1.3.5 Draft EIS Review Period Public Meetings

Public meetings provide members of the community the opportunity to ask the Navy questions about information in the Draft EIS, as well as to provide written and oral comments. In March 2013, the Navy held public meetings in the cities of Lemoore and El Centro (**Table 1.3-6**). The public meetings were conducted in an open-house format designed to provide the public an opportunity to discuss with Navy representatives questions and concerns they might have after their review of the Draft EIS. During the public meetings, attendees could speak individually with Navy representatives and submit written and oral comments. An independent Spanish interpreter was available to aid in discussions with Spanish-speaking community members. A stenographer was available to record and transcribe oral comments. A total of 191 individuals signed in at the two meetings, including federal and state elected officials, the media, city government agencies, local community planning groups, and local school representatives.

Table 1.3-6. Public Meeting Schedule, Locations, and Number of Attendees

Date	*Time*	*Location*	*Attendees*
Tuesday, March 19, 2013	5:00 p.m. to 8:00 p.m.	Lemoore Civic Auditorium 435 C Street Lemoore, California 93245	88
Thursday, March 21, 2013	5:00 p.m. to 8:00 p.m.	Southwest High School, Multipurpose Room 2001 Ocotillo Drive El Centro, California 92243	103

Media organizations were invited to participate in the public meetings. Representatives from Fresno television affiliates FSN Channel 30 ABC, KGPE Channel 47 CBS, as well as representatives from the Fresno Bee and Hanford Sentinel newspapers, attended the March 19, 2013 Lemoore public meeting. The El Centro public meeting was attended by representatives from television affiliates KECY Channel 9 Fox and KESE Channel 5 ABC, as well as the Desert Review and Imperial Valley Press newspapers.

1.3.6 Draft EIS Review Period Public Comments

The Navy would like to thank the elected officials, federal, state, and local agencies, as well as the public for taking the time to review the Draft EIS, attend the public meetings, and submit comments on the Draft EIS. Comments were received from individual members of the public; federal, state, and local elected officials; federal regulatory and state resource agencies; local agencies; businesses; and

community groups. **Table 1.3-7** provides the number of comment letters and forms submitted through the four methods made available to the public during the 82-day public comment period.

Table 1.3-7. Number of Comment Letters/Forms Received during Public Review Period

Method of Comment Submittal	*El Centro & Vicinity*	*Lemoore & Vicinity*	*General**	*Total Letters/Forms Received*
Written comments at public meetings	23	15	—	38
Oral comments to stenographer at public meetings	8	3	—	11
Written comments on project website	29	19	—	48
Written comments mailed	518	22	4	544
Total	**578**	**59**	**4**	**641**

Note: *Includes general comments related to the project but not pertaining specifically to either installation.

The Navy received comments on the Draft EIS from the following federal and state agencies: US Environmental Protection Agency, US Department of the Interior, Native American Heritage Commission, and the California State Clearinghouse and Planning Unit. Comments from the agencies generally included recommendations for further coordination, permit requirements, or mitigation. Areas of concern were: noise, bird/animal aircraft strike hazards, stormwater management, energy demand/renewable energy, water supply, air quality, and archaeological resources.

Many letters were received by local elected officials in the NAF El Centro and NAS Lemoore regions in support of homebasing in their community. Seventeen resolutions in support of homebasing at NAF El Centro were received from local city councils, chambers of commerce, school districts, economic development groups, the Imperial County Board of Supervisors, and the Imperial Irrigation District. One resolution was received from the City Council of the City of Coalinga in support of homebasing at NAS Lemoore. A citizen petition with 1,251 signatures in support of homebasing at NAF El Centro was submitted by the Imperial Valley United for Joint Strike Fighter Coalition. Most of the 641 comment letters and forms addressed multiple topics, which are summarized in **Table 1.3-8**.

Table 1.3-8. Summary of Comments Received during Public Review Period

Topic	*Number of Comments Received*	*General Summary of Comments*
Purpose and Need	16	Numerous commenters recognized the importance of the continued Navy mission and were in full support of the Navy proposed homebasing of the F-35C.
Proposed Action and Alternatives	602	Comments addressed: evaluation of projected F-35C operational costs; evaluation of the cost effectiveness of proximity of NAF El Centro to training ranges versus proximity of NAS Lemoore to training ranges; consideration of better weather conditions at NAF El Centro than NAS Lemoore in decision-making process; and the perceived base closure threat to NAF El Centro and NAS Lemoore.
Public Involvement	7	NAF El Centro and NAS Lemoore community members had positive and negative comments on the productivity of the public meeting, some thanking the Navy for the informative displays, and several expressing that their input did not matter and a decision had already been made.

Table 1.3-8. Summary of Comments Received during Public Review Period

Topic	*Number of Comments Received*	*General Summary of Comments*
Airfields and Airspace	7	Some commenters thought the airspace was less congested at NAF El Centro while others thought airspace was less congested at NAS Lemoore. El Centro community members commented on the operating hours at the NAS Lemoore airfield in comparison to NAF El Centro airfield.
Noise	24	Some community members expressed concern about noise from proposed aircraft operations; however, many indicated noise was not a concern.
Air Quality	13	El Centro residents expressed concerns regarding the air quality at NAS Lemoore and that homebasing the F-35C at NAS Lemoore would contribute to the poor air quality in the region.
Safety	4	Concern was expressed regarding future fighter jet accidents that may present safety issues for the public.
Land Use	8	El Centro residents expressed that appropriate land use planning has been conducted in the El Centro community for the purpose of sustaining the continued operation of NAF El Centro.
Infrastructure and Utilities	8	El Centro community members commented on water and wastewater treatment infrastructure.
Socioeconomics	69	El Centro and Lemoore communities both expressed how the proposed F-35C Homebasing would affect their economies and socioeconomic characteristics.
Environmental Justice	1	Concern was expressed that increases in noise may impact low-income and minority populations.
Community Services	10	El Centro community members expressed that schools in the El Centro area would have the capacity to accommodate additional students.
Transportation and Traffic	10	Comments were received about the traffic study for roadways and intersections associated with NAF El Centro.
Biological Resources	0	-
Topography and Soils	0	-
Water Resources	0	-
Cultural Resources	4	Comments received from Native American Tribes indicated there were no concerns regarding impacts to cultural resources.
Hazardous Waste and Materials	0	-
Cumulative Impacts	1	Concern was expressed over the greenhouse gas emission cumulative impact analysis.
Other	3	Comments were received regarding the overall analysis of the Draft EIS
General Support	561	Many community members support the project and want the project in their community.
General Opposition	2	Some commenters did not support the F-35 program.

1.4 RELEVANT ENVIRONMENTAL DOCUMENTS

Material relevant to an EIS may be incorporated by reference in accordance with CEQ regulations (40 C.F.R. 1502.21), with the intent of reducing the document's size. A number of documents provide important information directly related to the preparation of this EIS. The applicable content of these

documents is incorporated by reference due to their relevance to the proposed action and evaluation of potential impacts addressed in this EIS. These documents include:

- **Final EIS for Development of Facilities to Support Basing US Pacific Fleet FA-18E/F Aircraft on the West Coast of the United States** (DoN 1998a) – The EIS evaluated the potential impacts to the human environment from development of facilities to support the West Coast basing of the Navy FA-18E/F aircraft. It was necessary that these aircraft be based on the West Coast to provide a balance in the force structure and to be near the West Coast stationed aircraft carriers on which the aircraft deploy. The proposed action included siting 164 FA-18E/F aircraft, locating associated military personnel and family members, and providing associated training functions at the receiving installation. In addition to the increased staffing and equipment levels, the proposed action increased Navy activity and flight operations at the receiving installation. Specific facilities were required to support the training operations and associated personnel. The two installations considered for the West Coast base were NAS Lemoore and NAF El Centro; NAS Lemoore was the preferred alternative. The Record of Decision (ROD) for this EIS was signed in July 1998 (DoN 1998b). The EIS and ROD documents may be accessed at: http://www.navyf35cwestcoasteis.com/Links.aspx.
- **Final US Marine Corps F-35B West Coast Basing EIS** (DoN 2010a) – The F-35B EIS addressed: 1) basing of 11 operational F-35B Joint Strike Fighter squadrons (176 aircraft) and 1 F-35B Operational Test and Evaluation squadron (8 aircraft) on the West Coast of the United States; 2) construction and/or renovation of airfield facilities and infrastructure necessary to accommodate and maintain the F-35B squadrons; 3) personnel changes; and 4) conducting F-35B readiness and training operations to attain and maintain proficiency in the operational employment of the F-35B and special exercise operations. Six operational squadrons of F-35Bs will be based at Marine Corps Air Station (MCAS) Miramar, San Diego, California and five F-35B operational squadrons plus one Operational Test and Evaluation squadron will be based at MCAS Yuma, Yuma, Arizona. F-35B operations would occur in much of the same SUA proposed for use by the F-35C in this EIS (e.g., Kane Military Operations Area [MOA], Abel MOA, and Restricted Areas [R-] R-2306, R-2308, R-2507, and R-2512). The ROD for the F-35B EIS was signed in December 2010 (DoN 2010c). The EIS and ROD documents may be accessed at: http://www.navyf35cwestcoasteis.com/Links.aspx.
- **EA for Strike Fighter Realignment at NAS Lemoore, California** (DoN 2011b) – The EA evaluated potential environmental impacts from the proposed realignment of Strike Fighter community assets at NAS Lemoore that would occur between 2012 and 2015. The proposed action addressed the relocation of two 12-plane East Coast FA-18E/F Super Hornet squadrons to NAS Lemoore and the transition of up to five Strike Fighter squadrons currently based at NAS Lemoore from older FA-18C Hornet aircraft to newer FA-18E/F Super Hornets. Strike Fighter realignment is needed because FA-18C aircraft are reaching the end of their service life prior to the F-35C entering the Navy Fleet. Hangars 1, 2, and 4 would undergo modifications to accommodate the FA-18E/F aircraft. During the same timeframe as this proposed action, the Navy plans to reduce the FRS to eliminate FA-18C/D aircraft and associated personnel from NAS

Lemoore. Although the FRS reduction is not part of the proposed action addressed in this Strike Fighter Realignment EA, the number of FRS aircraft will be reduced by 30 aircraft during the 2012-2013 timeframe. Under the proposed action, and taking into account the FRS reduction, aircraft operations at NAS Lemoore would decrease by approximately 24 percent by 2015 compared to 2011 conditions, while aircraft loading would decrease by four aircraft. The proposed action and the FRS reduction would also include a net increase of 182 personnel. A Finding of No Significant Impact for the Strike Fighter Realignment at NAS Lemoore was signed in October 2011. The EA and Finding of No Significant Impact documents may be accessed at: http://www.navyf35cwestcoasteis.com/Links.aspx.

A number of additional related NEPA documents have been prepared for other actions at NAS Lemoore and NAF El Centro. Although these NEPA documents address actions that are separate and distinct from the proposed action analyzed in this EIS, the potential cumulative effects from these actions have been considered in the preparation of this EIS and are described further in Chapter 6, *Cumulative Impacts for Alternative 1 – NAF El Centro Homebasing* and Chapter 7, *Cumulative Impacts for Alternative 2 – NAS Lemoore Homebasing*.

1.5 BASELINE CONDITIONS

Subsequent chapters of this EIS describe the potential environmental consequences of providing facilities and functions at NAF El Centro or NAS Lemoore needed to support homebasing the F-35C. Conditions during 2015 provide a baseline for comparison to analyze the potential effects of the proposed action.

The EA for Strike Fighter Realignment at NAS Lemoore, California describes potential changes in Navy Pacific Fleet Strike Fighter force structure (number of squadrons and type of aircraft), which may take place during the period of 2012 through 2015. These potential changes include relocation of up to two strike fighter squadrons from the East Coast, the temporary transition of up to five FA-18C squadrons to FA-18E/F aircraft, and the ending of FA-18C training at the FRS. This realignment is necessary because FA-18C aircraft are reaching the end of their service life prior to the F-35C entering the Navy Pacific Fleet. Such actions, if implemented, will be complete before introduction of the F-35C; therefore, they are assumed to be fully implemented for the purposes of the analysis in this EIS. Thus, conditions (force structure and operational tempo) at the end of 2015 are used as baseline conditions for analysis of potential impacts on resources affected by personnel loading and operations.

1.6 CLARIFICATION AND CHANGES TO THE EIS

Numerous comments received during the Draft EIS review period resulted in revisions to the Draft EIS during preparation of this Final EIS. Revisions to the EIS text include technical edits, clarifications, enhancements, and the inclusion of updated information. These revisions improve the accuracy and thoroughness of the analysis presented in the Draft EIS, but do not alter any conclusions regarding the nature or magnitude of impacts on any resource. Substantive revisions from the Draft EIS to the Final EIS include the following.

1.6.1 Executive Summary

- Portions of the Executive Summary were revised to reflect the corresponding changes in the main text of the EIS.

1.6.2 Chapter 1: Introduction

- Section 1.3 was revised to reflect the public involvement process including the addition of Sections 1.3.4, 1.3.5, and 1.3.6 to summarize the Draft EIS review process.

1.6.3 Chapter 2: Proposed Action and Alternatives

- Section 2.1.2 was revised to indicate that facilities would be constructed to comply with the Executive Order addressing energy efficiency, renewable energy, toxic chemical reduction, recycling, sustainable buildings, electronics stewardship, and water conservation.
- Sections 2.7.4.2 and 2.8.4.2 were revised to reflect changes in proposed aircraft operations in Special Use Airspace (SUA).
- Section 2.8.2 was revised to address the proposed demolition of Building 21 at NAS Lemoore.
- Section 2.9 was revised to clarify the rationale behind the selection of the Preferred Alternative, particularly with regards to the proximity of NAS Lemoore to military training range assets.

1.6.4 Chapter 3: Resource Definitions, Regulatory Setting, and Approach to Analysis

- No substantive revisions were made to Chapter 3.

1.6.5 Chapter 4: Alternative 1 – NAF El Centro Homebasing

- Section 4.1.1.1 was revised to include the normal operating hours of the NAF El Centro airfield.
- Section 4.1.2.1 was revised to reflect changes in proposed aircraft operations in SUA.
- Section 4.2 was revised to describe the Navy's existing noise complaint procedures and noise abatement procedures, along with text noting that existing noise abatement procedures would continue to be followed for proposed aircraft operations.
- Section 4.4 was updated to reflect that F-35 aircraft have executed more than 10,000 flight operations without a serious in-flight mishap.
- Section 4.6.2.1 was revised to update solid waste disposal of demolition debris.
- Sections 4.8.1.1 and 4.8.2.1 were revised to include sources for capacity, enrollment, and available space data for regional schools as well as associated supplemental impact analysis.
- Section 4.9.1.2 was updated to reflect the results of an addendum to the Traffic Study (Appendix C).
- Section 4.13.2.1 was updated to include the letter of concurrence from the State Historic Preservation Office regarding "no historic properties affected" for the proposed NAF El Centro Homebasing Alternative.

1.6.6 Chapter 5: Alternative 2 – NAS Lemoore Homebasing

- Section 5.1.1.1 was revised to describe the normal operating hours of the NAS Lemoore airfield.
- Section 5.1.2.1 was revised to reflect changes in proposed aircraft operations in SUA.
- Section 5.2 was modified to describe the Navy's existing noise complaint procedures and noise abatement procedures, along with text noting that existing noise abatement procedures would continue to be followed for proposed aircraft operations.
- Section 5.3.2.1 was revised to include emissions from the proposed demolition of Bldg. 21. Also added was the San Joaquin Valley Unified APCD conclusion that project has fulfilled and satisfied federal general conformity requirements. The Final General Conformity Determination and the San Joaquin Valley Unified APCD's compliance determination are included in Appendix 1D. Text was added to specify the possible applicability of Rules 9510, 2010 and 2201.
- Section 5.4 was updated to reflect that F-35 aircraft have executed more than 10,000 flight operations without a serious in-flight mishap.
- Section 5.6.1.1 was revised to delete a sentence referring to NAS Lemoore's negotiation with the Bureau of Land Management for a guaranteed minimum entitlement of 7.8 billion gallons of water annually.
- Sections 5.6.2.1 and 5.6.2.2 were revised to correct the acreages of soil disturbance and proposed impervious surfaces and to update the solid waste disposal of construction and demolition debris.
- Section 5.7.2.2 was modified by adding an analysis of potential impacts to children and minority and low-income populations at NAF El Centro from the proposed increase in aircraft operations and changes in noise contours under Alternative 2.
- Section 5.8.1.1 was revised to include sources for capacity, enrollment, and available space data for regional schools as well as associated supplemental impact analysis.
- Section 5.11.2.1 was revised to include potential impacts to soils from demolition activities at NAS Lemoore.
- Sections 5.13.1.1 and 5.13.2.1 were revised to address potential impacts to cultural resources from the proposed demolition of Bldg. 21, including the letter of concurrence from the State Historic Preservation Officer regarding "no historic properties affected" for the proposed NAS Lemoore Homebasing Alternative (see Appendix H).
- Sections 5.14.1.1 and 5.14.2.1 were revised to address potential impacts from hazardous waste and materials related to the proposed demolition of Bldg. 21.

1.6.7 Chapter 6: Cumulative Impacts for Alternative 1 – NAF El Centro Homebasing

- Section 6.2.1 was updated reflect changes in proposed aircraft operations in SUA.

- Section 6.2.3 was updated to clarify that the air quality analysis assessed the potential impacts associated with both criteria pollutants and greenhouse gas (GHG) emissions.
- Section 6.2.3.1 was revised to include a more thorough explanation of the potential cumulative effects on air quality from the proposed action when combined with other past, present, and reasonably foreseeable future projects.

1.6.8 Chapter 7: Cumulative Impacts for Alternative 2 – NAS Lemoore Homebasing

- Section 7.2.3 was updated to clarify that the air quality analysis assessed the potential impacts associated with both criteria pollutants and greenhouse gas (GHG) emissions.
- Section 7.2.3.1 was revised to include a more thorough explanation of the potential cumulative effects on air quality from the proposed action when combined with other past, present, and reasonably foreseeable future projects.

1.6.9 Chapter 8: Other Considerations Required by NEPA

- No substantive revisions were made to Chapter 8.

1.6.10 Chapter 9: References

- To support revised chapter text, a number of additional references have been added.

1.6.11 Appendices

- Appendix A was modified to include the comments received during the 82—day public comment period on the Draft EIS, along with the Navy's responses to the substantive comments.
- Appendix G was modified to include an addendum to the Traffic Study, which was prepared using the roadway segment level of service thresholds published in the County of Imperial Circulation and Scenic Highways Element.

2. PROPOSED ACTION AND ALTERNATIVES

2.1 PROPOSED ACTION

The proposed action is to provide facilities and functions on the West Coast of the United States (US) to support homebasing F-35C aircraft in the Navy Pacific Fleet. Providing these facilities and functions involves the following four aspects, which are described in detail below: aircraft replacement and transition, facility and infrastructure requirements, personnel requirements, and aircraft operations.

2.1.1 Aircraft Replacement and Transition

Under the proposed action, seven Pacific Fleet FA-18 fleet squadrons (operating 70 aircraft in total) currently based at Naval Air Station (NAS) Lemoore would progressively transition to the new F-35C aircraft beginning in 2015 with the transition to be complete by 2028. The plan would also involve the establishment no earlier than 2017 of an F-35C Fleet Replacement Squadron (FRS) consisting of approximately 30 aircraft to meet the requirements for training Navy pilots to operate the F-35C. The proposed action would occur at one of the proposed West Coast homebasing locations, either Naval Air Facility (NAF) El Centro or NAS Lemoore.

The FRS provides advanced training for pilots and maintenance personnel prior to them serving in a fleet squadron. The FRS would be co-located with the fleet squadrons in order to provide immediate and daily access to the full resources of the aircraft community, senior leadership, guidance and policies, tactical development, overall fleet experience, and the critical logistical support.

2.1.2 F-35C Facility and Infrastructure Requirements

Homebasing the F-35C requires certain facilities and infrastructure to support the necessary training, maintenance, and operational requirements. The Joint Strike Fighter Program Office (a joint program with no lead service and staffed by Air Force, Navy, and Marine Corps personnel) developed recommendations for structures, utilities, and other facilities that are required to effectively support the F-35. These recommendations were used by the Navy to compare the F-35C requirements with existing facilities and infrastructure at the potential homebase locations. This comparison served to identify the types and sizes of additional and/or modified facilities and infrastructure needed to support F-35C homebasing. The Navy developed conceptual plans for modifying existing assets (e.g., buildings, etc.) or constructing new facilities and infrastructure where needed to resolve deficiencies at potential F-35C homebase locations. New construction, renovation, and modification of facilities and infrastructure would be required for each alternative. Facility development would be required to comply with Executive Order (EO) 13423, *Strengthening Federal Environmental, Energy, and Transportation Management,* for energy efficiency, renewable energy, toxic chemical reduction, recycling, sustainable buildings, electronics stewardship, and water conservation.

Existing site conditions are different at each potential homebase location. Accordingly, specific facilities and infrastructure plans are unique to each proposed action alternative. Detailed descriptions of the facility and infrastructure assessments for each alternative are provided in Section 2.7.2, *Alternative 1 – Facility and Infrastructure Assessment,* and Section 2.8.2, *Alternative 2 – Facility and Infrastructure Assessment*. A general description of the facilities and infrastructure required to homebase the F-35C

and to meet the needs of the proposed action is provided below in the categories of: training, operations and maintenance, and personnel support.

2.1.2.1 Training Facilities

Facilities and infrastructure required for F-35C training must accommodate Navy pilots, instructors, administrators, and support personnel. Training is conducted in Academic Training Centers, which can be located in various facilities throughout a homebase location. Academic Training Centers must provide adequate space in a configuration that supports training in classrooms; independent study at interactive workstations; and training in flight simulators, on various aircraft component mock-ups, and on maintenance devices.

2.1.2.2 Operations and Maintenance Facilities

F-35C operations and maintenance activities require facilities and infrastructure to accommodate aircraft movement, aircraft parking, secure spaces for pre- and post-mission activities, ordnance handling (ordnance generally refers to weapons and ammunition), aircraft maintenance/repair, and aircraft servicing. The facilities and infrastructure required for these activities must provide the necessary airfield pavement features, aircraft maintenance hangars, supply and storage facilities, and adequate utilities.

<u>Airfield Pavement</u>

The F-35C requires the same type of airfield pavement as legacy aircraft to include taxiways, runways, parking aprons, arm/de-arm pads, and aircraft wash racks. Taxiways accommodate aircraft movement to runways, fueling areas, and parking areas. Multiple runways allow for continued operations in the event the first runway becomes unusable for any reason. Runways must be long enough to allow aircraft to accelerate to takeoff speed, then abort the takeoff and stop without the use of arresting gear. Also, runways must be wide enough to allow for the departure of multiple aircraft in formation.

Aircraft parking aprons are paved areas used for flight support operations, such as aircraft parking, mooring, loading/unloading, line maintenance, and aircraft servicing. Parking aprons are located near maintenance hangars and taxiways to provide for aircraft movement. The area required for parking aprons must be sufficient to maintain proper wingtip separation clearance for each aircraft and is based on the type and number of aircraft to be parked.

The arm/de-arm area is located near the end of each runway to arm aircraft immediately before takeoff and for de-arming unexpended weapons after flight.

Aircraft cleaning at wash racks is required to prevent corrosion by removing contaminants from aircraft surfaces. Cleaning is performed in conjunction with periodic maintenance and upon conclusion of flight operations where the aircraft may have encountered salt spray. Wash racks are located near hangars and maintenance facilities where utility and pollution control systems are accessible. A storage building near the wash racks provides utilities and space for necessary cleaning supplies and equipment.

Aircraft Maintenance Hangars and Maintenance Facilities

F-35C maintenance is structured at two levels, organizational and depot, without the traditional intermediate-level maintenance shop. Without an intermediate-level for maintenance functions, the F-35 organization level maintenance is referred to as "organizational plus," as it includes some off-equipment maintenance functions that typically would have been performed at the intermediate-level. Day-to-day maintenance, such as tire, wheel, and battery maintenance, would be performed at the organizational level by the squadron maintenance department.

Depot-level maintenance involves complex repairs that would be performed by a government/industry partnership at off-site locations. Thus, dedicated depot-level maintenance facilities would not be required at potential homebase locations.

Maintenance hangars are needed for aircraft in the seven F-35C fleet squadrons and the F-35C FRS. The primary function of the hangars is to support aircraft maintenance, repair, inspection, servicing, and flight preparation. The high bay area in hangars allows for aircraft maintenance in a controlled environment. Maintenance hangars also provide the space necessary for administrative support, crew, flight planning, flight briefs and debriefs, training, and equipment storage.

Additional facilities are needed to perform those maintenance functions that are not typically accommodated in hangars, such as engine repair facilities. Adequate space is also required for the storage and maintenance of the specific support equipment used to perform maintenance on aircraft.

Supply and Storage Facilities

General warehouse space is needed for bulk and bin storage, as well as shipping and receiving. Warehouse space is located near maintenance areas with direct, unobstructed access for trucks. Storage space is also needed for hazardous and flammable materials, such as solvents, to comply with all applicable laws and regulations for safety and environmental protection.

Fuel storage tanks are needed to provide an operating and reserve supply of jet fuel. The aircraft defueling facility is used to assist in aircraft maintenance and defueling operations. Designated defueling trucks are used to provide these services.

Utilities

Utility capacity and systems must be adequate to support the demands generated by aircraft operations, maintenance, and personnel support facilities. Utilities and systems required include water, wastewater treatment, stormwater management, electricity, communications, natural gas, and solid waste disposal.

2.1.2.3 Personnel Support Facilities

In addition to facilities directly related to the F-35C mission, a variety of other facilities and infrastructure are needed to support Navy personnel and their families. These often include military family housing, bachelor quarters, physical fitness centers, commissaries, child development centers, and medical facilities.

2.1.3 F-35C Personnel Requirements

The proposed action requires military, civilian, and contractor personnel to perform F-35C operational, maintenance, and training functions. The Navy would not need to add any additional personnel to its overall force structure to implement the proposed action. Instead, existing Navy personnel, most of whom are currently supporting aging FA-18 aircraft, would transition and potentially relocate to provide support for F-35C squadrons. **Table 2.1-1** lists the approximate number of military personnel that are required to support F-35C squadrons. Details on the changes in the number of personnel for each alternative, (including military, civilian, and contractor personnel) are provided in Section 2.7.3, *Alternative 1 Personnel Changes,* and Section 2.8.3, *Alternative 2 Personnel Changes*.

Table 2.1-1. Military Personnel Required to Support F-35C Squadrons

Squadron Type	*Number of Squadrons*	*Number of Personnel per Squadron**			*Overall Personnel*
		Officers	*Enlisted*	*Total*	
F-35C Fleet Squadron	7	24	200	224	1,568
F-35C FRS	1	65	450	515	515
				Total Personnel	**2,083**

Note: *Does not include contractor or civilian employees.

2.1.4 F-35C Operations

Operating the F-35C requires a potential homebase location that has a suitable airfield and adequate Special Use Airspace[1] (SUA). Airfields located at elevations less than 1,000 feet (ft) above mean sea level (MSL) closely replicate the operational conditions in the vicinity of a nuclear-powered aircraft carrier (CVN), and therefore, support effective carrier landing practice training. The airfield should be near CVN operating areas at sea (within one unrefueled flight) to enable efficient operations. That distance should allow aircraft to arrive overhead the CVN with ample fuel to loiter, execute multiple approaches to landing and if necessary, execute a divert to a land-based runway. SUA must be of sufficient size and have the capacity to support the required aircraft operations.

F-35C fleet squadrons would conduct a series of unit level training flights to prepare for deployment onboard aircraft carriers. During its pre-deployment workup period, a typical fleet squadron would conduct routine flight operations at and in the vicinity of the homebase airfield. The F-35C FRS would conduct aircraft operations to train Navy pilots for fleet squadrons. FRS training would be tailored to different categories of students, from newly winged Navy pilots without fleet flying experience to experienced pilots needing refresher training.

F-35C flight training operations would be very similar to existing FA-18 training in quality and quantity, using the same weapons. Therefore, the Navy would use its existing training ranges and SUA in the same manner they are used currently. This Environmental Impact Statement (EIS) will analyze unit level training range operations associated with homebasing the F-35C fleet and FRS, only including training

[1] Special Use Airspace consists of airspace within which specific activities must be confined because of their nature, or where limitations are imposed on aircraft not participating in those activities.

missions flown from the homebase sites. Large force exercises such as integrated carrier air wing training flown from NAS Fallon or carrier strike group training flown from the CVN are not associated with the proposed action (homebasing F-35C fleet and squadrons FRS). These training operations will be covered in other National Environmental Policy Act (NEPA) documents including the Navy's At-Sea Phase II Environmental Compliance Program. For more information see Appendix B, *F-35C Training Operations*.

Aircraft flying activities can be described using the terms flight and operation. A "flight" consists of a single military aircraft's activities from takeoff through landing, and normally includes a training mission. A flight may include more than one operation. The term flight is used in this EIS when summarizing the amount of flight activity from a homebase.

An "operation" can apply to both airfield and airspace activities. At an airfield, an operation consists of a single aircraft movement such as a landing or a takeoff. Therefore, one training flight normally involves at least two airfield operations - a takeoff and a landing. In SUA, an operation involves one aircraft using an SUA, such as a Military Operations Area (MOA) or an Air Traffic Controlled Assigned Airspace (ATCAA). Each time a single aircraft flies in different SUA, one operation is counted for that SUA. When comparing proposed F-35C annual operations in local SUA for each of the alternatives, it is worthwhile noting that the SUA for each alternative is configured differently (e.g., size and shape) and accommodates training missions differently. For instance, a particular training mission may be accomplished in one large block of airspace (counted as one SUA operation) or in two adjacent smaller blocks of airspace (counted as two SUA operations). Each potential homebasing location is served by SUA with different configurations. As a result, there is no direct correlation between the numbers of proposed F-35C annual operations in SUA for each alternative.

2.1.4.1 F-35C Airfield Operations

F-35C operations would be conducted at the airfield of the selected homebase location. Aircraft would depart (takeoff) and arrive (land) on runways using established flight paths involving differing approaches or departures due to wind or other factors. Aircraft would also perform pattern operations in and around the airfield. F-35C departures, arrivals and pattern operations at airfields would be conducted in a manner similar to FA-18 operations.

2.1.4.2 F-35C Operations in Special Use Airspace and Military Training Routes

F-35C operations would be conducted in SUA and Military Training Routes[2] (MTRs) within the vicinity of the selected homebase airfield. Airspace must be of sufficient size and have adequate capacity to support the required training needs of F-35C squadrons. For example, SUA must have lateral dimensions large enough to support F-35C operations, such as air combat maneuvers and training, air-to-air refueling, and basic fighter maneuvers. Also, SUA must have the capacity to accommodate the tempo of operations required for F-35C training in addition to other military aircraft use of that SUA.

[2] Military Training Routes contain flight corridors used by military aircraft for low-altitude, high-speed terrain following training.

2.2 NO ACTION ALTERNATIVE

The Council on Environmental Quality (CEQ) regulations (40 Code of Federal Regulations [C.F.R.] 1502.14[d]) require an EIS to evaluate the No Action Alternative. The No Action Alternative provides a benchmark that typically enables decision makers to compare the magnitude of potential environmental effects of the proposed homebasing alternatives with baseline conditions.

Implementing the No Action Alternative, or taking "no action," means that the Navy would not provide the facilities and functions on the West Coast to support homebasing the F-35C in the Navy Pacific Fleet. Under the No Action Alternative, the Navy would not renovate, expand, or construct new facilities or infrastructure. Consequently, there would be no increase in functional capacity at any alternative homebasing site. Moreover, there would be no changes in personnel or aircraft operations related to the F-35C at potential homebase locations.

The No Action Alternative does not meet the purpose of or the need for the proposed project as stated in Section 1.2 of this EIS. However, the conditions associated with the No Action Alternative serve as reference points for describing and quantifying the potential impacts associated with the proposed homebasing alternatives. In this case, the 2015 aircraft loading, facility and infrastructure assets, personnel levels, and number of aircraft operations at potential homebasing alternatives provide the baseline to compare the proposed requirements necessary to accommodate homebasing the F-35C.

2.3 DEVELOPMENT OF F-35C HOMEBASING ACTION ALTERNATIVES

The Navy intends to base all its West Coast F-35C at one location in order to maximize the efficiency of support facilities, simulation devices, and on-site support personnel. Accordingly, the process for developing homebasing alternatives sought to ensure the efficient and economic transition to the F-35C at one West Coast homebase location. More than 100 Department of Defense (DoD) airfields were examined in a three-level screening process to identify potentially suitable F-35C homebase locations. The screening process applied geographic considerations, airfield characteristics, and mission compatibility factors.

Level 1 screening examined geographic considerations including distance from the home airfield to the West Coast aircraft carrier operating area (**Figure 2-1**) and the elevation of the home airfield. F-35C homebasing locations within 600 nautical miles of aircraft carrier operating areas in the Pacific Ocean off the West Coast would eliminate refueling during transit, minimize transit time and maximize operational efficiency and military readiness. Since aircraft handling characteristics vary greatly with altitude, the elevation of the home airfield should not exceed 1,000 ft above MSL in order to more closely resemble at-sea (i.e., aircraft carrier) conditions.

Per Level 1 screening criteria, the Navy screened all 134 DoD airfields within the continental 48 states for distance to the West Coast aircraft carrier operating area (W-291) and airfield elevation relative to sea level. Since geographical considerations cannot be changed, the Level 1 screening process narrowed the list of potentially suitable installations from 134 to the following 12, which met the Level 1 screening requirements:

- Beale Air Force Base, CA
- Marine Corps Base Camp Pendleton, CA

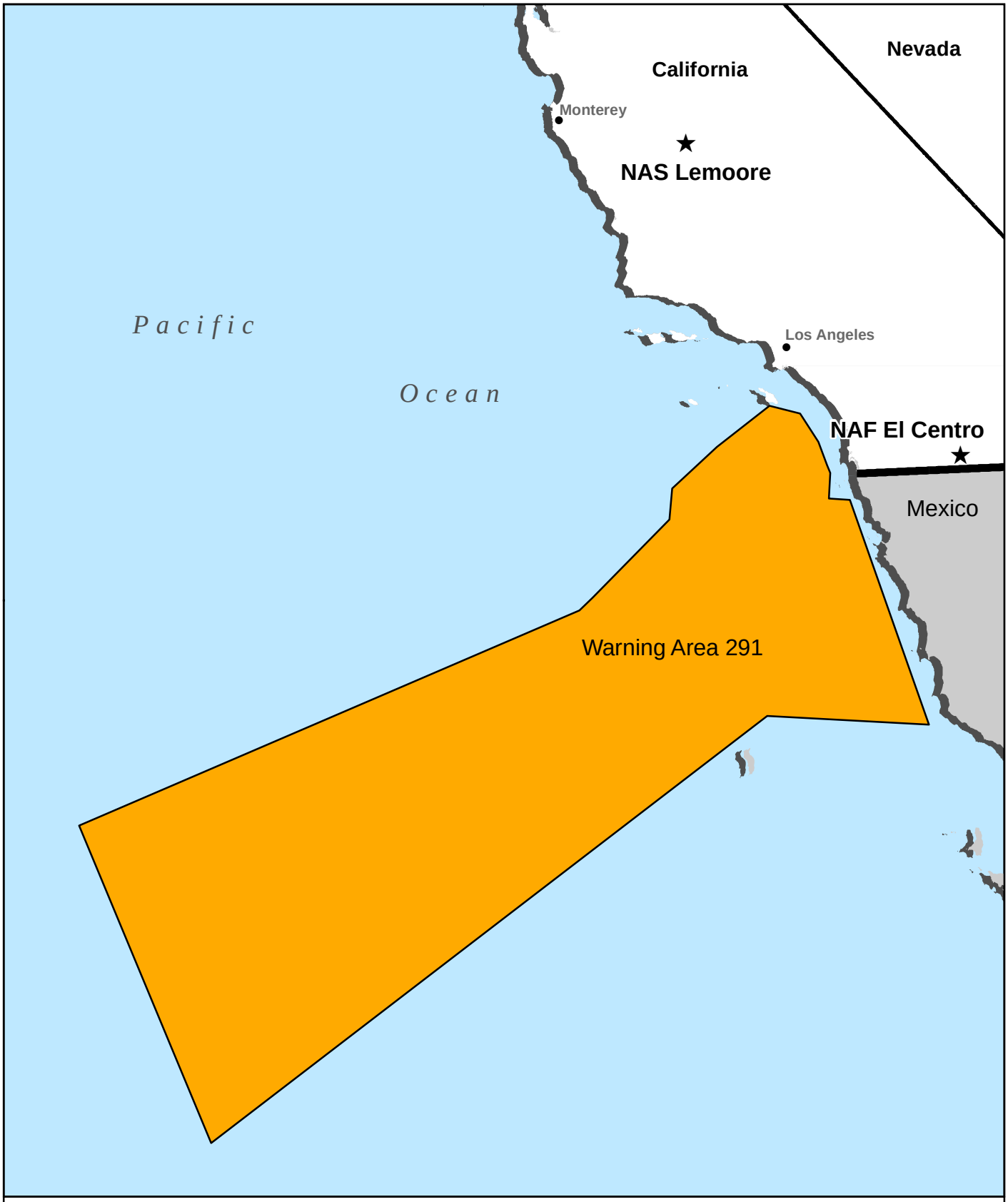


Figure 2-1
West Coast Aircraft Carrier Operating Area

- Laguna Army Airfield, AZ
- Los Alamitos Army Airfield, CA
- Marine Corps Air Station (MCAS) Miramar, CA
- MCAS Yuma, AZ
- NAF El Centro, CA
- NAS Point Mugu, CA
- NAS Lemoore, CA
- NAS North Island, CA
- Travis Air Force Base, CA
- Vandenberg Air Force Base, CA

Level 2 screening examined airfield characteristics such as runway configuration, runway length and width, and distance to training ranges to support the operational requirements of F-35C (**Table 2.3-1)**. The Level 2 screening process narrowed the list of potential suitable installations from 12 to 4: MCAS Miramar, MCAS Yuma, NAF El Centro, and NAS Lemoore.

Table 2.3-1. Level 2 Screening Factors

Capability	*Requirement*
Runways	Multiple
Primary Runway Length	≥9,000 ft
Secondary Runway Length*	≥8,000 ft
Runway Width	≥200 ft
Distance to Ranges	≤120 nautical miles
Suitable Air-to-Air Training Range Size	≥50 nautical miles x 80 nautical miles
Suitable Air-to-Ground Training Range Size	≥250 square nautical miles

Note: *NAF El Centro requires a parallel runway for Field Carrier Landing Practice (FCLP). This runway would meet the requirement for the secondary runway length.

Level 3 screening examined the compatibility of the existing mission of the four remaining installations with tactical aircraft operations associated with F-35C homebasing. It is assumed that any potential homebase would need to continue supporting its current mission, as well as F-35C operations. Level 3 screening factors are listed in **Table 2.3-2**.

Table 2.3-2. Level 3 Screening Factors

Existing Mission	*Compatible with Basing F-35C Operations*
Tactical Jet Aircraft Base	Compatible
Helicopter Bases	Incompatible
Civilian Flight Operations	Incompatible
Undergraduate (Basic and Intermediate) Flight Training	Incompatible
Test and Evaluation Bases	Incompatible
Limited Operations Capacity	Incompatible
Transport Bases	Incompatible

In accordance with the Naval Aviation Enterprise Global Shore Infrastructure Plan (Department of the Navy [DoN] 2008), certain aircraft operations are considered incompatible with tactical jet aircraft operations for safety or operational efficiency reasons as outlined below.

- **Helicopter Bases** – Large concentrations of fixed-wing squadrons should not be based with large concentrations of rotary-wing squadrons, unless the airspace can be divided so as to separate the respective operations. This is due to vast differences in performance and approach and departure flight paths.
- **Civilian Flight Operations** – Civilian flight operations are not compatible with large concentrations of military operations due to vast differences in performance and approach and departure flight paths.
- **Undergraduate (Basic and Intermediate) Flight Training** – Undergraduate pilot training bases conduct operations at a tempo commensurate with student pilot skill level, making these installations unsuitable for FRS, Fleet or Research Development Testing and Evaluation basing.
- **Research Development Acquisition Testing and Evaluation Bases** – Research Development Testing and Evaluation flight operations entail costly technical and logistic support, as well as unique flight profiles, warranting dedicated airspace and airfields.
- **Limited Operations Capacity** - A potential homebase is considered incompatible if it lacks sufficient operations capacity to support existing operations for its current mission, in addition to the requirements for proposed F-35C operations.
- **Transport Bases** – Large concentrations of fixed-wing tactical aircraft squadrons should not be based with large concentrations of large transport aircraft (e.g., C-17) because of the vast differences in performance and approach and departure flight paths.

MCAS Miramar was eliminated due to limited operations capacity. The Marine Corps plans to base 6 F-35 squadrons with a total of 96 aircraft at MCAS Miramar. Additionally, there will be 8 MV-22 squadrons with a total of 96 aircraft based at MCAS Miramar by 2020. There is insufficient capacity to support Navy F-35C operations combined with Marine Corps existing and planned operations without significant delays in aircraft departures and arrivals.

MCAS Yuma was also eliminated because of limited operations capacity. The Marine Corps plans to base 6 F-35 squadrons with a total of 88 aircraft at MCAS Yuma. There is insufficient capacity to support Navy F-35C operations combined with Marine Corps existing and planned operations without significant delays in aircraft departures and arrivals.

After reviewing the geographic considerations, airfield characteristics, and operational mission compatibility factors as described above, the two installations that best met Navy requirements for homebasing the F-35C on the West Coast are NAF El Centro and NAS Lemoore. As a result, NAF El Centro and NAS Lemoore are the two potential homebase locations analyzed in this EIS for providing facilities and functions on the West Coast.

On the East Coast, the transition of FA-18 Atlantic Fleet squadrons to the new F-35C is expected to begin no earlier than 2020. Due to differences in geography and timeframe for implementation, the Navy will analyze the potential environmental effects from the East Coast F-35C homebasing in a separate EIS.

2.4 CANDIDATE SITE DESCRIPTIONS

2.4.1 NAF El Centro

NAF El Centro is located in south-central California, approximately 60 miles west of Yuma, Arizona, and 10 miles north of Mexico, in Imperial County (**Figure 2-2**). It occupies approximately 2,690 acres of land in the western portion of the Imperial Valley and is located at the south end of the San Bernardino and San Jacinto Mountain ranges. The installation is within the Colorado Desert Region at an elevation of 43 ft below sea level (NAF El Centro 2007).

Originally established in 1942, El Centro was commissioned as a Naval Air Facility in 1946. NAF El Centro has ideal flying weather throughout the year, which makes it an alternative training location for other Navy and Marine Corps aviation units when there is adverse weather at their home stations. From January through March, NAF El Centro is the winter home for the Blue Angels, the US Navy Flight Demonstration Squadron. NAF El Centro is also used by British and Canadian air forces for training detachments. The predominant aircraft conducting detachment training at NAF El Centro are Navy and Marine Corps FA-18C/D/E/F Hornets and Super Hornets, T-45 Goshawks, with some AV-8B Harriers, EA-6B Prowlers, MV-22 Osprey, and a variety of helicopters.

2.4.2 NAS Lemoore

NAS Lemoore was established in 1961 and is located in the central portion of California's San Joaquin Valley, in Kings County and Fresno County, California (**Figure 2-3**). Situated between the Sierra Nevada Mountains on the east and the California Coast Range on the west, the installation is at an elevation of 240 ft above mean sea level (DoN 2001). The mission of NAS Lemoore is to support Navy fleet carrier strike fighter squadrons. NAS Lemoore hosts more than 40 aviation tenants, including Commander Strike Fighter Wing, US Pacific Fleet.

2.5 ALTERNATIVES CONSIDERED BUT DISMISSED

Over the past 20 years, Naval Aviation has achieved efficiencies in manpower, training and logistics through consolidation of assets by type/model/series at master operating bases. As described in the Naval Aviation Enterprise Global Shore Infrastructure Plan (DoN 2008), consolidating strike-fighter resources at "Master Tactical Air Bases" leverages existing facilities, organizations and manpower thereby improving the efficiency of operations and optimizing costs. Homebasing the seven Pacific Fleet F-35C squadrons and FRS at more than one installation would require duplication of manpower, training and logistics resources, consequently increasing annual, recurring costs (i.e., manpower and supply) and one-time investments (i.e., construction and procurement of equipment and pilot training simulators). In the interest of reducing the Navy's total ownership costs, and compliance with policy directives to reduce installation footprint, and to strive for zero manpower growth, the Navy eliminated consideration of multiple-site/split-site alternatives.

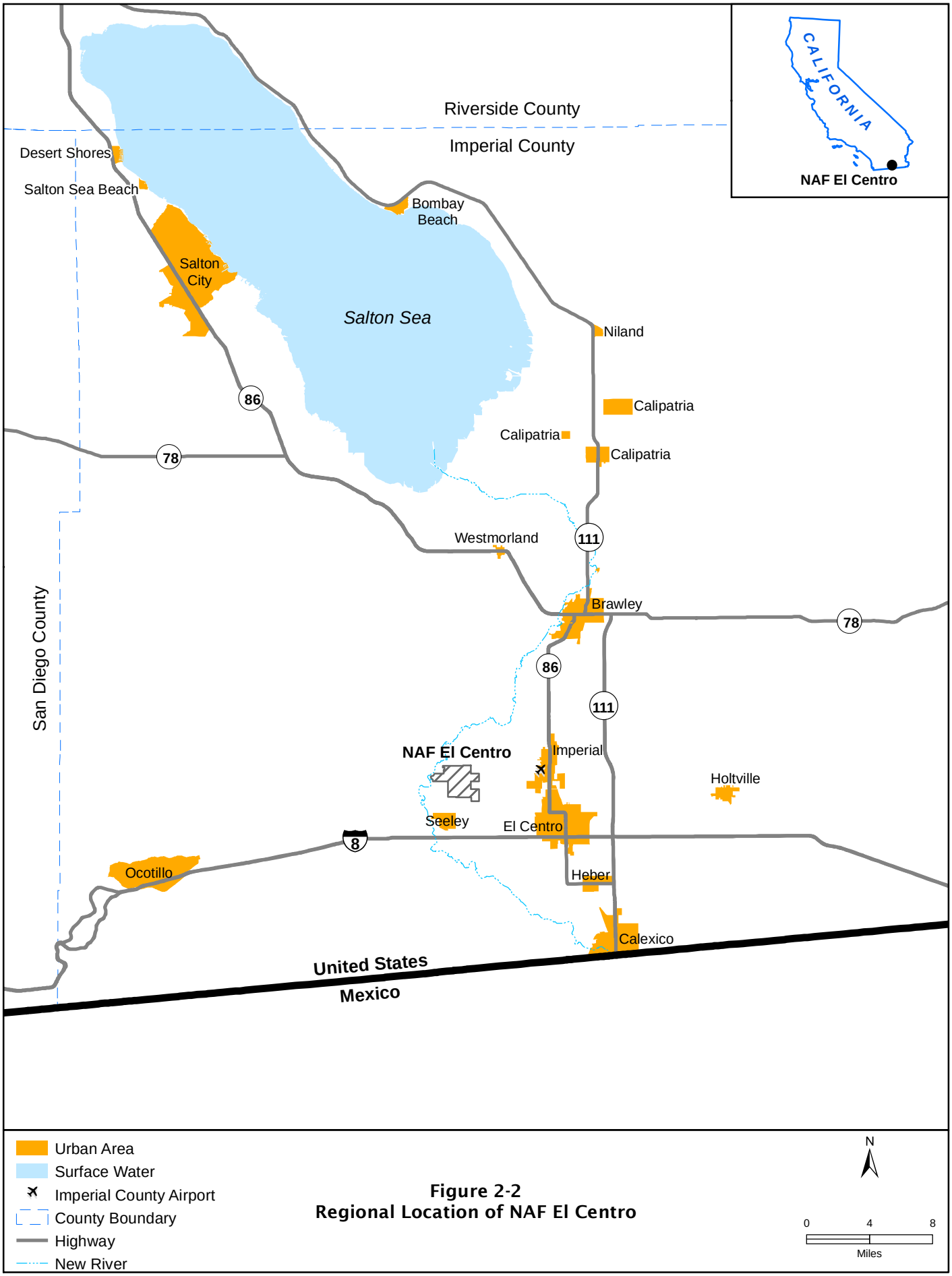


Figure 2-2
Regional Location of NAF El Centro

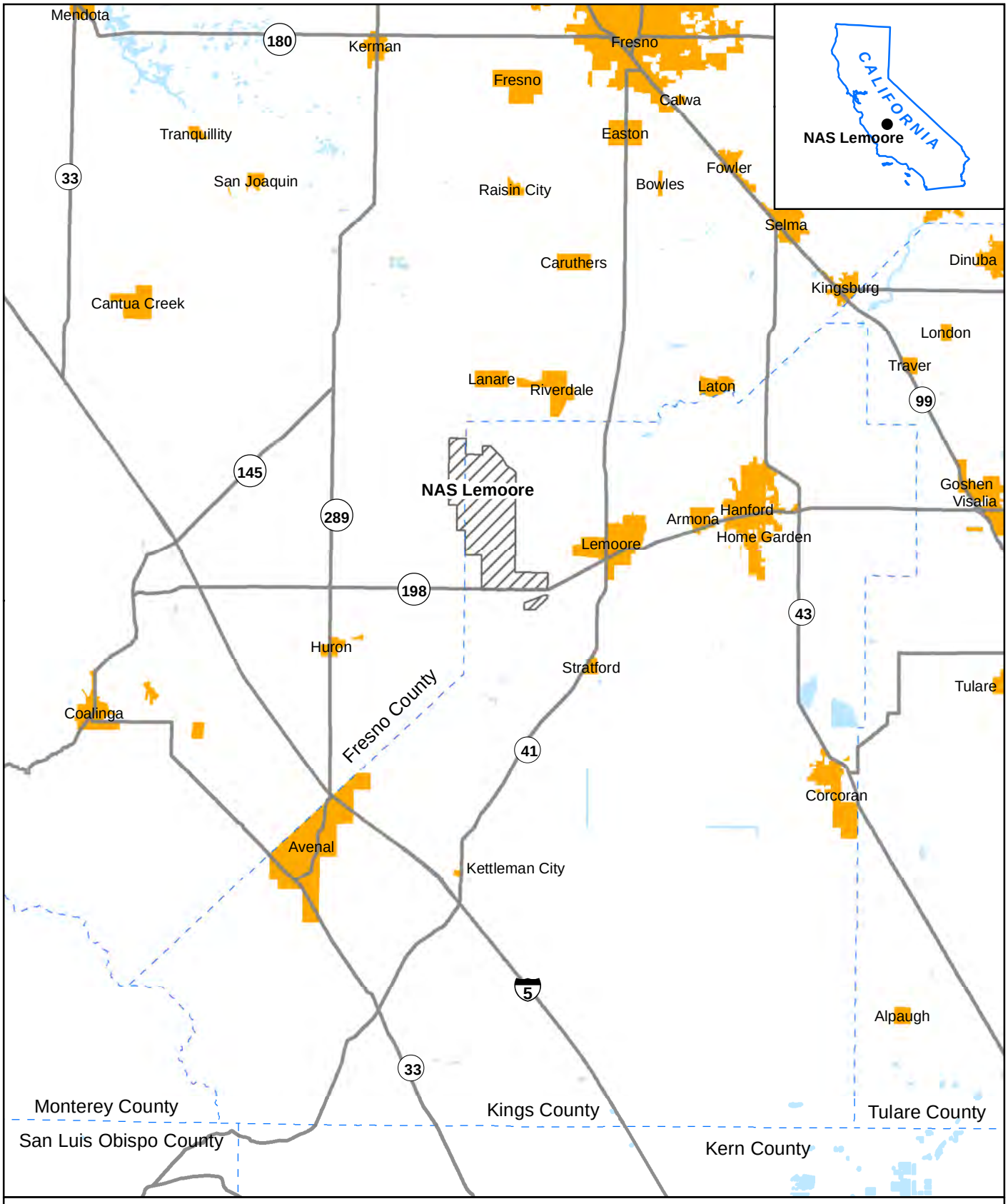


Figure 2-3
Regional Location of NAS Lemoore

2.6 SUMMARY OF ALTERNATIVES

Table 2.6-1 compares the proposed aircraft loading, facility and infrastructure, personnel, and aircraft operations for Alternative 1 – NAF El Centro Homebasing and Alternative 2 – NAS Lemoore Homebasing.

Table 2.6-1. Comparison of Alternatives 1 and 2

Component	*Baseline (2015)*	*Alternative 1 (2028)*			*Alternative 2 (2028)*		
		Total	*Change*	*% Change*	*Total*	*Change*	*% Change*
Aircraft Loading							
NAF El Centro	0	100	+100	Aircraft introduction	0	0	0
NAS Lemoore	237	167	-70	-29%	267	+30	+12.6%
Annual Airfield Operations							
NAF El Centro	65,800	165,200	+99,400	+151%	66,600	+800	+1.2%
NAS Lemoore	159,400	125,900	-33,500	-21%	227,800	+68,400	+43%
Annual Operations in Local SUA(1)							
NAF El Centro(2)	6,236	26,016	+19,780	+317%			
NAS Lemoore(3)	28,124				33,480	+5,356	+19%
Personnel							
NAF El Centro							
Military	318	2,832	+2,514	+791%	Personnel levels would not change at NAF El Centro under Alternative 2.		
Contractor/Civilian	403	864	+461	+114%			
Dependents	1,569	7,726	+6,154	+392%			
Total	2,290	11,419	+9,129	+398%			
NAS Lemoore							
Military	6,415	4,876	-1,539	-24%	6,975	+560	+9%
Contractor/Civilian	1,560	1,560	0	0%	1,751	+191	+12%
Dependents	16,519	13,405	-3,114	-19%	18,088	+1,569	+10%
Total	24,494	19,841	-4,653	-19%	26,814	+2,320	+9%
Proposed Facility Infrastructure							
NAF El Centro							
Construction		6,600,000 ft^2			7,250 ft^2		
Demolition		189,000 ft^2			0		
Total Cost(4)		$793,000,000			$9,000,000		
NAS Lemoore							
Construction		There would be no facility construction or demolition at NAS Lemoore under Alternative 1.			1,592,500 ft^2		
Demolition					2,790 ft^2		
Total Cost(4)					$233,000,000		

Notes: 1. When comparing proposed F-35C annual operations in local SUA for each of the alternatives, it is worthwhile noting that the SUA for each alternative is configured differently (e.g., size and shape) and accommodates training missions differently. For instance, a particular training mission may be accomplished in one large block of airspace (counted as one SUA operation) or in two adjacent smaller blocks of airspace (counted as two SUA operations). Each potential homebasing location would use different SUA with different configurations. As a result, there is no direct correlation between the numbers of proposed F-35C annual operations in SUA for each alternative.
2. NAF El Centro aircraft operations within SUA include only Navy operations.
3. NAS Lemoore aircraft operations within SUA include only Commander Strike Fighter Wing Pacific operations.
4. Costs provided to support socioeconomic analysis in Sections 4.7 and 5.7.

2.7 ALTERNATIVE 1 – NAF EL CENTRO HOMEBASING

Under Alternative 1, providing facilities and functions at NAF El Centro to homebase the F-35C would involve aircraft replacement and transition, facility and infrastructure, personnel changes, and aircraft operations. To accommodate facility and infrastructure needed to support the F-35C, the Navy would need to acquire interest in property not currently owned by the Navy. This proposed property acquisition is described further in Section 2.7.2, *Alternative 1 – Facility and Infrastructure.*

2.7.1 Alternative 1 – Aircraft Replacement and Transition

Under Alternative 1, homebasing the F-35C at NAF El Centro would replace aging FA-18 aircraft currently based at NAS Lemoore. **Table 2.7-1** shows the baseline (2015) and proposed (2028) aircraft loading at NAF El Centro and NAS Lemoore under Alternative 1.

Table 2.7-1. Aircraft Loading Changes at NAF El Centro and NAS Lemoore under Alternative 1

Aircraft	*Number of Aircraft*		*Change*
	Baseline (2015)	*Proposed (2028)*	
NAF El Centro Fleet Squadrons			
F-35C	0	70	+70
NAF El Centro FRS			
F-35C (VFA-100)	0	30	+30
NAF El Centro Total	**0**	**100**	**+100**
NAS Lemoore Fleet Squadrons			
FA-18C	20	0	-20
FA-18E	98	48	-50
FA-18F	72	72	0
NAS Lemoore FRS			
FA-18E (VFA-122)	13	13	0
FA-18F (VFA-122)	31	31	0
NAS Lemoore Search and Rescue Helicopters			
MH-60S	3	3	0
NAS Lemoore Total	**237**	**167**	**-70**

Currently, there are no permanently based fleet squadrons at NAF El Centro. Instead, NAF El Centro is used for detachment training by various aviation units. Detachment training refers to training conducted away from a homebase at non-local training ranges.

2.7.2 Alternative 1 – Facility and Infrastructure

In 2008, the Navy conducted an initial site evaluation at NAF El Centro to document the suitability of existing facilities and infrastructure to support the F-35C. In 2011, a more detailed site survey was conducted at NAF El Centro to evaluate existing facilities and infrastructure, identify deficiencies, and provide recommendations for resolving those deficiencies. The results of the site survey were used to develop specific plans for modifying existing buildings and constructing new facilities and infrastructure where needed to support homebasing the F-35C at NAF El Centro.

Homebasing the F-35C at NAF El Centro would require a variety of additional facilities and infrastructure for training, operations and maintenance, and personnel support, as well as the demolition of existing facilities. **Table 2.7-2** provides a list of the proposed construction, expansion, and renovation projects at NAF El Centro with corresponding construction year (CY), project size, and cost. Alternative 1 would not require any changes to facilities and infrastructure at NAS Lemoore.

Table 2.7-2. Proposed Construction at NAF El Centro under Alternative 1

Year	*Project Description*	*Project Size (ft^2)*	*Cost*[1]
Training Facilities			
2015	Academic Training Center[2]	86,934	$48,241,666
2015	Weapons School	23,439	$14,492,479
2015	Pilot Fit	4,100	$1,897,222
Operations and Maintenance Facilities			
2015	Aircraft Parking Apron	1,809,000	$59,331,923
2015	Hangar 11-2 Fleet Squadrons Aircraft Maintenance	94,298	$47,019,234
2015	Off-Equipment Aircraft Maintenance	85,144	$40,417,385
2015	Aircraft and Structural Fire Station	13,537	$8,563,090
2015	Air Operations/Air Traffic Control Tower/Air Passenger and Air Cargo Terminal	44,357	$23,775,481
2015	Two Aircraft Arm/De-Arm Areas	160,000	$3,343,380
2015	Communications Security	2,500	$1,502,815
2015	Consolidated Public Works	37,757	$13,289,341
2015	Supply Warehouse/Supply Administration	62,400	$12,992,959
2015	Hazardous Material Storage	2,000	$280,333
2019	Power Check Pad with Access Taxiway	112,500	$3,590,119
2019	3 Taxiways	150,000	$3,134,419
2019	Aircraft Access Apron	108,000	$3,274,046
2019	Hangar 12-2 Fleet Squadrons Aircraft Maintenance	94,298	$48,631,448
2019	Privately-Owned Vehicle Parking	440,000	$9,868,340
2019	Road-Extended 3rd St. to D St.	130,000	$2,915,646
2019	Wing Administration	3,300	$1,653,097
2019	Wastewater Treatment	130,680	$2,959,089
2019	Ordnance Operations	15,450	$4,296,270
2019	Ordnance Storage	40,177	$15,577,093
2022	Flight Line Fence	3,000	$79,032
2022	Hangar 10-FRS Aircraft Maintenance	71,354	$36,558,573
2022	Second Runway	1,900,000	$67,672,946
2022	Extension of Existing Runway	260,000	$5,432,993
2023	Hangar 13-2 Fleet Squadrons Aircraft Maintenance	94,298	$50,301,084
2025	Hangar 14-1 Fleet Squadron Aircraft Maintenance	47,149	$28,520,622
Personnel Support			
2015	Bachelor Enlisted Quarters 1	73,840	$30,579,974
2019	Indoor Physical Fitness Center	23,050	$10,310,112
2019	Family Services Center	7,185	$3,516,894
2019	Child Development Center	20,502	$10,271,446
2019	Youth Center	5,670	$3,005,438
2019	Enlisted Dining	22,948	$14,893,250
2019	Medical/Dental	99,800	$54,388,063
2019	Bachelor Enlisted Quarters 2	73,840	$31,628,814
2019	Naval Criminal Investigative Service /Naval Legal Services	1,200	$621,738

Table 2.7-2. Proposed Construction at NAF El Centro under Alternative 1

Year	*Project Description*	*Project Size (ft^2)*	*Cost[(1)]*
2019	Base Administration	4,500	$2,313,230
2022	Bachelor Enlisted Quarters 3	73,840	$32,712,713
2024	Bachelor Enlisted Quarters 4	71,000	$32,536,071
Land Acquisition			
2015	Land Acquisition for Ordnance Storage Facilities	-	$326,570
2016	Land Acquisition for Runway	-	$6,174,100
	Total	**6,503,047**	**$792,890,538**
	Planning Estimate	**6,600,000**	**$793,000,000**

Notes: 1. Cost is projected for proposed construction year and includes demolition costs.
2. Simulators would be located within the Academic Training Center

Under Alternative 1, approximately 6.6 million square feet (ft^2) of construction, expansion, and modification of facilities would be required. Proposed construction and demolition would be phased over multiple years with several projects beginning in 2015 and the last project starting around 2025. The total facility costs for Alternative 1 are estimated to be $793 million, which includes construction of new facilities and infrastructure, demolition of existing facilities, and land acquisition.

Table 2.7-3 provides a list of existing facilities and infrastructure that would be demolished with corresponding demolition year and project size, including 29 buildings and some concrete/asphalt areas.

Table 2.7-3. Proposed Demolition at NAF El Centro under Alternative 1

Year	*Building Number*	*Project Description*	*Project Size (ft^2)*
2015	126	Vehicle Shelter	3,060
2015	130	Air Control Tower	2,646
2015	136	Bike Parking	2,592
2015	137	Fire Station	10,004
2015	139	Air Operations	3,960
2015	142	Fire Station/Storage	6,240
2015	145	Administrative Office	5,884
2015	157	Auto Vehicle Maintenance and Public Works Shop	17,805
2015	158	Storage	320
2015	159	Glass/Boiler Shop	640
2015	160	Public Works Shop	1,920
2015	163	Administrative Office/ Public Works Maintenance Storage	3,456
2015	164	Public Works Maintenance Storage	3,368
2015	165	Laundry Facility/ Vehicle Maintenance Shop	5,328
2015	184	Public Works Maintenance Storage	80
2015	185	Public Works Maintenance Storage	80
2015	193	Public Works Maintenance Storage	350
2015	194	Public Works Maintenance Storage	700
2015	400	Filling Station, 2 Pumps	20
2015	402	Vehicle and Equipment Fuel Storage	496
2015	406	Filling Station	881
2015	446	Standby Generator/Sewage Pump Station	364
2019	100	Sewage Plant Equipment	147
2019	120	Wastewater Treatment Plant	908

Table 2.7-3. Proposed Demolition at NAF El Centro under Alternative 1

Year	*Building Number*	*Project Description*	*Project Size (ft^2)*
2019	433	Stand-by Power Plant	384
2019	436	Dining Facility	15,548
2019	440	Garbage House	320
2019	459	Sewage Pump Stations	704
2019	523	Medical/Dental Facilities	10,155
2022	-	Concrete/Asphalt Areas North of Existing Runway	89,734
		Total	**188,094**
		Planning Estimate	**189,000**

These existing facilities would be demolished because new facilities and infrastructure are proposed to be constructed at their current locations. Nearly 99,000 ft^2 of existing facilities and 90,000 ft^2 of existing concrete and asphalt areas would be demolished to accommodate the layout of proposed new facilities and infrastructure. In addition to the facilities proposed for demolition, there are several existing ordnance storage facilities near the location of the new runway in which the ordnance would be removed and the facilities would no longer be used to store ordnance.

Figure 2-4 shows the location of five areas where proposed construction and demolition would occur at NAF El Centro. **Figures 2-5** through **2-9** depict the conceptual layout of proposed new projects at NAF El Centro, along with the existing facilities that would be demolished. **Figure 2-5** also shows areas of concrete from existing roads that would be removed prior to construction activities. The total area that would be disturbed by construction and demolition is approximately 196 acres. The total new impervious surface area would be approximately 151 acres.

To accommodate the proposed facility and infrastructure described above, the Navy would potentially acquire interest in nine properties to meet safety requirements (**Figure 2-10**). Proposed construction of the second runway would require new Clear Zones on land currently held by private owners. The proposed consolidated ordnance storage facilities would generate new Explosive Safety Quantity Distance (ESQD) arcs and would be constructed on land currently held by private owners. The Navy would potentially purchase approximately 450 acres and acquire restrictive easements on approximately 55 acres. Currently, the properties proposed to be acquired or placed in restrictive easement are being used for agriculture or irrigation; no habitable dwellings are located on the properties.

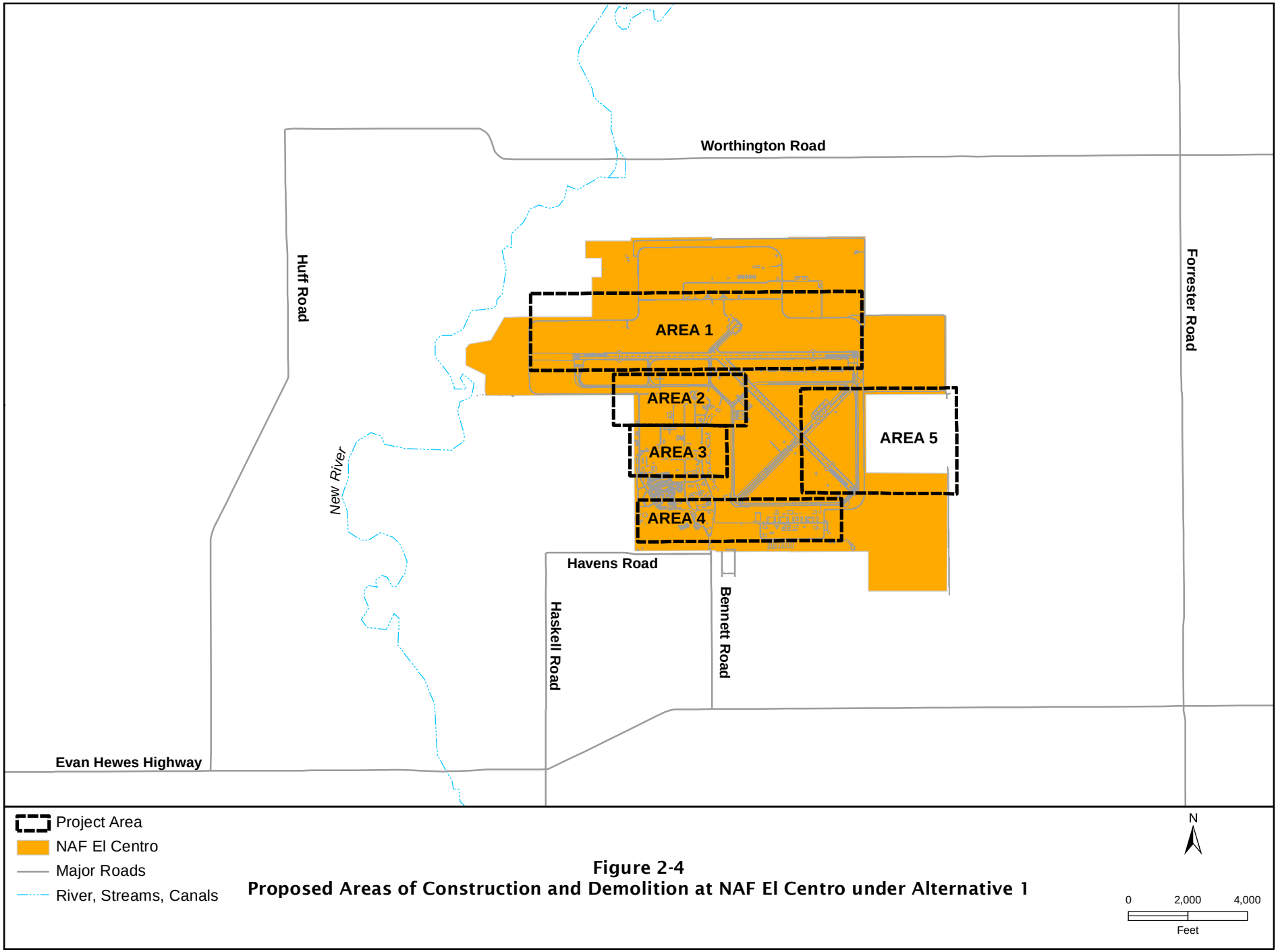


Figure 2-4
Proposed Areas of Construction and Demolition at NAF El Centro under Alternative 1

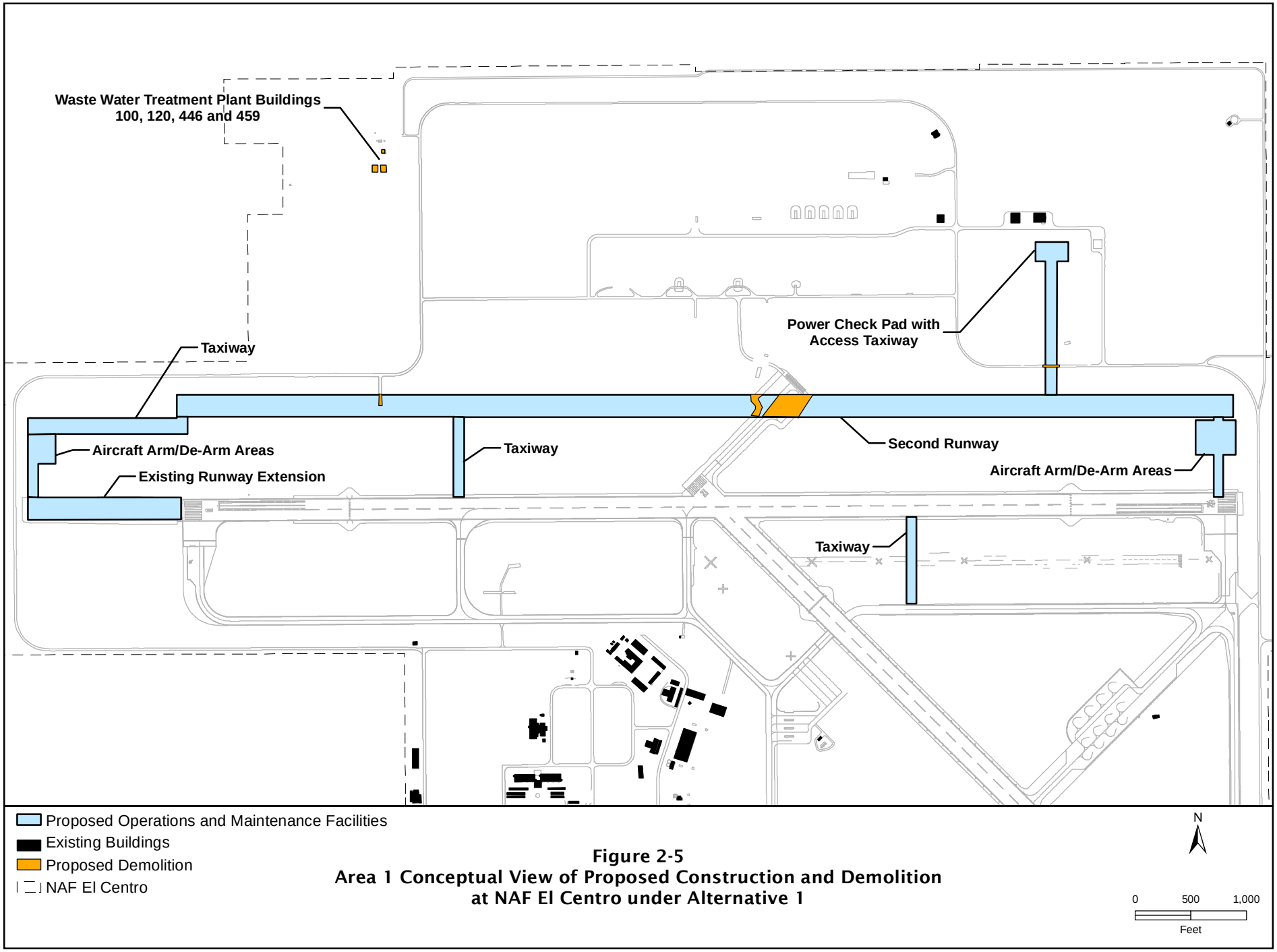
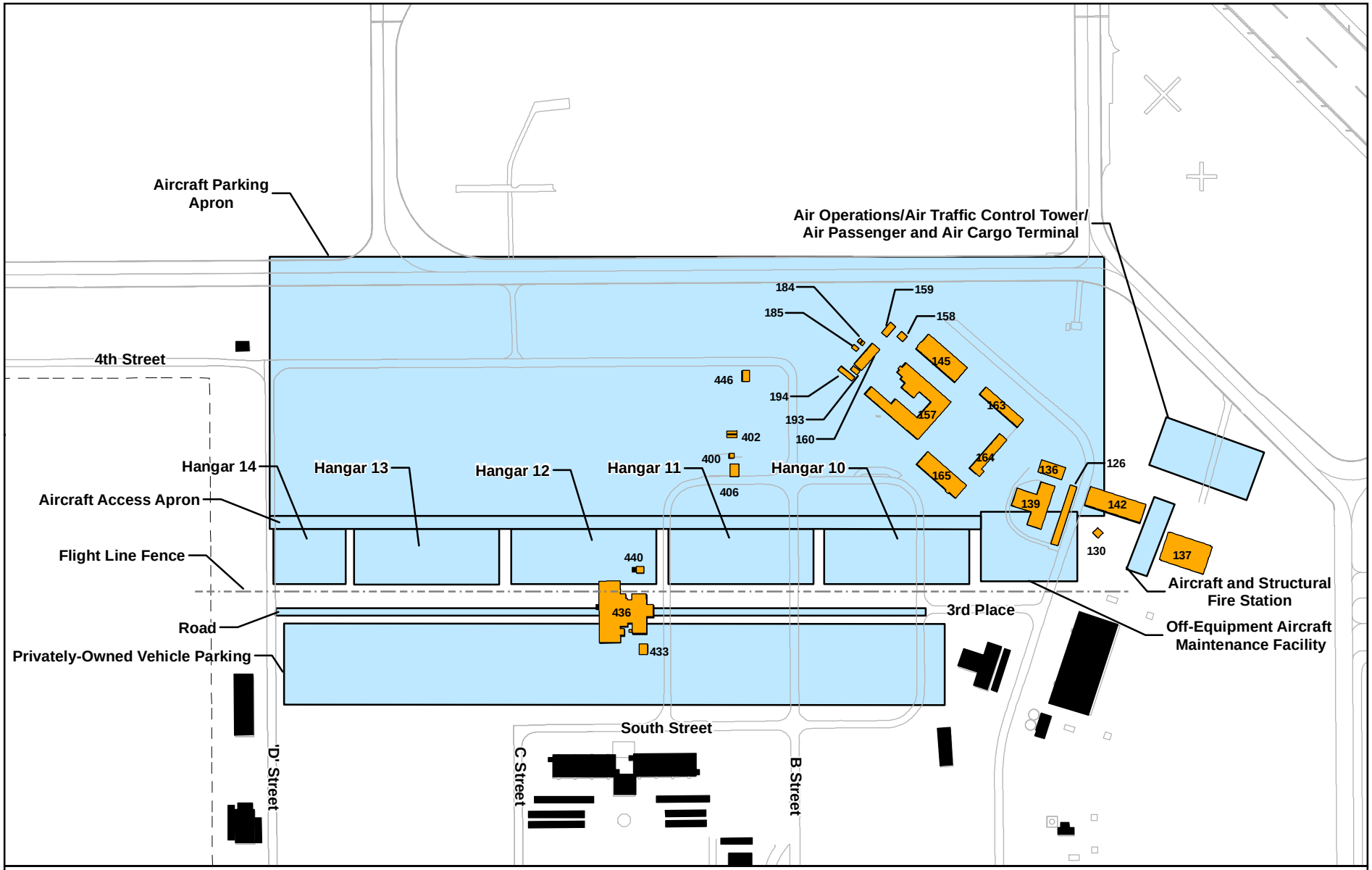


Figure 2-5
Area 1 Conceptual View of Proposed Construction and Demolition at NAF El Centro under Alternative 1



Proposed Operations and Maintenance Facilities
Existing Buildings
Proposed Demolition
NAF El Centro

N

0 200 400
Feet

Figure 2-6
Area 2 Conceptual View of Proposed Construction and Demolition at NAF El Centro under Alternative 1

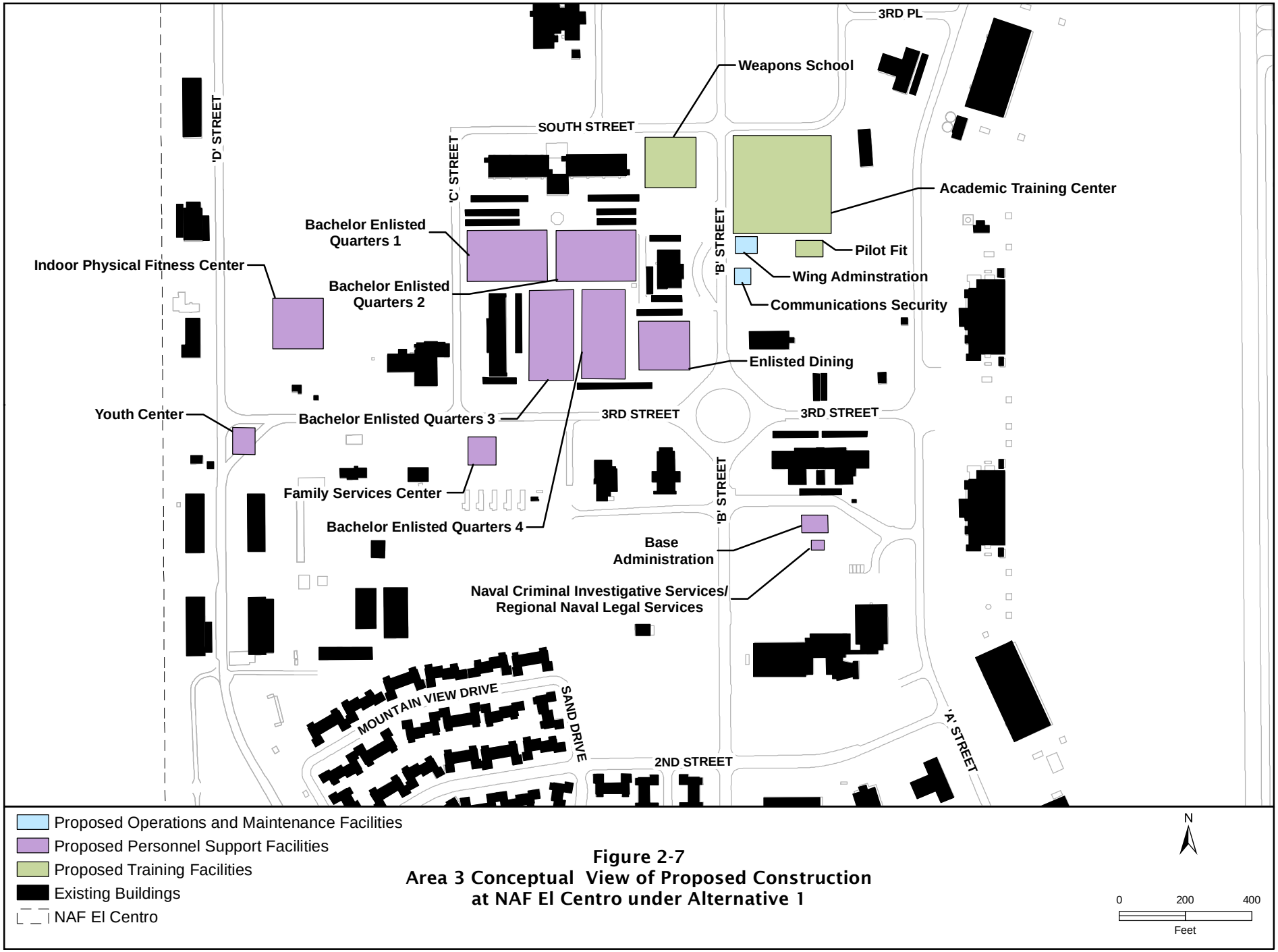
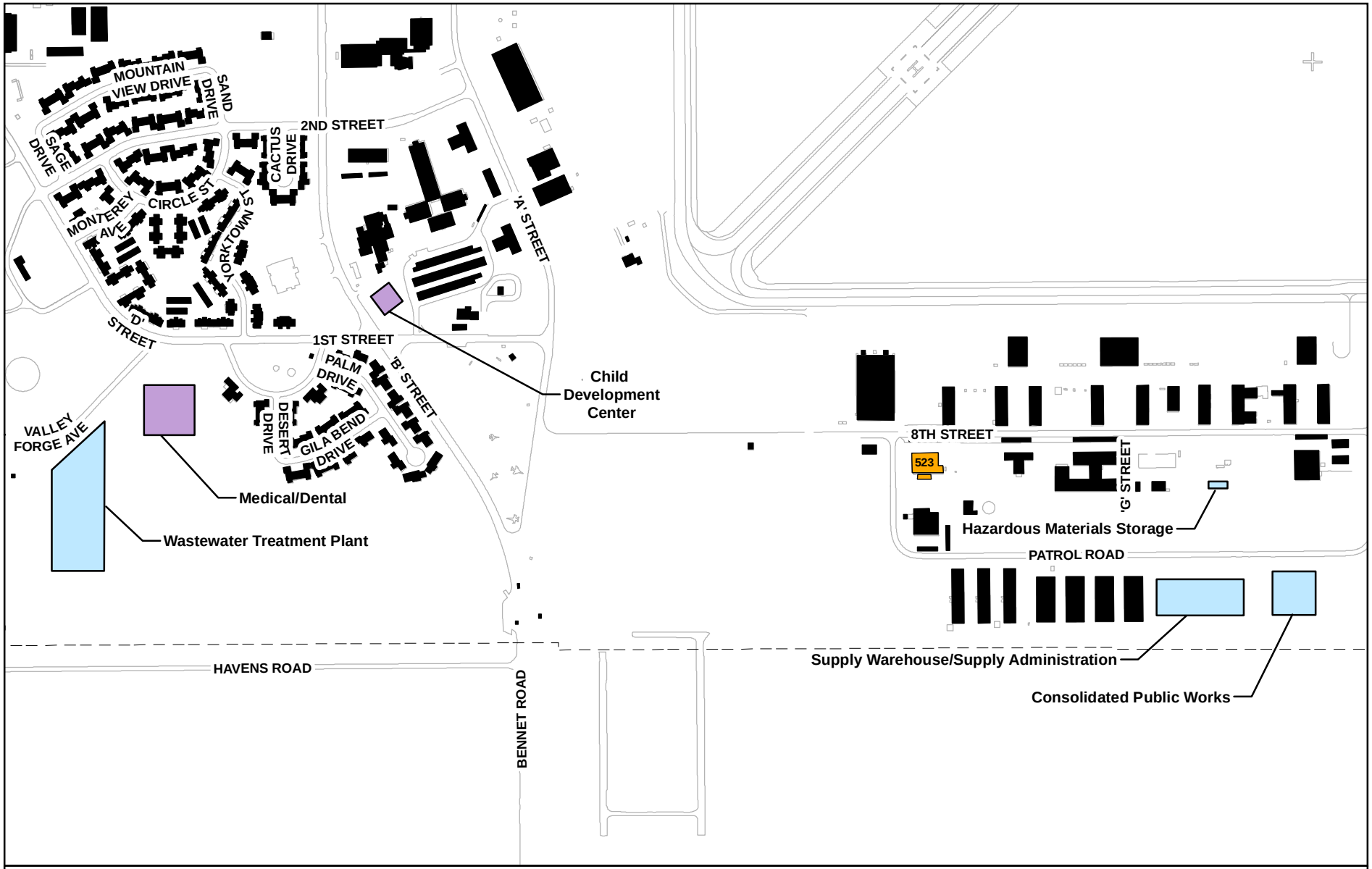


Figure 2-7
Area 3 Conceptual View of Proposed Construction at NAF El Centro under Alternative 1

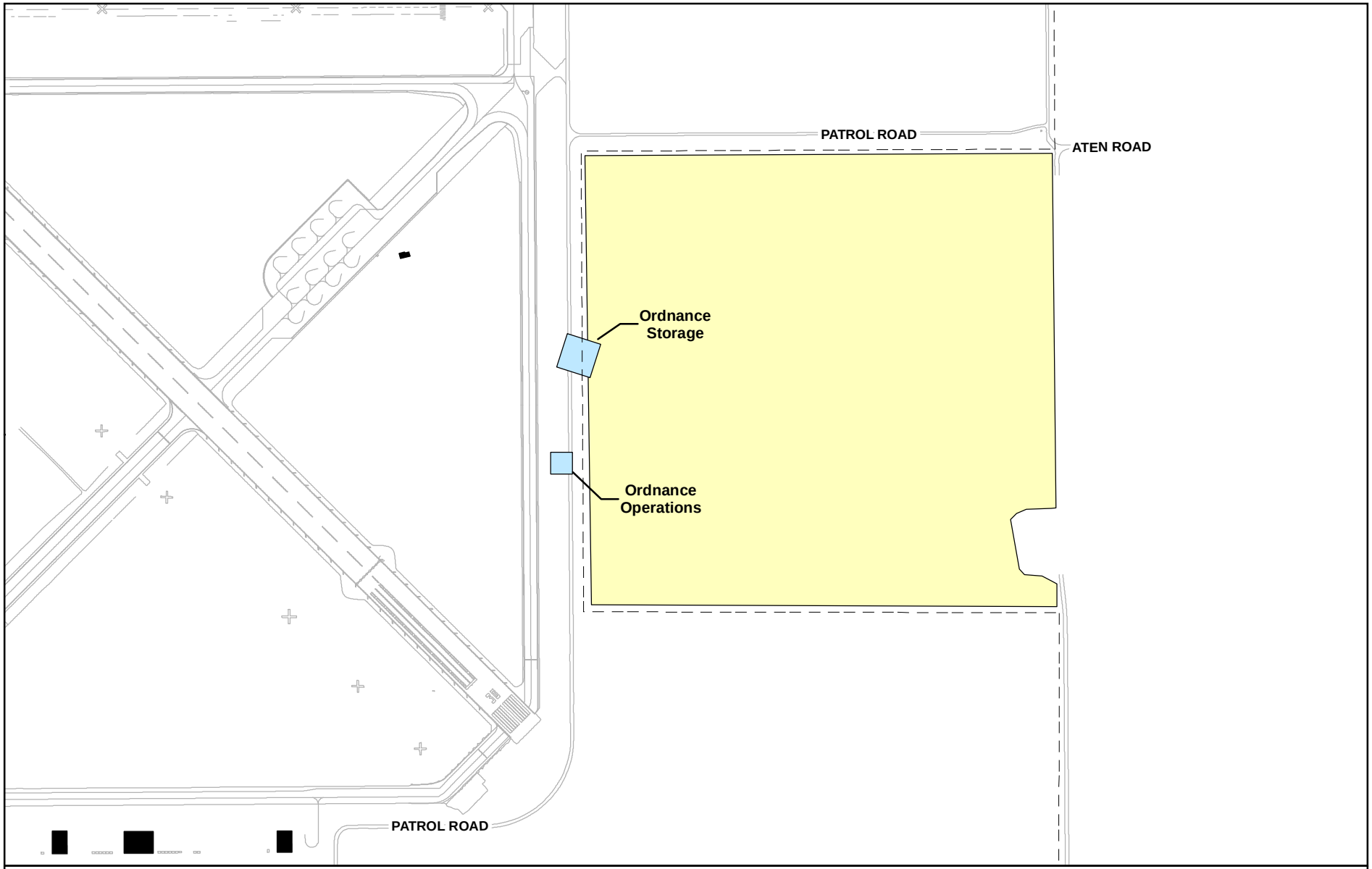


Proposed Personnel Support Facilities
Proposed Operations and Maintenance Facilities
Proposed Demolition
Existing Buildings
NAF El Centro

Figure 2-8
Area 4 Conceptual View of Proposed Construction and Demolition at NAF El Centro under Alternative 1

N

0 300 600
Feet

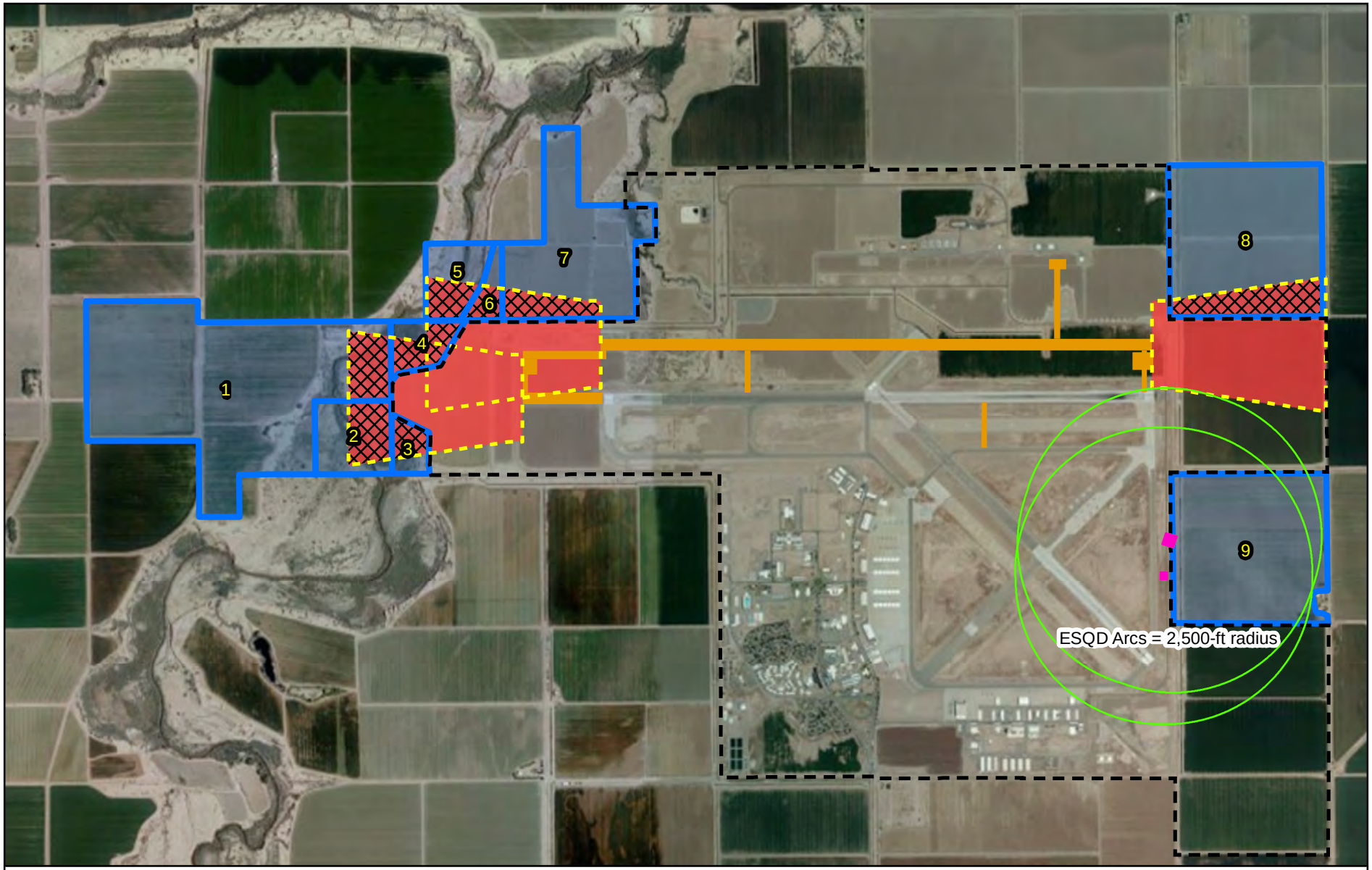


Proposed Operations and Maintenance Facilities
Proposed Land Acquisition Area
Existing Buildings
NAF El Centro

Figure 2-9
Area 5 Conceptual View of Proposed Construction at NAF El Centro under Alternative 1

N

0 400 800
Feet



Proposed Runway & Taxiway
Proposed Parcels for Potential Acquisition
Portion of Parcel Proposed for Acquisition
Relocation/Consolidation of Ordnance Facilities
Clear Zones
ESQD Arcs
Existing NAF El Centro Boundary

N

0 1,000 2,000
Feet

Figure 2-10
Potential Parcel Acquisition
at NAF El Centro under Alternative 1

2.7.3 Alternative 1 – Personnel Changes

Table 2.7-4 shows the baseline (2015) and proposed (2028) number of personnel at NAF El Centro and NAS Lemoore under Alternative 1. Homebasing the F-35C at NAF El Centro would result in an increase of 2,975 military and contractor/civilian personnel at NAF El Centro and a corresponding decrease of 1,539 military personnel at NAS Lemoore. The decrease in number of personnel at NAS Lemoore under Alternative 1 would occur when personnel who are currently supporting aging FA-18 squadrons at NAS Lemoore transition to supporting F-35C squadrons at NAF El Centro.

Table 2.7-4. Personnel Changes at NAF El Centro and NAS Lemoore under Alternative 1

Personnel Type	*Number of Personnel*		*Change*	*Percent Change*
	*Baseline (2015)**	*Proposed (2028)*		
NAF El Centro				
Military	318	2,832	+2,514	+791%
Contractor/Civilian	403	864	+461	+114%
Total	**721**	**3,696**	**+2,975**	**+413%**
NAS Lemoore				
Military	6,415	4,876	-1,539	-24%
Contractor/Civilian	1,560	1,560	0	0%
Total	**7,975**	**6,436**	**-1,539**	**-19%**

Note: *The number of personnel at NAS Lemoore considers the entire base population (e.g., squadron personnel, support personnel, and other units) and is higher than the end state number of personnel shown in the EA for Strike Fighter Realignment at NAS Lemoore (DoN 2011a), which focused only on the number of Strike Fighter squadron personnel.

Since NAF El Centro does not have permanently assigned operational squadrons, homebasing the F-35C would require 892 additional military personnel and contractor/civilian personnel, in addition to the 2,083 military personnel assigned to the fleet squadrons and FRS (refer to **Table 2.1-1**, Section 2.1.3, *F-35C Personnel Requirements*) to support the mission of a larger naval installation. These additional military, civilian, and contracted personnel would perform support security functions, technical services, medical, administration, base operations, and others.

Based on the increase of military and contractor/civilian personnel, there would be a corresponding increase of approximately 6,154 dependents (5,075 military dependents and 1,079 contractor/civilian dependents). Overall, Alternative 1 would result in an increase of approximately 9,129 persons (2,975 military, contractor/civilian personnel and 6,154 dependents) in the El Centro area by 2028. The decrease of military personnel at NAS Lemoore under Alternative 1 would be accompanied by a decrease of approximately 3,114 dependents for a total decrease of nearly 4,653 persons by 2028.

2.7.4 Alternative 1 – Aircraft Operations

The Navy developed data on the nature, frequency, and location of proposed F-35C operations for Alternative 1 based on currently available information, including initial training and readiness plans. This data reflects the F-35C's capabilities, its designated missions, and operations currently performed by the FA-18 aircraft being replaced. Under Alternative 1, F-35C operations would be conducted at the NAF El Centro airfield and in SUA in the vicinity of NAF El Centro as described in the next sections.

2.7.4.1 Alternative 1 – Airfield Operations

Under Alternative 1, F-35C aircraft would perform operations at the NAF El Centro airfield including departures, arrivals, and pattern operations (refer to Section 3.1.1, *Airfield Operations* and **Figures C-1, C-2,** and **C-3** in Appendix C, *Noise)*. **Table 2.7-5** shows the baseline (2015) and proposed (2028) annual airfield operations at NAF El Centro and NAS Lemoore under Alternative 1. At an airfield, an operation consists of a single aircraft movement such as a landing or takeoff. Therefore, one training flight normally involves at least two airfield operations – a takeoff and a landing.

Table 2.7-5. Changes in Annual Airfield Operations at NAF El Centro and NAS Lemoore under Alternative 1

Aircraft	*Number of Operations*[2]		*Change*
	Baseline (2015)	*Proposed (2028)*	
NAF El Centro			
F-35C Fleet Squadrons	0	23,900	+23,900
F-35C FRS	0	74,300	+74,300
Detachment/Transient[1]	65,800	67,000	+1,200
Total	**65,800**	**165,200**	**+99,400**
NAS Lemoore			
FA-18C Fleet Squadrons	11,400	0	-11,400
FA-18E/F Fleet Squadrons	75,300	53,200	-22,100
FA-18E/F FRS	62,200	62,200	0
Transient	10,500	10,500	0
Total	**159,400**	**125,900**	**-33,500**

Sources: DoN 2011a, 2012a.
Notes: 1. Detachment/Transient aircraft include FA-18, AV-8B, EA-6B, T-45, and a variety of helicopters.
2. Tables 4.2-1, 4.2-9, 5.2-1, and 5.2-9 provide additional details on the types and times of airfield operations. Number of operations rounded to the nearest hundred. Numbers of operations are estimated projections for typical annual operations, which may increase or decrease depending upon circumstances.

Homebasing the F-35C at NAF El Centro would result in an increase of approximately 99,400 operations at the NAF El Centro airfield and a decrease of approximately 33,600 operations at NAS Lemoore. The proposed decrease in operations at NAS Lemoore under Alternative 1 would be due to the reduction of operations by aging FA-18 squadrons, which would relocate to NAF El Centro as F-35C squadrons. Other planned changes at NAF El Centro are the addition of USMC F-35B detachment operations and Navy-wide aircraft upgrades, such as EA-18G replacing EA-6B, and MV-22 replacing CH-46.

At NAF El Centro, the prevailing wind is from the west and most operations are conducted in a westerly direction on Runway 26 and the proposed new Runway 26 Right (26R). Few straight-in arrivals are conducted at NAF El Centro. The majority of arrivals are either overhead break or carrier break arrivals. Field carrier landing practice (FCLP) patterns turn to the left to replicate operations aboard an aircraft carrier. Therefore, most FCLP operations occur over the installation. Ground-controlled approach (GCA) operations require precision radar approach capabilities at the airfield. Since NAF El Centro does not have precision approach radar and this capability is not proposed, GCA operations would be conducted at other military airfields as transient operations.

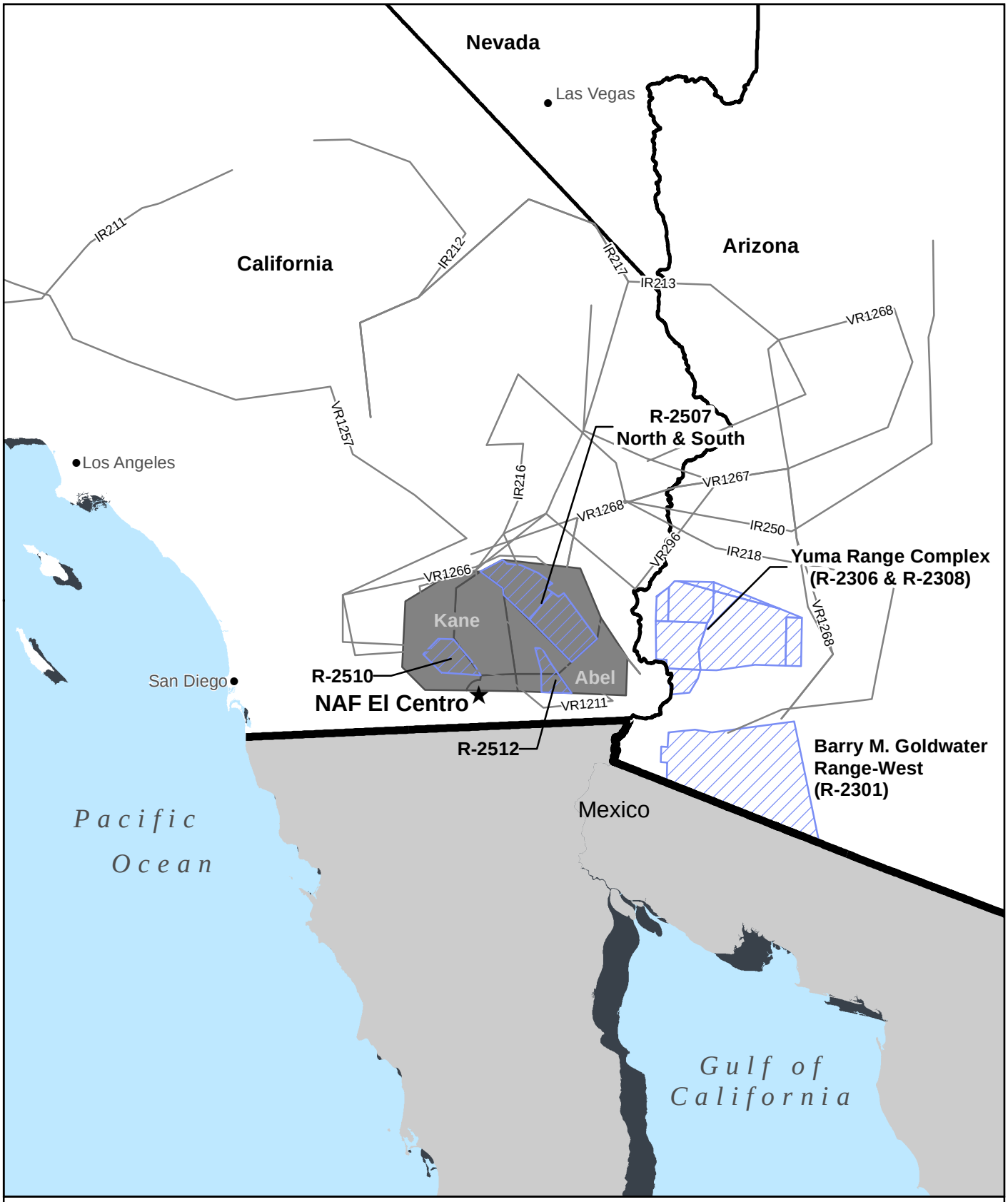
2.7.4.2 Alternative 1 – Operations in Special Use Airspace and Military Training Routes

Under Alternative 1, F-35C operations would take place in the following SUA and MTRs within the vicinity of NAF El Centro: Restricted Area (R-) R-2301 West (Barry M. Goldwater Range-West); R-2306/R-2308 and R-2507 (Yuma Range Complex); R-2510 and R-2512 (El Centro Range Complex); Kane/Abel MOAs[3]; and numerous MTRs, such as IR-211 and VR-296 (**Figure 2-11**). R-2507 North and South, R-2301 West, Kane MOA, and Able MOA are under the operational control of the Commanding Officer, MCAS Yuma. These ranges are considered to be "backyard" ranges for the 3rd Marine Aircraft Wing and are also the primary ranges of Marine Aviation Weapons and Tactics Squadron One. In SUA, an operation involves one aircraft using an SUA, such as a Restricted Area or MOA. Each time a single aircraft flies in a different SUA, one operation is counted for that SUA.

The proposed addition of roughly 24,000 annual Navy F-35C operations to SUA in the vicinity of NAF El Centro caused concerns because of the existing high demand for use of these particular SUA by other military services. The Navy coordinated with the US Marine Corps to address capacity concerns regarding the proposed Navy F-35C operations within the SUA. As a result of this coordination, assumptions for SUA availability were updated. The portion of the F-35C training requirement that could not be accommodated in SUA within the vicinity of NAF El Centro would be accomplished in W-291 off the coast of Southern California, roughly 17,000 operations.

Table 2.7-6 shows estimated annual operations in SUA in the vicinity of NAF El Centro for the baseline (2015) and proposed end state (2028) under Alternative 1. Homebasing the F-35C at NAF El Centro would potentially result in an increase of approximately 6,229 operations in local SUA; however, this increase would be offset by the elimination of roughly 4,020 Navy FA-18 operations. As a result, there would be a net increase of around 2,209 Navy operations in SUA in the vicinity of NAF El Centro. The majority of training events would occur in W-291, which would have a net increase of roughly 17,000 airspace operations under Alternative 1 (see Section 4.1.2.1 and Appendix B – *F-35C Training Operations*). Projected net increases in Marine Corps annual operations within SUA in the vicinity of NAF El Centro are addressed in Section 6.2.1, Airfields and Airspace – Potential Cumulative Impacts for Alternative 1.

[3] Military Operations Areas are designated to contain non-hazardous, military flight activities such as air combat maneuvers, air intercepts, and low altitude tactics.



MTRs
MOA
Restricted Airspace

N

0 30 60
Miles

Figure 2-11
SUA and MTRs Proposed for F-35C Operations in the Vicinity of NAF El Centro

Table 2.7-6. Changes in Annual Operations in Special Use Airspace under Alternative 1

SUA	Number of Operations[1,2]				
	Navy Baseline (2015)	Proposed Navy F-35C	Navy Legacy FA-18 Eliminated	Proposed End State (2028)	Change
R-2301 West	1,600	960	-804	1,756	+156
R-2306/R-2308	0	1,080	0	1,080	+1,080
R-2507/Abel/Kane MOAs	2,820	2,879	-2,134	3,565	+745
R-2512	1,264	388	-360	1,292	+28
R-2510	552	922	-722	752	+200
Subtotal in Local SUA	**6,236**	**6,229**	**-4,020**	**8,445**	**+2,209**
W-291	N/A[3]	17,571	N/A[3]	17,571	+17,571
Total	**6,236**	**23,800**	**-4,020**	**26,016**	**+19,780**

Sources: ATAC 2012a, 2012b, 2012c; DoN 2009, 2010, 2012a.
Notes: 1. The number of operations shown in this table differs from the number of operations shown in the USMC F-35B West Coast Basing EIS (DoN 2010) because the baseline only includes Navy operations.
2. Flights to a particular range are based on range availability and weather. Flights may be distributed between the ranges listed. Numbers of operations are estimated projections for typical annual operations, which may increase or decrease depending upon circumstances.
3. N/A – not applicable.

Table 2.7-7 shows annual operations in MTRs in the vicinity of NAF El Centro for the baseline (2015) and proposed end state (2028). Under Alternative 1, there would be an increase of approximately 213 operations in MTRs in the vicinity of NAF El Centro.

Table 2.7-7. Changes in Annual Operations in Military Training Routes under Alternative 1

MTR	Number of Operations		Change
	Baseline (2015)*	Proposed (2028)	
IR-211	48	56	+8
IR-212	36	42	+6
IR-213	12	14	+2
IR-216	156	183	+27
IR-217	168	197	+29
IR-218	24	28	+4
IR-250	36	42	+6
VR-296	144	169	+25
VR-1211	108	126	+18
VR-1257	156	183	+27
VR-1266	1,512	1,555	+43
VR-1267	72	84	+12
VR-1268	36	42	+6
Total	**2,508**	**2,721**	**+213**

Sources: DoN 2010.
Note: * The number of operations shown in this table differs from the number of operations shown in the USMC F-35B West Coast Basing EIS (DoN 2010) because the baseline years are different.

F-35C operations in SUA and MTRs around NAF El Centro would be similar to FA-18 operations and would include air combat maneuvers and training, air-to-air refueling, and basic fighter maneuvers. Proposed F-35C operations in MTRs are expected to be conducted during daytime hours.

2.8 ALTERNATIVE 2 – NAS LEMOORE HOMEBASING

Under Alternative 2, providing facilities and functions at NAS Lemoore to homebase the F-35C would involve aircraft replacement and transition, facility and infrastructure, personnel changes, and aircraft operations.

2.8.1 Alternative 2 – Aircraft Replacement and Transition

Under Alternative 2, homebasing the F-35C at NAS Lemoore would replace aging FA-18 aircraft currently based at NAS Lemoore. **Table 2.8-1** shows the baseline (2015) and the proposed (2028) aircraft loading at NAS Lemoore under Alternative 2. NAF El Centro is not represented in **Table 2.8-1** because it has no permanently based fleet squadrons, which would not change under Alternative 2.

Table 2.8-1. Aircraft Loading Changes at NAS Lemoore under Alternative 2

Aircraft	*Number of Aircraft*		*Change*
	*Baseline (2015)**	*Proposed (2028)*	
Fleet Squadrons			
FA-18C	20	0	-20
FA-18E	98	48	-50
FA-18F	72	72	0
F-35C	0	70	+70
FRS			
FA-18E (VFA-122)	13	13	0
FA-18F (VFA-122)	31	31	0
F-35C (VFA-100)	0	30	+30
Search and Rescue Helicopters			
MH-60S	3	3	0
Total	**237**	**267**	**+30**

Note: *Aircraft loading for fixed-wing aircraft in 2015 represents the end state of squadron transitions from the Strike Fighter Realignment at NAS Lemoore (DoN 2011a).

2.8.2 Alternative 2 – Facility and Infrastructure

In 2008, the Navy conducted an initial site survey at NAS Lemoore to document the suitability of existing facilities and infrastructure to support the F-35C. In 2011, a more detailed site survey was conducted at NAS Lemoore to evaluate existing facilities and infrastructure, identify deficiencies, and provide recommendations for resolving those deficiencies. The results of the site survey were used to develop plans for modifying existing buildings and constructing new facilities and infrastructure where needed to support homebasing F-35C at NAS Lemoore.

Homebasing the F-35C at NAS Lemoore would require additional facilities and infrastructure for training, operations and maintenance, and personnel support at NAS Lemoore, as well as demolition of an existing facility (Bldg. 21). Homebasing at NAS Lemoore would also require some facility development at NAF El Centro to accommodate F-35C squadrons from NAS Lemoore conducting detachment training operations at NAF El Centro (refer to Section 2.8.4, *Alternative 2 – Aircraft Operations*). Hangars 3 and 4 would be renovated to provide upgraded power. A Special Access Program Facility would be constructed.

Table 2.8-2 provides a list of the proposed construction, expansion, and renovation projects at NAS Lemoore and NAF El Centro with corresponding CY, project size, and cost. Under Alternative 2, approximately 1.6 million ft^2 of construction, expansion, and modification projects would be required. Proposed construction would be phased over multiple years, with several projects beginning in 2015 and the last project starting around 2025. The total facility costs for Alternative 2 are estimated to be $242 million, which includes the construction of new and expanded facilities and infrastructure at NAS Lemoore and a Special Access Program Facility and interior hangar renovations at NAF El Centro. One existing facility, Bldg. 21, a 2,790-ft^2 operational storage facility, would be demolished under Alternative 2 to accommodate the layout of proposed new facilities and infrastructure.

Table 2.8-2. Proposed Construction at NAS Lemoore and NAF El Centro under Alternative 2

Year	*Project Description*	*Project Size (ft^2)*	*Cost[1]*
NAS Lemoore Training Facilities			
2015	Academic Training Center (Phase I)-Addition to Bldg. 43[2,3]	34,000	$21,845,444
2019	Academic Training Center (Phase II)-Addition to Bldg. 43	28,503	$19,219,812
2019	Academic Training Center (Phase II)-Renovate Bldg. 43	9,806	$1,460,673
2019	Pilot Fit (Addition to Bldg. 43)	4,100	$1,820,746
2019	Communications Security - Interior Reconfiguration (Bldg. 140)	800	$1,708,812
NAS Lemoore Operations and Maintenance Facilities			
2015	Addition to Hangar 5	54,750	$30,047,673
2019	Privately-Owned Vehicle Parking	270,000	$5,953,798
2019	Central Engine Repair-Addition to Bldg. 170	20,500	$10,406,284
2019	Central Engine Repair Covered Storage	11,000	$1,460,673
2022	Hangar 6	71,344	$36,554,916
2022	Aircraft Parking Apron	758,400	$25,627,132
2022	Taxiway Connector	133,350	$2,693,862
2022	4 Taxiways	37,500	$757,554
2022	Aircraft Access Apron	21,000	$636,565
2025	2 Additions to Hangar 3	57,929	$37,548,066
NAS Lemoore Personnel Support			
2018	Bachelor Enlisted Quarters	79,520	$32,067,462
NAF El Centro Operations and Maintenance Facilities			
2015	Hangars 3 and 4 Interior Renovation	0	$3,489,432
2018	Special Access Program Facility[4]	7,249	$8,891,528
	Total	**1,599,751**	**$242,190,432**
	Planning Estimate	**1,600,000**	**$242,000,000**

Notes: 1. Cost is projected for proposed CY.
2. Simulators would be located within the Academic Training Center.
3. Includes cost for demolition of Bldg. 21.
4. For detachment training.

Figure 2-12 shows the location of three areas where proposed construction and demolition would occur at NAS Lemoore. **Figures 2-13** through **2-15** depict the conceptual layout of the proposed new projects at NAS Lemoore, along with the existing facility that would be demolished. **Figure 2-16** shows the

conceptual layout of the Special Access Program Facility at NAF El Centro. The total area that would be disturbed by construction is approximately 58 acres. The total new impervious surface area would be approximately 36 acres.

2.8.3 Alternative 2 – Personnel Changes

Table 2.8-3 shows the baseline (2015) and proposed (2028) number of personnel at NAS Lemoore under Alternative 2. Homebasing the F-35C at NAS Lemoore would result in an increase of 751 military and contractor/civilian personnel at NAS Lemoore. Unlike Alternative 1, Alternative 2 would not require any changes in personnel at NAF El Centro because there would be no change in the mission of NAF El Centro or the number of aircraft supported.

Table 2.8-3. Personnel Changes at NAS Lemoore under Alternative 2

Personnel Type[1]	*Number of Personnel*		*Change*	*Percent Change*
	Baseline (2015)[2]	*Proposed (2028)*		
Military	6,415	6,975	+560	+9%
Contractor/Civilian	1,560	1,751	+191	+12%
Total	**7,975**	**8,726**	**+751**	**+9%**

Notes: 1. There would be no changes in personnel at NAF El Centro under Alternative 2.
2. The number of personnel at NAS Lemoore considers the entire installation population (e.g., squadron personnel, support personnel, and other units) and is higher than the number of personnel shown in the EA for Strike Fighter Realignment at NAS Lemoore (DoN 2011a), which focused only on the number of Strike Fighter squadron personnel.

Personnel who are currently supporting aging FA-18 squadrons at NAS Lemoore would remain at NAS Lemoore while transitioning to F-35C squadrons. Based on the increase of military and contractor/civilian personnel, there would be a corresponding increase of approximately 1,569 dependents (1,145 military dependents and 424 contractor/civilian dependents). Overall, Alternative 2 would result in an increase of approximately 2,320 persons (751 military, contractor/civilian personnel and 1,569 dependents) in the Lemoore area by 2028.

2.8.4 Alternative 2 – Aircraft Operations

The Navy developed data on the nature, frequency, and location of proposed F-35C operations for Alternative 2 based on currently available information, including initial training and readiness plans. This data reflects the F-35C's capabilities, its designated missions, and operations currently performed by the FA-18 aircraft being replaced. Under Alternative 2, F-35C operations would be conducted at the NAS Lemoore airfield and in SUA in the vicinity of NAS Lemoore as described in the following sections. In addition, F-35C aircraft homebased at NAS Lemoore would conduct detachment training operations at NAF El Centro in much the same way that FA-18 squadrons currently operate at NAF El Centro.

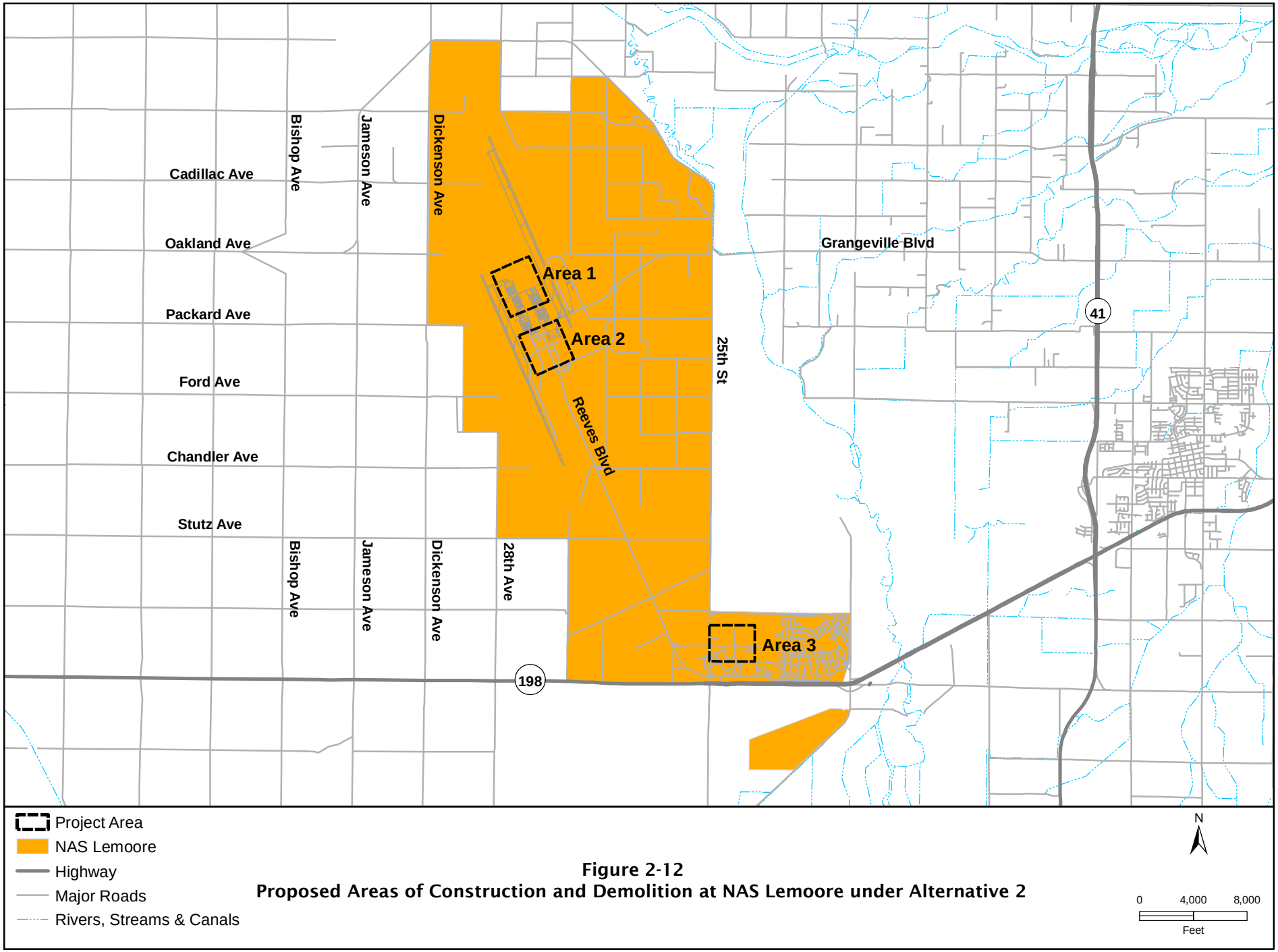


Figure 2-12
Proposed Areas of Construction and Demolition at NAS Lemoore under Alternative 2

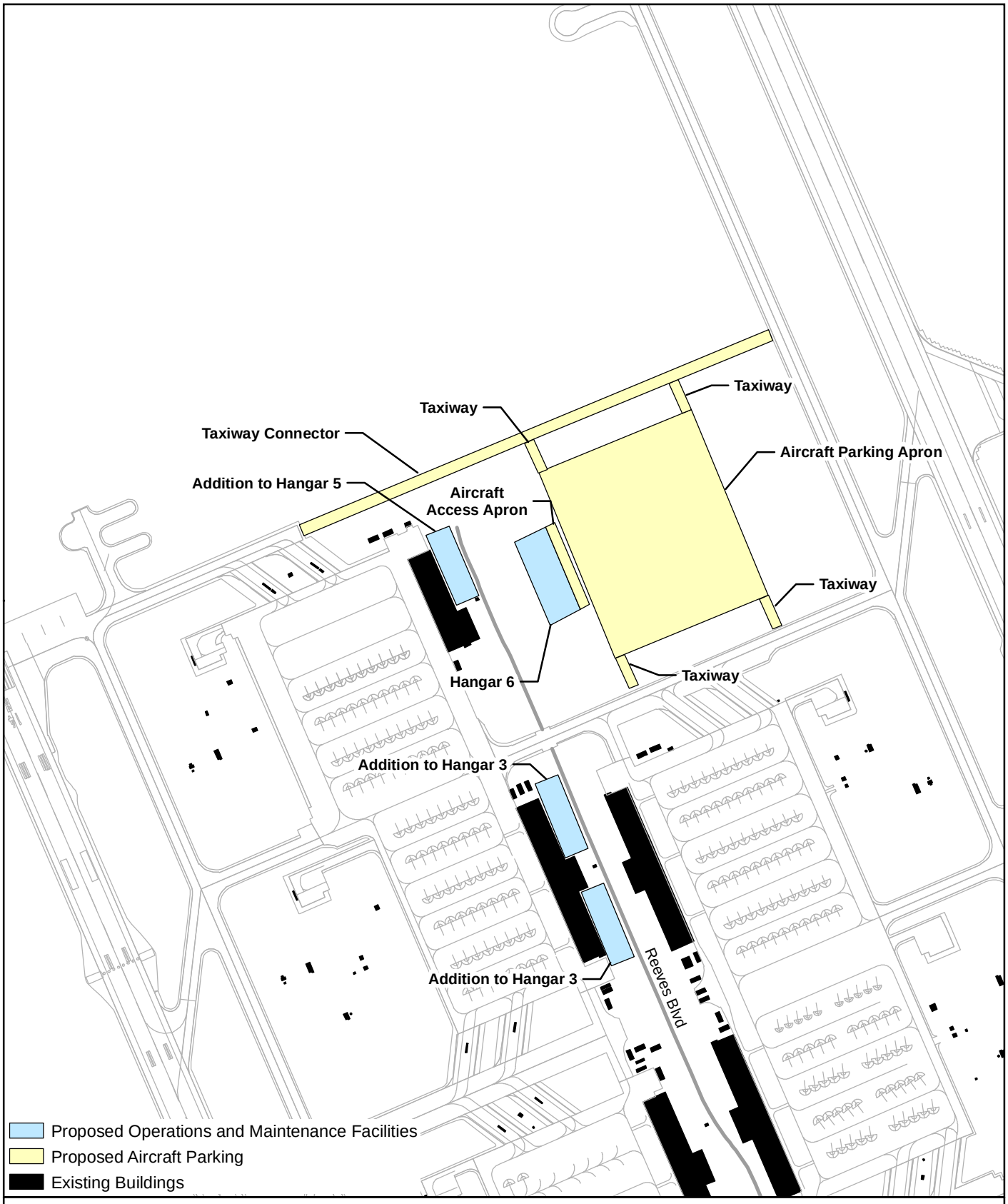


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Figure 2-13
Area 1 Conceptual View of
Proposed Construction at NAS Lemoore under Alternative 2

0 400 800
Feet

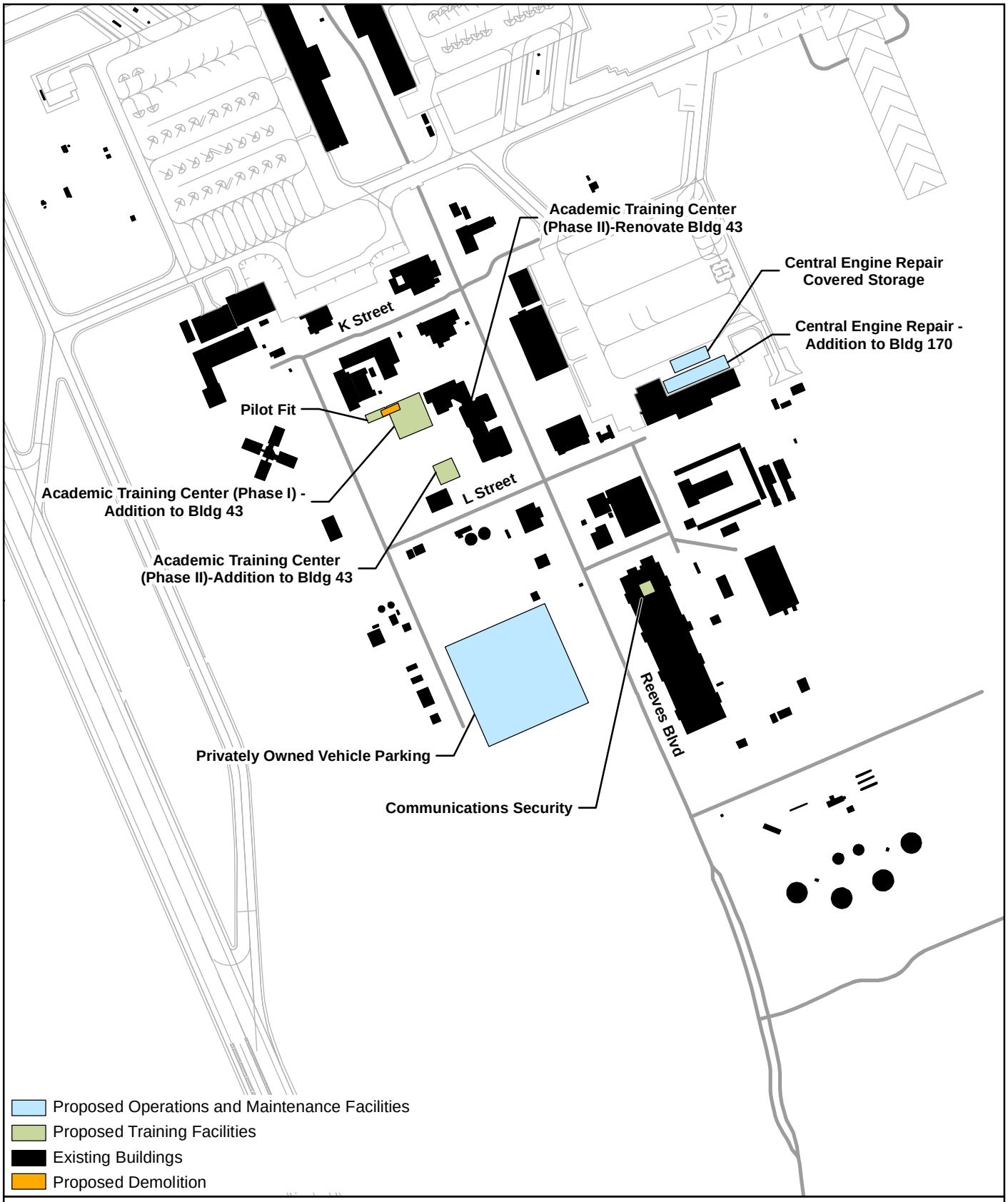

Figure 2-14
Area 2 Conceptual View of
Proposed Construction and Demolition
at NAS Lemoore under Alternative 2

N

0 300 600
Feet

Figure 2-15
Area 3 Conceptual View of
Proposed Construction at NAS Lemoore under Alternative 2

Proposed Operations and Maintenance Facilities
Existing Buildings
NAF El Centro

Figure 2-16
Conceptual View of Proposed Construction at NAF El Centro under Alternative 2

N

0 200 400
Feet

2.8.4.1 Alternative 2 – Airfield Operations

Under Alternative 2, F-35C aircraft would perform operations at the NAS Lemoore airfield including all departures, arrivals, and pattern operations (refer to Section 3.1.1, *Airfield Operations* and **Figures C-11, C-12,** and **C-13** in Appendix C, *Noise)*. **Table 2.8-4** shows the baseline (2015) and proposed (2028) annual airfield operations at NAS Lemoore and NAF El Centro under Alternative 2. At an airfield, an operation consists of a single aircraft movement such as a landing or takeoff. Therefore, one training flight normally involves at least two airfield operations – a takeoff and a landing.

Table 2.8-4. Changes in Annual Airfield Operations at NAS Lemoore and NAF El Centro under Alternative 2

Aircraft	*Number of Operations*[1]		*Change*
	Baseline (2015)[2]	*Proposed (2028)*[3]	
NAS Lemoore			
F-35C Fleet Squadrons	0	25,200	+25,200
F-35C FRS	0	76,700	+76,700
FA-18C Fleet Squadrons	11,400	0	-11,400
FA-18E/F Fleet Squadrons	75,300	53,200	-22,100
FA-18E/F FRS	62,200	62,200	0
Transient	10,500	10,500	0
Total	**159,400**	**227,800**	**+68,400**
NAF El Centro			
Detachment/Transient	65,800	66,600	+800
Total	**65,800**	**66,600**	**+800**

Sources: DoN 2011b, 2012b.

Notes: 1. Number of operations rounded to the nearest hundred. Numbers of operations are estimated projections for typical annual operations, which may increase or decrease depending upon circumstances.
2. Baseline (2015) operations reflect the number of operations depicted as the end-state operations from the Strike Fighter Realignment at NAS Lemoore (DoN 2011a); elimination of the FA-18C/D FRS, reduction to two FA-18C squadrons, and an increase of five FA-18E/F squadrons.
3. NAF El Centro operations for proposed action differs from baseline because NAS Lemoore based, F-35C FRS, detachment training operations and also the USMC FA-18C/D and AV-8B would be replaced by F-35B aircraft. Both actions would add operations to NAF El Centro.

Homebasing the F-35C at NAS Lemoore would result in an increase of approximately 68,400 operations at the NAS Lemoore airfield and a corresponding increase of approximately 800 operations at NAF El Centro. The proposed increase of approximately 800 operations at NAF El Centro under Alternative 2 would be from detachment and transient operations at NAF El Centro conducted by F-35C aircraft homebased at NAS Lemoore. Other planned changes at NAF El Centro are the addition of USMC F-35B detachment operations and Navy-wide aircraft upgrades, such as EA-18G replacing EA-6B, and MV-22 replacing CH-46.

The airfield at NAS Lemoore is composed of two parallel runways, 14 Left/32 Right (14L/32R) and 14R/32L, both more than 13,000 ft in length. Runways 32L and 32R are the preferred runways due to prevailing wind conditions, approach procedures, facilities, and airport design. Runway 32L is the preferred runway to practice FCLP operations.

2.8.4.2 Alternative 2 – Operations in Special Use Airspace and Military Training Routes

Under Alternative 2, F-35C operations would take place in the following SUA in the vicinity of NAS Lemoore: R-2508 Complex, R-2524 (Superior Valley Range), Lemoore MOA, R-2513/Hunter MOA, and numerous MTRs (**Figure 2-17**). F-35C would generally use the same procedures, routes, and altitudes as FA-18 currently use when transiting from the NAS Lemoore airfield to these SUA. In SUA, an operation involves one aircraft using an SUA, such as a Restricted Area or MOA. Each time a single aircraft flies in a different SUA, one operation is counted for that SUA.

Table 2.8-5 shows the baseline (2015) and proposed (2028) annual operations in SUA in the vicinity of NAS Lemoore under Alternative 2. Homebasing the F-35C at NAS Lemoore would potentially result in an increase of approximately 7,601 operations in local SUA; however, this increase would be offset by the elimination of roughly 4,207 Navy FA-18 operations. As a result, there would be a net increase of around 3,394 Navy operations in SUA in the vicinity of NAS Lemoore. A net increase of approximately 1,100 airspace operations would occur in offshore Warning Areas under Alternative 2 (see Section 5.1.2.1 and Appendix B, *F-35C Training Operations*). A net increase of approximately 830 operations would occur in the Fallon Range Training Complex, which would see its Lemoore-based transient operations increase from a baseline of 17,022 operations to 17,852 operations (see Appendix B – *F-35C Training Operations*).

Table 2.8-5. Changes in Annual Operations in Special Use Airspace under Alternative 2

SUA	*Number of Operations*[1]				
	Baseline (2015)[2]	*Proposed Navy F-35C*	*Navy FA-18 Legacy Eliminated*	*Proposed (2028)*	*Change*
R-2508 Complex	4,776	4,580	-2,200	7,156	+2,380
R-2524 Superior Valley Range	3,128	1,188	-1,076	3,240	+112
Lemoore MOA	1,264	1,721	-895	2,090	+826
R-2513/Hunter MOA	82	112	-36	158	+76
Subtotal in Local SUA	**9,250**	**7,601**	**-4,207**	**12,644**	**+3,394**
W-283	1,164	1,474	-414	2,224	+1,060
W-285	348	114	-118	344	-4
W-532	340	212	-136	416	+76
Fallon Range Training Complex	17,022	9,476	-8,646	17,852	+830
Total	**28,124**	**18,877**	**-13,521**	**33,480**	**+5,356**

Source: DoN 2012b, ATAC 2014.

Notes: 1. Flights to a particular range are based on range availability and weather. Flights may be distributed between the ranges listed. Numbers of operations are estimated projections for typical annual operations, which may increase or decrease depending upon circumstances.

2. Includes NAS Lemoore based FA-18 aircraft.

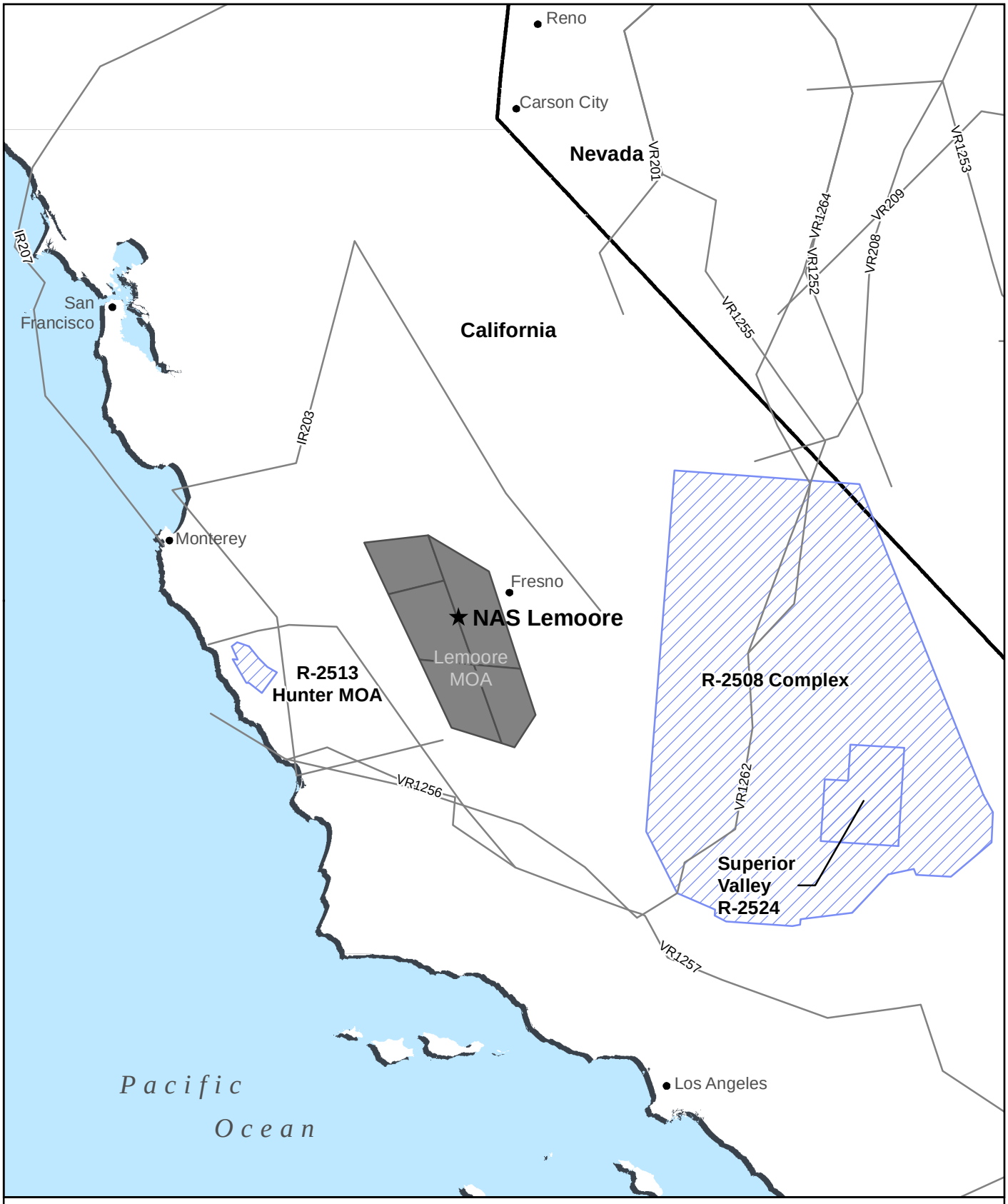

Figure 2-17
SUA and MTRs Proposed for F-35C Operations in the Vicinity of NAS Lemoore

Table 2.8-6 shows annual operations in MTRs in the vicinity of NAS Lemoore for the baseline (2015) and proposed end state (2028). Under Alternative 2, there would be an increase of approximately 54 operations in MTRs in the vicinity of NAS Lemoore.

Table 2.8-6. Changes in Annual Operations in Military Training Routes under Alternative 2

MTR*	Number of Operations		Change
	Baseline (2015)	Proposed (2028)	
IR-203	8	8	0
IR-207	129	129	0
VR-201	237	246	+9
VR-202	251	254	+3
VR-208	23	23	0
VR-209	51	51	0
VR-1250	61	63	+2
VR-1251	22	25	+3
VR-1252	1	1	0
VR-1253	17	17	0
VR-1254	6	6	0
VR-1255	255	284	+29
VR-1256	2	2	0
VR-1257	95	98	+3
VR-1259	4	4	0
VR-1260	2	2	0
VR-1261	24	26	+2
VR-1262	38	41	+3
VR-1264	1	1	0
Total	**1,227**	**1,281**	**+54**

Source: USFF 2011.
Note: * Includes all users of the MTRs.

Proposed F-35C operations in SUA and MTRs in the vicinity of NAS Lemoore would be similar to current FA-18 operations and would include air combat maneuvers and training, air-to-air refueling, and basic fighter maneuvers. FA-18 aircraft operating out of NAS Lemoore currently use these MTRs for daytime operations. Proposed F-35C operations in MTRs are expected to be conducted during daytime hours.

2.9 PREFERRED ALTERNATIVE

Alternative 2, Homebasing the F-35C at NAS Lemoore, is the preferred alternative because it best meets mission requirements; optimizes operational efficiencies related to personnel, training, and logistics support functions; maximizes the reuse of existing facilities and minimizes the need for new construction; and preserves NAF El Centro as a valuable Fleet training asset.

Specifically, Alternative 2, Homebasing at NAS Lemoore:

- **Maximizes the use of existing infrastructure and minimizes the need for military construction.** In accordance with the Naval Aviation Enterprise Global Infrastructure Plan (DoN 2008), reuse of existing facilities should be the first priority when considering infrastructure for new platforms. NAS Lemoore is the current home base for the seven fleet squadrons that will transition to the F-35C. Relocating those squadrons to NAF El Centro would leave useful maintenance, logistics,

operations and administrative facilities at NAS Lemoore vacant and require construction to duplicate those facilities at NAF El Centro. The proposed 1,597,500 square feet of construction at NAS Lemoore associated with Alternative 2 is less than the proposed 6,600,000 square feet of construction at NAF El Centro under Alternative 1 and complies with the priority to reuse existing facilities.

- **Maximizes operational synergies associated with concentration of the Pacific Fleet strike-fighter community at one location**. The F-35C and the FA-18E/F are strike-fighters with complementary capabilities designed to maximize warfighting capability in the Navy strike warfare mission set. Co-locating the F-35C Lightning II FRS and fleet squadrons with the Pacific Fleet FA-18E/F Super Hornet community facilitates daily interaction in operational training, mutual adversary support, and face-to-face collaboration in secure environments. Furthermore, F-35C, FA-18E/F and their associated FRS fall under the administrative control of Commander, Strike Fighter Wing Pacific, which is located at NAS Lemoore. Selection of Alternative 2/Homebasing at NAS Lemoore avoids the duplication of strike-fighter community personnel while the selection of Alternative 1/Homebasing at NAF El Centro would split the Pacific Fleet strike-fighter community to two locations, requiring additional type wing and weapon school personnel and equipment to provide administrative oversight, training, and operational security.
- **Minimizes the risk of exceeding special use airspace and training range capacity.** In particular, NAS Lemoore has access to available air-to-ground and air-to-air training range with the capacity to meet the full requirements of the F-35C training syllabus. Alternative 2/Homebasing at NAS Lemoore represents a manageable increase in operations in the special-use airspace and nearby available ranges. Selection of Alternative 1/Homebasing at NAF El Centro would represent a significant increase in training airspace requirements in the Southern California/Arizona area where competition for training range time amongst the Services is high. This strain on capacity along with the minimal utility of certain overland training ranges to support F-35C training flights (i.e., R-2510 and R-2512) forces more than 80 percent of Navy F-35C training operations to the overwater training ranges (i.e., W-291 and the Shore Bombardment Area in the Southern California Offshore Complex).
- **Preserves NAF El Centro as a valuable training asset.** NAF El Centro is a valuable training asset for rotary-wing and undergraduate training squadrons as well as the Navy Flight Demonstration Squadron all of whom depend on El Centro's current capabilities and continued availability. The predominant visual meteorological conditions (VMC) combined with multiple small air-to-ground training ranges in very close proximity to the airfield make NAF El Centro ideally suited for visual weapons deliveries and visual navigation training in rotary wing and undergraduate pilot training syllabi. The F-35C's only visual weapon delivery capability, the gun, represents a very small portion of training (i.e., one training event in the fleet training syllabus); therefore, these small training ranges are of little utility for F-35C training beyond basic FRS sorties like Familiarization and Formation. Under Alternative 1/Homebasing at El Centro, F-35C FRS and fleet squadrons would consume airfield facilities and services, reducing availability of the El Centro training complex to its current users, and disrupting proven training practices.

- **Minimizes the increase in flight operations at both sites**. Alternative 2 increases flight operations by approximately 43 percent at NAS Lemoore, while Alternative 1 represents a 150 percent increase in airfield operations at NAF El Centro.
- **Minimizes the changes to the baseline installation missions, functions and tasks of NAS Lemoore and NAF El Centro**. NAS Lemoore is a naval air station resourced to provide all personnel, logistics and training support functions as well as facilities associated with home basing a concentration of fleet squadrons. NAF El Centro is resourced to provide temporary training detachment support with limited capability to provide personnel support functions. As such, Alternative 2/Homebasing at NAS Lemoore is consistent with current installation resourcing and avoids the costs associated with relocation of personnel and equipment for six squadrons currently located at NAS Lemoore. Selection of Alternative 1/Homebasing at NAF El Centro requires significant base operating support investment, expansion of Navy shore installation management resources and costs associated with relocation of personnel and equipment to NAF El Centro.

Ultimately, the Secretary of the Navy makes final homebasing decisions based on statutory mission requirements, economic and technical considerations, and environmental considerations as presented in this EIS.

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3. RESOURCE DEFINITIONS, REGULATORY SETTING, AND APPROACH TO ANALYSIS

Chapter 3 provides the definitions, regulatory setting, and approach to analysis for the resources potentially affected by the proposed action alternatives described in Chapter 2. The list of resources addressed in this Environmental Impact Statement (EIS) was developed by considering information and comments received during the public scoping period, which are summarized in Appendix A, *Public Involvement*. The 14 resources that could potentially be affected by F-35C homebasing include: Airfields and Airspace, Noise, Air Quality, Safety, Land Use, Infrastructure and Utilities, Socioeconomics, Community Services, Ground Traffic and Transportation, Biological Resources, Topography and Soils, Water Resources, Cultural and Traditional Resources, and Hazardous Materials and Waste. Chapter 4 presents the affected environment and environmental consequences from Alternative 1 – Naval Air Facility (NAF) El Centro Homebasing, for each of these resources. Chapter 5 presents similar information for Alternative 2 – Naval Air Station (NAS) Lemoore Homebasing for each resource.

3.1 AIRFIELDS AND AIRSPACE

3.1.1 Airfield Operations

Airfield operations are associated with an installation's runways and include departure (takeoff), arrival (landing), and pattern operations, which are defined below.

- **Departure** – involves an aircraft taking off from the runway to a local training range, a non-local training range for detachment training, or as part of a training maneuver (i.e., pattern operation).
- **Arrival** – involves an aircraft landing on the runway after returning from a local training range, a non-local training range, or as part of a training maneuver. The three basic types of arrivals are:
    - Straight-In – an aircraft lines up to the runway centerline several miles away from the airfield, descends gradually, lands, comes to a full stop, and then taxis off the runway.
    - Overhead Break – an aircraft approaches the runway above the altitude of the landing pattern and initiates a break (i.e., turn to enter the pattern) at 1,500 ft above ground level (AGL) over the runway threshold. Approximately halfway down the runway, the aircraft performs a 180-degree turn and slows to enter the landing pattern. Once established in a pattern, the aircraft lowers its landing gear and flaps and performs a 180-degree descending turn to land on the runway. This event is an expeditious arrival using Visual Flight Rules (VFR).
    - Carrier Break – an aircraft approaches the runway, similar to an overhead break arrival, with a break altitude of 800 ft AGL.
- **Pattern Operation** – involves an aircraft landing on a runway and is commonly followed by a takeoff. Pattern operations include the following types:
    - Touch-and-Go – an aircraft lands on a runway and takes off without coming to a full stop. After touching down, the aviator immediately goes to full power and takes off again.

- Field Carrier Landing Practice (FCLP) – the required flight training that immediately precedes (and qualifies) pilots for carrier-landing operations. These operations are conducted on a runway that simulates an aircraft carrier flight deck. FCLP is generally flown in a left-hand, closed loop, racetrack pattern at 600 above ground altitude, ending with a "touch-and-go" (or near touch and go) landing. The pattern should simulate, as nearly as practicable, the conditions pilots would encounter during actual carrier landing operations at sea.
- Ground-Controlled Approach (GCA) – an aircraft lands with guidance from ground-based air traffic controllers to practice and conduct arrivals under actual or simulated adverse-weather conditions. Air traffic controllers provide pilots with verbal course and elevation information, allowing them to make an instrument landing during Instrument Flight Rules (IFR) conditions (i.e., when aircraft are flown referring only to the aircraft instrument panel for navigation). GCA training is conducted in both IFR and VFR conditions to provide realistic training for both Navy pilots and air traffic controllers.
- Simulated Flameout (SFO) – an aircraft approaches the runway at idle thrust to simulate engine power loss and either lands or waves off without landing (SFOs are unique to single engine aircraft). This event usually begins at approximately 10,000 feet (ft) above the runway and involves the aircraft making a series of turns during descent to approach the runway.

In this EIS, the airfields at NAF El Centro and NAS Lemoore are assessed for changes in the procedures to manage and control air traffic. These airfields are also assessed for impacts from changes to the number of annual operations that would occur from the transition of aging FA-18 aircraft to the F-35C.

3.1.2 Airspace Operations

Airspace management considers how airspace is designated, used, and administered to best accommodate the individual and common needs of military, commercial, and general aviation. The Federal Aviation Administration (FAA) considers multiple and sometimes competing demands for aviation airspace in relation to airport operations, federal airways, jet routes, military flight training activities, and other special needs to determine how the National Airspace System can best be structured to address all user requirements.

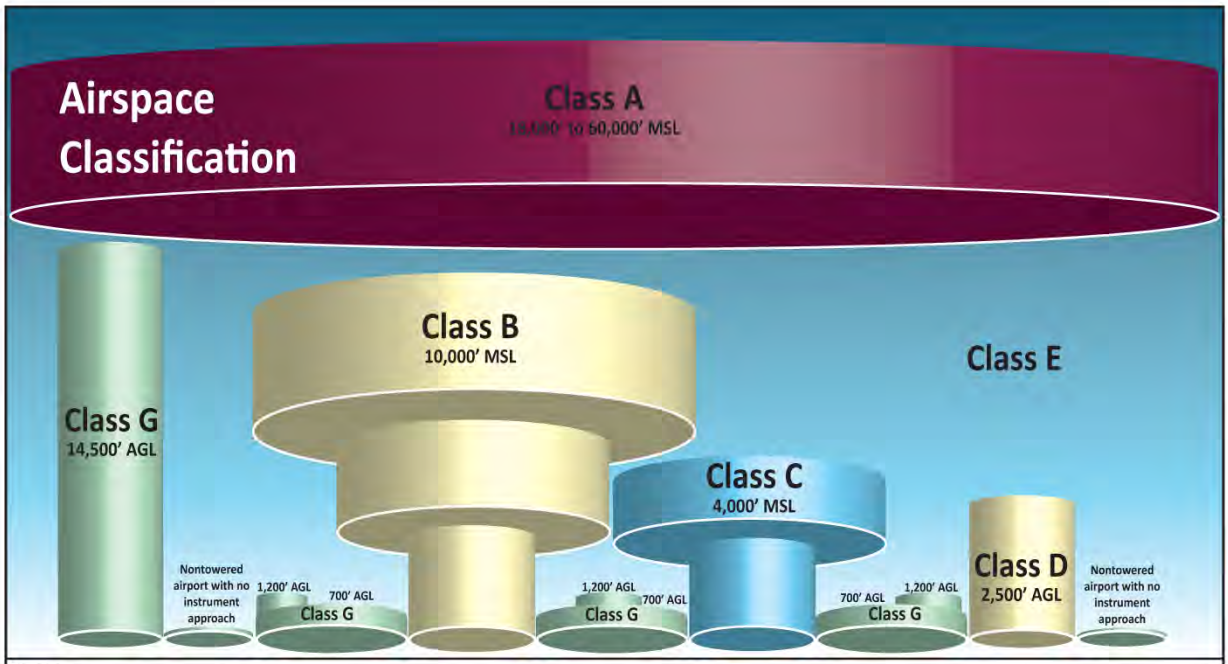
Airspace management is defined as the direction, control, and handling of flight operations in the “navigable airspace” that overlies the geopolitical borders of the United States (US) and its territories. Navigable airspace is defined as airspace above the minimum altitudes of flight prescribed by regulations under 49 US Code (U.S.C.) 40102, and includes airspace needed to ensure safety in the takeoff and landing of aircraft. Under 49 U.S.C. 40101 *et seq*., the US Government has exclusive sovereignty over the nation’s airspace. The FAA is responsible for developing plans and policies for the use of navigable airspace. The FAA assigns use of airspace necessary to ensure its efficient use, as well as the safety of aircraft (49 U.S.C. 40103(b); FAA Order JO 7400.8U). SUA identified for military and other governmental activities is charted and published by the National Aeronautical Charting Office in accordance with FAA Order JO 7400.8U and other applicable regulations and orders.

There are two categories of airspace: regulatory and non-regulatory. Within these two categories the FAA has designated four types of airspace above the United States: controlled airspace, Special Use Airspace (SUA), other, and uncontrolled airspace (FAA 2008).

- **Controlled airspace** is categorized into five separate classes: Classes A, B, C, D, and E airspace (**Figure 3.1-1**). These classes identify airspace that is controlled, airspace supporting airport operations, and designated airways affording en route transit from place-to-place. The classes also dictate pilot qualification requirements, rules of flight that must be followed, and the type of equipment necessary to operate within that airspace.
- **SUA** consists of airspace within which specific activities must be confined, or where limitations are imposed on aircraft not participating in those activities. The FAA has designated SUA that are listed in FAA Order 7400.8U and are also published in Department of Defense (DoD) Flight Information Publications AP/1A and AP/1B. These SUA are also charted on IFR and Visual Flight Rules (VFR) en route charts. Prohibited Areas, Restricted Airspace, Warning Areas, and Military Operations Areas (MOAs) are examples of SUA. Restricted areas (R-) contain airspace within which flight of aircraft, while not wholly prohibited, is subject to restrictions. This is designated rulemaking airspace where restrictions are placed on all non-participating aircraft. This airspace is used to contain hazardous military activities and lies within the territorial airspace of the United States. The term "hazardous" implies, but is not limited to, live firing of weapons, ordnance delivery, and/or aircraft testing. Most restricted areas have specific hours of operations, and users must have permission from the controlling agency before flight through the defined areas.
- **Other airspace** consists of advisory areas, areas that have specific flight limitations or designated prohibitions, areas designated for parachute jump operations, Military Training Routes (MTRs), and aerial refueling tracks. This category also includes Air Traffic Control Assigned Airspace (ATCAA) and airspace designated for altitude reservations.
- **Uncontrolled airspace** is designated Class G airspace and has no specific prohibitions associated with its use.

SUA (i.e., restricted areas and MOAs), MTRs, and ATCAA relevant to this EIS are defined below.

- **Restricted Area (R-)** – SUA supporting ground or flight activities that could be hazardous to non-participating aircraft. Entry into restricted airspace without approval from the using or controlling agency is prohibited. Permission is rarely granted while the airspace is in use except for emergencies or cooperative needs (i.e., Bureau of Land Management or US Forest Service fire-fighting aircraft). Restricted Areas commonly overlie ground ranges and may extend from the ground surface up to 60,000 ft Mean Sea Level (MSL) or higher.
- **Military Operations Area (MOA)** – SUA established to separate certain non-hazardous military activities from IFR aircraft traffic and to identify for VFR aircraft traffic where military activities are conducted. MOAs exist at altitudes up to 18,000 ft MSL. Civilian VFR traffic is allowed in MOAs, in which case both civilian and military aircraft use "see and avoid" procedures. Generally, civilian pilots avoid flying through MOAs because of the likelihood of encountering a fast moving military jet.



Notes:
1. Class A - Spanning from 18,000 to 60,000 feet MSL, Class A airspace mostly supports long-distance commercial and military aircraft. All flight operations must be under Air Traffic Control (ATC) radar coverage and have a clearance prior to entry.
2. Class B - Airspace surrounding the busiest airports in the U.S. (e.g., Phoenix, Los Angeles, Atlanta, etc.) normally beginning at the surface in the immediate airport area and extending higher as the distance from the airport increases, up to an upper limit of 10,000 feet MSL
3. Class C - Similar to Class B, but around moderately busy airports (e.g., Chicago Midway, Boise, Jacksonville, etc.) with a vertical limit of 4,000 feet above the airport.
4. Class D- This class extends from the surface to 2,500 feet AGL around airports with a control tower and not otherwise within Class B or Class C airspace.
5. Class E - Usually Class E airspace begins at 1,200 AGL and extends up to but not including 18,000 feet MSL. No ATC clearance or radio communication is required for flights under Visual Flight Rules.
6. Class F - There is no Class F airspace in the U.S.
7. Class G - Includes all airspace not otherwise classified below 60,000 feet MSL. Class G airspace is typically the airspace very near the ground; 700 or 1,200 feet AGL near airports adjacent to Class B, C or D airspace, and below 14,500 beneath Class E airspace away from airports.
Source: Derived from FAA 2008

Figure 3.1-1. Cross Section of Controlled and Uncontrolled Airspace Classes

- **Military Training Route (MTR)** – Contains flight corridors used by military aircraft for low-altitude, high-speed terrain following training. MTRs are used as "highways" by military aircraft to transit from an installation to SUA. MTRs are generally positioned below 10,000 ft MSL for operations at speeds in excess of 250 nautical miles per hour or knots. MTRs have a centerline with defined horizontal limits on either side of the centerline, and vertical limits expressed as minimum and maximum altitudes along the flight track.
- **Air Traffic Controlled Assigned Airspace (ATCAA)** – Controlled by the applicable FAA Air Route Traffic Control Center that may be available for military use by Letter of Agreement, if not required for other purposes. ATCAAs are typically created in conjunction with a MOA positioned below it, or a Restricted Area positioned above or below it, for aerial refueling or additional maneuver space. ATCAAs exist at altitudes of 18,000 ft MSL or higher.

In this EIS, SUA within the vicinity of NAF El Centro and NAS Lemoore is assessed for changes in management or structure. SUA is also assessed for impacts from changes to the number of annual operations that would occur from the transition of aging FA-18 aircraft to the F-35C, as well as the

potential effects to civil aviation. SUA in the vicinity of NAF El Centro includes R-2507 North and South, R-2301 West, Kane MOA, and Able MOA, which are under the operational control of the Commanding Officer, MCAS Yuma. These ranges are considered to be "backyard" ranges for the 3rd Marine Aircraft Wing and are also the primary ranges of Marine Aviation Weapons and Tactics Squadron One.

3.2 NOISE

Sound is a physical phenomenon consisting of minute vibrations that travel through a medium, such as air or water, and are sensed by the human ear. Sound is all around us. The perception and evaluation of sound involves three basic physical characteristics:

- Intensity – the acoustic energy, which is expressed in terms of sound pressure, in decibels (dB)
- Frequency – the number of cycles per second the air vibrates, in Hertz (Hz)
- Duration – the length of time the sound can be detected

Noise is defined as unwanted or annoying sound that interferes with or disrupts normal human activities. Although continuous and extended exposure to high noise levels (e.g., through occupational exposure) can cause hearing loss, the principal human response to noise is annoyance (see Appendix C, *Noise*). The response of different individuals to similar noise events is diverse and is influenced by the type of noise, perceived importance of the noise, its appropriateness in the setting, time of day, type of activity during which the noise occurs, and sensitivity of the individual. While aircraft are not the only sources of noise in an urban or suburban environment, they are readily identified by their noise output and are given special attention in this EIS. In depth background information on noise, including its effect on many facets of the environment, is provided in Appendix C, *Noise*.

3.2.1 Basics of Sound and A-weighted Sound Level

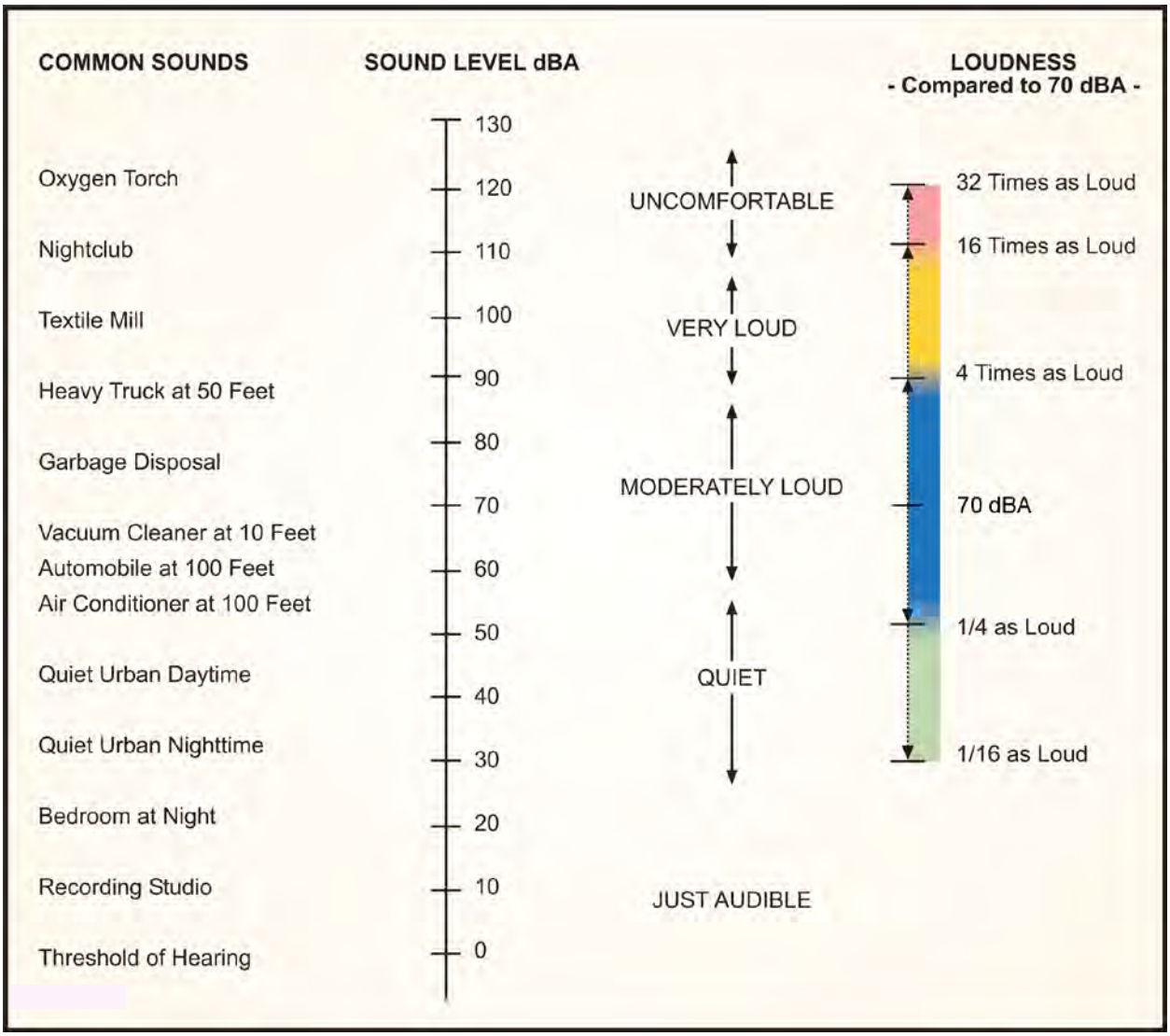
The loudest sounds that can be detected comfortably by the human ear have intensities that are a trillion times higher than those of sounds that can barely be detected. This vast range means that using a linear scale to represent sound intensity is not feasible. The dB is a logarithmic unit used to represent the intensity of a sound, also referred to as the sound level. All sounds have a spectral content, which means their magnitude or level changes with frequency, where frequency is measured in cycles per second or Hz. To mimic the human ear's non-linear sensitivity and perception of different frequencies of sound, the spectral content is weighted. For example, environmental noise measurements are usually on an "A-weighted" scale that filters out very low and very high frequencies in order to replicate human sensitivity. It is common to add the "A" to the measurement unit in order to identify that the measurement has been made with this filtering process (dBA). In this document, the dB unit refers to A-weighted sound levels. **Table 3.2-1** provides a comparison of how the human ear perceives changes in loudness on the logarithmic scale.

Table 3.2-1. Subjective Responses to Changes in A-Weighted Decibels

Change	*Change in Perceived Loudness*
3 dB	Barely perceptible
5 dB	Quite noticeable
10 dB	Dramatic – twice or half as loud
20 dB	Striking – fourfold change

Figure 3.2-1 provides a chart of A-weighted sound levels from typical noise sources. Some noise sources (e.g., air conditioner, vacuum cleaner) are continuous sounds that maintain a constant sound level for some period of time. Other sources (e.g., automobile, heavy truck) are the maximum sound produced during an event like a vehicle pass-by. Other sounds (e.g., urban daytime, urban nighttime) are averages taken over extended periods of time. A variety of noise metrics have been developed to describe noise over different time periods, as discussed below.

Noise levels from aircraft operations that exceed background noise levels at an airfield typically occur beneath main approach and departure corridors, in local air traffic patterns around the airfield, and in areas immediately adjacent to parking ramps and aircraft staging areas. As aircraft in flight gain altitude, their noise contributions drop to lower levels, often becoming indistinguishable from the background noise.



Sources: Derived from Harris (1979) and Federal Interagency Committee on Aviation Noise (1997).

Figure 3.2-1. A-Weighted Sound Levels from Typical Sources

3.2.2 Noise Metrics

A metric is a system for measuring or quantifying a particular characteristic of a subject. Since noise is a complex physical phenomenon, different noise metrics help to quantify the noise environment. The noise metrics used in this EIS are described in summary format below and in a more detailed manner in Appendix C. While the Day-Night Average Sound Level (DNL) and Community Noise Equivalent Level (CNEL) noise metrics are the most commonly used tools for analyzing noise generated at an airfield, the DoD has been developing additional metrics (and analysis techniques). These supplemental metrics and analysis tools provide more detailed noise exposure information for the decision process and improve the discussion regarding noise exposure. The DoD Noise Working Group product, *Improving Aviation Noise Planning, Analysis and Public Communication with Supplemental Metrics* (DoD Noise Working Group 2009) was used to determine the appropriate metrics and analysis tools for this EIS.

3.2.2.1 Day-Night Average Sound Level

The DNL metric is the energy-averaged sound level measured over a 24-hour period, with a 10-dB penalty assigned to noise events occurring between 10 p.m. and 7 a.m. (acoustic night). DNL values are average quantities, mathematically representing the continuous sound level that would be present if all of the variations in sound level that occur over a 24-hour period were averaged to have the same total sound energy. The DNL metric quantifies the total sound energy received and is therefore a cumulative measure, but it does not provide specific information on the number of noise events or the individual sound levels that occur during the 24-hour day. DNL is the standard noise metric used by the US Department of Housing and Urban Development, FAA, US Environmental Protection Agency (USEPA), and DoD. Studies of community annoyance in response to numerous types of environmental noise show that DNL correlates well with impact assessments; there is a consistent relationship between DNL and the level of annoyance (refer to Appendix C, *Noise*). Most people are exposed to sound levels of 50 to 55 DNL or higher on a daily basis.

Research has indicated that about 87 percent of the population is not highly annoyed by outdoor sound levels below 65 dB DNL (Federal Interagency Committee on Urban Noise 1980). Therefore, the 65 dB DNL noise contour is used to help determine compatibility of military aircraft operations with local land use, particularly for land use associated with airfields.

3.2.2.2 Community Noise Equivalent Level

CNEL is a noise metric adopted as a standard by the state of California. Therefore, CNEL was used in the noise analysis prepared by the Navy for NAS Lemoore and NAF El Centro. The CNEL metric is similar to the DNL metric and is also an energy-averaged sound level measurement. DNL and CNEL provide average noise levels taking into consideration and applying penalties for annoyance from intrusive events that occur during evening and nighttime hours. Both DNL and CNEL are measures of cumulative noise exposure over a 24-hour period, with adjustments to reflect the added intrusiveness of noise during certain times of the day. However, while DNL considers one adjustment period, CNEL reflects two adjustment periods. DNL includes a single adjustment period for night, in which each aircraft noise event at night (defined as 10 p.m. to 7 a.m.) is counted 10 times. CNEL adds a second adjustment period where

each aircraft noise event in the evening (defined as 7 p.m. to 10 p.m.) is counted three times. The nighttime adjustment is equivalent to increasing the noise levels during that time interval by 10 dB. Similarly, the evening adjustment increases the noise levels by approximately 5 dB.

3.2.2.3 Equivalent Sound Level

A cumulative noise metric useful in describing noise is the Equivalent Sound Level (Leq). Leq is the continuous sound level that would be present if all of the variations in sound level occurring over a specified time period were smoothed out as to contain the same total sound energy. The same calculation for a daily average time period such as DNL or CNEL but without the penalties is a 24 hour equivalent sound level, abbreviated $L_{eq}(24)$. Other typical time periods for Leq are 1 hour and 8 hours.

3.2.2.4 Sound Exposure Level

The Sound Exposure Level (SEL) metric is a composite metric that represents both the intensity of a sound and its duration. Individual time-varying noise events (e.g., aircraft overflights) have two main characteristics: a sound level that changes throughout the event and a period of time during which the event is heard. SEL provides a measure of total sound energy of the entire acoustic event, but it does not directly represent the sound level heard at any given time. During an aircraft flyover, SEL captures the total sound energy from the beginning of the acoustic event to the point when the receiver no longer hears the sound. It then condenses that energy into a 1-second period of time and the metric represents the total sound exposure received. The SEL has proven to be a good metric to compare the relative exposure of transient sounds, such as aircraft overflights, and is the recommended metric for sleep disturbance analysis (DoD Noise Working Group 2009). In this EIS, SEL is used in aircraft comparison and sleep disturbance analyses.

3.2.2.5 Maximum Sound Level

The highest A-weighted sound level measured during a single event where the sound level changes value with time (e.g., an aircraft overflight) is called the maximum A-weighted sound level or L_{max}. During an aircraft overflight, the noise level starts at the ambient or background noise level, rises to the maximum level as the aircraft flies closest to the observer, and returns to the background level as the aircraft recedes into the distance. L_{max} defines the maximum sound level occurring for a fraction of a second. For aircraft noise, the "fraction of a second" over which the maximum level is defined is generally 1/8 second (American National Standards Institute 1988). For sound from aircraft overflights, the SEL is usually greater than the L_{max} because an individual overflight takes seconds and the L_{max} occurs instantaneously. In this EIS, L_{max} is used in the analysis of aircraft comparison and speech interference.

3.2.2.6 Number of Events Above a Threshold Level

The Number of Events Above a Threshold Level (NA) metric provides the total number of noise events that exceed a selected noise level threshold during a specified period of time (DoD Noise Working Group 2009). Combined with the selected noise metric, L_{max} or SEL, the NA metric is symbolized as NAXXmetric (NA = number of events above, XX = dB level, metric = L_{max} or SEL). For example, the L_{max} and SEL NA metrics are symbolized as NA75L_{max} and NA75SEL, respectively, with 75 dB as the example dB level. In

this EIS, an L_{max} threshold is selected to analyze speech interference and an SEL threshold is selected for analysis of sleep disturbance.

3.2.3 Noise Effects

As detailed in Section C.3 of Appendix C, an extensive amount of research has been conducted regarding noise effects including annoyance, speech interference, sleep disturbance, noise-induced hearing impairment, nonauditory health effects, performance effects, noise effects on children, effects on domestic animals and wildlife, property values, structures, terrain, and archaeological sites. These effects are summarized below and in the environmental consequences analysis in Chapters 4 and 5.

3.2.3.1 Annoyance

As previously noted, the primary effect of aircraft noise on exposed communities is long-term annoyance, defined by the USEPA as any negative subjective reaction on the part of an individual or group. The scientific community has adopted the use of long-term annoyance as a primary indicator of community response and there is a consistent relationship between DNL/CNEL and the level of community annoyance (Federal Interagency Committee on Noise 1992).

3.2.3.2 Potential Hearing Loss

People living in high noise environments for an extended period of time (40 years) can be at risk for hearing loss called Noise Induced Permanent Threshold Shift (NIPTS). The NIPTS defines a permanent change in hearing level, or threshold, caused by exposure to noise (USEPA 1982). According to USEPA (1974), changes in hearing level of less than 5 dB are generally not considered noticeable or significant. There is no known evidence that an NIPTS of less than 5 dB is perceptible or has any practical significance for the individual affected. Furthermore, the variability in audiometric testing is generally assumed to be plus or minus 5 dB. The preponderance of available information on hearing loss risk is from the workplace with continuous exposure throughout the day for many years. Clearly, these data are applicable to the adult working population.

Based on a report by Ludlow and Sixsmith (1999), there were no significant differences in audiometric test results between military personnel, who as children, had lived in or near installations where fast jet operations were based, and a similar group who had no such exposure as children. Hence, for the purposes of this EIS, the limited data are considered applicable to the general population, including children, and are used to provide a conservative estimate of the risk of potential hearing loss.

DoD policy directive requires that hearing loss risk be estimated for the at-risk population, defined as the population exposed to DNL greater than or equal to 80 dB. To assess the potential for NIPTS, the Navy generally uses the 80 dB DNL noise contour (or in California 80 dB CNEL) as a threshold to identify the exposed population who may be at the most risk of possible hearing loss from aircraft noise (USEPA 1982; DoD Noise Working Group 2009). However, it should be recognized that characterizing noise exposure in terms of DNL and CNEL overestimates hearing loss risk but suffices when nighttime operations are 5 percent or less than the total operations. When nighttime operations are greater than 5 percent, $L_{eq}(24)$ is recommended for calculating potential hearing loss since hearing loss is a physical phenomenon due to the sound level and independent of annoyance. Thus, the additional penalties

applied by CNEL for evening and nighttime operations do not accurately portray the NIPTS. This EIS calculates potential hearing loss using $L_{eq}(24)$ to get the accuracy necessary for the larger amount of nighttime and evening operations.

3.2.3.3 Speech Interference

Speech interference associated with aircraft noise is a primary cause of annoyance for communities. Speech interference can cause disruption of routine activities, such as enjoyment of radio or television programs, telephone use, or family conversation, giving rise to frustration or irritation. In extreme cases, speech interference may cause fatigue and vocal strain to individuals who try to communicate over the noise. In this EIS, speech interference is measured by the number of daily indoor events (from 7 a.m. to 10 p.m.) that exceed 50 dB L_{max} at selected locations. This metric also accounts for noise level reduction provided by buildings with windows open or closed.

3.2.3.4 Classroom Criteria and Noise Effects on Children

Research suggests that environments with sustained high background noise can have variable effects, including effects on learning and cognitive abilities and various noise-related physiological changes. Research on the impacts of aircraft noise, and noise in general, on the cognitive abilities of school-aged children has received more attention in recent years. Several studies suggest that aircraft noise can affect the academic performance of school children. Physiological effects in children exposed to aircraft noise and the potential for health effects have been the focus of limited investigation (DoD Noise Working Group 2009).

Analyses for school-aged children are similar to speech interference by using the indoor number of events exceeding 50 dB L_{max}, but also has the added restriction of using an outdoor equivalent noise level of 60 dB L_{eq}(9hr). This represents a level that a person with normal hearing can clearly hear a speaker (teacher) speaking at a level of 50 dB indoors in a classroom setting.

3.2.3.5 Sleep Disturbance

The disturbance of sleep is a major concern for communities exposed to nighttime aircraft noise. In this EIS, sleep disturbance uses the SEL noise metric and calculates the probability of awakening from single aircraft overflights. These are based upon the particular type of aircraft, flight profile, power setting, speed, and altitude relative to the receptor. The results are then presented as a percent probability of people awakening (USEPA 1974).

3.2.3.6 Workplace Noise

In 1972, the National Institute for Occupational Safety and Health (NIOSH) published a criteria document with a recommended exposure limit of 85 dBA as an 8-hour time-weighted average. This exposure limit was reevaluated in 1998 when NIOSH made recommendations that went beyond conserving hearing by focusing on the prevention of occupational hearing loss. Following the reevaluation using a new risk assessment technique, NIOSH published another criteria document in 1998, which reaffirmed the 85 dB recommended exposure limit (NIOSH 1998).

3.2.3.7 Nonauditory Health Effects

Studies have been conducted to examine the nonauditory health effects of aircraft noise exposure, focusing primarily on stress response, blood pressure, birth weight, mortality rates, and cardiovascular health. Exposure to noise levels higher than those normally produced by aircraft in the community can elevate blood pressure and also stress hormone levels. However, the response to such loud noise is typically short in duration: after the noise goes away, the physiological effects reverse and levels return to normal. In the case of repeated exposure to aircraft noise, the connection is not as clear. The results of most cited studies are inconclusive, and it cannot be conclusively stated that a causal link exists between aircraft noise exposure and the various type of nonauditory health effects that were studied (DoD Noise Working Group 2009).

3.2.3.8 Noise Effects on Children

A review of the scientific literature indicated that there has not been a tremendous amount of research in the area of aircraft noise effects on children. The research reviewed does suggest that environments with sustained high background noise can have variable effects, including effects on learning and cognitive abilities and various noise-related physiological changes. Research on the impacts of aircraft noise, and noise in general, on the cognitive abilities of school-aged children has received more attention in recent years. Several studies suggest that aircraft noise can affect the academic performance of schoolchildren. Physiological effects in children exposed to aircraft noise and the potential for health effects have been the focus of limited investigation (DoD Noise Working Group 2009).

3.2.4 Noise Modeling

Computer modeling provides a tool to assess potential noise impacts. DNL/CNEL noise contours are generated by a computer model that draws from a library of actual aircraft noise measurements. Noise contours produced by the model allow a comparison of existing conditions and proposed changes or alternative actions, even when the aircraft studied are not currently operating from the installation. For these reasons, on-site noise monitoring is seldom used at military air installations, especially when the aircraft mix and operational tempo are not uniform.

The noise environment for this EIS was modeled using NOISEMAP. NOISEMAP analyzes all the operational data (types of aircraft, number of operations, flight tracks, altitude, speed of aircraft, engine power settings, and engine maintenance run-ups), environmental data (average humidity and temperature), and surface hardness and terrain. The result of the modeling is noise contours; lines connecting points of equal value (e.g., 65 dB CNEL and 70 dB CNEL). Noise zones cover an area between two noise contours and are usually shown in 5-dB increments (e.g., 65–69 dB CNEL, 70–74 dB CNEL, and 75–79 dB CNEL). As stated earlier, since the two homebasing alternatives considered are in California, CNEL is the standard used for noise calculations in this EIS.

A newer model, called the Advanced Acoustic Model, has not yet been approved for use by the DoD. Per Chief of Naval Operations Instruction (OPNAVINST) 11010.36C, *Air Installations Compatible Use Zones*

(AICUZ) Program, NOISEMAP is to be used for developing noise contours and is the best noise modeling science available today for fixed-wing aircraft until the Advanced Acoustic Model is approved.

3.3 AIR QUALITY

The air quality analysis considers criteria pollutants, a conformity evaluation, and greenhouse gas (GHG) emissions. Air pollutants may be emitted from stationary or mobile sources.

3.3.1 Criteria Pollutants

Air quality is defined by ambient air concentrations of specific pollutants determined by the USEPA to be of concern related to the health and welfare of the general public and the environment. The primary pollutants of concern, called "criteria pollutants," include carbon monoxide (CO), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), ozone (O_3), particulate matter with an aerodynamic diameter less than or equal to 10 microns (PM_{10}), particulate matter with an aerodynamic diameter less than or equal to 2.5 microns in diameter ($PM_{2.5}$), and lead. Under the Clean Air Act (CAA), the USEPA has established National Ambient Air Quality Standards (NAAQS) for these pollutants (40 Code of Federal Regulations [C.F.R.] 50.1-50.17).

Areas that are and have historically been in compliance with the NAAQS are designated as attainment areas. Areas that violate a federal air quality standard are designated as non-attainment areas. Areas that have transitioned from nonattainment to attainment are designated as maintenance areas and are required to adhere to maintenance plans to ensure continued attainment. The NAAQS represent the maximum levels of background pollution that are considered safe, with an adequate margin of safety, to protect public health and welfare. Short-term standards (1- 3-, 8-, and 24-hour periods) are established for pollutants contributing to chronic health effects.

States may also establish their own ambient air quality standards that are more stringent than those set by federal law. The California Health and Safety Code, Section 39606 authorizes the California Air Resources Board (CARB) to set ambient air pollution standards in consideration of public health, safety and welfare. The Board makes area designations for 10 pollutants: O_3, suspended particulate matter (PM_{10} and $PM_{2.5}$), CO, NO_2, SO_2, sulfates, lead, hydrogen sulfide, and visibility reducing particles. Each year, CARB reviews the area designations and updates them as appropriate, based on the three most recent complete and validated calendar years of air quality data. For this EIS, the three years of air quality data used for the 2012 review are: 2008, 2009, and 2010 (CARB 2012). **Table 3.3-1** lists the ambient air quality standards enforced by the USEPA and CARB.

In addition to the ambient air quality standards for criteria pollutants, national standards exist for hazardous air pollutants (HAPs), which are regulated under Section 112(b) of the 1990 CAA Amendments. The National Emission Standards for HAPs regulate hazardous HAP emissions from stationary sources (40 C.F.R. 61 and 63).

Table 3.3-1. Ambient Air Quality Standards

Pollutant	Averaging Time	National Standards		California Standards[1]
		Primary	Secondary	
Ozone	1-hour[2]	0.12 ppm	0.12 ppm	0.09 ppm
	8-hour (1997 standard)	0.08 ppm	0.08 ppm	-
	8-hour (2008 standard)	0.075 ppm	0.075 ppm	0.070 ppm
PM_{10}	24-hour	150 µg/m^3	150 µg/m^3	50 µg/m^3
	Annual Arithmetic Mean	-	-	20 µg/m^3
$PM_{2.5}$[3]	24-hour	35 µg/m^3	35 µg/m^3	-
	Annual Arithmetic Average	12 µg/m^3	15 µg/m^3	12 µg/m^3
CO	8-hour	9 ppm	-	9.0 ppm
	1-hour	35 ppm	-	20 ppm
NO_2	Annual Arithmetic Average	53 ppb	53 ppb	0.030 ppm
	1-hour	100 ppb	-	0.18 ppm
SO_2	Annual Arithmetic Average[6]	0.03 ppm	-	-
	24-hour[5]	0.14 ppm	-	0.04 ppm
	3-hour	-	0.5 ppm	-
	1-hour	75 ppb	-	0.25 ppm
Lead[4]	Rolling 3-month Average	0.15 µg/m^3	0.15 µg/m^3	-
	30-day Average	-	-	1.5 µg/m^3
Visibility reducing particles[5]	8-hour	No Federal NAAQS		See note (7)
Sulfates	24-hour			25 µg/m^3
Hydrogen sulfide	1-hour			0.03 ppm
Vinyl chloride[4]	24-hour			0.01 ppm

Sources: CARB 2012; USEPA 2011.

Notes: ppm = parts per million; ppb = parts per billion; µg/m3 = micrograms per cubic meter

1. California Standards for O_3, CO, SO_2, NO_2, PM_{10}, $PM_{2.5}$ and visibility reducing particles are values that are not to be exceeded. All others are not to be equaled or exceeded.
2. a. USEPA revoked the 1-hour O_3 standard in all areas, although some areas have continuing obligations under that standard ("anti-backsliding").
   b. The 1997 standard—and rules for that standard—will remain in place as USEPA undertakes rulemaking to address the transition from the 1997 O_3 standard to the 2008 O_3 standard.
   c. USEPA is in the process of reconsidering the 2008 standards (set in March 2008).
3. Published December 14, 2012. The USEPA anticipates making initial attainment/nonattainment designations by December 2014, with those designations likely becoming effective in early 2015.
4. The CARB has identified lead and vinyl chloride as 'toxic air contaminants' with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.
5. 8-hour standard is: Extinction coefficient of 0.23 per kilometer – visibility of 10 miles or more due to particles when relative humidity is less than 70 percent.
6. On June 2, 2010, a new 1-hour SO_2 standard was established and the existing 24-hour and annual primary standards were revoked. To attain the 1-hour national standard, the 3-year average of the annual 99th percentile of the 1-hour daily maximum concentrations at each site must not exceed 75 ppb. The 1971 SO_2 national standards (24-hour and annual) remain in effect until one year after an area is designated for the 2010 standard, except that in areas designated nonattainment for the 1971 standards, the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standards are approved (CARB 2012).
7. In 1989, the ARB converted the general statewide 10-mile visibility to an instrumental equivalent, which is "extinction of 0.23 per kilometer."

HAPs emitted from mobile sources are called Mobile Source Air Toxics (MSATs). MSATs are compounds emitted from highway vehicles and non-road equipment which are known or suspected to cause cancer or other serious health and environmental effects. In 2001, USEPA issued its first MSATs Rule, which identified 21 compounds as being HAPs that required regulation (USEPA 2001). A subset of six of these MSAT compounds were identified as having the greatest influence on health and included benzene, 1,3-butadiene, formaldehyde, acrolein, acetaldehyde, and diesel particulate matter. USEPA issued a second MSAT Rule in February 2007, which generally supported the findings in the first rule and provided additional recommendations of compounds having the greatest impact on health. The rule also identified several engine emission certification standards that must be implemented (USEPA 2007).

Unlike the criteria pollutants, there are no NAAQS for benzene and other HAPs. The primary control methodologies for these pollutants for mobile sources involves reducing their content in fuel and altering the engine operating characteristics to reduce the volume of pollutant generated during combustion. Because of the low levels of aircraft emissions of these pollutants in the ambient air below the mixing height (3,000 ft AGL), HAPs are not further evaluated in this EIS. Additionally, airborne emissions of lead are not addressed in this EIS because there are no known significant lead emission sources associated with the proposed action.

California is divided into 15 Air Basins to better manage air pollution. The San Joaquin Valley Air Basin, also known as the San Joaquin Valley Air Pollution Control District (APCD), comprises eight counties, including San Joaquin, Stanislaus, Merced, Madera, Fresno, Kings, Tulare and West Kern Counties, and includes NAS Lemoore. Air quality in a given location is described by the concentration of various pollutants in the atmosphere. A region's air quality is influenced by many factors including the type and amount of pollutants emitted into the atmosphere, the size and topography of the air basin, and the prevailing meteorological conditions. Pollutant emissions typically refer to the amount of pollutants or pollutant precursors introduced into the atmosphere by a source or group of sources.

The San Joaquin Valley is one of the most polluted regions in the state and country. The Valley does not currently meet health-based standards set by the USEPA for O_3 and particulate matter. On average the Valley exceeds the federal health-based standards for ground-level O_3 35-40 days. The levels of airborne particles exceed the federal standard on average, five times annually. The bowl-shaped Valley collects and holds emissions caused by the activities of the Valley's 3 million residents and their 2 million vehicles, as well as vehicles from other areas traveling on Highway 99 and Interstate 5. Farming and industry activity also plays a large role in the emission of particulates and O_3 in the Valley.

3.3.2 General Conformity Rule

The USEPA General Conformity Rule (40 C.F.R. 93 Subpart B) 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. Section 176(c) of the CAA, as articulated in the USEPA General Conformity Rule, states that a federal agency cannot issue a permit for or support an activity unless the agency determines that it will conform to the most recent USEPA-approved SIP. This means that projects using federal funds or requiring federal approval must not (1) cause or contribute to any new violation of a NAAQS, (2) increase the frequency or severity of any existing violation, or (3)

delay the timely attainment of any standard, interim emission reduction, or other milestone. Imperial County APCD Rule 925 and San Joaquin Valley APCD Rule 9110 implement the USEPA's General Conformity Rule within each district, respectively.

A conformity applicability analysis is the first step of a conformity evaluation and assesses if a federal action must be supported by a conformity determination. This is typically done by quantifying applicable direct and indirect emissions that are proposed to result from a federal action. Indirect emissions are those emissions caused by the federal action and originating in the region of interest, but which may occur at a later time and/or in a different location from the action itself and are reasonably foreseeable. The federal agency can control and will maintain control over the indirect action due to a continuing program responsibility of the federal agency. Reasonably foreseeable emissions are projected future direct and indirect emissions that are identified at the time the conformity evaluation is performed. The location of such emissions is known and the emissions are quantifiable, as described and documented by the federal agency based on its own information and after reviewing any information presented to the federal agency. If the results of the applicability analysis indicate that the total emissions would not exceed the *de minimis* emission thresholds of the proposed action, then the conformity evaluation process is completed. If emissions of one or more of these compounds exceed a *de minimis* threshold, the Navy must demonstrate conformity under one of the methods prescribed by the General Conformity Rule.

3.3.3 Greenhouse Gases

Greenhouse gases (GHGs) are gas emissions that trap heat in the atmosphere. These emissions occur from natural processes and human activities. Scientific evidence indicates a trend of increasing global temperature over the past century due to an increase in GHG emissions from human activities. The climate change associated with this global warming is predicted to produce negative economic and social consequences across the globe.

USEPA issued the *Final Mandatory Reporting of Greenhouse Gases Rule* on October 30, 2009 (USEPA 2009). In general, the Rule is referred to as 40 C.F.R. Part 98 or "Part 98." Implementation of Part 98 is referred to as the Greenhouse Gas Reporting Program. GHGs covered under the Greenhouse Gas Reporting Program are CO_2, methane, nitrous oxide (N_2O), hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride, and other fluorinated gases including nitrogen trifluoride and hydrofluorinated ethers. Each GHG is assigned a global warming potential (GWP). The GWP is the ability of a gas or aerosol to trap heat in the atmosphere. The GWP rating system is standardized to CO_2, which has a value of one. For example, methane has a GWP of 21, which means that it has a global warming effect 21 times greater than CO_2, on an equal-mass basis. The equivalent CO_2 rate is calculated by multiplying the emission of each GHG by its GWP and adding the results together to produce a single, combined emission rate representing all GHGs. Under the Greenhouse Gas Reporting Program, suppliers of fossil fuels or industrial GHGs, manufacturers of mobile sources and engines, and facilities that emit 25,000 metric tons or more per year of GHG emissions as CO_2 equivalent are required to submit annual reports to USEPA.

On a national scale, federal agencies are addressing emissions of GHGs by reductions mandated in federal laws and Executive Orders (EOs). Most recently, EO 13423, *Strengthening Federal Environmental, Energy, and Transportation Management,* and EO 13514, *Federal Leadership in Environmental, Energy, and Economic Performance,* were enacted to address GHGs, including GHG emissions inventory, reduction, and reporting.

The California Global Warming Solutions Act of 2006, also known as Assembly Bill 32, directs the State of California to reduce statewide GHG emissions to 1990 levels by the year 2020. The *Climate Change Scoping Plan* is California's strategy to reach the required GHG reduction goals. This plan calls for reducing the current annual emissions of 14 tons of CO_2 for every man, woman, and child in California down to about 10 tons per person by 2020. The Scoping Plan identifies a cap-and-trade program as one of the strategies California will employ to reduce the GHG emissions that cause climate change. On October 20, 2011, the Board adopted the final cap-and-trade regulation and Resolution 11-32. Under cap-and-trade, an overall limit on GHG emissions from capped sectors will be established by the cap-and-trade program and facilities subject to the cap will be able to trade permits (allowances) to emit GHGs.

In an effort to reduce energy consumption, reduce GHGs, reduce dependence on petroleum, and increase the use of renewable energy resources in accordance with the goals set by EO 13423 and the Energy Policy Act of 2005, the Navy has implemented a number of renewable energy projects (Department of the Navy [DoN] 2006). The types of projects currently in operation within the Navy Region Southwest include thermal and photovoltaic solar systems, geothermal power plants, and wind generators. The Navy continues to promote and install new renewable energy projects within the Navy Region Southwest. GHG emissions occur locally, but GHG impacts are both global in scale and cumulative over time. Therefore, GHG emissions for the baseline and the proposed action have been calculated and are presented and assessed in Chapter 6, *Cumulative Impacts*.

3.4 SAFETY

Safety addresses flight safety, Bird/Animal Aircraft Strike Hazard (BASH), Accident Potential Zones (APZs) and Clear Zones, and explosive safety.

3.4.1 Flight Safety

Navy requirements outlined in OPNAVINST 3500.39C, *Operational Risk Management*, provide a process to maintain readiness in peacetime and achieve success in combat while safeguarding people and resources. The FAA is responsible for ensuring safe and efficient use of US airspace by military and civilian aircraft and for supporting national defense requirements. In order to fulfill these requirements, the FAA has established safety regulations, airspace management guidelines, a civil-military common system, and cooperative activities with the DoD. The primary safety concern with regard to military training flights is the potential for aircraft mishaps to occur, which could be caused by mid-air collisions with other aircraft or objects, weather difficulties, mechanical failures, pilot error, or BASH strikes.

There is no generally recognized threshold of air safety that defines acceptable or unacceptable conditions. Instead, the focus of airspace managers is to reduce risks through a number of measures.

These include, but are not limited to, providing and disseminating information to airspace users, requiring appropriate levels of training for those using the airspace, setting appropriate standards for equipment performance and maintenance, defining rules governing the use of airspace, and assigning appropriate and well-defined responsibilities to the users and managers of the airspace. When these safety measures are implemented, risks are minimized, even though they can never be eliminated.

Aircraft mishaps are classified based on the extent of property damage. Mishap rates are typically calculated per 100,000 flying hours, with combat hours excluded. Emergency and mishap response involves the procedures and equipment needed to react to mishaps on or off the installation. Elements of this response include rescue, fire suppression, security, and investigation.

In this EIS, potential impacts to flight safety at both NAS Lemoore and NAF El Centro are analyzed by considering the possible changes to mishap rates as a result of proposed F-35C operations.

3.4.2 Bird/Animal Aircraft Strike Hazard

Potential bird/animal aircraft strikes are another safety concern for aircraft operations. Aircraft strikes of birds or other animals (e.g., bats and deer) are a safety concern because of the potential for damage to aircraft or injury to pilots or local populations if an aircraft crash should occur in a populated area. Aircraft may encounter birds at altitudes of 30,000 ft MSL or higher. However, most reported bird strikes occur at an elevation of less than 1,000 ft. Birds, in particular, are drawn to the open, grassy areas and warm pavement of an airfield. Although most bird and animal strikes do not result in crashes, they may cause structural and mechanical damage to aircraft. Due to the speed of the aircraft, collisions with birds or other animals can happen with considerable force.

BASH plans are developed for military airfields to reduce the potential for collisions between aircraft and birds or other animals. BASH plans account for seasonal migration patterns where risks to aircraft can increase. To reduce the potential for BASH, the FAA and the military recommend that land uses that attract birds (e.g., agricultural fields, landfills) be located at least 10,000 ft from the airfield.

In this EIS, potential impacts due to changes in BASH potential are analyzed by considering changes in aircraft frequency and profiles (e.g., altitudes, airspeeds, etc.) of proposed training operations in and around NAF El Centro and NAS Lemoore.

3.4.3 Clear Zones and Accident Potential Zones

In the 1970s and 1980s, recognizing the need to identify areas of accident potential, the services conducted studies of historic aircraft accidents throughout the United States. The studies showed that most aircraft mishaps occur on or near the runway, diminishing in likelihood with distance. Based on these studies, the Navy and other services have identified APZs. APZs are areas where aircraft accidents are most likely to occur, if they were to occur; they are not predictors of accidents. APZs follow departure, arrival, and pattern flight tracks and are based upon analysis of flight operations data. While the likelihood of a mishap is remote, the Navy recommends restricting people-intensive uses within these zones.

Airfield Safety Clearances and APZs are established at military airfields under the AICUZ Program. The main goals of the AICUZ program are to protect the health, safety, and welfare of people living or working near military airfields while preserving the defense flying mission. It achieves these goals by promoting land use compatible with aircraft operations.

Clear Zones and APZs are areas in the vicinity of airfield runways where an aircraft mishap is most likely to occur (if one were to occur). While the likelihood of a mishap is remote, the Navy recommends that the intensity and density of land uses within APZs be minimal or low density to ensure the maximum protection of public health and property. The components of a standard AICUZ study are defined as follows (adapted from OPNAVINST 11010.36C, *Air Installations Compatible Use Zones (AICUZ) Program*):

- **Clear Zone** - extends 3,000 ft immediately beyond the runway and has the highest potential for accidents. It measures 1,500 ft wide at the end of the runway and 2,284 ft wide at its outer edge. A Clear Zone is required for all active runways and should remain undeveloped.
- **APZ-I** - extends 5,000 ft beyond the Clear Zone, with a width of 3,000 ft. An APZ-I is typically rectangular; however, when circumstances warrant, the APZ may be curved to correspond with predominant flight tracks. An APZ-I area is provided for flight tracks that experience 5,000 or more annual operations (departures or approaches).
- **APZ-II** - extends 7,000 ft beyond APZ-I with a width of 3,000 ft. Similar to APZ-I, the geometric configuration of APZ-II may also be curved. When FCLP is an active aspect of aircraft operations at an installation, APZ-II extends the entire FCLP track beyond APZ-I resulting in a closed loop for the entire pattern.

Most land uses within the Clear Zone are incompatible with military aircraft operations. For this reason, the Navy's policy is to acquire sufficient real property interests in land within the Clear Zone to ensure that incompatible development does not occur. Within APZ-I and APZ-II, a variety of land uses are compatible; however, people-intensive uses (e.g., schools, apartments, etc.) should be restricted because of the greater risk in these areas. When events resulting in threats to operational integrity from incompatible development (encroachment) occur, and when local communities are unwilling or unable to take the initiative in combating the threat via their own authority, consideration will be given by the Navy to acquire real estate interests (DoN 2008). Outside the Clear Zone, APZ-I, and APZ-II, the risk of aircraft accidents is not significant enough to warrant special consideration in land-use planning.

In this EIS, potential changes to Clear Zones and/or APZs for NAF El Centro and NAS Lemoore are analyzed in accordance with OPNAVINST 11010.36C, which sets Clear Zone and APZ requirements for Navy airfields. The number and types of operations proposed under each action alternative determine if changes to airfield Clear Zones or APZs are required.

3.4.4 Explosive Safety

Regarding explosive safety, there are siting requirements for explosive materials storage (e.g., munitions) and handling facilities that are based on safety and security criteria established by the DoD Explosive Safety Board and managed by the Naval Ordnance Safety and Security Activity. The distance between the ordnance storage and handling facilities to inhabitable areas are determined by the type

and quantity of ordnance stored or used and are defined by Explosive Safety Quantity Distance (ESQD) arcs. Ammunition and bulk explosives are stored in magazines specifically designed, sited, and designated for this purpose. A magazine's ESQD arc is calculated by the type and amount of ordnance stored in that magazine. ESQD requirements, permissible storage capacities, and explosives safety management are established by DoD Directive 6055.9E, *Explosives Safety Management and the DoD Explosives Safety Board*, and Naval Sea Systems Command (NAVSEA) NAVSEA OP 5, *Ammunition and Explosives Safety Ashore*, and approved by the DoD Explosives Safety Board. Potential changes in explosive safety management and storage are analyzed in this EIS in accordance with the criteria in these DoD and Navy directives.

3.5 LAND USE

Land use often refers to human modification of land for residential or economic purposes. Land use categories typically include agriculture (includes livestock production), forestry, residential, commercial, industrial, transportation, utilities, mining, recreation, and communication. Land uses are frequently regulated by management plans, land use plans, comprehensive plans, and local zoning and ordinances. These plans and regulations assist in identifying where future development can occur so it is compatible with surrounding land uses and, in protecting specially designated or environmentally sensitive uses. On military installations, land use is typically divided into operation and support functions.

Land use is interrelated with other resource areas including noise, socioeconomics, biological resources, and cultural resources. The impact analysis in this EIS for land use focuses on those areas affected by proposed construction and airfield and airspace operations. This analysis relies not only on zoning designations, but also on APZs and noise zones as defined by the AICUZ Program.

The AICUZ Program was established in the early 1970s by the DoD to balance the need for aircraft operations with community concerns over aircraft noise and accident potential. The Program goals are to protect the safety, welfare, and health of those who live and work near military airfields while preserving the military flying mission. To accomplish these goals, the AICUZ Program analyzes accident potential, aircraft noise, operational procedures, and land use compatibility. The results of the AICUZ Program provide comprehensive recommendations for compatible development near installations, such as NAF El Centro and NAS Lemoore, and their associated SUA that support aircraft operations. Airfield safety footprints are identified (per AICUZ Program parameters) and are categorized into APZs. Refer to Sections 3.4, *Safety* for more information on APZs.

Noise zones are critical for the establishment of land use compatibility as residential land uses are normally not compatible at levels above 65 dB CNEL. For land-use planning purposes, three noise zones are defined:

- **Noise Zone 1 (less than 65 CNEL)** is generally considered an area of low or no noise impact.
- **Noise Zone 2 (65 to 75 CNEL)** is an area of moderate impact, where some land use controls are required.
- **Noise Zone 3 (greater than 75 CNEL**) is the most severely impacted area and requires the greatest degree of land use control.

Table E-1 (Appendix E) outlines land use compatibility based on CNEL noise zones. Additional land use requirements for compatibility may also result from state or local laws and Joint Land Use Study (JLUS) agreements.

The Navy works closely with local communities in the development of a JLUS. Whereas the AICUZ is the Navy's recommendation to the community for compatible development, the JLUS is a community document. The JLUS encourages collaborative planning and communication while encouraging compatible development near military facilities as those communities experience growth. The JLUS is produced in partnership with the DoD Office of Economic Adjustment. Both NAS Lemoore and NAF El Centro have entered into JLUS partnerships. NAS Lemoore completed its JLUS in 2011, which was adopted by Kings County. NAF El Centro's JLUS is currently in progress.

Land use analysis also considers the effects of noise on special management areas, such as National Parks, that lie directly under SUA. Refer to **Figures 2-11** and **2-17** for SUA in the vicinity of NAF El Centro and NAS Lemoore. Under the National Park Service Organic Act of 1916 (16 U.S.C. 1 *et seq.*), the National Park Service has oversight over the protection of cultural and natural resources, including natural sounds and general visitor experience. Portions of SUA including MTRs overlie National Parks.

3.6 INFRASTRUCTURE AND UTILITIES

Infrastructure refers to the system of public works, such as utilities, that provides the underlying framework for a community or installation. Infrastructure components and utilities discussed in this EIS include the water supply system, wastewater system, stormwater drainage system, electrical supply facilities, natural gas system, and solid waste management facilities. Transportation infrastructure, including roadway and street systems, the movement of vehicles, and mass transit, are discussed in Section 3.9, *Ground Traffic and Transportation*.

Because infrastructure and utilities systems are directly related to activities within the installation and the communities from which they draw their services, the potentially affected area includes the installations and the counties where they occur. The assessment of impacts is based on comparing existing use and conditions to anticipated changes in capacity associated with the utilities. The analysis compares current use with anticipated future demands to determine potential impacts. In circumstances where personnel are expected to increase, multipliers were used for each utility to assess how the increase in personnel would potentially impact the surrounding community. The multipliers are published by the US Geological Survey (USGS) and the US Department of Energy and represent the average per capita use or per household use. The analysis focuses on the change in demand in relation to the ability of providers to meet additional demands while maintaining the current level of service (LOS) for existing customers.

3.7 SOCIOECONOMICS

Socioeconomics describes the basic attributes and resources associated with the human environment, particularly population, employment, income, and housing. The affected area for socioeconomics is defined as the area where principal effects arising from F-35C homebasing are likely to occur. The

proposed action alternatives have the potential to cause socioeconomic impacts to the communities around the installations through changes or relocation of personnel and construction expenditures.

EO 12898, *Federal Actions to Address Environmental Justice in Minority and Low-Income Populations* (Environmental Justice), was issued in 1994. It stipulates that each federal agency is to make achieving environmental justice a part of its mission by identifying and addressing disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority and low-income populations. DoD's *Strategy on Environmental Justice* (DoD 1995) also established actions for addressing environmental justice in National Environmental Policy Act (NEPA) documents. A minority population is defined as either: 1) the minority population of the affected area exceeds 50 percent, or 2) the minority population percentage of the affected area is meaningfully greater than the minority population percentage in the appropriate community of comparison. Low-income populations are identified where a meaningfully greater portion of the population is living below the poverty level threshold as compared to the appropriate community of comparison (Council on Environmental Quality [CEQ] 1997). The environmental justice analysis in this EIS addresses the characteristics of race, ethnicity, and poverty status for populations residing in areas potentially affected by F-35C homebasing.

EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks* (Protection of Children) was issued in 1997 requiring federal agencies to identify and assess environmental health risks and safety risks that may disproportionately affect children. It also requires that each federal agency is to ensure that its policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks or safety risks. In this EIS, the protection of children analysis addresses the population under 18 residing in areas potentially affected by F-35C homebasing.

This socioeconomic analysis focuses on impacts due to changes in military and civilian personnel and construction expenditures. Economic impacts are defined to include direct effects, such as changes to employment, payrolls, and expenditures that affect the flow of dollars into the local economy and secondary effects, which result from the "ripple effect" of spending and re-spending in response to the direct effects.

Socioeconomic impacts, particularly impacts such as those being evaluated in this EIS, are often mixed: beneficial in terms of gains in jobs, expenditures, tax revenues, etc., and adverse in terms of growth management issues such as demands for housing and community services.

This analysis in this EIS identifies potential environmental justice issues. Impacts to environmental justice populations are identified where high and adverse human health or environmental effects may disproportionately affect minority or low-income populations. Impacts to children would occur if there was an increased disproportionate environmental, health, or safety risk to children (USEPA 2012).

3.8 COMMUNITY SERVICES

Community services include schools and childcare, police protection, fire protection, health services, parks and recreational services, and religious services. The potentially affected area includes the cities, towns, and counties where the installations are located and where personnel associated with the proposed action would live and work.

Police protection includes a discussion on the Navy Security Program, which is designed to safeguard personnel, property, facilities, and materiel and to enforce laws, rules, and regulations on Navy installations, activities, and operational commands. The continuing incidents of worldwide terrorism, criminal activities, and other unlawful acts necessitate highly trained security forces to meet emergent security requirements in a timely and effective manner. Naval Security Forces include Navy units and formations trained and equipped to conduct security operations in accordance with specified mission requirements, and include Physical Security and Law Enforcement components.

The analysis in this EIS focuses on the existing conditions of community services at the installations and within the adjacent communities in terms of capacity and availability. The anticipated demand for community services is described in relation to proposed increases or decreases in personnel and dependents. Lastly, the analysis describes ability of community services to accommodate anticipated changes in the demand for those services resulting from the proposed action.

3.9 GROUND TRAFFIC AND TRANSPORTATION

Ground traffic and transportation refers to vehicle movement throughout a road and highway network. The study area for ground traffic and transportation includes the road and highway networks that surround and support NAF El Centro and NAS Lemoore. The American Association of Highway and Transportation Officials classify roadways as principal arterials, minor arterial streets, collector streets, and local streets. Principal arterials (i.e., arterial highways and interstates) serve to move traffic regionally and between population and activity centers with a minimal level of access to adjacent properties. Collector roadways (i.e., minor arterial and collector streets) serve to move traffic from population and activity centers and funnel them onto principal arterials with a moderate level of access to adjacent properties. Local roadways provide access to adjacent properties and move traffic onto collector and arterial roadways.

Average daily traffic (ADT) and design capacity of the roadway represent two parameters to measure traffic (Transportation Research Board 2010). Using these two measures of traffic, each roadway segment receives a corresponding LOS. The LOS designation is a professional industry standard used to describe the operating conditions of a roadway segment or intersection. The LOS is defined on a scale of A to F that describes the range of operating conditions on a particular type of roadway facility. LOS A through LOS B indicates free flow travel. LOS C indicates stable traffic flow. LOS D indicates the beginning of traffic congestion. LOS E indicates the nearing of traffic breakdown conditions. LOS F indicates stop-and-go traffic conditions and represents unacceptable congestion and delay.

Impacts to ground traffic and transportation are analyzed in this EIS by considering the possible changes to existing traffic conditions and the capacity of area roadways from proposed increases in commuter and construction traffic.

3.10 BIOLOGICAL RESOURCES

Biological resources include living, native, or naturalized plant and animal species and the habitats where they occur. Plant associations are referred to as vegetation and animal species are referred to as wildlife. Habitat can be defined as the resources and conditions present in an area that supports the

existence of a plant or animal (Hall et al. 1997). Although the existence and preservation of biological resources are intrinsically valuable, these resources also provide aesthetic, recreational, and socioeconomic values to society. This analysis focuses on species or vegetation types that are important to the function of the ecosystem, of special societal importance, or are protected under federal or state law or statute.

For purposes of this EIS, these resources are divided into three major categories: vegetation, wildlife, and special-status species.

- **Vegetation –** includes terrestrial plant communities and the analysis will focus on vegetation types that are important to the function of the ecosystem or are protected under federal or state law.
- **Wildlife –** includes all vertebrate animals (i.e., mammals, reptiles, amphibians, birds, and fish) and sometimes invertebrate species or species groups such as mollusks or insects. Virtually all birds are protected under the Migratory Bird Treaty Act (MBTA). The MBTA was designed to protect migratory birds (including their eggs, nests, and feathers) and their habitats. For military readiness activities, DoD installations are exempt from incidental taking of migratory birds, pursuant to a final 2007 rulemaking in accordance with Section 315 of the National Defense Authorization Act for Fiscal Year (FY) 2003 (Public Law 107-314, 116 Stat. 2458). Congress defined military readiness activities as all training and operations of the US Armed Forces that relate to combat and the adequate and realistic testing of military equipment, vehicles, weapons, and sensors for proper operation and suitability for combat use. However, if any of the Armed Forces determine that a proposed or an ongoing military readiness activity may result in a significant adverse effect on a population of a migratory bird species, then they must confer and cooperate with the US Fish and Wildlife Service (USFWS) to develop appropriate and reasonable conservation measures to minimize or mitigate identified significant adverse effects. An activity has a significant adverse effect if, over a reasonable period of time, it diminishes the capacity of a population of a migratory bird species to maintain genetic diversity, to reproduce, and to function effectively in its native ecosystem.
- **Special-status species –** include plant and animal species that are listed or proposed for listing by the USFWS under the Endangered Species Act (ESA). The federal ESA provides for the conservation of threatened and endangered species of plants and animals and the habitats where they are found. In addition, designated and proposed critical habitat for ESA-listed species will also be included in this EIS, as appropriate. This section will also address species that are listed by the State of California as threatened or endangered.

3.11 TOPOGRAPHY AND SOILS

Topography describes the physical surface of the land and includes elevation, slope and other general surface features. Geologic factors influence soil stability, bedrock depth, and seismic properties. Soil is the unconsolidated material above bedrock. Soil is formed from the weathering of bedrock and other parent materials. The potentially affected environment for this resource is limited to lands that would be disturbed by proposed facility development.

The Farmland Protection Policy Act (FPPA), (7 U.S.C. 4201, *et seq.*), was introduced to conserve farmland soil and discourage the conversion of prime farmland soil to a non-agricultural use. The FPPA considers prime farmland soils as those that have the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops, and are also available for these uses. It has the soil quality, growing season, and moisture supply needed to economically produce sustained high yields of crops when treated and managed. Soils of statewide importance are those soils that are nearly prime farmland and that economically produce high yields of crops when treated and managed according to acceptable farming methods. The FPPA is based on the protection of prime farmland soils and not on whether the area is in agricultural use.

Topography and soils are analyzed in this EIS in terms of drainage, erosion, prime farmland, and seismic activity. The analysis of topography and soils focuses on the area of soils that would be disturbed, the potential for erosion of soils from construction areas, and the potential for eroded soils to become pollutants in downstream surface water during storm events. The analysis also examines potential impacts related to seismic events. Best Management Practices (BMPs) are identified to minimize soil impacts and prevent or control pollutant releases into stormwater.

3.12 WATER RESOURCES

Water resources include surface water, groundwater, water quality, wetlands, and floodplains. Potentially affected areas are limited to lands disturbed by facility development and potentially affected by aircraft operations and maintenance activities.

Waters of the United States are protected by the Clean Water Act (CWA) of 1972. The CWA defines waters as surface waters, rivers, lakes, estuaries, coastal waters, and wetlands. As part of CWA requirements, surface waters are required to be classified according to designated uses. Section 303 of the CWA addresses impaired waters or waters that cannot meet their intended uses or state-designated functions.

Groundwater is typically found in aquifers with high porosity soil where water can be stored between soil particles and within soil pore spaces. Groundwater is used for water consumption, agricultural irrigation, and industrial applications. Groundwater properties are often described in terms of depth to aquifer, aquifer or well capacity, water quality, and surrounding geologic composition. The principal federal regulation concerning the protection of groundwater is the Safe Drinking Water Act of 1974. This act was set forth to protect the nation's public water supplies, including groundwater in areas where it is the main potable water source. In this EIS, the analysis of groundwater focuses on the potential for impacts to the quality, quantity, and accessibility of the water.

Water quality refers to the suitability of water for a particular use (i.e., potable water, irrigation) based on selected physical, chemical, and biological characteristics. For the purposes of this EIS, water quality is considered in light of the statutory requirements that regulate water quality conditions. The Federal Water Pollution Control Act, as amended by the CWA, is intended to restore and maintain the chemical, physical, and biological integrity of the nation's waters. The CWA prohibits spills, leaks, or other discharges of oil or hazardous substances into the waters of the United States in quantities that may be harmful. The Act, as amended in 1987, requires each state to establish water quality standards for its

surface waters based on the amount of pollutants that a body of water can assimilate without deterioration of a designated use. Direct discharges of effluents are regulated under numerical limitations contained in National Pollutant Discharge Elimination System (NPDES) permits issued by the USEPA or under state NPDES programs approved by the USEPA. In this EIS, the analysis of water quality considers the potential for impacts that may change the water quality, including both improvements and degradation of current water quality.

Wetlands are transitional zones between the terrestrial and aquatic environments, which include jurisdictional and non-jurisdictional wetlands. Jurisdictional wetlands are those that meet the three criteria (hydrology, hydric soils, and hydrophytic vegetation [i.e., plants occurring in saturated soils]) defined in the US Army Corps of Engineers 1987 Wetland Delineation Manual. Wetlands are generally associated with drainages, stream channels, and water discharge areas (natural and man-made). Wetlands serve as a valuable resource for groundwater recharge and are regulated by the US Army Corps of Engineers under Section 404 of the CWA. In this EIS, the analysis of wetlands considers the potential for impacts that may change the local hydrology, soils, or vegetation that support a wetland.

EO 11988, *Floodplain Management*, defines floodplains as the lowland and relatively flat areas adjoining inland waters, including at a minimum, that area subject to a 1 percent or greater chance of flooding in any given year. The area subject to a 1 percent chance of flooding is referred to as the 100-year floodplain. EO 11988 directs federal agencies to avoid construction in floodplains and establishes a process for analysis and public notice if development is unavoidable. In this EIS, the analysis of floodplains considers if any new construction is proposed within a floodplain or may impede the functions of floodplains in conveying floodwaters.

3.13 CULTURAL AND TRADITIONAL RESOURCES

Cultural resources are defined as prehistoric or historic sites, buildings, structures, objects, archaeological sites, districts, or other physical evidence of human activity that are considered important to a culture or community for scientific, traditional, or religious reasons. Cultural resources include prehistoric and historic archaeological resources, architectural resources, and traditional cultural properties (TCPs).

- **Archaeological resources** –places where people changed the ground surface or left artifacts or other physical remains (e.g., arrowheads or bottles).
- **Architectural resources –** are standing buildings, dams, canals, bridges, and other structures.
- **Traditional cultural properties –** are resources associated with the cultural practices and beliefs of a living community that link that community to its past and help maintain its cultural identity. TCPs may include archaeological resources, locations of historic events, sacred areas, sources of raw materials for making tools, sacred objects, or traditional hunting and gathering areas.

Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended, and as implemented by 36 C.F.R. 800, requires federal agencies to consider the effects of their actions on historic properties before undertaking a project that uses federal funds or is located on federal lands. A historic property is defined as any cultural resource that is included in, or eligible for inclusion in, the National Register of Historic Places (NRHP). The NRHP, administered by the National Park Service, is the official inventory of

cultural resources that are significant in American history, prehistory, architecture, archaeology, engineering, and culture. The NRHP also includes National Historic Landmarks. In consideration of 36 C.F.R. 800, federal agencies are required to consult with the State Historic Preservation Office (SHPO), Indian Tribes, representatives of local governments, and the public in a manner appropriate to the agency planning process for the planned actions (undertakings), and to the nature of the undertaking, and to its potential to cause effects on historic properties. The methodology for identifying, evaluating, and mitigating impacts to cultural resources has been established through federal laws and regulations including the NHPA, the Archaeological Resource Protection Act, the Native American Graves Protection and Repatriation Act, and the American Indian Religious Freedom Act.

The affected environment for cultural and traditional resources is also referred to as the area of potential effects (APE). The APE must be defined in order to assess the effects of a proposed action on a historic property. An APE is defined as the geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of historic properties, if any such properties exist (36 C.F.R. 800.16[d]).

The analysis in this EIS applies the criteria of adverse effect (36 CFR 800.5) to evaluate the effects of the proposed action on any historic properties located in the APE of each action alternative. A project affects a historic property when it alters the property's characteristics (including relevant features of its environment or use) that qualify it as significant according to National Register criteria. Adverse effects may include the following: physical destruction, damage, or alteration of all or part of the resource; alteration of the character of the surrounding environment that contributes to the resource's qualifications for the National Register; introduction of visual, audible, or atmospheric elements that are out of character with the resource or alter its setting; and neglect of the resource resulting in its deterioration or destruction. Impacts to traditional Native American tribal properties can be determined only through consultation with the affected Tribes. However, ground disturbance to prehistoric archaeological sites and graves has often been cited as an adverse impact.

Analysis of potential impacts to historic properties (i.e., a cultural resource that is listed on, or eligible for listing on the NRHP) considers both direct and indirect impacts. Direct impacts may be the result of physically altering, damaging, or destroying all or part of a historic property, or neglecting the property to the extent that it deteriorates or is destroyed. Indirect impacts are those that may occur as a result of the completed project by altering characteristics of the surrounding environment through the introduction of visual or audible elements that are out of character for the period the property represents. An example of an indirect effect is increased vehicular or pedestrian traffic in the vicinity of the property.

3.14 HAZARDOUS MATERIALS AND WASTE

The analysis of hazardous materials, hazardous waste, toxic substances, and contaminated sites focuses on the potential for these substances to be introduced into the environment from aircraft operations and maintenance, or during construction/demolition activities. Potentially affected areas consist of the airfields and aircraft support and maintenance facilities. Factors considered in the analysis include the potential for increased human health risk or environmental exposure, as well as changes in the quantity

and types of hazardous substances transported, stored, used, and disposed. The methodology for contaminated sites compares the proximity of proposed facility development to contaminated sites and considers the operational uses of the facilities to determine potential impacts to or from the sites.

3.14.1 Hazardous Materials

Hazardous materials are chemical substances that pose a substantial hazard to human health or the environment when improperly treated, handled, used, packaged, stored, transported or disposed. This includes ignitable, corrosive, reactive or toxic materials (Federal Standard 313D; OPNAVINST 5100.23G, *Navy Safety and Occupational Health and Program Manual*; and 22 California Code of Regulations [CCR] 66260.10). Hazardous materials are identified and regulated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (42 U.S.C. 9601 *et seq*.); the Occupational Safety and Health Act (29 U.S.C. 651 *et seq*.); and the Emergency Planning and Community Right-to-Know Act (42 U.S.C. 11001 *et seq*.). Hazardous materials commonly used at installations include solvents, antifreeze, petroleum, oil, and lubricants.

3.14.2 Hazardous Waste

The Resource Conservation and Recovery Act (RCRA) (40 C.F.R. 240-280) and the Hazardous and Solid Waste Amendments of 1984 (40 C.F.R. 260) define hazardous waste as a solid waste, or combination of wastes that 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 may 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 under 40 C.F.R. 261.4(b) and if it exhibits identified characteristics of hazardous waste or meets other specified criteria (see 40 C.F.R. 261.3(a)), (DoN 2010). Hazardous wastes commonly generated at installations include: hazardous materials with an expired shelf life, paint and paint-contaminated media, and fluid from change out processes, such as oil.

3.14.3 Toxic Substances

The Toxic Substance Control Act (TSCA) addresses those chemical substances and mixtures that may present unreasonable risk of personal injury or health of the environment from their manufacturing, processing, distribution, use, or disposal. The TSCA Chemical Substances Inventory lists information on more than 62,000 chemicals and substances. Toxic substances evaluated in this EIS include asbestos, lead-based paint, and polychlorinated biphenyls (PCBs).

Asbestos is a common constituent of building materials manufactured prior to 1978 when a federal ban on its use in building materials became effective. Asbestos-containing materials are any material containing more than 1 percent asbestos. Asbestos-containing materials may be contained in plaster, acoustic ceiling tiles, wallboard, and floor tiles/carpeting mastic and asbestos particles may be present in building ductwork. Asbestos-containing materials have been classified as a HAP by the USEPA, in accordance with Section 112 of the CAA (40 C.F.R. 61). Asbestos-containing materials may be present in buildings or other facilities that would be modified or demolished as part of the proposed action.

Surveys would be conducted for asbestos-containing materials, as required by 40 C.F.R. 61.145, during the design phase of the project and prior to demolition of structures. Asbestos wastes would be handled and disposed of in accordance with the federal TSCA (40 C.F.R. 763).

Lead-based paint may also be present in buildings or other facilities that would be demolished as part of the proposed action. Lead is a common constituent of paint manufactured prior to 1980 when a federal ban on lead paint became fully effective. Lead-based paint would be characterized, managed, transported, and disposed of according to applicable state and federal requirements for protecting human health and safety and the environment. Applicable state regulations would require that surveys be conducted for lead-based paint in accordance with 8 CCR 1532.1 and 17 CCR 35022 and 35038, pertaining to lead-based paint at construction sites and in the work place. In addition, the analysis of lead-based paint in on-site structures would be done in accordance with the TSCA (15 U.S.C. 2601 *et seq*.). Included in these regulations are requirements for facility surveys, notification of intent to disturb lead-based paint, control measures, removal measures, and handling and disposal techniques. Proposed building demolition activities that include the removal and/or handling of lead-based paint would comply with these regulations. Lead-based paint sampling would be conducted on the structures to be removed and analyzed in accordance with USEPA-approved Toxicity Characteristic Leaching Procedure methodology. Based on this federal testing methodology, the paint would be considered hazardous if lead is detected at concentrations greater than 5 milligrams per liter (mg/l). If lead-based paint were detected at hazardous concentrations, these materials would be removed.

PCBs are common constituents of oils used as dielectric fluids or coolants in electrical equipment manufactured prior to 1979 when a federal ban of the manufacture of PCBs became effective. Although banning their manufacture, the USEPA allowed equipment containing PCBs to remain in use for the remainder of their useful lives. Therefore, PCB-containing electrical equipment (e.g., transformers, capacitors, compressors, etc.) may be present in buildings or other facilities that would be demolished as part of the proposed action. PCBs may also be in the capacitors of fluorescent light ballasts, especially any manufactured prior to 1979. Older waste and hydraulic oils may also contain PCBs. Any buildings or portions thereof constructed prior to 1979 would receive a full PCB survey prior to demolition. PCB-containing materials would be handled and disposed of in accordance with all applicable federal, state and local regulations.

3.14.4 Contaminated Sites

3.14.4.1 Environmental Restoration Program

Potential hazardous waste contamination areas are investigated as part of the Defense Environmental Restoration Program. As part of this program, DoD created the Environmental Restoration Program and the Military Munitions Response Program (MMRP). These programs were instituted to satisfy the requirements of CERCLA and RCRA for former and current hazardous waste sites. CERCLA was enacted into law in 1980, and its follow-up amendment, Superfund Amendments and Reauthorization Act (SARA), was passed in 1986. These two laws establish a series of programs for the cleanup of hazardous waste disposal and spill sites nationwide, including inactive and abandoned hazardous waste sites. Public involvement opportunities are available at various milestones in the CERCLA process (DoN 2006).

3.14.4.2 Military Munitions Response Program

The MMRP addresses response actions at munitions response sites where munitions and explosives of concern and munitions constituents are present in the environment. A munitions response site is defined as a discrete location within a munitions response area that is known to require a munitions response (Interstate Technology & Regulatory Council Unexploded Ordnance Team 2003). Munitions and explosives of concern are defined as unexploded ordnance, discarded military munitions, and munitions constituents present in high enough concentrations to pose an explosive hazard. Munitions constituents in lower concentrations insufficient to pose an explosive hazard are not considered munitions and explosives of concern. The stages of the MMRP include preliminary assessment; site inspection; if appropriate, an on-site reconnaissance; remedial investigation; and preliminary hazard assessment; which are followed by remedial or removal actions. Remedial actions often take the form of a combination of physical removal of munitions and land use controls (DoN 2006).

3.15 CUMULATIVE IMPACTS ANALYSIS

This section defines cumulative impacts and describes the approach taken in the analysis of cumulative impacts. Chapter 6, *Cumulative Impacts for Alternative 1 – NAF El Centro Homebasing*, and Chapter 7, *Cumulative Impacts for Alternative 2 – NAS Lemoore Homebasing*, contain descriptions of other actions relevant to cumulative impacts, an analysis of the incremental interaction the proposed action may have with other actions, and an evaluation of the cumulative impacts potentially resulting from these interactions.

The approach taken in the analysis of cumulative impacts follows the objectives of NEPA, Council on Environmental Quality (CEQ) regulations, and CEQ guidance. Cumulative impacts are defined in 40 C.F.R 1508.7 as:

> "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or Non-Federal) or person undertakes such other actions."

Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. A cumulative impact results from the additive effect of all projects in the same geographical area. Generally, an impact can be considered cumulative if: a) effects of several actions occur in the same locale, b) effects on a particular resource are the same in nature, and c) effects are long term in nature. The common factor key to cumulative assessment is identifying any potential temporally and/or spatially overlapping or successive effects that may significantly affect resources in the analysis areas.

3.16 ASSESSING SIGNIFICANCE

Chapters 4 and 5 present the affected environment and analysis of the potential direct and indirect effects of each alternative for each resource area described in this chapter. Chapters 6 and 7 present the analysis of the potential cumulative effects of each alternative for each resource area. The level of significance is assessed according to NEPA implementing regulations at 40 C.F.R. 1508.27, which requires considerations of both context and intensity.

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4. ALTERNATIVE 1 – NAF EL CENTRO HOMEBASING

Chapter 4 provides a description of the affected environment at Naval Air Facility (NAF) El Centro for the 14 resources potentially affected by Alternative 1. Additionally, the potential impacts at both NAF El Centro and Naval Air Station (NAS) Lemoore associated with implementation of Alternative 1 are analyzed in this chapter. While no mitigation measures are proposed under Alternative 1, several minimization measures and Best Management Practices (BMPs) are described for the resource sections.

4.1 AIRFIELDS AND AIRSPACE

4.1.1 Affected Environment

The affected environment for airfields and airspace includes the NAF El Centro airfield and Special Use Airspace (SUA) in the vicinity of NAF El Centro. This section addresses airfield operations and SUA.

4.1.1.1 Airfield Operations

The two runways at the NAF El Centro airfield are designated 08/26 and 12/30. Runway 08/26 is the primary runway at 9,503 feet (ft) long by 200 ft wide in an east-west orientation. Runway 12/30 crosses the primary runway at approximately a 40 degree angle and is 6,824 ft long by 200 ft wide in a southeast to northwest orientation. A helicopter landing/takeoff area is located southwest from midfield from Runway 12/30 (NAF El Centro 2010).

The airfield at NAF El Centro is designated as a Class II Control Tower Facility with no radar capability. Normal operating hours at the NAF El Centro airfield are: 7:00 a.m. to 11:00 p.m. local time Monday through Thursday, 7:00 a.m. to 6:00 p.m. on Friday, and 7:00 a.m. to 3:00 p.m. on Saturday; the NAF El Centro airfield is closed on Sunday (NAF El Centro 2010). An airfield's hours may be temporarily modified for a variety of reasons: budget, staffing, and Fleet training requirements. The published airfield hours should be considered the "normal" use under current conditions, with the understanding that these hours can be temporarily adjusted based on requirements.

The NAF El Centro airfield is surrounded by Class D airspace that overlies a 4.9-mile radius of the airfield and extends from the ground surface to 2,500 ft above mean sea level (MSL). NAF El Centro's Class D airspace terminates at Forrester Road because the Imperial County Airport is located 4.5 miles east of the installation (NAF El Centro 2010).

Historical aircraft operations at NAF El Centro have been dynamic and have fluctuated over the decades. The annual baseline number of operations at the NAF El Centro airfield used for analysis in this Environmental Impact Statement (EIS) is approximately 65,800, (refer to **Tables 2.7-5 and 4.2-1**), which was derived from the NAF El Centro Update to the Military Aviation Simulation Model (NASMOD) (Department of the Navy [DoN] 2012). The aircraft reflected in the baseline number of operations at NAF El Centro are transient. Transient military flight operations by fixed-wing aircraft using NAF El Centro include FA-18C, FA-18E/F, T-45, EA-6B, C-130, MV-22, and AV-8B. Transient rotary-wing aircraft that utilize NAF El Centro include the CH-46, AH-1, H-60, and UH-1. Unmanned aerial systems operations are also conducted at NAF El Centro. In addition to departures and arrivals from the airfield, pilots

perform closed pattern work including touch-and-go and Field Carrier Landing Practice (FCLP) to ensure proficiency in these areas (NAF El Centro 2010).

From January through mid-March each year, the Blue Angels practice flight demonstration performance two days per week within the airfield and airspace at NAF El Centro. Two practice sessions occur per day, each of which consists of approximately 88 low passes and numerous aerobatic aircraft maneuvers. A pass is defined as one aircraft flying on one flight track.

4.1.1.2 Special Use Airspace and Military Training Routes

Proposed F-35C operations within SUA in the vicinity of NAF El Centro would be similar to current FA-18 operations. F-35C operations would occur in: Restricted Area (R-) R-2301 West (Barry M. Goldwater Range West); R-2306/ R-2308 and R-2507 (Yuma Range Complex); R-2510 and R-2512 (El Centro Range Complex); Kane/Abel Military Operations Areas (MOAs); and numerous Military Training Routes (MTRs) (**see Figure 2-11**). F-35C operations in W-291 would be part of exercises and are not associated with the proposed homebasing action. These training operations in Warning Area (W-) W-291 are addressed in other National Environmental Policy Act (NEPA) documents including the Navy's At-Sea Phase II Environmental Compliance Program (see Appendix B, *Training Operations*).

<u>R-2301 West (Barry M. Goldwater Range West)</u>

R-2301 is a Restricted Area under the control of the Commanding Officer, MCAS Yuma, Arizona that occupies a trapezoidal-shaped area in Yuma County in the southwestern corner of Arizona (**Figure 2-11**). Altitudes are listed in **Table 4.1-1**. Military pilot training is the primary mission of the Barry M. Goldwater Range West. Training activities for both fixed-wing and rotary-wing aircraft conducted within R-2301 West include a full range of air-to-air and air-to-ground tactics, night vision goggle training, low-altitude training, and terrain-following exercises.

Table 4.1-1. Altitudes of Special Use Airspace in the Vicinity of NAF El Centro Proposed for Use by F-35C

SUA	*Floor*	*Ceiling*
Barry M. Goldwater Range Complex		
R-2301 West	Surface	80,000 ft MSL
Yuma Range Complex		
R-2306A/B	Surface	80,000 ft MSL
R-2306C	Surface	40,000 ft MSL
R-2308A	1,500 ft above ground level (AGL)	80,000 ft MSL
R-2308B	Surface	80,000 ft MSL
R-2507	Surface	40,000 ft MSL
El Centro Range Complex		
R-2510A	Surface	15,000 ft MSL
R-2510B	15,000 ft MSL	40,000 ft MSL
R-2512	Surface	23,000 ft MSL
Kane/Abel MOA		
Abel North, South, and Bravo MOAs	7,000 ft MSL	17,999 ft MSL
Abel East MOA	5,000 ft MSL	12,999 ft MSL
Kane MOA	10,000 ft MSL	17,999 ft MSL

R-2306/2308 (Yuma Range Complex)

R-2306 and R-2308 are Restricted Areas under control of the Army's Yuma Proving Ground. The Yuma Range Complex supports a diverse mix of testing, evaluation, and training activities. When it is not in use by the Army, restricted airspace is activated when required for mission purposes. SUA within the Yuma Range Complex proposed for use by F-35C includes R-2306A/B/C and R-2808A/B, with altitudes defined in **Table 4.1-1**.

R-2510 and R-2512 (El Centro Range Complex)

R-2510 and R-2512 are Restricted Areas in the El Centro Range Complex, which is located in the Imperial Valley near the Salton Sea and the City of El Centro. Military pilot training is the primary objective of airspace operations within R-2510 and R-2512. These restricted areas are located near R-2507 and are coincident with the Kane/Abel MOAs (see **Figure 2-11**). R-2512 is used for bombing exercises and air-to-ground missile and gunnery training (DoN 2006). Altitude profiles for R-2510 and R-2512 are presented in **Table 4.1-1**.

Typical training operations within R-2510 and R-2512 include aircraft familiarization, air-to-air refueling, tactical air control, bombing, rocket/small arms firing, air combat maneuvering, air intercept, survey flights, parachute drops, tactics, search and rescue flights, and air defense exercises. For training operations requiring larger SUA such as air intercepts, R-2510 and R-2512 are used in conjunction with some or all of the adjacent SUA to accommodate these exercises.

R-2507 and Kane/Abel MOAs

R-2507 is a Restricted Area and Kane and Able are Military Operations Areas under the control of the Commanding Officer, MCAS Yuma, Arizona. R-2507, along with R-2301 West, is the "backyard" range of the 3rd Marine Aircraft Wing. The range is used extensively by USMC aircraft operating from MCAS Miramar, MCAS Yuma, and MCAS Camp Pendleton. Additionally, the range is the primary range of Marine Aviation Weapons and Tactics Squadron One and is the primary training venue for the twice annual Weapons and Tactics Instructor Course. The primary function of R-2507 is military pilot training for air-to-air missions and the delivery of air-to-ground ordnance. Rotary-wing aircraft can use this area for familiarization profiles (day and night); formations (day and night); nuclear, biological and chemical equipment training (day and night); tactics; confined area landings; combined arms exercises; night vision goggle training; and terrain-following exercises. Fixed-wing aircraft use this area for a full range of training operations using simulated, inert, and live ordnance. The Kane MOA lies west of R-2507 and near the Salton Sea in California, while the Abel MOA surrounds R-2507. Altitude profiles for R-2507 and Kane and Abel MOAs are presented in **Table 4.1-1**.

Civil Aviation

The eastern edge of NAF El Centro's Class D airspace terminates near the Imperial County Airport (**Figures 4.1-1 and 4.1-2**). Airfield operations at NAF El Centro are restricted because of the airfield's proximity to this airport. Aircraft approaching westward to Runway 26 must hold an altitude at or above 2,500 ft when flying over Imperial County Airport before descending to the established 1,500 or 800 ft break altitude approach patterns west of Forrester Road. Aircraft transition from 2,500 ft over Imperial

County Airport to 1,500 ft (800 ft for simulated carrier break) in preparation for a transition to the 1,000 ft (600 ft for simulated carrier break) pattern on downwind. Aircraft approaching Runway 26 from the southeast must follow a similar high-to-low altitude break at Forrester Road (NAF El Centro 2010).

Due to its location next to the international border, few federal airways traverse the airspace near Barry M. Goldwater Range SUA. One high altitude jet route, J2-18, provides service from Phoenix and the east to the Los Angeles and San Diego areas, and Victor Route (V) 66-458 is a low altitude east-west route that mirrors the high altitude J2-18. Visual Flight Rules (VFR) traffic would generally follow these routes also, because the restricted airspace of Barry M. Goldwater Range West and East, as well as the Mexican border, funnel aircraft into those areas.

4.1.2 Environmental Consequences for Alternative 1

Under Alternative 1, potential impacts to airfields and airspace could occur from proposed F-35C aircraft operations. Potential impacts from homebasing at NAF El Centro are discussed in the next two sections in terms of effects at NAF El Centro and effects at NAS Lemoore.

4.1.2.1 Alternative 1 – NAF El Centro Homebasing, Effects at NAF El Centro

Airfield Operations

Under Alternative 1, a new 9,500-ft runway would be constructed parallel to the primary runway. The western portion of the primary runway would be extended to improve aircraft taxi flow and increase air traffic capacity (see **Figure 2-5)**.

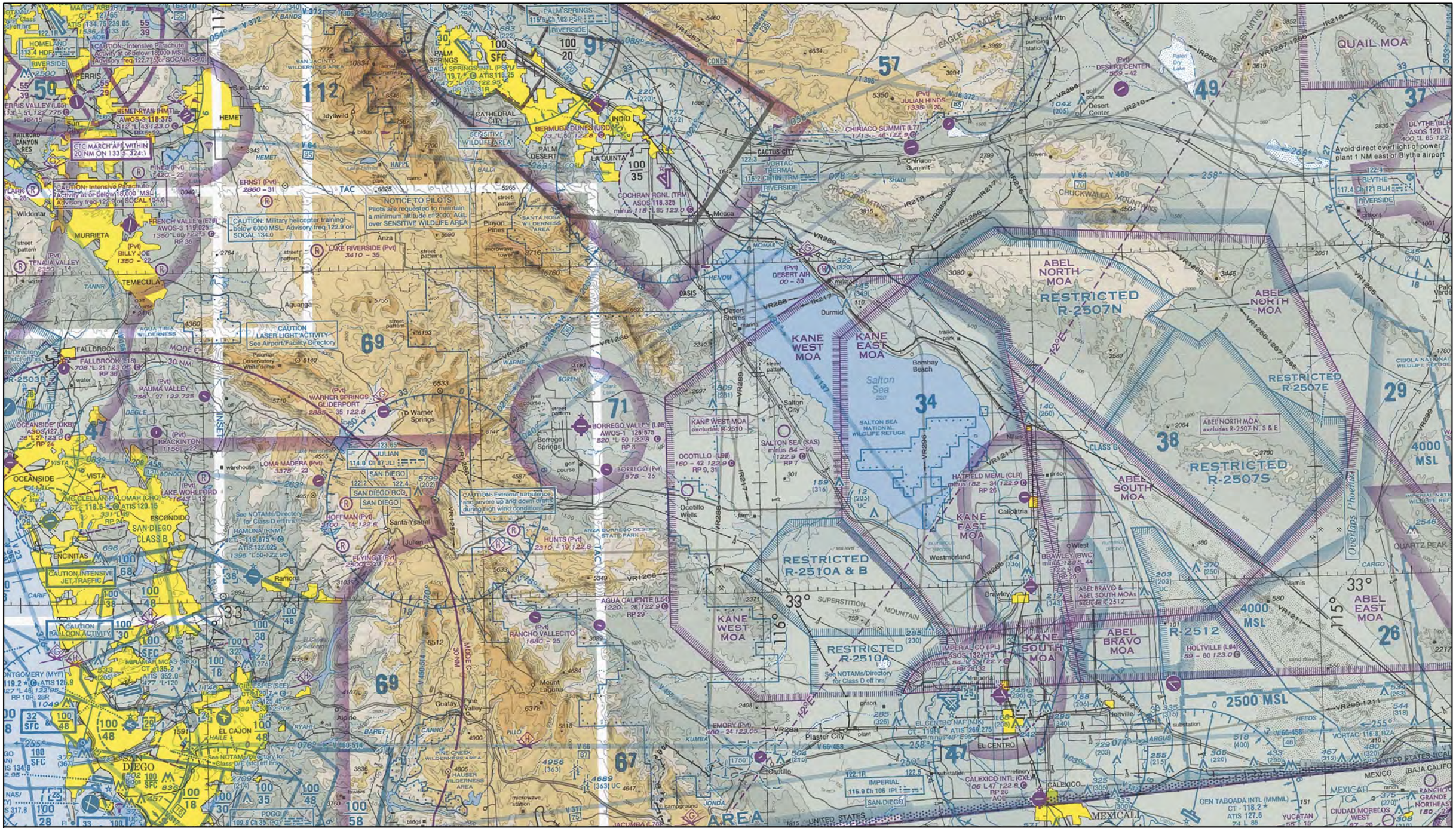
Homebasing the F-35C would result in an increase of 99,400 aircraft operations at the NAF El Centro airfield. This increase represents a change from the baseline of 65,800 operations in 2015 to a proposed 165,200 operations in 2028 (**Table 4.1-2**).

Table 4.1-2. Changes in Annual Airfield Operations at NAF El Centro under Alternative 1

Aircraft	*Number of Operations*[1]		*Change*
	Baseline (2015)	*Proposed (2028)*	
F-35C Fleet Squadrons	0	23,900	+23,900
F-35C Fleet Replacement Squadron (FRS)	0	74,300	+74,300
Detachment/Transient[2]	65,800	67,000	+1,200
Total	**65,800**	**165,200**	**+99,400**

Source: DoN 2012.
Notes: 1. Number of operations rounded to the nearest hundred.
2. Detachment/Transient aircraft include FA-18, AV-8B, EA-6B, T-45, and a variety of helicopters.

The F-35C would operate in an airfield environment similar to the current operational environment and would generally follow established local approach and departure patterns for the existing runway. However, there would be changes in approach and departure patterns for the new runway and extended primary runway. No changes would be required to the Controlled Airspace around NAF El Centro. Procedures established to manage and control air traffic in the area would be modified to include operations at the new runway.



Airports

Hard-surfaced runways 1,500 ft. to 8,069 ft. in length

Hard-surfaced runways greater than 8,069 ft. or some multiple runways less than 8,069 ft.

Additional Airport Information

Private "(Pvt)"- non-public use having emergency or landmark value

Military - Other than hard-surfaced; all military airports are identified by abbrevations AFB, NAS, AAF, etc.

Airport Traffic Service and Airspace Information

Class D Airspace

Ceiling of Class D Airspace in hundreds of feet (A minus ceiling value indicated surface up to but not uncluding that value.)

Class E (surface) Airspace

Class E Airspace with floor 700 ft. above surface

Class E Airspace with floor 1,200 ft. or greater above surface that abuts Class G Airspace

Prohibited, Restricted,and Warning Areas

Alert Area and MOA (Military Operations Area)

IR211 MTR-Military Training Route

Class E Airspace low altitude Federal Airways are indicated by center line

Intersection- Arrows are directed towards facilities with established intersections

Total mileage between NAVAIDs on direct Airways

N

0 3 6

Miles

Source: FAA 2012b

Figure 4.1-1 NAF El Centro Vicinity Aeronautical Chart (Western)

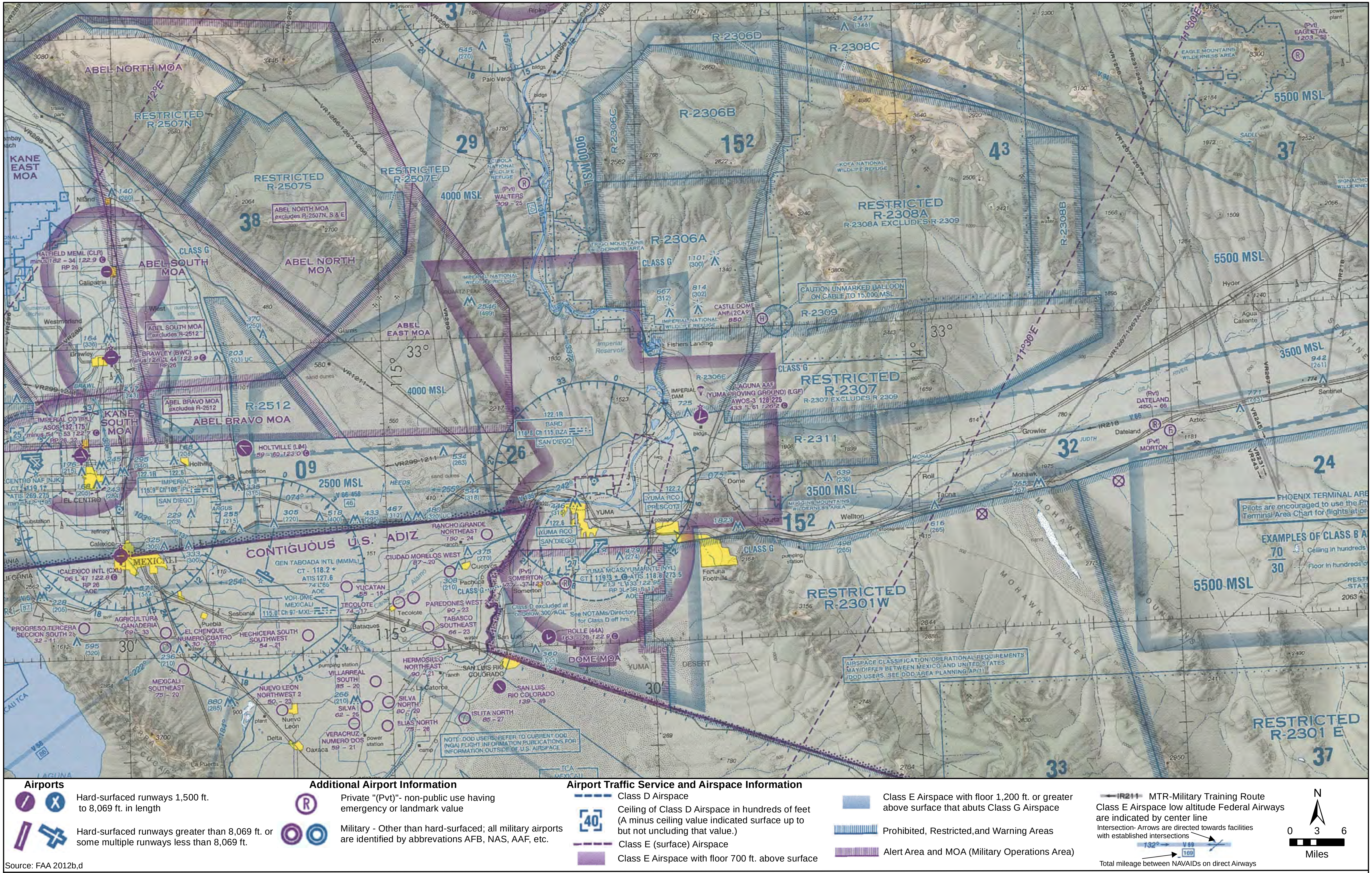


Figure 4.1-2 NAF El Centro Vicinity Aeronautical Chart (Eastern)

Although there would be an increase in the number of annual operations, a new runway would be constructed, and the existing runway extended, implementation of Alternative 1 would not result in adverse impacts to airfield operations at NAF El Centro.

Special Use Airspace and Military Training Routes

Homebasing at NAF El Centro would represent a significant increase in training airspace requirements in the Southern California/Arizona area where competition for training range time amongst the Services is high. This strain on capacity for high demand ranges, such as R-2507, along with the minimal utility of certain overland training ranges to support F-35C training flights (i.e., R-2510 and R-2512) forces more than 80 percent of Navy F-35C training operations to the overwater training ranges (i.e., W-291 and the Shore Bombardment Area in the Southern California Offshore Complex).

Under Alternative 1, homebasing the F-35C would potentially result in approximately 6,229 F-35C aircraft operations in SUA in the vicinity of NAF El Centro. These would be offset by the elimination of roughly 4,020 Navy FA-18 operations. As a result, there would be a net increase of around 2,209 Navy operations in SUA in the vicinity of NAF El Centro (**Table 4.1-3**). Overall, this increase represents a change from the baseline of 6,236 Navy operations in 2015 to 8,445 operations for the end state in 2028. This increase in aircraft operations may result in an increase in the demand for air traffic services.

Table 4.1-3. Changes in Annual Operations in Special Use Airspace under Alternative 1

SUA	*Number of Operations*[1,2]				
	Navy Baseline (2015)	*Proposed Navy F-35C*	*Navy Legacy FA-18 Eliminated*	*Proposed End State (2028)*	*Change*
R-2301 West	1,600	960	-804	1,756	+156
R-2306/R-2308	0	1,080	0	1,080	+1,080
R-2507/Abel/Kane MOAs	2,820	2,879	-2,134	3,565	+745
R-2512	1,264	388	-360	1,292	+28
R-2510	552	922	-722	752	+200
Subtotal in Local SUA	**6,236**	**6,229**	**-4,020**	**8,445**	**+2,209**
W-291	N/A[3]	17,571	N/A[3]	17,571	+17,571
Total	**6,236**	**23,800**	**-4,020**	**26,016**	**+19,780**

Sources: ATAC 2012a, 2012b, 2012c; DoN 2009, 2010, 2012a.
Notes: 1. The number of operations shown in this table differs from the number of operations shown in the USMC F-35B West Coast Basing EIS (DoN 2010) because the baseline only includes Navy operations.
2. Flights to a particular range are based on range availability and weather. Flights may be distributed between the ranges listed. Numbers of operations are estimated projections for typical annual operations, which may increase or decrease depending upon circumstances.
3. N/A – not applicable.

Under Alternative 1 and as shown in **Table 4.1-3**, there would be a net increase of 156 Navy operations in R-2301 West (net increases reflect the number of proposed Navy F-35C operations minus the number of FA-18 operations that would be eliminated). Training missions in the Restricted Area would be similar to those currently flown by legacy aircraft, including air combat training operations and supersonic events. Additionally, net F-35C operations in R-2306/2308 would increase by 1,080 operations over baseline conditions. Since more than 80 percent of Navy F-35C training operations would be conducted

in the overwater training ranges, the net increase to R-2507 and the Abel and Kane MOAs for Navy F-35C and FA-18 operations would increase by 745 over the Navy baseline. The activity within R-2510/2512 would increase with 28 and 200 net F-35C operations, respectively, under Alternative 1. These increases would not alter the capability of the SUA to accommodate scheduled aircraft. Such increases would not affect the capabilities of these SUA to accommodate the proposed training activities of the F-35C. Analyses conducted using an airspace simulation model indicates this increase would be consistent with the airspace and range's capacity (DoN 2012).

Because of capacity concerns and the high demand for use of local SUA this analysis assumes much of the F-35C training requirement will be accomplished in W-291 off the coast of southern California. However, this would reduce training efficiency and increase the cost of maintaining required readiness levels. Moreover, additional flight hours would be required to transit to and from the more distant SUA and there would be less time available for training. Simulation shows that by shifting all F-35C training events that can be shifted to W-291, the local SUA would not exceed capacity. Detailed scheduling coordination would be undertaken to ensure the most effective use of the limited airspace.

Training flights from NAF El Centro flying west to W-291 would need to transit the congested airspace in the San Diego area. The annual number of operations proposed for W-291 is approximately 17,600. However, this does not convert to 17,600 air traffic control operations. The F-35Cs would usually operate in groups of two, three, or four aircraft flying together. As a result, the total number of flights air traffic control would need to track would be approximately 6,000 (using an average of a three aircraft flight) because only the lead aircraft in a flight communicates with air traffic control. These 6,000 flights would average about one per hour. Federal Aviation Administration (FAA) agencies would direct the F-35C flights to altitudes that would not conflict with Southern California airport approach and departure routes. Since the number of flights is only one per hour, air traffic control would not likely be adversely affected by the proposed change.

As shown in **Table 4.1-4,** homebasing the F-35C at NAF El Centro would result in approximately 2,721 annual operations in the 13 MTRs in the vicinity of NAF El Centro. There would be a reduction of roughly 2,508 FA-18 operations on those same MTRs as those aircraft transition to F-35C, leaving a net increase of approximately 213 F-35C operations in the 13 local MTRs (see **Figure 2-11**). F-35C would not transit long distances for proposed training in SUA because the NAF El Centro airfield is adjacent to this SUA.

Table 4.1-4. Changes in Annual Operations in Military Training Routes under Alternative 1

MTR	Number of Operations		Change
	Baseline (2015)*	Proposed (2028)	
IR-211	48	56	+8
IR-212	36	42	+6
IR-213	12	14	+2
IR-216	156	183	+27
IR-217	168	197	+29
IR-218	24	28	+4
IR-250	36	42	+6
VR-296	144	169	+25
VR-1211	108	126	+18
VR-1257	156	183	+27

Table 4.1-4. Changes in Annual Operations in Military Training Routes under Alternative 1

MTR	Number of Operations		Change
	Baseline (2015)*	Proposed (2028)	
VR-1266	1,512	1,555	+43
VR-1267	72	84	+12
VR-1268	36	42	+6
Total	**2,508**	**2,721**	**+213**

Source: DoN 2010.
Note: * The number of operations shown in this table differs from the number of operations shown in the USMC F-35B West Coast Basing EIS (DoN 2010) because the baseline years are different.

Alternative 1 would not result in adverse impacts to SUA mainly because the majority of F-35C operations would occur offshore in W-291. Those sorties that occur in the local SUA would be conducted in a manner similar to the current Navy missions conducted by FA-18 aircraft temporarily assigned to NAF El Centro, in terms of profiles, altitudes, speeds, and durations. Although there would be increases in the number of annual operations, F-35C operations would not stretch the airspace beyond capacity.

Civil Aviation

Alternative 1 would not have an adverse impact to civil aviation transiting airspace in the Barry M. Goldwater Range West, Yuma Proving Ground, El Centro Ranges, R-2507/Kane/Abel MOAs, and MTRs because all SUA proposed for use by F-35C is already used for military aircraft training. Alternative 1 does not establish any new SUA. However, the opportunity for civil aviation to transit existing SUA (when it is unoccupied by military users) will likely be reduced due to the slight increase in military operations.

Civil aviation traffic on Victor airways (V137, V66, and V458) and Jet Routes (J2, J18, and J169) in the vicinity of NAF El Centro and the surrounding SUA is not anticipated to be affected by the increase in military traffic under the proposed action. This is due to a combination of light use of some of the airways, altitude separation between military and civil traffic, and low increases in use of some of the SUA. No changes to the structure of the SUA or the procedures for their use would be required.

Airport operations at Imperial County Airport and Brawley Municipal Airport would not be adversely affected by an increase in military range operations. Current procedures for aircraft separation in the local NAF El Centro area would continue, with military traffic avoiding those airfields.

Conclusion

Overall, Alternative 1 would not result in significant adverse impacts to airfields and airspace at NAF El Centro from proposed F-35C operations, the construction of a new runway, and the extension of the existing runway. There would be an increase of 99,400 annual aircraft operations at the NAF El Centro airfield, a net increase of 2,209 annual aircraft operations in SUA, and 213 in MTRs in the vicinity of NAF El Centro. F-35C operations would be conducted in a manner similar to the current Navy missions conducted by aircraft training at NAF El Centro. A similar training regime would be used and F-35C would operate similar to the FA-18 aircraft. Although there would be increases in the number of annual operations, F-35C operations would not require changes to the structure of the affected SUA, and current safety procedures would continue to be emphasized. The new runway and extension of the

existing runway would require changes in approach and departure patterns. Management and control of air traffic would be modified to include operations at the new runway. There may be less opportunity for civil aviation to transit existing SUA.

4.1.2.2 Alternative 1 – NAF El Centro Homebasing, Effects at NAS Lemoore

Under Alternative 1, homebasing the F-35C at NAF El Centro would result in a decrease of 33,600 operations at the NAS Lemoore airfield. This decrease represents a change from the baseline of 159,400 operations in 2015 to a proposed 125,800 operations in 2028 (**Table 4.1-5**). Decreased operations at the NAS Lemoore airfield would be due to the drawdown of some FA-18 squadrons stationed at NAS Lemoore. (Please see Section 5.1.1, *Affected Environment* for a description of the NAS Lemoore airfield.)

Table 4.1-5. Changes in Annual Airfield Operations at NAS Lemoore under Alternative 1

Aircraft	*Number of Operations*[1]		*Change*
	Baseline (2015)	*Proposed (2028)*	
FA-18C Fleet Squadron	11,400	0	-11,400
FA-18E/F Fleet Squadron	75,300	53,200	-22,100
FA-18E/F FRS	62,200	62,200	0
Transient[2]	10,500	10,500	0
Total	**159,400**	**125,900**	**-33,500**

Source: DoN 2011.
Notes: 1. Number of operations rounded to the nearest hundred.
2. Transient aircraft include: fighter jets, cargo/transport aircraft, propeller, and general aviation aircraft.

The decrease of 36,600 annual airfield operations at NAS Lemoore under Alternative 1 would not result in significant adverse impacts to airfields and airspace at NAS Lemoore.

4.1.3 Environmental Consequences for the No Action Alternative

Under the No Action Alternative, F-35C aircraft would not be based at NAF El Centro and associated construction and operations would not occur. The number of aircraft operations for the baseline year of 2015 as described in **Table 4.1-2** would not change as a result of F-35C operations. NAF El Centro would continue to serve as a training location for Navy and Marine Corps aviation units by supporting transient aircraft from visiting units. Therefore, there would be no changes to existing conditions at the NAF El Centro airfield and SUA and MTRs in the vicinity of NAF El Centro as a result of the No Action Alternative. Changes to NAF El Centro SUA and MTRs from US Marine Corps F-35 operations are analyzed in the Final US Marine Corps F-35B West Coast Basing EIS (DoN 2010a) (please see Section 1.4, *Relevant Environmental Documents)*.

4.2 NOISE

4.2.1 Affected Environment

The affected environment for noise includes the NAF El Centro airfield and SUA in the vicinity of NAF El Centro. This section addresses noise from aircraft operations, construction activities, and other noise sources. Noise impacts are assessed for noise exposure, potential hearing loss, speech interference and classroom criteria, sleep disturbance, and occupational noise.

4.2.1.1 Airfield Operations

Aircraft Operations

Operational data for baseline noise conditions was derived from the results of the recently completed Military Aviation Simulation Model (NASMOD) (DoN 2012). (See Appendix C for more detailed discussion of the noise study). As previously indicated, baseline operations at NAF El Centro are due primarily to detachment and transient operations from visiting units assembled at NAF El Centro to train in the El Centro Ranges and Chocolate Mountain Aerial Gunnery Range. While **Table 4.1-2** indicates the number of annual operations for baseline and proposed conditions, **Table 4.2-1** presents the baseline number of annual operations for day, evening, and night. Of the 65,800 annual operations, 78 percent occur during the day, 15 percent during evening, and 7 percent during night.

Table 4.2-1. Baseline NAF El Centro Airfield Operations for Day, Evening, and Night (2015)

Operation Type	*Day 7 a.m.-7 p.m.*	*Evening 7 p.m.-10 p.m.*	*Night 10 p.m.-7 a.m.*	*Total*
Detachment/Transient Operations				
Departure	15,376	4,180	1,915	21,471
Arrival (straight-in and break)	15,183	4,020	2,268	21,471
Touch and Go	3,978	68	44	4,090
FCLP	16,566	1,626	540	18,732
GCA	0	0	0	0
Total - All Aircraft	**51,103**	**9,894**	**4,767**	**65,800***

Note: *Total number of operations rounded to the nearest hundred.

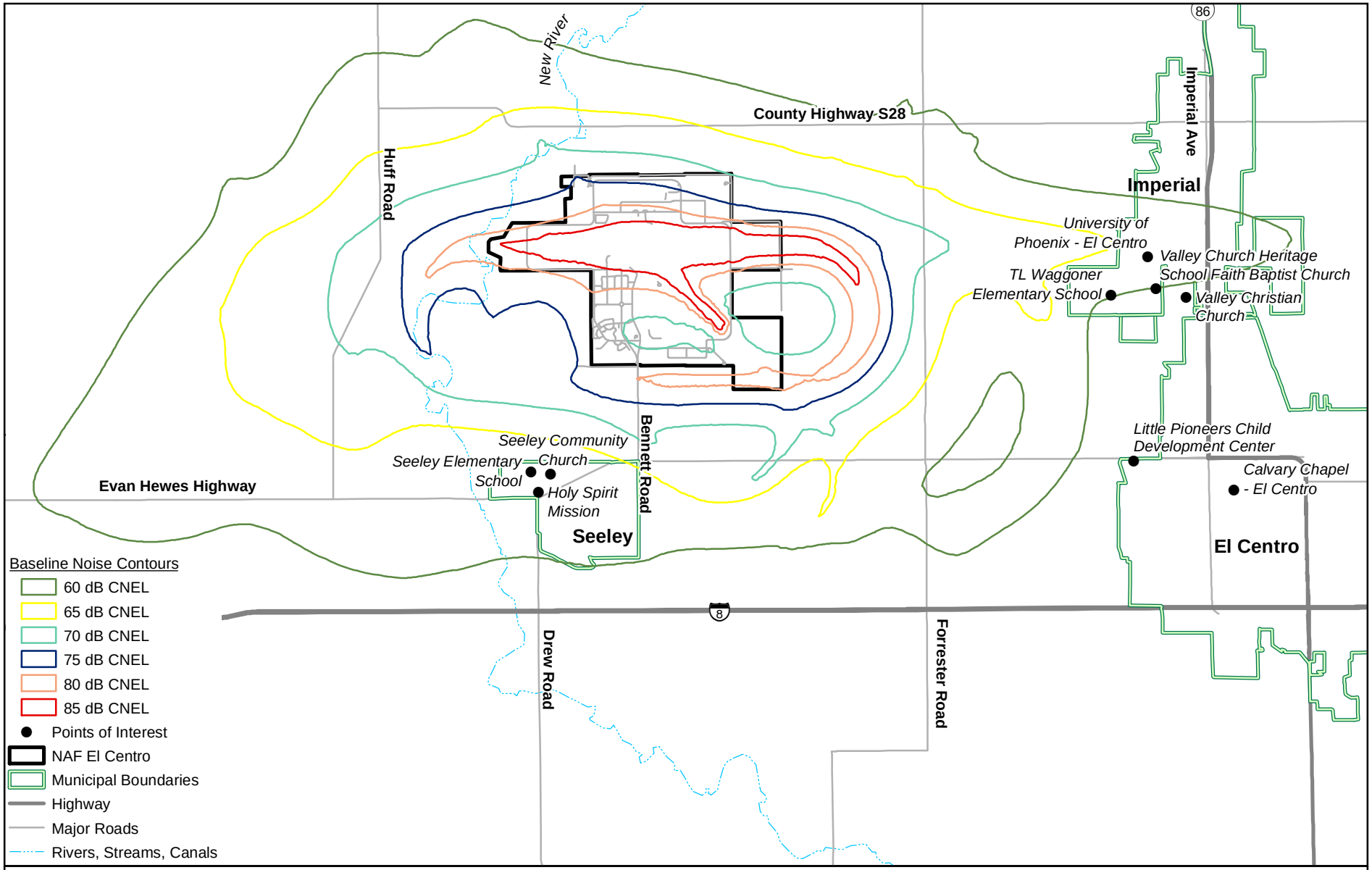
Noise Exposure

Table 4.2-2 presents total noise exposure (on and off the installation) in terms of estimated acreage and population under baseline conditions. Population estimates were calculated using the 2010 US Census block data for average numbers of persons per household. The number of houses was determined through the use of aerial imagery. This number was then multiplied by the average number of persons per household to determine the population within each noise zone (refer to Section 3.5, *Land Use*, for a description of noise zones). **Figure 4.2-1** shows the baseline noise contours for NAF El Centro.

Table 4.2-2. Noise Exposure within Baseline Noise Zones at NAF El Centro (2015)

*Noise Zone (dB CNEL)**	*Acreage*	*Population*
Noise Zone 2		
65 - 69	6,289	779
70 - 74	4,201	55
Noise Zone 3		
75 - 79	2,816	18
80 - 84	1,147	0
85+	785	0
Total	**15,238**	**852**

Note: *CNEL = Community Noise Equivalent Level.



N

0 4,000 8,000
Feet

Figure 4.2-1
Baseline Noise Contours and Points of Interest at NAF El Centro

Source: Wyle 2013

Many schools, houses of worship, and communities are within Noise Zone 1 (i.e., less than 65 dB) at NAF El Centro and are represented in **Table 4.2-3** along with the Community Noise Equivalent Level (CNEL) associated with the point of interest. A few of the points of interest are surrounded by residential areas (e.g., Seeley Community Church) and are shown as a "Non-school" type**.**

Table 4.2-3. CNEL at Various Points of Interest – Baseline (2015)

ID	Description	Type	CNEL (dB)
1	Seeley Community Church	Worship and Non-School	62
2	TL Waggoner Elementary School	School and Non-School	60
3	Little Pioneers Child Development Center	School	53
4	Seeley Elementary School	School	63
5	Valley Church Heritage School/Faith Baptist Church	Worship and School	60
6	University of Phoenix – El Centro	School	64
7	Calvary Chapel	Worship and Non-School	49
8	Holy Spirit Mission	Worship	62
9	Valley Christian Church	School	58

Notes: The type point of interest refers to the type of receptor used for the analyses. School is used for classroom criteria, non-school are points of interest that are surrounded by residential areas and are used for speech interference and sleep disturbance, and worship are churches, synagogues, temples, etc. and are also receptors used for speech interference analyses.

The Navy has an active Air Installations Compatible Use Zones (AICUZ) program that informs the public about its aircraft noise environment and recommends specific actions for local jurisdiction with planning and zoning authority that can enhance the health, safety, and welfare of those living near the NAF El Centro airfield. The current version of the AICUZ plan for NAF El Centro was published in 2010. NAF El Centro has noise abatement procedures for assigned and transient aircraft to promote measures to minimize aircraft noise. Airfield restrictions used to minimize/abate noise for operations conducted at the NAF El Centro airfield include specific flight tracks for certain types of flight operations, as well as avoiding flying over specific populated areas and cattle feed lots. These noise abatement procedures are included in the Course Rules brief for new pilots.

On average, NAF El Centro receives two noise complaints per month (NAF El Centro 2010). Noise complaints are received by the Public Affairs Officer (760) 339-2519 and are logged noting the complainant's location, time of complaint, and description of the noise issue. Complaints are coordinated with the Airfield Manager, who investigates the claim. The Public Affairs Officer then follows up with the complainant.

Potential Hearing Loss

People working or living in high noise environments for extended periods of time can potentially experience hearing loss. Under baseline conditions, no homes or population are located within the 80 dB CNEL or greater noise contour.

Speech Interference and Classroom Criteria

Speech interference caused by aircraft noise is a primary cause of annoyance for communities. Such interference is measured by the number of average daily/evening indoor (7:00 a.m. to 10:00 p.m.) events per hour that are subject to indoor maximum sound levels (L_{max}) of at least 50 dB at

representative locations. This measure also accounts for a 15 dB and 25 dB noise attenuation provided by buildings with windows open or closed, respectively. Therefore, maximum outdoor noise levels should be 65 dB with windows open and 75 dB with windows closed and are denoted as NA65L_{max} (windows open) and NA75L_{max} (windows closed). For example, NA75L_{max} denotes the number of events above an L_{max} of 75 dB within a building with windows closed. **Table 4.2-4** presents indoor speech interference under baseline conditions at representative locations.

Table 4.2-4. Baseline Indoor Speech Interference Events at Representative NAF El Centro Locations (2015)

Receptor	***Average Daily/Evening Indoor Events per Hour Daytime (7 a.m. to 7 p.m.)***	
	Windows Closed	***Windows Open***
Seeley Community Church	3	6
TL Waggoner Elementary School	1	4
Little Pioneers Child Development Center	0	2
Seeley Elementary School	2	6
Valley Church Heritage School/Faith Baptist Church	1	4
University of Phoenix – El Centro	1	4
Calvary Chapel	0	1
Holy Spirit Mission	1	5
Valley Christian Church	1	3

Supplemental noise metrics are applied to school environments to analyze speech interference in a classroom setting. When considering impacts from intermittent aircraft noise, indoor background noise levels and the loudness of the events are taken into account. For this analysis, a threshold on indoor background noise level of 40 dB L_{eq} and a limit on single events of 50 dB L_{max} are utilized. These limits translate to an outdoor equivalent noise level (L_{eq}) of 60 dB continuous level and an outdoor L_{max} of 65 and 75 dB to obtain the 40 dB L_{eq} threshold. The time period for classroom events are during normal school hours from 8:00 a.m. to 5:00 p.m. rather than the 7:00 a.m. to 10:00 p.m. used for normal conversation. **Table 4.2-5** presents outdoor and indoor equivalent noise levels and the number of events per hour above of 50 dB L_{max} indoors for the schools in the vicinity of NAF El Centro and the baseline classroom criteria levels for the school receptors. TL Waggoner Elementary School, Seeley Elementary School, Valley Church Heritage School, and University of Phoenix exceed the windows open criteria of 40 dB L_{eq} under baseline conditions.

Table 4.2-5. Baseline Classroom Criteria for Schools near or on NAF El Centro (2015)

Receptor	Outdoor Equivalent Noise Level [$L_{eq(8hr)}$]	Baseline Indoor Noise Levels and Number of Events Above a Maximum Indoor Noise Level of 50 dB L_{max}			
		Windows Closed		Windows Open	
		dB[$L_{eq(9hr)}$]	Events per Hour	dB[$L_{eq(9hr)}$]	Events per Hour
TL Waggoner Elementary School	60	35	1	45*	5
Little Pioneers Child Development Center	53	28	0	38	2
Seeley Elementary School	63	38	3	48*	7
Valley Church Heritage School/Faith Baptist Church	60	35	1	45*	4
University of Phoenix – El Centro	64	39	2	49*	4

Note: * Exceeds classroom criteria.

Sleep Disturbance

Sleep disturbance can also be a result of aircraft overflight. The significance of this potential impact can be assessed by determining the probabilities of awakenings. **Table 4.2-6** lists the probabilities of awakening events between the hours of 10:00 p.m. to 7:00 a.m. The probability of awakening for the representative residential locations ranges from a low of 2 percent at Calvary Chapel with windows closed to a high of 20 percent at Seeley Community Church with windows open. Indoor awakening is used to distinguish average night sleeping from awakenings during the day or outdoor activities (i.e., naps in a hammock or tent camping).

Table 4.2-6. Baseline Indoor Sleep Disturbance at Representative Locations Near NAF El Centro (2015)

Receptor	Average Nightly (10 p.m. - 7 a.m.) Probability of Awakening	
	Windows Closed	Windows Open
	Probability of Awakening	Probability of Awakening
Seeley Community Church	10%	20%
TL Waggoner Elementary School	6%	14%
Calvary Chapel	2%	5%

Note: Although the receptors listed are churches and schools, they are surrounded by residential areas and were used for the reference points.

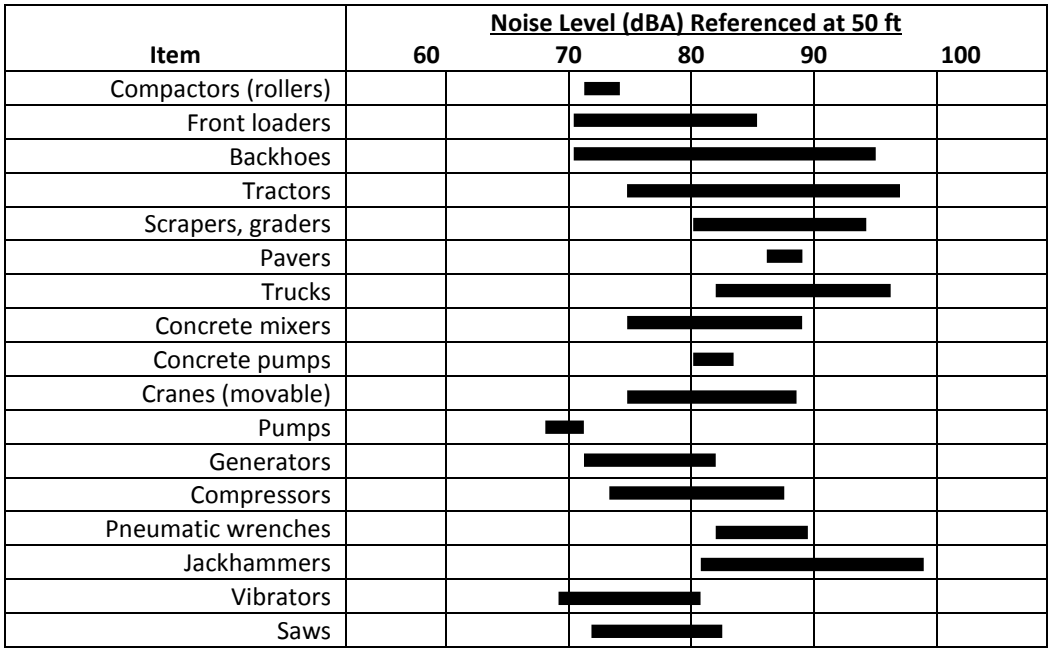
Occupational Noise

Existing Navy noise exposure procedures, such as hearing protection and monitoring, are undertaken to minimize the potential effects of occupational noise exposure that may occur on NAF El Centro. These procedures are in compliance with all Occupational Safety and Health Administration and Navy occupational noise exposure regulations.

Construction Noise

Noise associated with construction is typically dominated by grading/earth-moving equipment (e.g., graders, excavators, etc.) and impact devices (e.g., pile drivers, jackhammers, etc.). Smaller equipment such as skid-steer loaders, concrete trucks, man-lifts, etc., would likely be the types of construction equipment used. Noise from construction activities varies with the types of equipment used and the duration of use. During operation, heavy equipment and other construction activities generate noise levels typically ranging from 70 to 90 dB at a distance of 50 ft (**Figure 4.2-2**).

Figure 4.2-2. Ranges of Noise Levels of Construction Equipment



Sources: Federal Highway Administration 2011; Washington State Department of Transportation 2012.

Other Noise Sources

Other sources of noise, such as general vehicle traffic, and other maintenance and landscaping activities, are a common on-going occurrence at the base. While these sources may contribute to the overall noise environment, they are relatively minor compared to the dominant aircraft-generated noise at and adjacent to the base. For this reason, these other noise sources were not considered under baseline nor are they analyzed under this alternative.

4.2.1.2 Special Use Airspace and Military Training Routes

Navy aircraft operations in SUA under baseline conditions are approximately 6,236 annual operations (see **Table 2.7-6**) dispersed throughout the SUA including Restricted Areas R-2301 West, R-2306/2308, R-2510, and R-2512, and the Kane/Abel MOAs. MTRs used by NAF El Centro aircraft had 2,508 annual operations by all aircraft in 2015 (see **Table 2.7-7**). **Table 4.2-7** shows the noise level expressed as Sound Exposure Levels (SELs) for representative FA-18 low-level overflights at 500 and 1,000 ft AGL within MTRs. Although proposed airspace operations would occur at much higher altitudes (i.e., greater than 1,500 ft AGL), operations could occur occasionally at the altitudes in airspace where such low-level activity is allowed. Noise in airspace could reach the same levels shown, but would rarely occur.

Table 4.2-7. Representative Noise Levels for FA-18 Aircraft in Level Flight within MTRs

Aircraft	*Airspeed (knots)*	*Altitude (ft AGL)*	*Lateral Offset (nautical miles)*	*SEL (dB)*
FA-18C/D	500	500	0	114
			1	82
		1,000	0	108
			1	84
FA-18E/F	500	500	0	117
			1	82
		1,000	0	109
			1	84

4.2.2 Environmental Consequences for Alternative 1

Under Alternative 1, potential noise impacts could occur from proposed F-35C aircraft operations and construction/demolition activities. Potential impacts from homebasing at NAF El Centro are discussed in the next two sections in terms of effects at NAF El Centro and effects at NAS Lemoore.

4.2.2.1 Alternative 1 – NAF El Centro Homebasing, Effects at NAF El Centro

Airfield Operations

This assessment of noise examines how Alternative 1 compares to current baseline conditions at NAF El Centro and nearby communities.

Aircraft Operations

Data used for operations under Alternative 1 were derived from the NASMOD study used to predict the number of F-35C operations at NAF El Centro (DoN 2012). Upon full implementation of Alternative 1, there would be 165,200 annual operations with 68 percent of them occurring during the daytime, 23 percent during the evening, and 9 percent during the night (**Table 4.2-8**).

Table 4.2-8. Proposed NAF El Centro Airfield Operations under Alternative 1 (2028)

Operation Type	*Day 7 a.m.-7 p.m.*	*Evening 7 p.m.-10 p.m.*	*Night 10 p.m.-7 a.m.*	*Total*
F-35C Fleet – 7 F-35C Squadrons @10 aircraft each				
Departure	3,359	913	5	4,277
Arrival (Straight-in and Break)	3,081	966	230	4,277
Touch and Go	762	166	42	970
FCLP	7,288	4,498	274	12,060
GCA	0	0	0	0
SFO	1,678	500	112	2,290
F-35C Fleet Total	**16,168**	**7,043**	**663**	**23,900***
F-35C FRS – 1 F-35C FRS @30 aircraft				
Departure	8,881	2,005	5	10,891
Arrival (Straight-in and Break)	8,147	2,107	637	10,891
Touch and Go	16,708	3,990	1,508	22,206
FCLP	10,412	12,338	470	23,220
GCA	0	0	0	0
SFO	6,719	389	24	7,132
F-35C Fleet Total	**50,867**	**20,829**	**2,644**	**74,300***
Transient operations				
Departure	13,209	4,111	4,453	21,773
Arrival (Straight-in and Break)	13,323	4,049	4,401	21,773
Touch and Go	3,240	104	1,288	4,632
FCLP	16,160	1,282	1,374	18,816
GCA	0	0	0	0
Transient Total	**45,932**	**9,546**	**11,516**	**67,000***
Total - All Aircraft	**112,967**	**37,418**	**14,823**	**165,200***

Note: *Total number of operations rounded to the nearest hundred.

Comparison of Single Event Noise by Aircraft Type

Table 4.2-9 presents the single event noise exposure data using SEL for overflight events for the legacy FA-18C/D and the FA-18E/F and best available data on the next generation F-35 aircraft. These are the next generation aircraft type replacement that would occur at NAF El Centro under Alternative 1. Also shown are data for the F-35B and the AV-8B; the F-35B is the eventual replacement for USMC FA-18C/D and AV-8B aircraft, which conducts the majority of USMC operations at NAF El Centro. The SELs for F-35C overflight events are less than the SELs of FA-18C/D and FA-18E/F for each of the flight conditions shown. The greatest reductions in SELs are during mid-altitude departures between 1,000 and 10,000 ft AGL particularly in relation to FA-18E/F aircraft, but significant noise level reductions also occur during downwind legs of the closed patterns.

Table 4.2-9. Sound Exposure Levels and Maximum Sound Levels for Representative Flight Conditions of Primary Aircraft at NAF El Centro

Flight Condition	F-35C			FA-18C/D			FA-18E/F			USMC F-35B			USMC AV-8B		
	SEL (dB)	L_{max} (dB)	Speed (kts)	SEL (dB)	L_{max} (dB)	Speed (kts)	SEL (dB)	L_{max} (dB)	Speed (kts)	SEL (dB)	L_{max} (dB)	Speed (kts)	SEL (dB)	L_{max} (dB)	Speed (kts)
Departure through 1,000 ft AGL (Afterburner for Takeoff Roll)[1,2]	116	113	300	117	108	240	117	113	250	116	113	300	108	103	300
Departure through 10,000 ft MSL near CNEL Contour Differences[2,4]	68	60	300	89	76	350	90	82	350	77	68	300	78	68	300
Non-Break Arrival through 1,500 ft AGL (Near Initial Points)[3]	97	92	225	100	95	200	108	103	200	94	89	225	92	84	200
FCLP on Downwind (600 ft AGL)[3]	108	104	145	111	106	150	118	115	150	108	104	145	102	94	130

Source: Wyle 2013.

Notes: kts = knots. Weather: 71 degrees Fahrenheit, 59% relative humidity; -43 ft MSL field elevation with relatively flat terrain. SEL and L_{max} data derived from NoiseMap.

1. Each aircraft not at same geographic point over the ground.
2. Aircraft with gear and flaps up.
3. Aircraft with gear and flaps down.
4. F-35B/C departures level off at 10,000 ft MSL and reduce power for cruise.

Noise Exposure

Under Alternative 1, seven F-35C fleet squadrons and one F-35C FRS training squadron would be homebased to NAF El Centro. Under this alternative, an additional 15,967 acres and 1,312 people would be located within noise zones 2 and 3 as shown on **Table 4.2-10**. **Figure 4.2-3** depicts the noise contours under the Alternative 1.

Table 4.2-10. CNEL Noise Exposure within Baseline and Proposed Noise Zones at NAF El Centro

Noise Zone (dB CNEL)	Acreage			Population		
	Baseline (2015)	Proposed (2028)	Change	Baseline (2015)	Proposed (2028)	Change
Noise Zone 2						
65 - 69	6,289	12,021	5,732	779	2,036	1,257
70 - 74	4,201	5,834	1,633	55	52	-3
Noise Zone 3						
75 - 79	2,816	7,439	4,623	18	36	18
80 -84	1,147	3,675	2,528	0	32	32
85+	785	2,236	1,451	0	8	8
Total	**15,238**	**31,205**	**15,967**	**852**	**2,164**	**1,312**

Many schools and communities are near the noise zones at NAF El Centro and are represented in **Table 4.2-11** along with the CNEL levels associated with the point of interest. Of the nine representative receptor locations, five would experience an increase of CNEL noise levels under this alternative, two would not change, and two would decrease. The greatest increase would be the receptors around Seeley including Seeley Community Church, Seeley Elementary School, and Holy Spirit Mission with increases up to 6 dB CNEL. Existing noise abatement procedures and noise complaint procedures at NAF EL Centro would continue to be followed for proposed aircraft operations under Alternative 1.

Table 4.2-11. CNEL Levels at Various Points of Interest – Baseline and Proposed

Point of Interest			CNEL (dBA)		
ID	Description	Type	Baseline (2015)	Proposed (2028)	Change
1	Seeley Community Church	Worship and Non-School	62	68	+6
2	TL Waggoner Elementary School	School and Non-School	60	60	0
3	Little Pioneers Child Development Center	School	53	55	+2
4	Seeley Elementary School	School	63	69	+6
5	Valley Church Heritage School/ Faith Baptist Church	Worship and School	60	59	-1
6	University of Phoenix – El Centro	School	64	62	-2
7	Calvary Chapel	Worship and Non-School	49	51	+2
8	Holy Spirit Mission	Worship	62	67	+5
9	Valley Christian Church	Worship	58	58	0

Notes: The type point of interest refers to the type of receptor used for the analyses. School is used for classroom criteria, non-school are points of interest that are surrounded by residential areas and are used for speech interference and sleep disturbance, and worship are churches, synagogues, temples, etc. and are also receptors used for speech interference analyses.

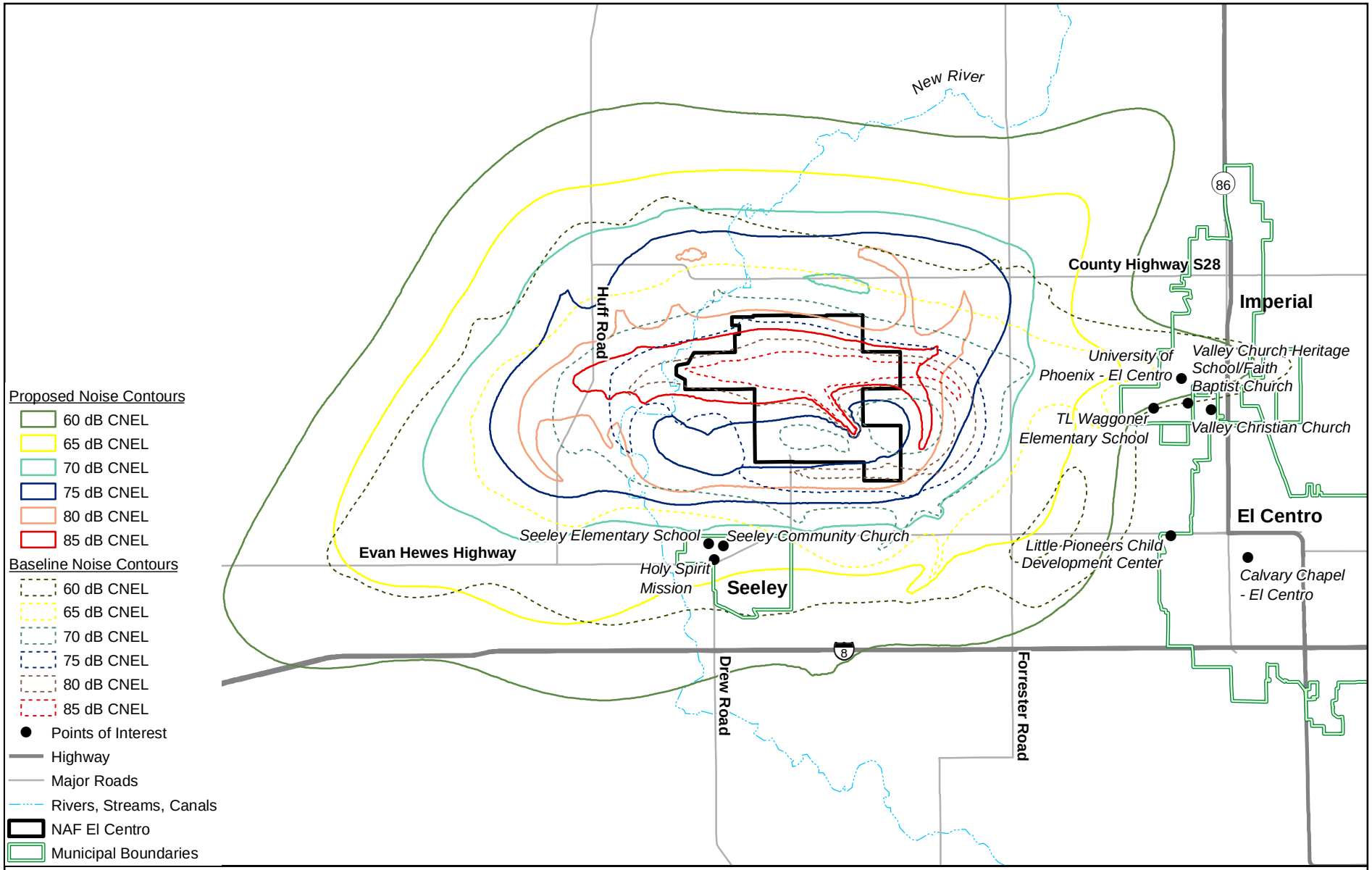


Figure 4.2-3
Baseline and Proposed Noise Contours and Points of Interest at NAF El Centro under Alternative 1

Source: Wyle 2013

Potential Hearing Loss

As shown in **Table 4.2-12**, the population off the installation exposed to noise levels greater than 80 dB L_{eq}(24) would increase to 26 people within the 80-81 dB noise zone and 8 people within the 81-82 dB noise zone under Alternative 1. The population exposed to 80 dB Leq(24) and higher noise levels would be in households located in the sparsely populated farmland surrounding NAF El Centro. These households generally lie east and west of the base roughly in line with the runways. Living in areas that are subjected to elevated noise levels for long periods of time can induce hearing loss to people residing in the areas. During a span of 40 years, the average person living in noise zone 80-81 dB L_{eq}(24) may experience a hearing loss of 3 dB, 3.5 dB in zone 81-82, and so forth. For example, a person prior to exposure may perceive a sound at 60 dB and after the prolonged exposure the same sound would be perceived as 57 dB. The most sensitive population in the 10th percentile in the 80-81 dB L_{eq}(24) zone may experience a 7 dB hearing loss.

Table 4.2-12. Baseline and Proposed Average NIPTS and 10th Percentile Noise Induced Permanent Threshold Shift (NIPTS) as a Function of L_{eq}(24)

L_{eq}(24)	Average NIPTS dB (1,2)	10th Percentile NIPTS dB(1,3)	Population	
			Baseline (2015)	Proposed (2028)
80-81	3.0	7.0	0	26
81-82	3.5	8.0	0	8
82-83	4.0	9.0	0	0

Notes: 1. Rounded to the nearest 0.5 dB.
2. Average NIPTS over entire affected population.
3. NIPTS for the 10% most sensitive population affected.

According to the US Environmental Protection Agency (USEPA) (1974), changes in hearing level of less than 5 dB are generally not considered noticeable or significant. There is no known evidence that an NIPTS of less than 5 dB is perceptible or has any practical significance for the individual affected. Furthermore, the variability in audiometric testing is generally assumed to be plus or minus 5 dB. The preponderance of available information on hearing loss risk is from the workplace with continuous exposure throughout the day for many years. Clearly, these data are applicable to the adult working population.

Based on a report by Ludlow and Sixsmith (1999), there were no significant differences in audiometric test results between military personnel, who as children, had lived in or near stations where fast jet operations were based, and a similar group who had no such exposure as children. Hence, for the purposes of this EIS, the limited data are considered applicable to the general population, including children, and are used to provide a conservative estimate of the risk of potential hearing loss.

To assess the potential for NIPTS in this EIS, Navy uses L_{eq}(24) as a threshold to identify the exposed population who may be at the most risk of possible hearing loss from aircraft noise. L_{eq}(24) is used because characterizing noise exposure in terms of CNEL overestimates hearing loss risk.

Speech Interference and Classroom Criteria

In terms of speech interference, **Table 4.2-13** shows the average daily/evening indoor (7:00 a.m. to 10:00 p.m.) events per hour for receptors that generally would experience L_{max} of at least 50 dB with

windows closed and open. Under Alternative 1, the number of speech interfering events across all receptors would range from 0 to 9 and 1 to 17 events per hour for windows closed and open, respectively, with an average increase of 3.9 and 8.6 events per hour relative to baseline windows closed and open respectively. As a result, impacts with regard to speech interference would increase at nearly all of the representative receptors.

Table 4.2-13. Proposed Indoor Speech Interference at Representative NAF El Centro Locations (2028)

Receptor	Average Daily/Evening Indoor Events per Hour (7 a.m. to 10 p.m.) Baseline/Proposed			
			Change from Baseline	
	Windows Closed	Windows Open	Windows Closed	Windows Open
Seeley Community Church	3/9	6/17	+6	+11
TL Waggoner Elementary School	1/2	4/7	+1	+3
Little Pioneers Child Development Center	0/1	2/2	+1	0
Seeley Elementary School	2/9	6/17	+7	+11
Valley Church Heritage School/ Faith Baptist Church	1/1	4/6	0	+2
University of Phoenix – El Centro	1/5	4/6	+4	+2
Calvary Chapel	0/0	1/1	0	0
Holy Spirit Mission	1/8	5/16	+7	+11
Valley Christian Church	1/0	3/5	-1	+2

While **Table 4.2-13** represents speech interference for normal conversation at the representative receptor locations, for schools two additional classroom criteria have to be applied reflecting the potential for disrupting classroom learning. **Table 4.2-14** presents the classroom criteria levels for the school receptors under Alternative 1. Under this alternative, noise levels and number of events per hour are mixed with some locations showing an increase and others a decrease. The largest increase would be at Seeley Elementary School with a 3 dB L_{eq}(9hr) increase for both windows closed and open, and 6 and 10 events per hour with windows closed and open respectively. With windows closed, Seeley Elementary would be the only school that exceeds classroom criteria. With windows open, the same four schools that exceeded classroom criteria under baseline conditions would continue to exceed classroom criteria under this alternative.

Table 4.2-14. Proposed Classroom Criteria for Schools near or on NAF El Centro (2028)

Receptor	Outdoor Equivalent Noise Level [$L_{eq(9hr)}$] Baseline/Proposed	Indoor Noise Levels and Number of Events above a Maximum Indoor Noise Level of 50 dB L_{max} Baseline/Proposed			
		Windows Closed		Windows Open	
		dB[$L_{eq(9hr)}$]	Events per hour	dB[$L_{eq(9hr)}$]	Events per hour
TL Waggoner Elementary School	60/57	35/32	1/2	45*/42*	5/8
Little Pioneers Child Development	53/54	28/29	0/1	38/39	2/2
Seeley Elementary School	63/66	38/41*	3/9	48*/51*	7/17
Valley Church Heritage School/ Faith Baptist Church	60/56	35/31	1/1	45*/41*	4/7
University of Phoenix – El Centro	64/56	39/34	2/5	49*/44*	4/7

Note: * Exceeds classroom criteria.

Sleep Disturbance

Sleep disturbance from aircraft overflights is assessed by determining the probabilities of awakenings. **Table 4.2-15** lists the probabilities of awakening events between the hours of 10:00 p.m. to 7:00 a.m. for the same representative residential locations with the probability of awakening ranging from a low of 15 percent to a high of 52 percent for windows closed and open respectively. Indoor awakening is used to distinguish average night sleeping from awakenings during the day or outdoor activities (i.e., naps in a hammock or tent camping).

Table 4.2-15. Proposed Indoor Sleep Disturbance at Representative Locations near NAF El Centro

Receptor*	Baseline (2015)		Proposed Average Nightly (10 p.m. - 7 a.m.) Probability of Awakening (2028)			
			Windows Closed		Windows Open	
	Windows Closed	Windows Open	Probability of Awakening	Change from Baseline	Probability of Awakening	Change from Baseline
Seeley Community Church	10%	20%	36%	+26%	52%	+32%
TL Waggoner Elementary School	6%	14%	19%	+13%	37%	+23%
Calvary Chapel	5%	10%	15%	+10%	31%	+21%

Note: *Although the receptors listed are churches and schools, they were used for the reference points as they are surrounded by residential areas.

Occupational Noise

Navy occupational noise exposure prevention procedures such as hearing protection and monitoring would continue to be required at NAF El Centro in compliance with all applicable Occupational Safety and Health Administration and Navy occupational noise exposure regulations. As a result, these measures are designed to minimize occupational hearing hazards and no increased risk of hearing impacts from occupational noise would be expected to occur compared to baseline conditions.

Construction Noise

Construction noise would be generated by multiple construction, modification, expansion, and demolition projects under Alternative 1. Many of these construction projects would occur on the flight line, between active runways, so that aircraft related noise would likely dominate construction noise. No residential areas or other sensitive receptors are located in the vicinity, and construction noise would be intermittent and would be phased over multiple years. Nonetheless, construction noise would be less than significant.

Special Use Airspace and Military Training Routes

Proposed aircraft operations in SUA in the vicinity of NAF El Centro under Alternative 1 include approximately 6,229 F-35C operations and a decrease of roughly 4,020 FA-18 operations for a net increase of around 2,209 Navy operations over the baseline of approximately 6,236 Navy operations (see **Table 2.7-6**). Projected net increases in Marine Corps annual operations in some of the same SUA, as documented in relevant NEPA documents, are shown in **Table 6.2-4** to portray cumulative conditions in 2028. Combined, these increases represent a change from the baseline of 81,100 annual operations in 2015 to 108,271 annual operations for the end state in 2028. The Navy contributors to these totals

would go from 6,236 to 8,445 operations under Alternative 1 (the net increase of 2,209 operations shown in **Table 2.7-6**). This projected increase of more than 2,209 operations is not anticipated to result in significant noise impacts. Typically, a doubling of aircraft operations would be required to create a 3 dB difference, which is considered a detectable noise difference. These operations would be dispersed throughout the SUA including Abel/Kane MOAs, and Restricted Areas R-2301, R-2306, R-2507, R-2510, and R2512.

MTRs used by NAF El Centro aircraft would increase by 213 operations per year in 2028 due to proposed F-35C aircraft (see **Table 2.7-7**). Viewing all 13 MTRs together, the increase in F-35C operations would be less than one operation per day.

The F-35C would operate in the SUA and MTRs similar to current aircraft. Since the floors of the Abel and Kane MOAs are 5,000 ft and 10,000 ft respectively, noise levels at potential receptors are not expected to appreciably increase. As shown on **Table 4.2-16**, noise levels from individual F-35C operations within MTRs would be less than noise levels from current legacy aircraft. However, the total number of noise events would increase by 213 annual operations.

Table 4.2-16. Representative Noise Levels for FA-18 and F-35C Aircraft in Level Flight within MTRs

Aircraft	*Airspeed (knots)*	*Altitude (ft AGL)*	*Lateral offset (nautical miles)*	*SEL (dBA)*
FA-18C/D	500	500	0	114
			1	82
		1000	0	108
			1	84
FA-18E/F	500	500	0	117
			1	82
		1000	0	109
			1	84
F-35C	475	500	0	109
			1	78
		1000	0	102
			1	80

Source: BRRC 2011.
Note: Based upon F-35A data, the F-35 operates at lower engine power setting almost 80% of the time while still maintaining 475-500 knots.

Conclusion

Overall, Alternative 1 would have significant noise impacts from proposed F-35C operations at the NAF El Centro airfield. The community of Seeley would experience increases in CNEL noise levels up to 6 dBA CNEL. The population exposed to noise levels greater than 80 dBA CNEL would increase to 34 people, which could result in potential hearing loss if the exposure is for long periods of time. Supplemental noise analyses, which provide a context for noise effects, indicate that Alternative 1 would result in increases in speech, classroom, and sleep disturbance. Noise effects in the SUA and MTRs would not be significant since the number of operations increase by about 3 percent and the noise levels at potential receptors are not expected to appreciably increase.

4.2.2.2 Alternative 1 – Homebasing at NAF El Centro, Effects at NAS Lemoore

Under Alternative 1, homebasing the F-35C at NAF El Centro would result in a decrease of 33,600 operations at the NAS Lemoore airfield. Decreased operations at the NAS Lemoore airfield would be due to the drawdown of the FA-18 squadrons stationed at NAS Lemoore.

Aircraft Operations

Data used for aircraft operations under Alternative 1 was derived from the NASMOD study to predict the number of FA-18E/F and transient operations remaining at NAS Lemoore due to homebasing the F-35C aircraft at NAF El Centro. There would be 125,900 annual operations with 66 percent of them occurring during daytime, 22 percent during evening, and 12 percent during night (**Table 4.2-17**).

Table 4.2-17. Proposed NAS Lemoore Airfield Operations under Alternative 1 (2028)

Operation Type	*Day 7 a.m.-7 p.m.*	*Evening 7 p.m.-10 p.m.*	*Night 10 p.m.-7 a.m.*	*Total*
FA-18E/F Fleet – 10 FA-18E/F @12 aircraft each				
Departure	11,342	2,658	218	14,218
Arrival (Straight-In and Break)	10,323	2,159	1,736	14,218
Touch and Go	0	0	0	0
FCLP	12,804	6,607	4,415	23,826
GCA	731	84	105	920
FA-18E/F FLT Total	**35,200**	**11,508**	**6,474**	**53,200***
FA-18E/F FRS – 1 FA-18E/F FRS @44 aircraft				
Departure	7,822	1,395	213	9,430
Arrival (Straight-In and Break)	7,073	1,508	849	9,430
Touch and Go	10,154	1,793	1,281	13,228
FCLP	13,468	10,423	4,907	28,798
GCA	667	316	281	1,264
FA-18E/F FRS Total	**39,184**	**15,435**	**7,531**	**62,200***
Transient operations				
Departure	1,877	189	33	2,097
Arrival (Straight-In and Break)	1,877	192	30	2,097
Touch and Go	3,535	553	123	4,211
FCLP	0	0	0	0
GCA	1,833	246	19	2,098
Transient Total	**9,122**	**1,180**	**205**	**10,500***
Total - All Aircraft	**83,506**	**28,123**	**14,210**	**125,900***

Source: Wyle 2013.
Note: * Total number of operations rounded to the nearest hundred.

Noise Exposure

Under Alternative 1, seven F-35C fleet squadrons and one F-35C FRS training squadron would be homebased at NAF El Centro replacing two FA-18C and five FA-18E squadrons stationed at NAS Lemoore under baseline conditions. Under this alternative, the areas within Noise Zones 2 and 3 (i.e., greater than 65 dB CNEL) would decrease by 6,339 acres and 402 less people would be included under the noise zones as shown on **Table 4.2-18**. **Figure 4.2-4** depicts the noise contours at NAS Lemoore under Alternative 1.

Table 4.2-18. Noise Exposure within Baseline and Proposed Noise Zones at NAS Lemoore under Alternative 1

Noise Zone (dB CNEL)	Acreage			Population		
	Baseline (2015)	Proposed (2028)	Change	Baseline (2015)	Proposed (2028)	Change
Noise Zone 2						
65 - 69	28,783	27,162	-1,621	844	677	-167
70 - 74	17,693	16,078	-1,614	641	483	-158
Noise Zone 3						
75 - 79	10,101	9,342	-759	77	3	-74
80 - 84	9,547	8,722	-825	3	0	-3
85+	9,323	7,803	1,520	0	0	0
Total	**75,446**	**69,107**	**-6,339**	**1,565**	**1,163**	**-402**

Many schools and communities are near the noise zones at NAS Lemoore and are represented in **Table 4.2-19** along with the CNEL levels associated with the point of interest. In general, all of the noise levels are well below 65 dB CNEL with Burrel and Lanare being the highest at 59 dB CNEL. Under this alternative each location would decrease in noise levels by one to two dB CNEL except Huron Middle School which would not change. Existing noise abatement procedures and noise complaint procedures at NAS Lemoore would continue to be followed for proposed aircraft operations under Alternative 1.

Table 4.2-19. CNEL Levels at Various Points of Interest – Baseline and Proposed under Alternative 1

Point of Interest			CNEL (dB)		
ID	Description	Type	Baseline (2015)	Proposed (2028)	Change
1	Community of Burrel	School and Non-School	60	59	-1
2	Community of Caruthers	School and Non-School	52	51	-1
3	Central Union School	School	53	52	-1
4	College Park Apartments	Non-School	50	49	-1
5	Community of Conejo	School and Non-School	57	56	-1
6	Fairway Homes at Lemoore Golf Course	Non-School	48	46	-2
7	Community of Helm	School and Non-School	50	49	-1
8	Huron Middle School	School	43	43	0
9	Island Elementary School	School	51	50	-1
10	Community of Lanare	Non-School	60	59	-1
11	Neutra and Akers Elementary Schools	School	60	59	-1
12	Community of Riverdale	School and Non-School	50	49	-1
13	Santa Rosa Rancheria homes near Tachi Casino	Non-School	49	45	-4
14	Community of Stratford	School and Non-School	50	49	-1
15	West Hills College	School	58	57	-1

Notes: The type point of interest refers to the type of receptor used for the analyses. School is used for classroom criteria, non-school are points of interest that are surrounded by residential areas and are used for speech interference and sleep disturbance, and worship are churches, synagogues, temples, etc. and are also receptors used for speech interference analyses.

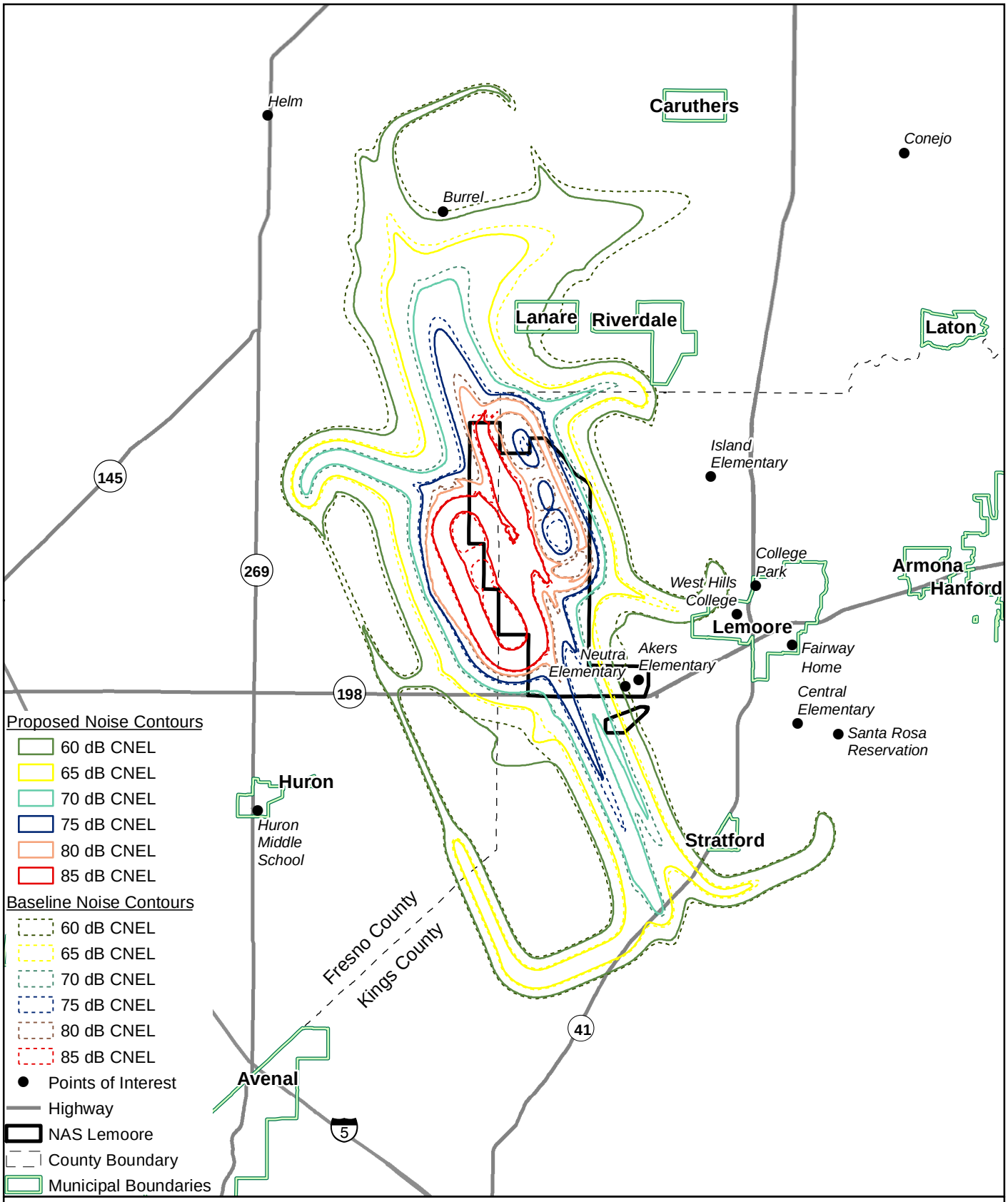


Figure 4.2-4
Baseline and Proposed Noise Contours and Points of Interest at NAS Lemoore under Alternative 1

Source: Wyle 2013

Potential Hearing Loss

Under baseline conditions and Alternative 1, the number of nighttime operations well exceeds the 5 percent maximum recommended for potential hearing loss calculations at 12 percent. Similar to baseline conditions, no people would be exposed to an $L_{eq}(24)$ of 80 dB or higher under this alternative. Therefore, there is no population at risk for potential hearing loss.

Speech Interference and Classroom Criteria

In terms of speech interference, **Table 4.2-20** shows the average daily/evening indoor (7:00 a.m. to 10:00 p.m.) events per hour for receptors that generally would experience indoor L_{max} of at least 50 dB with windows closed and open. Under Alternative 1 at NAS Lemoore, the number of speech interfering events across all receptors would range from 0 to 3 and 0 to 5 events per hour for windows closed and open, respectively.

Table 4.2-20. Proposed Indoor Speech Interference at Representative Locations at NAS Lemoore under Alternative 1 (2028)

Receptor	Average Daily/Evening Indoor Events per Hour (7 a.m. to 10 p.m.)			
	Windows Closed	Windows Open	Change from Baseline	
			Windows Closed	Windows Open
Community of Burrell	3	4	0	-2
Community of Caruthers	0	3	0	-1
College Park Apartments	0	0	0	0
Community of Conejo	3	3	+1	-1
Fairway Homes at Lemoore Golf Course	0	1	0	0
Community of Helm	0	1	0	0
Community of Lanare	3	5	0	-2
Community of Riverdale	0	3	0	0
Santa Rosa Rancheria homes near Tachi Casino	0	1	0	-1
Community of Stratford	0	1	0	0

Table 4.2-21 presents the classroom criteria levels for the school receptors under Alternative 1, effects at NAS Lemoore. Under this alternative, noise levels and number of events per hour would decrease and two less schools that exceeded classroom criteria under baseline would exceed the classroom criteria with windows open. With windows closed, none of the schools exceed noise levels higher than classroom criteria.

Table 4.2-21. Baseline and Proposed Classroom Criteria for Schools near or on NAS Lemoore under Alternative 1

Receptor	Outdoor Equivalent Noise Level [$L_{eq(9hr)}$] Baseline/Proposed	Indoor Noise Levels and Number of Events Above a Maximum Indoor Noise Level of 50 dB L_{max} Baseline/Proposed			
		Windows Closed		Windows Open	
		dB[$L_{eq(9hr)}$]	Events per hour	dB[$L_{eq(9hr)}$]	Events per hour
Burrell Elementary School*	62/60	37/35	7/4	47*/45*	10/5
Caruthers High School	55/53	30/28	1/0	40*/38	7/4

Table 4.2-21. Baseline and Proposed Classroom Criteria for Schools near or on NAS Lemoore under Alternative 1

Receptor	Outdoor Equivalent Noise Level [$L_{eq(9hr)}$] Baseline/Proposed	Indoor Noise Levels and Number of Events Above a Maximum Indoor Noise Level of 50 dB L_{max} Baseline/Proposed			
		Windows Closed		Windows Open	
		dB[$L_{eq(9hr)}$]	Events per hour	dB[$L_{eq(9hr)}$]	Events per hour
Central Union School	54/51	29/26	0/0	39/37	1/0
Conejo School*	60/57	35/32	6/3	45*/42*	7/3
Helm Elementary School	50/47	25/22	1/0	35/32	1/1
Huron Middle School	38/37	13/12	0/0	23/22	0/0
Island Elementary School	53/49	28/24	1/0	38/34	1/0
Neutra and Akers Elementary Schools	61/58	36/33	3/1	46*/43*	7/2
Riverdale High School	52/50	27/25	0/0	37/35	6/4
Stratford Elementary School	50/47	25/23	0/0	35/32	2/1
West Hills College*	57/54	32/29	0/0	42*/39	1/1

Note: * Exceeds classroom criteria.

Sleep Disturbance

Sleep disturbance can also be a result of aircraft overflight. By determining the probabilities of awakenings this impact can be assessed. **Table 4.2-22** lists the probabilities of awakening events between the hours of 10:00 p.m. to 7:00 a.m. for the same representative residential locations with probability of awakening ranges between 0 percent and 8 percent. Indoor awakening is used to distinguish average night sleeping from awakenings during the day or outdoor activities (i.e., naps in a hammock or tent camping).

Table 4.2-22. Proposed Indoor Sleep Disturbance at Representative Locations near NAS Lemoore under Alternative 1

Receptor	Baseline (2015)		Proposed Average Nightly (10 p.m. - 7 a.m.) Probability of Awakening (2028)			
			Windows Closed		Windows Open	
	Windows Closed	Windows Open	Probability of Awakening	Change from Baseline	Probability of Awakening	Change from Baseline
Community of Burrell	3%	6%	2%	-1%	4%	2%
Community of Caruthers	0	1%	0%	0%	0%	0%
College Park Apartments	0	2%	0%	0%	2%	0%
Community of Conejo	1%	2%	0%	-1%	0%	0%
Fairway Homes at Lemoore Golf Course	1%	2%	0%	-1%	1%	0%
Community of Helm	1%	3%	1%	0%	2%	1%
Community of Lanare	5%	9%	4%	-1%	8%	4%
Community of Riverdale	0%	2%	1%	1%	3%	1%
Santa Rosa Rancheria homes near Tachi Casino	4%	7%	1%	-3%	1%	1%
Community of Stratford	2%	8%	2%	0%	4%	2%

Conclusion

Overall, Alternative 1 would not have significant noise impacts at NAS Lemoore because there would be a decrease in the number of annual aircraft operations resulting in decreases in the acreage and population affected by noise.

4.2.3 Environmental Consequences for the No Action Alternative

Under the No Action Alternative, F-35C aircraft would not be based at NAF El Centro and associated construction and operations would not occur. The number of aircraft operations for the baseline year of 2015 as described in Table 4.1-2 would not change as a result of F-35C operations. Baseline noise conditions at the NAF El Centro airfield described in the Affected Environment, Section 4.2.1 would not change under the No Action Alternative. Therefore, there would be no changes at NAF El Centro due to noise impacts as a result of the No Action Alternative. Changes to noise levels in NAF El Centro SUA and MTRs from US Marine Corps F-35 operations are analyzed in the Final US Marine Corps F-35B West Coast Basing EIS (DoN 2010a) (please see Section 1.4, *Relevant Environmental Documents)*.

4.3 AIR QUALITY

To determine potential impacts to regional air quality under Alternative 1, NAF El Centro baseline conditions were compared to those projected for the proposed increase in F-35C aircraft and associated engine maintenance runup operations, as well as commuter vehicular emissions associated with personnel employed at NAF El Centro to support aircraft operations and emissions associated with proposed facility construction activities. Air quality impacts were reviewed for significance in light of federal, state, and local air pollution standards and regulations. For analysis of the proposed action emissions, if they were projected to exceed a threshold requiring a conformity determination in the Imperial County Air Pollution Control District (i.e., 100 tons per year of VOCs, NOx, or $PM_{2.5}$; or 70 tons per year of PM_{10}), then further analysis was conducted to assess impact significance. If emissions conform to the approved State Implementation Plan (SIP), then impacts would be less than significant. For criteria pollutants that the Imperial County Air Pollution Control District (APCD) is in attainment of the National Ambient Air Quality Standards (NAAQS), the analysis evaluated the magnitude and location of project emissions to determine if they would be expected to cause a significant adverse impact to air quality.

All of the criteria pollutants and their precursors, except lead, that are generated by the proposed action are considered in this analysis. Precursors for ozone (O_3) are nitrogen oxides (NOx) and volatile organic compounds (VOCs). Precursors for particulate matter 2.5 microns in diameter or less ($PM_{2.5}$) are sulfur dioxide (SO_2), NOx, VOCs, and ammonia. Airborne emissions of lead are not included because there are no known significant lead emission sources associated with the proposed action. The precursor ammonia is not included because it is not a significant contributor to $PM_{2.5}$ as related to the proposed action.

In accordance with General Conformity requirements for maintenance and nonattainment areas, emissions associated with the proposed action were calculated and evaluated against the *de minimis* thresholds for each applicable pollutant: VOCs, NOx, SO_2, particulate matter with an aerodynamic diameter of 2.5 microns or less ($PM_{2.5}$), and particulate matter with an aerodynamic diameter of 10

microns or less (PM_{10}). If emissions were projected to exceed a *de minimis* threshold, then further analysis in the form of a conformity determination was conducted to assess impact significance.

4.3.1 Affected Environment

The affected environment for the air quality analysis at NAF El Centro is the Imperial County APCD. The Imperial County APCD is located in the Southeast Desert Interstate Air Quality Control Region (40 C.F.R. 81.167), also known as the Southeast Desert Air Basin as named by the California Air Resources Board (CARB). In 1996, the CARB further split the Southeast Desert Basin into the Mojave Desert Air Basin and the Salton Sea Basin (California Air Pollution Control Officers Association 2011).

Imperial County extends over 4,500 square miles, bordering Mexico, Riverside County, San Diego County, and the State of Arizona. Terrain elevation within the County varies from as low as 230 ft below sea level at the Salton Sea to more than 2,800 ft above sea level along the mountain summits in the western portion of the county. The desert climate includes hot summers and mild winters, gusty winds frequently occurring in the spring and very little rainfall. The combination of the flat terrain of the valley and the strong diurnal temperature differentials created by solar heating produce moderate winds and deep thermal convection. During August, it is not uncommon for daytime temperatures to exceed 110 degrees Fahrenheit. The sun shines, on average, more in Imperial County than anywhere else in the continental United States (US). Prevailing winds are from the west and northwest seasonally from fall through spring. These originating prevailing winds are known to be from the Los Angeles area to the west. Imperial County experiences surface inversions almost every day of the year. Due to strong surface heating, these inversions are usually broken, allowing pollutants to be more easily dispersed.

On December 3, 2009 the USEPA ruled that Imperial County, which had been a “moderate” 8-hour O_3 non-attainment area, had attained the 1997 8-hour NAAQS for O_3. This determination effectively suspended requirements that the state submit a variety of related planning documents as long as Imperial County continues to stay in attainment with the 1997 8-hour O_3 NAAQS (USEPA 2009). However, this determination does not constitute a redesignation to attainment under CAA section 107(d)(3). Formal redesignation will not occur until such time as USEPA determines that Imperial County meets the CAA requirements for attainment redesignation. To meet these CAA requirements, Imperial County submitted a 2009 8-Hour O_3 Modified Air Quality Management Plan (AQMP) for USEPA approval. This Modified AQMP was formally adopted by the Imperial County APCD on July 13, 2010, and applies to VOC and NOx emission sources located within Imperial County. Currently, Imperial County is awaiting USEPA’s approval of this plan (CARB 2010).

On April 30, 2012, the USEPA issued final designations for the 2008 Ground-Level O_3 Standards for Region 9, which includes Imperial County. Imperial County is designated “Marginal” for the 2008 O_3 Standards (USEPA 2012a). The 2008 standard final rule was signed March 12, 2008 for the 8-hour standard of 0.075 parts per million (ppm). The 1997 O_3 standard and related implementation rules remain in place (USEPA 2012b).

In September 2006, the USEPA reduced the national 24-hour $PM_{2.5}$ standard to 35 micrograms per cubic meter ($\mu g/m^3$). The USEPA issued final designations for this standard which became effective in December 2009. The City of Calexico, on the United States-Mexico border in southern Imperial County,

and the surrounding area was designated as nonattainment for the 24-hour standard. $PM_{2.5}$ Attainment Plans were due to USEPA in December 2012. Urbanized portions of Imperial County are in nonattainment, but more rural regions of the county remain in attainment of the 24-hour $PM_{2.5}$ standard.

On December 14, 2012, the USEPA reduced the national annual $PM_{2.5}$ primary standard from 15 $\mu g/m^3$ to 12 $\mu g/m^3$. The USEPA anticipates making initial attainment/nonattainment designations by December 2014, with those designations likely becoming effective in early 2015 (USEPA 2012a).

The Imperial County APCD currently maintains the following NAAQS designations: nonattainment for 24-Hour $PM_{2.5}$, moderate nonattainment for 8-hour O_3 (1997), marginal for 2008 ground-level O_3 standards, and serious nonattainment for PM_{10} (USEPA 2012b). The applicable General Conformity Rule *de minimis* levels for the Imperial County APCD are listed in **Table 4.3-1.**

Table 4.3-1. Applicable General Conformity Rule de minimis Levels (tons/year)

VOCs	*CO*	*NOx*	*SO_2*	*PM_{10}*	*$PM_{2.5}$*
100	NA*	100	100	70	100

Source: 40 C.F.R. 93.153.
Note: * Not Applicable.

Mobile source emissions are the primary air quality issue associated with Alternative 1. Alternative 1 includes construction of new facilities and personnel transitions, as well as changes to the transient aircraft operations. There are no permanently assigned aircraft at NAF El Centro and transient aircraft utilizing the airfield vary substantially each day. It has been assumed that current operations would not substantially change through 2015. Therefore, 2015 airfield operations and commuting personnel represent the baseline for airfield operations and commuter vehicle emissions.

The baseline aircraft operations at NAF El Centro consist of operations associated with transient aircraft. These include FA-18C/D (both Blue Angels aircraft and other transient squadrons), FA-18E/F, T-45, AH/UH-1, H-46, AV-8B, C-130, EA-6B, and UH-60 rotary-wing aircraft (helicopters). Baseline emissions are based on an average of 65,800 operations annually. In addition to baseline flight operations, the baseline air emissions captures ground support equipment (GSE) operations, Government-owned vehicles (GOVs) assigned to the squadrons, and commuter vehicle emissions associated with personnel employed in airfield operation activities at NAF El Centro. Aircraft operations, construction, and commuter vehicle emissions are evaluated against the General Conformity Rule *de minimis* thresholds. **Table 4.3-2** presents baseline airfield operations and commuter vehicle emissions.

Table 4.3-2. Baseline Mobile Source Emissions at NAF El Centro

Airfield Operation	*Air Pollutant Emissions (tons/year)*					
	VOCs	*CO*	*NOx*	*SO_2*	*PM_{10}*	*$PM_{2.5}$*
FA-18C/D	36.31	101.42	15.84	2.36	11.55	11.21
FA-18C/D (Blue Angels)	10.45	29.24	13.14	1.11	4.28	4.15
Engine Maintenance Runups	4.97	12.08	0.37	0.14	1.22	1.18
FA-18E/F	116.40	658.99	60.76	6.73	31.66	30.71
AV-8B	48.51	293.35	95.30	12.94	50.22	48.72
EA-6B	6.75	14.41	3.41	0.74	7.88	7.64

Table 4.3-2. Baseline Mobile Source Emissions at NAF El Centro

Airfield Operation	*Air Pollutant Emissions (tons/year)*					
	VOCs	*CO*	*NOx*	*SO_2*	*PM_{10}*	*$PM_{2.5}$*
T-45	5.95	34.02	7.21	1.53	7.39	7.17
C-130	0.83	1.60	1.87	0.32	0.98	0.95
T-6	0.16	0.51	0.01	0.01	0.00	0.00
MV-22	0.01	0.61	1.56	0.24	0.27	0.26
Helicopters (CH-53, UH-60. AH/UH-1)	0.22	1.67	0.47	0.11	0.30	0.29
Other Military (RNAF) (FA-18C/D)	11.59	32.37	5.05	0.75	3.69	3.58
Subtotal Aircraft Operations	**242.14**	**1,180.26**	**204.98**	**26.97**	**119.43**	**115.84**
GSE	0.09	2.61	2.59	0.00	0.01	0.01
GOVs	0.56	4.71	1.70	0.01	0.11	0.08
Total Airfield Operations	**242.79**	**1,187.58**	**209.28**	**26.98**	**119.55**	**115.93**
Commuter Vehicles	1.39	12.70	1.26	0.02	0.19	0.12
Grand Total	**244.18**	**1,200.28**	**210.55**	**27.01**	**119.74**	**116.06**

Stationary sources currently at NAF El Centro include abrasive blasting units, arresting gear engines, boilers and hot water heaters, generators, paint booths, fuel storage, fuel transfer equipment, hydroblasting units, welding equipment, and an on-site wastewater treatment plant (WWTP) (Alliance Compliance Group Joint Venture 2010). Because it is assumed that operations do not substantially change in future years, the emissions from stationary sources are also assumed to not change and so represent baseline emissions, which are presented in **Table 4.3-3**.

Table 4.3-3. Baseline Stationary Source Air Emissions at NAF El Centro

Pollutant	*Total Emissions (tons/year)*
CO	0.80
NOx	1.90
PM_{10}	0.14
SO_x	0.02
VOCs	4.67

Source: Alliance Compliance Group Joint Venture 2010.

4.3.2 Environmental Consequences for Alternative 1

Under Alternative 1, potential impacts to air quality could occur from proposed F-35C aircraft operations, the construction and operation of new facilities, and personnel changes. Potential impacts from homebasing at NAF El Centro are discussed in the next two sections in terms of effects at NAF El Centro and NAS Lemoore.

4.3.2.1 Alternative 1 – NAF El Centro Homebasing, Effects at NAF El Centro

Construction of required infrastructure at NAF El Centro under Alternative 1 would begin in 2015 and the last project would start around 2025. The basing of F-35C aircraft would begin in 2016. By 2027/2028, all aircraft relocations and transitions associated with Alternative 1 would be complete, along with associated personnel changes required to support aircraft operations. There are likely to be

arresting gear engines, a WWTP, various heating and cooling equipment, back-up power emergency generators, fuel storage tanks, fuel transfer, and other sources. At this time, there is no specific information available regarding the number or size of these sources that would be required. Any boilers, generators or other equipment subject to permitting or registration would have applications submitted to the Imperial County APCD prior to construction.

Stationary Sources

Changes in stationary source emissions associated with implementation of Alternative 1 at NAF El Centro could include arresting gear engines, a WWTP, various heating and cooling equipment, back-up power emergency generators, fuel storage tanks, fuel transfer, and other sources as listed in Section 4.3.1, *Affected Environment*. The increase in operations of carrier-based aircraft including the F-35C would increase operation of the arresting gear. The WWTP emissions would vary from baseline based on the technology chosen for treatment and the daily WWTP flow. Emissions from stationary sources like boilers and hot water heaters would be expected to change from baseline. However, these emissions are not quantified because limited information is currently available. Operation of new or modified stationary sources would be in accordance with CARB and Imperial County APCD rules including, but not limited to APCD Rule 200, *Permits Required*; Rule 400, *Fuel Burning Equipment – Oxides of Nitrogen*; Rule 414, *Storage of Reactive Organic Compound Liquids*; and Rule 425, *Aerospace Coating Operations*. NAF El Centro would coordinate with the Imperial County APCD to obtain all appropriate permits or registrations prior to operation of any new stationary sources.

Construction and Commuter Vehicle Emissions

Approximately 6.6 million square feet (ft^2) of construction, modification and expansion projects would be required to support all 100 F-35C aircraft by 2028. In addition to construction, approximately 189,000 ft^2 of buildings and infrastructure would be demolished to accommodate the new facilities. Proposed demolition and construction activities would be spread out over multiple years. The facilities proposed for construction and demolition are listed in **Tables 2.7-2** and **2.7-3,** respectively. For the purposes of estimating air emissions from mobile sources related to demolition and construction, it is assumed that construction of the facilities is substantially completed within the calendar year scheduled as shown in **Tables 2.7-2** and **2.7-3**.

Emissions from construction activities include temporary emissions from off-road heavy diesel-powered construction equipment, architectural coatings, and fugitive dust emissions during construction. It is estimated that BMPs and California-required vehicle retrofits and emissions system modifications would be implemented by the contractors. Additional emissions are estimated from the temporary increase in construction work commuters to NAF El Centro to complete the construction.

Emission estimate calculations for construction activities utilize the California Emissions Estimator Model (California Emissions Estimator Model [CalEEMod] 2011). For construction scenarios for which CalEEMod does not have an industry standard or activity of similar type and complexity, calculations were completed using emissions factors from CalEEMod and include the CARB OFFROAD 2007 model. For additional information on the methodology utilized to calculate emissions from construction equipment and vehicles used for commuting construction and staff workers, please refer to Appendix D.

Airfield Operations

Airfield operational emissions include:

- F-35C operations within the airfield and surrounding airspace environs under the 3,000 ft AGL mixing height. For NAF El Centro this includes all transient aircraft operations as well.
- GSE operations.
- Fleet vehicles used for squadron operations and for commuting on the installation from base housing.

Data used to calculate emissions from aircraft operations were obtained from NAF El Centro personnel, the Navy Aircraft Environmental Support Office (AESO), and subcontractors including Wyle (Wyle 2012a, b, c). Information on GSE was obtained from NAF El Centro personnel (NAF El Centro 2011) and emission factors for GSE were derived from Appendix D: Off-Road Simulation Model and Summary of Off-road Emissions Inventory Update (CARB 2010). Fleet vehicle emissions were calculated using the South Coast Air Quality Management District's (SCAQMD) California Environmental Quality Act spreadsheets (SCAQMD 2009), which were developed from CARB's EMFAC 2007 model.

Operational, construction and commuter emissions associated with the proposed action are presented for each year or range of years when changes occur. In-depth emission calculations are provided in Appendix D.

The proposed basing of F-35C aircraft would begin in 2016 with six Fleet aircraft. The total number of F-35C aircraft would remain less than 20 until 2021, at which time the total number would gradually increase to the proposed 100 total aircraft in 2027/2028. Based F-35C aircraft operations would increase in direct proportion to the number of planes at NAF El Centro for that year. In addition to the based F-35C, there would be additional transient operations of additional F-35C, as well as the F-35B variant. NAF El Centro would continue to serve as the winter training ground for the Blue Angels, and also provide facilities for various transient aircraft and helicopters as described in Chapter 2. The number of transient operations would be adjusted up or down depending on the type of aircraft and based on the estimate requirements and air space availability in 2028. Emissions estimates for each year assume a steady rate increase or decrease from baseline operations to 2028 operations. Estimated emissions at NAF El Centro under Alternative 1 are presented in **Table 4.3-4**.

Table 4.3-4. Estimated Annual Emissions at NAF El Centro under Alternative 1

Year	*Air Pollutant Emissions (tons/year)*					
	VOC	*CO*	*NOx*	*SO_2*	*PM_{10}*	*$PM_{2.5}$*
Baseline	244.18	1,200.28	210.55	27.01	119.74	116.06
2015	262.62	1,330.36	246.69	27.39	123.53	118.99
2015 Net Change	**18.44**	**130.08**	**36.15**	**0.38**	**3.79**	**2.93**
2016	243.46	1,215.97	233.95	29.73	119.68	106.32
2016 Net Change	-0.73	**15.69**	**23.41**	**2.72**	**-0.06**	**-9.74**
2017	196.77	956.26	153.27	18.34	64.02	52.33
2017 Net Change	-47.42	**-244.02**	**-57.28**	**-8.67**	**-55.72**	**-63.73**
2018	188.27	911.86	148.85	17.84	61.67	59.73
2018 Net Change	-55.92	**-288.43**	**-61.69**	**-9.17**	**-58.06**	**-56.33**
2019	190.88	930.35	147.92	15.53	62.35	59.57
2019 Net Change	-53.31	**-269.93**	**-62.63**	**-11.48**	**-57.39**	**-56.48**
2020	171.05	821.53	141.20	16.92	57.02	55.23
2020 Net Change	-73.13	**-378.75**	**-69.34**	**-10.08**	**-62.72**	**-60.83**
2021	166.43	896.60	356.09	39.57	57.60	55.79
2021 Net Change	-77.76	**-303.68**	**145.55**	**12.57**	**-62.14**	**-60.26**
2022	166.01	924.95	412.03	44.04	56.74	54.70
2022 Net Change	-78.18	**-275.33**	**201.48**	**17.03**	**-62.99**	**-61.36**
2023	155.38	936.46	535.09	58.95	56.00	54.14
2023 Net Change	-88.80	**-263.83**	**324.54**	**31.94**	**-63.74**	**-61.92**
2024	148.16	934.23	596.20	65.75	54.74	52.91
2024 Net Change	-96.03	**-266.05**	**385.65**	**38.74**	**-65.00**	**-63.14**
2025	140.70	934.64	659.75	73.04	53.23	51.50
2025 Net Change	-103.48	**-265.64**	**449.21**	**46.03**	**-66.51**	**-64.56**
2026	133.89	962.27	762.78	85.02	52.46	50.73
2026 Net Change	**-110.29**	**-238.01**	**552.23**	**58.02**	**-67.28**	**-65.33**
2027-2028	**126.05**	938.11	788.82	87.95	50.60	48.92
2027-2028 Net Change	-118.14	**-262.17**	**578.27**	**60.94**	**-69.13**	**-67.13**
de minimis Threshold	100	NA*	100	100	70	100
Exceed *de minimis*?	**No**	**NA**	**Yes**	**No**	**No**	**No**

Note: *NA = Not applicable. *De minimis* thresholds only apply to pollutants for which an area is categorized as either nonattainment or maintenance.

Over the period, operations from FA-18C/D/E/F aircraft are reduced while the F-35-B and -C aircraft begin operations. Additionally, the AV-8 aircraft would be removed from service and the EA-6B replaced with the EA-18G. Because of these changes, overall emissions for some pollutants (VOCs and CO) decrease while emissions for others (NOx, SO_2 and PM) increase. The calculated and compared results indicate that beginning in 2021, the NOx emissions exceed the NOx *de minimis* threshold. As a result, a draft general conformity determination has been prepared for NAF El Centro and can be found in Appendix 2D. The draft general conformity determination has been prepared to demonstrate that NOx emissions from the proposed action would conform to an applicable SIP. The draft general conformity determination document underwent public review and comment, along with the Draft EIS. NAF El Centro has a current growth allowance or "wedge" in the Final 2009 1997 O_3 Air Quality Management Plan for Imperial County that currently allows emissions growth for Military Jet Aircraft Operations up to 2023 (Imperial County APCD 2013). **Table 4.3-5** presents the NOx emissions associated with the proposed F-35C homebasing action airfield operation emissions within the Imperial County APCD for the

first year of the proposed action airfield operations (2016), the first year net emissions exceed the *de minimis* threshold (2021), the furthest year of the applicable SIP's emission budget (2023), and the year of greatest emissions (2028). As shown in the table, the emission allowances are more than sufficient to cover the NOx emissions associated with airfield operation emissions under Alternative 1 of the proposed F-35C homebasing action. The emission allowance for 2023 is shown for the end-state year 2028 to demonstrate that the allowance for the furthest year for which emissions are budgeted remains sufficient for the project emissions.

Table 4.3-5. Annual Conformity-Related Airfield Operation Emissions within the Imperial County APCD under Alternative 1

Annual Emissions	*NOx (tons/year)*
2016 Total Airfield Operations	232.42
2016 SIP Allowance	1,391.90
2021 Total Airfield Operations	354.27
2021 SIP Allowance	1,391.90
2023 Total Airfield Operations	529.68
2023 SIP Allowance	1,391.90
2028 Total Airfield Operations	785.29
2023 SIP Allowance	1,391.90

This growth allowance is intended to cover growth in aircraft emissions as well as engine maintenance runups, squadron GOVs, and GSE. Additionally, construction and commuter vehicle emissions are included in the Imperial County APCD emission inventory. The Imperial County APCD is currently awaiting USEPA approval of the Plan. The Imperial County APCD is committed to working with NAF El Centro and USEPA to include emissions extending beyond 2023 in future SIP revisions.

Conclusion

In summary, the basing of F-35C aircraft at NAF El Centro under Alternative 1 would result in exceedance of the NOx *de minimis* threshold. A Conformity Determination was prepared to further evaluate NOx emissions associated with the proposed action. The results of the Determination conclude that the NOx emissions generated from implementing Alternative 1 of the proposed F-35C homebasing action at NAF El Centro would conform to the SIP upon approval because the net NOx emissions are covered by:

- A Military Jet Increment for airfield operations in the emission inventory,
- Appropriate “On-Road” Mobile Sources in the Air District emission inventory for commuter emissions, and
- Appropriate categories in the Air District emission inventory for construction emissions.

Thus, all of the direct and indirect emissions associated with the proposed action are identified and accounted for in the 2009 Ozone Modified Air Quality Management Plan, which is in the process of being approved by USEPA as part of the California SIP. As a result, emissions from implementing Alternative 1 at NAF El Centro would result in less than significant impacts to air quality.

4.3.2.2 Alternative 1 – NAF El Centro Homebasing, Effects at NAS Lemoore

Although there would be no construction at NAS Lemoore under Alternative 1, homebasing of the F-35C at NAF El Centro would have an effect at NAS Lemoore. FA-18E/F operations would decrease, with a reduction of approximately 22,100 operations annually. The FA-18C/D aircraft would continue to be drawn down at the same tempo as for Alternative 2 and would be completely removed from basing at NAS Lemoore by 2019. There would also be a resultant decrease in commuting staff. **Table 4.3-6** presents the baseline airfield operations emissions, the change in emissions for the first year of airfield operations (2016), and the end state annual emissions in 2027/2028. Airfield emissions decrease yearly to the end state. Detailed calculations can be found in Appendix D.

Table 4.3-6. Estimated Total Emissions at NAS Lemoore under Alternative 1

Year	*Air Pollutant Emissions (tons/year)*					
	VOCs	*CO*	*NOx*	*SO_2*	*PM_{10}*	*$PM_{2.5}$*
Baseline						
Total Emissions	**985.45**	**5,479.34**	**1,152.66**	**153.54**	**427.18**	**414.04**
2016 includes 10 FA-18C/D & 214 FA-18E/F						
Total Emissions	948.50	5,371.48	1,131.03	148.54	412.59	399.89
Net Change	-36.95	-107.86	-21.63	-5.00	-14.59	-14.15
2027-2028 on includes 164 FA-18E/F						
Total Emissions	721.83	4,203.34	914.85	117.12	326.07	315.89
Net Change	-263.62	-1,276.00	-237.81	-36.43	-101.12	-98.15
de minimis Thresholds	10	NA*	10	100	100	100
Exceed *de minimis?*	**No**	**NA**	**No**	**No**	**No**	**No**

Note: *NA = Not applicable. *De minimis* thresholds only apply to pollutants for which an area is categorized as either nonattainment or maintenance.

With the drawdown of the FA-18C/D aircraft and the reduction in FA-18C/D airfield operations, fewer staff would be based at NAS Lemoore. Emissions from implementing Alternative 1 would not exceed *de minimis* thresholds and a Record of Non-Applicability (RONA) has been prepared and can be found in Appendix 2D. Therefore, based on the analysis, the criteria pollutant emissions associated with implementation of Alternative 1 at NAS Lemoore would be exempt from the requirements for conformity, and no further evaluation of conformity is required.

<u>Conclusion</u>

Emissions from implementing Alternative 1 would not exceed *de minimis* thresholds. Emissions of all criteria pollutants would decrease as compared to baseline emissions. Implementing Alternative 1 at NAS Lemoore would have a beneficial effect on regional air quality in the San Joaquin Valley APCD.

4.3.3 Environmental Consequences for the No Action Alternative

Under the No Action Alternative, the proposed action would not be implemented. As a result, existing air quality conditions as described in Section 4.3 would continue.

4.4 SAFETY

4.4.1 Affected Environment

The affected environment for safety includes NAF El Centro, its immediate vicinity, and the SUA in the vicinity of NAF El Centro. This section addresses flight safety, Bird/Animal Aircraft Strike Hazard (BASH), Accident Potential Zones (APZs) and Clear Zones, and explosive safety.

4.4.1.1 Flight Safety

Potential aircraft mishaps are the primary safety concern with regard to military training flights. NAF El Centro maintains detailed emergency and mishap response plans to react to an aircraft accident, should one occur. These plans assign agency responsibilities and prescribe functional activities necessary to react to mishaps, whether on or off the installation. Response would normally occur in two phases. The initial response focuses on rescue, evacuation, fire suppression, safety, elimination of explosive devices, ensuring security of the area, and other actions immediately necessary to prevent loss of life or further property damage. The initial response element usually consists of the Fire Chief, who would normally be the first on-scene commander, fire-fighting and crash-rescue personnel, medical personnel, security police, and crash-recovery personnel. The second phase is the mishap investigation, which involves an array of organizations whose participation would be governed by the circumstances associated with the mishap and actions required to be performed ([Department of Defense] DoD Instruction 6055.07, *Mishap Notification, Investigation, Reporting, and Record Keeping*).

To complement flight training, all Navy pilots use state-of-the-art simulators extensively. Simulator training includes all facets of flight operations and comprehensive emergency procedures, which minimizes risk associated with pilot error. Additionally, highly trained maintenance crews perform inspections on each aircraft in accordance with Navy regulations, and maintenance activities are monitored to ensure that aircraft are equipped to withstand the rigors of operational and training events safely.

4.4.1.2 Bird/Animal Aircraft Strike Hazard

Another major concern with regard to flight safety is BASH. Aircraft may encounter birds at altitudes up to 30,000 ft. However, most birds fly close to the ground. Approximately 90 percent of reported aircraft-wildlife strikes occur on or near airports, when aircraft are below altitudes of 2,000 ft AGL (FAA et al. 2003). Approximately 65 percent of BASH incidents occur in the NAF El Centro airfield environment (NAF El Centro 2012). The Navy BASH program was established to minimize the risk for collisions of birds and aircraft and the subsequent loss of life and property. For airspace used by NAF El Centro aircrews, the risk of bird-aircraft strikes varies throughout the year. As a result, pilots and safety officers continually evaluate BASH potential.

The NAF El Centro BASH plan identifies potential areas of concern and establishes procedures for minimizing the threat of aircraft striking birds and other animals (NAF El Centro 2012). The management strategies covered in this plan include bird avoidance and control through harassment, grounds maintenance, habitat modification, and depredation. The key to this program is to track BASH incidents through reporting. This plan is reviewed and updated annually by the NAF El Centro Safety Officer. Plan

review and update are necessary to ensure adaptive management that facilitates pilot safety and minimizes impacts on bird and other wildlife communities on NAF El Centro.

The NAF El Centro BASH Plan provides a color coded warning system to indicate the relative level of bird/animal hazard condition that can be expected at the airfield. A Red or severe condition signifies heavy concentrations of birds on or immediately adjacent to the runway which present an immediate hazard to flight operations. While flight operations during Red forecasts are not recommended, national defense and local emergency requirements may preclude any flight restrictions as long as the BASH condition is reported to all aircrews. A Yellow or moderate condition indicates that moderate concentrations of birds are in a location that represents a probable hazard to flight operations. Green or low condition signifies sparse bird activity on the airfield and a low probability of hazard to air operations. The forecast is intended for use by aircrews, schedulers, natural resource managers, air traffic controllers, airfield managers, and others in charge of flight safety and natural resource management. It is a tool for managing the hazard of collisions between aircraft and birds at NAF El Centro (NAF El Centro 2012).

During the period from 1981 to 1998, aircraft from NAF El Centro have been involved in 53 recorded bird strikes or an average of 3 bird strikes per year. Most of the BASH incidents involved E-2, FA-18 and F-16 aircraft (NAF El Centro 2000; Zakrajsek and Bissonette 2002). From May 2011 through July 2012, there were 16 reported bird strikes at NAF El Centro; the majority of the incidents involved FA-18 (7 incidents) and T-45 aircraft (5 incidents) (Naval Facilities Engineering Command [NAVFAC] Southwest 2012).

4.4.1.3 Accident Potential Zones and Clear Zones

An accident is more likely to occur in APZ-I than APZ-II, and is more likely to occur in the Clear Zone than in APZ-I or APZ-II. An APZ-II area is designated whenever APZ-I is required. APZs extend from the end of the runway but apply to the predominant arrival and departure flight tracks used by the aircraft. Therefore, if an airfield has more than one predominant flight track to or from the runway, APZs can extend in the direction of each flight track. **Figure 4.4-1** shows the NAF El Centro APZs produced as part of the 2010 AICUZ study (NAF El Centro 2010).

4.4.1.4 Explosive Safety

The ordnance storage and handling facilities at NAF El Centro have designated Explosive Safety Quantity Distance (ESQD) arcs to protect inhabitable areas. All current NAF El Centro ESQDs are in compliance with the approved requirements and permissible storage capacities. **Figure 4.4-1** shows the ESQD arcs at NAF El Centro.

4.4.2 Environmental Consequences for Alternative 1

Under Alternative 1, potential impacts to safety could occur from proposed F-35C aircraft operations. Potential impacts from homebasing at NAF El Centro are discussed in the next two sections in terms of effects at NAF El Centro and effects at NAS Lemoore.

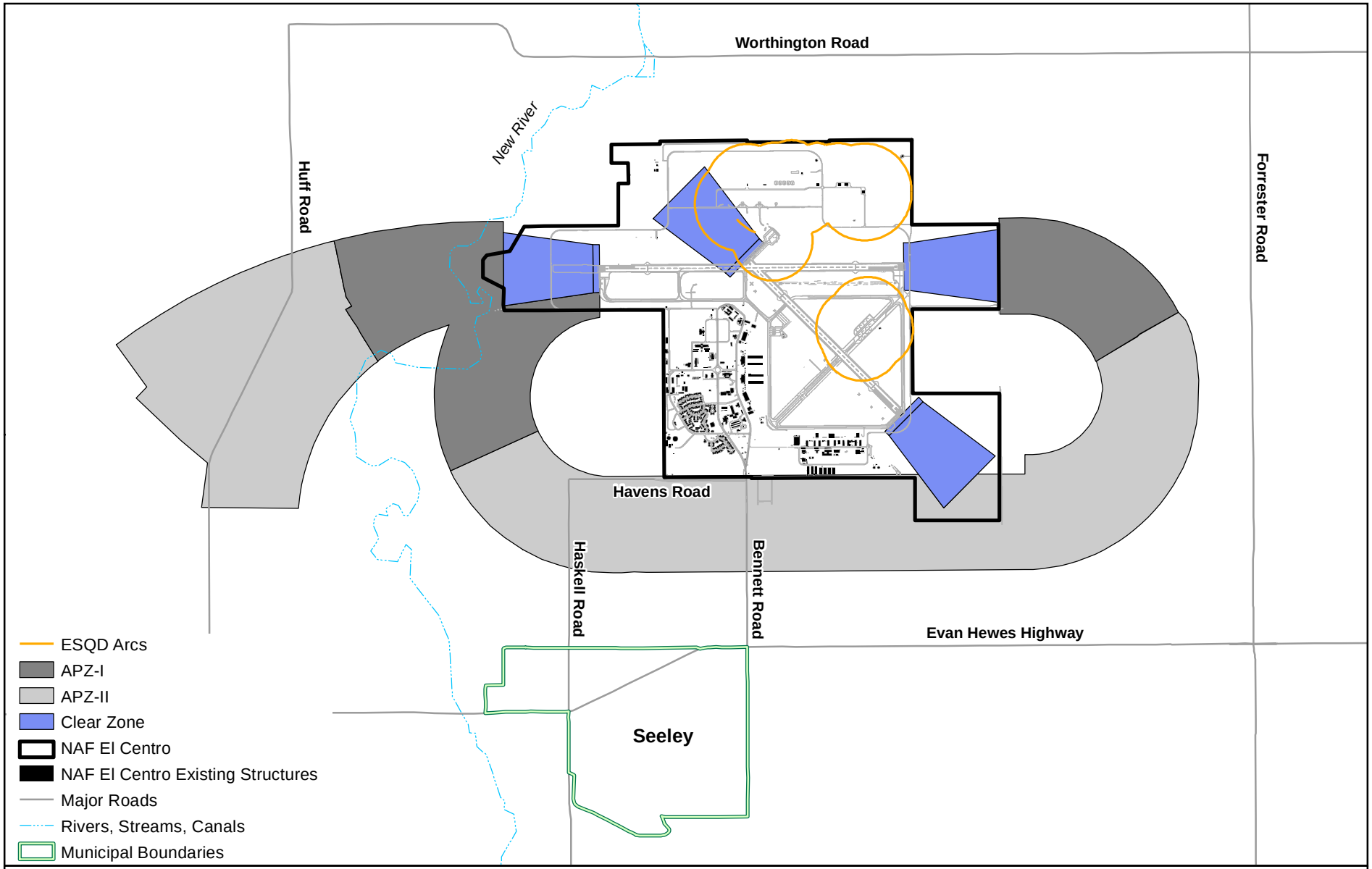


Figure 4.4-1
Existing Clear Zones, APZs, and ESQD Arcs at NAF El Centro

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Source: NAVFAC SW 2011

4.4.2.1 Alternative 1 – NAF El Centro Homebasing, Effects at NAF El Centro

Flight Safety

It is difficult to project future safety/mishap rates for any new aircraft. Since the proposed action involves a number of legacy aircraft being replaced over time by newer aircraft, there is some uncertainty about what mishap rates are to be expected. Modeling, simulation, and ground tests reduce the uncertainties of flight testing, and the subsequent flight-test program includes efforts to ensure flight safety and to reduce risks associated with the operation of new aircraft. In all cases, each new aircraft type will meet all required standards prior to certification. As of October 2013, all three variants of the F-35 had executed more than 10,000 flight operations without a serious in-flight mishap (Lockheed Martin 2013).

In all cases, the DoD maximizes the use of lessons learned and current technology to minimize the chances of aircraft loss. Throughout the years, several technologies have been engineered to reduce mishap rates. These include, but are not limited to, advancements such as: 1) advanced warnings to prevent controlled flight into terrain and collision avoidance with other aircraft; 2) data recorders that ensure the DoD services learn from each and every mishap; and 3) back-up and redundant systems that ensure the aircraft are controllable and can be landed with system failures and malfunctions. These advancements and upgrades applied to legacy aircraft have been designed into the F-35C.

The F-35C is a new aircraft and historical trends show that mishaps of all types decrease the longer an aircraft is operational as flight crews and maintenance personnel learn more about the aircraft's capabilities and limitations. The mishap rate is expected to be comparable with a similarly sized aircraft with a similar mission. F-35C improved electronics and maintenance practices are expected to improve safety. In an effort to reduce the most common mishap cause, pilot error, the F-35 program is built around extensive, high fidelity simulator training. The sophistication of the F-35 simulators will allow for a wide range of training, including most facets of flight operations and comprehensive emergency procedures, making pilots better prepared to succeed in the aircraft.

Although the F-35C is a new aircraft, the single engine that powers it is a compilation product of 30 years of engineering, lessons learned from previous single aircraft engines with a similar core, and tens of thousands of hours of operational use. The propulsion system design includes a dedicated system safety program with more stringent limits than legacy engines. The F-35C engine safety program focuses on the major contributors of what previously caused the loss of an aircraft and provides redundancies in case of control system failures. Additionally, this program allows for safe landing of the aircraft even with system failures. Throughout the design and testing process, the safety initiatives took the previous Best Practices for single engine safety and built upon them to promote flight safety progress. Examples of design characteristics that are damage tolerant and enhance safety include a dual wall engine liner, a fan blade containment shell, and a shaft monitor for vibration, torque, and alignment.

Under Alternative 1, a new 9,500-ft runway would be constructed parallel to the primary runway. The western portion of the primary runway would be extended (see **Figure 2-5)**. All existing flight safety protocols would continue to be implemented for operations at the new runway.

Under Alternative 1, there would be an increase of 99,400 aircraft operations at the NAF El Centro airfield. There would be a net increase of 2,209 Navy aircraft operations in local SUA and 213 operations in MTRs in the vicinity of NAF El Centro. However, this increase in operations is not anticipated to result in significant impacts to safety at the NAF El Centro airfield or SUA. All current aviation, range, maintenance, and training safety and operational policies and procedures, verified by command inspections would continue to be followed for every aircraft operation.

The introduction of F-35C would not introduce any new types of activity within the NAF El Centro airfield. All current training regulations and procedures would be updated to reflect F-35C specific rules, and pilots would continue to adhere to training policies. NAF El Centro airfield safety conditions would be similar to existing conditions. No significant safety impacts from F-35C operational training actions would be expected for operations at NAF El Centro or within SUA.

Bird/Animal Aircraft Strike Hazard

Under Alternative 1, there would be an increase of 99,400 aircraft operations at the NAF El Centro airfield. This increase in operations would also result in an increase in the BASH potential. This increase in BASH potential would be mitigated by continued adherence to the comprehensive procedures used at NAF El Centro to minimize incidences of bird/animal-aircraft strikes (NAF El Centro 2012). For example, BASH risk can increase during seasonal migration patterns. Special briefings are provided to Navy pilots whenever there is an increased BASH potential. Also, limits may be placed on low altitude flight and some types of training (e.g., multiple approaches, closed pattern work) at the airfield and in SUA during periods of increased BASH potential.

Accident Potential Zones and Clear Zones

Under Alternative 1, a new runway would be constructed and the existing primary runway would be extended. As a result, there would be changes to Clear Zones and APZs. Proposed Clear Zones are shown on **Figure 2-10**. Proposed construction, renovation, and infrastructure improvement projects related to the proposed action would comply with military airfield safety clearances below aircraft arrival and departure flight tracks and surrounding the airfield. New construction would be sited so as not to be an obstruction to airspace. Therefore, construction activity would not result in any greater safety risk or obstructions to navigation.

Explosive Safety

Under Alternative 1, there would be an increase of 99,400 aircraft operations and a corresponding increase in the types and amount of ordnance required to complete training missions. No new types of ammunition or ordnance would be expected with the arrival of the F-35C.

Several existing ordnance storage facilities near the location of the proposed runway would no longer be used for ordnance storage. As a result, the ESQD arcs associated with these existing facilities would not be needed. New ordnance storage facilities would be constructed and new ESQD arcs would be developed during the planning of the new facilities to account for appropriate safety distances.

The ESQD arcs associated with the existing and proposed ordnance storage facilities would change due to the construction of the new runway. However, explosive safety activities and procedures would continue to be followed and would not result in any greater risk to ground safety or explosive safety.

Conclusion

Overall, as discussed above, implementation of Alternative 1 at NAF El Centro would not result in significant impacts to safety from increased aircraft operations, construction of a new runway, extension of the existing runway, and changes in the position of Clear Zones, APZs, and ESQD arcs. Extensive use of flight simulators would minimize the risk associated with aircraft mishaps due to pilot error. Increased aircraft operations would result in increased BASH potential. However, limits may be placed on low altitude flights and pilots would have special briefings during periods of increased BASH potential.

4.4.2.2 Alternative 1 – NAF El Centro Homebasing, Effects at NAS Lemoore

Under Alternative 1, aircraft operations at NAS Lemoore would decrease by 33,600 annual operations. This decrease in operations would not affect safety at NAS Lemoore. Please see Section 5.4.1, *Affected Environment* for a description of safety at NAS Lemoore.

4.4.3 Environmental Consequences for the No Action Alternative

Under the No Action Alternative, the proposed action would not be implemented and operations at NAF El Centro would continue at current levels. All regulations and plans that pertain to runways, APZs, mishaps, BASH and other flight safety considerations would continue to be followed under the No Action Alternative. There would be no change to air/ground safety risks at NAF El Centro.

4.5 LAND USE

4.5.1 Affected Environment

The affected environment for land use includes NAF El Centro and portions of Imperial County, the City of Imperial, the City of El Centro, and the unincorporated community of Seeley. This section addresses NAF El Centro land use, local and regional land use, and land use and the noise environment.

4.5.1.1 NAF El Centro Land Use

Land uses within the installation are predominantly for military operational and training purposes and include operations, mission support, and housing directly related to the Navy, as well as outleased agricultural fields. The operations area of the installation includes two operational runways, aircraft parking aprons, a fueling station, maintenance hangars, a helicopter pad, ground support equipment, supply buildings, and a fire station. The installation has no permanently based tactical aircraft but serves as a support facility for air training and as the winter training location for the Blue Angels Flight Demonstration Squadron. Mission Support includes public works, maintenance, ordnance storage, and command and control. The housing area includes family and bachelor units, recreation, and community support services (NAF El Centro 2005). **Figure 4.5-1** depicts existing land uses within NAF El Centro.

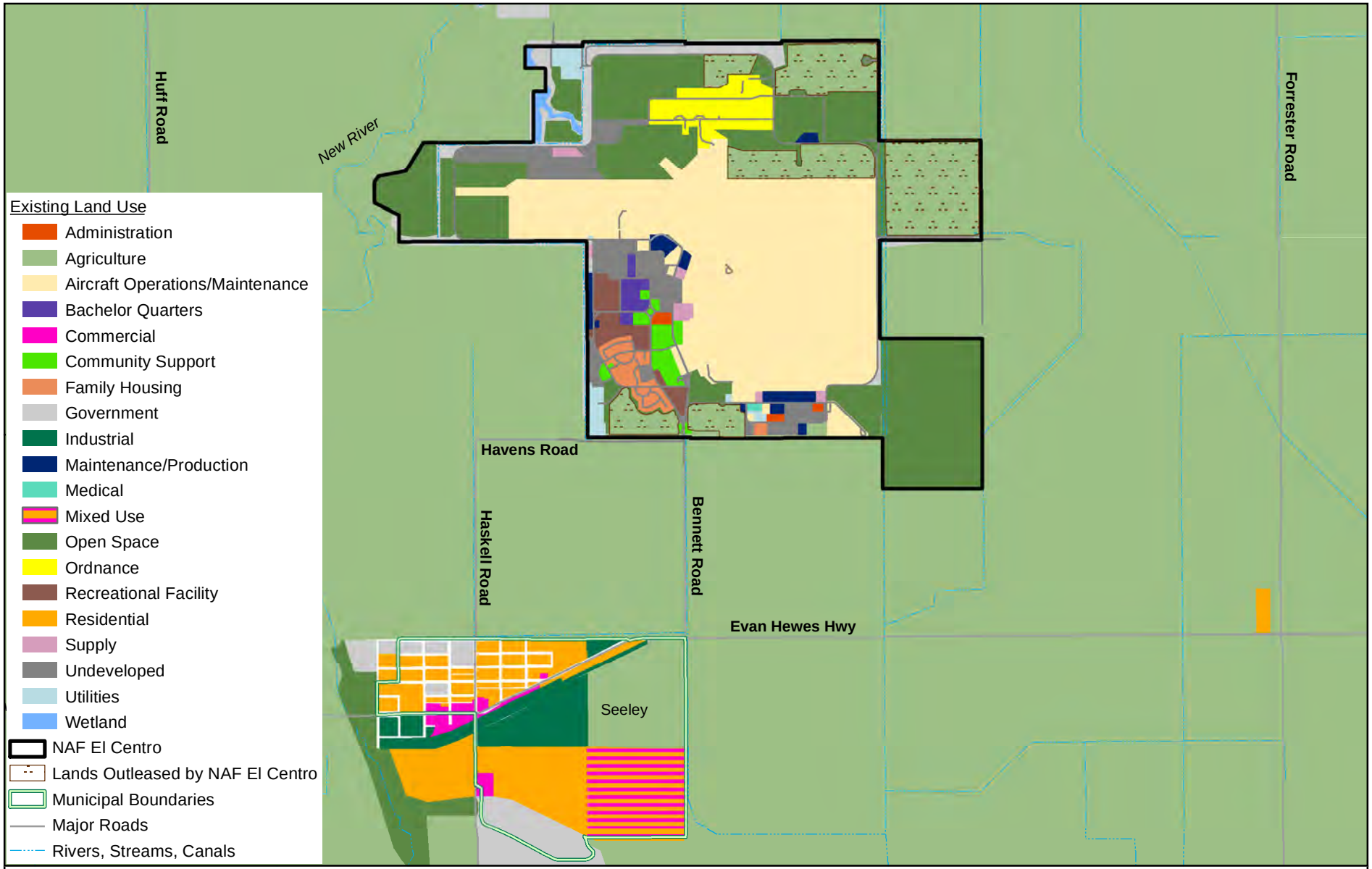

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Figure 4.5-1
Existing Land Use at NAF El Centro and Seeley

Source: Tierra Data 2011

Approximately 1,105 acres of the installation are outleased for agricultural purposes on a 5-year term. Crops produced on these lands include alfalfa and Bermuda grass (DoN 2001a). Crops are irrigated through a system of canals that crisscross the region. The majority of land surrounding NAF El Centro is currently in agricultural use, and this creates a buffer between the installation and outside communities (**Figure 4.5-2**). The cities of Imperial and El Centro are located approximately 7 miles to the east of NAF El Centro, and the community of Seeley is located less than 1.5 miles to the south.

Development within and adjacent to NAF El Centro is guided and controlled by the following Navy policies and plans:

- Activity Overview Plan, NAF El Centro (NAF El Centro 2005)
- AICUZ Study Update, NAF El Centro (NAF El Centro 2010)
- Integrated Natural Resources Management Plan (INRMP), NAF El Centro (DoN 2001a)

Additionally, while not subject to the following municipal and county plans, NAF El Centro conducts its activities in accordance with such plans to the extent practicable:

- City of El Centro General Plan (City of El Centro 2004)
- City of Imperial General Plan (City of Imperial 1992)
- Imperial County General Plan (Imperial County 2008)
- Seeley Urban Area Plan (Imperial County 1994)

<u>2005 Activity Overview Plan</u>

The Activity Overview Plan was developed to provide guidance for efficient use of existing resources and development of future facilities for the execution of the air mission at NAF El Centro. The plan provides long-range guidance for future construction and demolition projects and for infrastructure and basing actions (NAF El Centro 2005). The Activity Overview Plan indicates that functions associated with operations and training activities are the largest land uses at the airfield. This includes the runways, helicopter pad, air traffic control tower, parking aprons, hangars, and aircraft safety zones (NAF El Centro 2005).

As part of the mission of the airfield, adjacent land uses are monitored to prevent incompatible development from negatively impacting military activities at the installation (encroachment). NAF El Centro is aided by Imperial County zoning ordinances that restrict land use surrounding the entire installation. The Navy stresses dialogue and interaction – but may also potentially take action such as acquiring land – in its efforts to maintain compatible land use practices. Other recommendations identified by the 2005 Activity Overview Plan involve the demolition of obsolete buildings, changes to airfield configuration, construction of adequate housing facilities, and consolidation of redundant functions. The Activity Overview Plan identifies future airfield expansion areas, including a new runway configuration, replacement of four World War II-era hangars, as well as construction of a combined Air Operations Complex (NAF El Centro 2005).

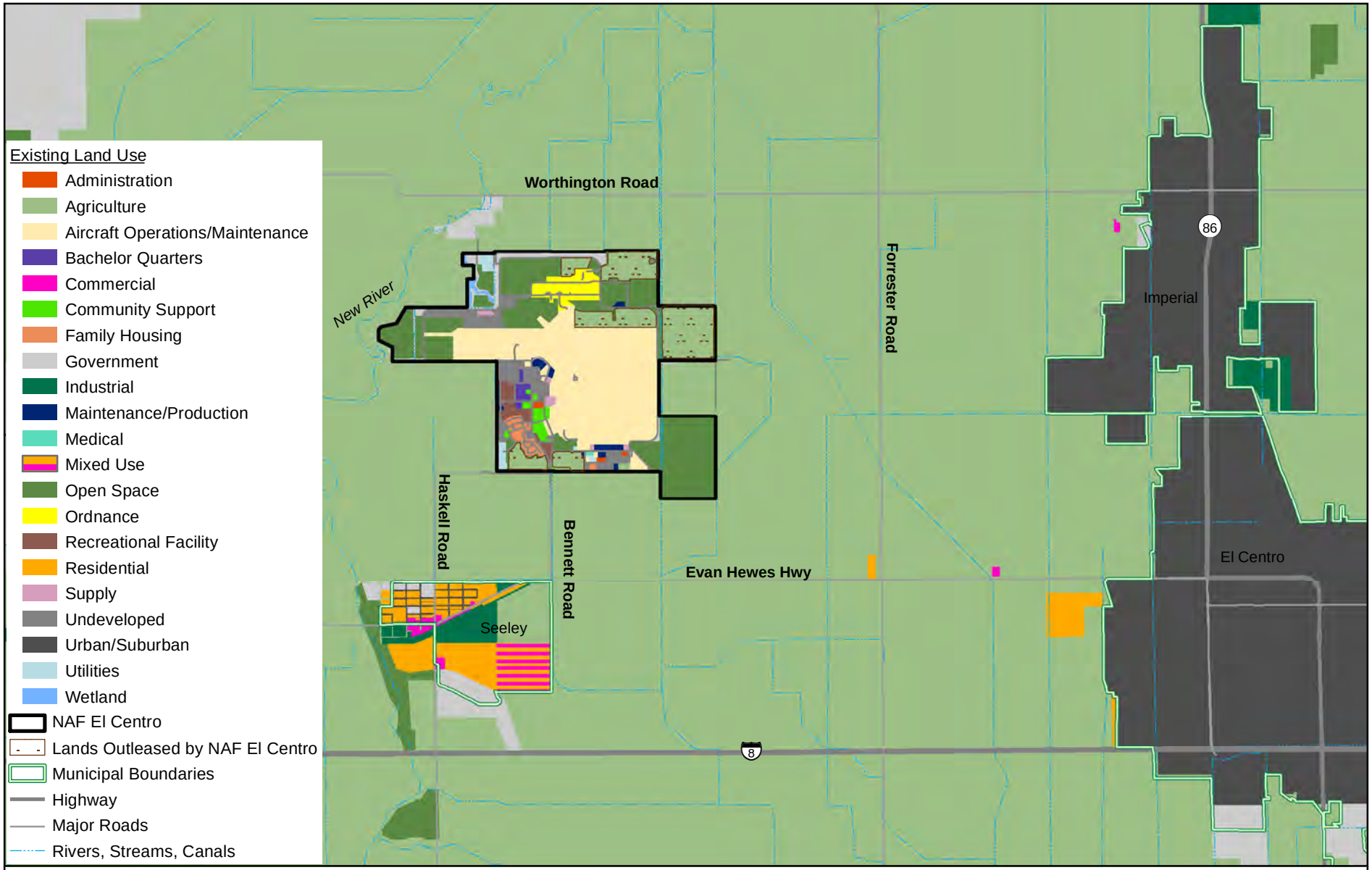


Figure 4.5-2
Existing Land Use in the Vicinity of NAF El Centro

Source: Tierra Data 2011

2010 AICUZ Study Update

As mentioned in Section 3.5, the AICUZ Program was established by DoD to balance the need for aircraft operations with community concerns over aircraft noise and accident potential. As part of the AICUZ process, the study defines noise zones, APZs, and recommendations to promote community development compatible with air operations.

In 2010, the Navy released its latest AICUZ for NAF El Centro. The AICUZ establishes APZs and Noise Zones for the installation (NAF El Centro 2010). Section 4.4.1.3, *Accident Potential Zones and Clear Zones*, provides additional details about NAF El Centro's APZs. **Figure 4.4-1** shows the NAF El Centro Clear Zones and APZs as part of the 2010 AICUZ study (NAF El Centro 2010).

DoD also takes an active role in promoting compatible development around military installations through their Office of Economic Adjustment. The Office of Economic Adjustment works in partnership with the local communities to produce a Joint Land Use Study (JLUS). Its purpose is to promote compatible civilian development patterns near military installations by applying the local planning process to update local comprehensive/general plans and supporting land use regulations.

A JLUS is produced by and for the local jurisdiction(s). The JLUS benefits both the local community and the military installation by combining the work of the AICUZ program with the JLUS program. The JLUS program is a basic planning process designed to identify encroachment issues confronting both the civilian community and the military installation and to recommend strategies to address the issues in the context of local comprehensive/general planning programs. In 2010, the Office of Economic Adjustment entered into an agreement with Imperial County to produce a JLUS. With input from the cities of El Centro and Imperial, Imperial County will identify land use issues that may impact the operational effectiveness of NAF El Centro, develop recommendations to prevent such impacts, and create an action plan to implement the recommendations (Office of Economic Adjustment 2012). The JLUS is projected to be completed in spring 2014.

While the AICUZ, JLUS, and US Navy F-35C West Coast Homebasing EIS are all contemporary, they perform different functions. The AICUZ is a land use planning document based on reasonable projections of future operations and missions while the JLUS builds on the AICUZ through community input to recommend future land use development consistent with the military airfield's mission. The EIS, however, has other goals. Under NEPA, the EIS describes the possible impacts of alternative action scenarios and compares them to a No Action Alternative. This allows the project proponent, with agency and public input, to determine the effects on the natural and human environment when deciding on a course of action.

In the EIS process, the No Action Alternative is often referred to as the environmental baseline. The NAF El Centro AICUZ also uses a baseline contour from which its prospective contours are developed. Both these contours differ due to methodology used to determine the baseline and the year of each baseline.

The AICUZ baseline employed a five-year average of operations, from 2003 through 2007. The AICUZ study employed this methodology since annual operations may vary greatly due to mission, budget and world events. In fact, operations within the five year sample varied as much as 17 percent. The EIS focuses its baseline on a set year (2015) that is seven years beyond the AICUZ baseline contour.

In the AICUZ, the Navy examined existing and planned land uses for Imperial County, the City of Imperial, the City of El Centro, and the unincorporated community of Seeley. Much of the land surrounding the installation is currently zoned agricultural and residential. However, the nearby communities of Imperial, El Centro, and Seeley currently lie within or partially within the AICUZ footprint (NAF El Centro 2010).

The City of Imperial General Plan contains policies relating to noise effects and land use, indicating what types of family housing are acceptable within known noise exposure areas. The plan notes pressure to develop open lands on the west side of town. Some of this area is currently being developed with commercial and industrial ventures, as opposed to residential. However, residential pressures remain high (NAF El Centro 2010).

The City of El Centro General Plan institutes policies similar to those of Imperial. El Centro is also experiencing pressures to develop lands on the west side of the city, between it and NAF El Centro. The city's planning department continues to direct all development into previously defined areas.

The community of Seeley falls entirely within the AICUZ noise contour footprint for NAF El Centro. Further development in and around Seeley could potentially have an effect on the mission of the installation by producing noise and safety hazards and altering flight operations (NAF El Centro 2010).

The General Plans for each of these communities currently seek to work in conjunction with the AICUZ to contain development within designated areas, but increasing pressures could potentially lead to redesignation of zoning in the future (NAF El Centro 2010).

Integrated Natural Resources Management Plan

The purpose of the INRMP is to effectively and proactively manage natural resources on the installation in support of the military operations of NAF El Centro. The installation's natural resources management program helps to safeguard the natural ecosystems, wildlife, water, and land at NAF El Centro; assists mission requirements for land use while meeting environmental compliance; and provides for the daily administration of the installation's natural resources. In addition, the INRMP limits new construction activities to existing developed areas when possible, and calls for unused portions of the installation to be restored to native habitat (NAF El Centro 2001).

4.5.1.2 Local and Regional Land Use

2004 City of El Centro General Plan

The General Plan for the City of El Centro was adopted in 2004 to replace the 1989 plan. The plan was developed to guide the city's long-term goals and future development. The plan focuses on economic growth and safety of the city, redevelopment of land, and developing public facilities. Due to the importance of agriculture in this area, the plan seeks to concentrate additional growth within its current urban boundaries. Specifically, the plan delineates near-term growth areas in the immediate northwest and southwest portions of the city. In the long-term, growth areas are delineated east of the city. The City's Urban Development Program seeks to create a pedestrian and public transit oriented community that retains as much agricultural land as possible (City of El Centro 2004). While the plan does not apply

to noise or land use associated with NAF El Centro, its current policies for constraining growth and retaining agricultural lands are in line with the policies of the installation.

1992 City of Imperial General Plan

A revision to the 1989 City of Imperial General Plan was adopted in 1992. The plan provides for new commercial and residential land uses tied to the anticipated population growth of the area. Goals of the plan are to retain the urban character of the city and rural residential areas around it, while providing for the future development needs of the community. Although the plan does not delineate specific areas in the city for future development, its land use goals seek to maintain rural character and importance of agriculture by limiting residential development in outlying agricultural areas and encouraging the preservation of agricultural lands (City of Imperial 1992). While the plan does not apply to noise or land use associated with NAF El Centro, its current policies for constraining growth and retaining agricultural lands are in line with the policies of the installation.

2008 Imperial County General Plan

The General Plan for Imperial County was adopted in 2008 to replace the 1998 plan. The plan was developed to guide the county's growth and retain its economic importance through agriculture and the rural setting of the area. Approximately 20 percent of the county's area is currently irrigated for agricultural uses and approximately 50 percent of the county is undeveloped and under federal ownership. The plan sets standards for the retention of agricultural, recreational, open space, industrial, commercial, residential, and infrastructure lands. Objectives of the plan include promoting and guiding economic and residential growth while preserving agricultural resources through effective land use planning (Imperial County 2008).

1994 Seeley Urban Area Plan

The Seeley Urban Area Plan was adopted in 1994 to replace the 1973 plan. The plan's purpose was to implement land use guidelines and to identify goals, standards, and policies to guide the future growth of the area. One goal of the plan is to prevent development that would impact continued agricultural use of adjacent property or cause "leapfrog" or "checkerboard" land use patterns. Any new development would need to conform to the existing land use designations and goals identified in the Seeley Urban Area Plan and the Imperial County General Plan, and be adequately served by public services and facilities. Existing land use designations within Seeley include low, medium, and high density residential; commercial; government; industrial; recreational/open space; and agricultural. The plan does not apply to noise restrictions or land uses associated with NAF El Centro (Imperial County 1994).

National Parks

National Parks near the NAF El Centro SUA and MTRs are shown on **Figure 4.5-3**. VR-1257 and IR-216 pass over Joshua Tree National Park. IR-212 and IR-213 pass over the Mojave National Preserve. IR-212 passes over Death Valley National Park. The number of existing annual training operations in these areas is identified in **Table 2.7-7**.

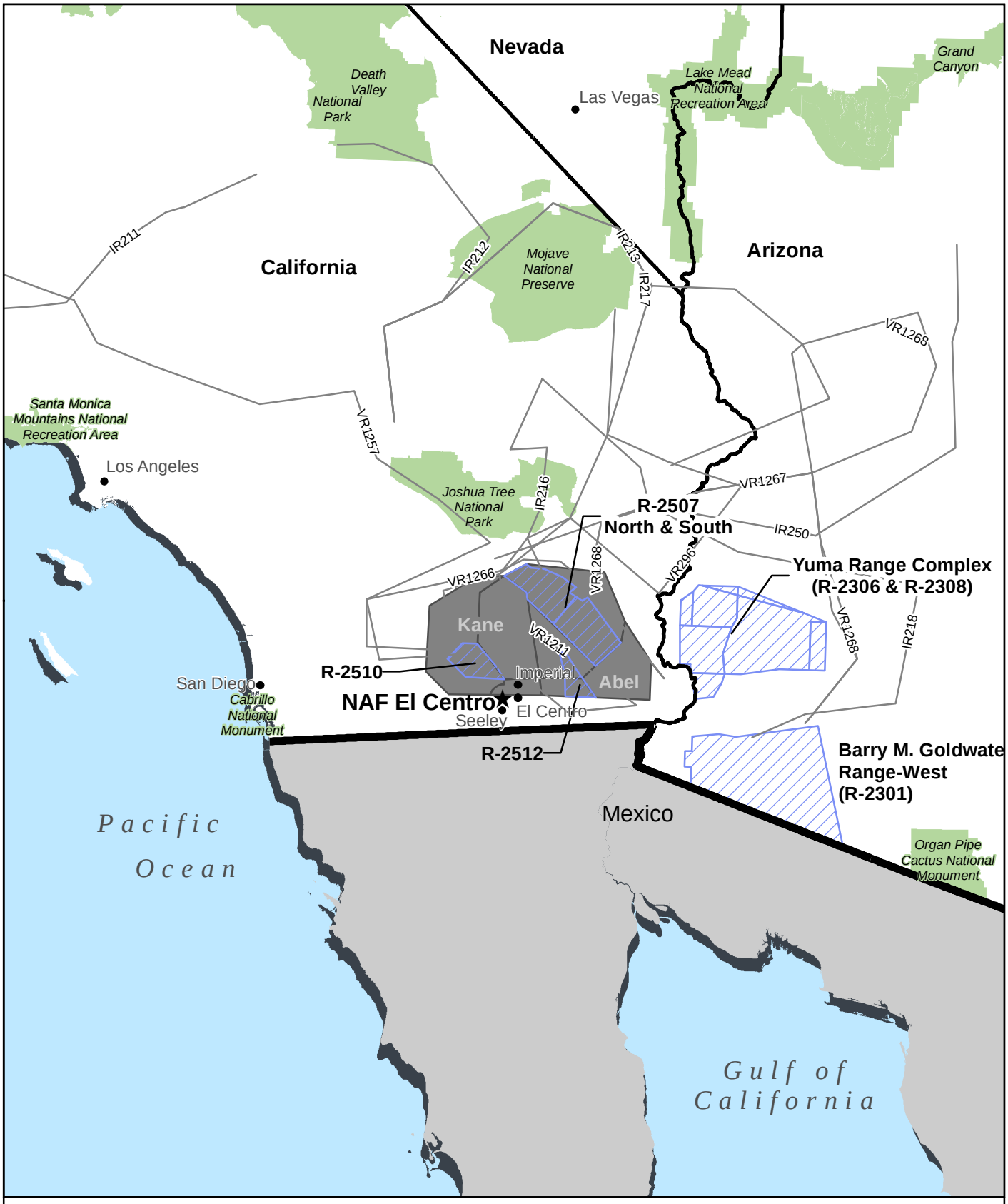


Figure 4.5-3
National Parks within the Vicinity of NAF El Centro Airspace

4.5.1.3 Land Use and the Noise Environment

Land uses most likely to be impacted by noise generally include residential communities, public services, commercial areas, and recreational and cultural areas. According to the AICUZ Instruction, aircraft operation noise levels are measured using CNEL (NAF El Centro 2010). Noise compatibility criteria for land uses are established by the Navy's AICUZ Instruction (Chief of Naval Operations Instructions [OPNAVINST] 11010.36C, *Air Installations Compatible Use Zones (AICUZ) Program*). According to these standards, noise levels greater than 65 dB CNEL are not compatible with certain public amenities, residential areas, or recreational, cultural, and entertainment facilities (**Table E-1**, Appendix E).

The area surrounding NAF El Centro is very sparsely populated and consists of agricultural lands, which provide a buffer between the installation and urban or residential parts of the surrounding community. The AICUZ study for NAF El Centro provides guidelines for maintaining the buffer and for working with the local communities to ensure that future development is kept out of these designated areas (NAF El Centro 2007, 2010). The AICUZ study used known regional growth patterns, operational flight paths and patterns, and the general plans for the cities of Imperial, Seeley, and El Centro and Imperial County to determine how operations at the installation affect these communities and to develop guidelines.

Noise levels in 2010 indicated that the community of Seeley lies entirely within the greater than 65 dB CNEL noise contour and that the western and southern portions of Imperial and the northern part of El Centro lie within the 60-65 dB CNEL noise (NAF El Centro 2010). For a more detailed discussion of noise for NAF El Centro, refer to Section 4.2, *Noise*. **Figures 4.5-4** and **4.5-5** show the baseline noise contours over the existing land use in NAF El Centro and the surrounding communities respectively.

4.5.2 Environmental Consequences for Alternative 1

Under Alternative 1, potential impacts to land use could occur from proposed facility development, personnel changes, and F-35C aircraft operations. Potential impacts from homebasing at NAF El Centro are discussed in the next two sections in terms of effects at NAF El Centro and effects at NAS Lemoore.

4.5.2.1 Alternative 1 – NAF El Centro Homebasing, Effects at NAF El Centro

<u>NAF El Centro Land Use</u>

Under Alternative 1, homebasing at NAF El Centro would not significantly impact existing land uses on the installation. The majority of new construction would take place in areas that have been previously developed. **Figure 4.5-6** shows the proposed construction within the existing land use categories for NAF El Centro. The proposed second runway and the Medical/Dental facility would have minor impacts on lands currently utilized as agricultural outlease parcels and undeveloped areas. The Academic Training Center, Pilot Fit, Wing Administration, and Communications Security facilities would also be built on previously undeveloped land within NAF El Centro. In accordance with AICUZ recommendations and Navy installation design criteria, new construction of noise-sensitive uses would be located outside high noise areas and/or incorporate noise level reduction measures and sound attenuation features into the construction.

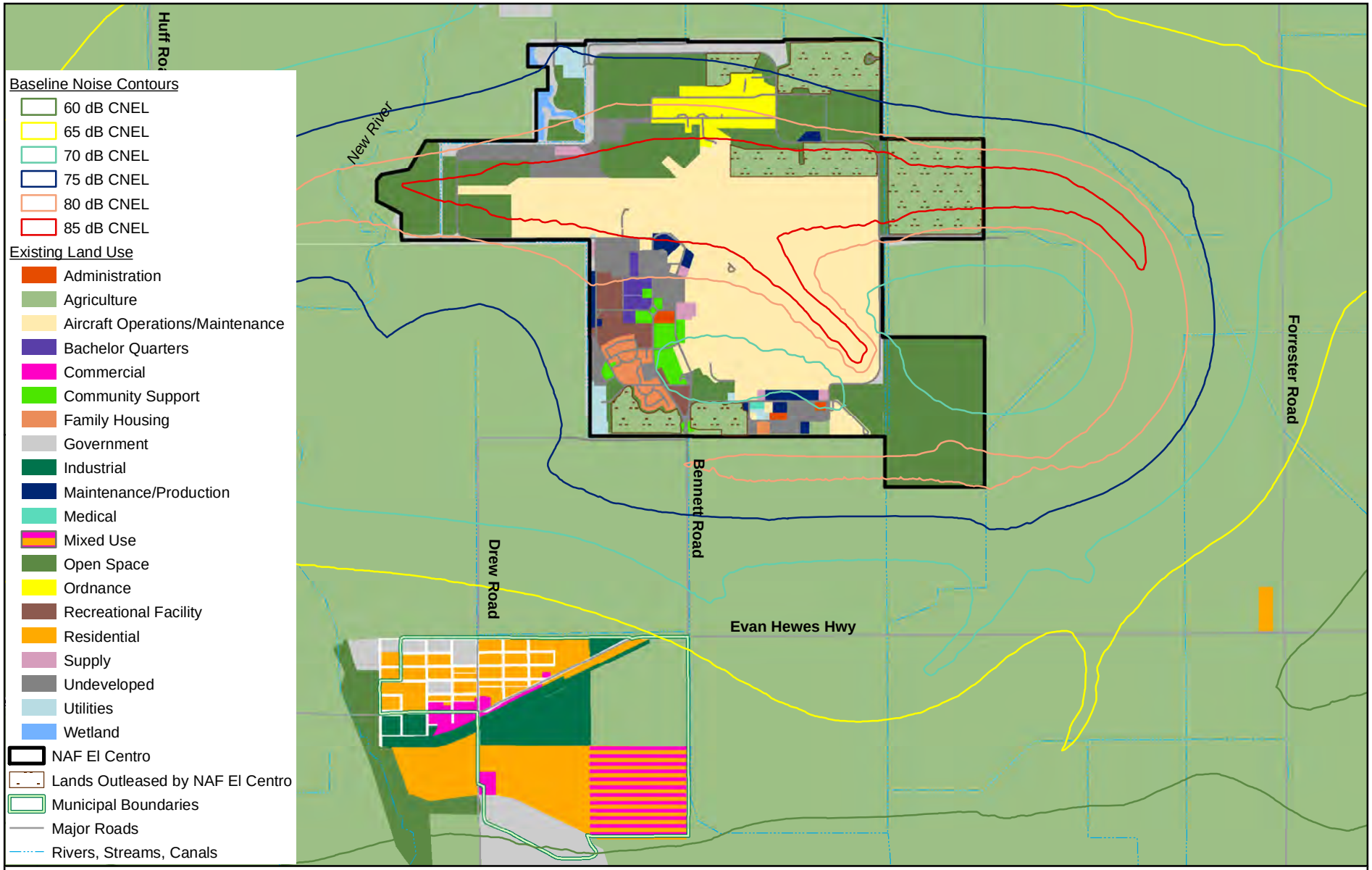


Figure 4.5-4
Baseline Noise Contours and Existing Land Use at NAF El Centro

Sources: Tierra Data 2011; Wyle 2013

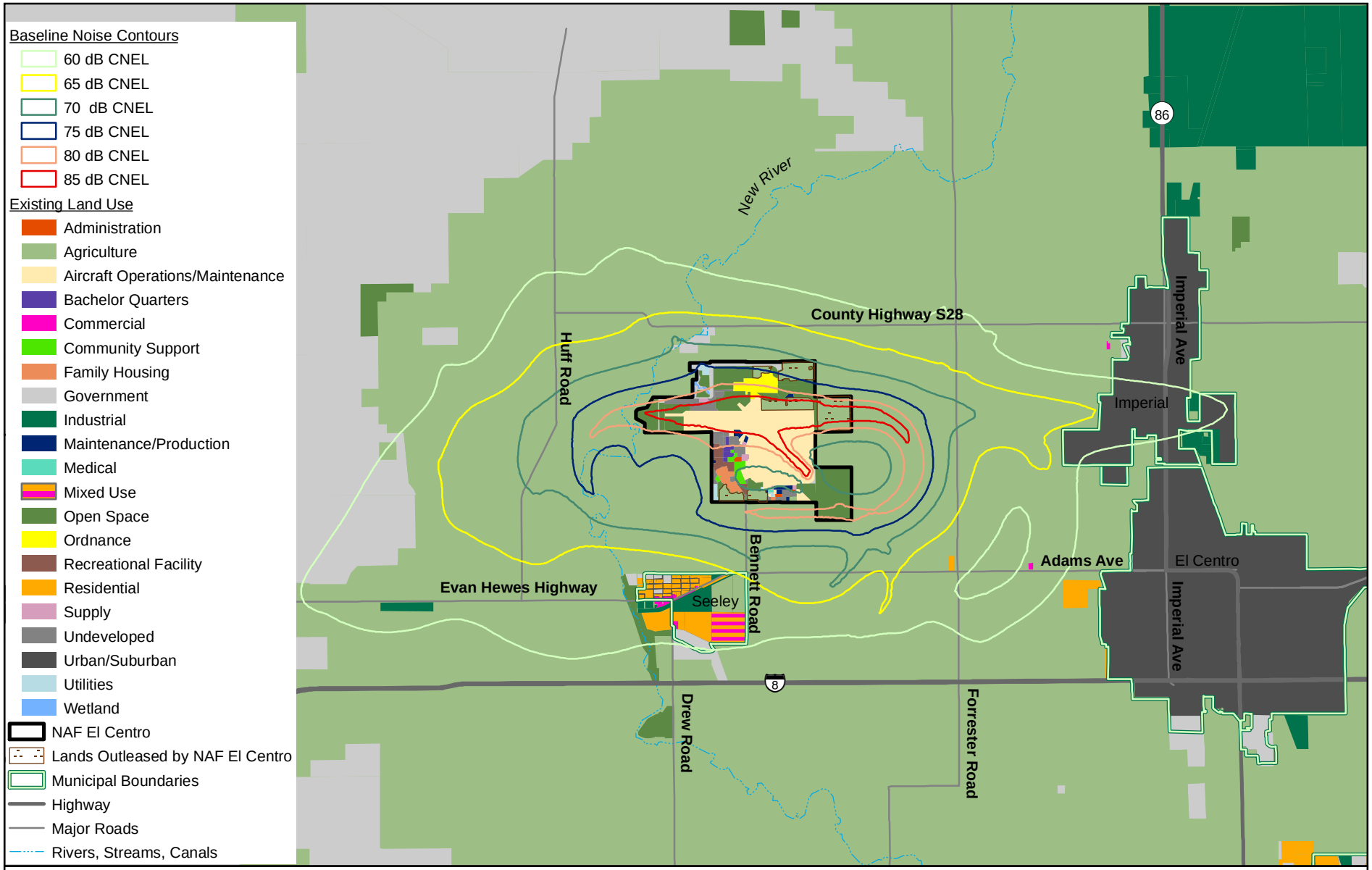


Figure 4.5-5
Baseline Noise Contours and Existing Land Use in the Vicinity of NAF El Centro

Sources: Tierra Data 2011; Wyle 2013

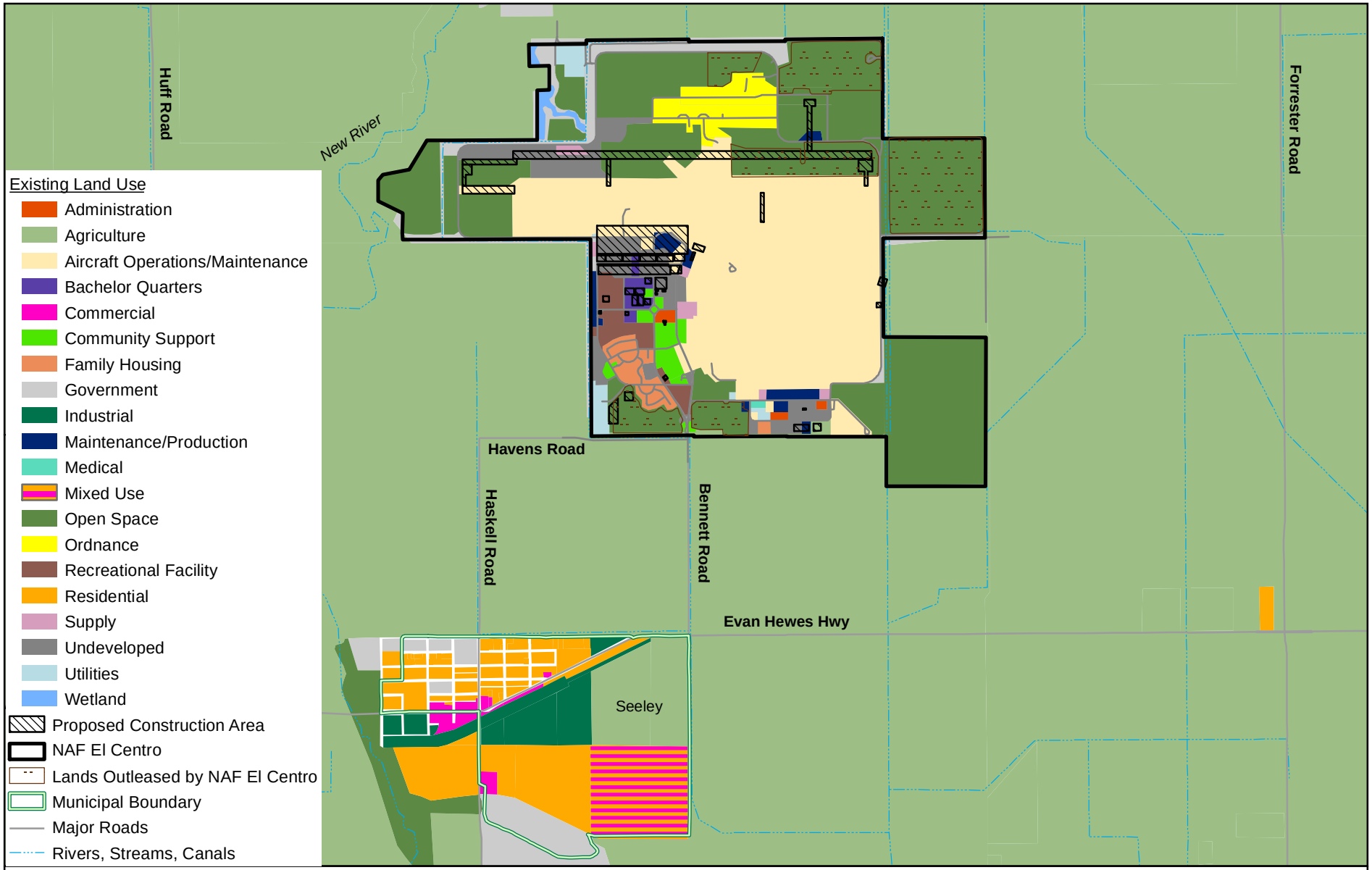


Figure 4.5-6
Existing Land Use and Proposed Construction at NAF El Centro under Alternative 1

Source: Tierra Data 2011

Local and Regional Land Use

Under Alternative 1, homebasing at NAF El Centro may alter existing land uses outside the installation due to the need for additional housing and services to accommodate the approximate increase of 9,129 persons (2,975 military, contractor/civilian personnel and 6,154 dependents) in the El Centro area by 2028. Some of these personnel would be housed within the proposed Bachelor Enlisted Quarters.

There would be an anticipated deficit of 564 military family housing units (DoN 2011). Projected new residential developments in the surrounding communities would be required to remain consistent with local zoning ordinances. Some designated land uses could change. Six master planned communities proposed for development in southern Imperial County in the next three decades would convert agricultural lands to residential or mixed use developments (see Chapter 6, *Cumulative Impacts for Alternative 1*). For a more detailed discussion of housing, see Chapter 4, Section 4.7.2, *Socioeconomics – Environmental Consequences for Alternative 1, Housing.*

Although the majority of construction, demolition, and renovation activities associated with Alternative 1 would take place within NAF El Centro (**Figure 4.5-6**), the Navy would potentially acquire interest in nine properties currently held by private owners to meet safety requirements and to accommodate some of the proposed facility and infrastructure construction. **Figure 2-10** shows the potential new Clear Zones associated with proposed construction of the second runway, and ESQD arcs associated with proposed construction of consolidated ordnance storage facilities. Currently, the land proposed to be acquired (approximately 450 acres) or placed in restrictive easement (approximately 55 acres) is being used for agriculture or irrigation; no habitable dwellings are located on the properties. The agricultural and irrigation use of the properties would remain the same if the Navy acquired interest in them. However, land use would change from a privately owned property to government owned property. Navy-leased lands in the agricultural lease program that would not be affected by facility development under Alternative 1 would remain in agricultural use.

National Parks

This section evaluates the impacts of projected F-35C noise levels on National Parks that lie under MTRs. Under Alternative 1, three National Parks could be overflown by F-35C aircraft: Joshua Tree, Mojave National Preserve, and Death Valley (**Figure 4.5-3**). Although there would be increases in annual aircraft operations in MTRs near National Parks, not all of the proposed F-35C operations would fly over National Parks. Annual aircraft operations in both VR-1257 and IR-216 would each increase by approximately 27 for a proposed total of 183 per year in each MTR. Annual aircraft operations in IR-212 would increase by 6 for a proposed total of 42 per year. For F-35C operations in IR-213, there would be 2 additional operations per year (proposed annual total of 14).

F-35C would generally use the same procedures, routes, and altitudes that FA-18 currently use when conducting training in MTRs near NAF El Centro. MTRs are designed to accommodate high-speed, low-level flights. However, F-35C flights would comply with the altitude restriction of 1,500 ft AGL for the part of VR-1257 over Joshua Tree National Park. As indicated in **Table 4.2-16**, individual overflight F-35C noise levels in MTRs are expected to remain the same or be lower than existing operations. Noise levels

from proposed F-35C operations in MTRs would not affect the status or character of the underlying National Parks. Alternative 1 would not result in significant impacts to land use at National Parks.

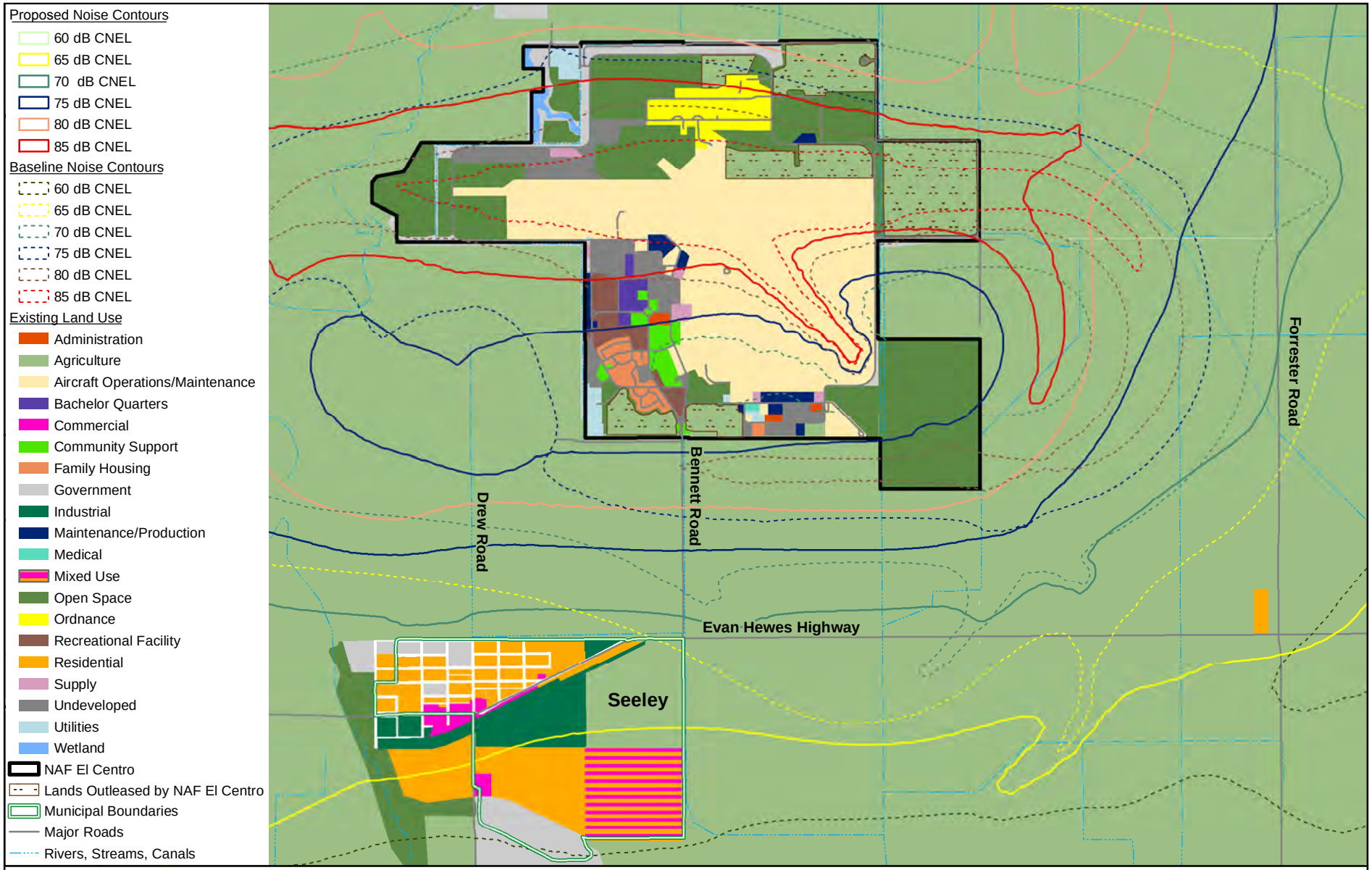
Land Use and the Noise Environment

This section compares the projected F-35C noise contours to existing land uses on and off the installation. As discussed in Section 4.2 *Noise*, Alternative 1 would result in an increase in the area affected by noise (**Figure 4.5-7**). As indicated in **Table 4.5-1**, NAF El Centro land use categories affected by noise levels 80-84 dB CNEL and lower would decrease when compared to the baseline. The largest decrease would occur in areas in 70-74 dB CNEL. However, nearly all land uses on the installation affected by noise levels 85 dB CNEL and greater would experience an 89 percent increase. This increase would have a significant impact, as the designated land uses such as residential (Bachelor Enlisted Quarters and family housing) and services would become incompatible (see **Table E-1**, Appendix E). The proposed location for the Bachelor Enlisted Quarters would be within the 80 to greater than 85 dB CNEL level, which would be incompatible. Overall, Alternative 1 would result in 64 acres of residential land use in noise levels greater than 75 dB CNEL within the installation, which would be incompatible under OPNAVINST 11010.36C, *Air Installations Compatible Use Zones (AICUZ) Program* (see **Table E-1**, Appendix E).

Outside the installation boundaries, increases in the noise footprint would be primarily within the agricultural and open space (classified under resource production and extraction) land use categories (**Figure 4.5-8**). **Table 4.5-2** indicates that the greatest percentage increases in acreages affected by noise would occur in noise levels greater than 80 dB CNEL. However, according to the land use compatibility recommendations outlined in the *AICUZ Program* (**Table E-1**, Appendix E), agricultural uses are generally compatible for these noise levels, but livestock production would be incompatible at noise levels greater than 75 dB CNEL. As indicated in **Table 4.5-2**, the acreage of residential land use affected by noise within 65-69 dB CNEL would increase from 69 acres under the baseline to 558 acres under Alternative 1, which would be a significant impact to land use. For affected points of interest outside the installation, please see Section 5.2, *Noise.*

Conclusion

Overall, as discussed above, implementation of Alternative 1 at NAF El Centro would result in significant impacts to land use from noise because designated residential land uses would be incompatible with proposed noise levels. Proposed facility and infrastructure construction at NAF El Centro under Alternative 1 would not result in changes to the currently designated military land use. However, land use would change for some privately owned properties that the Navy proposes to acquire. The need for additional housing and services may alter existing local and regional land uses. There would be no significant impacts to National Parks from proposed F-35C aircraft overflights.



N

Figure 4.5-7
Proposed Noise Contours and Existing Land Use at NAF El Centro under Alternative 1

0 2,000 4,000
Feet

Sources: Tierra Data 2011; Wyle 2013

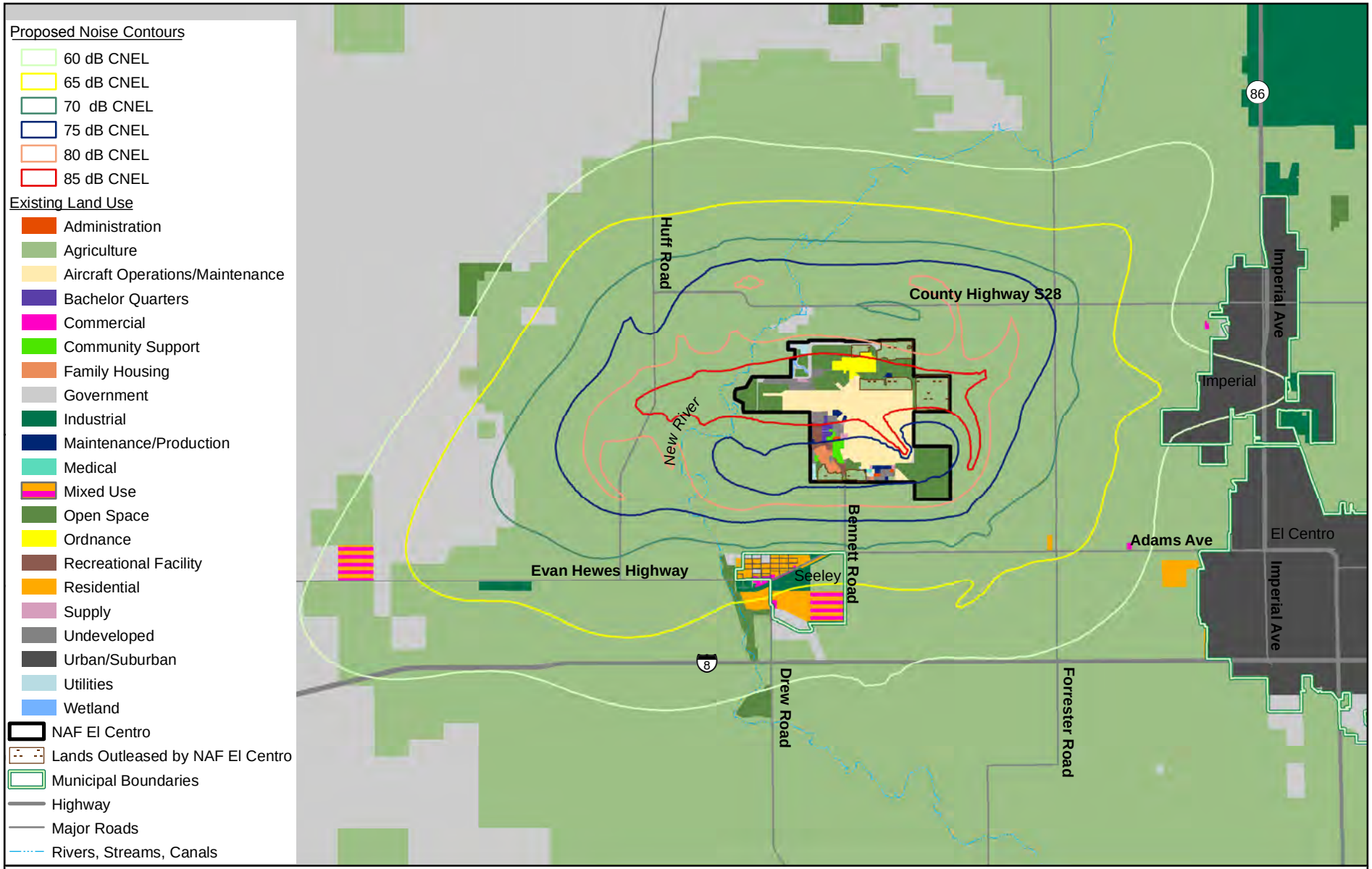


Figure 4.5-8
Proposed Noise Contours and Existing Land Use in the Vicinity of NAF El Centro under Alternative 1

N

0 5,000 10,000
Feet

Sources: Tierra Data 2011; Wyle 2013

Table 4.5-1. Baseline and Proposed Acreages for NAF El Centro Land Use Noise Compatibility under Alternative 1

Land Use	Noise Zone 2				Noise Zone 3					
	65-69 dB CNEL		70-74 dB CNEL		75-79 dB CNEL		80-84 dB CNEL		85+ dB CNEL	
	Baseline (2015)	Proposed (2028)	Baseline (2015)	Proposed (2028)	Baseline (2015)	Proposed (2028)	Baseline (2015)	Proposed (2028)	Baseline (2015)	Proposed (2028)
Residential	0	0	0	0	60	44	4	17	0	3
Manufacturing	0	0	5	0	16	16	12	6	3	14
Transportation, Communication, Utilities	0	0	3	0	28	17	0	14	0	0
Trade	0	0	1	0	8	5	0	4	0	0
Services	0	0	15	0	34	37	8	14	0	6
Cultural, Entertainment and Recreational	0	0	209	0	442	320	304	277	246	605
Resource Production and Extraction	0	0	0	0	0	0	0	0	0	0
Military	0	0	108	0	294	256	279	187	445	683
Total	**0**	**0**	**341**	**0**	**882**	**695**	**607**	**519**	**694**	**1,311**
Change	**NA***	**0 /0%**	**NA**	**-341 / -100%**	**NA**	**-187 /-21%**	**NA**	**-88 /-14%**	**NA**	**+617 /+89%**

Note: *NA = Not applicable.

Table 4.5-2. Baseline and Proposed Acreages for Regional Land Use Noise Compatibility under Alternative 1

Land Use	*Noise Zone 2*				*Noise Zone 3*					
	65-69 dB CNEL		*70-74 dB CNEL*		*75-79 dB CNEL*		*80-84 CNEL*		*85+ dB CNEL*	
	Baseline (2015)	*Proposed (2028)*	*Baseline (2015)*	*Proposed (2028)*	*Baseline (2015)*	*Proposed (2028)*	*Baseline (2015)*	*Proposed (2028)*	*Baseline (2015)*	*Proposed (2028)*
Residential	69	558	0	0	0	0	0	0	0	0
Manufacturing	0	70	0	0	0	0	0	0	0	0
Cultural Entertainment Recreational	98	0	42	0	71	172	34	4	0	69
Resource Production and Extraction	6,122	11,393	3,818	5,834	1,863	6,572	506	3,152	91	856
Total	**6,289**	**12,021**	**3,860**	**5,834**	**1,934**	**6,744**	**540**	**3,156**	**91**	**925**
Change	**NA***	**+5,732 /+91%**	**NA**	**+1,974 /+51%**	**NA**	**+4,810 /+249%**	**NA**	**+2,616 /+484%**	**NA**	**+834 /+916%**

Note: *NA = Not applicable.

4.5.2.2 Alternative 1 – NAF El Centro Homebasing, Effects at NAS Lemoore

Alternative 1 does not involve facility development or demolition at NAS Lemoore. There would be a decrease in aircraft operations and personnel at NAS Lemoore, which would not affect land use on or off the installation. (Please see Section 5.5.1, *Affected Environment* for a description of land use at NAS Lemoore.)

4.5.3 Environmental Consequences for the No Action Alternative

Under the No Action Alternative, no installation infrastructure improvements to support next generation aircraft training operations at NAF El Centro would be implemented. Existing land use conditions and incompatibilities with noise and safety zones would remain as they are today. Safety zones off-installation would not change.

4.6 INFRASTRUCTURE AND UTILITIES

4.6.1 Affected Environment

The affected environment for infrastructure and utilities includes NAF El Centro and the City of El Centro, along with its outlying areas. This section addresses water supply, wastewater, stormwater, electricity, natural gas, and solid waste.

4.6.1.1 Water Supply

NAF El Centro, the City of El Centro, and other proximate municipalities receive drinking water from the Colorado River via the All-American Canal as regulated by the Imperial Irrigation District. The Imperial Irrigation District includes more than 3,000 miles of canals and drains delivering up to 1,010,139 million gallons of water within its 1,658 square mile service area in Southern California (Imperial Irrigation District 2011). The City of El Centro owns and maintains all distribution pipes, canals, and other associated infrastructure located within the City of El Centro. However, NAF El Centro owns and maintains the potable water distribution system within the installation (City of El Centro 2012b). The installation receives its water through the Imperial Irrigation District Elder Canal (Gate No. 104B) tributary of the All-American Canal.

NAF El Centro water supply consists of one active aqueduct source and 6 million gallons of raw storage (the term “raw” refers to water that has not yet been treated for human consumption). NAF El Centro treats raw water from the Elder Canal through a water treatment plant located in the southwestern portion of the installation with a permitted capacity of 2.0 million gallons per day (mgd). In addition, NAF El Centro has 2.6 million gallons of treated water storage capacity. The water treatment plant is composed of a primary and a secondary water treatment facility that includes a settling basin with flocculation and sedimentation chambers in addition to a network of pipelines. These pipelines include service lateral lines within the network and a main lateral pipeline serving remote areas north of Runway 8/26. Average potable water consumption at NAF El Centro from Fiscal Year (FY) 2008 through FY 2010 was 0.37 mgd (NAF El Centro 2011).

Water quality concerns associated with the NAF El Centro treatment facility and the distribution system regarding proper water chlorination and disinfection were addressed when the polyvinyl chloride (PVC)

main distribution lines were upgraded in 1996 through 1997, and the water main underlying the runway was replaced in 2004 (DoN 2005).

4.6.1.2 Wastewater

The City of El Centro wastewater treatment plant is designed to utilize an activated sludge treatment process. The facility processes wastewater through primary treatment, secondary treatment, and ultraviolet disinfection. Wastewater and stormwater runoff are collected throughout the City and treated at the plant (City of El Centro 2010). The City of El Centro wastewater treatment plant has a design capacity of 8.0 mgd and a current flow of 4.0 mgd (City of El Centro 2011).

The treatment and disposal of wastewater at NAF El Centro occurs at a wastewater treatment facility located at the far northwestern portion of the installation. Wastewater is treated using a “Modified Activated Sludge” system. A "Modified Activated Sludge" treatment process uses organic materials to break down waste materials. The resulting mixture is then sent to a clarifier, which uses gravity to settle out heavier particles, clarifying the upper layer. The cleared upper layer is then discharged into the New River in compliance with National Pollutant Discharge Elimination System (NPDES) Permit No. CA0104906. The settled out heavier parts are sent to one of six sludge drying ponds (DoN 2005). The NAF El Centro wastewater treatment facility has a current capacity of 0.3 mgd. In 2004, 17,500 ft of force mains and 4,600 ft of the most deteriorated pipes were replaced with new PVC pipe throughout the installation. Average wastewater generation at NAF El Centro from FY 2008 through FY 2010 was 0.05 mgd (54,277 gallons per day) (NAF El Centro 2011).

4.6.1.3 Stormwater

NAF El Centro is located within the southern portion of the Imperial Valley and is surrounded by irrigation canals and irrigated fields. Drainage from NAF El Centro either discharges, east into Elm Canal or to the west through Elder Drain, Rice Drain 5, Rice Drain 6, and unnamed natural drainages, all of which discharge into the New River. The Elder Canal runs adjacent to the western portion of the installation and also discharges into the New River. The New River is located to the west of the installation and ultimately converges further downstream with the Salton Sea to the north (DoN 2010).

4.6.1.4 Electricity

Electricity is provided to NAF El Centro, the City of El Centro, and other proximate municipalities by the Imperial Irrigation District. The Imperial Irrigation District provides electrical generation, transmission, and distribution services to more than 146,000 residential, commercial, and industrial customers in Southern California (Imperial Irrigation District 2010). The Imperial Irrigation District owns and maintains all power lines, substations, and other associated infrastructure within the City of El Centro and all other municipalities in its service area (City of El Centro 2012a); however, NAF El Centro owns and maintains the electrical distribution system within the installation.

The Imperial Irrigation District maintains a substation just south of the installation (Imperial Irrigation District 2010). The electrical system at NAF El Centro is composed of underground power lines in the vicinity of the airfield and overhead power lines in a majority of the housing and administrative areas. During power outages, back-up generators are used at some facilities including the wastewater

treatment facility, water treatment plant, control tower, medical and dental clinic, and fire department (DoN 2005). Average electricity consumption at NAF El Centro from FY 2008 through FY 2010 was 16,637,847 kilowatt-hours (NAF El Centro 2011).

4.6.1.5 Natural Gas

Natural gas is provided to NAF El Centro, the City of El Centro, and other proximate municipalities by the Southern California Gas Company (SoCalGas). SoCalGas provides natural gas to 20.9 million consumers with a service territory of approximately 20,000 square miles throughout Southern California (SoCalGas 2011). SoCalGas owns and maintains the natural gas distribution lines and other associated infrastructure within the City of El Centro and all other municipalities in its service area; however, NAF El Centro owns and maintains the distribution system within the installation (Southern California Gas Company 2012). NAF El Centro receives natural gas via a 3-inch gas main that runs along Bennett Road and enters the installation at the main gate. The main line splits into feeder lines to serve the eastern and western portions of the installation (DoN 2005). Average natural gas consumption at NAF El Centro from FY 2009 through FY 2011 was 12,926,000 cubic ft per year (NAF El Centro 2011).

4.6.1.6 Solid Waste

Solid waste collection and disposal at NAF El Centro is performed by Allied Waste to the Allied Imperial Landfill. The Allied Imperial Landfill has a permitted capacity of 19.5 million cubic yards and has a remaining capacity of approximately 79 percent (15.5 million cubic yards). The permitted throughput is 1,700 tons per day and the estimated closure date of the landfill is December 2040 (State of California 2011).

Average municipal solid waste collected from NAF El Centro and delivered to Allied Imperial Landfill from FY 2008 through FY 2010 was 765 tons per year. Average municipal solid waste generated at NAF El Centro that was diverted from landfills and recycled from FY 2008 through FY 2010 was 623 tons per year, for an average diversion rate of 45 percent over those three years. Recyclable materials handled on the installation include glass, metals, fibers, plastic, wood, compost, and lead-acid batteries (NAF El Centro 2011).

4.6.2 Environmental Consequences for Alternative 1

Under Alternative 1, potential impacts to infrastructure and utilities could occur from the demolition of existing facilities, the construction and operation new facilities, and personnel changes. Potential impacts from homebasing at NAF El Centro are discussed in the next two sections in terms of effects at NAF El Centro and effects at NAS Lemoore.

4.6.2.1 Alternative 1 – NAF El Centro Homebasing, Effects at NAF El Centro

Under Alternative 1, there would be an increase of military and civilian personnel at NAF El Centro. At the end state scenario (2028), personnel and dependents at NAF El Centro would increase by approximately 9,129 people (2,975 total personnel and 6,154 total dependents) (**Table 2.7-4**). For the range of infrastructure and utilities discussed below, the installation would plan for and assess specific infrastructure and utility requirements prior to final design of facilities to ensure that the proposed functions and associated increases in personnel would be accommodated. The installation identifies

infrastructure or utility needs within the scope of each corresponding project. If particular projects require additional infrastructure or utilities, they are incorporated as a part of that project. This process ensures that any infrastructure or utility deficiencies are identified in the initial planning stages.

For the following analysis, it is assumed that population impacts from the increase of 9,129 people would be incurred on and off the installation. Under Alternative 1, 824 personnel (single, with no dependents) would live on NAF El Centro (9 percent of the total population increase) and 8,305 people would live off the installation. It is assumed a majority of the new personnel and dependents would reside within the City of El Centro, with the remainder of personnel and dependents dissipating toward the outlying areas. It is likewise assumed that impacts to utilities in the outlying areas would be minimal as relatively fewer people would reside there). Therefore, this discussion focuses on impacts to the City of El Centro. When discussing impacts regarding the installation, even though only 824 personnel would permanently reside on the installation, the total increase in personnel (2,975) is used to assess impacts as all personnel would be present on the installation during work hours.

Water Supply

The Imperial Irrigation District supplies potable water from the Colorado River to both the City of El Centro and outlying areas, including NAF El Centro. Under Alternative 1, water consumption would be expected to increase as a result of the increase in personnel. It is assumed that population impacts would be incurred on and off the installation. According to a 2005 water use report by the US Geological Survey (USGS), the average total domestic per capita use of potable water is 124 gallons per day (0.000124 mgd) for the state of California (USGS 2005). An increase in 9,129 people (2,975 total personnel and 6,154 total dependents) would increase potable water demand by a maximum of 1,130,880 gallons per day (approximately 1,266 acre-ft per year). Imperial Irrigation District's current water allotment is 3.1 million acre ft per year. The average usage of Imperial Irrigation District's water supply over the past 10 years has been 2.6 million acre ft (which would include current consumption at NAF El Centro). Increased usage as a result of the proposed action is anticipated to be 1,266 acre ft per year; therefore the existing water supply should be able to accommodate the increase. Since the Imperial Irrigation District supplies potable water to the surrounding communities and NAF El Centro, consumption for personnel both on and off the installation are included in 1,266 acre ft per year increase.

The demand for water (e.g., if used as a BMP to control dust) could also increase during demolition and construction phases. However, this increase would be temporary and intermittent and would not be expected to impact the regional water supply.

The existing water supply is anticipated to accommodate the increase in water consumption both on and off the installation; therefore, no significant impacts are anticipated.

Wastewater

The existing capacity of the City of El Centro wastewater treatment facility is 8.0 mgd with a current flow of 4.0 mgd (City of El Centro 2011). Under Alternative 1, wastewater generation would be expected to increase as a result of the proposed increase in personnel at NAF El Centro. According to the USEPA,

estimated average per capita wastewater flow typical of residential dwellings is 70 gallons per day (USEPA 2002). The increase of 8,305 personnel and dependents (824 personnel would reside on NAF El Centro) would result in a maximum increase to the City of El Centro municipal wastewater treatment facility of 581,350 gallons per day (0.58 mgd). This would increase the existing wastewater generation rate to 4.58 mgd; however, this would not exceed the existing capacity of 8 mgd. Persons residing outside the City of El Centro in unincorporated areas of Imperial County would utilize wells and septic systems and would not be connected to municipal sewer or potable water systems (Imperial County 2011).

The existing wastewater treatment facility at NAF El Centro is expected to be nearing capacity; current capacity is 0.3 mgd. The average wastewater generation per day at NAF El Centro from FY 2008 through FY 2010 was 0.05 mgd. At a maximum (as it is assumed a majority of personnel would live off the installation and only generate wastewater during work hours), the increase of 2,975 additional personnel would increase wastewater generation on NAF El Centro by 0.21 mgd. This would increase existing wastewater generation on the installation to a total of 0.26 mgd; however, this would not exceed existing capacity of 0.3 mgd. In addition, a site analysis conducted in 2012 recommended the NAF El Centro wastewater treatment facility increase capacity to 0.6 mgd. The existing 0.3 mgd facility would be demolished in 2016. A new 0.6 mgd capacity facility would be built (**Figure 2-8**) to accommodate increases in personnel.

Stormwater

The proposed construction activities at NAF El Centro could temporarily affect the quality of stormwater runoff through potential increases in soil erosion. Under Alternative 1, there would be approximately 196 acres of soil disturbed and the creation of 151 acres of new impervious surfaces. These activities can expose soils and, during storm events, stormwater can pick up soil particles, thereby increasing sediment loading of the stormwater runoff. In accordance with the Clean Water Act (CWA) Section 402 NPDES program, BMPs would be implemented during construction and demolition projects to minimize runoff. Prior to starting construction on individual projects, a Notice of Intent (NOI) would be filed with the California Regional Water Quality Control Board Region 7 (Colorado River) to obtain coverage under the General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (General Permit No. CAS000002). In addition, use of a site-specific Storm Water Pollution Prevention (SWPP) Plan and associated BMPs for construction sites where one or more acres would be disturbed would be required.

In accordance with Unified Facilities Criteria (UFC) 3-210-10, Low Impact Development (as amended, 2010), any increase in surface water runoff as a result of the proposed construction would be reduced through the use of temporary and/or permanent drainage management features such as use of bioretention, filter strips, vegetated buffers, grassed swales, infiltration trenches, water harvesting, and other applicable BMPs. The integration of Low Impact Development design concepts incorporates site design and stormwater management to maintain the site's pre-development runoff rates and volumes to further minimize potential adverse impacts associated with increases in impervious surface area. The use of these features would also increase groundwater recharge through direct percolation offsetting the loss of pervious surface due to future construction.

Electricity

Under Alternative 1, electricity demand would be expected to increase as a result of the proposed increase in personnel at NAF El Centro. Additionally, the proposed facilities to support the F-35C operations would require additional electricity. However, new facilities and additions associated with Alternative 1 would be implemented with more energy efficient design standards and utility systems than are currently in place. Construction projects would incorporate Leadership in Energy and Environmental Design (LEED) and sustainable development concepts to achieve optimum resource efficiency, sustainability, and energy conservation. Therefore, average energy consumption per facility for new buildings would be expected to remain consistent or decrease compared to energy consumption associated with existing facilities of similar size.

According to the US Department of Energy (USDOE) State Energy Consumption Estimates, the average annual electricity consumption for a US residential home in 2008 was 11,040 kilowatt-hours (USDOE 2010). Assuming each personnel member constitutes one household, an increase of 2,973 personnel would increase electricity use by approximately 32,821,920 kilowatt-hours (32,822 megawatt-hours) per year. In FY 2009, the Imperial Irrigation District sold 3,316,121 megawatt-hours of electricity to its customers (Imperial Irrigation District 2009). An increase of 32,822 megawatt-hours would represent a 1 percent increase in energy consumption and would not be expected to impact energy service to the area.

Construction activity associated with Alternative 1 would result in some temporary interruption of utility services during construction periods. These impacts would be short-term, occurring briefly during active construction periods. In addition, the demand for energy (primarily electricity) could increase slightly during demolition and construction phases. The energy supply at the installation and in the region is adequate and would not be affected by this temporary increase in demand.

Natural Gas

SoCalGas supplies natural gas to both the City of El Centro and outlying areas, including NAF El Centro. Under Alternative 1, natural gas consumption would be expected to increase as a result of the proposed increase in personnel at NAF El Centro. Average residential consumption of natural gas within the United States in 2008 was 75,000 cubic ft per household (Energy Information Administration 2010). Assuming each personnel member constitutes one household, an increase of 2,975 personnel would increase natural gas use by approximately 223.125 million cubic ft. SoCalGas infrastructure currently spans the area surrounding NAF El Centro and the City of El Centro and they do not anticipate capacity issues associated with the addition of 9,129 people to the area (2,975 total personnel and 6,154 total dependents). In the unlikely scenario that SoCalGas would have to extend infrastructure, they have in-house crews that perform that service routinely (SoCalGas 2012).

Solid Waste

Under Alternative 1, proposed construction and demolition would generate debris requiring landfill disposal. Construction activities would begin in 2015 and the last project would start around 2025 resulting in approximately 6.6 million ft^2 of new construction. The estimated pounds of waste generated

each year from new construction as described in the *Characterization of Building-Related Construction and Demolition Debris in the United States* (USEPA 1998) is:

(Total square footage of new construction per year) x (4.38 pounds/ft^2)* = X pounds of debris.

*4.38 pounds per ft^2 is an estimate of debris generated during new construction based on sampling studies documented in *Characterization of Building-Related Construction and Demolition Debris in the United States* (USEPA 1998).

Under Alternative 1, proposed construction (6.6 million ft^2) would generate 28,908,000 pounds (14,454 tons) of construction debris requiring landfill disposal. Also, 188,094 ft^2 of facilities and infrastructure would be demolished under Alternative 1. Using the USEPA 115 pounds/ft^2 debris generation rate associated with demolition, there would be approximately 21,630,810 pounds (10,815 tons) generated from proposed demolition activities. The combined 25,269 tons of solid waste generated by construction and demolition under Alternative 1 could result in impacts to solid waste management facilities in the area. The Allied Imperial Landfill has a permitted capacity of 19.5 million cubic yards with remaining capacity at 79 percent (15.5 million cubic yards). The permitted throughput is 1,700 tons per day and the estimated closure date of the landfill is December of 2040 (State of California 2011). Assuming conservatively that the construction and demolition debris would primarily consist of concrete, the 25,269 tons of construction debris that would be generated as a result of Alternative 1 would represent 13,367 cubic yards, which would be approximately 0.09 percent of the remaining capacity of the landfill. The construction proposed under Alternative 1 would be phased over multiple years. As a result, impacts to the Allied Imperial Landfill would not be expected to exceed the permitted throughput or reduce the remaining capacity significantly.

Compliance with the NAF El Centro Solid Waste Management Plan and establishment of waste reduction and recycling programs would help to minimize the increase in overall solid waste generation as a result of Alternative 1. Off-installation contractors completing construction projects would be responsible for disposing of waste generated from construction activities. Contractors are required to comply with federal, state, local, and Navy regulations for the collection and disposal of municipal solid waste from the installation. Much of this material can be recycled or reused, or otherwise diverted from landfills, per the NAF El Centro Integrated Solid Waste Management Program. All non-recyclable construction and demolition waste or other components not appropriate for a standard landfill would be collected in dumpsters until removal off-site and would be hauled away by the contractor to an appropriate landfill.

Construction and demolition waste contaminated with hazardous waste, asbestos-containing material, lead-based paint, or other undesirable components would be removed by licensed contractors and disposed of in a local hazardous waste-permitted landfill in accordance with DoN, federal, state, and local laws and regulations (see also Section 4.14, *Hazardous Materials and Waste*).

Under Alternative 1 non-hazardous municipal solid waste would be generated by personnel and their dependents both on- and off-installation. According to EPA the average non-hazardous municipal waste generated for a household is 4.43 pounds/person/day. Therefore, it is assumed that those personnel residing on the installation (824) would produce 3,650 pounds of non-hazardous municipal waste per day. Non-hazardous municipal waste generated by personnel and dependents off-base would result in

40,441 pounds per day. Additionally, CalRecycle identifies solid waste generated by government agencies at 0.59 tons/employee/year. Therefore, it is anticipated that in the course of their work day, personnel would generate 1,755 tons of non-hazardous municipal waste per year. Total non-hazardous municipal waste generated by Alternative 1 is anticipated to be 9,135 tons per year or 25 tons per day. Based on the current permitted capacity of 1,700 tons per day and the current daily use of 207 tons per day, and additional 25 tons per day would not result in impacts to the landfill.

Conclusion

Overall, as discussed above, implementation of Alternative 1 at NAF El Centro would not result in significant impacts to infrastructure and utilities from proposed F-35C operations, facility development, and personnel increases. The increase in demand for water, wastewater treatment, electricity, natural gas, and solid waste disposal would be met by available capacity. Stormwater runoff from demolition and construction activities would be minimized with SWPP Plans and BMPs.

4.6.2.2 Alternative 1 – NAF El Centro Homebasing, Effects at NAS Lemoore

Under Alternative 1, there would be a decrease in military positions at NAS Lemoore, as personnel who currently support FA-18 squadrons at NAS Lemoore transition to supporting F-35C squadrons at NAF El Centro. (Please see Section 5.6.1, *Affected Environment* for a description of infrastructure and utilities at NAS Lemoore.)

The number of personnel at NAS Lemoore would decrease by 4,653 people (1,539 personnel and 3,114 dependents, **Section 2.7.3 *Alternative 1 Personnel Changes***), representing an estimated 19 percent decrease in the consumption of potable water, electricity, and natural gas. In addition, there would be a 19 percent decrease in wastewater and solid waste generation. Decreases in the consumption of energy and generation of wastes would be considered positive as there would be a small decline in the consumption of natural resources in the immediate area and an associated decrease in utility costs for NAS Lemoore. There is no construction at NAS Lemoore associated with Alternative 1. Therefore, no impacts to solid waste generation would occur due to construction.

Additionally, the decrease in personnel and dependents would represent a decrease of 3 percent for Kings County and 0.5 percent for Fresno County (2010 populations of 152,982 and 930,450, respectively) (USCB 2011). Subsequently, it is assumed there would be a 3 percent decrease in demand for services in Kings County and a 0.5 percent decrease in services for Fresno County. As a result, potable water, electricity, and natural gas consumption and wastewater and solid waste generation in each of these counties would decrease proportionately. A decrease of 3 percent and 0.5 percent would not be expected to impact regional utility systems in Kings and Fresno counties.

4.6.3 Environmental Consequences for the No Action Alternative

Under the No Action Alternative, the demand for infrastructure at NAF El Centro would remain the same as described in Section 4.6. Existing Conditions for infrastructure and utilities would remain the same, including the ongoing and as-needed maintenance and upgrading of existing systems.

4.7 SOCIOECONOMICS

4.7.1 Affected Environment

The affected environment for socioeconomics includes NAF El Centro and Imperial County, the county with the strongest economic ties to activities at NAF El Centro. This section addresses population, employment, income, and housing characteristics of the study area. This section also assesses environmental justice and the protection of children.

4.7.1.1 Population

The 2010 population in Imperial County was approximately 174,528 (**Table 4.7-1**). The City of El Centro grew by approximately 13 percent from 2000 to 2010 while the City of Imperial almost doubled in population over the decade. Imperial County grew by approximately 23 percent over the same time period. Growth in Imperial County is due, in part, to the area's relatively low land and labor costs and proximity to Mexico. El Centro is the regional shopping destination with the majority of sales made to residents of Mexicali and neighboring Imperial County communities (Wahlstrom and Associates 2011). Rapid population growth is expected to continue, with Imperial County projected to grow by approximately 37 percent from 2010 to 2020. Population in the study area grew faster than in the state as a whole, and is projected to continue to grow at a faster rate (US Census Bureau 2011b, California Department of Finance 2007).

Table 4.7-1. Study Area Population Trends

Jurisdiction	*2000*	*2010*	*Percent Growth Rate 2000-2010*	*2020 Projection**	*Percent Growth Rate 2010-2020*
City of El Centro	37,835	42,598	12.6%	-	-
City of Imperial	7,560	14,758	95.2%	-	-
Imperial County	142,361	174,528	22.6%	239,149	37.0%
California	33,871,648	37,253,956	10.0%	44,135,923	18.5%

Source: US Census Bureau 2011b; California Department of Finance 2007.
Note: *2020 Projections only available for county and state.

The FY 2010 population associated with NAF El Centro included 662 federal government personnel (307 military personnel and 355 contractor/civilian employees) and approximately 614 military dependents (NAVFAC Headquarters 2011). In addition, approximately 1,273 transient personnel per year participate in training programs at NAF El Centro.

4.7.1.2 Employment and Income

Employment by industry in Imperial County for 2011 is shown in **Table 4.7-2**. The industries that employ the greatest number of people in Imperial County include: government (34.5 percent); transportation and utilities (19.2 percent); agriculture (17.2 percent); trade, educational and health services (7.0 percent); and leisure and hospitality (6.5 percent) (California Employment Development Department 2011).

Table 4.7-2. Study Area Employment, 2011

Industry	*Number Employed - Imperial County**
Agriculture	9,300
Construction, Mining, Logging	1,300

Table 4.7-2. Study Area Employment, 2011

Industry	*Number Employed - Imperial County**
Manufacturing	2,400
Trade, Transportation, and Utilities	10,400
Information	400
Financial Activities	1,300
Professional and Business Services	2,400
Educational and Health Services	3,800
Leisure and Hospitality	3,500
Other Services	700
Government	18,700
Total	**54,200**

Source: California Employment Development Department 2011.
Note: *Not seasonally adjusted. April 2011, preliminary.

Total personal income increased by about 29 percent in Imperial County from 2005 to 2009 (**Table 4.7-3**). Total personal income grew faster in the study area than for the state as a whole. Per capita income increased from 2005 to 2009 by 18 percent in Imperial County. While per capita income in the study area was less than that for California, it grew faster between 2005 and 2009 in Imperial County than at the state level (US Department of Commerce 2011a).

Table 4.7-3. Study Area Personal and Per Capita Income

Jurisdiction	*Personal Income(1,2)*			*Per Capita Income(1,3)*		
	2005	*2009*	*Percent Increase – 2005-2009*	*2005*	*2009*	*Percent Increase – 2005-2009*
Imperial County	$3,720,263,000	$4,786,081,000	28.6%	$24,308	$28,681	18.0%
California	$1,387,661,013,000	$1,566,999,086,000	12.9%	$38,767	$42,395	9.4%

Source: US Department of Commerce 2011b.
Notes: 1. Not adjusted for inflation.
2. Personal income is the income that is received by all persons from all sources.
3. Per capita income is the income per person in an area.

Unemployment rates in the study area have increased dramatically over the last few years as shown in **Table 4.7-4**, increasing by an average of 57 percent from 2007 to 2011. The 2011 unadjusted unemployment rate in Imperial County was 27.9 percent. The comparable 2011 unadjusted unemployment rate for California was 11.7 percent and 8.7 percent for the nation (California Employment Development Department 2011).

Table 4.7-4. Study Area Unemployment Rates

Jurisdiction	*2007(1)*	*2008(1)*	*2009(1)*	*2010(1)*	*2011(1,2)*	*Percent Increase 2007-2011*
City of El Centro	17.0	21.1	26.5	28.2	26.4	55.3%
City of Imperial	12.1	15.3	19.5	20.9	19.5	61.2%
Imperial County	18.0	22.3	27.9	29.7	27.9	55.0%
California	5.3	7.2	11.3	12.4	11.7	120.8%

Source: California Employment Development Department 2011.
Notes: 1. Not seasonally adjusted.
2. April 2011, preliminary.

In FY 2010 there were 662 federal government personnel (307 military personnel and 355 civilians) employed at NAF El Centro (NAVFAC Headquarters 2011). Total payroll to support this workforce was approximately $24 million. Income generated by the 2010 air show included approximately 13,406 guest-nights of local hotel occupancy associated with transient military and civilian personnel trained at NAF El Centro and air show visitors in FY 2010. An economic impact assessment determined that NAF El Centro's total direct and indirect economic impact in Imperial County was $105 million (including $4 million in state and local tax revenues) and an additional 800 jobs in FY 2010 (NAF El Centro 2011).

4.7.1.3 Housing

In 2011, there were approximately 56,000 housing units in Imperial County (**Table 4.7-5**). The vacancy rate in the City of El Centro was 9.5 percent and 7.3 percent in the City of Imperial. Imperial County's vacancy rate was 12.4 percent. Only the City of Imperial had a lower vacancy rate than the state as a whole (8.1 percent) (US Census Bureau 2011b).

Table 4.7-5. Study Area Housing Units, 2010

Jurisdiction	*Housing Units*	*Percent Vacant*	*Occupied Housing Units*		
			Total	*Percent Owner*	*Percent Renter*
City of El Centro	14,476	9.5%	13,108	49.5%	50.5%
City of Imperial	4,751	7.3%	4,405	71.1%	28.9%
Imperial County	56,067	12.4%	49,126	55.9%	44.1%
California	13,680,081	8.1%	12,577,498	55.9%	44.1%

Source: US Census Bureau 2011b.

In 2009 NAF El Centro prepared an update of the 2006 Housing Requirement Market Analysis (HRMA). The HRMA assessed the housing market within a 60-minute commute of NAF El Centro. There were approximately 19,515 rental housing units in 2009, of which approximately 8,128 units (42 percent) were considered suitable for military families in terms of physical conditions, health and safety concerns, and availability. A manpower update to the 2009 HRMA was completed in 2011 (Robert D. Niehaus, Inc. 2011 [16 August memo to Ms. Pamela Driggers from Miguel Delgado Helleseter]). The 2011 update determined that there would be a military family community housing shortfall of 564 units and a community housing shortfall for unaccompanied personnel of 216 units in 2014 (Robert D. Niehaus, Inc. 2011).

NAF El Centro currently has 101 military family housing units (31 officer units and 70 enlisted units) (NAVFAC Southwest 2007). On average, less than 10 percent of the units are vacant (NAF El Centro 2005). NAF El Centro has 600 unaccompanied personnel rooms with capacity for approximately 900 personnel (NAF El Centro 2005).

4.7.1.4 Environmental Justice

This section identifies minority and low-income communities that could be affected by the proposed action. Imperial County serves as the community of comparison since it is the next largest geographic area that encompasses the study area.

The total minority population is calculated as the percent of the population that is categorized in one of six racial categories and those of Hispanic or Latino origin (without double counting those who report

two or more races/origins) (CEQ 1997). The low-income population is calculated using data from the 2010 American Community Survey for individuals whose income in the past 12 months has been below the poverty level. **Table 4.7-6** presents the 2010 census data on the total minority and 2010 American Community Survey 5-Year Estimates data on low-income population for the study area.

Table 4.7-6. Minority and Low-Income Population

Jurisdiction	*Total Population*	*Minority Population*	*Percent Minority*	*Percent Low-Income**
City of El Centro	42,598	36,840	86.5%	20.9%
City of Imperial	14,758	11,776	79.8%	12.6%
Imperial County	174,528	150,601	86.3%	21.4%
California	37,253,956	22,297,703	59.9%	13.7%

Source: US Census Bureau 2011a, US Census Bureau 201b.
Note: *Includes all individuals for whom poverty status is determined.

4.7.1.5 Protection of Children

This section identifies the population under 18 that could be affected by the proposed action. Imperial County serves as the community of comparison since it is the next largest geographic area that encompasses the study area. **Table 4.7-7** presents the 2010 census data on the population less than the age of 18 in the study area.

Table 4.7-7. Percent under the Age of 18, 2010

Jurisdiction	*< Age 18*
City of El Centro	29.7%
City of Imperial	33.4%
Imperial County	29.3%
California	25.0%

Source: US Census Bureau 2011b.

The NAF El Centro housing and community support area is the closest location to the proposed action where children are present on a regular basis. This area also contains the NAF El Centro Child Development Center and Youth Center.

4.7.2 Environmental Consequences for Alternative 1

Under Alternative 1, potential impacts to socioeconomics could occur from changes in military and civilian personnel and construction expenditures. Potential impacts from homebasing at NAF El Centro are discussed in the next two sections in terms of effects at NAF El Centro and effects at NAS Lemoore.

4.7.2.1 Alternative 1 – NAF El Centro Homebasing, Effects at NAF El Centro

<u>Population</u>

Under Alternative 1, military personnel at NAF El Centro would increase by 2,514 and contractor/civilian employees by 461. This would represent a 791 percent increase in military positions and a 114 percent increase in contractor/civilian positions. Total military dependents would increase by approximately 5,075 and contractor/civilian dependents by about 1,079. The total population of Imperial County would increase by approximately 9,129, or about 5 percent of the 2010 population and 4 percent of the projected 2020 population.

Employment and Income

Including their basic pay and housing and subsistence allowances, the total gain of personnel at NAF El Centro would earn an estimated total of $141.2 million in direct annual income. Some of these earnings would be paid to taxes, and some would be saved and invested, but most would be spent on consumer goods and services in the region. This spending would represent final demand increases to numerous economic sectors.

Ongoing secondary impacts (direct, indirect, and induced effects) would total an estimated 1,139 jobs and an estimated $64.2 million in labor income (Minnesota IMPLAN Group, Inc. 2011). The jobs include full- and part-time positions, and the income includes both employee compensation and proprietors' income. These jobs—in addition to the primary impacts—would last as long as the personnel changes are in effect, and the income would occur each year (though results are presented in 2012 dollars).

These 1,139 jobs represent 2.1 percent of the 54,200 people in the region's civilian labor force in 2011 (California Employment Development Department 2011). With an unemployment rate of almost 30 percent in Imperial County, it would be expected that many of the new jobs would be filled by this unemployed labor force. Other jobs would be filled by family members of the new personnel, by other regional workers taking second jobs, and by existing employees working extra hours. Therefore, it would not be likely that the employment impacts by themselves would trigger any in-migration to the region, beyond the military and civilian personnel and dependents.

Additional taxes would accrue to the federal, state, and local governments as a result of this new economic activity. According to the social accounting framework used for this analysis (Minnesota IMPLAN Group, Inc. 2011), the federal government would collect an additional $7.3 million annually, and California and local governments would collectively gain $7.4 million annually. Refer to Appendix E for additional information.

Military construction and demolition projects at NAF El Centro for Alternative 1 would span multiple years. For analysis purposes, the projects are grouped in representative construction years (CYs) (refer to Section 2.7.2, *Alternative 1 – Facility and Infrastructure*, for more information). As shown in **Table 4.7-8**, the peak year of impacts would be CY1, resulting in an estimated 2,755 full- and part-time jobs. Total labor income impacts in that peak year are estimated at $156 million.

Overall, the peak year total represents about 5.1 percent of the region's civilian labor force in 2011 and the peak construction employment (1,948 positions) represents approximately 150 percent increase in the 1,300 total regional construction, mining, and logging jobs in 2011 (California Employment Development Department 2011). With the extremely high rate of unemployment in Imperial County, it would be expected that some of these positions would be filled by regional unemployed workers. It would also be extremely likely that some construction workers would move into the region in response to the direct job impacts in construction, but these workers would most likely leave the region for other opportunities when the construction projects near completion.

Table 4.7-8. Employment and Income Impacts Associated with Military Construction Projects at NAF El Centro under Alternative 1

Sector[1]	*CY1*	*CY2*	*CY3*	*CY4*	*CY5*	*CY6*
Employment Impacts[2]						
Direct	1,948	1,420	835	306	147	168
Indirect	356	234	172	51	57	28
Induced	451	324	195	70	37	39
Total	**2,755**	**1,977**	**1,201**	**427**	**241**	**234**
Labor Income Impacts[3]						
Direct	122.841	89.415	52.612	19.314	9.276	10.587
Indirect	16.764	10.951	7.786	2.469	2.205	1.353
Induced	15.906	11.431	6.881	2.482	1.307	1.361
Total	**155.510**	**111.796**	**67.279**	**24.265**	**12.788**	**13.301**

Source: Estimated for this study with IMPLAN (Minnesota IMPLAN Group 2011).
Notes: 1. Impacts due to MILCON projects, assuming all expenditures in region. May not add due to rounding.
2. Number of jobs.
3. Employee compensation plus proprietors' income (in millions of 2011 dollars).

Additional taxes from construction activities would result in a federal gain of approximately $56.8 million over the course of the construction period. In addition, California and local governments would collectively gain approximately $33.4 million over the course of construction (Minnesota IMPLAN Group, Inc. 2011). Refer to Appendix E for additional information.

Housing

Under Alternative 1, 2,514 additional military and 461 contractor/civilian personnel would be assigned to NAF El Centro over 13 years. Under this alternative, four Bachelor Enlisted Quarters facilities would be constructed that would house approximately 824 unaccompanied personnel. Under a conservative scenario, the military personnel not accommodated in the proposed Bachelor Enlisted Quarters and the contractor/civilian personnel would seek community housing at the same time. This would represent approximately 4 percent of the current Imperial County housing stock.

The 2011 manpower update of the 2009 HRMA determined that there would be a total military family community housing shortfall of 564 units and a community housing shortfall for unaccompanied personnel of 216 units in 2014 (Robert D. Niehaus, Inc. 2011). Therefore, implementation of this alternative would have a potentially significant impact to the local housing market.

While the influx of new households would strain the capacity of the existing housing market, the phasing of the personnel transition over approximately 13 years, vacancy rates that range from 7 percent to 12 percent, plus the response of the housing market to the proposed action would lessen the short- and long-term impacts to the local housing market. In addition, six master planned residential and commercial communities are proposed for development in southern Imperial County over the next one to three decades (see Chapter 6, *Cumulative Impacts*). Furthermore, advance planning and coordination with Navy planners and community leaders in the NAF El Centro area would also help to minimize potential negative effects associated with the increase in personnel.

Environmental Justice

This section evaluates potential impacts on minority and low-income communities residing in areas near NAF El Centro in accordance with the requirements of EO 12898. In order to analyze the potential for disproportionate impacts to minority populations and low income populations, the estimated population within Noise Zones 2 and 3 (i.e., greater than 65 dB CNEL) was further analyzed using census data at the block group level. Section 3.2 and Appendix C detail the methodology used to estimate the population within the noise zones. Census data estimates for percent minority and low-income populations within the affected block groups were used to derive the estimated minority and low-income populations within Noise Zones 2 and 3. As the US Census Bureau no longer reports poverty data in the decennial census, the analysis relied on poverty data from the 2006-2010 American Community Survey 5-Year Estimates.

Table 4.7.9 presents the results of this analysis for the baseline and Alternative 1. Under Alternative 1, the population within Noise Zones 2 and 3 comprises approximately 83 percent minority populations. The estimated percent minority within Noise Zones 2 and 3 under Alternative 1 is greater than under the baseline, which is estimated at 68.5 percent. Both the baseline and Alternative 1 are less than the minority population percentage in Imperial County (86.3 percent) but greater than in California (59.9 percent).

A 20.0 percent low-income population is estimated within Noise Zones 2 and 3 under Alternative 1 as compared to an estimated 18.3 percent low-income population within Noise Zones 2 and 3 under baseline conditions. Both percentages are less than the low-income populations for Imperial County (21.4 percent) but greater than in California (13.7 percent).

Therefore, Alternative 1 would not have disproportionately high and adverse human health or environmental effects on minority populations and low income populations compared to the community of comparison, Imperial County. Based on the analysis in this EIS, Navy concludes that Alternative 1 would not result in disproportionately high and adverse human health or environmental effects on minority populations and low-income populations in the NAF El Centro area.

Table 4.7-9. Baseline and Proposed Minority and Low-Income Populations Underlying NAF El Centro Aircraft Noise Zones under Alternative 1

Noise Zones (dB CNEL)	*Total Population*	*Total Minority Population*	*Percent Minority*	*Total Low-Income Population*	*Percent Low-Income*
Baseline (2015)					
Noise Zone 2					
65-69	779	543	69.7%	141	18.1%
70-74	55	31	56.4%	11	20.0%
Noise Zone 3					
75-79	18	10	55.6%	4	22.2%
80-84	0	0	-	0	-
85+	0	0	-	0	-
Total	**852**	**584**	**68.5%**	**156**	**18.3%**

Table 4.7-9. Baseline and Proposed Minority and Low-Income Populations Underlying NAF El Centro Aircraft Noise Zones under Alternative 1

Noise Zones (dB CNEL)	*Total Population*	*Total Minority Population*	*Percent Minority*	*Total Low-Income Population*	*Percent Low-Income*
Proposed (2028)					
Noise Zone 2					
65-69	2,036	1,721	84.5%	407	20.0%
70-74	52	30	57.7%	10	19.2%
Noise Zone 3					
75-79	36	21	58.3%	7	19.4%
80-84	32	14	43.8%	6	18.8%
85+	8	4	50.0%	2	25.0%
Total	**2,164**	**1,790**	**82.7%**	**432**	**20.0%**
Net Change from Baseline	**+1,312**	**+1,206**	**-**	**+276**	**-**

Protection of Children

This section evaluates potential impacts on the population under 18 residing in areas near NAF El Centro in accordance with the requirements of EO 13045. **Table 4.7-10** presents the population under the age of 18 that would be affected by noise levels 65 dB CNEL or greater under Alternative 1. Approximately 406 more children would be affected by Alternative 1 than under the baseline. The percentage of the population aged 18 and under that would be affected under this alternative would be 31.1 percent, slightly less than under baseline conditions (31.3 percent). Both the baseline and Alternative 1 are greater than the percentage for Imperial County (29.3 percent). The percentage of the California population under the age of 18 is 25.0 percent.

One school, Seeley Elementary School, would be within Noise Zones 2 and 3 for Alternative 1 (Refer to Section 4.2, *Noise*). There would be no disproportionate environmental health and safety risks to children from implementation of Alternative 1 compared to baseline conditions. However, Alternative 1 would introduce significant new noise to children under the age of 18 because 406 more children would be affected by noise from Alternative 1 than under the baseline.

Table 4.7-10. Population Under the Age of 18 Underlying NAF El Centro Aircraft Noise Zones under Alternative 1

Noise Zones (dB CNEL)	*Total Population*	*Total < Age 18 Population*	*Percent < Age 18*
Baseline (2015)			
Noise Zone 2			
65-69	779	244	31.3%
70-74	55	17	30.9%
Noise Zone 3			
75-79	18	6	33.3%
80-84	0	0	-
85+	0	0	-
Total	**852**	**267**	**31.3%**

Table 4.7-10. Population Under the Age of 18 Underlying NAF El Centro Aircraft Noise Zones under Alternative 1

Noise Zones (dB CNEL)	*Total Population*	*Total < Age 18 Population*	*Percent < Age 18*
Proposed (2028)			
Noise Zone 2			
65-69	2,036	634	31.1%
70-74	52	16	30.8%
Noise Zone 3			
75-79	36	11	30.6%
80-84	32	10	31.3%
85+	8	2	25.0%
Total	**2,164**	**673**	**31.1%**
Net Change from Baseline	**+1,312**	**+406**	-

Conclusion

Overall, as discussed above, implementation of Alternative 1 at NAF El Centro would result in significant impacts to socioeconomic characteristics from disproportionate effects to children from noise and from the impact to local housing markets due to the 5 percent increase in demand for community housing in Imperial County. There would be a 5 percent increase in the projected 2020 population. Industry resources would likely be able to accommodate employment demand associated with proposed construction and demolition activities. Proposed facility development and personnel increases would result in short-term and long-term economic benefits to the region. There would be no disproportionate impact to minority or low-income populations in the NAF El Centro area.

4.7.2.2 Alternative 1 – NAF El Centro Homebasing, Effects at NAS Lemoore

Under Alternative 1, there would be a decrease in military positions at NAS Lemoore, as personnel who currently support FA-18 squadrons at NAS Lemoore transition to supporting F-35C squadrons at NAF El Centro. (Please see Section 5.7.1, *Affected Environment* for a description of socioeconomics at NAS Lemoore.)

Population

Under Alternative 1, military positions at NAS Lemoore would decrease by 1,539; there would be no change to contractor/civilian positions. This would represent a 24 percent decrease in military positions, or 19 percent of total installation employment. Total military dependents would decrease by approximately 3,114. The total population of the study area would decrease by approximately 4,653, or less than 1 percent of the 2010 and 2020 populations.

Employment and Income

Including their basic pay and housing and subsistence allowances, the total loss of personnel at NAS Lemoore would result in an estimated loss of direct annual income of $70.7 million. This loss of regional spending would affect final demand in numerous economic sectors.

Ongoing secondary impacts (direct, indirect, and induced effects) would result in an estimated 787 lost jobs and an estimated $38.7 million in reduced labor income (Minnesota IMPLAN Group, Inc. 2011). The jobs include full- and part-time positions, and the income includes both employee compensation and proprietors' income. These employment impacts represent less than 1 percent of the 366,900 people in the study area's civilian labor force (California Employment Development Department 2011). The long-term loss of these positions may result in a minor increase in the regional unemployment rate as laid-off employees seek new positions.

Federal, state, and local government tax revenues would decline as a result of this lost economic activity. According to the social accounting framework used for this analysis (Minnesota IMPLAN Group, Inc. 2011), the federal government would lose $7.1 million annually, and California and local governments would lose $6.4 million annually. Under Alternative 1, there would be no construction spending for facility demolition or renovation at NAS Lemoore.

Housing

Under Alternative 1, 1,539 military personnel would be reassigned from NAS Lemoore to NAF El Centro. A conservative scenario would result in 1,539 housing units put up for sale at the same time. This would represent less than 1 percent of the current housing stock in the study area. However, it is unlikely that all the military personnel would be reassigned at the same time since this alternative would be phased over approximately 13 years. Furthermore, not all the military personnel who would be reassigned own homes. Therefore, while there may be short-term impacts, the local housing market would be expected to recover.

Environmental Justice

Under this alternative, seven FA-18 squadrons would be phased out at NAS Lemoore. This would result in a reduction in noise levels and a change to noise zones (see Section 4.2, *Noise*). Therefore, Alternative 1 would not have disproportionately high and adverse human health or environmental effects on minority populations and low income populations compared to the communities of comparison, Kings and Fresno counties.

Protection of Children

Under this alternative, noise levels at NAS Lemoore would be reduced (See Section 4.2, *Noise*). Therefore, there would be no disproportionate environmental health and safety risks to children.

Conclusion

Overall, as discussed above, implementation of Alternative 1 would not result in significant impacts to socioeconomic characteristics from the decrease in military positions at NAS Lemoore. There would be less than 1 percent decrease in the population, which would result in direct income losses affecting regional spending. Lost jobs would result in a reduction of labor income in the region. A minor increase in the regional unemployment rate would be expected. Short-term impacts to the local housing market would be expected to recover.

4.7.3 Environmental Consequences for the No Action Alternative

Under the No Action Alternative, the proposed action would not be implemented and existing socioeconomic conditions described in Section 4.7 would remain unchanged.

4.8 COMMUNITY SERVICES

4.8.1 Affected Environment

The affected environment for community services includes NAF El Centro, the City of El Centro, and Imperial County. This section addresses schools and childcare, police and fire protection, health services, parks and recreation, and religious services.

4.8.1.1 Schools and Childcare

Imperial County is served by 16 school districts. Nine districts provide grades K-8, two districts provide grades 9-12, and five districts provide grades K-12 (California Department of Education 2012). However, NAF El Centro dependents are served primarily by three school districts: Seeley Union School District, Central Union High School District, and El Centro School District. **Table 4.8-1** summarizes the schools districts that serve NAF El Centro, the schools the grades served, the enrollment, capacity, and available space. Many schools do not report their actual capacities. Capacity, enrollment, and available space data were collected from the schools and in cases where the data were not available from the schools, the California Department of Education School Accountability Report Card was used. The School Accountability Report Card is information provided annually by the schools to give the public information about student achievement, school resources, and demographics. In cases where specific school capacity information was not available, California Education Code § 17071.10-17071.46 was used to determine an approximate capacity. California Education Code § 17071.10-17071.46 defines school building capacity as 25 students per classroom for kindergarten through sixth grade, and 27 students per classroom for grades seven and higher. This requirement was used to estimate the potential capacity of schools not reporting capacity; estimated capacities are identified in **Table 4.8-1**.

Table 4.8-1. Capacity and Available Space in Schools Serving the NAF El Centro Region

School District	*School Name*	*Grades Served*	*Enrollment*	*Capacity*	*Available Capacity*[1]
Seeley Union School District	Seeley Elementary School	K-8	392	620	228
Central Union High School District	Central Union High School	9-12	1,781	2,268	487
	Southwest High School	9-12	2,037	3,000	963
	Desert Oasis High School	9-12	Variable	Not Available	-
El Centro Elementary School District	Desert Garden Elementary School	K-6	434	550	116
	Harding Elementary School	K-6	488	550	62
	Lincoln Elementary School	K-5	382	600	218
	Margaret Hedrick Elementary School	K-6	458	575	117
	Martin Luther King Jr. Elementary School	K-5	380	650	270

Table 4.8-1. Capacity and Available Space in Schools Serving the NAF El Centro Region

School District	*School Name*	*Grades Served*	*Enrollment*	*Capacity*	*Available Capacity*[1]
El Centro Elementary School District	McKinley Elementary School	K-5	430	600	170
	Sunflower Elementary School	K-6	457	600	143
	Washington Elementary School	K-6	470	750	280
	De Anza Magnet School	K-8	538	525	-13
	Kennedy Middle School	6-8	548	832	284
	Wilson Junior High School	7-8	728	1,080	352
		Total[2]	**9,523**	**13,200**	**3,677**

Sources: Seeley Union School District 2012, Central Union High School 2012, Southwest High School 2012, California Department of Education 2012.
Notes: 1. Based on capacity minus enrollment.
2. Does not include Desert Oasis High School.

All children living on the installation attend Seeley Elementary School for kindergarten through eighth grade unless parents request a move to another school district. Expansion plans for the Seeley Union School District include portable classrooms, which are on order (Seeley Union School District 2012).

Central Union High School District is made up of two comprehensive high schools and one alternative high school. Data indicate that enrollment at Central Union High School has decreased primarily as a result of the economy, which has resulted in students moving outside of the school district's boundary (Central Union High School 2012). Southwest High School is the newest school in the Central Union High School District, and was constructed in 1996. Desert Oasis High School is an alternative high school serving students in need of extra academic or behavioral assistance. Many students attend transiently as required by the Central Union High School District's disciplinary board. The daily enrollment generally fluctuates throughout the year between 150 and 195 students, however at times it can reach up to 350 students who attend transiently throughout the year (Desert Oasis High School 2012). In the 2011-2012 academic year, 155 students attended Desert Oasis High School.

El Centro Elementary School District is composed of nine elementary schools and two middle schools providing kindergarten through eighth grade education. Of these schools, all are operating below capacity, with the exception of the De Anza Magnet School, which operated above capacity in the 2011-2012 school year. No students attending the El Centro School District reside at NAF El Centro.

In August, 2010, NAF El Centro opened a new, 12,077 ft^2, Combined Child Care and Youth Center Facility. Children at the facility are supervised by qualified staff that receive ongoing training and provide activities that promote physical growth, motor development, thought and language development and creativity. Fees are based on total family income. The facility has the capacity for 116 children including: eight infants (six weeks of age), 10 pre-toddlers, 14 toddlers, 24 pre-kindergarten, 15 teenagers, and 45 school age children. The facility is currently operating under capacity in all age groups for a total of 65 children. The breakdown of existing age groups currently enrolled at the facility includes: seven infants,

four pre-toddlers, nine toddlers, 21 pre-kindergarten, four teenagers, and 20 school age children (NAF El Centro 2011b).

NAF El Centro's Youth Center program consists of diversified recreational, social and athletic curriculum to satisfy the interests and needs of children ages six to twelve years old. Fees are based on total family income. The program is designed to provide training in the leisure time skills. The program offer arts and crafts, bowling and outdoor activities. Field trips are also part of the curriculum.

NAF El Centro also has a Child Development Home Program that offers home-based child care on a full-time basis. Child Development Home Care providers are qualified professionals operating independent programs in military and civilian housing. There is currently one home care provider on the installation and the provider can care for up to six children.

4.8.1.2 Police Protection

NAF El Centro uses Naval Security Forces standardized policies and procedures to enforce the law, maintain good order and discipline, investigate offenses, safeguard the rights of all persons, and provide service to the community. Security policies and procedures maintained at NAF El Centro may include specific local issues beyond that of Navy requirements and are contained in supplemental instructions to the Navy regulations.

Navy Security services at NAF El Centro are provided by approximately 31 military personnel who patrol the installation 24 hours a day. The security personnel are responsible for providing force protection, anti-terrorism, and physical security to NAF El Centro and visiting detachments (Commander Navy Installations Command [CNIC] 2011).

Police services for the NAF El Centro and the City of El Centro are currently provided by the City of El Centro Police Department. The department operates one police station and employs 45 sworn officers or 1.2 officers per 1,000 residents in service area. This is below the City of El Centro’s goal of 1.4 officers per 1,000 residents; the City is operating at an eight-officer deficit (City of El Centro 2005). 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 Sherriff’s Department. The Sherriff’s Department operates patrols out of the main department in El Centro, and out of five substations: Brawley, Palo Verde, Niland, Salton City, and Winterhaven (Imperial County Sherriff’s Office 2011).

4.8.1.3 Fire Protection

NAF El Centro maintains a fire and rescue station in an aircraft hangar on the installation. The station has a total staffing level of 38 civilian firefighters (NAF El Centro 2011a). 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 installation maintains mutual aid agreements with the City of El Centro Fire Department and the Imperial County Fire Department for additional fire protection services (City of El Centro, 2005; City of Imperial, 2008).

The City of El Centro Fire Department operates two stations and employs 33 uniformed personnel (including firefighters, emergency medical technicians, bomb technicians, and other specialties) and four non-uniformed, administrative personnel. The department maintains four fire engines for active service and two other fire engines as reserves (City of El Centro 2005). 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 two stations, and maintains fire engines at 14 fire stations throughout the county (DoN 1990). The cities of Brawley and Holtville also have their own fire departments.

NAF El Centro provides three-alarm fire support to the cities of Brawley, Calexico, Calipatria, Calipatria Prison, El Centro, Holtville, Imperial, Niland, West Moreland, and Winterhaven, as well as to the facilities at Calipatria Prison and Marine Corps Air Station (MCAS) Yuma. NAF El Centro offers second-alarm support to Centinela State Prison and the City of Ocotillo, and fourth-alarm support to the City of Yuma. NAF El Centro provides variable second- through fourth- alarm support to the unincorporated regions of Imperial County (City of Imperial 2008).

NAF El Centro receives second-alarm fire support from the City of El Centro, Centinela Prison, and Imperial County. Third-alarm fire support may come from Holtville or Calexico. Fourth-alarm support comes from the cities of Brawley, Westmoreland, and Calipatria, as well as Calipatria Prison, and Imperial County Rural Metro fire support. NAF El Centro manages all first-alarm level events with internal staff and equipment (City of Imperial 2008).

4.8.1.4 Health Services

NAF El Centro has a combined medical and dental clinic on the installation. The medical clinic provides only primary care services to active duty installation 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. The dental services are provided one week per month for active duty installation personnel (CNIC 2011, Naval Medical Center San Diego 2011).

Patients requiring medical services beyond what the clinic can provide are referred to civilian medical doctors or to local hospitals. For emergency room or hospital service patients use the two major hospitals in Imperial County—El Centro Regional Medical Center in El Centro or Pioneers Memorial Hospital in Brawley (DoN 1990). Under certain circumstances, the clinic may transport patients to the Balboa Naval Hospital in San Diego All hospitals in Imperial County provide 24-hour emergency services.

In the event of a mass-casualty incident such as an aircraft accident, NAF El Centro relies on Mutual Aid agreements with surrounding municipalities. These agreements are coordinated through the area fire departments, but the focus of the agreement is the response to incidents involving larger quantities of injured people, rather than a fire emergency. NAF El Centro relies on internal facilities and personnel for a first-alarm mass casualty event. The City of El Centro, Imperial County, and Centinela Prison provide second-alarm support; the cities of Borstar, Calexico, and Holtville, as well as further Imperial County services provide third-alarm support. The cities of Brawley, Calipatria, and Westmoreland provide fourth-alarm support (City of Imperial 2008).

4.8.1.5 Parks and Recreation

Outdoor recreation areas at NAF El Centro include two tennis courts, two pools, a skeet range, a baseball diamond, a softball field, a football field, shuffleboard courts, handball/racquetball courts, a picnic area, golf driving range, and grass play areas near the baseball field. Indoor recreation areas include a bowling alley, hobby/arts and crafts shop, auto hobby shop, youth center, theater building, enlisted club, officers club, racquetball court, arcades, weight room, and aerobics facility (CNIC 2011).

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 installation as arranged at the Duty Office or a reporting sailor's sponsor (CNIC 2011).

4.8.1.6 Religious Services

NAF El Centro also has a full-time chaplain on the installation. Weekly Sunday worship service is provided for Protestant/non-denominational Christian and Catholic religious. The chaplain also provides informal, faith-based support via the Chaplain's Religious Enrichment Development Operation, a program that provides retreat opportunities for the close examination of an individual's spiritual needs in the modern, military world. Other religious services include a food ministry, home/hospital visits, children's religious education, counseling, marriage preparation, and additional as-needed personal services (CNIC 2011).

4.8.2 Environmental Consequences for Alternative 1

Under Alternative 1, potential impacts to community services could occur from changes in military and civilian personnel and dependents. Potential impacts from homebasing at NAF El Centro are discussed in the next two sections in terms of effects at NAF El Centro and effects at NAS Lemoore.

4.8.2.1 Alternative 1 – NAF El Centro Homebasing, Effects at NAF El Centro

<u>Schools and Childcare</u>

As discussed in Section 4.7, *Socioeconomics*, Alternative 1 would increase the military dependent population by approximately 5,075 and contractor/civilian dependents by approximately 1,079, for a total of 6,154. Of this population, 1,791 are expected to be school-age (i.e., between 6 and 18 years) children (NAVFAC Headquarters 2011). Assuming an even distribution of ages for school district impact, this approximates 1,240 additional students in grades kindergarten through eight, and 551 additional high school students.

The Seeley Elementary School has capacity for up to 620 students, 228 more than enrolled in the 2010-2011 academic year. Thus, some population growth resulting from the proposed action could be absorbed by the Seeley Elementary School. The remaining 809 predicted elementary school children would need to travel farther, to the adjacent elementary schools in the El Centro Elementary School District. This district has the capacity to enroll an additional 1,999 elementary students based on 2010-2011 enrollment, and therefore could absorb the additional student population.

The capacity for the schools in the Central Union High School District was calculated using information in the 2010-2011 SARCs and the 2007-2008 Central Union High School Comprehensive School Safety Plan, which outlines the number of classrooms and portable classrooms used at Central Union High School. The 2011 SARC for Southwest High School identified a capacity of 3,000 and the Central Union High School Comprehensive School Safety Plan identified 72 classrooms and 8 portable classrooms. Additionally, specialized classrooms were included in the plan (e.g., wood shop, auto shop) and a total of 4 were included in the capacity estimate. The capacity identified in Table 4.8-1 indicates there would be sufficient capacity in the Central Union High School. The most substantial challenge to both the school districts would be ensuring adequate staffing of the schools, as budgets have required shrinking staffs annually since 2008. This challenge may be offset by an increase in local tax revenue, as discussed in Section 4.7, *Socioeconomics*.

During the public review period of the Draft EIS, resolutions in support of homebasing at NAF El Centro were received from the El Centro Elementary School District, the Calipatria Unified School District, the Brawley Elementary School District, and the Seeley Union School District. Superintendents from the Seeley Union School District, Imperial County School, Imperial Unified School District, and Central Union School District submitted comments in support of homebasing at NAF El Centro during the public review period for the Draft EIS (Appendix A).

As stated previously, the NAF El Centro Combined Child Care and Youth Center Facility is currently operating under capacity serving approximately 100 children under the age of 6 with a maximum capacity of 350. Based on the increase in personnel under Alternative 1 it is anticipated that the number of dependents that would utilize child care would increase and require additional facilities. To determine if a new facility would be required under Alternative 1 it was assumed for planning purposes that 619 military children under the age of 6 years would be part of the military dependent population and 116 civilian children under the age of 6 years would require child care. Assuming 50 percent of the population would utilize the Child Development Center, it was determined that a facility to support 368 children would be required. Therefore, with the increase in children under the age of 6 years due to an increase in personnel and the existing children under the age of 6 years the facility would be over the maximum capacity and a new child care facility would be required.

Police Protection

Under Alternative 1, there would be an increase in approximately 2,975 personnel at NAF El Centro. Local training of NAF El Centro personnel, vehicle screening, cameras, mobile surveillance systems and other technologies, and the continuance of an exceptional partnership with state, local, and federal partners would unify operations and address the complex challenges in securing this installation near the United States – Mexico border.

Based on existing population growth projections, the City of El Centro anticipates that, for proper levels of police services, the city would need 62 officers on staff by the year 2025, based industry standards and the City of El Centro's goal of 1.4 officers per 1,000 people (City of El Centro 2005). Based on their goals, the City of El Centro is currently underserved. The additional population that would result under Alternative 1 would not be entirely within the El Centro city limits. However, the additional population would still put additional pressure on the City of El Centro and surrounding incorporated towns.

Under Alternative 1 it is expected that with an increase of 2,975 personnel and dependents, an additional 4 officers according to the City of El Centro's goal of 1.4 officers per 1,000 people. Since the increase of personnel and dependents would occur over an extended period it is anticipated that the City of El Centro would have time to add officers to their staff; therefore impacts to police protection are not anticipated to be significant.

Fire Protection

The El Centro Fire Department Service Area Plan anticipates population growth within the department's service area. The plan calls for the development of two additional fire stations, as well as the staffing increased associated with those stations (City of El Centro 2005). The City of Imperial Service Area plan similarly anticipates the need for one additional fire station that jointly serves the City of Imperial and Imperial County to accommodate future growth. Alternative 1 also includes the construction of a new aircraft and structural fire station to improve fire response within the installation.

Health Services

NAF El Centro does not currently provide dental care to military dependents or to non-active duty personnel. The clinic at El Centro does not provide hospitalization services or after-hours urgent care. Alternative 1 would increase the military dependent population by approximately 5,075 and contractor/civilian dependents by approximately 1,079, for a total of 6,154. The dental and urgent care needs of these dependents would be provided entirely through private practitioners in the surrounding region resulting in an increased demand for health services. The El Centro Regional Medical Center has a 165-bed capacity. If a major incident occurred on the installation, the Regional Medical Center could potentially be overwhelmed, forcing those in need of care to travel farther to Brawley for medical attention.

Under Alternative 1, a new medical and dental facility is proposed, which would offer health services to active duty personnel during normal business hours. Since the increase of personnel and dependents would occur over an extended period it is anticipated that area health care providers would have time to add additional staff. If additional health care staff were not added, the increased demand for health services could cause those in need of care to travel farther for medical care. Nonetheless, impacts to health services are not anticipated to be significant.

Parks and Recreation

NAF El Centro is surrounded by public recreational amenities. Under Alternative 1, even if amenities on the installation were to become crowded, ample opportunities outside of the installation would continue to be available.

Religious Services

Under Alternative 1, there would be an increase in personnel of 2,973 plus dependents. NAF El Centro has a full-time chaplain on the installation and provides informal, faith-based support via the Chaplain's Religious Enrichment Development Operation program. It is anticipated that under Alternative 1, the existing religious services would be able to accommodate all military and their dependents. If additional religious services and as-needed personal services are needed, they would be addressed accordingly.

Conclusion

Overall, as discussed above, implementation of Alternative 1 at NAF El Centro would not result in significant impacts to community services from increases in personnel and dependents. Adequate capacity exists in schools and childcare facilities for school age children. Additional police officers would be required in the region. A new fire station would be constructed at NAF El Centro. The City of El Centro and City of Imperial plan to develop new fire stations to accommodate anticipated population growth. There would be an increased demand for health services, dental, and urgent care, as well as religious services. Recreational opportunities on and off the installation would continue to be available.

4.8.2.2 Alternative 1 – NAF El Centro Homebasing, Effects at NAS Lemoore

Under Alternative 1, military positions at NAS Lemoore would decrease by 1,539; there would be no change to contractor/civilian positions. Total military dependents would decrease by approximately 3,114. The total population of the study area would decrease by approximately 4,653. As a result, there would be a decrease in demand for all community services at NAS Lemoore and in the surrounding communities. (Please see Section 5.8.1, *Affected Environment* for a description of community services at NAS Lemoore.)

4.8.3 Environmental Consequences for the No Action Alternative

Under the No Action Alternative, the proposed action would not be implemented and there would be no increases in operations at NAF El Centro; therefore, there would be no increases in personnel and dependents and no impacts to community services.

4.9 GROUND TRAFFIC AND TRANSPORTATION

4.9.1 Affected Environment

The affected environment for ground traffic and transportation includes NAF El Centro, the City of El Centro and Imperial County. This section addresses local and regional traffic circulation, traffic conditions at NAF El Centro, and public transit.

4.9.1.1 Local and Regional Traffic Circulation

NAF El Centro is located approximately 7 miles northwest of the City of El Centro in Imperial County, California and approximately 13 miles north of the United States – Mexico border. NAF El Centro is bounded by Huff Road to the west, Imperial Avenue (State Route 86) on the east, Interstate 8 (I-8) on the south, and County Highway S-28 to the north (**Figure 4.9-1**).

Several principal roadways provide local access to the installation including: Drew Road, Bennett Road, and Forrester Road. Drew Road is a two-lane, north-south collector roadway. Drew Road intersects with I-8, southwest of NAF El Centro. The roadways connect with a diamond interchange and stop sign controls at the east and westbound off ramps. Drew Road provides access to NAF El Centro via Evan Hewes Highway (County Highway S-80). This intersection is controlled by a four-way stop.

Bennett Road is a two-lane roadway classified as a local street. Bennett Road is a north-south roadway that provides sole access to the main gate at NAF El Centro via Evan Hewes Highway. Bennett Road ends

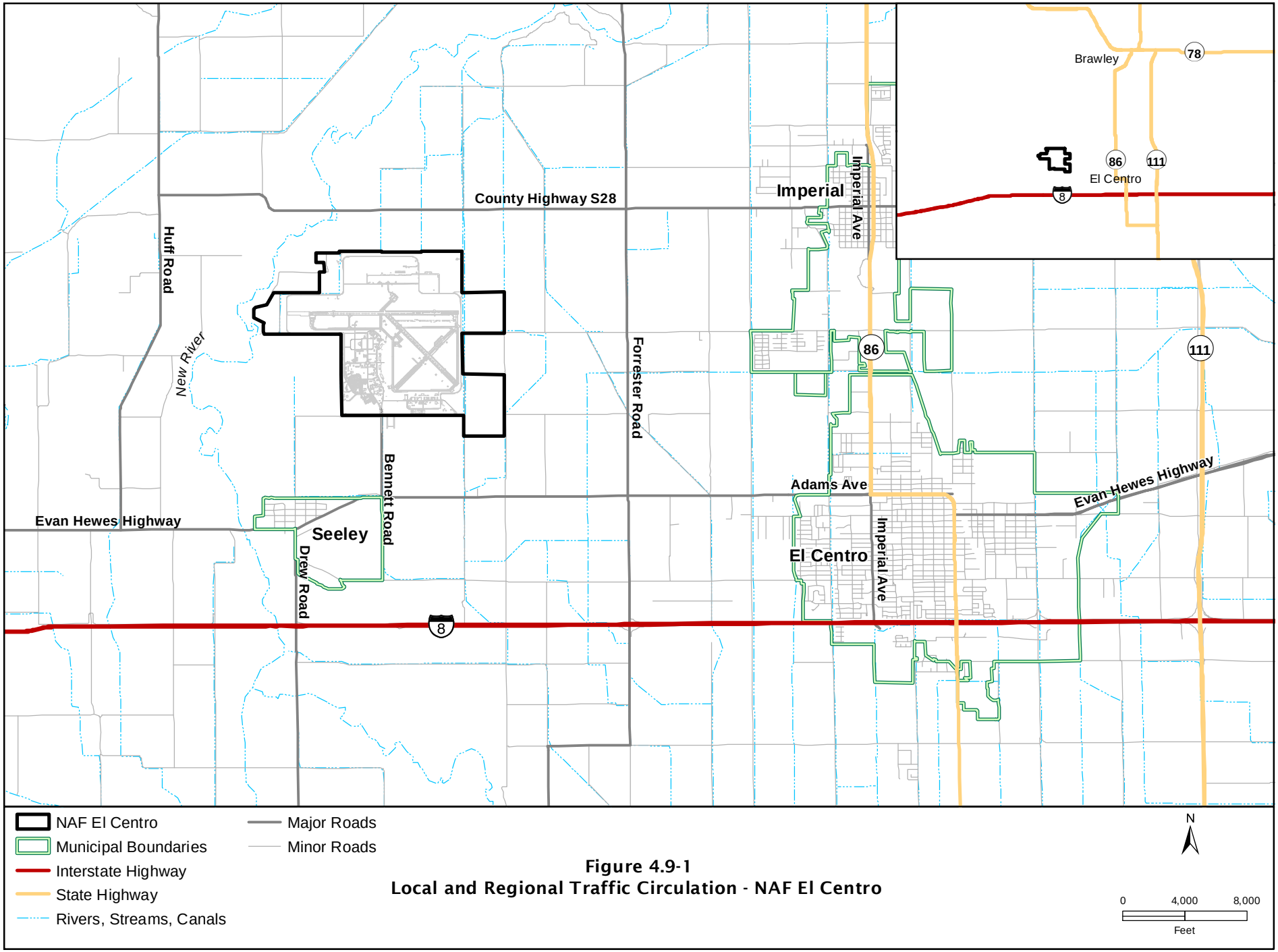


Figure 4.9-1
Local and Regional Traffic Circulation - NAF El Centro

at the main gate of NAF El Centro. The intersection of Bennett Road and Evan Hewes Highway is controlled by a four-way stop.

Forrester Road is a north-south, two-lane collector road. Forrester Road intersects with I-8 east of NAF El Centro. The interchange with I-8 is stop sign-controlled at both the eastbound and westbound off-ramps. Forrester Road provides access to NAF El Centro via Evan Hewes Highway.

Regional roadways within the area include I-8, State Route 111, and Evan Hewes Highway. I-8 is an east-west highway located to the south of NAF El Centro. I-8 carries traffic between San Diego, California to the west and Yuma, Arizona to the east. Access to NAF El Centro is provided via interchanges with Drew Road and Forrester Road.

State Route 111 is a north-south highway that connects the City of El Centro with Calexico, California on the United States – Mexico border. The roadway consists of a four-lane divided highway south of I-8 and a two-lane undivided highway north of I-8. Evan Hewes Highway is north of, and parallel to, I-8. The Evan Hewes Highway is an east-west highway that varies between two-lanes and four-lanes. The highway intersects with the major local roadway network at Drew Road, Bennett Road, and Forrester Road. These three intersections are all four-way stop controlled. Evan Hewes Highway also has a signalized intersection with Imperial Avenue.

4.9.1.2 Traffic Conditions at NAF El Centro

The NAF El Centro traffic study (Appendix F) conducted in September 2011 included the analysis of the following six intersections: Drew Road/Evan Hewes Highway (County Highway S-80), Bennett Road/Evan Hewes Highway, Forrester Road (County Highway S-30)/Evan Hewes Highway, Imperial Avenue (State Route 86)/Adams Avenue, Forrester Road/I-8 Westbound Ramps, Forrester Road /I-8 Eastbound Ramps. The above intersections were selected as it is expected that a large majority of personnel to be stationed at NAF El Centro under the Proposed Action would reside in and around the City of El Centro. The intersections analyzed in the Traffic Study were selected due to their location along likely travel routes between the installation and these residential areas, and would therefore accommodate the greatest concentration of project-related traffic.

In addition to the analysis of the six intersections, the traffic study also evaluated five roadway segments including: Evan Hewes Highway (west of Bennett Road), Evan Hewes Highway (east of Bennett Road), Evan Hewes Highway (east of Forrester Road), Bennett Road (north of Evan Hewes Highway), Forrester Road (south of Evan Hewes Highway).

The results of the traffic analysis (**Table 4.9-1**) show that the above intersections and roadway segments are operating at a level of service (LOS) C or better under existing conditions, which is considered by the City of El Centro and Imperial County as the general threshold for acceptable traffic operations for both signalized and non-signalized intersections (DoN 2011). The California Department of Transportation defines the acceptable LOS threshold as C/D. LOS C is acceptable in all cases and LOS D is determined acceptable on a case-by-case basis (DoN 2011). An addendum to the Traffic Study was prepared using the roadway segment LOS thresholds published in the County of Imperial Circulation and Scenic Highways Element (ICPDSD 2008) (Appendix G). The results of this addendum support the conclusions of the 2011 traffic study.

Table 4.9-1. 2011 Existing Conditions - Intersection Level of Service

ID#	Intersection	Control Type	AM Peak Hour		PM Peak Hour	
			Delay*	LOS	Delay*	LOS
1	Drew Road/Evan Hewes Highway	All-way stop-control	9.4	A	8.5	A
2	Bennett Road/Evan Hewes Highway	All-way stop-control	8.7	A	9.3	A
3	Forrester Road/Evan Hewes Highway	Signal	19.1	C	26.1	C
4	Imperial Avenue /Adams Avenue	Signal	31.3	C	30.2	C
5	Forrester Road/I-8 Westbound Ramps	Two-way stop-control	9.5	A	9.5	A
6	Forrester Road/I-8 Westbound Ramps	Two-way stop-control	11.5	B	12.8	B

Source: DoN 2011.
Note: *Delay is presented in seconds/vehicle.

4.9.1.3 Public Transit

Imperial Valley Transit provides public transportation in the El Centro area. Imperial Valley Transit primary routes service Brawley, Imperial, El Centro, and Heber to Calexico. These routes do not provide service to NAF El Centro (Imperial Valley Transit 2011).

4.9.2 Environmental Consequences for Alternative 1

Under Alternative 1, potential impacts to ground traffic and transportation could occur from changes in military and civilian personnel. Potential impacts from homebasing at NAF El Centro are discussed in the next two sections in terms of effects at NAF El Centro and effects at NAS Lemoore.

4.9.2.1 Alternative 1 – NAF El Centro Homebasing, Effects at NAF El Centro

For purposes of this analysis, the following assumptions have been made: all unaccompanied and married personnel would reside off-base in the surrounding community; and no changes to existing infrastructure.

<u>Operations Traffic</u>

Under Alternative 1, there would be an increase of 2,975 personnel and 6,154 dependents at NAF El Centro, transitioning in over approximately 13 years. There is little additional capacity for personnel and their dependents to reside within NAF El Centro. Four bachelor enlisted quarters are proposed to be constructed as part of Alternative 1 in 2015, 2019, 2022, and 2024 to house approximately 824 unaccompanied personnel (**Table 2.7-2**). While the four bachelor enlisted quarters would reduce the number of personnel driving to and from the installation daily from 2,975 to 2,151, the traffic analysis considered the potential impact of 2,975 daily commuters as a worst case scenario for planning purposes.

An increase of 2,975 personnel driving to and from the installation daily would generate additional traffic and result in changes to traffic volumes and patterns. In addition to accounting for the increase in personnel, the traffic study also took into account projected growth within the study area that would not be related to Alternative 1. A 1.7 percent growth per year for Imperial County between 2008 and 2035 has been forecasted in the draft 2012 Southern California Association of Governments *Regional*

Transportation Plan. This growth rate was applied to the 2011 existing traffic volumes to forecast 2015 and 2028 volumes. The 2015 volumes represent four years of growth (6.8 percent) and 2028 volumes represent 17 years of growth (28.9 percent) applied to existing volumes (DoN 2011). The baseline traffic conditions in 2015 are compared to the projected traffic conditions in 2028 in **Table 4.9-2**. The methods and calculations used to determine the baseline and projected traffic conditions in 2015 and 2028 are described in Appendix F.

Table 4.9-2. Baseline and Proposed Traffic Conditions under Alternative 1

ID #	Intersection	Peak Hour	2015		2028	
			Delay*	LOS	Delay*	LOS
1	Drew Road/Evan Hewes Highway	AM	9.5	A	10.6	B
		PM	8.5	A	9.0	A
2	Bennett Road/Evan Hewes Highway	AM	9.7	A	>80.0	F
		PM	16.0	C	>80.0	F
3	Forrester Road/Evan Hewes Highway	AM	20.5	C	>80.0	F
		PM	33.5	C	>80.0	F
4	Imperial Avenue/Adams Avenue	AM	31.5	C	28.7	C
		PM	32.2	C	>80.0	F
5	Forrester Road/I-8 Westbound Ramps	AM	10	B	>80.0	F
		PM	9.6	A	12.2	B
6	Forrester Road/I-8 Eastbound Ramps	AM	11.6	B	11.9	B
		PM	16.7	C	>80.0	F

Source: DoN 2011.
Note: *Delay is presented in seconds/vehicle.

As previously discussed, the existing 2011 conditions indicate that the major roadways and traffic segments are currently operating at acceptable levels of service. The traffic study also indicates that when homebasing begins in 2015, the intersections would be operating at acceptable levels of service in the AM and PM Peak Hours. However, when homebasing is complete in 2028, several of the intersections would have failing levels of service during both morning and evening peak hours. These failing intersections would result in congestion to local roadway segments. Based on the results of the traffic impact analysis, operation of NAF El Centro with the homebasing of the F-35C would result in impacts to five of the six intersections. Impacts to local roadways would occur and would result in unacceptable levels of service during either one or both of the AM and PM Peak Hours at the following intersections: Bennett Road/Evan Hewes Highway (AM and PM Peak Hours), Forrester Road/Evan Hewes Highway (AM and PM Peak Hours), Imperial Avenue/Adams Avenue (PM Peak Hour), Forrester Road/I-8 Westbound Ramps (AM Peak Hour), Forrester Road/I-8 Eastbound Ramps (PM Peak Hour).

On Bennett Road, railroad tracks are located approximately 350 ft north of the Bennett Road/Evan Hewes Highway intersection. The average queue length on the southbound approach to that intersection is projected to be more than 200 vehicles during the PM Peak Hour. A queue of this length represents a failure of the intersection and would extend well beyond the train tracks and continue back to the installation gate. It would create the potential for vehicles to get trapped on the rail crossing, resulting in a safety hazard (DoN 2011).

There are several measures that could be taken to reduce the identified impacts to levels of service.

- Traffic management measures on the installation to minimize peak morning and evening traffic congestion.
- New gate and access improvements to enhance traffic movement during construction periods.
- Consider use of alternative access during construction periods depending upon internal circulation requirements.
- Four barracks are proposed for construction under this alternative. The barracks would house approximately 824 personnel, 28 percent of the 2,975 increase in personnel would live on the installation. These 824 personnel were included in the overall traffic analysis to provide a worst case scenario for planning purposes. However, with these personnel residing on the installation they would not be making a daily commute to their jobs at NAF El Centro on area roadways, which would result in a reduction of personnel entering the installation during peak hours thereby reducing the impact to traffic congestion.

With the increase in personnel accessing the installation, Bennett Road/Evan Hewes Highway intersection would require signalization and substantial improvements as follows:

- **Westbound approach** – provide two channelized, free right-turn lanes; change the through-left lane to a separate left turn lane and a single through lane
- **Eastbound approach** – add a through lane
- **Northbound approach** – Add a second lane to create a separate left-turn lane and a through-right lane
- **Southbound approach** – provide two left-turn lanes and a shared through-right lane

These improvements would require partially enclosing the adjacent irrigation channel, relocating utility poles on one or both sides of both roadways, and possibly relocating the gas pipeline on the south side of Evan Hewes Highway. Even with the identified improvements, the intersection's proximity to the at-grade rail crossing would result in queues during the PM Peak Hour that regularly extend well beyond the crossing. To prevent vehicles from becoming trapped on the crossing, the traffic signal at the intersection would require a railroad preemption phase that would clear the southbound approach to the intersection when an oncoming train is detected.

The Forrester Road/Evan Hewes Highway intersection is a relatively newly installed signalized intersection. To accommodate large increase in traffic volumes through the intersection, the following improvements would be required:

- **Westbound approach** – provide two additional through lanes
- **Eastbound approach** – provide two through lanes and one right-turn lane
- **Northbound approach** – change single-lane approach to two left-turn lanes and one shared through-right lane
- **Southbound approach** – no change

These improvements would require partially enclosing the adjacent irrigation channels, relocating traffic signal poles, relocating utility poles on one or both side of Evan Hewes Highway, and possibly relocating the gas pipeline on the south side of Evan Hewes Highway.

The Imperial Avenue/Adams Avenue intersection is the only intersection in the project study area located in the City of El Centro. In 2028, the PM Peak Hour at this intersection would result in a failing

LOS F. LOS D is approved as acceptable operations for this intersection by the City of El Centro. In order to get this intersection to the acceptable LOS during PM Peak Hours, the following improvements would be required:

- **Westbound approach** – no change
- **Eastbound approach** – add additional left-turn lane
- **Northbound approach** – add a through lane and change through-right to a right-turn lane
- **Southbound approach** – provide additional through lane

The I-8 freeway ramps at Forrester Road would need to be signalized to accommodate the increase in peak hour trips. In addition, the Forrester Road/I-8 westbound off-ramp would need an additional turn lane. Last, the following measures could be taken to offset impacts to levels of service associated with roadway segments:

- Widen Evan Hewes Highway to a 4-lane divided roadway between Bennett Road and Imperial Avenue.
- Widen Bennett Road to a 4-lane undivided roadway between Evan Hewes Highway and NAF El Centro.

With the measures identified above, the impacts to intersections and roadway segments would be reduced and traffic would flow at acceptable levels of service. The Defense Access Road Program is available to assist military installations in sharing the cost of public highway improvements necessary due to an unusual impact as a result of defense activity. A significant increase in military personnel would be considered an unusual impact. The Defense Access Road program is run through the Federal Highway Administration's Office of Federal Lands Highway.

Construction Traffic

Temporary impacts to local and regional traffic would occur during demolition and construction activities. It is anticipated that construction vehicles would primarily use the main gate at Bennett Road which may result in minor congestion if substantial numbers of construction vehicles are entering the main gate during peak commute times. However, it is anticipated that the construction vehicles entering and exiting the main gate would be dispersed over the course of the work day. Therefore, it is anticipated that construction vehicles would not contribute to congestion and vehicle backlogs at the main gate that may affect traffic on Bennett Road. Coordination with base security would occur to reduce congestion from construction traffic.

Conclusion

Overall, as discussed above, implementation of Alternative 1 at NAF El Centro would result in significant impacts to traffic and transportation from increases in personnel and associated traffic on local roads. End state traffic conditions would result in several intersections with failing levels of service. Several measures would need to be taken to reduce impacts, such as providing signalization and additional turning and through lanes. There would be temporary increases in traffic associated with construction and demolition activities.

4.9.2.2 Alternative 1 – NAF El Centro Homebasing, Effects at NAS Lemoore

Under Alternative 1, approximately 1,539 of the total 2,973 incoming personnel would be relocated from NAS Lemoore to NAF El Centro. This change in personnel would decrease the traffic on area roadways associated with NAS Lemoore. The decrease in average daily traffic associated with the relocation would likely result in improvements in capacity and LOS on roadways within the vicinity of NAS Lemoore. Therefore, under Alternative 1, there is the potential for beneficial impacts to traffic and transportation on roadways that service NAS Lemoore. (Please see Section 5.9.1, *Affected Environment* for a description of ground traffic and transportation at NAS Lemoore.)

4.9.3 Environmental Consequences for the No Action Alternative

Under the No Action Alternative, the proposed action would not be implemented. There would be no change to the number of military personnel that commute to NAF El Centro and baseline conditions would be unchanged.

4.10 BIOLOGICAL RESOURCES

4.10.1 Affected Environment

The affected environment for biological resources includes those areas at NAF El Centro that would be disturbed by demolition and construction activities and proposed aircraft operations. This section addresses vegetation, wildlife, and special-status species.

4.10.1.1 Vegetation

NAF El Centro is located in the Imperial Valley Basin within the American Semidesert and Desert Province (Bailey 2008). Most areas associated with NAF El Centro have been actively altered through development, landscaping and pavement, and therefore contain little native vegetation. The primary types of vegetation that occur within the main cantonment area include landscaped areas (cantonment/developed), agricultural areas, and dispersed shrubs (**Figure 4.10-1** and **Table 4.10-1**). A majority of the undeveloped land associated with the installation is managed for agriculture purposes as it helps control soil erosion and is part of the installation's dust abatement program. Agriculture crops are alfalfa (*Medicago ruthenica*), Bermuda grass (*Cynodon dactylon*), and Sudan grass (*Sorghum bicolor*) (DoN 2001).

Table 4.10-1. Vegetation Types on NAF El Centro

Type	*Acres*
Bare Ground	1,099
Agricultural Outlease	1,022
Cantonment-Developed	512
Dispersed Shrubs	58
Parachute Zone*	14
Wetland/Riparian	6
Trees	3
Total	**2,714**

Source: Tierra Data 2011.
Note: *Parachute Zone consists primarily of bare ground with a few scattered shrubs.

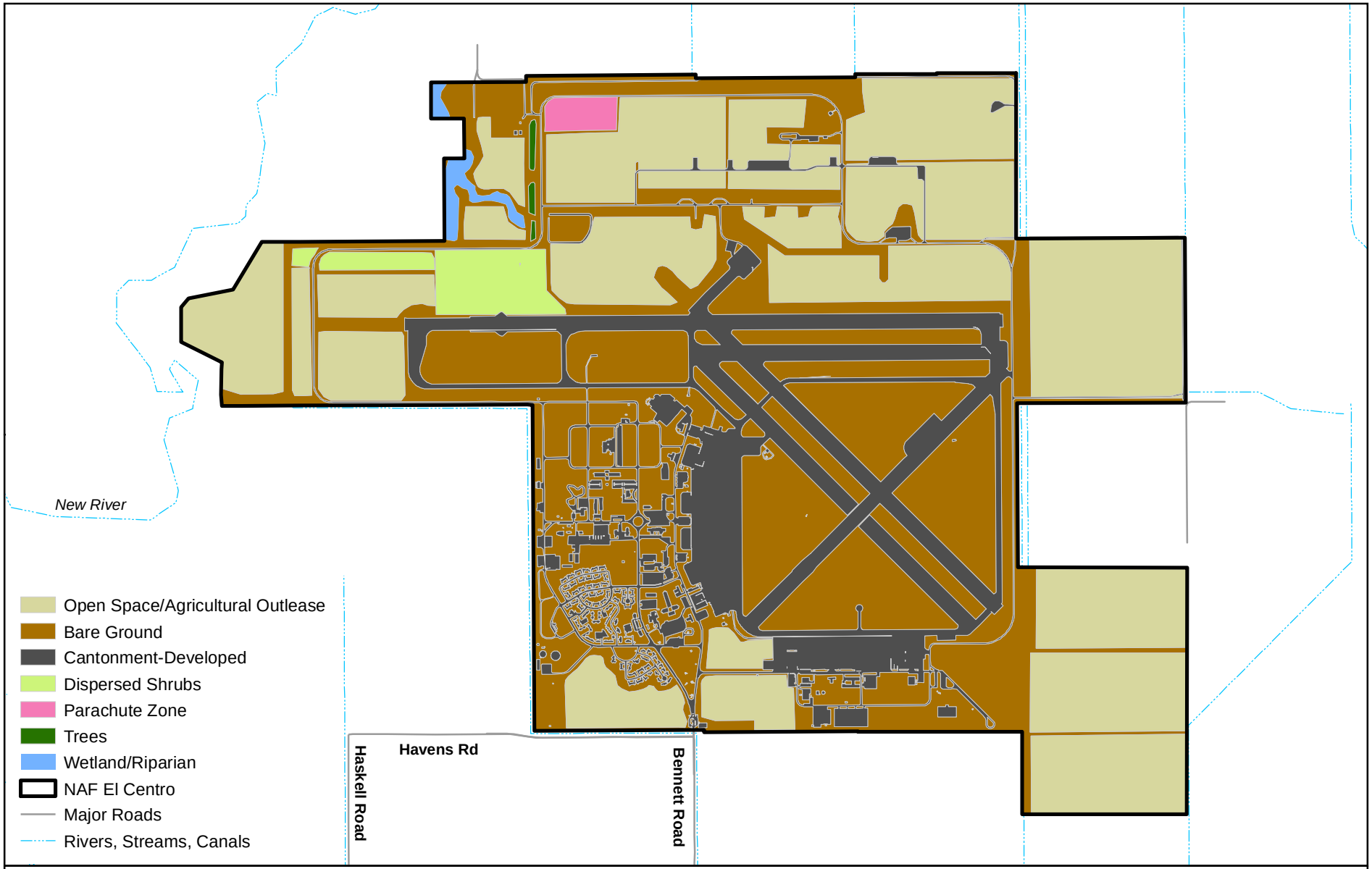


Figure 4.10-1
Vegetation Types at NAF El Centro

N

0 1,000 2,000
Feet

Source: Tierra Data 2011

A small portion of the installation (approximately 6 acres) consists of riparian communities, including wetlands, that border the New River found along the northwestern border of the installation (**Figure 4.10-1**). Vegetative cover in these areas include screw bean (*Prosopis pubescens*), tamarisk (*Tamarix aphylla),* sea-blite (*Suaeda torreyana*), big saltbush (*Atriplex lentiformis*), and arrow weed (*Pluchea sericea*) (DoN 2001).

4.10.1.2 Wildlife

Previous biological surveys on NAF El Centro have observed 12 mammal, 3 reptile, 2 amphibian, and 75 bird species.

Mammals

Common mammals observed on NAF El Centro include coyote (*Canis latrans*), black-tailed jackrabbit (*Lepus californicus*), desert cottontail (*Sylvilagus audubonii*), cactus mouse (*Peromyscus eremicus*), deer mouse (*Peromyscus maniculatus*), and round-tailed ground squirrel (*Spermophilus tereticaudus*) (DoN 2001).

Reptiles and Amphibians

Reptiles and amphibians known to occur on the installation include tiger whiptail (*Cnemidophorus tigris*), desert spiny lizard (*Sceloporus magister*), long-tailed brush lizard (*Urosaurus graciosus*), Woodhouse's toad (*Bufo woodhousei*), and bullfrog (*Rana catesbeiana*) (DoN 2001).

Birds

Some of the common bird species observed on NAF El Centro include European starling (*Sturnus vulgarus*), house sparrow (*Passer domesticus*), black-tailed gnatcatcher (*Polioptila melanura),* white-faced ibis (*Plegadis shihi*), northern mockingbird (*Mimus polyglottos),* Brewer's blackbird (*Euphagus cyanocephalus*), cattle egret (*Bubulcus ibis*), western meadowlark (*Sturnella neglecta*), mountain bluebird (*Sialia currucoides*)*,* American kestrel (*Falco sparverius*), and red-tailed hawk (*Buteo jamaicensis*). The most abundant and diverse populations of birds are found in wetland/riparian areas supporting cattail (*Typha* spp.), phragmites (*Phragmites australis*), and salt cedar (*Tamarix ramosissima*). Species such as Abert's towhee (*Pipilo aberti*), Bullock's oriole (*Icterus bullockii*), and common yellowthroat (*Geothlypis trichas)* can be found there (DoN 2001; Arnold 2011)*.*

The burrowing owl (*Athene cunicularia*), a California species of special concern, is considered common on NAF El Centro. The burrowing owl is the only owl that nests underground, using burrows abandoned by other animals, primarily ground squirrels in California. Burrowing owl habitat is typically open, dry, and sparsely vegetated. During a 2012 survey, 22 active burrows were observed throughout the installation, including along the drainage ditch next to the gas station, along the irrigation ditch to the agriculture field in the southwest corner of the installation, and along the southern edge of the old agriculture field on the eastern side of the installation (NAF El Centro 2012a) (**Figure 4.10-2**). Surveys conducted in 2006 and 2011 found active burrows in similar locations throughout the installation, as well as additional locations near the runways and within current and old agricultural areas across the installation (Arnold 2011; NAF El Centro 2011).

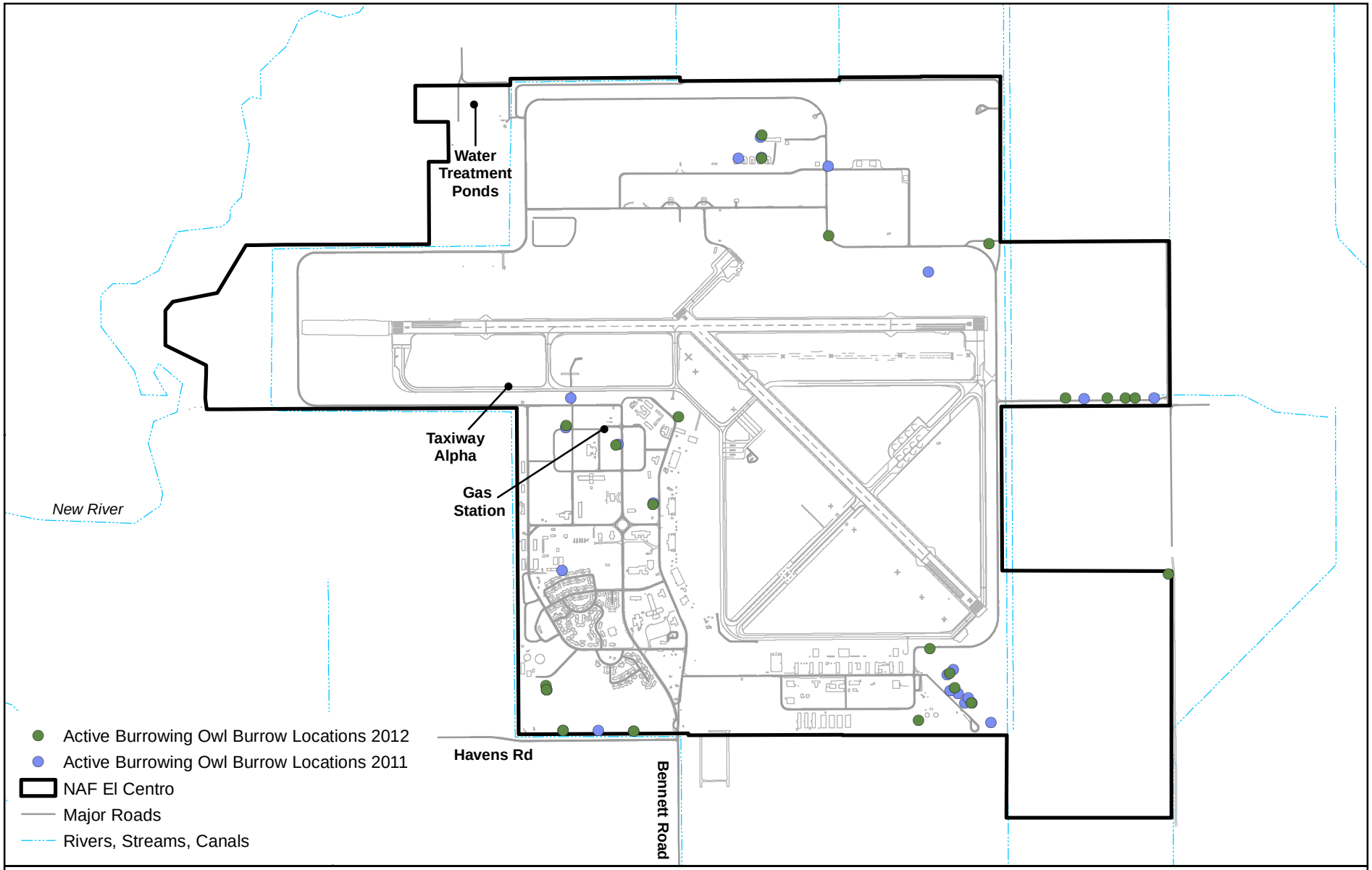


Figure 4.10-2
Burrowing Owl Burrow Locations at NAF El Centro

N

0 1,000 2,000
Feet

Sources: Arnold 2011; NAF El Centro 2011, 2012a

The Migratory Bird Treaty Act (MBTA) is the primary legislation established to conserve migratory birds. It prohibits taking, killing, or possessing migratory birds unless permitted by regulation. For military readiness activities, DoD installations are exempt from incidental taking of migratory birds, in accordance with final 2007 rulemaking in accordance with Section 315 of the National Defense Authorization Act for FY 2003 (Public Law 107-314, 116 Statute 2458), unless such activities may result in a significant adverse effect on a population of a migratory bird species, in which case the Armed Service in question must confer and cooperate with USFWS to minimize or mitigate such significant adverse effects. On July 31, 2006, the DoD and the USFWS entered into a Memorandum of Understanding (MOU) to Promote the Conservation of Migratory Birds, in accordance with EO 13186, *"Responsibilities of Federal Agencies to Protect Migratory Birds."* This MOU describes specific actions that should be taken by DoD to advance migratory bird conservation; avoid or minimize the take of migratory birds; and ensure DoD operations-other than military readiness activities-are consistent with the MBTA.

NAF El Centro is located along the Pacific Flyway, one of four main migration flyways that waterfowl, passerines, hawks, and other birds use to make their seasonal migrations. Of the 75 bird species that have been observed on NAF El Centro, all are protected under the MBTA except four species: European starling, house sparrow, rock dove (*Columba livia*), and common ground-dove (*Columbina passerina*).

4.10.1.3 Special-Status Species

<u>Endangered Species Act-Listed Species and Critical Habitat</u>

No federally listed species have been observed and critical habitat has not been designated on NAF El Centro. Potential habitat for the federally endangered Yuma clapper rail (*Rallus longirostris yumanensis*) exists within a wetland in the northwestern corner of NAF El Centro, but this species has not been observed on NAF El Centro (DoN 2001). The only record of an Endangered Species Act (ESA)-listed species in the vicinity of NAF El Centro is of a Yuma clapper rail in 2000 approximately 1 mile west of NAF El Centro along the New River (California Natural Diversity Database [CNDDB] 2011).

<u>California-Listed Species</u>

No California-listed species have been observed on NAF El Centro. Wetland habitats on NAF El Centro could potentially provide habitat for the state threatened California black rail (*Laterallus jamaicensis coturniculus*), which has been known to breed within the Imperial Valley (CNDDB 2011).

4.10.2 Environmental Consequences for Alternative 1

Under Alternative 1, potential impacts to biological resources could occur from proposed facility development and F-35C aircraft operations. Potential impacts from homebasing at NAF El Centro are discussed in the next two sections in terms of effects at NAF El Centro and effects at NAS Lemoore.

4.10.2.1 Alternative 1 – NAF El Centro Homebasing, Effects at NAF El Centro

<u>Vegetation</u>

Impacts to vegetation at NAF El Centro due to the proposed demolition of existing facilities and construction of new facilities would not be significant due to the lack of sensitive vegetation in the project area. Construction of new facilities at NAF El Centro would primarily occur on bare ground,

agricultural outleases, or areas that are currently developed, and would impact approximately 216 acres, resulting in an increase of 151 acres of impervious surfaces (**Table 4.10-2** and **Figure 4.10-3**). Therefore, there would be no significant impacts to vegetation at NAF El Centro under Alternative 1.

Table 4.10-2. Potential Impacts to Vegetation at NAF El Centro under Alternative 1

Type	*Acres*
Bare Ground	105
Cantonment/Developed	28
Dispersed Shrubs	15
Agricultural Outlease	69
Parachute Zone	0
Trees	0
Wetland/Riparian	0
Total	**217**

Wildlife

Proposed construction and demolition activities at NAF El Centro would primarily occur within areas that have been previously disturbed and are actively managed (i.e., mowed, landscaped, and used for agriculture). Project activities would result in short-term increases in noise levels within project areas temporarily displacing wildlife and migratory birds from the immediate area. While wildlife and migratory birds may experience short-term intermittent disturbance associated with noise from construction activities, this potential effect is lessened in context of the airfield environment, where the existing ambient noise and activity levels are high. Wildlife species, including migratory birds, in the area have adapted to a developed, urban setting and are therefore less likely to be affected by any short-term noise associated with the proposed construction projects. Due to their habituation to relatively high ambient noise levels and the limited areas of suitable habitat that would be impacted by proposed demolition and construction activities, wildlife and migratory birds would not be significantly impacted from proposed construction and airfield activities under Alternative 1.

Four active burrowing owl burrows (as of 2012) are located within the footprint of proposed construction projects under Alternative 1: three within cantonment-developed areas or bare ground and one within an agricultural outlease (**Figures 4.10-3** and **4.10-4**). Burrowing owls are a migratory bird species that is well-known to be an adaptable species often occupying open space areas at airfields, apparently unperturbed by aircraft noise or human presence. However, burrowing owls can also become a potential BASH problem. NAF El Centro, like many military airfields with a stable burrowing owl population, actively manages this species' potential habitat by mowing open space areas near the flightline to maintain very short grass conditions. It is unlikely that burrowing owls would be disturbed by short-term construction noise under Alternative 1.

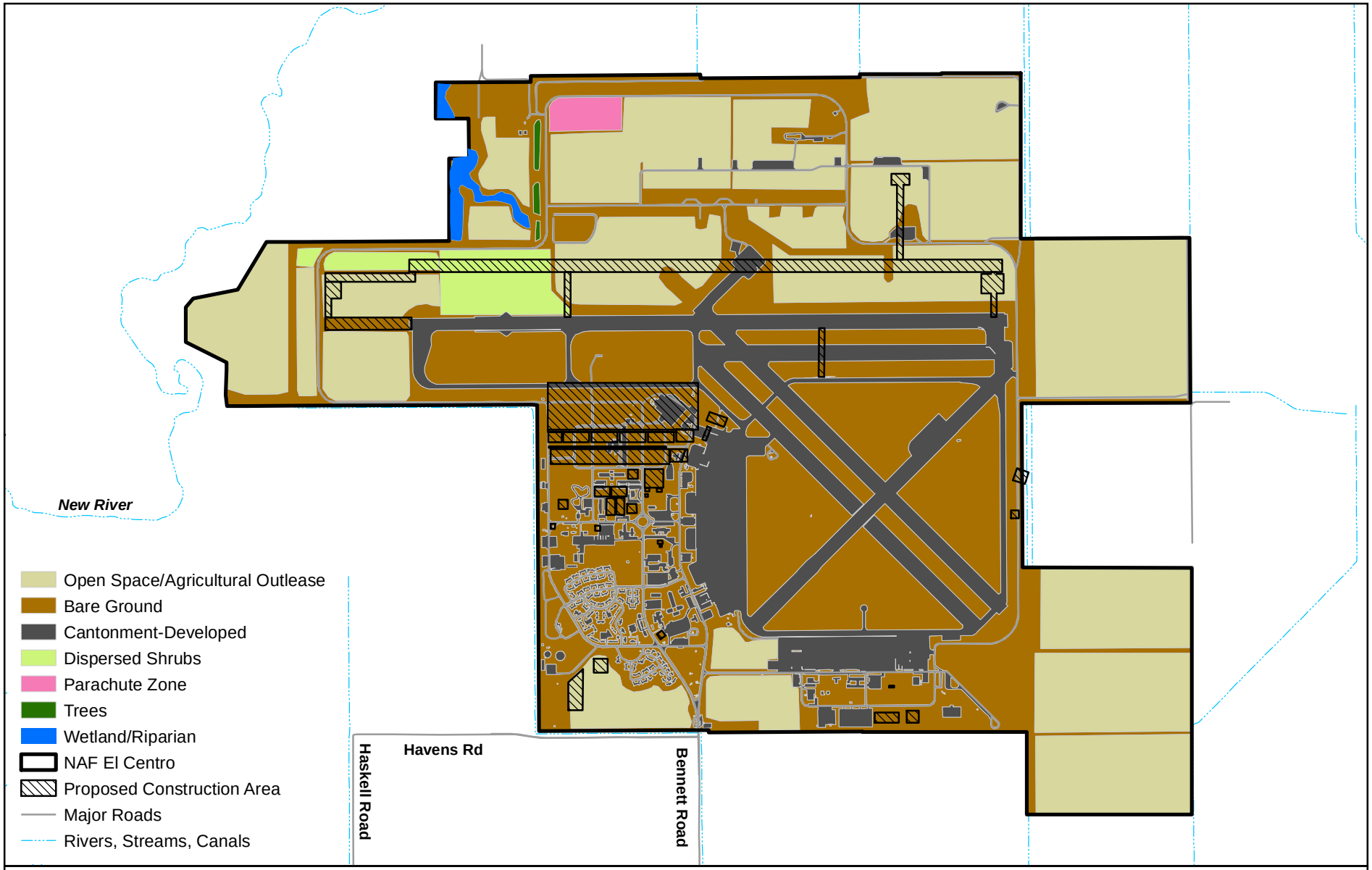


Figure 4.10-3
Potential Impacts to Vegetation Types at NAF El Centro under Alternative 1

N

0 1,000 2,000
Feet

Source: Tierra Data 2011

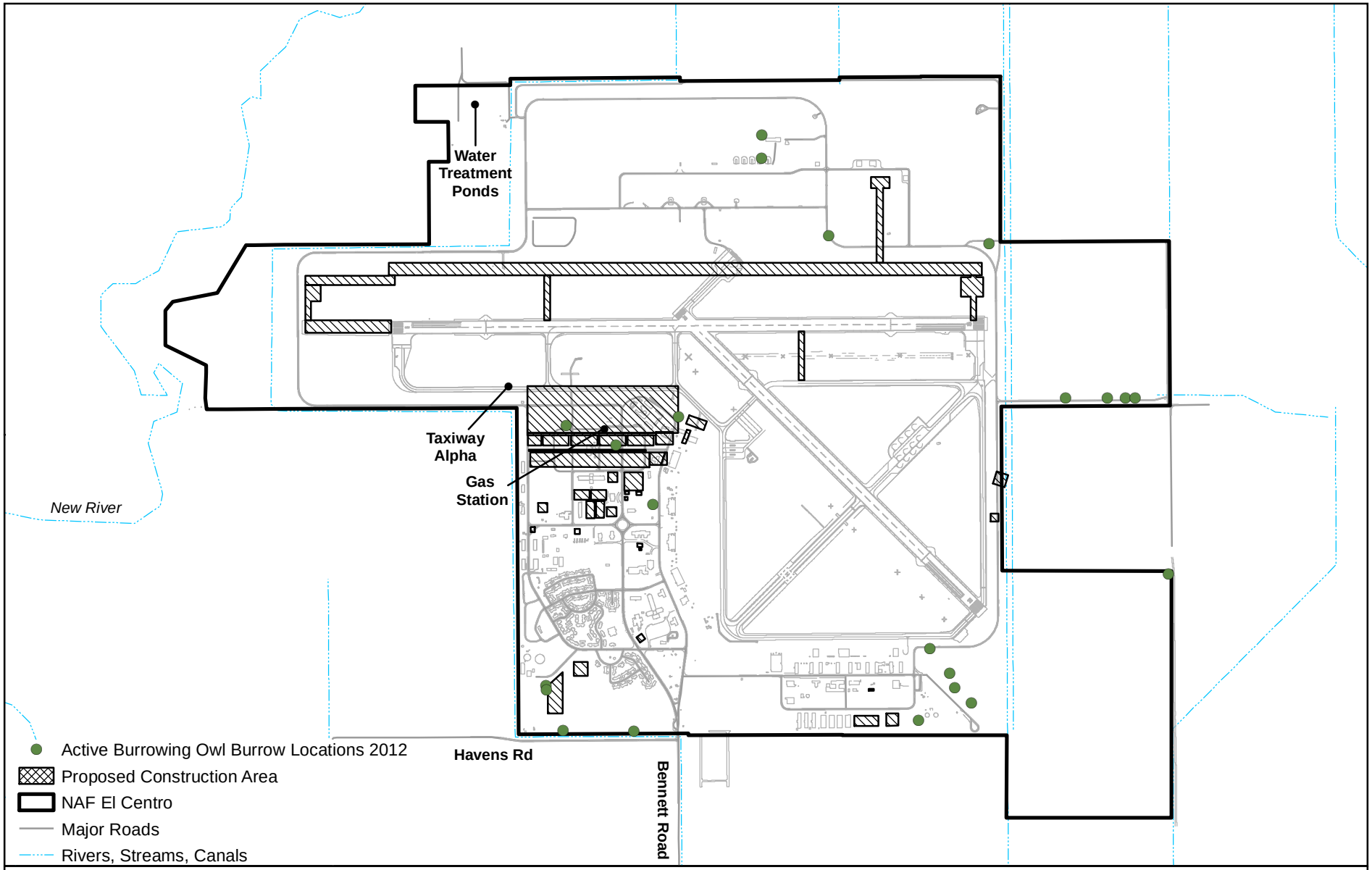


Figure 4.10-4
Potential Impacts to Burrowing Owl Burrows at NAF El Centro under Alternative 1

Source: NAF El Centro 2012a

N

0 1,000 2,000
Feet

In order to avoid potential impacts to burrowing owls from ground disturbing construction activities, avoidance and minimization measures provided in the installation's INRMP would be implemented. These include but are not limited to, surveying all project areas prior to construction. If owls are found within the project area, they would be passively relocated outside the breeding season prior to construction in accordance with California Department of Fish and Game (CDFG) requirements (CDFG 2012). Implementation of these measures would ensure that potential impacts to burrowing owls would be avoided and minimized to the maximum extent practicable. With these measures in place, there would be no significant impacts to burrowing owls from construction activities under Alternative 1.

Noise levels within the airfield environment would increase with the proposed increase in airfield operations (**Table 4.2-10, Figure 4.2-3**). Background information on noise, including its effect on many facets of the environment can be found in Appendix C. The increase in noise levels is not expected to have a significant impact on wildlife and migratory birds in the area due to the limited areas of suitable habitat within the airfield environment and because wildlife species are likely accustomed to current noise levels associated with ongoing aircraft operations at NAF El Centro. Although noise levels would increase under Alternative 1, impacts to wildlife and migratory birds from increased aircraft operations are not expected to be significant.

Table 4.10-3 provides a summary of the potential changes in exposure of burrowing owl burrows within NAF El Centro airfield noise contours for baseline (2015) and proposed (2028) conditions under Alternative 1.

Table 4.10-3. Changes in Exposure of Burrowing Owl Burrows within NAF El Centro Airfield Noise Contours under Alternative 1

Noise (dB CNEL)	*Baseline (2015)**	*Proposed (2028)*	*Change*
70	1	0	-1
75	14	10	-4
80	6	6	0
85	1	6	+5

Sources: Arnold 2011; NAF El Centro 2011, 2012a.
Note: * The number of active burrowing owl burrows in 2012 is assumed to be the same for 2015.

Six burrows would be exposed to noise levels ≥85 dB CNEL under proposed conditions as opposed to only one burrow under baseline conditions. Given the nature of the airfield and the associated habitat, the relatively short duration of any single aircraft event exceeding 85 dB CNEL, the habituation of resident burrowing owls to relatively high noise levels (e.g., 21 of 22 burrows exposed to noise levels >75 dB under baseline), and the fact that the majority of proposed aircraft operations would not occur when burrowing owls are most active above ground and foraging (i.e., dawn and dusk), it is unlikely that individual burrowing owls would be significantly impacted by aircraft overflights associated with proposed aircraft operations at NAF El Centro. In addition, due to the attenuation of noise within underground burrows (Bowles et al. 1995; Francine et al. 1995), it is expected that noise levels within burrows would not be significantly greater than current levels. No significant impacts to individuals or populations of burrowing owls from aircraft operations are anticipated under Alternative 1 at NAF El Centro.

In summary, potential impacts to wildlife and migratory birds under Alternative 1 would occur from proposed demolition and construction activities and increased noise levels within the airfield environment associated with increased airfield operations. These impacts to wildlife and migratory birds would not be significant due to the limited areas of suitable habitat that would be impacted and habituation by wildlife species to current relatively high noise levels associated with ongoing aircraft operations at NAF El Centro.

Bird/Animal Aircraft Strike Hazard

The presence of resident and migratory birds and other wildlife creates a BASH risk at NAF El Centro. The airfield's proximity to expanses of grass, agricultural fields, and natural habitats on the installation intensify the BASH risk. NAF El Centro's current BASH Plan prescribes an ongoing process to reduce the potential for collisions between aircraft and birds or other animals (NAF El Centro 2012b). This is accomplished by the distribution of information and active and passive measures to control how birds use critical areas around the airfield.

As part of its BASH-oriented wildlife management program to reduce or eliminate wildlife attractants near runways and taxiways, NAF El Centro implements various habitat management and modification techniques including, but not limited to: the removal of food sources, mowing tall grasses, cutting back shrubs, relocating perching and nesting structures, controlling weeds to maintain bare dirt areas, and preventing standing water in areas near the flightline (NAF El Centro 2012b). Further details on NAF El Centro's BASH Program can be found in Section 4.4, *Safety*.

Under Alternative 1, there would be an increase of 99,400 aircraft operations at NAF El Centro. This increase in operations would also result in an increase in the potential for bird/ animal aircraft strikes. Species involved in strikes aren't always identified; however common species reported in the past include white egrets, terns, doves, herons, and raptors. This increased BASH potential and impacts to wildlife species and populations would be minimized by continued adherence to the comprehensive procedures used at NAF El Centro to minimize BASH (NAF El Centro 2012b). For example, when the BASH potential increases during periods of increased migratory bird movement (i.e., spring and fall migration), pilots receive special briefings highlighting the increased BASH potential, and limits are placed on low-altitude flight and some types of training (e.g., multiple approaches, closed pattern work) in the airport environment. Therefore, there would be no significant impacts to wildlife, including migratory birds, with regards to BASH under Alternative 1. See Section 4.4, *Safety*, for further detailed discussion of BASH.

Special-Status Species

No special-status species are known to occur on NAF El Centro. In addition, potential habitat for special-status species on NAF El Centro is not located within the proposed construction footprints. Due to the developed and disturbed nature of the lands surrounding NAF El Centro and lack of suitable habitat, there is only one record from 2000 of an ESA-listed species (Yuma clapper rail) within the vicinity of NAF El Centro, approximately 1 mile west; it is unknown whether this location currently supports Yuma clapper rails. However, the increase in aircraft operations would not result in a significant change in noise levels potentially experienced at this location and noise levels would continue to be approximately

75-80 dB CNEL. Therefore, there would be no significant impacts to special-status species and no effect to ESA-listed species under Alternative 1.

Conclusion

Overall, as discussed above, implementation of Alternative 1 at NAF El Centro would not result in significant impacts to biological resources. Proposed demolition and construction activities would impact previously disturbed or actively managed areas. Short-term noise increases from construction and demolition would temporarily displace wildlife and migratory birds. Avoidance measures would be implemented to minimize potential impacts to burrowing owls from construction activities. Noise levels associated with proposed increases in aircraft operations would not result in significant impacts to wildlife and migratory birds because of high ambient noise levels within the airfield environment. The NAF El Centro BASH plan would continue to be implemented. There would be no impacts to special-status species and no effect on ESA-listed species.

4.10.2.2 Alternative 1 – NAF El Centro Homebasing, Effects at NAS Lemoore

Under Alternative 1, there would be no facility development there would be a decrease in aircraft operations and personnel at NAS Lemoore. Therefore, there would be no impacts to biological resources with implementation of Alternative 1 at NAS Lemoore. (Please see Section 5.10.1, *Affected Environment* for a description of biological resources at NAS Lemoore.)

4.10.3 Environmental Consequences for the No Action Alternative

Under the No Action Alternative, the proposed action would not be implemented. Wildlife, migratory birds, and threatened and endangered species would continue to be managed in accordance with the NAF El Centro October 2001 INRMP. Biological resource conditions would continue to be exposed to aircraft noise at their current levels as described in Section 4.10.

4.11 TOPOGRAPHY AND SOILS

4.11.1 Affected Environment

The affected environment for topography and soils includes those areas at NAF El Centro that would be disturbed by demolition and construction activities. This section addresses topography, soils, and seismic activity.

NAF El Centro is located in the Imperial Valley at the south end of the San Bernardino and San Jacinto mountains and within the Colorado Desert, a sub-region of the Sonoran Desert. The immediate landform is primarily flat, open, undeveloped lands (USGS 1979).

NAF El Centro is located within the Salton Trough Physiographic Section of the Basin and Range Province. The Basin and Range Province is characterized by steep, linear mountain ranges interspersed with flat, dry desert areas (USGS 2004). Soils within NAF El Centro include soils of the Badland, Holtville, Imperial, and Imperial Glenbar Series (**Table 4.11-1**). Soils of the Imperial Silty Clay, Imperial Silty Clay Wet, Imperial Glenbar Silty Clay Loams, and Imperial Silty Clay Loams Wet are considered to be Prime and Important Farmland soils (Natural Resources Conservation Service [NRCS] 2008).

Table 4.11-1. Soil Types Located within NAF El Centro

Soil Series	*Prime/Important Farmland Soils*	*Description*
Holtville Silty Clay, Wet; 0-2% slopes	No	On basin floors; parent material consists of alluvium derived from mixed sources; moderately well drained; not flooded or ponded and does not meet hydric criteria; has a slightly saline and sodic horizon.
Imperial Silty Clay; 0-2% slopes	Yes	On basin floors; parent material consists of clayey alluvium and/or clayey lacustrine deposits derived from mixed sources; moderately well drained; not flooded or ponded and does not meet hydric criteria; has a slightly saline and sodic horizon.
Imperial Silty Clay, Wet; 0-2% slopes	Yes	
Imperial Glenbar Silty Clay Loam, Wet; 0-2% slopes	Yes	
Imperial Glenbar Silty Clay Loams, 2-5% slopes	Yes	On basin floors; parent material consists of alluvium and clayey alluvium and/or clayey lacustrine deposits derived from mixed sources; well drained to moderately well drained; not flooded or ponded and does not meet hydric criteria; has a slightly saline and sodic horizon.
Badland	No	Badland is a miscellaneous area.

Source: NRCS 2008.

NAF El Centro is situated in an area of seismic activity and is located in proximity to a number of minor faults. The nearest active faults are the Superstition Hills Fault and Wienert Fault, both located approximately three miles northeast of the installation. These faults have exhibited displacement within the last 200 years and lateral movement has been indicated in a northwest-southeast direction. A number of additional small, active and inactive faults are located within 5 miles of the installation (Jennings and Bryant 2010).

The east side of the Salton Trough rests along the San Andreas Fault, approximately 40 miles north of NAF El Centro. The San Andreas Fault is a right-lateral strike-slip fault that has been active in the recent past and has caused catastrophic earthquakes such as the 1906 San Francisco earthquake. The main portion of the San Andreas Fault ends near the east side of the Salton Sea; however, this area of the Salton Trough is crisscrossed by numerous north-south and east-west running active and inactive fault lines. Although some of these faults have not been active in modern times, they continue to creep at a slow and constant rate, causing a consistent displacement rate of up to 2 inches per year. The Imperial Fault, which is located approximately 15 miles east of El Centro, has exhibited displacement as recently as the 1990s and a large earthquake in 1940 that created a lateral displacement of 17 ft (Schulz and Wallace 1997; Jennings and Bryant 2010).

4.11.2 Environmental Consequences for Alternative 1

Under Alternative 1, potential impacts to topography and soils could occur from proposed facility development. Potential impacts from homebasing at NAF El Centro are discussed in the next two sections in terms of effects at NAF El Centro and effects at NAS Lemoore.

4.11.2.1 Alternative 1 – NAF El Centro Homebasing, Effects at NAF El Centro

New construction would disturb approximately 196 acres of land, most of which has been previously disturbed. Demolition activities would cause short-term impacts to soils in areas where existing buildings would be demolished. Areas of new construction, including the aircraft parking apron, hangars, and training facilities would also be subject to short-term impacts associated with clearing, grading, compaction, and potential erosion and sedimentation of exposed soils. In accordance with the USEPA NPDES General Construction Permit (Permit CAS000002), a SWPP Plan would be prepared during the design phase of the project. The SWPP Plan would identify potential pollutant sources associated with the project and would identify measures that would be implemented to either prevent or control pollutant releases into stormwater. The SWPP Plan would be submitted to the Regional Water Board for approval. The approved plan and permits would be obtained and other BMPs would be implemented and monitored during construction activities. In addition, the relative flatness of the topography in conjunction with BMPs would prevent erosional soil impacts. Therefore, there would be no significant impacts to soils or topography at NAF El Centro under Alternative 1.

The project area does contain soils classified as prime farmland soils which are protected under the Farmland Protection Policy Act (FPPA) (NRCS 2008). However, regulations relevant to the FPPA identify development with a density of 30 structures per 40 acres as being exempt from evaluation under the FPPA (7 C.F.R. PART 658). Therefore, no further coordination with regard to prime farmland soils would be required.

NAF El Centro is not underlain by any active faults and the activities associated with the proposed construction or demolition activities would not increase the potential for seismic events to occur.

<u>Conclusion</u>

Overall, as discussed above, implementation of Alternative 1 at NAF El Centro would not result in significant impacts to topography and soils from construction and demolition activities. A SWPP Plan and BMPs would be implemented to avoid and minimize erosion and sedimentation.

4.11.2.2 Alternative 1 – NAF El Centro Homebasing, Effects at NAS Lemoore

Alternative 1 does not involve facility development at NAS Lemoore. There would be no impacts to topography and soils at NAS Lemoore under Alternative 1. (Please see Section 5.11.1, *Affected Environment* for a description of topography and soils at NAS Lemoore.)

4.11.3 Environmental Consequences for the No Action Alternative

Under the No Action Alternative, the proposed action would not be implemented and there would be no construction or other activities that would affect geography, topography or soils.

4.12 WATER RESOURCES

4.12.1 Affected Environment

The affected environment for water resources includes those areas at NAF El Centro that would be disturbed by demolition and construction activities, as well as the immediate downstream areas of the New River. This section addresses surface water, ground water, water quality, wetlands, and floodplains.

4.12.1.1 Surface Water

Figure 4.12-1 displays the major surface water features in the vicinity of NAF El Centro, including wetlands, rivers, canals, ponds, and the 100-year floodplain. NAF El Centro is within the Imperial Valley Basin of the Colorado River hydrologic region. Major surface waters within the area of NAF El Centro include the Colorado River, the New River, and the Salton Sea. The Colorado River Basin receives average annual precipitation of 5.5 inches, and is therefore considered arid. The Imperial Valley covers 1,870 square miles and drainage is provided by the New and Alamo rivers and irrigation drainage ditches that discharge into the Salton Sea. The Salton Sea watershed, which extends into Mexico with an area of about 7,700 square miles, receives an average annual precipitation of 1-3 inches (Hely et al. 1966; Case and Barnum 2007; California Water Resources Control Board 2011). The Salton Sea receives water from the New River, the Alamo River, the Imperial Valley Agricultural Drains, and the Coachella Valley Stormwater Channel, as well as from direct precipitation and overland flow (CEPA 2012). Any loss of water from the Salton Sea would be through evaporation.

The majority of the water used within the Colorado River Basin comes from the Colorado River and is used for agriculture. Colorado River water is allocated by interstate and international agreements. The New River has poor water quality due largely to wastewater from Mexicali, Mexico. The International Boundary and Water Commission (IBWC), formed in 1944 under the provisions of the 1944 Water Treaty between the United States and Mexico, is tasked to study New River pollution originating in Mexico. In 1955, the population of Mexicali was approximately 25,000, and the resultant sewage was discharged into the New River without treatment. Industry and population in Mexicali continued to grow, and both sewage and industrial waste were discharged into the New River until the first wastewater treatment facility was brought online in 1972. In 1982, the IBWC received reports of raw sewage, industrial waste, low dissolved oxygen, fish kills, oil, floating trash, and foam in the New River at the United States and Mexico border. In 1988, The IBWC reported that effluent did not meet USEPA secondary treatment standards. In 1992, the IBWC developed the Conceptual Plan for the Long Term Solution to the Border Sanitation Problem of the New River at Calexico, California – Mexicali, Baja California. This plan developed water quality standards, treatment priorities, and monitoring plans. Water quality continued to be poor, and the IBWC instituted a program to identify top priority, immediately resolvable issues and projects that could result in improved water quality in the New River. These projects did improve water quality in the New River, but are insufficient to resolve the ongoing poor water quality issues at the border crossing of the New River (Gruenberg 1998). Today, 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.

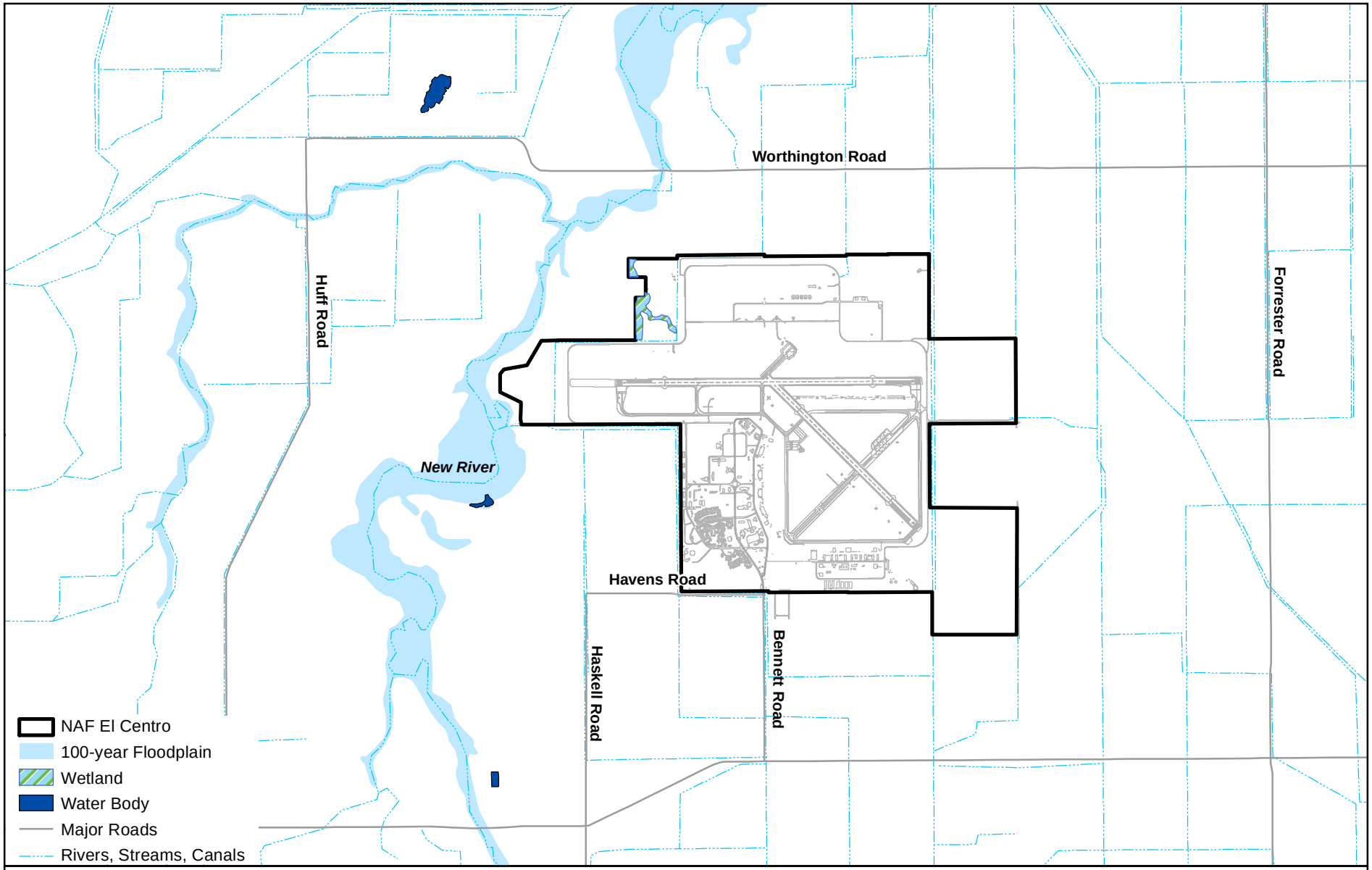


Figure 4.12-1
Major Surface Water Features at NAF El Centro

N

0 2,000 4,000
Feet

Sources: FEMA 2008; Tierra Data 2011

The California Regional Water Quality Control Board has listed the Salton Sea as "impaired" due to the amount of salt that is present in the Sea. The Salton Sea has poor water quality as a result of its lack of an outlet. The New River, Alamo River and other tributaries carry approximately 5 million tons of salt per year into the Sea however none of the salt leaves the Sea because there is no outlet. In addition to high levels of salt, studies by the USGS have found high levels of selenium which comes from the Colorado River via agricultural drainage ditches that empty into the Salton Sea (Gruenberg 1998).

Surface drainage at NAF El Centro is primarily to the west into the New River (**Figure 4.12-1**). The NAF El Centro Storm Water Discharge Management Plan outlines an elimination and prevention program for non-storm water discharge, as well as a storm water pollution prevention plan, and monitoring and reporting plan for the installation (DoN 2001). The management plan identifies prohibited and unauthorized non-storm discharges and how they can be eliminated. The management plan also identifies potential sources of storm water pollutants, and identifies BMPs for reducing or preventing the discharge of pollutants into storm water runoff. The SWDMP will be revised and updated whenever there are changes that: 1) may significantly increase the quantities of pollutants in storm water discharge; 2) cause a new area of industrial activity at the facility to be exposed to storm water; or 3) begin an industrial activity that would introduce a new pollutant source to the facility (DoN 2001).

4.12.1.2 Groundwater

Shallow, perched groundwater occurs at depths of as little as 3-5 ft below the ground surface in the vicinity of NAF El Centro (City of El Centro 2011). Several confined aquifer units exist below the perched aquifer. Wells at depths of 1,000 to 8,000 ft encounter hydrothermal brines, which are used to produce geothermal energy (Hely et al. 1966). The main source of groundwater recharge in the Imperial Valley is from the Colorado River and leakage from canals. Regional groundwater flow moves toward the axis of the Imperial Valley, which roughly corresponds with the channel of the Alamo River, and then flows northwest toward the Salton Sea. The amount of groundwater used annually within the Colorado River Basin is independent of rainfall and averages about 80,000 acre-ft per year (California Department of Water Resources 2003).

4.12.1.3 Water Quality

The New River has poor water quality due largely to wastewater from Mexicali, Mexico. The IBWC, formed in 1944 under the provisions of the 1944 Water Treaty between the United States and Mexico, is tasked to study New River pollution originating in Mexico. In 1955, the population of Mexicali was approximately 25,000, and the resultant sewage was discharged into the New River without treatment. Industry and population in Mexicali continued to grow, and both sewage and industrial waste were discharged into the New River until the first wastewater treatment facility was brought online in 1972.

Additional treatment lagoons were constructed subsequently, such that by 1981, 13 lagoons were in use for water treatment but were still not able to provide satisfactory water treatment. In 1982, the IBWC received reports of raw sewage, industrial waste, low dissolved oxygen, fish kills, oil, floating trash, and foam in the New River at the United States – Mexico border. In 1988, The IBWC reported that effluent did not meet USEPA secondary treatment standards. In 1992, the IBWC developed the Conceptual Plan for the Long Term Solution to the Border Sanitation Problem of the New River at Calexico, California –

Mexicali, Baja California. This plan developed water quality standards, treatment priorities, and monitoring plans for the New River border crossing. Water quality continued to be poor, and the IBWC instituted a "quick fix" program to identify top priority, immediately resolvable issues and projects that could result in improved water quality in the New River. These projects did improve water quality in the New River, but are insufficient to resolve the ongoing poor water quality issues at the border crossing of the New River (Gruenberg 1998). Today, 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.

Groundwater in the Imperial Valley contains mineral concentrations in excess of primary drinking water standards. Sulfate concentrations range from 80 to 4,000 milligrams per liter (mg/l), chloride concentrations from 500 to 8,500 mg/l, and total dissolved solids concentrations from 1,480 to 15,700 mg/l (California Department of Water Resources 2009).

The quality and quantity of water available from the Colorado River has steadily declined during recent years due to increased upstream use and reduced allocations (California Department of Water Resources 2009). The installation receives all of its water from the Imperial Irrigation District, which diverts the water from the Colorado River at the Imperial Dam.

4.12.1.4 Wetlands

As shown in **Figure 4.12-1**, there are approximately 6 acres of jurisdictional wetlands in the northwestern portion of NAF El Centro that are associated with a tributary to the New River.

4.12.1.5 Floodplains

Imperial Valley structural flood protection measures include a dike system that provides flood protection from 100- and 500-year events for areas adjacent to the Salton Sea. The Imperial Irrigation District drainage system largely consists of earthen open channels paralleling irrigation canals on the downstream side of the fields. The drains collect excess surface flows from the agricultural fields (tailwater), subsurface flows from a system of tile drains underlying the fields (tilewater), and operational spill from the canals and laterals. The entire system was designed strictly to drain excess irrigation water; consequently, the system has no more than incidental capacity to intercept and convey storm runoff from the surrounding desert, mountains, or the urban areas in the Imperial Valley (Imperial Irrigation District 2009).

The entirety of Imperial County is subject to various degrees of flooding in the form of flash floods or slow floods caused by heavy precipitation. A severe storm causing a large amount of precipitation in a short time can generate a flash flood. Areas with steep slopes and narrow stream valleys are particularly vulnerable to flash flooding, as are the banks of small tributary streams. In hilly areas, the high-velocity flows and short warning time make flash floods hazardous and very destructive. In developed areas, flash flooding can occur where impervious surfaces, gutters, and storm sewers speed runoff. The Imperial County Flood Risk Management Plan identifies the risk of flooding and flooding severity of several developed areas. While this plan does not directly address risks at NAF El Centro, it does identify the City of Brawley as having a high probability and high severity of flood occurrence. The plan further identifies the City of Calexico as having a medium probability of medium severity flooding. Both of these cities are adjacent to the New River, as is NAF El Centro (Imperial County 2007).

The 100-year floodplain of the New River extends to within approximately 400 ft onto the westernmost portion of NAF El Centro (Federal Emergency Management Agency [FEMA] 2008). No slow-rise flooding has occurred outside this floodplain since the completion of the Hoover Dam and the All American Canal in the 1930s (California Department of Water Resources 2003).

4.12.2 Environmental Consequences for Alternative 1

Under Alternative 1, potential impacts to water resources could occur from proposed facility development. Potential impacts from homebasing at NAF El Centro are discussed in the next two sections in terms of effects at NAF El Centro and effects at NAS Lemoore.

4.12.2.1 Alternative 1 – NAF El Centro Homebasing, Effects at NAF El Centro

Surface Water

Under Alternative 1 there would be an increase in approximately 151 acres of impervious surface that would result in increases to stormwater runoff that could result in pollutants being carried to nearby surface waters. The NAF El Centro Storm Water Discharge Management Plan would be updated to reflect the changes in stormwater runoff and address the increase in runoff through the implementation of additional BMPs to reduce or prevent sediment and/or pollutant discharges into nearby surface waters. Additionally, construction activities would contribute to short-term impacts to water quality. Excavation and grading activities would result in the potential for increased sediment to be carried to nearby surface waters. BMPs would be implemented to minimize this impact.

Groundwater

NAF El Centro does not currently use groundwater. Groundwater wells at the installation are for geothermal energy uses, which do not consume groundwater or alter its quality. Therefore, under Alternative 1, NAF El Centro would continue to not utilize groundwater resources and there would be no significant impacts on groundwater resources at NAF El Centro.

Water Quality

The Navy is required to comply with requirements of the CWA to prevent nonpoint source discharges. All construction activities would be performed in compliance with California's General Construction Stormwater Permit. Proposed demolition and construction activities would require preparation of a SWPP Plan and use of BMPs to limit potential erosion and runoff. Construction-related erosion control measures would include, but not be limited to, erosion control blankets, soil stabilizers, temporary seeding, silt fencing, hay bales, sand bags, and storm drain inlet protection devices. Therefore, Alternative 1 would not have significant impacts on water quality at NAF El Centro or the region.

Wetlands

Under Alternative 1, proposed project activities would occur no closer than 300 ft from the wetlands in the northwestern corner of NAF El Centro (**Figure 4.12-2**). With the implementation of SWPP Plan and use of BMPs, consistent with the requirements of California's General Construction Stormwater Permit, any construction-related run off or erosion would be contained within the construction area. Therefore, there would be no impacts to wetlands at NAF El Centro under Alternative 1.

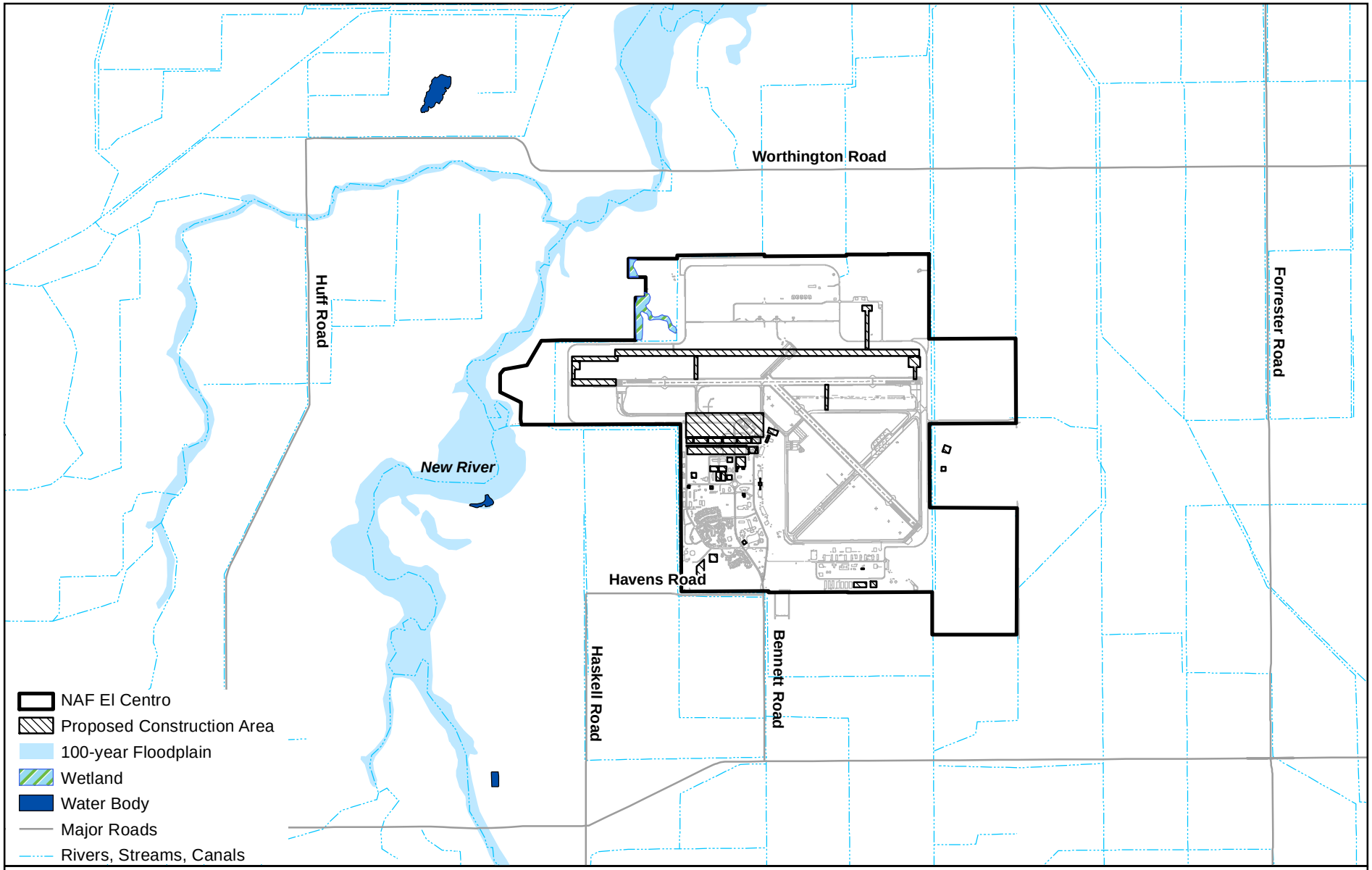


Figure 4.12-2
Major Surface Water Features at NAF El Centro in the Vicinity of Proposed Construction Areas under Alternative 1

N

0 2,000 4,000
Feet

Sources: FEMA 2008; Tierra Data 2011

Floodplains

Under Alternative 1, proposed project areas at NAF El Centro would not be located on or in the vicinity of a designated 100-year floodplain (**Figure 4.12-2**). Therefore, Alternative 1 would have no significant impact on floodplains or floodplain management at NAF El Centro.

Conclusion

Overall, as discussed above, implementation of Alternative 1 at NAF El Centro would not result in significant impacts to water resources from proposed facility development. Groundwater, water quality, wetlands, and floodplains would not be impacted. Construction activities would be performed in compliance with California's General Construction Stormwater Permit. A SWPP Plan and BMPs would be implemented to limit erosion and runoff into surface waters.

4.12.2.2 Alternative 1 – NAF El Centro Homebasing, Effects at NAS Lemoore

Alternative 1 does not involve facility development at NAS Lemoore. In addition, the reduction in personnel at NAS Lemoore under Alternative 1 would not impact groundwater resources. There would be no adverse impacts to water resources at NAS Lemoore under Alternative 1. (Please see Section 5.12.1, *Affected Environment* for a description of water resources at NAS Lemoore.)

4.12.3 Environmental Consequences for the No Action Alternative

Under the No Action Alternative, the proposed action would not be implemented and existing conditions of surface waters would remain the same, including stormwater management.

4.13 CULTURAL AND TRADITIONAL RESOURCES

4.13.1 Affected Environment

This section addresses architectural resources, archaeological resources, and traditional cultural properties (TCPs). The APE for architectural resources and TCPs includes NAF El Centro, areas adjacent to the installation, and SUA where noise from proposed aircraft operations may affect historic properties. The archaeological APE for this project is considered to be the area on NAF El Centro within which ground disturbance would take place from proposed facility development.

The management of cultural resources at NAF El Centro is guided by the installation's Integrated Cultural Resources Management Plan (ICRMP) (NAVFAC Southwest 2012). The ICRMP provides the protocols for managing and protecting cultural resources and TCPs at NAF El Centro. The ICRMP also addresses compliance actions for meeting federal regulations regarding cultural resources.

4.13.1.1 Architectural Resources

Two surveys and evaluations of architectural resources at NAF El Centro have been completed (NAVFAC Southwest 1994, 2004). An architectural survey of 113 World War II-era buildings and structures conducted in 1994 concluded that none of the resources, either individually or as components of a historic district, was eligible for listing on the National Register of Historic Places (NRHP) (NAVFAC Southwest 1994). In 1995, the California State Historic Preservation Office (SHPO) concurred that none of the surveyed resources was eligible (NAVFAC Southwest 2012). In 2004, a survey and evaluation of

249 Cold War-era (1946–1989) buildings, structures, and objects at NAF El Centro and the land training areas of its ranges determined that no architectural resources either individually or as components of a historic district were eligible for listing on the NRHP (NAVFAC Southwest 2004).

A total of 29 buildings and structures would be demolished as part of the facilities and infrastructure requirements for the NAF El Centro Homebasing Alternative. All these architectural resources were evaluated for NRHP eligibility and determined to be not eligible (**Table 4.13-1**).

Table 4.13-1. Buildings and Structures to be Demolished under Alternative 1

Building Number	*Facility Name*	*Year Built*	*NRHP Eligibility Determination*
100	Sewage Plant Equipment	1961	Not Eligible
120	Wastewater Treatment Plant	1978	Not Eligible
126	Vehicle Shelter	1989	Not Eligible
130	Air Control Tower	1953	Not Eligible
136	Bike Parking	1995	Not Eligible
137	Fire Station	1944	Not Eligible
139	Air Operations	1942	Not Eligible
142	Fire Station/Storage	1942	Not Eligible
145	Administrative Office	1944	Not Eligible
157	Auto Vehicle Maintenance and Public Works Shop	1943	Not Eligible
158	Storage	1944	Not Eligible
159	Glass/Boiler Shop	1944	Not Eligible
160	Public Works Shop	1944	Not Eligible
163	Administrative Office/ Public Works Maintenance Storage	1944	Not Eligible
164	Public Works Maintenance Storage	1944	Not Eligible
165	Laundry Facility/ Vehicle Maintenance Shop	1944	Not Eligible
184	Public Works Maintenance Storage	1944	Not Eligible
185	Public Works Maintenance Storage	1944	Not Eligible
193	Public Works Maintenance Storage	1954	Not Eligible
194	Public Works Maintenance Storage	1954	Not Eligible
400	Filling Station, 2 Pumps	1967	Not Eligible
402	Vehicle and Equipment Fuel Storage	1995	Not Eligible
406	Filling Station	1967	Not Eligible
433	Stand-by Power Plant	1942	Not Eligible
436	Dining Facility	1942	Not Eligible
440	Garbage House	1943	Not Eligible
446	Standby Generator/Sewage Pump Station	1942	Not Eligible
459	Sewage Pump Stations	1942	Not Eligible
523	Medical/Dental Facilities	1969	Not Eligible

Source: NAVFAC Southwest 2012

No standing buildings or aboveground structures are within the nine properties proposed to be acquired or placed in restrictive easement for the NAF El Centro Homebasing Alternative.

4.13.1.2 Archaeological Resources

NAF El Centro manages 59,699 acres of property and major portions of the installation, including the majority of the main installation, have been previously surveyed for archaeological resources. Predictive

modeling determined high sensitivity for the discovery of prehistoric sites along the former shoreline of prehistoric Lake Cahuilla, which is located under portions of the installation (NAVFAC Southwest 2012).

A total of 225 archaeological sites have been identified at NAF El Centro and on associated ranges and drop zones, including lithic and ceramic scatters, prehistoric occupation sites, prehistoric isolates, historic wagon trails, mining claims, military refuse deposits, a narrow-gauge rail line, and multi-component sites with historic and prehistoric deposits (NAVFAC Southwest 2012). Of the 225 identified archaeological sites, 18 are located on the main installation (**Table 4.13-2**). These sites have been determined to be not eligible for the NRHP or have not been evaluated (NAVFAC Southwest 2012). There are no NRHP-listed or eligible sites located within the proposed construction area on the main installation.

Table 4.13-2. Archaeological Resources at NAF El Centro

CA-IMP-	*Description*	*NRHP Eligibility*
6451H	Historic: Homestead Site, Refuse Deposit	Not eligible
6452H	Historic: Refuse Deposit	Not eligible
6989H	Historic: Refuse Deposit	Unknown
6990H	Historic: Refuse Deposit	Unknown
6991H	Historic: Refuse Deposit	Not eligible
6992H	Historic: Refuse Deposit	Not eligible
6993H	Historic: Refuse Deposit	Not eligible
6994H	Historic: Refuse Deposit	Not eligible
6995H	Historic Isolate	Not eligible
6996H	Historic Isolate	Not eligible
6997-I	Prehistoric Isolate	Not eligible
6998H	Historic Isolate	Not eligible
6999H	Historic Isolate	Not eligible
7000H	Historic Isolate	Not eligible
7001H	Historic Isolate	Not eligible
7002H	Historic Isolate	Not eligible
7003	Prehistoric: Lithic Scatter	Not eligible
7004-I	Prehistoric Isolate	Not eligible

Three archaeological resources within NAF El Centro target/range areas have been determined to be eligible for listing on the NRHP. The remainder of the previously recorded sites on NAF El Centro have been determined to be not eligible for the NRHP or have not been evaluated (NAVFAC Southwest 2012).

A records search from the South Coastal Information Center of the California Historical Resources Information System located at San Diego State University revealed no previously inventoried archaeological resources are within any of the nine properties proposed to be acquired or placed in restrictive easement for the NAF El Centro Homebasing Alternative.

4.13.1.3 Traditional Cultural Properties

Under Section 106 of the National Historic Preservation Act (NHPA), a federal agency is required to give consideration to issues of traditional religious or cultural areas concerning Native American groups. No

TCPs have been identified within the NAF El Centro installation areas (NAVFAC Southwest 2012). During the public scoping period, a representative of the Quechan tribe provided detailed information concerning the archaeological and cultural significance of the cultural landscape of the Quechan people. The cultural landscape of the Quechan includes areas below the SUA of the NAF El Centro Homebasing Alternative.

There are a number of Native American tribes that have ties to the NAF El Centro area and SUA. They include: Ewiiaapaayp Band of Kumeyaay Indians, Campo Band of Diegueno Mission Indians of the Campo Reservation, Manzanita Band of Mission Indians of the Manzanita Reservation, La Posta Band of Diegueno Mission Indians of the La Posta Reservation, Augustine Band of Mission Indians of the Augustine Reservation, Torres-Martinez Desert Cahuilla Indians, Quechan Tribe of the Fort Yuma Indian Reservation, Cocopah Tribe of Arizona, Barona Group of Capitan Grande Band of Mission Indians of the Barona Reservation, Jamul Indian Village of California, Inaja Band of Diegueno Mission Indians of the Inaja and Cosmit Reservation of California, Mesa Grande Band of Diegueno Mission Indians of the Mesa Grande Reservation, Sycuan Band of the Kumeyaay Nation, Santa Ysabel Band of Diegueno Mission Indians of the Santa Ysabel Reservation, San Pasqual Band of Diegueno Mission Indians, Viejas Group of Capitan Grande Band of Mission Indians of the Viejas Reservation, and Cabazon Band of Mission Indians. The Navy initiated consultation with these tribes regarding the proposed action in letters dated June 11, 2012 (see Appendix H for correspondence). The Cocopah Indian Tribe did not indicate concern over the NAF El Centro Homebasing Alternative and concurred with the Navy's finding that no historic properties would be affected (see page H-29 of Appendix H).

4.13.2 Environmental Consequences for Alternative 1

Under Alternative 1, potential impacts to cultural and traditional resources could occur from proposed facility development and F-35C aircraft operations. Potential impacts from homebasing at NAF El Centro are discussed in the next two sections in terms of effects at NAF El Centro and effects at NAS Lemoore.

4.13.2.1 Alternative 1 – NAF El Centro Homebasing, Effects at NAF El Centro

Architectural Resources

Alternative 1 would involve demolishing 29 buildings and structures within the cantonment area of NAF El Centro. All 29 buildings and structures were determined not eligible for the NRHP. Therefore, Alternative 1 would have no effect on NRHP-listed or eligible architectural resources.

Archaeological Resources

There are no NRHP-listed or eligible archaeological sites within the APE of proposed demolition and construction. The APE consists of areas that are previously disturbed and developed and thus, any archaeological sites would have been previously destroyed. Therefore, there would be no effects to archaeological sites as a result of proposed demolition and construction activities under Alternative 1. Should an inadvertent discovery of archaeological materials be made during proposed demolition and construction activities, the Navy would follow procedures outlined in the NAF El Centro ICRMP.

NAF El Centro and the California SHPO are currently in the process of developing a Programmatic Agreement that would allow the NAF El Centro command, with technical support from the NAVFAC

Southwest Cultural Resources Program, to define APEs, identify historic properties, and make effects determinations for undertakings resulting in either "no historic properties affected" or "no adverse effect" without further consultation with the California SHPO. This Programmatic Agreement would include any undertakings on the nine properties proposed for acquisition or restrictive easement as part of the NAF El Centro Homebasing Alternative. Therefore, if Alternative 1 is chosen, Section 106 compliance for any future actions on the nine properties would be covered by the Programmatic Agreement.

Airspace operations in the SUA do not involve ground disturbance from new construction. Therefore, there would be no effects to archaeological sites as a result of airspace operations under Alternative 1.

Traditional Cultural Properties

No TCPs have been identified within NAF El Centro installation areas. Cultural features and sites of the Quechan Indian Tribe lie on lands under the SUA to be used for proposed airspace operations. The proposed number of aircraft operations in each airspace unit under Alternative 1 would increase. These operations would be dispersed throughout the SUA in relative proportion to current aircraft operations. Noise levels are not expected to appreciably increase (see Section 4.2.2.1, *SUA and MTRs*). Therefore, the NAF El Centro Homebasing Alternative is not expected to affect the use of traditional cultural places. Use of MTRs would also increase; however, the increase would amount to less than one additional operation per day. Despite the increase in operations, noise levels within MTRs from F-35C operations would be less than noise levels generated by current legacy aircraft (**Table 4.2-16**). Therefore, no impacts to TCPs would occur due to F-35C operations in MTRs.

Consultation and SHPO Concurrence

In accordance with Section 106 of the NHPA, NAF El Centro consulted with the California SHPO regarding the potential effects to historic properties from the proposed NAF El Centro Homebasing Alternative. In a letter dated June 11, 2012, NAF El Centro presented a description of the undertaking; defined the APE; identified whether historic properties are present within the APE; and the findings of the undertaking. As no historic properties were identified within the APE, NAF El Centro presented a finding of "no historic properties affected" for the proposed NAF El Centro Homebasing Alternative (NAF El Centro 2012). In a response dated March 18, 2013, the California SHPO concurred with this finding. The letter of concurrence from the California SHPO is provided in Appendix H, *Cultural and Traditional Resources*.

Conclusion

Overall, as discussed above, implementation of Alternative 1 at NAF El Centro would not result in significant impacts to cultural and traditional resources. Buildings and structures to be demolished are not eligible for the National Register. There would be no impacts to archaeological sites or traditional cultural properties. The Navy would follow procedures in its ICRMP should any inadvertent discoveries be made during construction and demolition activities. A Programmatic Agreement between the Navy and California State Historic Preservation Officer would cover Section 106 compliance for any future actions involving properties proposed for acquisition or restrictive easement.

4.13.2.2 Alternative 1 – NAF El Centro Homebasing, Effects at NAS Lemoore

Alternative 1 does not involve facility development or demolition at NAS Lemoore. There would be a decrease in aircraft operations and personnel at NAS Lemoore, which would not affect cultural and traditional resources. (Please see Section 5.13.1, *Affected Environment* for a description of cultural and traditional resources at NAS Lemoore.)

4.13.3 Environmental Consequences for the No Action Alternative

Under the No Action Alternative no additional improvements or construction would occur at NAF El Centro; therefore no impacts to NRHP-listed or eligible architectural or archaeological resources would be impacted. Additionally, no TCPs would be impacted by the No Action Alternative.

4.14 HAZARDOUS MATERIALS AND WASTE

4.14.1 Affected Environment

The affected environment for hazardous materials and waste includes those areas at NAF El Centro that would be disturbed by demolition and construction activities, as well as the areas where F-35C aircraft maintenance activities would occur. This section addresses hazardous materials management, hazardous waste management, and contaminated sites.

4.14.1.1 Hazardous Materials Management

The Hazardous Waste/Hazardous Materials/Hazardous Minimization Division is responsible for the procurement, storage, disbursement, and effective use of hazardous materials at NAF El Centro. Hazardous materials at NAF El Centro are managed in accordance with Commander, Fleet and Industrial Supply Centers Instruction 5090.1, *Hazardous Material Standard Operating Procedures*. These standard operating procedures apply to all Regional Consolidated Hazardous Material Reutilization Inventory Management Program Centers and satellites under the authority of the Commander, Fleet and Industrial Supply Centers. This standard operating procedure does not apply to bulk fuels; radioactive/biohazardous material; ammunition and explosive substances; medicinal hazardous materials and hazardous waste; or reagents used in medical laboratory settings (DoN 2002).

Hazardous materials are used in daily operations at NAF El Centro to perform and support its mission. Solvents, hydraulic fluid, antifreeze, paints, adhesives, pesticides, herbicides, fertilizers, and other substances may be found at many of the activity sites. Most of these materials are received and issued by a hazardous materials distribution center at Building 512 to activities that maintain 14-day hazardous materials lockers. The amounts of non-bulk hazardous materials are generally limited and stored in consumer quantity type containers (DoN 2010).

The following hazardous substances are stored in bulk at NAF El Centro: liquid oxygen, nitrogen, sodium hypochlorite, hydrochloric acid, sodium bisulfite, aluminum sulfate, sodium permanganate and Propac 9810. The following petroleum products are stored in bulk at NAF El Centro: jet fuel (jet propellant [JP] type 8), diesel fuel, unleaded gasoline, and smoke oil. Petroleum products are used in significant quantities at NAF El Centro and are stored, transferred, and used at several locations. While petroleum products are delivered directly by a commercial vendor to some locations on the installation, such as the

Navy Exchange Gas Station, most of the fuel receipt, storage, and handling are performed by a private company, under contract to the Navy and under the supervision of the Fuels Officer, NAF El Centro Supply Division. Bulk fuels, mainly JP-8 jet fuel, are received primarily from a commercial pipeline, and then stored and transferred from the Bulk Storage Fuel Farm. The average weekly throughput of JP-8 is approximately 294,000 gallons (DoN 2010).

Aboveground Storage Tanks

There are 35 aboveground storage tanks in use at NAF El Centro. The tanks range in size from 89 to 840,000 gallons and have a total storage capacity of 1,798,117 gallons (DoN 2010).

Bulk Storage Fuel Farm

The Bulk Storage Fuel Farm is the largest petroleum storage site on NAF El Centro and is located in the southeast corner of the installation within the restricted area of the flightline perimeter fence. There are five aboveground storage tanks in service at the Fuel Farm that contain diesel fuel, JP-8, or recovered JP-8 fuel.

Direct Fueling Pad Facilities

The Direct Fueling Pad Facilities, also known as the Hot Pit, receives fuel directly from the Bulk Storage Tank Farm via pipeline. The Hot Pit area contains three storage tanks, four fueling stations, and associated piping.

Government Vehicle Filling Station

The Government Vehicle Filling Station (Building 400) is located on North Street just west of B Street and it is used for Government and contractor vehicles. The station contains two aboveground storage tanks for unleaded gasoline and diesel fuel, an off-loading port and two dispensing stations.

Navy Exchange Gas Station

The Navy Exchange Gas Station (Building 200), also known as the Jet Mart, is located along 1st Street, west of A Street. The station contains two aboveground storage tanks and fuel dispensing stations for regular and premium unleaded automotive gasoline.

Smoke Oil Tank

The Smoke Oil Tank was originally placed in service in December 1996. It was recently relocated to the southwest corner of the airfield near the junction of taxiways D and E and Building 204. Smoke oil is delivered to NAF El Centro infrequently by commercial tanker trucks by an outside contractor and normally is dispensed only during the winter months (November through March), while the Blue Angels are training at NAF El Centro (DoN 2010).

Several other aboveground storage tanks are located throughout the installation at various sites. These tanks store fuel for mobility use or for emergency generators.

Underground Storage Tanks

Underground storage tanks have been used throughout NAF El Centro's history to supply fuel for heaters, generators, equipment, motor vehicles, and aircraft. Underground storage tanks have been

removed over the years and replaced with aboveground storage tanks as needed. No active petroleum underground storage tanks remain at NAF El Centro. Underground storage tank sites at NAF El Centro have been either officially closed or are going through site investigations and/or remediation for future closure. An updated Tank Management Plan for NAF El Centro was prepared in 2006. At that time, 71 underground storage tank sites had been closed and there were a total of 42 outstanding underground storage tank site closure requests for which Regional Water Quality Control Board concurrence has not been received. A total of 51 known and suspected underground storage tank sites were under consideration for further action and a total of 17 underground storage tank sites remained open and had not been located. In addition, 13 previously suspected underground storage tank sites were dropped from the underground storage tank program and were no longer considered tank sites. No further action is being considered for these sites. A total of 26 sites on lands previously owned by NAF El Centro were identified to be addressed under the Formerly Used Defense Sites program (NAVFAC Southwest 2006).

Asbestos-containing Materials

Asbestos-containing materials may be present in buildings or other facilities that would be demolished under Alternative 1. Asbestos may be contained in plaster, acoustic ceiling tiles, wallboard, and floor tiles/carpeting mastic and asbestos particles may be present in building ductwork. The most recent asbestos-containing materials survey conducted at NAF El Centro was performed in June 2011 (NAVFAC Southwest 2011a). Prior to that, the last asbestos-containing materials survey was completed in 1994. The 2011 asbestos-containing materials survey was limited to Buildings 145, 139, 131, 227, 270, 565, 529, 318, 362, 231, 221, and 359 and Site 7.

Lead-based Paint

Lead-based paint may also be present in buildings or other facilities that would be demolished under Alternative 1. The most recent lead-based paint survey conducted at NAF El Centro was performed in June 2011 (NAVFAC Southwest 2011a). Prior to that, the last lead-based paint survey was completed in 1998. The 2011 lead-based paint survey was limited to Buildings 227, 270, 231, 221, 131, 139, 145, 359, 362, 318, 529, and 565.

Polychlorinated Biphenyls

The installation maintains oil-filled items of electrical equipment, including transformers, at various locations throughout the installation. Therefore, polychlorinated biphenyl (PCB)-containing electrical equipment (e.g., transformers, capacitors, compressors, etc.) may be present in buildings or other facilities that would be demolished under Alternative 1. No PCB surveys are known to have been conducted at NAF El Centro. PCB-containing materials may also be in the capacitors of the fluorescent light ballasts, especially any manufactured prior to 1979. Older waste and hydraulic oils may also contain PCBs.

4.14.1.2 Hazardous Waste Management

All Naval facilities that generate hazardous waste are required to have a Hazardous Waste Management Plan. The NAF El Centro Hazardous Waste Management Plan is consistent with all Federal, State (California), and local (Imperial County) regulations/policies (DoN 2002).

Hazardous waste generated at NAF El Centro is packaged by the generating activity and stored for up to 14-days at Hazardous Waste Generator Sites located throughout the installation. After 14 days the waste is picked up by a contractor and taken to the Central Hazardous Waste Storage Compound at Building 530. The hazardous waste is then characterized, consolidated, re-packaged, labeled, and stored up to 90 days prior to disposal (DoN 2002, 2010).

Hazardous waste generated by NAF El Centro is disposed of through a contract administered by the Defense Logistics Agency Disposition Services. NAF El Centro assumes the role of generator. The Defense Logistics Agency Disposition Services Contractor manages the transport of waste off-site and the ultimate disposition of the waste whether it be recycled or appropriately disposed of (DoN 2002).

All Hazardous Waste Generator Sites are managed by the Hazardous Waste/Hazardous Materials/Hazardous Minimization Division, including inspections and maintenance (DoN 2002). NAF El Centro is classified by the USEPA as a large-quantity generator of hazardous waste (USEPA ID# CA6170090017) and in FY 2010 NAF El Centro disposed of approximately 238,336 pounds of hazardous waste of which approximately 185,000 pounds were attributed to aircraft operations and maintenance.

4.14.1.3 Pollution Prevention

EPA's Final Oil Pollution Prevention Regulation (40 C.F.R. 112) requires facilities to have a fully prepared and implemented Spill Prevention Control and Countermeasures (SPCC) Plan. The NAF El Centro SPCC Plan establishes spill prevention procedures, methods, and equipment requirements for non-transportation-related facilities with: 1) total aboveground, nonburied, oil storage capacity greater than 1,320 gallons, including only those containers of oil 55 gallons or greater; or 2) underground, buried, oil storage capacity greater than 42,000 gallons, as required by the regulation. The SPCC Plan identifies storage locations on the installation and describes proper storage and handling procedures needed to minimize potential spills at the point of use (DoN 1999).

The NAF El Centro Integrated Contingency Plan for Oil and Hazardous Substance Spill Prevention and Response is prepared as an integrated contingency plan (DoN 2010). It is consistent with the National Contingency Plan, the Area Contingency Plan, and the California State Marine Oil Spill Contingency Plan. The plan recognizes the response phases of discovery and notification; preliminary assessment and initiation of action; containment, counter-measures, cleanup and disposal; and documentation and cost recovery. Hazard identification, vulnerability and risk are also addressed to protect the public and response personnel to avoid escalation of an incident, and to stabilize the situation.

4.14.1.4 Contaminated Sites

<u>Environmental Restoration Program</u>

In 1980, the DoD instructed each branch of the armed services to comply with the requirements of Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (and later with Superfund Amendments and Reauthorization Act [SARA]). In response, the Environmental Restoration Program was developed by DoD to remediate contamination at military facilities caused by past use,

storage, handling, and disposal of hazardous and other potential toxic substances. Under the Environmental Restoration Program, Installation Restoration sites can be cleaned up through either removal or remedial actions. A remedial action is conducted to control or clean up contamination that does not pose an immediate threat. A removal action is conducted to address immediate and significant dangers to the public or the environment. Removal actions may either be short-term or long-term solutions; remedial actions are long-term solutions. Both remedial and removal actions begin with a preliminary assessment/site inspection.

The Environmental Restoration Program at NAF El Centro began with 17 sites with potential soil and groundwater contamination (**Figure 4.14-1**): 6 of the 17 sites did not require cleanup and 9 sites have been cleaned up and closed. Cleanup and site characterization is underway at the two remaining sites, with closure anticipated by 2012. The Installation Restoration sites that are being investigated are Site 2 (A, B and C) (Patrol Road Landfill) and Site 7. In 2007, the Navy discovered a new site with contamination and identified it as Site 18 "landfill." Site 18 is located in the northwestern corner of NAF El Centro to the west of Installation Restoration Site 3 (NAVFAC Southwest 2011b). These sites are discussed further below.

Installation Restoration Site 2

Installation Restoration Site 2 (A, B and C) consists of a former ravine and adjacent flat ground between the runway on the south and Patrol Road on the north (**Figure 4.14-1**). The installation used the ravine as a municipal landfill from about 1946 until 1965, when landfill operations were transferred to Installation Restoration Site 1 (Magazine Road Landfill). Debris piles accumulated in the area surrounding the inactive municipal landfill through about 1979 (NAVFAC Southwest 2008). Most of the Site 2 area remains covered by surface debris piles. The chemicals of concern at Installation Restoration Site 2 are arsenic, chromium, lead, pesticides, other metal, and polynuclear aromatic hydrocarbons (NAVFAC Southwest 2008).

Installation Restoration Site 7

Installation Restoration Site 7 is a former fuel farm that originally consisted of 23 underground storage tanks that were used from 1942 until 1958. Twelve underground storage tanks were closed in place when Runway 8/26 was extended in 1955. The remaining 11 underground storage tanks were decommissioned in 1958, emptied, crushed in place and backfilled and were subsequently removed in 1993–1994. Based on historical information and data, the chemicals of concern at Installation Restoration Site 7 are VOCs and total petroleum hydrocarbons as gasoline, and benzene and 1,2-dichloroethane (NAVFAC Southwest 2009a). Groundwater at NAF El Centro has been designated as non-beneficial use due to the high total dissolved solids concentrations and a soil vapor extraction system is currently installed and running at Site 7.

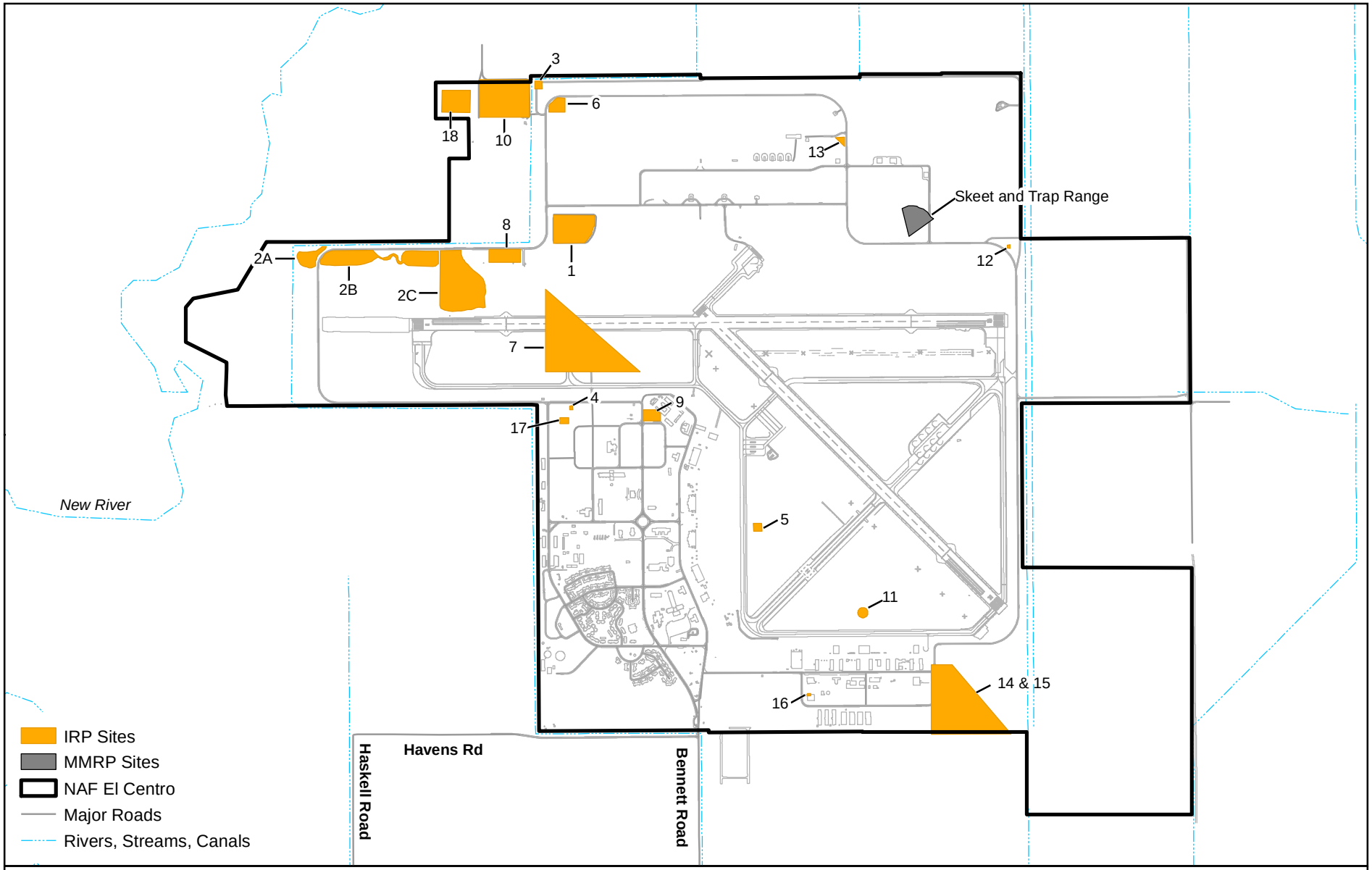


Figure 4.14-1
Installation Restoration and MMRP Sites at NAF El Centro

N

0 1,000 2,000
Feet

Source: NAF El Centro 2005

Installation Restoration Site 18

The Navy used Installation Restoration Site 18 for burning and dumping waste materials generated at the installation from approximately the mid-1940s to the 1970s. Reported wastes included acids, corrosives, batteries, waste oil, potassium-ferric cyanide, formaldehyde, 60-millimeter film canisters, aircraft parts, gutted plane parts, beryllium brakes, parachutes, tires, wood, pallets, railroad ties, asbestos sheeting and blankets, drums, various canisters, trash, miscellaneous scrap metal, and expended ammunition cartridges (40-millimeter, 38-caliber, 45-caliber, and 50-caliber munitions). Chemicals of concern identified at the site include metals (antimony, arsenic, barium, cadmium, chromium, cobalt, copper, lead, manganese, mercury, molybdenum, nickel, selenium, thallium, vanadium, and zinc), total dichlorodiphenyltrichloroethane, and dioxin toxicity equivalency quotient. Removal of the burn debris, debris piles and contaminated soil, was recommended to mitigate risks to human health and the environment. The removal action is anticipated to be completed by 2013. Once completed, the Navy will continue to investigate and evaluate the release of hazardous substances at Installation Restoration Site 18 to assess site conditions and evaluate alternatives, if necessary, to select a final remedy for the site (NAVFAC Southwest 2011b).

Installation Restoration Sites 2, 4, 7, 8, 9, and 17 have the potential to be affected by demolition/construction activities associated with Alternative 1 (**Table 4.14-1** and **Figure 4.14-1**). Sites 1, 14 and 15 are located near proposed construction locations but are located outside of the construction buffers and would not be affected by construction activities. The majority of these sites have been closed with no further action planned (DoN 2001).

Military Munitions Response Program Sites

There are five Military Munitions Response Program (MMRP) sites associated with NAF El Centro. Four are located within the secured boundary of NAF El Centro. One site, the former Carrizo Impact Area, is located approximately 25 miles west of NAF El Centro. Site investigations have been conducted at the MMRP sites and all but one, the Aircraft and Machine Gun Bore Sight Range, remain open (NAVFAC Southwest 2009b).

Table 4.14-1. Installation Restoration Sites within the Project Area at NAF El Centro

Site Number	*Site Name*	*Site Description*	*Chemicals of Concern*	*Current Status*
Site 2 (A, B and C)	Patrol Road Landfill	Ravine and flat ground between runway and Patrol Road	Arsenic, chromium, lead, pesticides, other metal, polynuclear aromatic hydrocarbons	Active
Site 4	4th St. Fire Fighting Area	-	-	No further action
Site 7	Abandoned Fuel Farm	Primarily unpaved soil, with pavement covering the runways and taxiways and a limited amount of vegetative cover	VOCs, total petroleum hydrocarbons	Active, quarterly groundwater monitoring
Site 8	Scrap Yard	Site located south of patrol road. The site is flat, has a rectangular shape and is approximately 500 ft long and 190 ft wide.	The primary contaminants of concern for Site 8 are asbestos, arsenic, cadmium, chromium, lead, and PCBs.	No further action

Table 4.14-1. Installation Restoration Sites within the Project Area at NAF El Centro

Site Number	*Site Name*	*Site Description*	*Chemicals of Concern*	*Current Status*
Site 9	Transformer Storage Area	-	PCBs	No further action
Site 17	Fire Fighting Training Area	-	-	No further action

Source: NAVFAC Southwest 2006

4.14.2 Environmental Consequences for Alternative 1

Under Alternative 1, potential impacts to hazardous materials and waste could occur from proposed demolition and construction, as well as aircraft maintenance activities. Potential impacts from homebasing at NAF El Centro are discussed in the next two sections in terms of effects at NAF El Centro and effects at NAS Lemoore.

4.14.2.1 Alternative 1 – NAF El Centro Homebasing, Effects at NAF El Centro

Hazardous Materials Management

Construction and demolition activities associated with Alternative 1 would have no impact on the management of hazardous materials at NAF El Centro. Hazardous materials would continue to be managed under established hazardous material standard operating procedures. Construction and demolition contractors would be required to comply with all applicable requirements concerning handling of construction related hazardous substances on, near, or away from the site. Contractors would use BMPs and engineering controls to prevent or minimize any adverse impact to the environment from any unexpected spills or releases of hazardous materials.

Hazardous materials associated with the F-35C program would not impact installation management programs. Existing facilities and established procedures are in place for the safe handling, use, and disposal of hazardous materials at NAF El Centro. Implementation of Alternative 1 would not result in significant hazardous materials related impacts. Management protocols for hazardous substances related to the F-35C would follow existing regulations and procedures for comparable materials.

F-35C operations are expected to be similar to the legacy aircraft they are replacing with respect to many of the types and volumes of hazardous materials required to operate and maintain, especially regarding adhesives and sealants and support equipment. The F-35 Program includes an Air System Lifecycle Plan, which focuses on hazardous materials reduction and elimination initiatives (Fetter 2006). Some of the materials substitutions that have been implemented in the development of the F-35 include reducing or eliminating the use of many heavy metals and other environmentally sensitive materials. The F-35 has implemented the use of titanium or stainless steel fasteners instead of traditional, cadmium-plated screws and rivets. A new Integrated Power Package has replaced a toxic hydrazine system that is used in F-16 legacy aircraft to restart stalled engines at altitude. The F-35 employs a high velocity oxygenated fuel technology that uses a powder to coat the parts, improving the function and extending the lifespan of F-35 actuators, wear surfaces, and landing gear without use of chrome plating. The F-35 uses non-chrome primers that do not require the use of traditional cadmium and hexavalent chromium-based material, as well as top-coat paints that comply with VOC requirements. In addition,

new materials are being used where feasible in place of the copper-beryllium bushings formerly used in high-load actuators, such as the tail and landing gear (Fetter 2006; Luker 2009).

Additionally, a detection device has been developed that will alert F-35 maintenance teams to corrosion issues in the aircraft, thereby eliminating the need for whole-aircraft stripping and reducing repainting to an as-needed procedure (Fetter 2006; Luker 2009). Any repair-related paint removal operation will be localized and completed through the use of scuff sanding instead of chemical strippers (Luker 2009 in NAVFAC 2011). Therefore, hazardous materials associated with F-35 painting operations and hazardous waste volumes would be substantially reduced relative to legacy aircraft.

Although flight activities are expected to remain consistent, maintenance operations for all new airframes may decline since newer aircraft should not require the extensive repairs currently necessary to maintain older aircraft. This would further reduce the materials required to conduct these repairs (Luker 2009). Traditional maintenance programs were automatically triggered based on flight hours, whereas, modern maintenance is performed on an as-needed basis determined by actual aircraft condition. This change generally translates into fewer maintenance operations and their associated use of hazardous materials. The elimination and/or reduction of the hazardous substances discussed above would reduce the overall amount of hazardous materials used in the Navy Pacific Fleet. However, with the addition of 100 F-35C aircraft, there would be an increase in the amount of hazardous materials used at NAF El Centro. This increase in hazardous material usage would follow established hazardous material standard operating procedures. Therefore, there would be no significant impacts from increased amounts of hazardous materials with the implementation of Alternative 1.

Aboveground Storage Tanks

According to site mapping and the current tank inventory for NAF El Centro, construction would result in the removal or relocation of six aboveground storage tanks (130, 137, 400A, 400B, 433, 446). Aboveground storage tank removal and relocation would be conducted in accordance with applicable regulations and the installation Spill, Prevention, Control and Countermeasures Plan to eliminate/minimize potential adverse impacts.

Asbestos-containing Materials

Asbestos-containing materials may be present in structures proposed to be demolished. Surveys would be conducted for asbestos-containing materials, as required by 40 C.F.R. 61.145, prior to alteration or demolition of the structures. A California licensed asbestos abatement contractor would characterize the material and determine the proper technique for removing the asbestos-containing materials and demolishing the facilities. Asbestos-containing materials would be removed, characterized, managed, transported, and disposed according to applicable federal (e.g., Toxic Substance Control Act [TSCA] [40 C.F.R. 763]), state, and local requirements for protecting human health and safety and the environment. Therefore, adverse impacts associated with asbestos-containing materials would not occur.

Lead-based Paint

Surveys would be conducted for lead-based paint in accordance with 8 California Code of Regulations (CCR) 1532.1 and 17 CCR 35022 and 35038, pertaining to lead-based paint at construction sites and in the work place. In addition, the analysis of lead-based paint in on-site structures would be done in

accordance with the TSCA (15 US Code [U.S.C.] 2601 *et seq*.). Included in these regulations are requirements for facility surveys, notification of intent to disturb lead-based paint, control measures, removal measures, and handling and disposal techniques. Proposed building demolition activities that include the removal and/or handling of lead-based paint would comply with these regulations. Lead-based paint sampling and analysis would be conducted in accordance with USEPA Toxicity Characteristic Leaching Procedure methodology. Based on this federal testing methodology, the paint would be considered hazardous if lead is detected in concentrations greater than 5 mg/l. If lead-based paint were detected in hazardous concentrations, these materials would be removed and disposed of as appropriate. Lead-based paint would be characterized, managed, transported, and disposed of according to applicable state, federal, and local requirements for protecting human health and safety and the environment. Therefore, any impacts associated with lead-based paint would be beneficial in nature.

Polychlorinated biphenyls

Any buildings or portions thereof constructed prior to 1979 would receive a full PCB survey prior to demolition. PCB containing materials would be handled and disposed of in accordance with all applicable federal, state and local regulations. PCBs would be characterized, managed, transported, and disposed of according to applicable state, federal, and local requirements for protecting human health and safety and the environment. PCB-containing materials are classified according to the concentration of PCBs present. There are three classifications of PCB-containing materials: (a) PCBs (>500 parts per million [ppm]), (b) PCB-contaminated (5-500 ppm) and (c) non-PCB (<5 ppm). Any PCB or PCB-contaminated material would be disposed of at an approved disposal facility within one year from the date when the item is declared a waste or is no longer fit for use in accordance with applicable regulations. The removal of PCB-containing equipment from the installation would have a beneficial impact on hazardous wastes at the installation.

Hazardous Waste Management

The types of hazardous wastes generated by proposed F-35C operations in the Navy Pacific Fleet are expected to be fewer than for legacy aircraft since painting operations, cadmium and hexavalent chromium primers, chrome, hydrazine, and various heavy metals would be eliminated or greatly reduced for the F-35 (Fetter 2006; Luker 2009). However, with the addition of 100 F-35C aircraft, there would be an increase in the amount of hazardous waste generated at NAF El Centro. This increase in hazardous waste would be managed in accordance with the NAF El Centro Hazardous Waste Plan. Implementation of Alternative 1 would not result in significant hazardous waste related impacts because management protocols for hazardous substances related to the F-35C would follow existing regulations and procedures for like materials.

Pollution Prevention

Under Alternative 1, a parallel runway would be constructed on the north side of the existing runway and road projects, hangars, aprons, parking areas training facilities and an air operations tower and fire station would be constructed to the south of the existing runway. During construction, contractors would be required to comply with all applicable requirements concerning the management and disposal

of hazardous materials and waste on, near, or away from the site. The contractor would use BMPs and engineering controls to prevent or minimize any adverse impact to the environment from any unexpected spills or releases of hazardous materials and waste.

Hazardous materials associated with the F-35C program would not impact pollution prevention programs. The number of aircraft would increase along with the use of associated hazardous materials and waste. However, existing facilities and established procedures are in place and would continue to be followed for the safe handling, use, and disposal of hazardous waste at NAF El Centro. Alternative 1 would not result in significant pollution impacts because management protocols for hazardous substances related to the F-35C would follow existing regulations and procedures for like materials.

Contaminated Sites

Environmental Restoration Program

Under Alternative 1, the construction of the parallel runway would occur directly on portions of Installation Restoration Sites 2, 7 and 8 **(Figure 4.14-2)**. Construction of the aircraft parking apron would occur over all of Installation Restoration Sites 4, 9 and 17. Soil samples would need to be taken and analyzed prior to disturbing any soils at an Installation Restoration site. If contaminants are found, removal action(s) and/or remedial action(s) would need to be conducted, pursuant to CERCLA, to remove hazardous substances, pollutants, or contaminants present at these sites, prior to or in conjunction with the commencement of any grading and construction activities. Any such work involving Installation Restoration sites would be coordinated by Navy personnel with the appropriate federal and state regulatory agencies.

Although many of the contaminated sites at NAF El Centro have been sufficiently characterized, remediated, and closed with respect to regulatory compliance, it is possible that residual contamination remains in the subsurface at these locations and might be excavated or disturbed during construction.

Unknown or undocumented subsurface contamination may also be encountered in construction areas located outside of designated Installation Restoration sites. If contaminated soil or groundwater is encountered or disturbed during demolition or construction-related activities, potential impacts on surface water, groundwater, or the health and safety of on-site workers could occur. However, implementation of the following project planning and design actions would mitigate any potential impacts.

Construction personnel current in Occupational Safety and Health Administration 40-hour training for hazardous materials would complete excavations in areas of potentially contaminated soil. An Occupational Safety and Health Administration 40-hour trained monitor, with experience in identification of contaminated soil, would also be present during grading and excavations to determine whether petroleum-based contaminated soil and/or groundwater are encountered. Contaminated soils would be segregated from clean soils prior to off-site disposal.

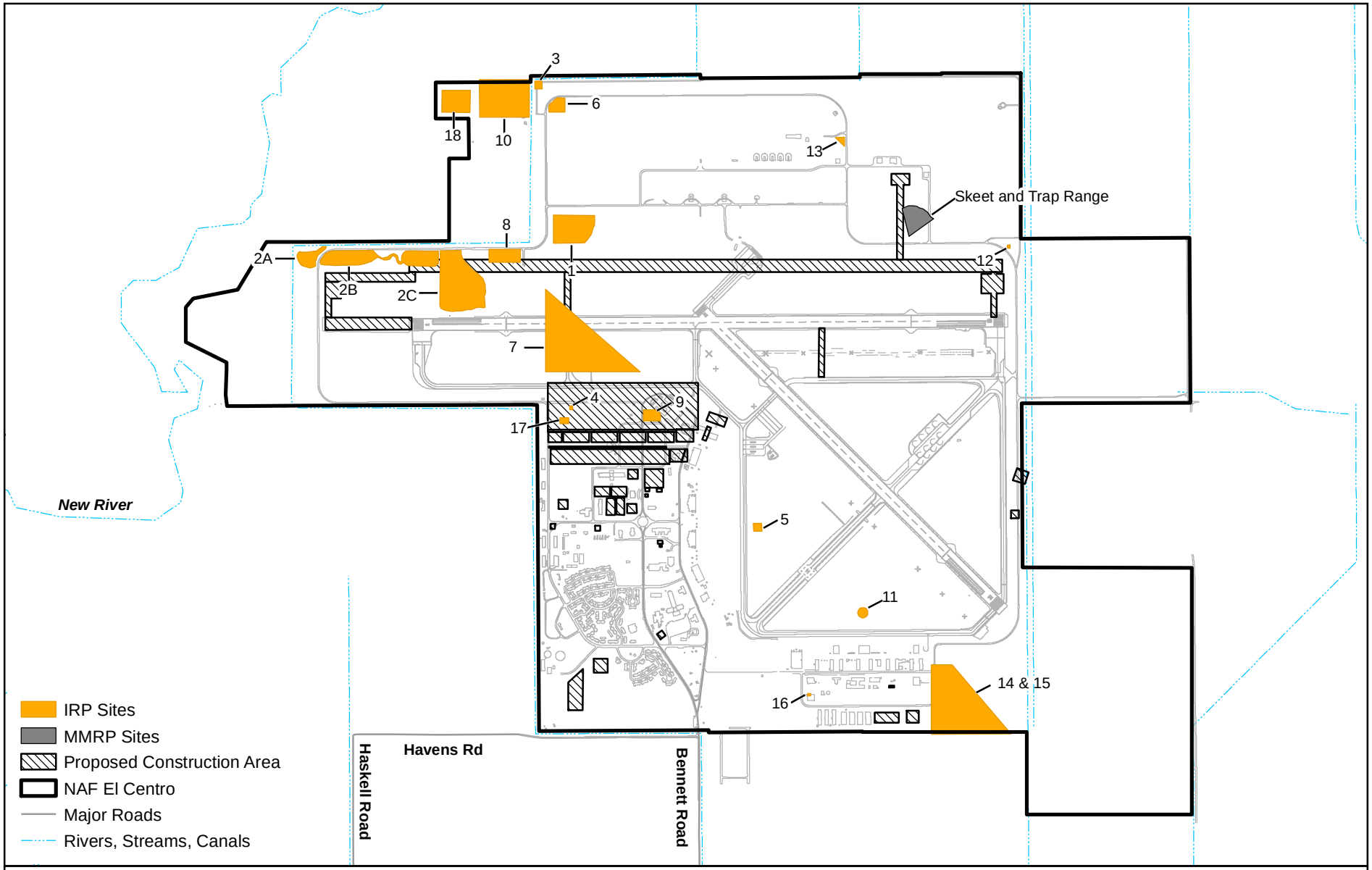


Figure 4.14-2
Installation Restoration and MMRP Sites within the Vicinity of Proposed Construction Activities at NAF El Centro under Alternative 1

Source: NAF El Centro 2005

N

0 1,000 2,000
Feet

The contractor would also prepare and implement a Health and Safety Plan prior to the start of grading/excavating to establish policies and procedures to protect workers and the public from potential hazards posed by potentially contaminated soil. The plan would identify all contaminants, appropriate Occupational Safety and Health Administration 40-hour trained workers, public health and environmental protection equipment and procedures, emergency response procedures, route to the hospital, etc. The plan would be reviewed and signed off by all workers that may be in contact with potentially contaminated soil.

Operational activities associated with Alternative 1 would have no impact on Installation Restoration sites at NAF El Centro. All currently active sites would continue to be remediated and monitored in accordance with current plans, policies and procedures.

Military Munitions Response Program Sites

Of the four open MMRP sites, only one, the Trap and Skeet Range, would be affected by Alternative 1. The power check pad with access taxiway would be constructed within the boundaries of the Trap and Skeet Range. It is expected that MMRP site restoration activities would be completed prior to construction activities associated with Alternative 1. Remediation strategies are in place and funding programmed to meet the Defense Planning Goal of MMRP site cleanup by 2014. The preferred result of cleanup activities is site closure with unrestricted land use. When this result is not possible, the goal is to substantially reduce risks to human health and the environment by eliminating exposure pathways. Regardless of the results of site cleanup, it is expected that the construction activities would be implemented in coordination with the MMRP program to address any issues.

Operational activities associated with Alternative 1 would have no impact on MMRP sites at NAF El Centro. All currently active sites would continue to be remediated and monitored in accordance with current plans, policies and procedures.

Conclusion

Overall, as discussed above, implementation of Alternative 1 at NAF El Centro would not result in significant impacts to public health and safety from hazardous materials and waste related to proposed F-35C operations and facility development. Hazardous waste management activities would follow existing procedures for the safe handling, use, and disposal of hazardous substances and waste. The addition of 100 F-35C aircraft would increase the use of hazardous materials and generation of hazardous waste, which would follow established hazardous material standard operating procedures and hazardous waste management plans. There would be no significant impact to human health and the environment from the removal/relocation of aboveground storage tanks to accommodate facility development. Structures proposed for demolition would be surveyed for hazardous materials, such as lead, asbestos-containing materials, and PCBs. Installation Restoration sites and an MMRP site would be disturbed during construction, which would be conducted in accordance with CERCLA requirements. Hazardous materials associated with the F-35C would not impact installation management programs at NAF El Centro.

4.14.2.2 Alternative 1 – NAF El Centro Homebasing, Effects at NAS Lemoore

Under Alternative 1, aircraft operations at the NAS Lemoore airfield would decrease by 33,600 annual operations. This decrease in operations would result in a decreased amount of hazardous material generated, but would not impact the overall management of hazardous materials or hazardous waste at NAS Lemoore. Alternative 1 does not involve facility development at NAS Lemoore. There would be no impacts to contaminated sites at NAS Lemoore under Alternative 1. (Please see Section 5.14.1, *Affected Environment* for a description of hazardous materials and waste at NAS Lemoore.)

4.14.3 Environmental Consequences for the No Action Alternative

Under the No Action Alternative, operations at NAF El Centro would continue at current levels and all regulations and plans that pertain to hazardous material, hazardous waste, toxic substances, and contaminated sites would continue to be followed and existing conditions would remain unchanged.

5. ALTERNATIVE 2 – NAS LEMOORE HOMEBASING

Chapter 5 provides a description of the affected environment at Naval Air Station (NAS) Lemoore for the 14 resources potentially affected by Alternative 2. Additionally, the potential impacts at both NAS Lemoore and Naval Air Facility (NAF) El Centro associated with implementation of Alternative 2 are analyzed in this chapter. While no mitigation measures are proposed under Alternative 2, several minimization measures and Best Management Practices (BMPs) are described for the resource sections.

5.1 AIRFIELDS AND AIRSPACE

5.1.1 Affected Environment

The affected environment for airfields and airspace includes the NAS Lemoore airfield and Special Use Airspace (SUA) in the vicinity of NAS Lemoore. This section addresses airfield operations and SUA.

5.1.1.1 Airfield Operations

The two parallel runways at the NAS Lemoore airfield are designated 14L/32R and 14R/32L. These runways are 13,500 feet (ft) long by 200 ft wide in a southeast to northwest orientation. Runways 32L and 32R are used most often due to prevailing wind conditions, approach procedures, facilities, and airport design.

NAS Lemoore maintains a Radar Air Traffic Control Facility that controls aircraft traversing the NAS Lemoore airspace. NAS Lemoore airspace is divided into two areas: Alpha and Bravo. The control from Radar Air Traffic Control Facilities extends from the ground surface to 15,000 ft Mean Sea Level (MSL) in the Alpha area and from the ground surface to 10,000 ft MSL in the Bravo area. Normal operating hours at the NAS Lemoore airfield are: 8:00 a.m. to midnight local time Monday through Thursday, 8:00 a.m. to 6:00 p.m. on Friday, 10:00 a.m. to 6:00 p.m. on Saturday, and 1:00 p.m. to 9:00 p.m. on Sunday (Department of the Navy [DoN] 2010). An airfield's hours may be temporarily modified for a variety of reasons: budget, staffing, and Fleet training requirements. The published airfield hours should be considered the "normal" use under current conditions, with the understanding that these hours can be temporarily adjusted based on requirements.

Historical aircraft operations at NAS Lemoore have been dynamic and have fluctuated over the decades of use, generally due to Navy mission changes. Between 2003 and 2007, the number of aircraft operations averaged 210,000 annually with a peak of over 240,000 in 2004 (DoN 2010). Only recently these numbers have decreased due to recent runway repairs and the on-going elimination of the FA-18C Fleet Replacement Squadron (FRS) (Naval Facilities Engineering Command [NAVFAC] Southwest 2010). The annual baseline number of operations at the NAS Lemoore airfield used for analysis in this Environmental Impact Statement (EIS) is approximately 159,400, (refer to **Table 2.8-4**), which reflects the end-state number of operations from the Strike Fighter Realignment at NAS Lemoore. Homebased and transient military flight operations by fixed-wing aircraft stationed at or using NAS Lemoore include the FA-18C and FA-18E/F. In 2012, NAS Lemoore will host three MH-60S helicopters. In addition to departures and arrivals from the airfield, pilots also perform closed pattern work including touch-and-go, Field Carrier Landing Practice (FCLP), and Ground-controlled Approach (GCA) to ensure proficiency in these areas.

5.1.1.2 Special Use Airspace and Military Training Routes

Proposed F-35C operations within SUA in the vicinity of NAS Lemoore would be similar to current FA-18 operations. F-35C operations would occur in: Restricted Areas (R-) R-2508, R-2524 (Superior Valley Range), Lemoore Military Operations Area (MOA), R-2513/Hunter MOA, and numerous Military Training Routes (MTRs) (**see Figure 2-17**). F-35C operations in Warning Area (W-) W-283, W-285, and W-532 would be part of exercises and are not associated with the proposed homebasing action. These training operations in W-283, W-285, and W-532 are addressed in other National Environmental Policy Act (NEPA) documents including the Navy's At-Sea Phase II Environmental Compliance Program (see Appendix B, *Training Operations*).

<u>R-2508 Complex</u>

R-2508 is a Restricted Area Complex that includes all the airspace and associated land presently used and managed by the three principal military activities in the Upper Mojave Desert region:

- Air Force Flight Test Center, Edwards Air Force Base
- National Training Center, Fort Irwin
- Naval Air Warfare Center Weapons Division, China Lake

The R-2508 Complex is composed of internal restricted areas, MOAs, Air Traffic Controlled Assigned Airspace (ATCAAs), and other. The four primary MOA work areas within R-2508 have a floor of 200 above ground level (AGL), with some higher exceptions over sensitive areas (e.g., airports, National Parks). The ATCAAs are used to fill the airspace gap between the top of the MOAs and the base of R-2508. Typical operations within the R-2508 Complex include:

- Aircraft research and development in all stages of flight
- Operational weapons test and evaluation flights
- Student pilot training
- Air combat maneuvering and proficiency flights
- Civilian test aircraft in direct support of Department of Defense (DoD) and/or defense testing

The R-2508 Complex is shared-use airspace, so operations must remain flexible as airspace requirements are not entirely predictable. Therefore, to make the best use of available SUA, participating aircraft operating in R-2508 Complex are not given exclusive use of the SUA but are considered to be operating under concurrent operations. Participating aircraft must accept radar traffic advisories and use a "see-and-avoid" principle to avoid interfering with the missions of other aircraft.

<u>R-2524 (Superior Valley Range)</u>

The R-2524 is a Restricted Area that is part of the R-2508 Complex. R-2524 extends from the surface to an unlimited altitude. Use of R-2524 is scheduled through a central coordinating facility with the R-2508 Complex.

<u>Lemoore MOAs</u>

The Lemoore MOAs are MOAs that cover 30 nautical miles by 70 nautical miles and are divided into five sections with five corresponding ATCAAs overlying them: A, B, C, D, and E. The ceiling of the Lemoore MOA is 18,000 ft, which is the start of the ATCAA. The floor and ceiling of Lemoore MOA is shown in

Table 5.1-1. Both the MOA and the overlying ATCAA are usually activated concurrently. For each training mission, the Navy only activates SUA required to accomplish that specific mission.

Table 5.1-1. Lemoore MOA/ATCAA Floor and Ceiling Altitudes

SUA	Floor (ft)	Ceiling (ft MSL)
Lemoore A MOA /ATCAA	5,000 ft MSL	26,000 ft MSL
Lemoore B MOA /ATCAA	13,000 ft MSL	26,000 ft MSL
Lemoore C MOA /ATCAA	16,000 ft MSL	26,000 ft MSL
Lemoore D MOA /ATCAA	5,000 ft MSL	26,000 ft MSL
Lemoore E MOA /ATCAA	5,000 ft MSL	26,000 ft MSL

R-2513/Hunter MOA

R-2513 is a Restricted Area and the Hunter MOA is a MOA. The Hunter MOA/ATCAA complex lies 60 to 90 miles west of NAS Lemoore. It is composed of a high MOA, which extends from 11,000 MSL to 18,000 MSL and is overlain by an ATCAA to 23,000 ft MSL, and five low MOAs designated A through E. The floor and ceiling of Hunter MOA is shown in **Table 5.1-2**.

Table 5.1-2. Hunter MOA Floor and Ceiling Altitudes

SUA	Floor (ft AGL)	Ceiling (ft MSL)
Hunter Low MOA A	200	To but not including 11,000
Hunter Low MOA B	2,000	To but not including 11,000
Hunter Low MOA C	3,000	To but not including 11,000
Hunter Low MOA D	1,500	6,000
Hunter Low MOA E	1,500	3,000

R-2513 is contained within the lateral boundary of the Hunter Low MOA A and Hunter High MOA; it extends from the surface to 24,000 ft MSL. The United States (US) Army has joint control of the Hunter MOA. They control R-2513 and their operations may take priority over Navy training.

MTRs in the vicinity of NAS Lemoore used by FA-18 would continue to be used by the F-35C. **Table 2.8-6** shows the MTR usage by each route for baseline and proposed operations. FA-18C/D/E/F aircraft operating out of NAS Lemoore use these MTRs only for daytime operations.

Civil Aviation

Private and commercial air traffic is active in the airspace near NAS Lemoore (DoN 1994) (**Figures 5.1-1 and 5.1-2**). Commercial jet corridors connecting northwestern and southern California are some of the busiest flight corridors in the country (DoN 1998). Commercial and general aviation aircraft routinely pass through the NAS Lemoore airspace to land at one of the several private or commercial airports in the vicinity of the NAS Lemoore airfield, including Bakersfield and Fresno.

The southern border of the NAS Lemoore airspace is also the border between the Federal Aviation Administration (FAA) regional centers in Oakland and Los Angeles. NAS Lemoore coordinates air traffic with the Oakland and Los Angeles centers and neighboring air traffic control facilities. Neighboring facilities include the Fresno Yosemite International Airport to the northeast and the Meadows Field Airport in Bakersfield to the southeast. Air traffic from these local commercial and general aviation airports may receive air traffic control services from NAS Lemoore upon request.

5.1.2 Environmental Consequences for Alternative 2

Under Alternative 2, potential impacts to airfields and airspace could occur from proposed F-35C aircraft operations. Potential impacts from homebasing at NAS Lemoore are discussed in the next two sections in terms of effects at NAS Lemoore and effects at NAF El Centro.

5.1.2.1 Alternative 2 – NAS Lemoore Homebasing, Effects at NAS Lemoore

Airfield Operations

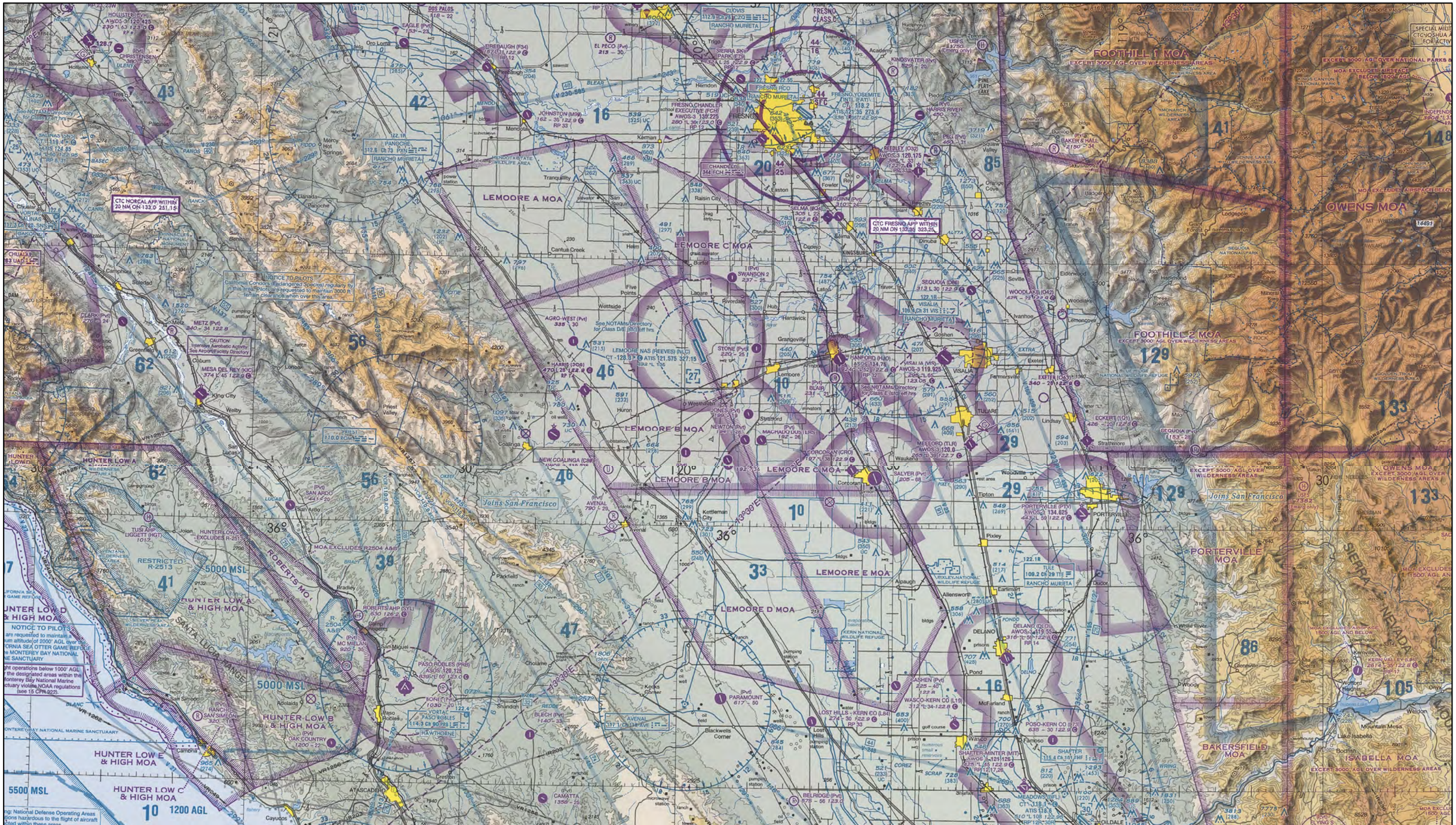
Homebasing the F-35C would result in an increase of 68,400 aircraft operations at the NAS Lemoore airfield. This increase represents a change from the baseline of 159,400 operations in 2015 to a proposed 227,800 operations in 2028 (**Table 5.1-3**). Proposed airfield operations at NAS Lemoore would be consistent with historical operations because the proposed level of 227,800 operations in 2028 would below the peak level of 240,000 annual operations experienced in 2004.

Table 5.1-3. Changes in Annual Airfield Operations at NAS Lemoore under Alternative 2

Aircraft	*Number of Operations*[1]		*Change from Baseline*
	Baseline (2015) [2]	*Proposed (2028)*	
F-35C Fleet Squadrons	0	25,200	+25,200
F-35C FRS	0	76,700	+76,700
FA-18C Fleet Squadrons	11,400	0	-11,400
FA-18E/F Fleet Squadrons	75,300	53,200	-22,100
FA-18E/F FRS	62,200	62,200	0
Transient	10,500	10,500	0
Total	**159,400**	**227,800**	**+68,400**

Source: DoN 2012.
Notes: 1. Number of operations rounded to the nearest hundred.
2. Baseline (2015) operations reflect the number of operations depicted as the end-state operations from the Strike Fighter Realignment at NAS Lemoore (DoN 2011a); elimination of the FA-18C/D FRS, reduction to two FA-18C squadrons, and an increase of five FA-18E/F squadrons.

The F-35C would operate in an airfield environment similar to the current operational environment and would generally follow established local approach and departure patterns. No new flight tracks are proposed. No changes would be required to the Controlled Airspace around NAS Lemoore or to the established procedures for managing and controlling air traffic in the area. Including the increase of operations, the total number of proposed operations would be below historic highest levels. Although there would be an increase in the number of annual operations, implementation of Alternative 2 would not result in adverse effects to airfield operations at NAS Lemoore.



Airports

Hard-surfaced runways 1,500 ft. to 8,069 ft. in length

Hard-surfaced runways greater than 8,069 ft. or some multiple runways less than 8,069 ft.

Additional Airport Information

Private "(Pvt)"- non-public use having emergency or landmark value

Military - Other than hard-surfaced; all military airports are identified by abbrevations AFB, NAS, AAF, etc.

Airport Traffic Service and Airspace Information

Class D Airspace

40 — Ceiling of Class D Airspace in hundreds of feet (A minus ceiling value indicated surface up to but not uncluding that value.)

Class E (surface) Airspace

Class E Airspace with floor 700 ft. above surface

Class E Airspace with floor 1,200 ft. or greater above surface that abuts Class G Airspace

Prohibited, Restricted,and Warning Areas

Alert Area and MOA (Military Operations Area)

IR211 MTR-Military Training Route

Class E Airspace low altitude Federal Airways are indicated by center line

Intersection- Arrows are directed towards facilities with established intersections

132° V 69 100

Total mileage between NAVAIDs on direct Airways

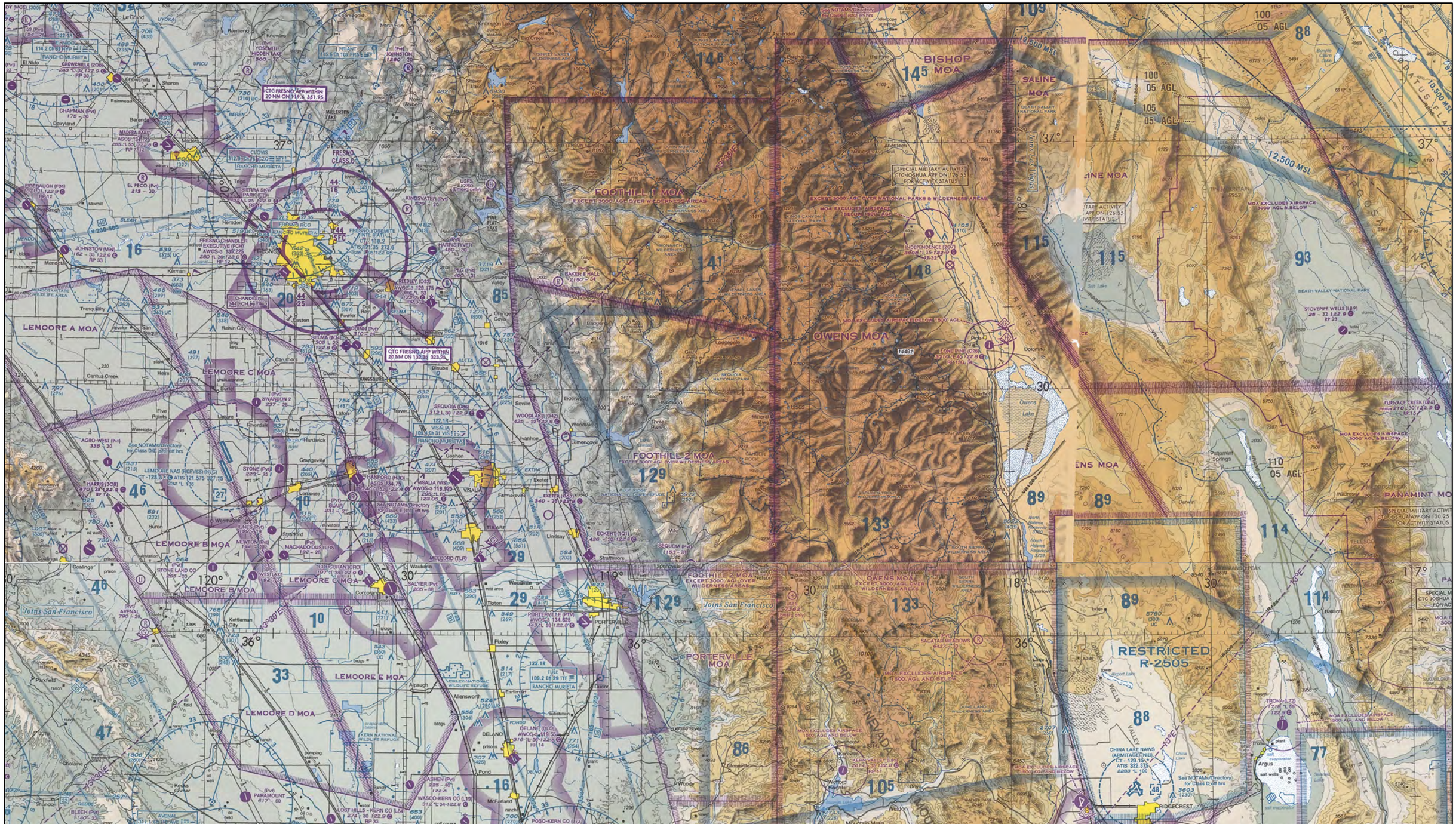
N

0 4 8

Miles

Source: FAA 2012a,b

Figure 5.1-1 NAS Lemoore Vicinity Aeronautical Chart (Western)



Airports

Hard-surfaced runways 1,500 ft. to 8,069 ft. in length

Hard-surfaced runways greater than 8,069 ft. or some multiple runways less than 8,069 ft.

Additional Airport Information

Private "(Pvt)"- non-public use having emergency or landmark value

Military - Other than hard-surfaced; all military airports are identified by abbrevations AFB, NAS, AAF, etc.

Airport Traffic Service and Airspace Information

Class D Airspace

Ceiling of Class D Airspace in hundreds of feet (A minus ceiling value indicated surface up to but not uncluding that value.)

Class E (surface) Airspace

Class E Airspace with floor 700 ft. above surface

Class E Airspace with floor 1,200 ft. or greater above surface that abuts Class G Airspace

Prohibited, Restricted,and Warning Areas

Alert Area and MOA (Military Operations Area)

IR211 MTR-Military Training Route

Class E Airspace low altitude Federal Airways are indicated by center line

Intersection- Arrows are directed towards facilities with established intersections

Total mileage between NAVAIDs on direct Airways

N

0 4 8

Miles

Source: FAA 2012a,b,c

Figure 5.1-2 NAS Lemoore Vicinity Aeronautical Chart (Eastern)

Special Use Airspace and Military Training Routes

Under Alternative 2, homebasing the F-35C would result in an increase of 3,394 aircraft operations in SUA and 54 aircraft operations in MTRs in the vicinity of NAS Lemoore. This increase represents a change from the baseline of 9,250 annual operations in 2015 to a proposed 12,644 annual operations in 2028 in the SUAs and 1,227 annual operations to 1,281 annual operations in the MTRs (**Tables 5.1-4** and **5.1-5**). This equates to a proposed increase of 13 additional flights per day (using a flying schedule of 260 days per year) spread across all the SUA and MTRs. A net increase of approximately 830 operations would occur in the Fallon Range Training Complex, which would see its Lemoore-based transient operations increase from a baseline of 17,022 operations to 17,852 operations (see Appendix B – *F-35C Training Operations*).

Table 5.1-4. Changes in Annual Operations in Special Use Airspace under Alternative 2

SUA	*Number of Operations*[1]				
	Baseline (2015)[2]	*Proposed Navy F-35C*	*Navy FA-18 Legacy Eliminated*	*Proposed (2028)*	*Change*
R-2508 Complex	4,776	4,580	-2,200	7,156	+2,380
R-2524 Superior Valley Range	3,128	1,188	-1,076	3,240	+112
Lemoore MOA	1,264	1,721	-895	2,090	+826
R-2513/Hunter MOA	82	112	-36	158	+76
Subtotal in Local SUA	**9,250**	**7,601**	**-4,207**	**12,644**	**+3,394**
W-283	1,164	1,474	-414	2,224	+1,060
W-285	348	114	-118	344	-4
W-532	340	212	-136	416	+76
Fallon Range Training Complex	17,022	9,476	-8,646	17,852	+830
Total	**28,124**	**18,877**	**-13,521**	**33,480**	**+5,356**

Source: DoN 2012b, ATAC 2014.
Notes: 1. Flights to a particular range are based on range availability and weather. Flights may be distributed between the ranges listed. Numbers of operations are estimated projections for typical annual operations, which may increase or decrease depending upon circumstances.
2. Includes NAS Lemoore based FA-18 aircraft.

Under Alternative 2 and as shown in **Table 5.1-4**, there would be an increase in 2,380 F-35C operations in R-2508. Training missions in the Restricted Area would be similar to those currently flown by legacy aircraft, including air combat training operations and supersonic events. Additionally, F-35C operations in R-2524 would increase by 112 operations over baseline conditions. For the Lemoore MOA, operations would increase by 826 over baseline. The activity within R-2513/Hunter MOA would increase by 76 operations under Alternative 2. These increases would not affect the capabilities of the SUA to accommodate the proposed training activities of the F-35C and would not result in a need for structural changes to the SUA.

Table 5.1-5. Changes in Annual Operations in Military Training Routes under Alternative 2

MTR*	Number of Operations		Change
	Baseline (2015)	Proposed (2028)	
IR-203	8	8	0
IR-207	129	129	0
VR-201	237	246	9
VR-202	251	254	3
VR-208	23	23	0
VR-209	51	51	0
VR-1250	61	63	2
VR-1251	22	25	3
VR-1252	1	1	0
VR-1253	17	17	0
VR-1254	6	6	0
VR-1255	255	284	29
VR-1256	2	2	0
VR-1257	95	98	3
VR-1259	4	4	0
VR-1260	2	2	0
VR-1261	24	26	2
VR-1262	38	41	3
VR-1264	1	1	0
Total	**1,227**	**1,281**	**+54**

Source: US Fleet Forces Command (USFF) 2011.
Note: * Includes all users of the MTRs.

There would be an increase of 54 F-35C operations in the 13 MTRs (see **Figure 2-17**). Viewing all 19 MTRs cumulatively, the increase in F-35C operations would be about one additional flight per week. FA-18 operations in MTRs are not conducted during nighttime hours (10:00 p.m. – 7:00 a.m.). The F-35C operations would also be expected to only use MTRs during the day.

Civil Aviation

Alternative 2 would not have a significant adverse impact to civil aviation in the R-2508 Complex, R-2524 (Superior Valley Range), Lemoore MOA, R-2513/Hunter MOA, and MTRs because all SUA proposed for use by F-35C is already used for military aircraft training. Alternative 2 does not establish any new SUA. However, there may be less opportunity for civil aviation to transit existing SUA (when it is unoccupied by military users) due to increased military operations.

Civil traffic on established airways would continue to be separated from military traffic laterally and/or by altitude. Instrument Flight Rules (IFR) traffic would continue to be rerouted around active restricted areas and MOAs by FAA. Visual Flight Rule (VFR) traffic, although allowed access into the MOAs at all times, may prefer to circumnavigate the area to avoid the responsibilities of visual separation from military jets. Victor routes V-107 and V-23 run parallel on either side of the Lemoore MOAs and no federal airways cross the Lemoore MOAs, ensuring no civil aviation conflict. The preponderance of the proposed SUA operations, nearly 2,400, are bound for the R-2508 complex. Military traffic flying from NAS Lemoore east to R-2508 use established routes at altitudes of 19,000 to 23,000 ft MSL. These altitudes put NAS Lemoore traffic above civil air traffic on Victor routes and below the commercial jet traffic which is generally above 29,000 ft MSL.

Conclusion

Alternative 2 would not result in significant adverse impacts to airfields and airspace because F-35C operations would be conducted in a manner similar to the current Navy missions conducted by aircraft assigned to NAS Lemoore. A similar training regime would be used and F-35C would operate similar to the FA-18 aircraft. There would be an increase of 68,400 annual aircraft operations at the NAS Lemoore airfield and an increase of 3,448 annual aircraft operations in SUA and MTRs in the vicinity of NAS Lemoore. Although there would be increases in the number of annual operations, F-35C operations would not require changes to the management or structure of the affected SUA, and current safety procedures would continue to be emphasized. The use and structure of approach and departure patterns, along with air traffic control, would remain unchanged. There may be less opportunity for civil aviation to transit existing SUA.

5.1.2.2 Alternative 2 – NAS Lemoore Homebasing, Effects at NAF El Centro

Under Alternative 2, homebasing the F-35C at NAS Lemoore would result in an increase of 800 operations at the NAF El Centro airfield. This increase represents a change from the baseline of 65,800 operations in 2015 to a proposed 66,600 operations in 2028 (**Table 5.1-6**). Increased operations at the NAF El Centro airfield would be due to NAS Lemoore squadrons conducting detachment operations at NAF El Centro. Most of these operations would be conducted by the F-35C FRS. (Please see Section 4.1.1, *Affected Environment* for a description of the NAF El Centro airfield.) Alternative 2 would not result in significant adverse impacts to airfields and airspace at NAF El Centro.

Table 5.1-6. Changes in Annual Airfield Operations at NAF El Centro under Alternative 2

Aircraft	*Number of Operations*[1]		*Change*
	Baseline (2015)	*Proposed (2028)*[2]	
Detachment/Transient	65,800	66,600	+800
Total	**65,800**	**66,600**	**+800**

Source: DoN 2012.
Notes: 1. Number of operations rounded to the nearest hundred.
2. NAF El Centro operations for proposed action differs from baseline because NAS Lemoore based, F-35C FRS, detachment training operations and also the USMC FA-18C/D and AV-8B would be replaced by F-35B aircraft. Both actions would add operations to NAF El Centro.

5.1.3 Environmental Consequences for the No Action Alternative

Under the No Action alternative, F-35C aircraft would not be based at NAS Lemoore and associated construction and operations would not occur. The number of aircraft operations for the baseline year of 2015 as described in **Table 5.1-3** would not change under the No Action alternative. Therefore, there would be no changes to the NAS Lemoore airfield and SUA and MTRs in the vicinity of NAS Lemoore as a result of the No Action alternative.

5.2 NOISE

5.2.1 Affected Environment

The affected environment for noise includes NAS Lemoore and SUA in the vicinity of NAS Lemoore. This section addresses noise from aircraft operations, construction activities, and other noise sources. Noise

impacts are assessed for noise exposure, potential hearing loss, speech interference and classroom criteria, sleep disturbance, and occupational noise.

5.2.1.1 Airfield Operations

Aircraft Operations

Operational data for the 2015 baseline noise conditions were derived from the recently completed (2011) Strike Fighter Realignment EA. While **Table 5.1-3** indicates the number of annual operations for baseline and proposed conditions, **Table 5.2-1** presents the baseline number of annual operations for day, evening, and night. Of the 159,400 annual operations, 66 percent occur during day, 22 percent during evening, and 12 percent during night.

Table 5.2-1. Baseline NAS Lemoore Airfield Operations for Day, Evening, and Night (2015)

Operation Type	*Day 7 a.m.-7 p.m.*	*Evening 7 p.m.-10 p.m.*	*Night 10 p.m.-7 a.m.*	*Total*
FA-18C Fleet				
Departure	2,782	611	0	3,393
Arrival (Straight-in and Break)	2,545	509	338	3,392
Touch and Go	0	0	0	0
FCLP	2,525	1,239	644	4,408
GCA	173	25	21	219
FA-18C Total	**8,025**	**2,384**	**1,003**	**11,400***
FA-18E/F Fleet				
Departure	16,068	3,766	309	20,143
Arrival (Straight-in and Break)	14,705	3,022	2,417	20,144
Touch and Go	0	0	0	0
FCLP	18,139	9,360	6,254	33,753
GCA	1,035	118	149	1,302
FA-18E/F FLT Total	**49,947**	**16,266**	**9,129**	**75,300***
FA-18E/F FRS				
Departure	7,822	1,395	213	9,430
Arrival (Straight-in and Break)	7,073	1,508	849	9,430
Touch and Go	10,154	1,793	1,281	13,228
FCLP	13,468	10,423	4,907	28,798
GCA	667	316	281	1,264
FA-18E/F FRS Total	**39,184**	**15,435**	**7,531**	**62,200***
Transient operations				
Departure	1,877	189	33	2,099
Arrival (Straight-in and Break)	1,877	192	30	2,099
Touch and Go	3,535	553	123	4,211
FCLP	0	0	0	0
GCA	1,833	246	19	2,098
Transient Total	**9,122**	**1,180**	**205**	**10,500***
Total - All Aircraft	**106,278**	**35,265**	**17,868**	**159,400***

Source: DoN 2011.
Note: *Total number of operations rounded to the nearest hundred.

Noise Exposure

Table 5.2-2 presents total noise exposure (on and off the installation) in terms of estimated acreage and population under baseline conditions. Population estimates were calculated using the 2010 US Census block data for average numbers of persons per household. The number of houses was determined through the use of aerial imagery. This number was then multiplied by the average number of persons per household to determine the population within each noise zone. **Figure 5.2-1** shows the baseline noise zones for NAS Lemoore (refer to Section 3.5, *Land Use*, for a description of noise zones).

Table 5.2-2. Noise Exposure within Baseline Noise Zones at NAS Lemoore (2015)

Noise Zone (dB CNEL)	*Acreage*	*Population*
Noise Zone 2		
65 - 69	28,783	844
70 - 74	17,693	641
Noise Zone 3		
75 - 79	10,101	77
80 - 84	9,547	3
85+	9,323	0
Total	**75,446**	**1,565**

Note: *CNEL = Community Noise Equivalent Level.

Many schools and communities are within Noise Zone 1 (i.e., less than 65 dB) at NAS Lemoore and are represented in **Table 5.2-3** along with the Community Noise Equivalent Level (CNEL) associated with the point of interest.

Table 5.2-3. CNEL Levels at Various Points of Interest – Baseline (2015)

Point of Interest			
ID	*Description*	*Type*	*CNEL (dBA)*
1	Community of Burrel	School and Non-School	60
2	Community of Caruthers	School and Non-School	52
3	Central Union School	School	53
4	College Park Apartments	Non-School	50
5	Community of Conejo	School and Non-School	57
6	Fairway Homes at Lemoore Golf Course	Non-School	48
7	Community of Helm	School and Non-School	50
8	Huron Middle School	School	43
9	Island Elementary School	School	51
10	Community of Lanare	Non-School	60
11	Neutra and Akers Elementary School	School	60
12	Community of Riverdale	School and Non-School	50
13	Santa Rosa Rancheria homes near Tachi Casino	Non-School	49
14	Community of Stratford	School and Non-School	50
15	West Hills College	School	58

Notes: The type point of interest refers to the type of receptor used for the analyses. School is used for classroom criteria, non-school is used for speech interference and sleep disturbance, and, although not used in this table, worship are churches, synagogues, temples, etc. and are also receptors used for speech interference analyses.

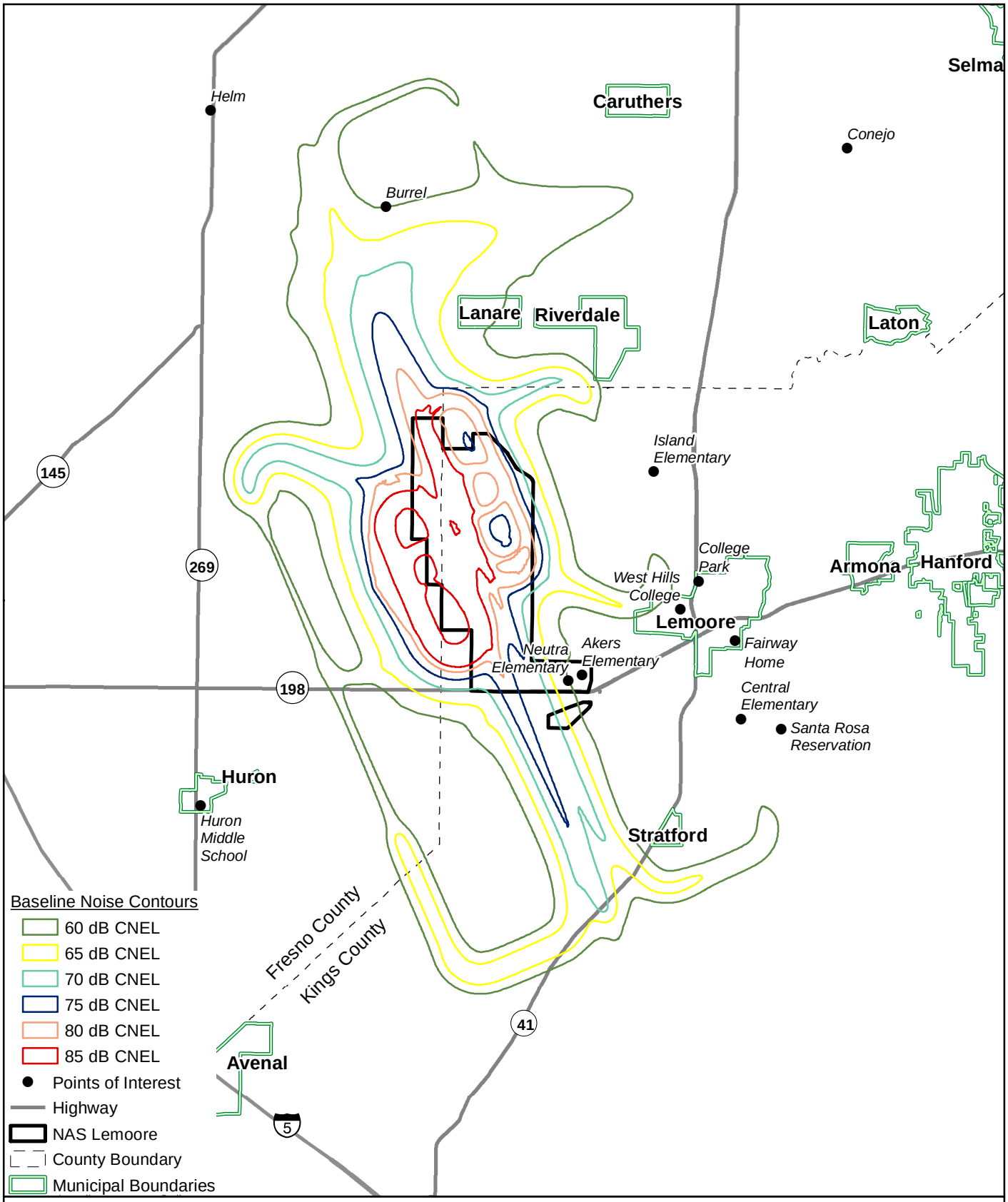


Figure 5.2-1
Baseline Noise Contours and
Points of Interest at NAS Lemoore

Source: Wyle 2013

The Navy has an active Air Installations Compatible Use Zones (AICUZ) program that informs the public about its aircraft noise environment and recommends specific actions for local jurisdiction with planning and zoning authority that can enhance the health, safety, and welfare of those living near the NAS Lemoore airfield. The current version of the AICUZ plan for NAS Lemoore was published in 2010. NAS Lemoore actively pursues operational measures to reduce aircraft noise. Airfield restrictions used to minimize noise for operations conducted at the NAS Lemoore airfield include specific flight tracks and elevations for certain types of flight operations, as well as avoiding flying over the specific populated areas.

On average, NAS Lemoore typically receives one noise complaint per month. A noise complaint form is available at the NAS Lemoore public website: http://www.cnic.navy.mil/regions/cnrsw/installations/nas_lemoore/about/pao/noise_complaint_form.html. Noise complaints received via this website are logged noting the complainant's location, time of complaint, and description of the noise issue. Complaints are coordinated with the Airfield Manager, who investigates the complaint. The Public Affairs Officer then follows up with the complainant.

Potential Hearing Loss

Although three people are estimated to live in the 80 dB CNEL zone or higher (**Table 5.2-2**), none are exposed to an $L_{eq}(24)$ of 80 dB or higher. Therefore there is no population at risk for potential hearing loss.

Speech Interference and Classroom Criteria

Speech interference caused by aircraft noise is a primary cause of annoyance for communities. Such interference is measured by the numbers of average daily/evening indoor (7:00 a.m. to 10:00 p.m.) events per hour that are subject to indoor maximum sound levels (L_{max}) of at least 50 dB at representative locations. This measure also accounts for a 15 dB and 25 dB noise attenuation provided by buildings with windows open or closed, respectively. Therefore, maximum outdoor noise levels should be 65 dB with windows open and 75 dB with windows closed and are denoted as $NA65L_{max}$ (windows open) and $NA75L_{max}$ (windows closed). For example, $NA75L_{max}$ denotes the number of events above an L_{max} of 75 dB within a building with windows closed. **Table 5.2-4** presents indoor speech interference under baseline conditions at representative locations.

Table 5.2-4. Baseline Indoor Speech Interference Events at Representative Locations at NAS Lemoore (2015)

Receptor	*Average Daily/Evening Indoor Events per Hour (7 a.m. to 7 p.m.)*	
	Windows Closed	*Windows Open*
Community of Burrell	3	6
Community of Caruthers	0	4
College Park Apartments	0	0
Community of Conejo	2	4
Fairway Homes at Lemoore Golf Course	0	1
Community of Helm	0	1
Community of Lanare	3	7
Community of Riverdale	0	3
Santa Rosa Rancheria homes near Tachi Casino	0	2
Community of Stratford	0	1

Supplemental noise metrics are applied to school environments to analyze speech interference in a classroom setting. When considering impacts from intermittent aircraft noise, indoor background noise levels and the loudness of the events are taken into account. For this analysis, a threshold on indoor background noise level of 40 dB L_{eq} and a limit on single events of 50 dB L_{max} are utilized. These limits translate to an outdoor equivalent noise level (L_{eq}) of 60 dB continuous level and an outdoor L_{max} of 65 and 75 dB to obtain the 40 dB L_{eq} threshold. The impacts are stated as number of events above a certain level, in this case, 65 and 75 dB L_{max} and are presented as NA65L_{max} and NA75L_{max}. The time period for classroom events are during normal school hours from 8:00 a.m. to 5:00 p.m. rather than the 7:00 a.m. to 10:00 p.m. for normal conversation. **Table 5.2-5** presents outdoor and indoor equivalent noise levels and the number of events per hour above of 50 dB L_{max} indoors for the schools in the vicinity of NAS Lemoore. Burrell Elementary School, Caruthers High School, Conejo School, Neutra/Akers Elementary Schools and West Hills Community College exceed the windows open criteria of 40 dB L_{eq} under baseline conditions.

Table 5.2-5. Baseline Classroom Criteria for Schools near or on NAS Lemoore (2015)

Receptor	***Outdoor Equivalent Noise Level [$L_{eq(9hr)}$]***	***Baseline Indoor Noise Levels and Number of Events above a Maximum Indoor Noise Level of 50 dB L_{max}***			
		Windows Closed		***Windows Open***	
		dB[$L_{eq(9hr)}$]	***Events per hour***	***dB[$L_{eq(9hr)}$]***	***Events per hour***
Burrell Elementary School*	62	37	7	47*	10
Caruthers High School*	55	30	1	40*	7
Central Union School	54	29	0	39	1
Conejo School*	60	35	6	45*	7
Helm Elementary School	50	25	1	35	1
Huron Middle School	38	13	0	23	0
Island Elementary School	53	28	1	38	1
Neutra and Akers Elementary School*	61	36	3	46*	7
Riverdale High School	52	27	0	37	6
Stratford Elementary School	50	25	0	35	2
West Hills College*	57	32	0	42*	1

Notes: * Exceeds classroom criteria.

Sleep Disturbance

Sleep disturbance can also be a result of aircraft overflight. The significance of this potential impact can be assessed by determining the probabilities of awakenings. **Table 5.2-6** lists the probabilities of awakening events between the hours of 10:00 p.m. to 7:00 a.m. The probability of awakening for the representative residential locations ranges from a low of 0 percent to a high of 9 percent for windows closed and open respectively. Indoor awakening is used to distinguish average night sleeping from awakenings during the day or outdoor activities (i.e., naps in a hammock or tent camping).

Table 5.2-6. Baseline Indoor Sleep Disturbance at Representative Locations Near NAS Lemoore (2015)

Receptor	***Average Nightly (10 p.m. - 7 a.m.) Probability of Awakening (%)***	
	Windows Closed	***Windows Open***
	Probability of Awakening	***Probability of Awakening***
Community of Burrell	3%	6%
Community of Caruthers	0	1%
College Park Apartments	0	2%
Community of Conejo	1%	2%
Fairway Homes at Lemoore Golf Course	1%	2%
Community of Helm	1%	3%
Community of Lanare	5%	9%
Community of Riverdale	0	2%
Santa Rosa Rancheria homes near Tachi Casino	4%	7%
Community of Stratford	2%	8%

Occupational Noise

Existing Navy noise exposure procedures, such as hearing protection and monitoring, are undertaken to minimize the potential effects of occupational noise exposure that may occur on NAS Lemoore. These procedures are in compliance with all Occupational Safety and Health Administration and DoN occupational noise exposure regulations.

Construction Noise

Noise associated with construction is typically dominated by grading/earth-moving equipment (e.g., graders, excavators, etc.) and impact devices (e.g., pile drivers, jackhammers, etc.). Smaller equipment such as skid-steer loaders, concrete trucks, man-lifts, etc., would likely be the types of construction equipment used. Noise from construction activities varies with the types of equipment used and the duration of use. During operation, heavy equipment and other construction activities generate noise levels typically ranging from 70 to 90 dB at a distance of 50 ft (refer to **Figure 4.2-2**).

Other Noise Sources

Other sources of noise, such as general vehicle traffic, and other maintenance and landscaping activities, are a common on-going occurrence at the base. While these sources may contribute to the overall noise environment, they are relatively minor compared to the dominant aircraft-generated noise at and adjacent to the base. For this reason, these other noise sources were not considered under baseline nor are they analyzed under this alternative.

5.2.1.2 Special Use Airspace and Military Training Routes

Aircraft operations in local SUA and MTRs under baseline conditions equal approximately 10,477 annual operations (see **Tables 2.8-5** and **2.8-6**) dispersed throughout the SUA of R-2508 training Complex, Lemoore MOA, R-2513/Hunter MOA, and MTRs. Additionally, the Fallon Range Training Complex would continue to be used by Lemoore-based aircraft, with operations there going from 17,022 annual operations by Lemoore-based aircraft to 17,852 operations, for a gain of about 830 annual operations (see **Table 2.8-5**). MTRs used by NAS Lemoore aircraft and make up 213 of the 1,227 annual operations by all aircraft in 2015. Noise levels are expressed as Sound Exposure Levels (SELs) for representative FA-

18 low-level overflights at 500 and 1,000 ft AGL within MTRs (**Table 4.2-7**). Although proposed airspace operations would occur at much higher altitudes (i.e., greater than 1,500 ft AGL), operations could occur occasionally at the altitudes in airspace where such low level activity is allowed. Noise in airspace could reach these levels, but would rarely occur. In fact, R-2508 is the most utilized airspace NAS Lemoore FA-18s operate in and the total number of operations in R-2508 is 4,776. Assuming 250 flying days per year, this equates to less than one FA-18 operation per hour.

5.2.2 Environmental Consequences for Alternative 2

Under Alternative 2, potential noise impacts could occur from proposed F-35C aircraft operations and construction and demolition activities. Potential impacts from homebasing at NAS Lemoore are discussed in the next two sections in terms of effects at NAS Lemoore and effects at NAF El Centro.

5.2.2.1 Alternative 2 – NAS Lemoore Homebasing, Effects at NAS Lemoore

<u>Airfield Operations</u>

This assessment of noise examines how Alternative 2 compares to current baseline conditions at NAS Lemoore and nearby communities.

Aircraft Operations

Data used for F-35C operations at NAS Lemoore under Alternative 2 were derived from the Military Aviation Simulation Model (NASMOD) study (DoN 2012). Upon full implementation of this alternative in 2028, there would be 227,800 annual operations with 66 percent of them occurring during daytime, 22 percent during evening, and 12 percent during night (**Table 5.2-7**).

Table 5.2-7. Proposed NAS Lemoore Airfield Operations under Alternative 2 (2028)

Operation Type	*Day 7 a.m.-7 p.m.*	*Evening 7 p.m.-10 p.m.*	*Night 10 p.m.-7 a.m.*	*Total*
F-35C Fleet – 7 F-35C Squadrons @10 aircraft each				
Departure	3,508	1,053	127	4,688
Arrival (Straight-in and Break)	3,117	871	700	4,688
Touch and Go	500	114	94	708
FCLP	6,702	2,840	2,634	12,176
GCA	572	156	106	834
SFO	1,406	368	296	2,070
F-35C Fleet Total	**15,805**	**5,402**	**3,957**	**25,200***
F-35C FRS – 1 F-35C FRS @30 aircraft				
Departure	8,121	1,473	222	9,816
Arrival (Straight-in and Break)	7,258	1,686	700	9,816
Touch and Go	15,250	3,126	2,176	20,552
FCLP	11,180	7,392	4,918	23,490
GCA	2,892	2,276	808	5,976
SFO	6,766	238	38	7,042
F-35C FRS Total	**51,467**	**16,191**	**9,034**	**76,700***
FA-18E/F Fleet – 10 FA-18E/F @12 aircraft each				
Departure	11,342	2,658	218	14,218
Arrival (Straight-in and Break)	10,323	2,159	1,736	14,219
Touch and Go	0	0	0	0
FCLP	12,804	6,607	4,415	23,826
GCA	731	83	105	920
FA-18E/F Fleet Total	**35,200**	**11,508**	**6,474**	**53,200***
FA-18E/F FRS – 1 FA-18E/F FRS @44 aircraft				
Departure	7,822	1,395	213	9,430
Arrival (Straight-in and Break)	7,073	1,508	849	9,430
Touch and Go	10,154	1,793	1,281	13,228
FCLP	13,468	10,423	4,907	28,798
GCA	667	316	281	1,264
FA-18E/F FRS Total	**39,184**	**15,435**	**7,531**	**62,200***
Transient operations				
Departure	1,877	189	33	2,097
Arrival (Straight-in and Break)	1,877	192	30	2,097
Touch and Go	3,535	553	123	4,211
FCLP	0	0	0	0
GCA	1,833	246	19	2,098
Transient Total	**9,122**	**1,180**	**205**	**10,500***
Total - All Aircraft	**150,778**	**49,716**	**27,201**	**227,800***

Source: Wyle 2013.
Note: *Total number of operations rounded to the nearest hundred.

Comparison of Single Event Noise by Aircraft Type

Table 5.2-8 presents the single event noise exposure data using SEL for overflight events for the legacy FA-18C/D and the FA-18E/F and best available data on the next generation F-35 aircraft. These are the next generation aircraft type replacement that would occur at NAS Lemoore under Alternative 2. The SEL for F-35C overflight events are approximately equal to or less than the SELs of FA-18C/D and FA-18E/F for each of the flight conditions shown with the exception that the F-35C is 1 dB greater than the FA-18C/D for departures through 10,000 ft MSL. The greatest reductions in SELs are during arrivals particularly in relation to FA-18E/F aircraft, but significant noise level reductions also occur during downwind legs of the closed patterns. L_{max} shows similar results except the F-35C is louder than the FA-18C/D for both departure flight conditions, 6 dB higher for departure through 1,000 ft, 5 dB higher for departure through 10,000 ft, and 1 dB higher than FA-18E/F during departure through 1,000 ft.

Table 5.2-8. Sound Exposure Levels and Maximum Sound Levels for Representative Flight Conditions of Primary Aircraft at NAS Lemoore under Alternative 2

Flight Condition	FA-18C/D			FA-18E/F			F-35C		
	SEL (dB)	L_{max} (dB)	Speed (kts)	SEL (dB)	L_{max} (dB)	Speed (kts)	SEL (dB)	L_{max} (dB)	Speed (kts)
Departure through 1,000 ft AGL (Afterburner for Takeoff Roll)(1,2)	117	108	300	117	113	300	117	114	300
Departure through 10,000 ft MSL (prior to Highway 41) near CNEL Contour Differences	91	77	310	92	83	350	92	83	350
Non-Break Arrival through 1,800 ft MSL (Near Initial Points)(3,4)	105	98	135	110	103	135	99	92	145
Touch and Go on Downwind (1,000 ft AFE)(3)	109	103	150	114	108	135	105	99	145
FCLP on Downwind (600 ft AFE) (3)	113	108	135	118	113	135	108	104	145
GCA Downwind Leg (1,800 ft MSL)(2,4)	90	85	250	101	93	250	89	83	250

Source: Wyle 2013.
Notes: kts = knots. Weather: 63 degrees Fahrenheit, 50% relative humidity. SEL = Sound Exposure Level; L_{max} = Maximum (instantaneous) Sound Level; both are A-weighted decibels (dB). SEL and L_{max} data derived from NoiseMap.
1. Each aircraft not at same geographic point over the ground.
2. Aircraft with gear and flaps up.
3. Aircraft with gear and flaps down.
4. 1,570 ft above field elevation (AFE) (1,800 ft MSL).

Noise Exposure

Under Alternative 2, seven F-35C fleet squadrons and one F-35C FRS would be homebased at NAS Lemoore replacing two FA-18C and five FA-18E squadrons. Under this alternative, the area underlying Noise Zones 2 and 3 would decrease by 140 acres and 224 fewer people would be exposed to Zone 2 and 3 noise levels as shown on **Table 5.2-9**. **Figure 5.2-2** depicts the baseline and proposed noise contours under Alternative 2.

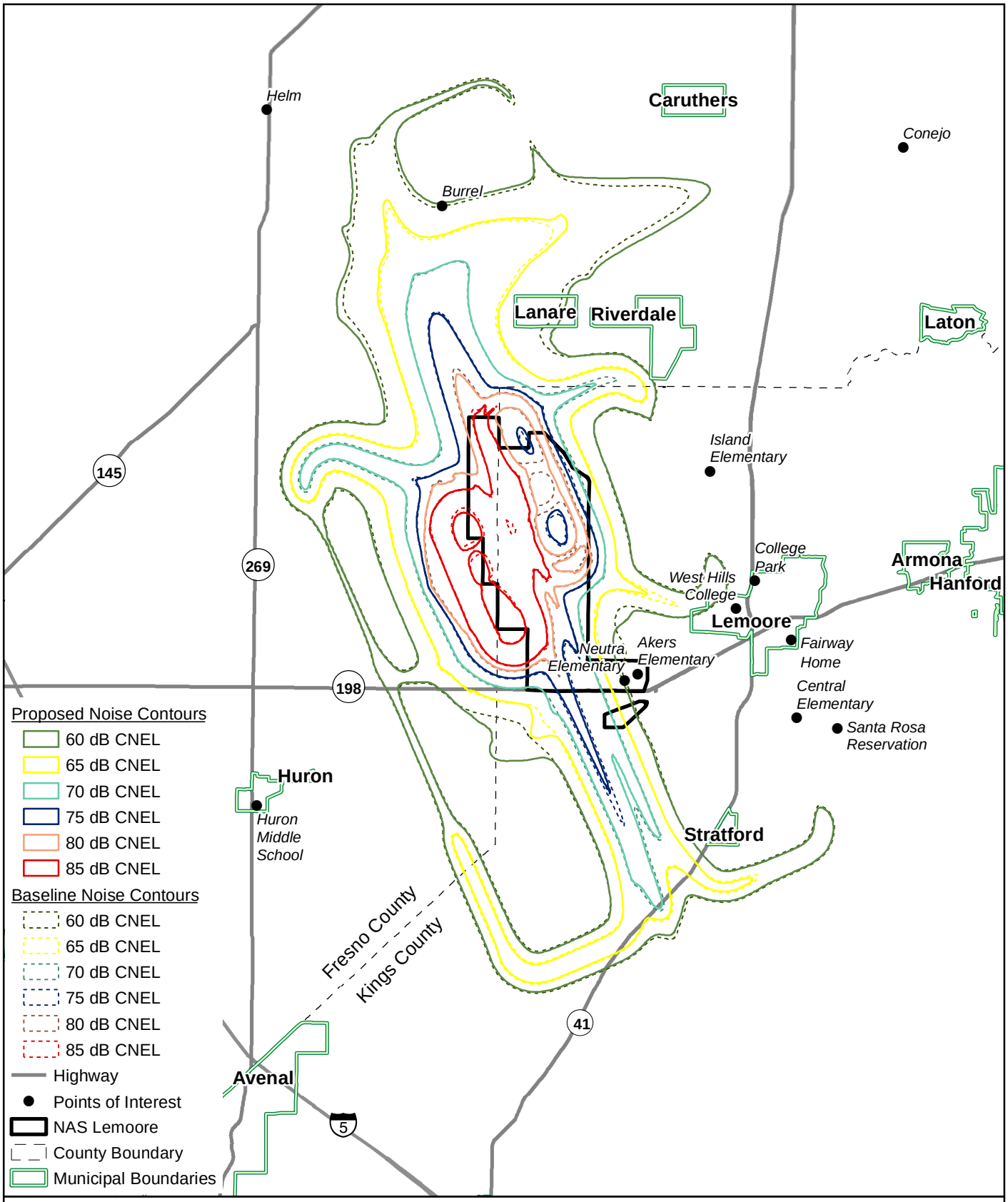


Figure 5.2-2
Baseline and Proposed Noise Contours and Points of Interest at NAS Lemoore under Alternative 2

Source: Wyle 2013

Table 5.2-9. Baseline and Proposed Noise Exposure within Noise Zones at NAS Lemoore under Alternative 2

Noise Zone (dB CNEL)	Acreage			Population		
	Baseline (2015)	Proposed (2028)	Change	Baseline (2015)	Proposed (2028)	Change
Noise Zone 2						
65 - 69	28,783	29,898	+1,115	844	810	-34
70 - 74	17,693	17,431	-262	641	528	-113
Noise Zone 3						
75 - 79	10,101	10,021	-80	77	0	-77
80 - 84	9,547	8,538	-1,009	3	3	0
85+	9,323	9,418	+96	0	0	0
Total	**75,446**	**75,306**	**-140**	**1,565**	**1,341**	**-224**

A reduction in acreage and population exposed under the noise zones is counterintuitive when the number of aircraft operations increases from 159,400 to 227,800, but there are several reasons why this would occur:

- The shape of the noise contours change because the F-35C would climb a little steeper upon takeoff and reduce throttle while gaining altitude before accelerating above 10,000 ft AGL.
- The FA-18E aircraft that were temporarily transitioned at NAS Lemoore would be replaced by the F-35C which is quieter than the FA-18E in general and especially on downwind legs for touch-and-goes, FCLP, and GCA operations as shown on **Table 5.2-8**.

These differences cause shifts in the noise contours with the overall effect between baseline and proposed as nearly neutral.

Many schools and communities are near the noise zones at NAS Lemoore and are represented in **Table 5.2-10** along with the CNEL associated with the point of interest. In general, all of the noise levels are well below 65 dB, with Burrel and Lanare being the highest at 61 dB CNEL. Seven of the locations would experience an increase of 1 dB, while six locations would experience no change, one would have 1-dB decrease, and one would have a 2-dB decrease.

Table 5.2-10. CNEL Levels at Various Points of Interest – Baseline and Proposed Under Alternative 2

Point of Interest			CNEL (dBA)		
ID	Description	Type	Baseline (2015)	Proposed (2028)	Change
1	Community of Burrel	School and Non-School	60	61	+1
2	Community of Caruthers	School and Non-School	52	53	+1
3	Central Union School	School	53	53	0
4	College Park Apartments	Non-School	50	49	-1
5	Community of Conejo	School and Non-School	57	57	0
6	Fairway Homes at Lemoore Golf Course	Non-School	48	48	0
7	Community of Helm	School and Non-School	50	51	+1
8	Huron Middle School	School	43	44	+1
9	Island Elementary School	School	51	52	+1
10	Community of Lanare	Non-School	60	61	+1
11	Neutra and Akers Elementary School	School	60	60	0

Table 5.2-10. CNEL Levels at Various Points of Interest – Baseline and Proposed Under Alternative 2

Point of Interest			CNEL (dBA)		
ID	***Description***	***Type***	***Baseline (2015)***	***Proposed (2028)***	***Change***
12	Community of Riverdale	School and Non-School	50	51	+1
13	Santa Rosa Rancheria homes near Tachi Casino	Non-School	49	47	-2
14	Community of Stratford	School and Non-School	50	50	0
15	West Hills College	School	58	58	0

Notes: The type point of interest refers to the type of receptor used for the analyses. School is used for classroom criteria, non-school are points of interest that are surrounded by residential areas and are used for speech interference and sleep disturbance, and worship are churches, synagogues, temples, etc. and are also receptors used for speech interference analyses.

Existing noise abatement procedures and noise complaint procedures at NAS Lemoore would continue to be followed for proposed aircraft operations under Alternative 2.

Potential Hearing Loss

Similar to baseline conditions, no people would be exposed to an $L_{eq}(24)$ of 80 dB or higher under this alternative. Therefore, there is no population at risk for potential hearing loss under Alternative 2.

Speech Interference and Classroom Criteria

In terms of speech interference, **Table 5.2-11** shows the average daily/evening indoor (7:00 a.m. to 10:00 p.m.) events per hour for receptors that generally would experience L_{max} of at least 50 dB with windows closed and open. Under Alternative 2, the number of speech interfering events across all receptors would range from 0 to 6 and 1 to 7 events per hour for windows closed and open, respectively, with an average increase of 1.7 and 1.4 events per hour relative to baseline windows closed and open respectively. As a result, impacts with regard to speech interference would increase at half of the representative locations and stay the same or decrease at the other half of the representative locations. Neither increase nor decrease of the number of events would be considered significant.

Table 5.2-11. Proposed Indoor Speech Interference at Representative Locations at NAS Lemoore under Alternative 2 (2028)

Receptor	Average Daily/Evening Indoor Events per Hour (7 a.m. to 10 p.m.) Baseline/Proposed			
	Windows Closed	***Windows Open***	***Change from Baseline***	
			Windows Closed	***Windows Open***
Community of Burrell	3/6	6/7	+3	+1
Community of Caruthers	0/1	4/5	+1	+1
College Park Apartments	0/0	0/1	0	+1
Community of Conejo	2/4	4/4	+2	0
Fairway Homes at Lemoore Golf Course	0/0	1/1	0	0
Community of Helm	0/1	1/1	+1	0
Community of Lanare	3/5	7/8	+2	+1
Community of Riverdale	0/0	3/5	0	+2
Santa Rosa Rancheria homes near Tachi Casino	0/0	2/1	0	-1
Community of Stratford	0/0	1/1	0	0

While **Table 5.2-11** represents speech interference for normal conversation at the representative receptor locations, for schools two additional classroom criteria have to be applied reflecting the potential for disrupting classroom learning. **Table 5.2-12** presents the classroom criteria levels of an interior L_{max} above 50 dB that would trigger a disturbance event for the school receptors under Alternative 2. Under this alternative, noise levels and number of events per hour would decrease but the same five locations that exceeded classroom criteria would continue to exceed the classroom criteria with windows open. With windows closed, none of the schools exceed noise levels exceeding classroom criteria.

The supplemental metric analysis results for classroom speech show that most locations would experience a reduction in disturbing events per hour for this alternative relative to baseline. The baseline disturbance events include both FA-18 takeoff events and pattern events such as the downwind portion of GCA patterns. Under this alternative, the F-35C is sufficiently quieter than FA-18C/D and FA-18E/F along downwind portions of pattern events, such as GCA patterns.

Table 5.2-12. Baseline and Proposed Classroom Criteria for Schools near or on NAS Lemoore under Alternative 2

Receptor	*Outdoor Equivalent Noise Level [$L_{eq(9hr)}$] Baseline/Proposed*	*Indoor Noise Levels and Number of Events above a Maximum Indoor Noise Level of 50 dB L_{max} Baseline/Proposed*			
		Windows Closed		*Windows Open*	
		dB[$L_{eq(9hr)}$]	*Events per hour*	*dB[$L_{eq(9hr)}$]*	*Events per hour*
Burrell Elementary School*	62/61	37/36	7/7	47*/46*	10/8
Caruthers High School*	55/54	30/30	1/1	40*/40*	7/6
Central Union School	54/51	29/27	0/0	39/37	1/1
Conejo School*	60/58	35/34	6/5	45*/44*	7/5
Helm Elementary School	50/48	25/24	1/1	35/34	1/1
Huron Middle School	38/39	13/15	0/0	23/25	0/0
Island Elementary School	53/51	28/26	1/0	38/36	1/1
Neutra and Akers Elementary School*	61/59	36/34	3/1	46*/44*	7/5
Riverdale High School	52/51	27/27	0/0	37/37	6/6
Stratford Elementary School	50/48	25/23	0/0	35/33	2/1
West Hills College*	57/55	32/30	0/0	42*/40*	1/1

Note: * Exceeds classroom criteria.

Sleep Disturbance

Sleep disturbance from aircraft overflights is assessed by determining the probabilities of awakenings. **Table 5.2-13** lists the probabilities of awakening events between the hours of 10:00 p.m. to 7:00 a.m. for the same representative residential locations listed in **Table 5.2-12**. Indoor awakening is used to distinguish average night sleeping from awakenings during the day or outdoor activities (i.e., naps in a hammock or tent camping).

Table 5.2-13. Proposed Indoor Sleep Disturbance at Representative Locations Near NAS Lemoore

Receptor	Baseline (2015)		Proposed Average Nightly (10 p.m. - 7 a.m.) Probability of Awakening (2028)			
			Windows Closed		Windows Open	
	Windows Closed	Windows Open	Probability of Awakening	Change from Baseline	Probability of Awakening	Change from Baseline
Community of Burrell	3%	6%	4%	+1%	7%	+1%
Community of Caruthers	0	1%	0	0	0	-1%
College Park Apartments	0	2%	0	+1%	3%	+1%
Community of Conejo	1%	2%	0	-1%	0	-2%
Fairway Homes at Lemoore Golf Course	1%	2%	0	-1%	2%	0
Community of Helm	1%	3%	2%	+1%	4%	+1%
Community of Lanare	5%	9%	6%	+1%	13%	+4%
Community of Riverdale	0	2%	1%	+1%	5%	+3%
Santa Rosa Rancheria homes near Tachi Casino	4%	7%	1%	-3%	2%	-5%
Community of Stratford	2%	8%	2%	0	6%	-2%

Occupational Noise

DoN occupational noise exposure prevention procedures, such as hearing protection and monitoring, would continue to be required at NAS Lemoore in compliance with all applicable Occupational Safety and Health Administration and Navy occupational noise exposure regulations. As a result, these measures are designed to minimize occupational hearing hazards and no increased risk of hearing impacts to occupational noise would be expected to occur compared to baseline conditions.

Construction Noise

Construction noise would be generated by multiple construction, modification, expansion , and demolition projects under Alternative 2. These construction projects would occur on the flight line between active runways so that aircraft related noise would likely dominate construction noise. No residential areas or other sensitive receptors are located in the vicinity, and construction noise would be intermittent as construction would be phased over multiple years. As a result, construction noise would be less than significant.

Special Use Airspace and Military Training Routes

Aircraft operations in SUA in the vicinity of NAS Lemoore would increase from approximately 10,477 to 13,925, refer to **Tables 2.8-5** and **2.8-6**, under Alternative 2. However, the increase in operations (and associated noise) would be minimal in the NAS Lemoore airspace because a detectable noise difference occurs when there is a 3 dB change in noise levels. In order to create a 3 dB difference, a doubling of aircraft operations would be required. There would be no doubling of aircraft operations in any of the SUA under Alternative 2. There would be an increase of 54 F-35C operations in the 13 MTRs (see **Figure 2-17**). Viewing all 19 MTRs cumulatively, the increase in F-35C operations would be about one additional flight per week. FA-18 operations in MTRs are not conducted during nighttime hours (10:00 p.m. – 7:00 a.m.). The F-35C operations would also be expected to only use MTRs during the day. As previously shown on **Table 4.2-16**, noise levels due to F-35C operations within MTRs would be less than current noise levels from legacy aircraft.

Conclusion

Overall, Alternative 2 would not have significant noise impacts from proposed F-35C operations at the NAS Lemoore airfield because the acreage and population exposed to noise levels would be slightly reduced. Supplemental noise analyses indicate minor fluctuations for speech interference, classroom noise, and sleep disturbance. Noise effects in the SUA and MTRs would not be significant since the number of operations increase by about 3 percent and the noise levels at potential receptors are not expected to appreciably increase.

5.2.2.2 Alternative 2 – NAS Lemoore Homebasing, Effects at NAF El Centro

This section addresses the effects at NAF El Centro resulting from basing the F-35C at NAS Lemoore. Under this alternative, the F-35C would be based at NAS Lemoore replacing the two FA-18C squadrons and the five temporary FA-18E/F squadrons operating at NAS Lemoore under baseline conditions. Permanently stationed FA-18E/F operations at NAS Lemoore would not change. Currently, NAS Lemoore squadrons routinely train at NAF El Centro. Upon completion of this alternative, the proposed F-35C FRS would also train at NAF El Centro. The local noise effects around NAF El Centro are presented due to this increase of operations. Moreover, by 2028, the Marine Corps would replace their aging AV-8 and FA-18C fleet with F-35B/C aircraft and also operate at NAF El Centro. In addition, by 2028, the EA-18G, Growler, will have replaced the EA-6B and the MV-22 will have replaced the CH-46. Sound Exposure Levels, occupational, construction, and airspace noise levels are expected to be the same or slightly less under this scenario and are not addressed further in detail.

Aircraft Operations

Upon full implementation of this alternative in 2028, NAF El Centro operations would increase by 800 operations to 66,600 annual operations with 78 percent of them occurring during daytime, 15 percent during evening, and 7 percent during night (**Table 5.2-14**).

Table 5.2-14. Proposed NAF El Centro Airfield Operations under Alternative 2 (2028)

Operation Type	*Day 7 a.m.-7 p.m.*	*Evening 7 p.m.-10 p.m.*	*Night 10 p.m.-7 a.m.*	*Total*
Detachment/Transient operations				
Departure	15,735	4,228	1,920	21,883
Arrival (Straight-in and Break)	15,557	4,054	2,272	21,883
Touch and Go	3,978	68	44	4,090
FCLP	16,566	1,626	540	18,732
GCA	0	0	0	0
Total - All Aircraft	**51,836**	**9,976**	**4,776**	**66,600***

Note: *Total number of operations rounded to the nearest hundred.

Noise Exposure

Under Alternative 2, F-35C would be homebased at NAS Lemoore and there would be 800 additional operations at NAF El Centro by 2028. As stated earlier, the mix of aircraft would also change. Under Alternative 2, an additional 5,004 acres would be included under the noise zones, but 57 fewer people

would be impacted as shown in **Table 5.2-15**. **Figure 5.2-3** depicts the noise contours at NAF El Centro under Alternative 2.

Table 5.2-15. Baseline and Proposed Noise Exposure within Noise Zones at NAF El Centro under Alternative 2

Noise Zone (dB CNEL)	Acreage			Population		
	Baseline (2015)	Proposed (2028)	Change	Baseline (2015)	Proposed (2028)	Change
Noise Zone 2						
65 - 69	6,289	8,487	2,198	779	720	-59
70 - 74	4,201	4,650	449	55	39	-16
Noise Zone 3						
75 - 79	2,816	4,324	1,508	18	36	18
80 - 84	1,147	1,539	392	0	0	0
85+	785	1,242	457	0	0	0
Total	**15,238**	**20,242**	**5,004**	**852**	**795**	**-57**

Many schools and communities are near the noise zones at NAF El Centro and are represented in **Table 5.2-16** along with the CNEL levels associated with the point of interest. In general, all of the noise levels are below 65 dB CNEL except Seeley Elementary School which would be 66 dB CNEL. Three locations experience an increase of as much as 2 dB, Seeley Community Church, Seeley Elementary School, and Holy Spirit Mission all three are in the community of Seeley.

Table 5.2-16. CNEL Levels at Various Points of Interest – Baseline and Proposed under Alternative 2

Point of Interest			CNEL (dBA)		
ID	Description	Type	Baseline (20115)	Proposed (2028)	Change
1	Seeley Community Church	Worship and Non-School	62	64	+2
2	TL Waggoner Elementary School	School and Non-School	60	58	-2
3	Little Pioneers Child Development Center	School	53	54	+1
4	Seeley Elementary School	School	63	66	+3
5	Valley Church Heritage School/ Faith Baptist Church	Worship and School	60	57	-3
6	University of Phoenix – El Centro	School	64	60	-4
7	Calvary Chapel	Worship and Non-School	49	49	0
8	Holy Spirit Mission	Worship	62	64	+2
9	Valley Christian Church	School	58	56	-2

Notes: The type point of interest refers to the type of receptor used for the analyses. School is used for classroom criteria, non-school are points of interest that are surrounded by residential areas and are used for speech interference and sleep disturbance, and worship are churches, synagogues, temples, etc. and are also receptors used for speech interference analyses.

Existing noise abatement procedures and noise complaint procedures at NAF El Centro would continue to be followed for proposed aircraft operations under Alternative 2.

Potential Hearing Loss

The population exposed to noise levels greater than 80 dB CNEL or $L_{eq}(24)$ noise levels would remain at zero people at NAF El Centro under Alternative 2.

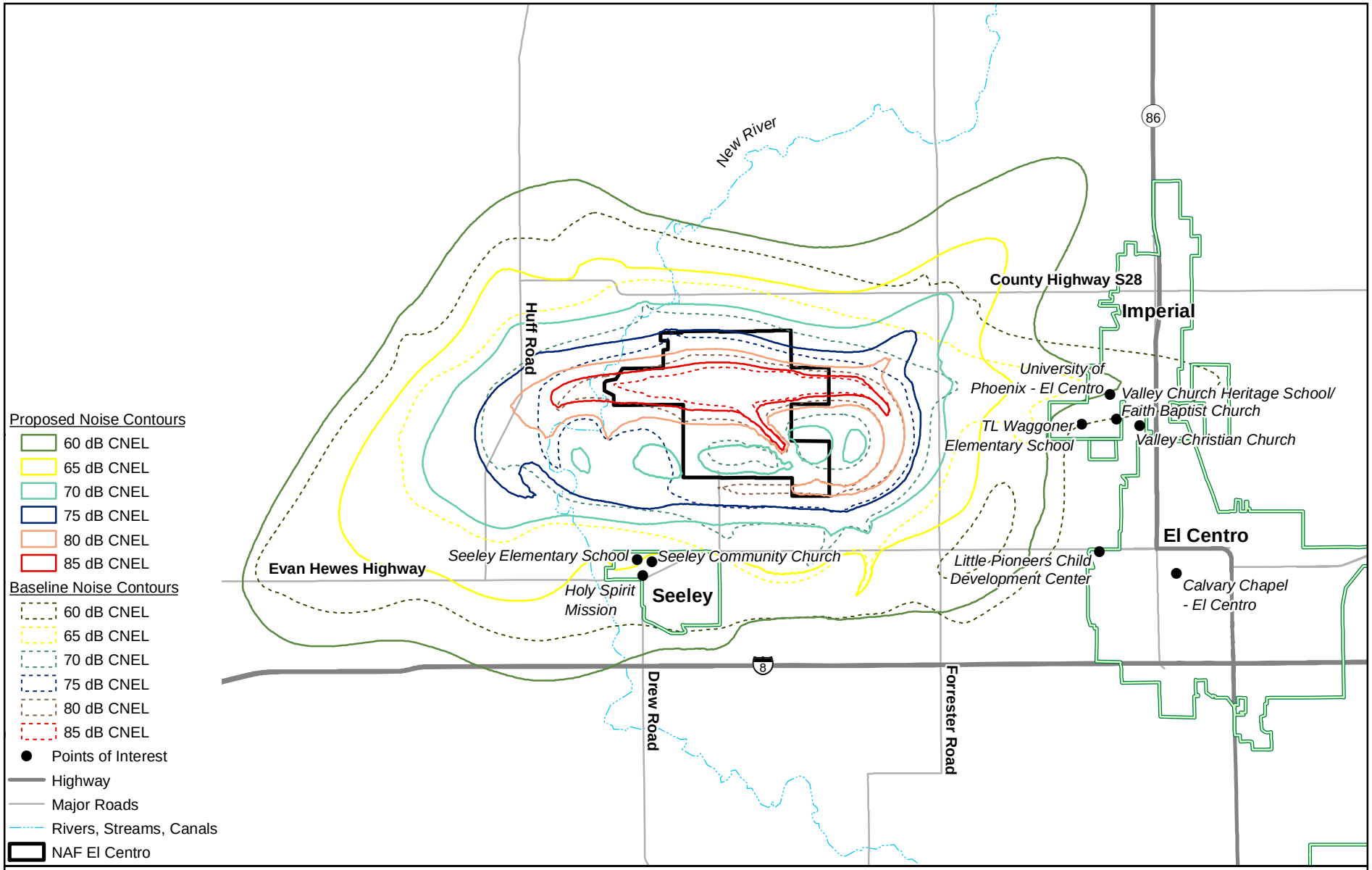


Figure 5.2-3
Baseline and Proposed Noise Contours and Points of Interest at NAF El Centro under Alternative 2

Source: Wyle 2013

N

0 4,000 8,000
Feet

Speech Interference and Classroom Criteria

In terms of speech interference, **Table 5.2-17** shows the average daily/evening indoor (7:00 a.m. to 10:00 p.m.) events per hour for receptors that generally would experience indoor L_{max} of at least 50 dB with windows closed and open. Under Alternative 2, the number of speech interfering events across all receptors would range from 0 to 6 and 1 to 8 events per hour for windows closed and open, respectively, with an average increase of 2.6 and 4.2 events per hour relative to baseline windows closed and open respectively. As a result, impacts to receptors in the vicinity of Seeley with regard to speech interference would increase.

Table 5.2-17. Proposed Indoor Speech Interference at Representative Locations at NAF El Centro under Alternative 2 (2028)

Receptor	*Average Daily/Evening Indoor Events per Hour (7 a.m. to 10 p.m.)*			
			Change from Baseline	
	Windows Closed	*Windows Open*	*Windows Closed*	*Windows Open*
Seeley Community Church	6	8	+3	+2
TL Waggoner Elementary School	1	4	0	0
Little Pioneers Child Development Center	1	2	+1	0
Seeley Elementary School	5	7	+3	+1
Valley Church Heritage School/ Faith Baptist Church	1	3	0	-1
University of Phoenix – El Centro	3	3	+2	-1
Calvary Chapel	0	1	0	0
Holy Spirit Mission	5	7	+4	+2
Valley Christian Church	1	3	0	0

Table 5.2-18 presents the classroom criteria levels for the school receptors under Alternative 2. Under this alternative, noise levels would decrease at each representative location but the number of events per hour would range from a decrease of 1 event per hour at TL Waggoner with windows open and University of Phoenix with windows closed to an increase of three events per hour at Seeley Elementary School. Overall, all of the schools would meet criteria for classrooms with windows open except for Seeley Elementary School; however, Seeley Elementary would be at a level 1 db L_{eq}(9hr) lower with windows open than it is under baseline conditions.

Table 5.2-18. Proposed Classroom Criteria for Schools near or on NAF El Centro under Alternative 2 (2028)

Receptor	*Outdoor Equivalent Noise Level [$L_{eq(9hr)}$] Baseline/Proposed*	*Indoor Noise Levels and Number of Events above a Maximum Indoor Noise Level of 50 dB L_{max} (Baseline/Proposed)*			
		Windows Closed		*Windows Open*	
		dB[$L_{eq(9hr)}$]	*Events per Hour*	*dB[$L_{eq(9hr)}$]*	*Events per Hour*
TL Waggoner Elementary	60/53	35/28	1/1	45*/38	5/4
Little Pioneers Child	53/50	28/25	0/1	38/35	2/2
Seeley Elementary School	63/62	38/37	3/6	48*/47*	7/8
Valley Church Heritage School/ Faith Baptist Church	60/52	35/27	1/1	45*/37	4/4
University of Phoenix – El	64/54	39/29	4/3	49*/39	4/4

Note: * Exceeds classroom criteria.

Sleep Disturbance

Sleep disturbance can also be a result of aircraft overflight. By determining the probabilities of awakenings this impact can be assessed. **Table 5.2-19** lists the probabilities of awakening events between the hours of 10:00 p.m. to 7:00 a.m. The probability of awakening for the representative residential locations ranges from a low of 7 percent to a high of 24 percent for windows closed and open respectively. Indoor awakening is used to distinguish average night sleeping from awakenings during the day or outdoor activities (i.e., naps in a hammock or tent camping).

Table 5.2-19. Proposed Indoor Sleep Disturbance at Representative Locations near NAF El Centro under Alternative 2

Receptor	*Baseline (2015)*		*Proposed Average Nightly (10 p.m. - 7 a.m.) Probability of Awakening (2028)*			
			Windows Closed		*Windows Open*	
	Windows Closed	*Windows Open*	*Probability of Awakening*	*Change from Baseline*	*Probability of Awakening*	*Change from Baseline*
Seeley Community Church	10%	20%	15%	+5%	24%	+4%
TL Waggoner Elementary School	6%	14%	8%	+2%	15%	+1%
Calvary Chapel	5%	10%	7%	+2%	14%	+4%

Note: Although the receptors listed are churches and schools, they are surrounded by residential areas and were used for the reference points.

Conclusion

Overall, Alternative 2 would not have significant noise impacts at NAF El Centro from detachment operations conducted by F-35C aircraft homebased at NAS Lemoore. Although an additional 18 people and 1,508 acres would be affected by noise levels greater than 75 dB CNEL within the community of Seeley, the overall increase would be a maximum of 3 dBA CNEL at Seeley Elementary School.

5.2.3 Environmental Consequences for the No Action Alternative

Under the No Action alternative, F-35C aircraft would not be based at NAS Lemoore and associated construction and operations would not occur. Baseline noise conditions described in the Affected Environment, Section 5.2.1 would not change under the No Action Alternative. Therefore, there would be no changes at NAS Lemoore due to noise impacts as a result of the No Action Alternative.

5.3 AIR QUALITY

To determine potential impacts to regional air quality under Alternative 2, NAS Lemoore baseline conditions were compared to those projected for the proposed increase in F-35C aircraft and associated engine maintenance runup operations, as well as construction and commuter vehicle emissions associated with military personnel assigned to NAS Lemoore with the aircraft. Air quality impacts were reviewed for significance in light of federal, state, and local air pollution standards and regulations. For analysis of the proposed action, if emissions were projected to exceed a threshold requiring a conformity determination in the San Joaquin Valley APCD (i.e., 10 tons per year of VOCs or NOx; 100 tons per year of $PM_{2.5}$ or PM_{10}), then further analysis was conducted to assess impact significance. If emissions conform to the approved State Implementation Plan (SIP), then impacts would be less than significant. For criteria pollutants that the San Joaquin Valley Air Pollution Control District (APCD) is in attainment of the National Ambient Air Quality Standards (NAAQS), the analysis evaluated the

magnitude and location of project emissions to determine if they would be expected to cause a significant adverse impact to air quality.

All of the criteria pollutants and their precursors, except lead, that are generated by the proposed action are considered in this analysis. Precursors for ozone (O_3) are nitrogen oxides (NOx) and volatile organic compounds (VOCs). Precursors for particulate matter 2.5 microns in aerodynamic diameter or less ($PM_{2.5}$) are sulfur dioxide (SO_2), NOx, VOCs, and ammonia. Airborne emissions of lead are not included because there are no known significant lead emission sources in the region or associated with the proposed action. The precursor ammonia is not included because it is not a significant contributor to $PM_{2.5}$ as related to the proposed action.

In accordance with General Conformity requirements for maintenance and nonattainment areas, emissions associated with the proposed action were calculated and evaluated against the *de minimis* thresholds for each applicable pollutant: VOCs, NOx, SO_2, $PM_{2.5}$, and particulate matter with an aerodynamic diameter less than 10 microns (PM_{10}). If emissions were projected to exceed a *de minimis* threshold, then further analysis in the form of a conformity determination was conducted to assess impact significance.

5.3.1 Affected Environment

The affected environment for the air quality analysis is the San Joaquin Valley Intrastate Air Quality Control Region, which is also identified as the San Joaquin Valley Air Pollution Control District (San Joaquin Valley APCD). This area includes all of Fresno County, Kings County, Madera County, Merced County, San Joaquin County, Stanislaus County, Tulare County, and the San Joaquin Valley Air Basin portion of Kern County, which is that portion of the county that straddles the Sierra Nevada and Tehachapi mountains (40 C.F.R. 81.165).

The San Joaquin Valley APCD is currently designated as nonattainment for the following NAAQS: 8-hour O_3 (extreme), 24-hour $PM_{2.5}$, and annual $PM_{2.5}$ (40 C.F.R. 81.305). On December 14, 2012, the US Environmental Protection Agency (USEPA) reduced the national annual $PM_{2.5}$ primary standard from 15 $\mu g/m^3$ to 12 $\mu g/m^3$. USEPA anticipates making initial attainment/nonattainment designations by December 2014, with those designations likely becoming effective in early 2015 (USEPA 2013).

The San Joaquin Valley APCD has achieved attainment for PM_{10}, and is therefore a PM_{10} Maintenance Area. The entire San Joaquin Valley APCD is designated as unclassifiable, attainment, or better than national standards for the federal SO_2, and CO standards. There are two small regions within the San Joaquin Valley APCD that are classified as maintenance areas for CO. These regions are specifically termed the “Fresno Urbanized Area” and the “Stockton Urbanized Area” in the California SIP for CO (California Air Resource Board [CARB] 2004). These maintenance areas are located 40 miles and 132 miles, respectively, from NAS Lemoore, which is located in portions of Kings County and Fresno County. Therefore, NAS Lemoore is not located in a CO maintenance area but is within 40 miles of the closest one within the San Joaquin Valley. The applicable GCR *de minimis* levels for the San Joaquin Valley APCD are listed in **Table 5.3-1**.

Table 5.3-1. Applicable General Conformity Rule de minimis Levels (tons/year)

VOCs(1)	NOx(1)	CO	SO_2	PM_{10}(2)	$PM_{2.5}$(3)
10	10	NA(4)	100(5)	100	100

Source: 40 C.F.R. 93.153.

Notes: 1. San Joaquin Valley APCD is an extreme nonattainment area for the 8-hour federal O_3 standard; VOCs and NOx are precursors to the formation of O_3.
2. San Joaquin Valley APCD is considered a maintenance area for the federal PM_{10} standard.
3. San Joaquin Valley APCD is in nonattainment of the federal $PM_{2.5}$ standards.
4. NA = not applicable because all but the Urbanized Fresno Area and Urbanized Stockton Area have never been classified nonattainment of the federal CO standard.
5. SO_2 is a precursor to the formation of $PM_{2.5}$.

Mobile source emissions are the primary air quality issue associated with the Alternative 2. Construction activities would be phased over multiple years and are scheduled to begin in 2015, with the last project starting in 2025. Airfield operations and commuting personnel for 2015 represent the baseline, with a total of 234 fixed wing aircraft. The baseline operations at NAS Lemoore include operations associated with permanently-assigned aircraft and transient aircraft. The baseline permanently-assigned aircraft include 20 FA-18C/Ds and 214 FA-18E/Fs. In addition to baseline flight operations, the baseline for air emissions captures ground support equipment (GSE) operations, government-owned vehicles (GOVs) assigned to the squadrons, and commuter vehicle emissions associated with military personnel assigned to NAS Lemoore with the aircraft. Air emissions for the period 2015 – 2028 include construction emissions (construction years [CYs] for the projects), commuter vehicle emissions (all years) and airfield operations (all years). These emissions are evaluated against the General Conformity Rule *de minimis* thresholds. **Table 5.3-2** presents baseline operation emissions for both aircraft operations and commuting highway vehicles.

Table 5.3-2. Baseline Mobile Source Emissions at NAS Lemoore

Operations	Pollutant (tons/year)					
	VOCs	CO	NOx	SO_2	PM_{10}	$PM_{2.5}$
FA-18C/D	61.45	177.64	40.98	9.25	25.18	24.43
Engine Maintenance Runups	11.59	28.59	1.13	0.75	3.97	3.85
FA-18E/F	745.98	4,825.63	959.28	124.10	332.26	322.30
Engine Maintenance Runups	141.79	292.67	106.07	14.05	52.48	50.90
H-60	0.42	3.77	1.03	0.41	0.71	0.69
Engine Maintenance Runups	0.06	0.40	0.16	0.01	0.09	0.09
Transients	16.87	82.99	36.65	4.85	11.44	11.09
Subtotal Aircraft	**978.16**	**5,411.68**	**1,145.31**	**153.43**	**426.14**	**413.36**
GSE	0.02	0.42	0.69	0.00	0.02	0.02
Fleet Vehicles	0.01	0.09	0.07	0.00	0.00	0.00
Total Airfield Operations	**978.19**	**5,412.18**	**1,146.07**	**153.43**	**426.17**	**413.38**
Commuter Vehicles	7.26	67.16	6.58	0.12	1.01	0.66
Grand Total	**985.45**	**5,479.34**	**1,152.66**	**153.54**	**427.18**	**414.04**

5.3.2 Environmental Consequences for Alternative 2

Under Alternative 2, potential impacts to air quality could occur from proposed F-35C aircraft operations, the construction and operation new facilities, and personnel changes. Potential impacts

from homebasing at NAS Lemoore are discussed in the next two sections in terms of effects at NAS Lemoore and effects at NAF El Centro.

5.3.2.1 Alternative 2 – NAS Lemoore Homebasing, Effects at NAS Lemoore

Construction of required infrastructure at NAS Lemoore would begin in 2015 and the last project would start around 2025. The basing of F-35C aircraft would begin in 2016. By 2027/2028, all aircraft relocations and transitions associated with the Alternative 2 would be complete, along with associated personnel changes required to support aircraft operations. There are likely to be small stationary sources associated with the Alternative 2, which would include hot water heaters, emergency generators, and possibly a boiler for the Bachelor Enlisted Quarters. At this time, there is no specific information available regarding the number or size of these sources that would be required. Any boilers, generators, or other equipment subject to permitting or registration would have applications submitted to the San Joaquin Valley APCD prior to construction and any sources would be evaluated for the possible applicability of San Joaquin Valley APCD Rules 9510 (Indirect Source Review), 2010 (Permits Required) and 2201 (New and Modified Stationary Source Review Rule).

<u>Construction and Commuting Staff</u>

Construction of infrastructure and basing support facilities, as described in Section 2.8.2, *Alternative 2 – Facility and Infrastructure,* would require use of diesel heavy construction equipment on the installation. Approximately 1.6 million square feet (ft^2) of facility development would be required, while Bldg. 21 would be demolished to accommodate new facilities. By 2026, all construction activities would be completed.

Emission factors for construction equipment calculations throughout the period 2015 – 2025 are from the California Emissions Estimator Model (CalEEMod) (SCAQMD2011), developed in cooperation with air districts throughout the state.

In accordance with San Joaquin Valley APCD Rule 4102, *Nuisance,* and Rule 4601, *Architectural Coatings,* the emission of any air pollutants as a result of ground disturbance, use of equipment, coatings application or other construction activities would be controlled by incorporating BMPs, to include minimal idling of engines, watering of soils to be disturbed, use of low volatility coatings and other recognized controls.

Paving and other applications requiring the use of asphalt products are not anticipated for the construction activities; however, if small surface areas require asphalt coatings, these would be selected and applied in accordance with Rule 4641, *Cutback, Slow Cure, and Emulsified Asphalt, Paving and Maintenance Operations*. Additionally, building construction and renovation activities that are planned would be reviewed to ensure compliance with Rule 4002, which incorporates by reference the National Emission Standards for Hazardous Air Pollutants (HAPs).

Air emissions from the construction activities would primarily result due to the operation of construction equipment. It is expected that if construction workers were not occupied at NAS Lemoore, they would be involved in similar work elsewhere in the region. Therefore the only construction worker commute emissions evaluated in this EIS are for mileage on base. Emissions from construction workers driving onsite during the construction period have been estimated based on 405 workers working onsite

in 2015, 155 workers onsite in 2018, 276 in 2019, 400 in 2022, and 177 workers onsite in 2025. Additional emission sources include construction equipment, although the work involving their use would be intermittent and short term for various periods during the calendar year.

Airfield Operations

Airfield operations are associated with the retirement of legacy FA-18C/D aircraft, and the transition of FA-18E/F and F-35C aircraft, as well as emissions from transient aircraft, which are assumed to remain unchanged throughout the 2015 – 2028 period. Airfield operational emissions include:

- Aircraft operations within the airfield and surrounding airspace environs under the 3,000 ft AGL mixing height.
- GSE operations.
- Fleet vehicles used for squadron operations and for commuting on the installation from base housing.

Data used to calculate emissions from aircraft operations were obtained from NAS Lemoore personnel, the Navy Aircraft Environmental Support Office (AESO), and subcontractors (Qinetiq 2011; Wyle 2012). Information on GSE was obtained from NAS Lemoore personnel (NAS Lemoore 2011) and emission factors for GSE were derived from Appendix D: OSM and Summary of Off-road Emissions Inventory Update (CARB 2010). Fleet vehicle emissions were calculated using the South Coast Air Quality Management District's (SCAQMD) California Environmental Quality Act spreadsheets (SCAQMD 2009), which were developed from the CARB's EMFAC 2007 model. Airfield operations for the No Action Alternative in 2015 represent the baseline, with a total of 234 aircraft. Aircraft transition begins in 2016, with drawdown of aircraft from the FA-18C/D Fleet. Operational, construction and commuter vehicle emissions associated with Alternative 2 are presented for each year or range of years when changes occur. In-depth emission calculations are provided in Appendix D.

Table 5.3-3 presents the estimated emissions associated with implementation of Alternative 2, beginning with the baseline of 2015. The total of these emissions is compared to the baseline year emissions to determine the net change. This net change is then compared to the General Conformity Rule *de minimis* thresholds to assess conformity for VOCs, NOx, PM_{10}, and $PM_{2.5}$. Table 5.3-3 also includes the demolition of Bldg. 21 and concrete/asphalt areas currently located where proposed construction would occur.

Table 5.3-3. Estimated Annual Emissions at NAS Lemoore Under Alternative 2

Year	*Air Pollutant Emissions (tons/year)*					
	VOCs	*CO*	*NOx*	*SO_2*	*PM_{10}*	*$PM_{2.5}$*
Baseline	985.45	5,479.34	1,152.66	153.54	427.18	414.04
2015	987. 70	5,481.59	1,155.94	153.54	427.73	414.29
Net Change	**2.25**	**2.25**	**3.28**	**0.00**	**0.55**	**0.25**
2016	948.71	5,377.51	1,139.25	150.10	412.72	400.04
Net Change	**-36.74**	**-101.83**	**-13.40**	**-3.45**	**-14.46**	**-14.00**
2017/2018	948.60	5,362.98	1,144.22	151.11	412.84	400.16
Net Change	**-36.85**	**-116.36**	**-8.44**	**-2.44**	**-14.34**	**-13.88**
2019	954.24	5,491.58	1,161.67	150.13	417.85	404.24
Net Change	**-31.21**	**12.24**	**9.02**	**-3.42**	**-9.33**	**-9.80**

Table 5.3-3. Estimated Annual Emissions at NAS Lemoore Under Alternative 2

Year	Air Pollutant Emissions (tons/year)					
	VOCs	CO	NOx	SO_2	PM_{10}	$PM_{2.5}$
2020	952.91	5,490.54	1,163.42	151.42	416.89	403.94
Net Change	**-32.54**	**11.19**	**10.76**	**-2.12**	**-10.29**	**-10.10**
2021	954.52	5,554.54	1,296.73	174.89	418.68	405.72
Net Change	**-30.93**	**75.20**	**144.08**	**21.34**	**-8.50**	**-8.32**
2022	918.40	5,359.40	1,284.38	173.32	404.56	391.99
Net Change	**-67.05**	**-119.95**	**131.74**	**19.77**	**-22.62**	**-22.05**
2023	879.08	5,182.61	1,313.07	181.57	389.95	377.89
Net Change	**-106.37**	**-296.73**	**160.41**	**28.02**	**-37.23**	**-36.15**
2024	841.14	4,987.72	1,304.59	181.84	375.36	363.75
Net Change	**-144.31**	**-491.62**	**151.94**	**28.30**	**-51.82**	**-50.29**
2025	804.04	4,796.72	1,300.16	182.37	360.99	349.77
Net Change	**-181.40**	**-682.62**	**147.50**	**28.83**	**-66.19**	**-64.27**
2026	727.39	4,399.85	1,265.68	180.32	331.43	321.16
Net Change	**-258.06**	**-1,079.49**	**113.02**	**26.78**	**-95.76**	**-92.88**
2027/2028	727.63	4,408.04	1,280.03	182.92	331.63	321.37
Net Change	**-257.82**	**-1,071.31**	**127.38**	**29.38**	**-95.55**	**-92.67**
de minimis Threshold	10	NA*	10	100	100	100
Exceed *de minimis?*	**No**	**NA**	**Yes**	**No**	**No**	**No**

Note: *NA = Not applicable. *De minimis* thresholds only apply to nonattainment or maintenance area pollutants.

Airfield operations show a reduction in all pollutant emissions for the period 2016 – 2018. During the period 2019 – 2028, NOx and SO_2 emissions increase. At the end state in 2028, a total of 264 fixed-wing aircraft and three rotary wing aircraft would be based at NAS Lemoore. The calculated and compared results indicate that beginning in 2020, NOx emissions exceed the NOx *de minimis* threshold. As a result, a Draft General Conformity Determination was prepared for NAS Lemoore and demonstrates that NOx emissions from the proposed action would conform to the applicable SIP. The draft general conformity determination document underwent public review and comment, along with the Draft EIS. The San Joaquin Valley Unified APCD reviewed the Draft EIS and Draft General Conformity Determination and issued a letter on May 1, 2013 concluding that the project has fulfilled and satisfied federal general conformity requirements. The Final General Conformity Determination and the San Joaquin Valley Unified APCD's compliance determination are included in Appendix 1D.

NAS Lemoore has a current growth allowance or "wedge" in the SIP for San Joaquin Valley APCD that currently allows emissions growth up to 2025 (San Joaquin Valley APCD 2011) for Military Jet Aircraft Operations. **Table 5.3-4** presents the NOx emissions associated with the proposed F-35C homebasing action airfield operation emissions within the San Joaquin Valley APCD for the first year of the proposed action (2016), the first year net emissions exceed the *de minimis* threshold (2020), the furthest year of the applicable SIP's emission budget (2025), and the year of greatest emissions (2023). As shown in the table, the emission allowances are more than sufficient to cover the NOx emissions associated with airfield operation emissions under Alternative 2 of the proposed F-35C homebasing action. The SIP allowance for 2025 is shown for the end-state year 2028 to demonstrate that the allowance for the furthest year in the currently applicable SIP remains sufficient for the project emissions.

Table 5.3-4. Annual Conformity-Related Airfield Operation Emissions within the San Joaquin Valley APCD under Alternative 2

Annual Emissions	*NOx (tons/year)*
2016 includes 10 FA-18C/D, 214 FA-18E/F, 6 F-35C Aircraft	
Total Airfield Operations	1,133.13
2016 SIP Allowance	1,258.52
2020 includes 224 FA-18E/F and 10 F-35C Aircraft	
Total Airfield Operations	1,158.55
2020 SIP Allowance	1,362.55
2023 includes 204 FA-18E/F and 50 F-35C Aircraft	
Total Airfield Operations	1,308.68
2023 SIP Allowance	1,362.55
2025 includes 184 FA-18E/F and 73 F-35C Aircraft	
Total Airfield Operations	1,293.47
2025 SIP Allowance	1,362.55
2028 includes 164 FA-18E/F and 100 F-35C Aircraft	
Total Airfield Operations	1,276.11
2025 SIP Allowance	1,362.55

This growth allowance is intended to cover growth in aircraft emissions as well as engine maintenance runups, GOVs, and GSE and is in the process of being extended to beyond 2025. NAS Lemoore and Navy Region Southwest are in the process of revising the emission allowance budget in coordination with the San Joaquin Valley APCD. Additionally, construction and commuter vehicle emissions are included in the San Joaquin Valley APCD emission inventory.

Conclusion

In summary, the basing of F-35C aircraft at NAS Lemoore under Alternative 2 would result in exceedance of the NOx *de minimis* threshold. A Conformity Determination was prepared to further evaluate NOx emissions associated with the proposed action. The results of the Determination conclude that the NOx emissions generated from implementing Alternative 2 of the proposed F-35C homebasing action at NAS Lemoore would conform to the SIP because the net NOx emissions are covered by:

- A Military Jet Increment for airfield operations in the emission inventory,
- Appropriate "On-Road" Mobile Sources in the Air District emission inventory for commuter emissions, and
- Appropriate categories in the Air District emission inventory for construction emissions.

Thus, all direct and indirect emissions associated with the proposed action are identified and accounted for in the 2007 Ozone Plan and 2008 $PM_{2.5}$ Plan, which are approved as part of the California SIP.

Because the emissions associated with the proposed action would result in increases in NOx emissions in the Air District, NAS Lemoore may choose to enter into a Voluntary Emissions Reduction Agreement (VERA) with the San Joaquin Valley APCD. The VERA is a legally binding document that describes how emissions associated with the Proposed Action that exceed General Conformity thresholds would be offset and mitigated by achieving real, surplus, quantifiable, and enforceable reductions of NOx through implementation of specified Emission Reduction Measures. These measures would be funded through the Navy's payment to the APCD, calculated on a tons per year basis. These monies are then used to

establish specific programs that create air quality benefits within the APCD (e.g., replacement of old agricultural equipment with newer equipment that generates fewer emissions).

5.3.2.2 Alternative 2 – NAS Lemoore Homebasing, Effects at NAF El Centro

Under Alternative 2, no F-35C would be homebased at NAF El Centro. Instead, the F-35C would be based at NAS Lemoore. NAF El Centro would still have transient aircraft operations as well as F-35C transient training operations. Overall, the number operations at NAF El Centro for transient aircraft would increase by approximately 800 operations from the baseline. All activities related to transient operations including fleet vehicles and GSE would be expected to increase with the operations. There would be no planned staffing changes to NAF El Centro for Alternative 2, therefore, all commuter vehicle emissions would be based on baseline numbers. NAF El Centro would continue to serve as the winter training grounds for the Blue Angels, and also provide facilities for various transient aircraft and helicopters as described in Chapter 2. The number of transient operations would be adjusted up or down depending on the type of aircraft and based on the estimate requirements and air space availability in 2028. There would be no changes from baseline until 2016. Along with interior hangar renovations, there would be one new facility constructed at NAF El Centro for Alternative 2, a Special Access Facility, in 2018. Each year of emissions is presented separately in **Table 5.3-5** and in-depth emission calculations are provided in Appendix D.

Table 5.3-5. Estimated Total Emissions at NAF El Centro under Alternative 2

Year	*Pollutant (tons/year)*					
	VOCs	*CO*	*NOx*	*SO_2*	*PM_{10}*	*$PM_{2.5}$*
Baseline (includes Transient Aircraft and Blue Angels)						
Baseline Total Emissions	244.18	1,200.88	210.55	27.01	119.74	116.06
2016						
Total Emissions	**195.96**	**918.36**	**129.67**	**15.84**	**69.72**	**67.55**
Net Change:	-48.23	-281.92	-80.87	-11.17	-50.02	-48.51
2017						
Total Emissions	**194.73**	**935.68**	**138.11**	**16.61**	**63.30**	**61.34**
Net Change:	-49.45	-264.61	-72.43	-10.39	-56.43	-54.72
2018						
Total Emissions	**185.33**	**886.92**	**134.07**	**16.03**	**60.64**	**58.74**
Net Change:	-58.85	-313.36	-76.48	-10.97	-59.10	-57.31
2019						
Total Emissions	**167.20**	**780.09**	**111.86**	**13.52**	**55.53**	**53.79**
Net Change:	-76.98	-420.19	-98.69	-13.48	-64.21	-62.27
2020						
Total Emissions	**165.78**	**784.42**	**122.95**	**14.88**	**55.18**	**53.46**
Net Change:	-78.41	-415.86	-87.59	-12.12	-64.56	-62.60
2021						
Total Emissions	**156.78**	**762.73**	**154.04**	**18.76**	**52.99**	**51.35**
Net Change:	-87.41	-437.55	-56.51	-8.25	-66.74	-64.71
2022						
Total Emissions	**147.53**	**727.97**	**168.40**	**20.56**	**50.58**	**49.02**
Net Change:	-96.66	-472.32	-42.15	-6.45	-69.15	-67.04

Table 5.3-5. Estimated Total Emissions at NAF El Centro under Alternative 2

Year	*Pollutant (tons/year)*					
	VOCs	*CO*	*NOx*	*SO_2*	*PM_{10}*	*$PM_{2.5}$*
2023						
Total Emissions	**138.70**	**710.34**	**204.34**	**25.02**	**48.49**	**47.00**
Net Change:	-105.48	-489.94	-6.21	-1.99	-71.25	-69.06
2024						
Total Emissions	**129.60**	**681.30**	**225.86**	**27.70**	**46.18**	**44.77**
Net Change:	-114.59	-518.99	15.31	0.69	-73.56	-71.29
2025						
Total Emissions	**120.51**	**653.99**	**249.70**	**30.68**	**43.90**	**42.57**
Net Change:	-123.67	-546.30	39.15	3.67	-75.83	-73.48
2026						
Total Emissions	**111.91**	**645.84**	**297.68**	**36.62**	**41.97**	**40.72**
Net Change:	-132.28	-554.44	87.13	9.61	-77.77	-75.34
2027-2028						
Total Emissions	**102.41**	**604.75**	**304.70**	**37.52**	**39.43**	**38.26**
Net Change:	-141.77	-595.53	94.16	10.52	-80.31	-77.80
de minimis Thresholds	100	NA*	100	100	70	100
Exceed *de minimis?*	**No**	**NA**	**No**	**No**	**No**	**No**

Note: *NA = Not applicable. *De minimis* thresholds only apply to pollutants for which an area is categorized as either nonattainment or maintenance.

The calculated and compared results indicate that no year in the period 2016-2028 would be anticipated to exceed *de minimis* thresholds, and emissions would have less than significant impacts on regional air quality. A Record of Non-Applicability (RONA) has been prepared and can be found in Appendix 1D.

Conclusion

It can therefore be concluded, based on the analysis, that the criteria pollutant emissions associated with implementing Alternative 2 at NAF El Centro would be exempt from the requirements for conformity, and no further evaluation of conformity would be required. Emissions from implementing Alternative 2 at NAF El Centro would result in less than significant impacts to air quality.

5.3.3 Environmental Consequences for the No Action Alternative

Under the No Action Alternative, the proposed action would not be implemented. As a result, existing air quality conditions as described in Section 5.3 would continue.

5.4 SAFETY

5.4.1 Affected Environment

The affected environment for safety includes NAS Lemoore, its immediate vicinity, and the SUA listed in the vicinity of NAS Lemoore. This section addresses flight safety, Bird/Animal Aircraft Strike Hazard (BASH), APZs and Clear Zones, and explosive safety.

5.4.1.1 Flight Safety

Potential aircraft mishaps are the primary safety concern with regard to military training flights. NAS Lemoore maintains detailed emergency and mishap response plans to react to an aircraft incident (to

include its own Search and Rescue unit starting in 2012), should one occur. These plans assign agency responsibilities and prescribe functional activities necessary to react to major mishaps, whether on or off the installation. Response would normally occur in two phases. The initial response focuses on rescue, evacuation, fire suppression, safety, elimination of explosive devices, ensuring security of the area, and other actions immediately necessary to prevent loss of life or further property damage. The initial response element usually consists of the Fire Chief, who would normally be the first on-scene Commander, fire-fighting and crash-rescue personnel, medical personnel, security police, and crash-recovery personnel. The second phase is the mishap investigation, which involves an array of organizations whose participation would be governed by the circumstances associated with the mishap and actions required to be performed (DoD Instruction 6055.07, *Mishap Notification, Investigation, Reporting, and Record Keeping*).

To complement flight training, all Navy pilots use state-of-the-art simulators extensively. Simulator training includes all facets of flight operations and comprehensive emergency procedures, which minimize risk associated with pilot error. Additionally, highly trained maintenance crews perform routine inspections on each aircraft in accordance with Navy regulations, and maintenance activities are monitored to ensure that aircraft are equipped to withstand the rigors of operational and training events safely.

NAS Lemoore identifies and addresses several hazards to flight safety to be avoided in the airfield vicinity: bird/animal aircraft strike hazard; electromagnetic interference; lighting; and smoke, dust, and steam (DoN 2010). NAS Lemoore has few airfield safety criteria issues and continues to maintain its airfield infrastructure (DoN 2005).

5.4.1.2 Bird/Animal Aircraft Strike Hazard

Another major concern with regard to flight safety is BASH. Aircraft may encounter birds at altitudes up to 30,000 ft. However, most birds fly close to the ground. Approximately 90 percent of reported aircraft-wildlife strikes occur on or near airports, when aircraft are below altitudes of 2,000 ft AGL (FAA et al. 2003). Approximately 60 percent of BASH incidents occur in the NAS Lemoore airfield environment (NAS Lemoore 2012). The Navy BASH program was established to minimize the risk for collisions of birds and aircraft and the subsequent loss of life and property. For airspace used by NAS Lemoore aircrews, the risk of bird-aircraft strikes varies throughout the year. As a result, pilots and safety officers continually evaluate BASH potential.

The NAS Lemoore BASH Plan identifies potential areas of concern and establishes procedures for minimizing the threat of aircraft striking birds and other animals. The management strategies covered in this plan include bird avoidance and control through harassment, grounds maintenance, habitat modification, and depredation. The key to this program is to track BASH incidents through reporting. This plan is reviewed and updated annually by the NAS Lemoore Safety Officer. Plan review and update are necessary to ensure adaptive management that facilitates pilot safety and minimizes impacts on bird and other wildlife communities on NAS Lemoore.

NAS Lemoore utilizes Wildlife Activity Advisories to provide valuable information to aircrews operating in the airfield environment, on low-level routes, and in training areas so that aviators can make good decisions regarding flight safety and wildlife hazards. Wildlife Activity Advisories are communicated to

all airborne and taxiing aircraft by air traffic control and in the Automated Terminal Information System. The Wildlife Activity Advisories are intended for use by aircrews, schedulers, natural resource managers, air traffic controllers, airfield managers, and others in charge of flight safety and natural resource management. It is a tool for managing the hazard of collisions between aircraft and birds at NAS Lemoore (NAS Lemoore 2012). NAS Lemoore also conducts monthly Wildlife Hazard Assessments of the Station to assist in identifying seasonal and local wildlife hazards to aircrews operating at NAS Lemoore (US Department of Agriculture 2011).

The extent of BASH problems at NAS Lemoore has been historically low, but the frequency of air traffic and the abundance of birds surrounding the airfield suggest a potential increase in BASH incidents. From 1980 to 2010, NAS Lemoore had an annual average of 7 reported bird or animal strikes (NAS Lemoore 2012).

5.4.1.3 Accident Potential Zones and Clear Zones

An accident is more likely to occur in Accident Potential Zone (APZ)-I than APZ-II, and is more likely to occur in the Clear Zone than in APZ-I or APZ-II. An APZ-II area is designated whenever APZ-I is required. APZs extend from the end of the runway but apply to the predominant arrival and departure flight tracks used by the aircraft. Therefore, if an airfield has more than one predominant flight track to or from the runway, APZs can extend in the direction of each flight track. **Figure 5.4-1** illustrates the NAS Lemoore APZs produced as part of the 2010 AICUZ study (DoN 2010).

All Clear Zones and the majority of APZ-I for both runways are contained within the NAS Lemoore installation boundary, while a significant portion of APZ-II extends in a loop over primarily agricultural land to the east and west of NAS Lemoore.

5.4.1.4 Explosive Safety

The ordnance storage and handling facilities at NAS Lemoore have designated Explosive Safety Quantity Distance (ESQD) arcs to protect inhabitable areas. All NAS Lemoore ESQD arcs are in compliance with approved requirements and permissible storage capacities. **Figure 5.4-1** shows the ESQD arcs at NAS Lemoore.

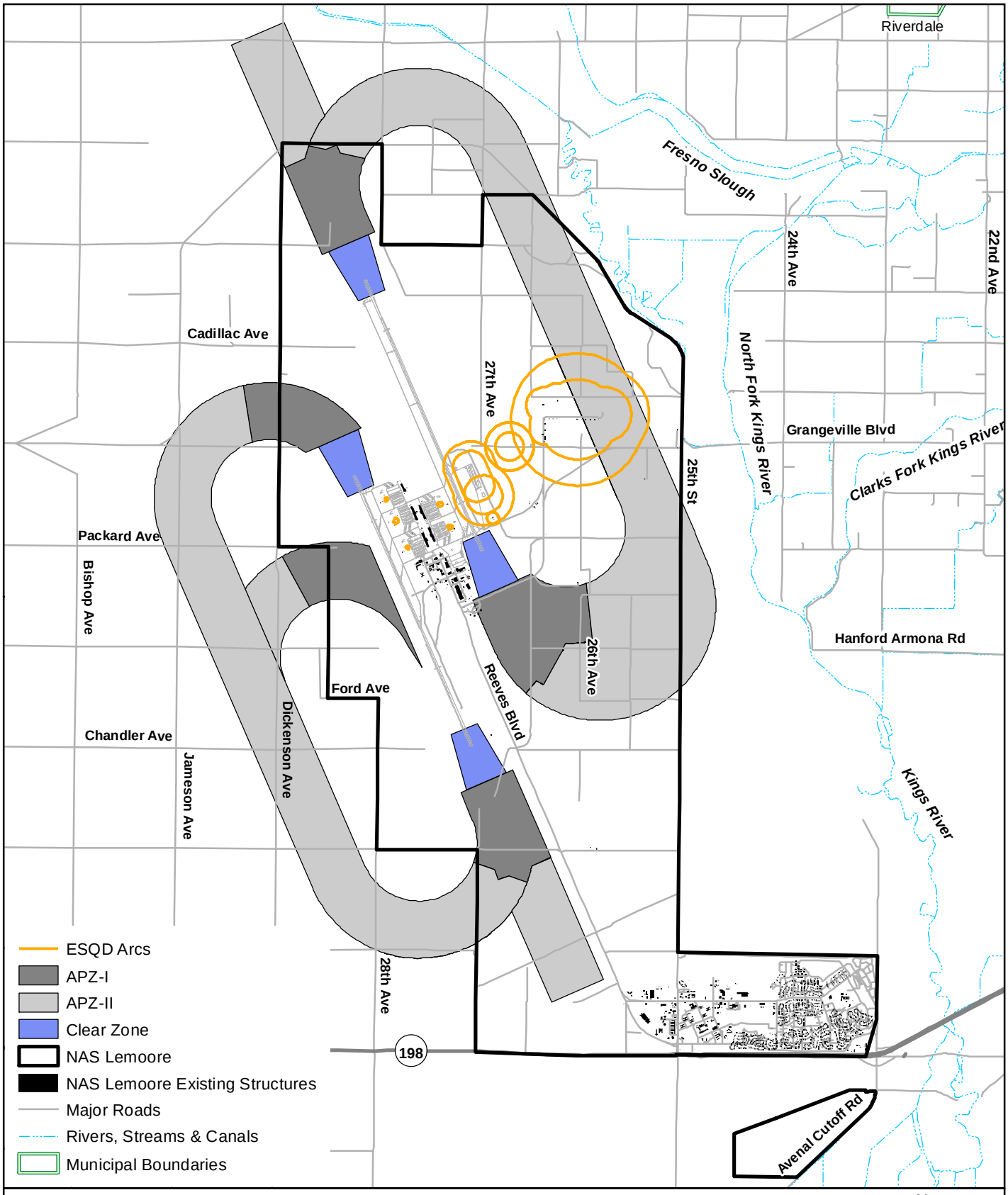


Figure 5.4-1
Existing Clear Zones, APZs, and ESQD Arcs at NAS Lemoore

Source: NAVFAC SW 2011

5.4.2 Environmental Consequences for Alternative 2

Under Alternative 2, potential impacts to safety could occur from proposed F-35C aircraft operations. Potential impacts from homebasing at NAS Lemoore are discussed in the next two sections in terms of effects at NAS Lemoore and effects at NAF El Centro.

5.4.2.1 Alternative 2 – NAS Lemoore Homebasing, Effects at NAS Lemoore

Flight Safety

It is difficult to project future safety/mishap rates for any new aircraft. Since the proposed action involves a number of legacy aircraft being replaced over time by newer aircraft, there is some uncertainty about what mishap rates are to be expected. Modeling, simulation, and ground tests reduce the uncertainties of flight testing, and the subsequent flight-test program includes efforts to ensure flight safety and to reduce risks associated with the operation of new aircraft. In all cases, each new aircraft type will meet all required standards prior to certification. As of October 2013, all three variants of the F-35 had executed more than 10,000 flight operations without a serious in-flight mishap (Lockheed Martin 2013).

In all cases, the DoD maximizes the use of lessons learned and current technology to minimize the chances of aircraft loss. Throughout the years, several technologies have been engineered to reduce mishap rates. These include, but are not limited to, advancements such as: 1) advanced warnings to prevent controlled flight into terrain and collision avoidance with other aircraft; 2) data recorders that ensure the DoD services learn from each and every mishap; and 3) back-up and redundant systems that ensure the aircraft are controllable and can be landed with system failures and malfunctions. These advancements and upgrades applied to legacy aircraft have been designed into the F-35C.

The F-35C is a new aircraft and historical trends show that mishaps of all types decrease the longer an aircraft is operational as flight crews and maintenance personnel learn more about the aircraft's capabilities and limitations. The mishap rate is expected to be comparable with a similarly sized aircraft with a similar mission. F-35C improved electronics and maintenance practices are expected to improve safety. In an effort to reduce the most common mishap cause, pilot error, the F-35 program is built around extensive, high fidelity simulator training. The sophistication of the F-35 simulators will allow for a wide range of training, including most facets of flight operations and comprehensive emergency procedures, making pilots better prepared to succeed in the aircraft.

Although the F-35C is a new aircraft, the single engine that powers it is a product of 30 years of engineering, lessons learned from previous single aircraft engines with a similar core, and tens of thousands of hours of operational use. The propulsion system design includes a dedicated system safety program with more stringent limits than legacy engines. The F-35C engine safety program focuses on the major contributors of what previously caused the loss of an aircraft and provides redundancies in case of control system failures. Additionally, this program allows for safe landing of the aircraft even with system failures.

Throughout the design and testing process, the safety initiatives took the previous Best Practices for single engine safety and built upon them to promote flight safety progress. Examples of design

characteristics that are damage tolerant and enhance safety include a dual wall engine liner, a fan blade containment shell, and a shaft monitor for vibration, torque, and alignment.

Under Alternative 2, there would be an increase of 68,400 aircraft operations at the NAS Lemoore airfield. There would be an increase of 3,448 aircraft operations in SUA and MTRs in the vicinity of NAS Lemoore. However, this increase in operations is not anticipated to result in significant impacts to safety at NAS Lemoore airfield or SUA because the same safety protocol would be followed for every aircraft operation. All current airspace safety procedures, maintenance, training, and inspections discussed previously would continue to be implemented. Every additional airfield flight operation would adhere to established safety procedures.

The introduction of F-35C would not introduce any new types of activity within the NAS Lemoore airfield. All current training regulations and procedures would be updated to reflect F-35C specific rules, and pilots would continue to adhere to training policies. NAS Lemoore airfield safety conditions would be similar to existing conditions. No significant safety impacts from F-35C operational training actions would be expected for operations NAS Lemoore or within SUA.

Bird/Animal Aircraft Strike Hazard

Under Alternative 2, there would be an increase of 68,400 aircraft operations at the NAS Lemoore airfield. This increase in operations would also result in an increase in the BASH potential. This increase in BASH potential would be mitigated by continued adherence to the comprehensive procedures used at NAS Lemoore to minimize incidences of bird/animal-aircraft strikes (NAS Lemoore 2012). For example, BASH risk can increase during seasonal migration patterns. Special briefings are provided to Navy pilots whenever there is an increased BASH potential. Also, limits may be placed on low altitude flight and some types of training (e.g., multiple approaches, closed pattern work) at the airfield and in SUA during periods of increased BASH potential.

Accident Potential Zones and Clear Zones

Under Alternative 2, there would be no changes to Clear Zones or APZs. Proposed construction, renovation, and infrastructure improvement projects related to the Alternative 2 would comply with military airfield safety clearances below aircraft arrival and departure flight tracks and surrounding the airfield. New construction would be sited so as not to be an obstruction to airspace. Therefore, construction activity would not result in any greater safety risk or obstructions to navigation. Operations would fall within the same general types as historically occurred at NAS Lemoore (DoN 2010). For example, the F-35C would follow established local approach and departure patterns used and perfected for over 10 years, minimizing accident risks to the community.

Explosive Safety

Under Alternative 2, there would be an increase of 68,400 aircraft operations and a corresponding increase in the amount of ordnance required to complete training missions. No new types of ammunition or ordnance would be expected with the arrival of the F-35C. Existing ordnance storage and handling areas would not change. Proposed construction projects are not within any ESQD arcs. So, there would be no change in ESQD arcs.

Conclusion

Overall, as discussed above, implementation of Alternative 2 at NAS Lemoore would not result in significant impacts to safety from increased aircraft operations. Extensive use of flight simulators would minimize the risk associated with aircraft mishaps due to pilot error. Increased aircraft operations would result in increased BASH potential. However, limits may be placed on low altitude flights and pilots would have special briefings during periods of increased BASH potential.

5.4.2.2 Alternative 2 – NAS Lemoore Homebasing, Effects at NAF El Centro

Under Alternative 2, aircraft operations at NAF El Centro would increase by 800 annual operations. This increase in operations would not affect safety at NAF El Centro. (Please see Section 4.4.1, *Affected Environment* for a description of safety at NAF El Centro.)

5.4.3 Environmental Consequences for the No Action Alternative

Under the No Action Alternative, the proposed action would not be implemented and operations at NAS Lemoore would continue at current levels. All regulations and plans that pertain to runways, APZs, mishaps, BASH and other flight safety considerations would continue to be followed under the No Action Alternative. There would be no change to air/ground safety risks at NAS Lemoore.

5.5 LAND USE

5.5.1 Affected Environment

The affected environment for land use includes NAS Lemoore and portions of Kings County and Fresno County, as well as portions of the western edge of the City of Lemoore. This section addresses NAS Lemoore land use, local and regional land use, and land use and the noise environment.

5.5.1.1 NAS Lemoore Land Use

NAS Lemoore occupies 18,784 acres; approximately 15,744 acres is within Kings County and another 3,040 acres is within Fresno County (NAVFAC EFA West 2001). In addition, the Navy owns easements on another 11,020 acres of land surrounding the installation for the purposes of controlling development and safety within the flight zones (NAVFAC EFA West 2001). The majority of the land surrounding NAS Lemoore is currently in agricultural use.

Land use at NAS Lemoore includes developed and undeveloped areas. Developed areas are used primarily for air operations, administration, and housing. The air operations area occupies approximately 4,100 acres in the central part of the installation and primarily contains functions that directly support air operations, including: training/operations, public works, maintenance, administration, and supply facilities. The administration and housing areas each occupy approximately 600 acres at the southeastern end of NAS Lemoore. Administration and housing areas includes training, security, public works, medical, retail, and administration facilities in addition to the predominant use by housing, personnel support, and recreational facilities. The administration and housing areas are bordered by agricultural outlease lands to the west and off the installation by agricultural lands along the north, south, and east (DoN 2006). **Figure 5.5-1** depicts existing land use within NAS Lemoore.

Undeveloped areas are used primarily for agricultural production, natural resources management, and outdoor recreation. Most of the land area of NAS Lemoore, approximately 13,715 acres, is undeveloped and is leased to local farmers for agriculture. Agricultural lands leased in accordance with Public Law 97-321 permit the Secretary of the Navy to retain the lease rental receipts to cover the expenses of leasing and to finance multiple land use management programs (e.g., natural resources projects). Agricultural outlease lands are used primarily for producing cotton, wheat, and sugar beets, although other crops, including alfalfa, barley, corn, garlic, lettuce, melons, onions, safflower, and tomatoes, also are periodically produced. Five resource management areas are located in the northern and northeastern areas of NAS Lemoore. These five areas have been and continue to be managed for the benefit of wildlife and native plant communities. Outdoor recreational uses on the installation are those that depend on or are integrated with the natural environment (DoN 2006).

Land Use Controls

Development within and adjacent to NAS Lemoore is guided and controlled by the following policies and plans:

- Activity Overview Plan (NAS Lemoore 2005)
- AICUZ study (DoN 2010)
- Integrated Natural Resources Management Plan (INRMP) (NAVFAC EFA West 2001)
- NAS Lemoore Joint Land Use Study (JLUS) adopted August 25, 2011 (NAS Lemoore 2011)

Additionally, while not subject to the following municipal and county plans, NAS Lemoore conducts its activities in accordance with such plans to the extent practicable:

- San Joaquin Valley Blueprint
- City of Lemoore 2030 General Plan
- Fresno County General Plan
- Kings County General Plan

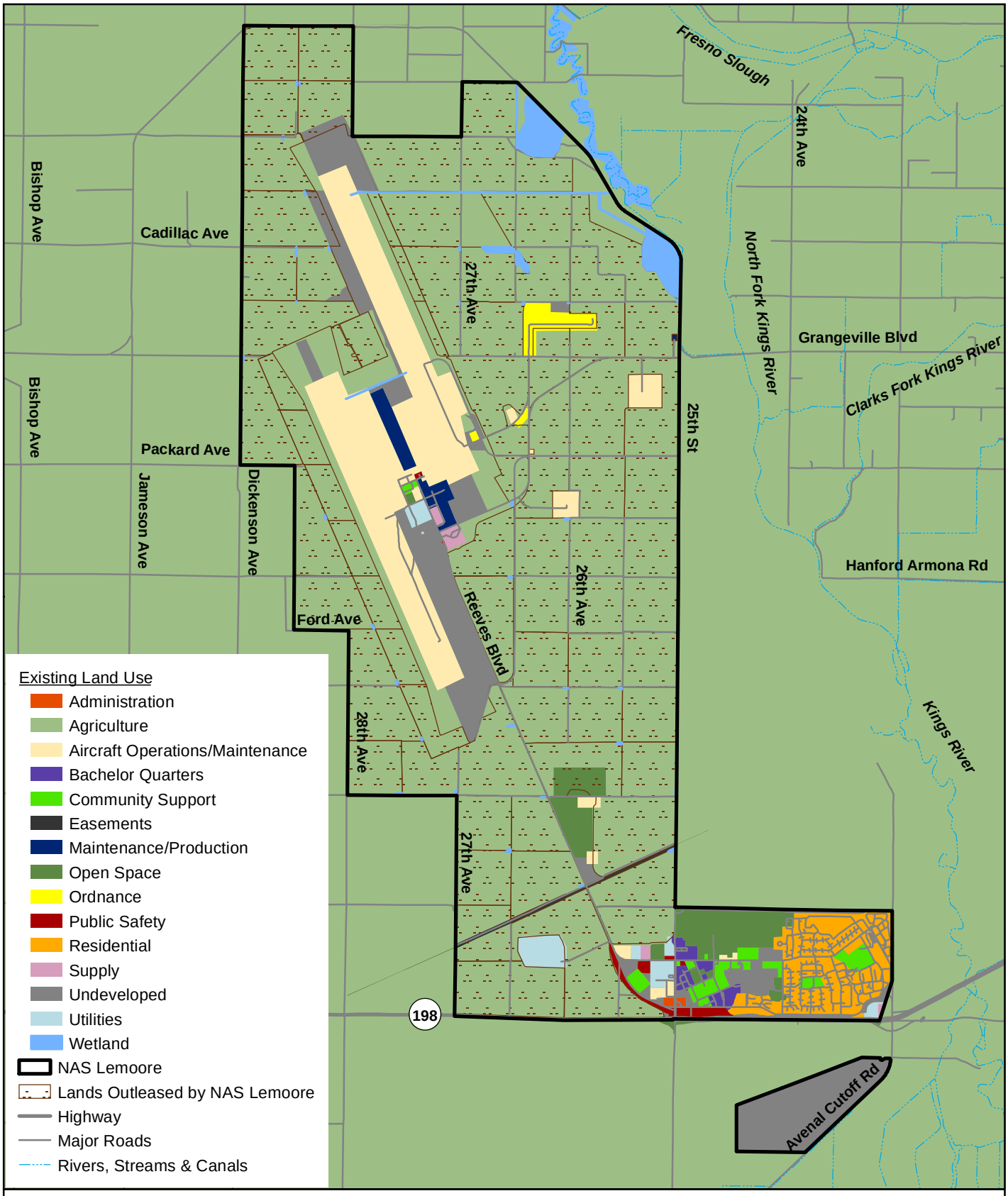


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Figure 5.5-1
Existing Land Use at NAS Lemoore

Sources: DoN 2001; Tierra Data 2011

2005 Activity Overview Plan

The Activity Overview Plan was developed to provide long-term land use policies that conform to the current and future operational mission of NAS Lemoore and fit within the planning strategies of the region. The plan assessed factors such as noise, housing, public works and utilities, operations, facilities condition, development, and encroachment. Using the results of these studies, a future Development Plan was created to allow for future expansion of operations and services on the installation (such as administration and housing), to set goals for short and long-term development projects, and to provide a land use plan for the installation (NAS Lemoore 2005).

The Activity Overview Plan indicates that functions associated with operations and training activities are the largest land uses, occupying approximately 4,100 acres in the central portion of the installation. This includes the runways, helicopter pad, air traffic control tower, parking aprons, hangars, and aircraft safety zones. This area is approximately 4.3 miles away from the administration and family housing areas in order to reduce the noise and aircraft safety impacts on these areas. The operations and training area is surrounded primarily by agricultural land and flight easement areas (NAS Lemoore 2005).

There are some foreseeable incompatible development projects off the installation: new and proposed developments in the southeast corridor bound by Highway 198 to the south and Highway 41 to the east. Namely, the existing West Hills College Campus and proposed Wal-Mart and any potential tangential development are areas of concern. The Planning Commissions of the Counties of Kings and Fresno have established a three-mile wide greenbelt buffer zone to alleviate the potential for urban development near the installation (NAS Lemoore 2005).

2010 AICUZ Study

The AICUZ Study for NAS Lemoore was originally developed in 1978 and was updated in 1993 and 2010. The 2010 AICUZ Study includes current noise study results (DoN 2010). The Navy examined existing and planned land uses for Kings and Fresno counties and the City of Lemoore (see discussion below regarding the General Plans for these entities). The AICUZ establishes APZs for the installation, including the Clear Zone, APZ-I, and APZ-II. Section 5.4.1.3, Airfield Safety Clearances, provides additional details about NAS Lemoore's Clear Zones and APZs. **Figure 5.4-1** shows the NAS Lemoore Clear Zones and APZs as part of the 2010 AICUZ Study (DoN 2010).

The General Plans for Kings County and Fresno County both provide guidance for future land development plans in the area of NAS Lemoore, including minimum parcel size and restrictions of usage to low-density agricultural uses (DoN 2010). Information from the Navy's AICUZ was utilized by the General Plan for the City of Lemoore to determine proper use of the lands on the west side of the city between NAS Lemoore and the City of Lemoore to preserve the existing noise buffer (City of Lemoore 2008).

The 2010 AICUZ noise zones for NAS Lemoore extend off the installation in all directions. However, of the 146,775 acres within the AICUZ noise footprint, 127,443 acres currently contain compatible land uses, 19,178 acres have compatible land uses with restrictions, 43 acres have incompatible land uses with exceptions, and 111 acres are considered to have incompatible land uses.

2001 Integrated Natural Resources Management Plan

The purpose of the INRMP is to effectively and proactively manage natural resources on the installation in support of the military operations of NAS Lemoore. The installation's natural resources management program helps to minimize hazards to aircraft operations such as dust and fires, preserves agricultural and other important land for the future, manages ecosystems, promotes good land stewardship programs, and provides additional revenue to support natural resources management programs at NAS Lemoore. Agricultural outleases are managed by NAVFAC Southwest, which manages natural resources under each lease, oversees conservation practices, awards leases, and prepares soil and water plans (NAVFAC EFA West 2001).

In addition to agricultural lands, there are five Resource Management Areas at NAS Lemoore. These areas total approximately 410 acres and are maintained as undeveloped wildlife preservation areas, including the Sunset Lake Wildlife Area, East Area Wildlife Area, Wildlife Area 3 (ponds), Wildlife Area 4 (grasslands), and the Wildlife Area 5 (Tumbleweed Park). Also included under the INRMP are the maintenance of outdoor recreational areas, air operations areas, and administration and housing areas (NAVFAC EFA West 2001).

5.5.1.2 Local and Regional Land Use

NAS Lemoore Joint Land Use Study

A NAS Lemoore JLUS, overlaying zoning classifications with aircraft noise, was adopted on August 25, 2011 (NAS Lemoore 2011). The goals of the JLUS are to identify land use issues and ensure that development does not impact the operational integrity of NAS Lemoore, and guide future planning in the region of the installation. Subsequently, Kings County, Fresno County, and the City of Lemoore have passed resolutions adopting most of the JLUS recommendations.

By identifying areas of concern, the JLUS was developed to map recent and future planned development activity and integrate it with information from the 2011 NAS Lemoore AICUZ, in order to develop compatible land use policy recommendations as well as long-term regional planning policies for high noise areas (60+ dB CNEL). The JLUS identified concerns and recommendations within Kings County, the City of Lemoore, Fresno County, and within the installation (NAS Lemoore 2011).

San Joaquin Valley Blueprint

The San Joaquin Valley Blueprint is a joint initiative of eight county governments in the San Joaquin Valley that seeks to consolidate the countywide blueprints into a more cohesive vision with shared goals, objectives, and performance measures. It includes the Council of Fresno County Governments and the Kings County Association of Governments, among other entities. The San Joaquin Valley Blueprint discourages growth on prime agriculture lands, particularly those surrounding NAS Lemoore (San Joaquin Valley Blueprint 2010).

City of Lemoore 2030 General Plan

The City of Lemoore began as an agricultural community and developed under the influence of the naval installation. The city is zoned primarily low-to-medium density residential housing with a low percentage of commercial, professional, and industrial space, as well as community services. Lemoore is surrounded

by parks, greenspace, and agricultural lands, especially on the west side of the city separating it from NAS Lemoore (City of Lemoore 2008).

One of the prime factors in the Lemoore General Plan is to preserve as much farmland as possible and to retain the small town character of the city while promoting economic development. The Plan indicated that information from the Navy's AICUZ, under development at that time, would be utilized to determine proper use of the lands on the west side of the city between NAS Lemoore and the City of Lemoore. Until that time, no applications for development or annexation of land to the the south and west of the city would be accepted. The plan also called for the completion of Federal Emergency Management Agency (FEMA) flood hazard studies prior to further development of those lands (City of Lemoore 2008).

2010 Fresno County General Plan

The Fresno County General Plan was adopted in 2000 to replace the 1976 plan. The plan assessed the individual needs of sub-regions and cities within the county and made recommendations for future land use planning. In general, the plan expected the population to continue to rise in each of the larger incorporated communities within Fresno County, indicating overall growth in housing, utilities, and public services within the county (Fresno County 2010).

The northern portion of NAS Lemoore is located within Fresno County, including portions of the installation's two runways. The 1993 AICUZ study indicated that noise effects from NAS Lemoore extend significantly into Fresno County. Fresno County defers to the Kings County General Plan in its approach to issues of noise from aircraft operations from the installation. The Kings County General Plan limits development within 3 miles of NAS Lemoore in order to create a buffer for noise effects and for safety purposes. Parcels within this area are zoned agricultural and are required to be 40 acres or more in size (Fresno County 2010).

In addition, a NAS Lemoore JLUS map, overlaying zoning classifications with aircraft noise, APZs, continuing compatible land uses, planned infrastructure expansion, and other important issues, was adopted by the Kings County Association of Governments, which includes the City of Lemoore, Kings County and Fresno County (NAS Lemoore 2011).

2035 Kings County General Plan

The Kings County General Plan was originally adopted in 1993, and revised and updated in 2010 to encompass county planning through 2035. The purpose of the plan is to "guide the physical growth of the unincorporated portion of Kings County and the conservation of its resources in a manner consistent with the goals of the people of Kings County." The plan identifies areas of desired development and planned preservation within the county through 2035. The plan identifies that NAS Lemoore's Military Influence Area (MIA) covers most of the northwestern portion of the county and ensures compatible land uses and appropriate mitigation measures for noise, safety, and resource conservation through agricultural land use designations surrounding the installation (**Figure E-1**, Appendix E). Agriculture is a major factor in the economy of Kings County and the area surrounding NAS Lemoore is designated as Exclusive Agriculture. This designation is utilized to protect 47,936 acres of farmland and farm-related businesses while providing a noise and safety buffer around NAS Lemoore. The General Plan specifies a

3-mile wide buffer zone around the portions of the installation located within Kings County (Kings County 2010).

National Parks

National Parks near the NAS Lemoore SUA and MTRs are shown on **Figure 5.5-2.** The R-2508 Complex overlies Kings Canyon, Sequoia, and Death Valley National Parks. R-2524 Superior Valley is within R-2508 and adjacent to Death Valley National Park. VR-1257 passes over Joshua Tree National Park, and VR-1262 and VR-1264 pass over Death Valley National Park. The number of existing annual training operations in these areas is identified in **Tables 2.8-5** and **2.8-6**.

5.5.1.3 Land Use and the Noise Environment

Land use activities most likely to be impacted by noise generally include residential communities, public services, commercial areas, and recreational and cultural areas. According to the AICUZ, aircraft operations noise levels are measured through the CNEL standards. Noise compatibility criteria for land uses are established by the Navy's AICUZ instruction (OPNAVINST 11010.36C, *Air Installations Compatible Use Zones (AICUZ) Program*). According to these standards, noise levels greater than 65 dB CNEL are not compatible with certain public amenities, residential areas, or recreational, cultural, and entertainment facilities (Table E-1, Appendix E).

Areas surrounding NAS Lemoore generally consist of agricultural lands, which provide a buffer between the installation and urban or residential parts of nearby communities. The AICUZ Study and JLUS for NAS Lemoore provide guidelines for maintaining these buffers and for working with the local communities to ensure that future development is kept out of these designated areas. These studies utilized known regional growth patterns, operational flight paths and patterns, and the general plans for the City of Lemoore and Fresno and Kings Counties to determine how the installation affects these communities and to develop guidelines.

Currently, Kings County and Fresno County General Plans do not allow residential construction within areas labeled 60 dB CNEL or greater; however, the City of Lemoore does allow certain residential construction within the 60 CNEL dB noise level contour (NAS Lemoore 2011). For a more detailed discussion of noise for NAS Lemoore, refer to Section 5.2, *Noise.* **Figures 5.5-3** and **5.5-4** show baseline noise zones over the existing land uses in NAS Lemoore and the surrounding communities respectively.

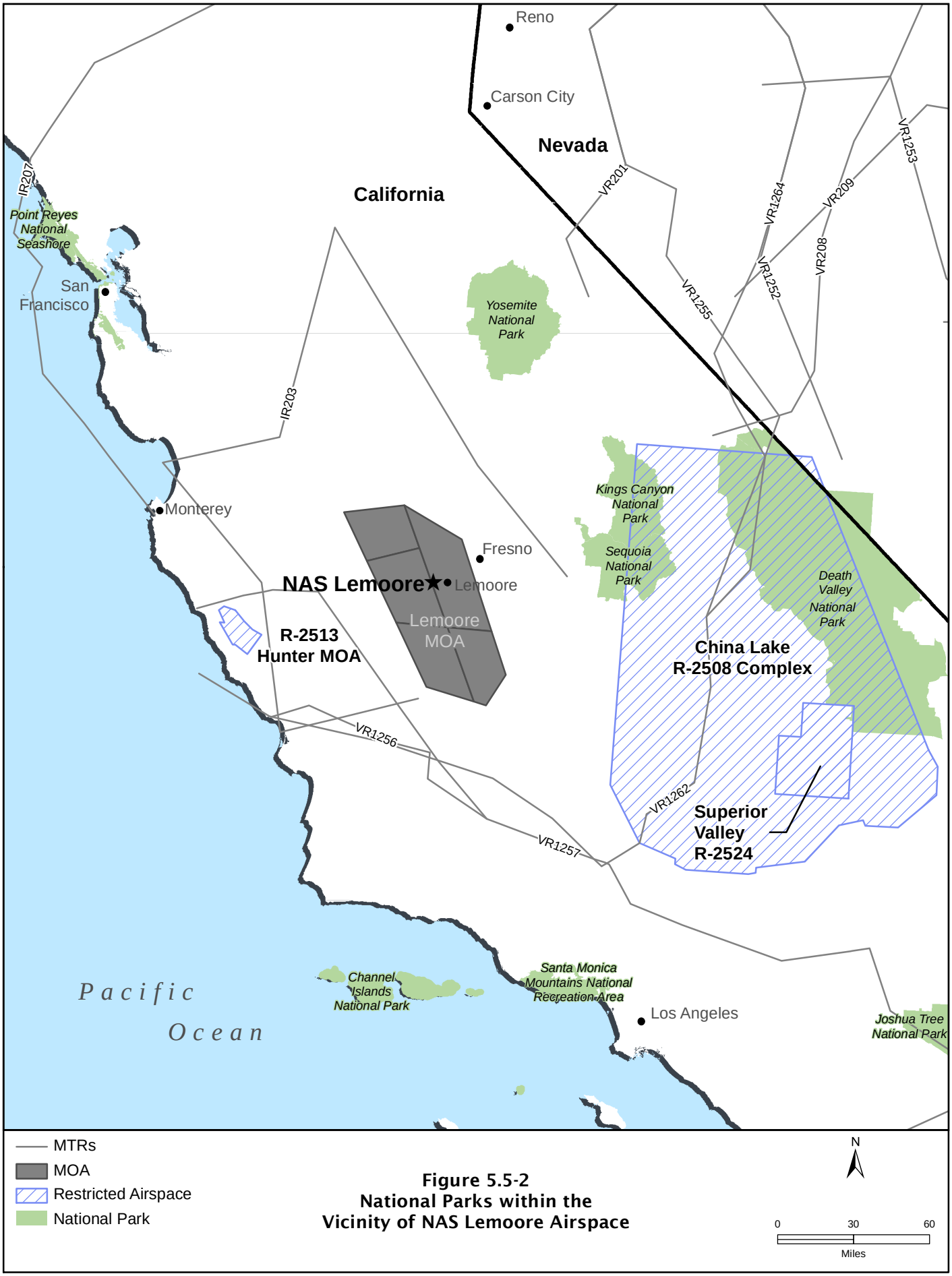

Figure 5.5-2
National Parks within the Vicinity of NAS Lemoore Airspace

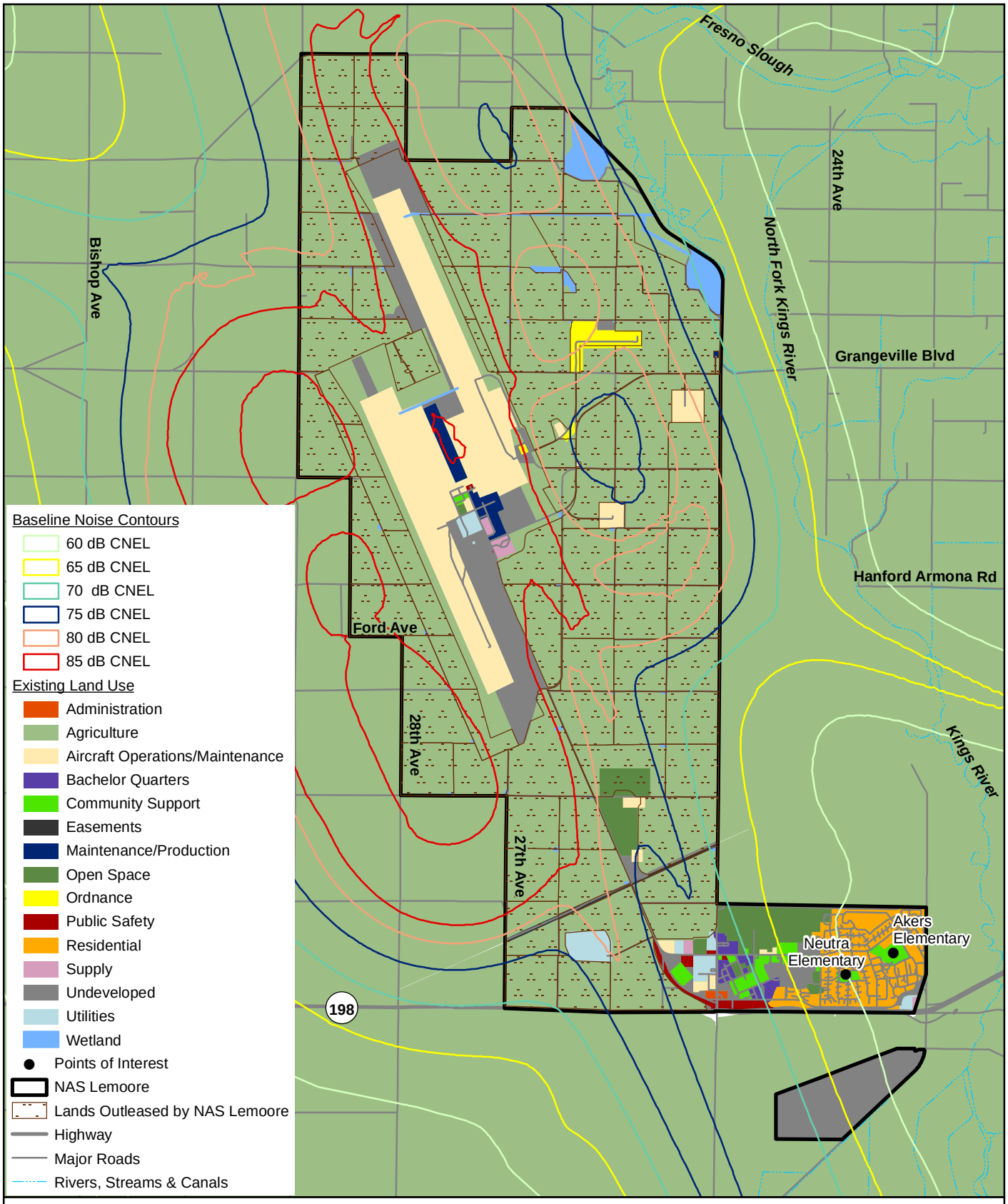

Figure 5.5-3
Baseline Noise Contours and Existing Land Use at NAS Lemoore

Sources: DoN 2001; Tierra Data 2011; Wyle 2013

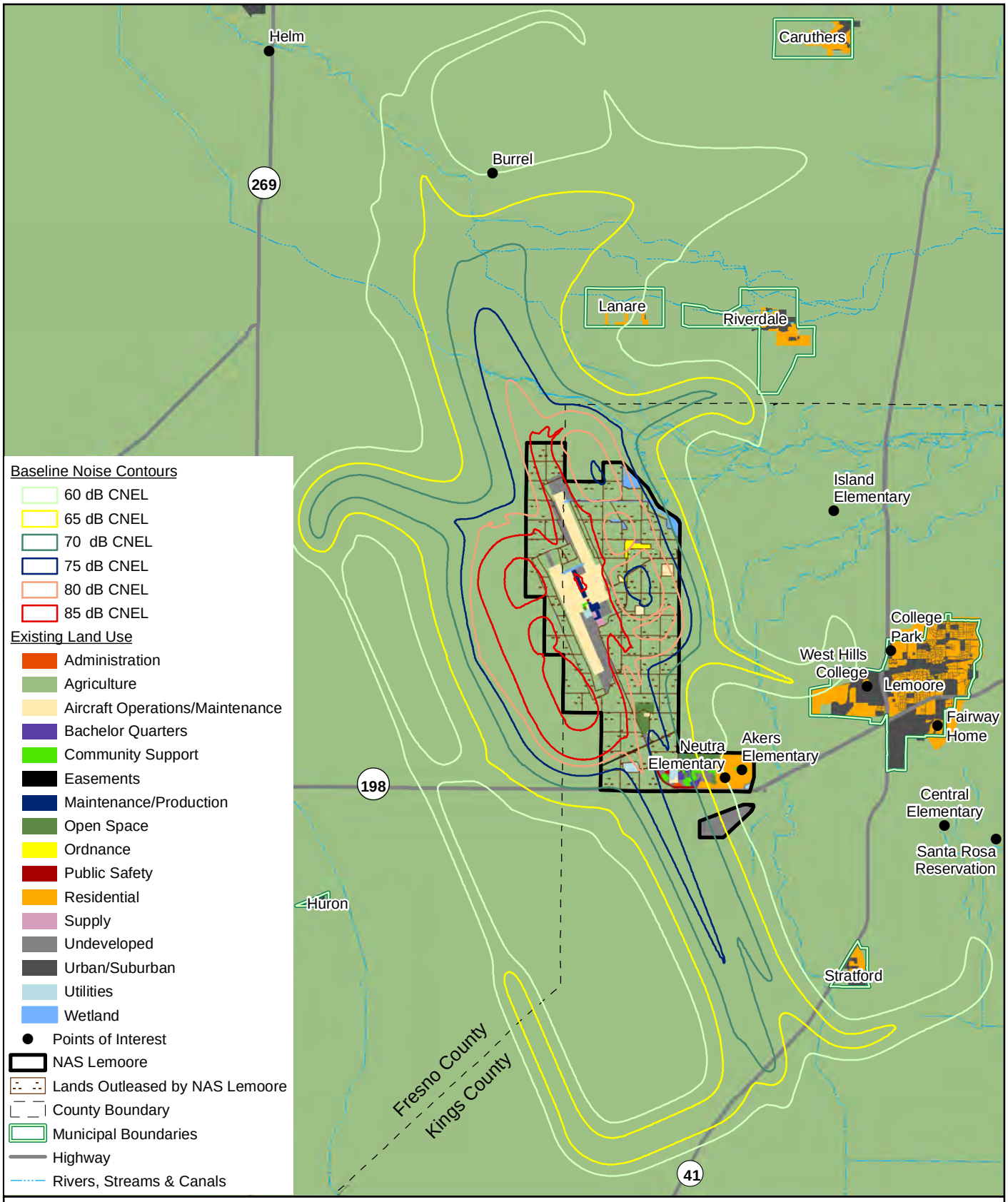

Figure 5.5-4
Baseline Noise Contours and
Existing Land Use in the Vicinity of NAS Lemoore

Sources: DoN 2001; Tierra Data 2011; Wyle 2013

An MIA has been defined for NAS Lemoore. As a military airfield utilizing the most advanced jet aircraft technology, the primary interaction between NAS Lemoore operations and the surrounding communities results from the effects of aircraft overflights, especially associated with noise and safety issues. Accordingly, defining an operations-based MIA was focused on the area around the air station subject to overflights and related noise. Factors influencing the definition of the MIA include where aircraft change power settings, thereby reducing or increasing the noise, and where aircraft traffic patterns associated with approaches, departures, and other related activities occur. The defined MIA encompasses a 614 square mile area consisting of the lands most affected by NAS Lemoore airfield operations, and is the area within which the Navy takes action to maintain the current level of compatibility. Incompatible development with the greatest potential impact on operational capability is most likely to originate from within this area. Flight tracks and power settings tend to change less frequently than noise zones, making the MIA a useful zone for long-term management activities that prevent incompatible development. In addition, the MIA boundary is configured to follow geographical land use boundaries, such as roads, land features, and major waterways. The Navy has a strong interest in preserving land use compatibility within the MIA. The MIA represents an appropriate focus area for land use planning actions, potential property or easement acquisitions, and for cooperative policy interaction with local planning agencies.

5.5.2 Environmental Consequences for Alternative 2

Under Alternative 2, potential impacts to land use could occur from proposed facility development, personnel changes, and F-35C aircraft operations. Potential impacts from homebasing at NAS Lemoore are discussed in the next two sections in terms of effects at NAS Lemoore and effects at NAF El Centro.

5.5.2.1 Alternative 2 – NAS Lemoore Homebasing, Effects at NAS Lemoore

<u>NAS Lemoore Land Use</u>

Alternative 2 would not significantly impact existing land use on the installation. New structures would be sited to be consistent with existing land use patterns. The majority of new construction would take place mainly in areas that have been previously disturbed and would not impact lands currently utilized as agricultural outlease areas. **Figure 5.5-5** depicts the proposed construction within the existing land use categories for NAS Lemoore. The proposed construction of the aircraft parking apron and associated access taxiways would be on undeveloped land within NAS Lemoore. This land lies immediately adjacent to areas designated for use as maintenance and production as well as aircraft operations/maintenance. Therefore, it is well suited for the proposed construction. In accordance with AICUZ recommendations and Navy installation design criteria, new construction of noise-sensitive uses would be located outside high noise areas and/or incorporate noise level reduction measures and sound attenuation features into the construction.

<u>Local and Regional Land Use</u>

Alternative 2 would not significantly alter existing land uses outside the installation. All proposed construction and renovation activities would take place within NAS Lemoore and no changes to local and regional land uses or designations would occur. Lands bordering the installation would remain agricultural.

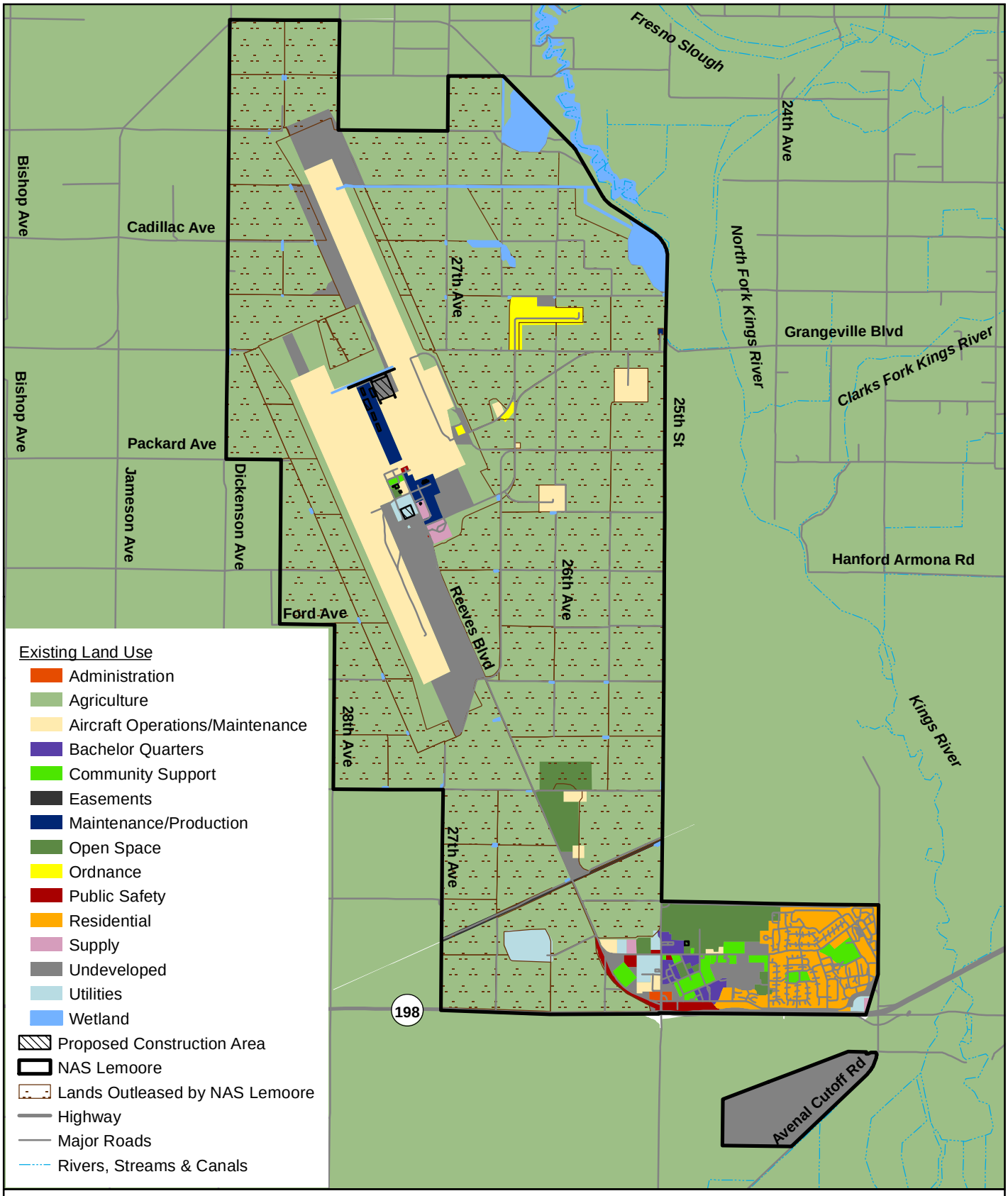

Figure 5.5-5
Existing Land Use and Proposed Construction Areas at NAS Lemoore under Alternative 2

Sources: DoN 2001; Tierra Data 2011

National Parks

This section evaluates the impacts of projected F-35C noise levels on National Parks that lie under SUA and MTRs. Under Alternative 2, four National Parks could be overflown by F-35C aircraft: Sequoia, Kings Canyon, Death Valley, and Joshua Tree (**Figure 5.5-2)**. Although there would be increases in annual aircraft operations in SUA and MTRs near National Parks, not all of the proposed F-35C operations would fly over National Parks. Annual aircraft operations in the R-2508 Complex would increase by approximately 2,380 for a proposed total of 7,156 per year. Annual aircraft operations in R-2524 Superior Valley would increase by 112 for a proposed total of 3,240 per year (**Table 2.8-5)**. For F-35C operations in MTRs over National Parks, there would be 3 additional operations per year in both VR-1257 (proposed annual total of 98) and VR-1262 (proposed annual total of 41). Operations in VR-1264 would remain the same at 1 per year (**Table 2.8-6)**.

National Parks overflown by proposed F-35C flights would not experience perceptible changes in noise levels because the increase in annual aircraft operations would not create a 3 dB change in noise levels, the threshold by which a noise difference is generally detectable (please see Section 5.2.2.1 for the environmental consequences from noise in SUA and MTRs). F-35C would generally use the same procedures, routes, and altitudes that FA-18 currently use when transiting from the NAS Lemoore airfield to R-2508 and R-2524. In SUA, F-35C would fly over National Parks at a minimum altitude of 3,000 ft AGL in compliance with OPNAVINST 3710.7U, *NATOPS General Flight and Operating Instructions*. F-35C would enter R-2524 Superior Valley at an altitude of 23,000 ft and exit at 20,000 ft, which is 5,000 ft above the highest elevation of 15,000 ft in Sequoia and Kings Canyon National Parks.

MTRs are designed to accommodate high-speed, low-level flights. However, F-35C flights would comply with the altitude restriction of 1,500 ft AGL for the part of VR-1257 over Joshua Tree National Park. As indicated in **Table 4.2-16**, individual overflight F-35C noise levels in MTRs are expected to remain the same or be lower than existing operations.

Noise levels from proposed F-35C operations in SUA and MTRs would not affect the status or character of the underlying national parks. Alternative 2 would not result in significant impacts to land use at National Parks.

Land Use and the Noise Environment

This section compares the projected F-35C noise contours to existing land uses on and off the installation. As indicated in **Table 5.5-1** and depicted in **Figure 5.5-6**, land use categories between 65 and 74 dB CNEL would remain essentially unchanged, with the exception of lands designated for agricultural (classified under Resource Production and Extraction) and military use, which would experience an increase in these noise levels which would experience an increase in these noise levels. This increase would not have a significant impact, as the designated land use would remain compatible (see **Table E-1**, Appendix E). Acreage under 75-79 dB CNEL would increase by 426 acres. There would be nearly a 17 percent decrease in acres between the 80 to 84 dB CNEL noise levels primarily designated for agricultural and military uses, remaining compatible with recommendations. Also, there would be a 3 percent increase in acres in the greater than 85 dB CNEL. There would be no residential areas within the installation above 75 dB CNEL.

Outside of the installation boundaries, increases in the noise footprint remain within the agricultural land use designation (see **Figure 5.5-7**). **Table 5.5-2** shows that the greatest increases in acreages occur in noise level 65-69 dB CNEL; however, according to the land use compatibility recommendations outlined in OPNAVINST 11010.36C, *Air Installations Compatible Use Zones (AICUZ) Program* (**Table E-1**, Appendix E), agricultural uses remain generally compatible for these contours. Livestock production would also be compatible at noise levels less than 75 dB CNEL. For affected points of interest outside the installation, please see Section 5.2 *Noise.*

Conclusion

Overall, as discussed above, implementation of Alternative 2 at NAS Lemoore would not result in significant impacts to local and regional land use. Proposed facility and infrastructure construction at NAS Lemoore under Alternative 2 would not result in changes to the currently designated military land use. There would be no significant impacts to National Parks from proposed F-35C aircraft overflights.

5.5.2.2 Alternative 2 – NAS Lemoore Homebasing, Effects at NAF El Centro

Under Alternative 2, a Special Access Program Facility would be constructed at NAF El Centro to accommodate F-35C squadrons from NAS Lemoore conducting detachment training operations at NAF El Centro (see **Figure 2-16**). This facility would be constructed within the installation boundary in a currently vacant lot designated as "supply." This facility would thus remain compatible with existing land use within the installation. Proposed interior hangar renovations would not affect land use (Please see Section 4.5.1, *Affected Environment* for a description of land use at NAF El Centro.)

5.5.3 Environmental Consequences for the No Action Alternative

Under the No Action Alternative, no-on Station infrastructure improvements to support next generation aircraft training operations at NAS Lemoore would be implemented. Existing land use conditions and incompatibilities with noise and safety zones would remain as they are today. Safety zones off-installation would not change.

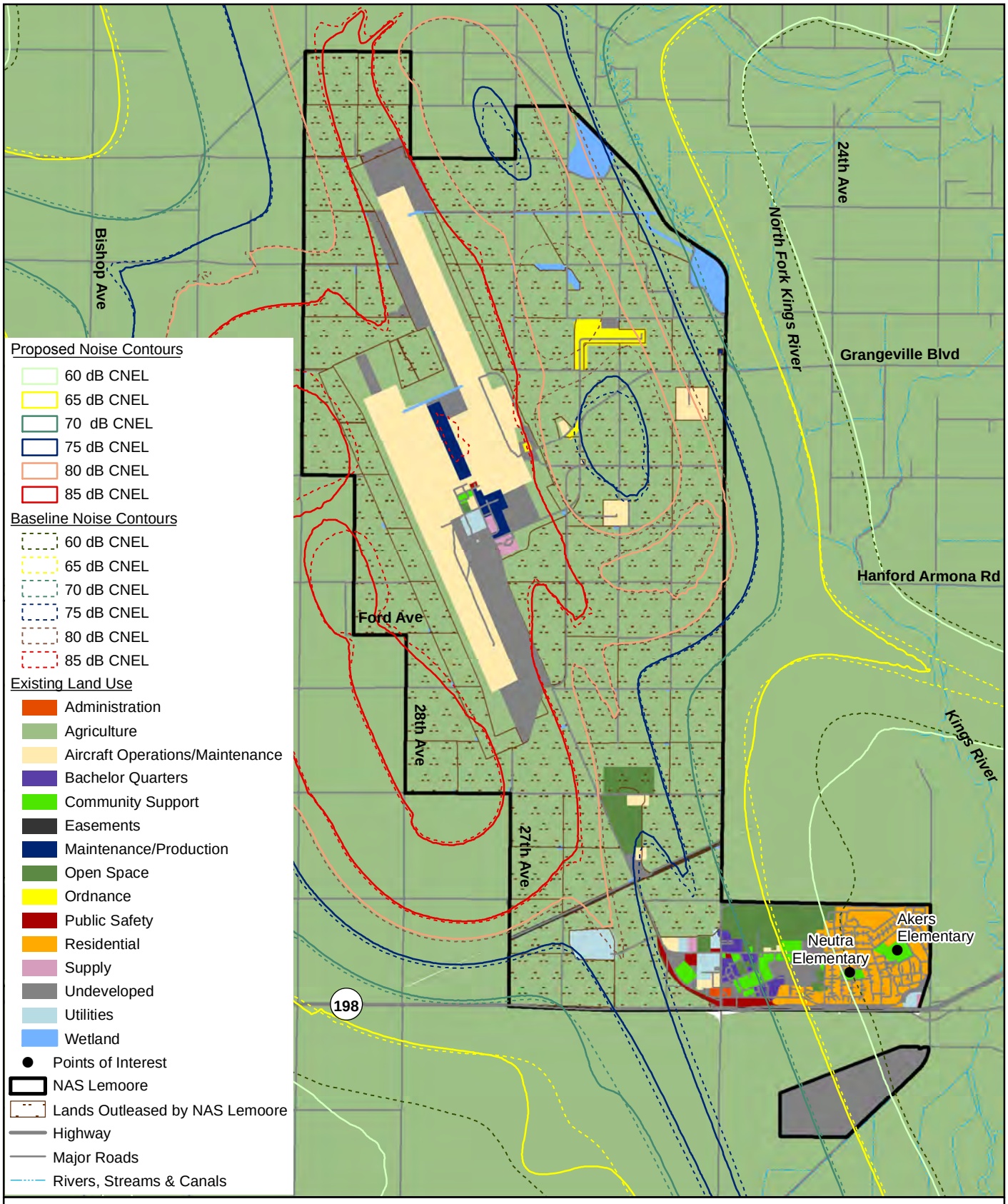

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Figure 5.5-6
Proposed Noise Contours and Existing Land Use at NAS Lemoore under Alternative 2

Sources: DoN 2001; Tierra Data 2011; Wyle 2013

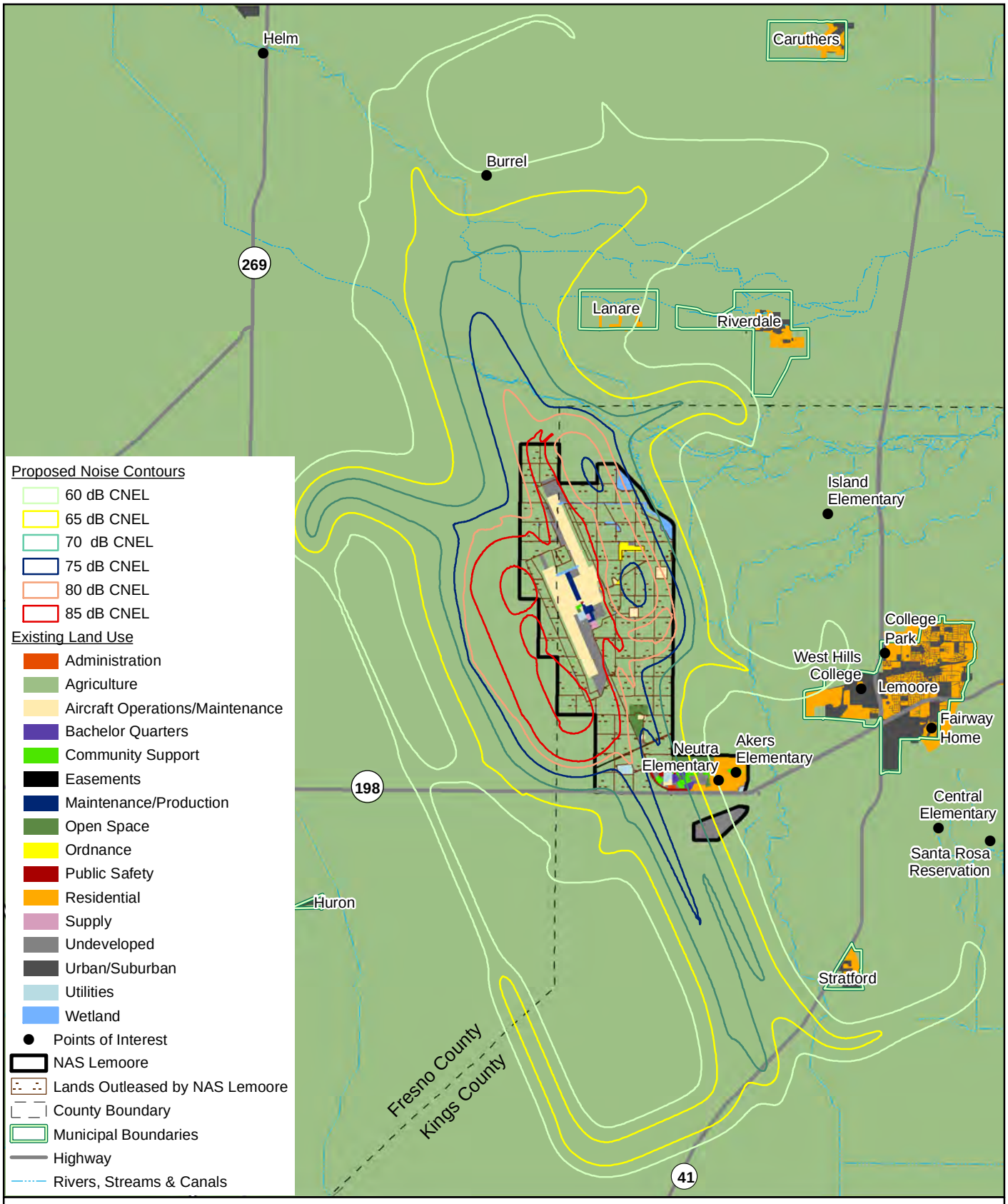


Figure 5.5-7
Proposed Noise Contours and Existing Land Use in the Vicinity of NAS Lemoore under Alternative 2

Sources: DoN 2001; Tierra Data 2011; Wyle 2013

Table 5.5-1. Baseline and Proposed Acreages for NAS Lemoore Land Use Noise Compatibility under Alternative 2

Land Use	Noise Zone 2				Noise Zone 3					
	65-69 dB CNEL		70-74 dB CNEL		75-79 dB CNEL		80-84 dB CNEL		85+ dB CNEL	
	Baseline	Proposed	Baseline	Proposed	Baseline	Proposed	Baseline	Proposed	Baseline	Proposed
Residential	51	51	59	56	0	0	0	0	0	0
Manufacturing	0	0	2	2	0	0	27	0	88	115
Transportation, Communication, Utilities	0	0	51	53	65	75	13	0	27	27
Trade	0	0	11	11	0	0	0	0	0	0
Services	33	34	137	133	0	0	0	0	42	42
Cultural Entertainment Recreational	94	93	58	56	175	172	1	0	5	5
Resource Production and Extraction	288	343	1,755	1,972	3,553	3,886	4,775	4,071	3,345	3,444
Military	242	249	203	193	191	277	222	106	2,207	2,226
Total	**708**	**770**	**2,276**	**2,476**	**3,984**	**4,410**	**5,038**	**4,177**	**5,714**	**5,859**
Change	**NA***	**+62 /+9%**	**NA**	**+200 /+9%**	**NA**	**+426 /+11%**	**NA**	**-861 /-17%**	**NA**	**+145 /+3%**

Note: *NA = Not applicable.

Table 5.5-2. Baseline and Proposed Acreages for Regional Land Use Noise Compatibility under Alternative 2

Land Use	Noise Zone 2				Noise Zone 3					
	65-69 dB CNEL		70-74 dB CNEL		75-79 dB CNEL		80-84 CNEL		85+ dB CNEL	
	Baseline	Proposed	Baseline	Proposed	Baseline	Proposed	Baseline	Proposed	Baseline	Proposed
Resource Production and Extraction	28,015	29,157	15,426	14,850	6,118	5,099	3,999	3,778	4,193	4,790
Total	**28,015**	**29,157**	**15,426**	**14,850**	**6,118**	**5,099**	**3,999**	**3,778**	**4,193**	**4,790**
Change	**NA***	**+1,142 /+4%**	**NA**	**-576 /-4%**	**NA**	**-1,019 /-17%**	**NA**	**-221 /-6%**	**NA**	**+597 /+14%**

Note: *NA = Not applicable.

5.6 INFRASTRUCTURE AND UTILITIES

5.6.1 Affected Environment

The affected environment for infrastructure and utilities includes NAS Lemoore and the City of Lemoore, along with its outlying areas. This section addresses water supply, wastewater, stormwater, electricity, natural gas, and solid waste.

5.6.1.1 Water Supply

The water supply for NAS Lemoore, the City of Lemoore, and other proximate municipalities is provided by the Westlands Water District (the District). The District receives its water from the US Bureau of Reclamation's Central Valley Project, a federal water project that stores water in large reservoirs for use throughout California. The District's contract entitlements from the Central Valley Project total 854.9 million gallons per day (mgd) in addition to 100.4 to 148.7 mgd from the confined underground aquifer. Thus, the total water available (lower limit) is approximately 955.3 mgd - about 159.8 mgd (15 percent) short of the 1,115.1 mgd required to irrigate the entire District (Westlands Water District 2011). The City of Lemoore is provided 19.15 mgd from the District (City of Lemoore 2012). The City of Lemoore owns and maintains all distribution pipes, canals, and other associated infrastructure located within the City of Lemoore. However, NAS Lemoore owns and maintains the potable water distribution system within the installation (City of Lemoore 2012).

NAS Lemoore's water supply is divided among two principal uses: agricultural and municipal and industrial. Water for agricultural purposes is made available from the District to the lessees of agricultural lands on NAS Lemoore for irrigation of crops. The amount of agricultural water available varies from year to year based on a percentage allocation set annually by the Bureau of Reclamation against the land's basic water entitlement. In a 100 percent allocation year, each irrigable acre of land is entitled to 847,200 gallons (2.6 acre-feet [ac-ft]) of water for irrigation purposes, which totals approximately 9.71 billion gallons (29,810 ac-ft) for all 11,466 acres of irrigable land on NAS Lemoore that lie within the District. Since 2003, the percentage allocation set by the Bureau has ranged from a low of 10 percent in 2009 to a high of 100 percent in 2006, with an average allocation of 59.5 percent. In an effort to minimize the impact of lower water allocation years, NAS Lemoore entered into a Supplemental Water Allocation Agreement with the District in May 2003 that provides NAS Lemoore with an additional entitlement to 3.26 billion gallons (10,000 ac-ft) of water annually. This supplemental water entitlement is subject to the same percentage allocation as the basic water entitlement, however, which means the installation only receives the full entitlement in 100 percent allocation years. The installation's agricultural outlease program is critical in reducing mishaps associated with bird-aircraft strikes. Agricultural water is delivered to the installation by the District and is distributed directly to each agricultural parcel via a system of delivery pipelines that extend throughout the agricultural outlease lands.

Municipal and industrial water is delivered to NAS Lemoore from the District through two connection points at the water treatment plant, located in the southwest portion of the Administration Area, through a 30-inch and a 28-inch lateral line. The amount of municipal and industrial water available to NAS Lemoore is established by contract with the District, which allows for up to 1.63 billion gallons

(5,000 ac-ft) annually, or approximately 4.46 mgd. In addition to this District water entitlement, in 2012 NAS Lemoore began construction on a new domestic water well that, when complete, is expected to produce up to an additional 1.16 billion gallons (3,551 ac-ft) of municipal and industrial water annually, or approximately 3.17 mgd. The water treatment plant at NAS Lemoore has a maximum capacity of 7.6 mgd (DoN 2011a). Average potable water consumption at NAS Lemoore from Fiscal Year (FY) 2008 through 2010 was 2.4 mgd (DoN 2011b). Potable water serving the Housing, Administration, and Operations Areas at NAS Lemoore is distributed via 387,517 linear ft of service laterals made of asbestos cement and polyvinyl chloride (PVC) (DoN 2005). There are three 600,000 gallon storage tanks in the Administration Area, two 600,000 gallon storage tanks in the Operations Area, and two storage tanks with 2.0 and 2.66 million gallons of storage at the water treatment plant (DoN 2011a). In 2007, the water treatment plant's filter valves were replaced to improve operations and reliability, including the replacement of 16 main water distribution valves throughout the Administration Area of the installation (DoN 2007).

5.6.1.2 Wastewater

The City of Lemoore wastewater treatment plant is designed to utilize an aerated lagoon system, consisting of four large lagoons with floating surface aerators. Wastewater in the City of Lemoore is managed by the City Public Works Department. Wastewater is collected throughout the city via a network of sanitary sewer collection pipelines treated at the wastewater treatment plant which discharges into the Westlake Canal and ultimately is used to supplement irrigation. The capacity of the City of Lemoore wastewater treatment plant is 6 mgd with a current flow of 4.1 mgd (City of Lemoore 2012).

The treatment and disposal of wastewater at NAS Lemoore occurs at the wastewater treatment facility located in the southeastern corner of the installation. The system treats domestic wastewater, treated industrial wastewater, and some storm drain flow. Industrial wastes (e.g., solvents, grease, and oil) are pre-treated to remove volatile organic chemicals, hydrocarbons, and heavy metals at a site in the southern portion of the Operations Area (DoN 2005). All sanitary sewers on the installation are directed to one of two oxidation ponds where biological agents are used to degrade organic components. The treated wastewater is then transferred to one of three evaporation basins that cover approximately 429 acres of land located south of the Administration Area (DoN 2011a).

The wastewater treatment facility consists of approximately 35 miles of laterals and gravity sewers that are made of vitrified clay and PVC pipe that range in diameter from 4 inches to 21 inches. The wastewater discharge requirements stipulate that the monthly average daily discharge flow from the wastewater treatment facility to the sewage evaporation ponds will not exceed 2.12 mgd (DoN 2011a). Average wastewater generation at NAS Lemoore from FY 2007 through FY 2009 was 1.27 mgd (DoN 2011b).

While portions of the wastewater treatment facility pipeline infrastructure are relatively new, particularly in the Housing Area, the infrastructure in the Administration and Operations Areas are over 40 years old and are considered to be in poor condition. The infiltration pipeline associated with the sewage ponds is in need of repair and it is believed that the high salts in the shallow groundwater are

infiltrating into the old storm-water discharge pipes (DoN 2005). In 2011, a Special Project (RM1011818) was awarded to replace the existing pumping station that is used to pump the sewage across State Route 198 to the sewage ponds. The project will also replace the existing gates at the sewage pond.

5.6.1.3 Stormwater

NAS Lemoore is composed of three major drainage areas: the operations area, the administration area, and the housing area. Stormwater runoff from the operations area drains to the east through inlets, catch basins, area drains, and storm drain piping to three unlined storm ditches. The three storm ditches converge into one main storm ditch which ultimately discharges to the Kings River (DoN 2009).

Stormwater associated with the Administration and Housing Areas is collected through a series of storm drain structures (e.g., inlets, catch basins, and piping) that discharge to the Storm Water Station (Building 986). The runoff collected at the Storm Water Station is pumped to an unlined storm ditch that also discharges into the Kings River. Stormwater is typically contained within the boundaries of NAS Lemoore for most rain events and only during significant rainfall will discharge directly from the installation discharge into Kings River (DoN 2009).

The Lower Kings River (Island Weir to Stinson and Empire Weirs) is an impaired water body on the list of water quality limited segments for three pollutants/stressors: conductivity (including salinity, total dissolved solids, chlorides, and sulfates), Molybdenum, and Toxaphene (USEPA 2011). The potential source of the contaminants is considered to be agriculture (DoN 2009).

5.6.1.4 Electricity

Electricity is provided to the City of Lemoore, the areas surrounding NAS Lemoore, and other proximate municipalities through Pacific Gas and Electric Company (PG&E). PG&E provides electric service to approximately 15 million people throughout a 70,000-square-mile service area in northern and central California. PG&E owns and maintains all transmission lines and related infrastructure within the City of Lemoore and outlying areas in its service area (PG&E 2012a).

Electricity is provided to NAS Lemoore by the Western Area Power Administration (WAPA), which delivers hydroelectric power and related services within a 15-state region of the central and western United States In 2010, WAPA's net generation of energy was 28,118,999,998 kilowatt-hours (WAPA 2010). NAS Lemoore owns and maintains all transmission lines and related infrastructure within the installation (PG&E 2012b). Energy is delivered to NAS Lemoore through a 70 kilovolt (kV) line to the main substation, located in the Administration Area. A second substation is located in the Operations Area. Power is transferred throughout the installation through overhead and underground lines, including 4.6 miles of 70 kV transmission and 19.8 miles of 12.47 kV distribution lines. Other components of the electrical system include 21.2 miles of concrete encased ductline (DoN 2011a; 2011b). Average electricity consumption at NAS Lemoore from FY 2008 through FY 2010 was 89,688,410 kilowatt-hours (DoN 2011c).

5.6.1.5 Natural Gas

Natural gas is provided to NAS Lemoore, the City of Lemoore, and other proximate municipalities from the Southern California Gas Company (SoCalGas). SoCalGas provides natural gas to 20.9 million consumers with a service territory of approximately 20,000 square miles throughout Central and Southern California. SoCalGas owns and maintains the natural gas distribution lines and other associated infrastructure within the City of Lemoore and all other municipalities in its service area; however, NAS Lemoore owns and maintains the distribution system within the installation (PG&E 2012a).

Natural gas is supplied to NAS Lemoore through a series of 4-inch, high pressure gas lines entering the installation at the Housing Area and the main gate and then distributed to one of three regulator/purchase stations: one in the Administration Area, one in the Operations Area, and one in the Housing Area. These stations reduce the pressure of the natural gas to 25 pounds per square inch (PSI) and divide the natural gas into a pipeline distribution system. There is a total of approximately 230,814 linear ft of ¾-inch to 6-inch natural gas distribution pipes composed of steel, PVC, and polyethylene within the natural gas system (DoN 2011). Average natural gas consumption at NAS Lemoore from FY 2008 through FY 2010 was 186,976.83 cubic ft per year (DoN 2011b).

5.6.1.6 Solid Waste

Solid waste at NAS Lemoore is transported off the installation to the Avenal Municipal Landfill, approximately 21 miles southwest of NAS Lemoore (DoN 2011). The Avenal Municipal Landfill has a remaining capacity of 8.2 million cubic yards. The maximum permitted throughput is 6,000 tons per day and the estimated closure date of the landfill is 2029 (Kings County 2007).

A 40-acre landfill was located within the installation but was closed when it reached capacity. The retired landfill is now used for the stockpiling of clean fill for use in other projects (DoN 2005). In FY 2010, a total of 2,600 tons was sent to the Avenal landfill. The diversion rate for construction and demolition debris in FY 2010 was 65 percent. NAS Lemoore has instituted a recycling program and currently diverts approximately 45 percent of generated municipal solid waste to recycling centers. Recyclable materials handled on the installation include food, cardboard, paper, plastics, wood, glass, compost, metal, aluminum cans, used motor oil, antifreeze, and batteries (DoN 2011b).

5.6.2 Environmental Consequences for Alternative 2

Under Alternative 2, potential impacts to infrastructure and utilities could occur from the demolition of an existing facility, construction and operation of new facilities and personnel changes. Potential impacts from homebasing at NAS Lemoore are discussed in the next two sections in terms of effects at NAS Lemoore and effects at NAF El Centro.

5.6.2.1 Alternative 2 – NAS Lemoore Homebasing, Effects at NAS Lemoore

Under Alternative 2, there would be an overall increase in the number of personnel and dependents located at NAS Lemoore, as well as construction of the facilities required to support the homebasing of the proposed F-35C. Unlike Alternative 1 with proposed changes at both NAF El Centro and NAS Lemoore, Alternative 2 would not require any changes at NAF El Centro. At the end state scenario

(2028), personnel and dependents would increase at NAS Lemoore by 2,320 people (751 total personnel and 1,569 total dependents), a 9 percent increase from baseline conditions in 2015 (See **Table 2.5-3**).

For the range of infrastructure and utilities discussed below, the installation would plan for and assess specific infrastructure and utility requirements prior to final design of facilities to ensure that the proposed functions, and increases in personnel would be accommodated. The installation identifies infrastructure or utility needs within the scope of each corresponding project. If particular projects require additional infrastructure or utilities, they are incorporated as a part of that project. This process ensures that any infrastructure or utility deficiencies are identified in the initial planning stages.

For the following analysis, it is assumed that population impacts would be incurred on and off the installation. Under Alternative 2, an additional 34 personnel (single, with no dependents) would live on NAS Lemoore (1.5 percent of the total proposed population increase). It is assumed a majority of the new personnel and dependents would reside within the City of Lemoore, with the concentration of personnel and dependents dissipating toward the outlying areas. As the outlying areas would likely have fewer impacts to utilities (as less people would reside there), the discussion is primarily focused on impacts to the City of Lemoore. When discussing impacts regarding the installation, there would be an additional 34 personnel permanently residing on the installation however, the total increase in personnel (751) is used to assess impacts as all personnel would be on the installation during work hours.

<u>Water Supply</u>

The Westlands Water District supplies potable water to both the City of Lemoore and outlying areas, including NAS Lemoore. Water consumption would be expected to increase under Alternative 2 as a result of the increase in personnel. According to a 2005 water use report by the US Geological Survey (USGS), the average total domestic per capita use of potable water in 2005 was 124 gallons per day (0.000124 mgd) for the state of California (USGS 2005). An increase of 2,320 people (751 total personnel and 1,569 total dependents) would increase potable water demand in the region by 0.28 mgd. As the Westlands Water District supplies approximately 955.3 mgd, this increase in consumption (an increase of less than 1 percent) would not be expected to negatively impact regional potable water supply. The City of Lemoore is allocated 19.15 mgd from the Westlands Water District and the increase in personnel and dependents to this area would increase potable water consumption within the City of Lemoore by approximately 1.5 percent; however, the City of Lemoore does not anticipate any issues with this increase and currently has the capacity to accommodate this increase in growth (City of Lemoore 2012). Persons residing outside City of Lemoore city limits in unincorporated areas would utilize wells and septic systems and would most likely not be connected to municipal sewer or potable water systems (Kings County Community Development Agency 2012).

The NAS Lemoore water treatment plant has a capacity of 7.6 mgd. Average potable water consumption at NAS Lemoore from FY 2008 through FY 2010 was 2.4 mgd (DoN 2011b). It is assumed that 751 personnel, including the 34 single personnel living on the installation, would consume an average of 124 gallons per day per person. Therefore, water consumption at the installation would increase by 93,124

gallons per day (0.09 mgd). The increase in water consumption would result in a total consumption rate of 2.49 mgd; however, this increase would not exceed the existing capacity of 7.6 mgd.

The demand for water (e.g., if used as a BMP to control dust) could also increase during demolition and construction phases. However, this increase would be temporary and intermittent and would not be expected to impact regional water supply. NAS Lemoore has developed an Installation Appearance Plan and a Smart Landscaping Plan in addition to implementing water efficiency BMPs to help reduce its dependence on water transported from the Central Valley Project, including: low maintenance and low water use plants and mineral products, and compliance with Executive Order (EO) 13514, Federal Leadership in Environmental, Energy, and Economic Performance. EO 13514 requires federal facilities to reduce potable water consumption intensity by 2 percent annually through FY 2020, or 26 percent by the end of FY 2020 relative to the FY 2007 baseline.

Wastewater

The existing capacity of the City of Lemoore wastewater treatment plant is 6 mgd with a current flow of 4.1 mgd (City of Lemoore 2012). Under Alternative 2, wastewater generation would be expected to increase as a result of the proposed increase in personnel at NAS Lemoore. According to the USEPA, estimated average per capita wastewater flow typical of residential dwellings is 70 gallons per day (USEPA 2010). The increase in 2,320 personnel and dependents would result in a maximum increase to City of Lemoore wastewater treatment plant of 162,400 gallons per day (0.16 mgd). This would increase the existing wastewater generation to 4.26 mgd; however this would not exceed the existing capacity of 6 mgd. Persons residing outside City of Lemoore city limits in unincorporated areas would utilize wells and septic systems and would most likely not be connected to municipal sewer or potable water systems (Kings County Community Development Agency 2012).

The permitted capacity of the wastewater treatment facility at NAS Lemoore is 2.12 mgd (DoN 2011a). Average wastewater generation at NAS Lemoore from FY 2007 through FY 2009 was 1.27 mgd (DoN 2011b). It is assumed that of the 751 additional personnel, 714 would reside off-base with their dependents and 34 single personnel would reside on the installation. Although water consumption for personnel residing off-base was discussed in the previous paragraph, the off-base personnel would consume water during working hours and their consumption must be accounted for on-installation as well as off-installation. Therefore, the increase in 751 additional personnel would increase wastewater generation on NAS Lemoore by 0.05 mgd. This would increase existing wastewater generation on the installation to a total of 1.32 mgd; however, this would not exceed existing capacity of 2.12 mgd.

Stormwater

The proposed construction activities could temporarily affect the quality of stormwater runoff through potential increases in soil erosion. Under Alternative 2, there would be 58 acres of soil disturbed and the creation of 36 acres of new impervious surfaces. These activities can expose soils, and during storm events, stormwater can pick up soil particles, thereby increasing sediment loading of the stormwater runoff. In accordance with the Clean Water Act (CWA) Section 402 National Pollutant Discharge Elimination System (NPDES) program, BMPs would be implemented during demolition and construction

projects to minimize runoff. Prior to the start of construction for individual projects, a Notice of Intent (NOI) would be filed with the state of California, Regional Water Quality Control Board Region 5F (Central Valley) to obtain coverage under the General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (General Permit No. CAS000002). Preparation of a site-specific Stormwater Pollution Prevention (SWPP) Plan and use of associated BMPs for construction sites where one or more acres would be disturbed would also be required.

In addition, in accordance with Unified Facilities Criteria (UFC) 3-210-10, Low Impact Development (as amended, 2010), any increase in surface water runoff as a result of the proposed construction would be reduced through the use of temporary and/or permanent drainage management features such as use of bioretention, filter strips, vegetated buffers, grass swales, infiltration trenches, water harvesting, and other applicable BMPs. The integration of Low Impact Development design concepts incorporates site design and stormwater management to maintain the site's pre-development runoff rates and volumes to further minimize potential adverse impacts associated with increases in impervious surface area. The use of these features would also increase groundwater recharge through direct percolation offsetting the loss of pervious surface due to future construction.

Electricity

Electricity is provided to the City of Lemoore and surrounding areas by PG&E; however, WAPA provides electricity to NAS Lemoore. Demand for electricity would be expected to increase as a result of the increase in personnel, and the building space and facilities to be constructed would require additional electricity. However, any new facilities and additions associated with Alternative 2 would be implemented with more energy efficient design standards and utility systems than are currently in place. Construction projects would incorporate Leadership in Energy and Environmental Design (LEED) and sustainable development concepts to achieve optimum resource efficiency, sustainability, and energy conservation. Therefore, average energy consumption per facility for new buildings would be expected to remain consistent or decrease compared to energy consumption associated with existing facilities of comparable size.

According to the US Department of Energy (USDOE) State Energy Consumption Estimates, the average annual electricity consumption for a US residential home in 2008 was 11,040 kilowatt-hours (USDOE 2010). Assuming each personnel member constitutes one household, an increase of 717 personnel (34 personnel would permanently reside on NAS Lemoore) would increase electricity use in the City of Lemoore by 7,915,680 kilowatt-hours per year. According to PG&E, current forecasts show no capacity deficiencies in the area for the next three to six years. Early coordination with PG&E of anticipated growth in the area would facilitate any needed expansions to the electrical infrastructure (PG&E 2012a).

Average electricity consumption at NAS Lemoore from FY 2008 through FY 2010 was 89,688,410 kilowatt-hours (DoN 2011b). WAPA generated 28,119 gigawatt-hours (28,118,999,998 kilowatt-hours) of energy in FY 2010; the increase in 751 personnel would represent an electricity use increase of 0.03 percent of the energy generated by WAPA in FY 2010 and would not be expected to impact energy supply to NAS Lemoore.

Construction activity associated with Alternative 2 would result in some temporary interruption of utility services during construction periods. These impacts would be temporary, occurring briefly during active construction periods. In addition, the demand for energy (primarily electricity) could increase slightly during construction phases. The energy supply at the installation and in the region is adequate and would not be affected by this temporary increase in demand.

Natural Gas

SoCalGas supplies natural gas to both the City of Lemoore and outlying areas, including NAS Lemoore. Under Alternative 2, natural gas consumption would be expected to increase as a result of the increase in personnel at NAS Lemoore. Average residential consumption of natural gas within the United States in 2008 was 75,000 cubic ft per household (Energy Information Administration 2010). Assuming each personnel member constitutes one household, an increase in 751 personnel would increase natural gas use by approximately 56.3 million cubic ft. SoCalGas provides natural gas to over 20.9 million people; an increase in 751 customers (a 0.004 percent increase) would not be expected to disrupt natural gas supply to the region. SoCalGas does not anticipate any capacity issues associated with the increase of 2,320 personnel and dependents in the area as there are ample natural gas supplies in the area surrounding NAS Lemoore and the City of Lemoore (The Gas Company 2012).

Solid Waste

Proposed construction and demolition projects would generate debris requiring landfill disposal. Construction activities would begin in 2015 with the last project starting around 2025, resulting in approximately 1,382,114 ft^2 of new construction, 210,388 ft^2 of additions and alterations, and 2,790 ft^2 of building demolition. The estimated pounds of waste generated each year from new construction as described in the Characterization of Building-Related Construction and Demolition Debris in the United States (USEPA 1998) is:

(Total square footage of new construction per year) x (4.38 pounds/ ft^2)* = X pounds of debris.

*4.38 pounds per ft^2 is an estimate of debris generated during new construction based on sampling studies documented in *Characterization of Building-Related Construction and Demolition Debris in the United States* (USEPA, [June 1998]).

Under Alternative 2, the new construction (1,382,114 ft^2) would generate 6,053,659 pounds (3,027 tons) of construction debris requiring landfill disposal. The EPA has not established a generation rate for the renovation or addition of structures. As a result, these units were conservatively evaluated using the higher debris generation rate associated with demolition, 115 pounds/ft^2 (USEPA 1998). Based upon 210,388 ft^2 of additions and alterations, it is estimated that approximately 24,194,620 pounds (12,097 tons) of debris would result. Using this same calculation for the 2,790 ft^2 of building demolition it is estimated that demolition activities would result in approximately 320,850 pounds or 160 tons of debris requiring disposal. Therefore, the total amount of construction and demolition debris generated as a result of Alternative 2 would be 15,284 tons.

The solid waste generated under Alternative 2 could result in impacts to solid waste management facilities in the area. The Avenal Municipal Landfill has a remaining capacity of 8.2 million cubic yards and a permitted throughput of 475 tons per day. Assuming conservatively that the construction debris would consist primarily of concrete, the 15,284 tons of construction debris that would be generated as a result of Alternative 2 would represent 8,099 cubic yards, approximately 0.1 percent of the remaining capacity of the landfill. The construction proposed under Alternative 2 would be phased over a period of multiple years. As a result, impacts to the Avenal Municipal Landfill would not be expected to exceed the permitted throughput or significantly reduce the remaining capacity.

Compliance with the NAS Lemoore Solid Waste Management Plan and establishment of waste reduction and recycling programs would help to minimize the increase in overall solid waste generation as a result of Alternative 2. Off-installation contractors completing construction projects would be responsible for disposing of waste generated from construction activities. Contractors are required to comply with federal, state, local, and Navy regulations for the collection and disposal of municipal solid waste from the installation. Much of this material can be recycled or reused, or otherwise diverted from landfills, per the NAS Lemoore Integrated Solid Waste Management Program. All non-recyclable construction and demolition waste would be collected in a dumpster until removal off-site and would be hauled away by the contractor to the Avenal Municipal Landfill.

Construction and demolition waste contaminated with hazardous waste, asbestos-containing materials, Lead-based paint, or other undesirable components would be removed by licensed contractors and disposed of in a local hazardous waste-permitted landfill in accordance with Navy, federal, state, and local laws and regulations (see also Section 5.14, *Hazardous Materials and Waste*).

Under Alternative 2 non-hazardous municipal solid waste would be generated by personnel and their dependents both on- and off-installation. According to EPA the average non-hazardous municipal waste generated for a household is 4.43 pounds/person/day. Therefore, it is assumed that those personnel residing on the installation (34) would produce 151 pounds of non-hazardous municipal waste per day or 80 tons per year. Non-hazardous municipal waste generated by personnel and dependents off-base would result in 10,278 pounds per day or 1,875 tons per year. Additionally, CalRecycle identifies solid waste generated by government agencies at 0.59 tons/employee/year. Therefore, it is anticipated that in the course of their work day, personnel would generate 443 tons of non-hazardous municipal waste per year. Total non-hazardous municipal waste generated by Alternative 2 is anticipated to be 2,398 tons per year or 6.6 tons per day. Based on the current permitted capacity of 6,000 tons per day an additional average of 25 tons per day would not impact the current permitted capacity of the landfill.

<u>Conclusion</u>

Overall, as discussed above, implementation of Alternative 2 at NAS Lemoore would not result in significant impacts to infrastructure and utilities from proposed F-35C operations, facility development, and personnel increases. The increase in demand for water, wastewater treatment, electricity, natural gas, and solid waste disposal would be met by available capacity. Stormwater runoff from demolition and construction activities would be minimized with SWPP Plans and BMPs.

5.6.2.2 Alternative 2 – NAS Lemoore Homebasing, Effects at NAF El Centro

Under Alternative 2, a 7,249 ft^2 Special Access Program Facility would be constructed at NAF El Centro to support crew and equipment spaces, as well as pilot briefing and administrative spaces. Proposed interior renovations to Hangars 3 and 4 would provide upgraded power. These facilities would require additional electricity. However, it is anticipated that this would be a minor increase in usage and the local electrical supply could accommodate this increase. The construction activities associated with the new facility would generate approximately 31,751 pounds (16 tons) of construction debris. This would result in 8.4 cubic yards of waste requiring landfill disposal. The Allied Imperial Landfill, where NAF El Centro disposes of solid waste has approximately 15.5 million cubic yards of capacity remaining. Disposal of 8.4 cubic yards at the Allied Imperial Landfill would not result in impacts to the landfill. The new facility and upgrades to Hangars 3 and 4 would not require an increase in personnel at NAF El Centro. Therefore, other impacts to infrastructure and utilities are not anticipated. (Please see Section 4.6.1, *Affected Environment* for a description of infrastructure and utilities at NAF El Centro.)

5.6.3 Environmental Consequences for the No Action Alternative

Under the No Action Alternative, the demand for infrastructure at NAS Lemoore would remain the same as described in Section 5.6. Existing Conditions for infrastructure and utilities would remain the same, including the ongoing and as-needed maintenance and upgrading of existing systems.

5.7 SOCIOECONOMICS

5.7.1 Affected Environment

The affected environment for socioeconomics includes NAS Lemoore and Kings and Fresno counties, the counties with the strongest economic ties to activities at NAS Lemoore. This section addresses population, employment, income, and housing characteristics of the study area. This section also assesses environmental justice and the protection of children.

5.7.1.1 Population

The 2010 population in the study area was approximately 1,083,000 (see **Table 5.7-1**). The City of Lemoore grew by approximately 24 percent from 2000 to 2010. Kings and Fresno counties grew by approximately 18 percent and 16 percent, respectively, over the same time period. Rapid population growth is expected to continue, with Kings and Fresno counties projected to grow by approximately 34 percent and 29 percent, respectively, from 2010 to 2020. Population in the study area grew faster than in the state as a whole, and is projected to continue to grow at a faster rate (US Census Bureau 2011b, California Department of Finance 2007).

Table 5.7-1. Study Area Population Trends

Jurisdiction	*2000*	*2010*	*Percent Growth Rate 2000-2010*	*2020 Projection**	*Percent Growth Rate 2010-2020*
City of Lemoore	19,712	24,531	24.4%	-	-
Kings County	129,461	152,982	18.2%	205,707	34.5%
Fresno County	799,407	930,450	16.4%	1,201,792	29.2%
California	33,871,648	37,253,956	10.0%	44,135,923	18.5%

Source: US Census Bureau 2011b; California Department of Finance 2007.
Note: *2020 Projections only available for county and state.

The FY 2008 population associated with NAS Lemoore included 7,600 total personnel (6,123 military, 1,477 civilian), 4,100 military dependents, and 8,713 retirees (5,671 of who live in Kings and Fresno counties). In addition, 23,456 transient personnel participated in training programs at NAS Lemoore in FY 2008 (DoN 2009a). By 2015, after the realignment of Strike Fighter squadrons to NAS Lemoore, military personnel will total 6,415 and civilian personnel, 1,560 (DoN 2011).

5.7.1.2 Employment and Income

Employment by industry in Kings and Fresno counties for 2011 is shown in **Table 5.7-2**. The industries that employ the greatest number of people in Kings County included government (36.0 percent); agriculture (15.9 percent); trade, transportation, and utilities (12.6 percent); educational and health services (11.1 percent); and manufacturing (8.3 percent). In Fresno County, the industries that employ the most people are government (21.7 percent), trade, transportation, and utilities (16.7 percent), agriculture (13.5 percent), educational and health services (12.6 percent), and leisure and hospitality (8.4 percent) (California Employment Development Department 2011).

Table 5.7-2. Study Area Employment, 2011

Industry	*Kings County*[1]	*Fresno County*[1]
Agriculture	6,700	43,800
Mining and Logging	900	200
Construction[2]	-	10,900
Manufacturing	3,500	24,900
Trade, Transportation, and Utilities	5,300	54,100
Information	200	3,700
Financial Activities	900	13,100
Professional and Business Services	1,500	25,500
Educational and Health Services	4,700	40,900
Leisure and Hospitality	2,800	27,200
Other Services	500	10,000
Government	15,200	70,400
Total	**42,200**	**324,700**

Source: California Employment Development Department 2011.
Notes: 1. Not seasonally adjusted. April 2011, preliminary.
2. Included with Mining and Logging for Kings County.

Total personal income in the study area increased by about 16 percent in Kings County from 2005 to 2009, and by approximately 17 percent in Fresno County, over the same period (**Table 5.7-3**). Per capita income also increased from 2005 to 2009 by about 11 percent in Kings County and by approximately 10 percent in Fresno County. Total personal income grew faster in the study area than for the state as a whole. While per capita income in the study area was less than that for the state, it grew faster between 2005 and 2009 in the study area than the state level (US Department of Commerce 2011a).

Table 5.7-3. Study Area Personal and Per Capita Income

Jurisdiction	Personal Income[1,2]			Per Capita Income[1,3]		
	2005	2009	Percent Increase – 2005-2009	2005	2009	Percent Increase – 2005-2009
Kings County	$3,398,282,000	$3,931,274,000	15.7%	$23,735	$26,426	11.3%
Fresno County	$24,078,117,000	$28,049,514,000	16.5%	$27,758	$30,646	10.4%
California	$1,387,661,013,000	$1,566,999,086,000	12.9%	$38,767	$42,395	9.4%

Source: US Department of Commerce 2011b.
Notes: 1. Not adjusted for inflation.
2. Personal income is the income that is received by all persons from all sources.
3. Per capita income is the income per person in an area.

Unemployment rates in the study area have increased dramatically over the last few years as shown in **Table 5.7-4**, almost doubling from 2007 to 2011 in the City of Lemoore and Kings County, and doubling in Fresno County. The comparable 2011 unadjusted unemployment rate for California was 11.7 percent and 8.7 percent for the nation (California Employment Development Department 2011).

Table 5.7-4. Study Area Unemployment Rates

Jurisdiction	*2007[1]*	*2008[1]*	*2009[1]*	*2010[1]*	*2011[1,2]*	*Percent Increase 2007-2011*
City of Lemoore	7.5	9.1	12.7	14.5	14.6	94.7%
Kings County	8.6	10.5	14.6	16.5	16.6	93.0%
Fresno County	8.5	10.4	15.0	16.8	17.0	100%
California	5.3	7.2	11.3	12.4	11.7	120.8%

Source: California Employment Development Department 2011.
Notes: 1. Not seasonally adjusted.
2. April 2011, preliminary.

In FY 2008, NAS Lemoore employed 6,123 military and 1,477 civilian personnel. Military and civilian payrolls were approximately $557 million (DoN 2009a). Approximately 23,400 transient military and civilian personnel trained at NAS Lemoore in FY 2008, spending an average of 21 days. An economic impact assessment determined that payrolls, procurement contracts, installation expenditures, and military retirement and disability benefits resulted in an additional 4,542 jobs with labor income of approximately $161 million in Fresno and Kings counties in FY 2008. Tax revenues generated from the economic activity at NAS Lemoore provided approximately $51.6 million to federal government entities and $51.7 million to state and local government entities in 2008 (DoN 2009a). After the realignment of Strike Fighter squadrons to NAS Lemoore, 2015 employment will total 6,415 military personnel and 1,560 civilian personnel (DoN 2011).

5.7.1.3 Housing

There were approximately 359,000 housing units in Kings and Fresno counties (**Table 5.7-5**). The vacancy rate was 6.0 percent in Kings County and 8.3 percent in Fresno County, compared to 8.1 percent for California (US Census Bureau 2011b).

Table 5.7-5. Study Area Housing Units, 2010

Jurisdiction	*Housing Units*	*Percent Vacant*	*Occupied Housing Units*		
			Total	*Percent Owner*	*Percent Renter*
City of Lemoore	8,632	5.1%	8,196	52.7%	47.3%
Kings County	43,867	6.0%	41,233	54.2%	45.8%
Fresno County	315,531	8.3%	289,391	54.8%	45.2%
California	13,680,081	8.1%	12,577,498	55.9%	44.1%

Source: US Census Bureau 2011b.

In 2009 NAS Lemoore prepared an update of the 2006-2011 Housing Requirements and Market Analysis (HRMA). The HRMA assessed the housing market within an approximately 30-mile radius of NAS Lemoore, a smaller geographic area than the two-county study area. The HRMA rental market reflects the down turn in the local economy. There were approximately 15,573 rental housing units in 2009, of which approximately 12,688 units (82.5 percent) were considered suitable for military families in terms of physical conditions and health and safety concerns. A manpower update was completed in July 2011. This analysis determined that there would be a military family housing deficit of 84 units and a bachelor housing deficit of 34 units in 2014 (DoN 2009b, SAIC 2011).

NAS Lemoore recently completed construction or renovation of 1,630 single and multifamily residential homes. Family housing at NAS Lemoore averages 97 percent occupancy. In support of its bachelor population, NAS Lemoore has 16 barracks that can accommodate more than 2,000 personnel (DoN 2010). The occupancy rate averages 89 percent for the junior enlisted personnel and 50 percent for officers/senior enlisted personnel (DoN 2011). Several projects are currently underway that will convert 20 percent of bachelor housing from two to one person per room, while leaving 80 percent of bachelor housing as two person rooms. These conversions will continue through 2017 and will result in a total of 1,992 bachelor spaces (DoN 2011).

5.7.1.4 Environmental Justice

This section identifies minority and low-income communities that could be affected by the proposed action. Kings and Fresno counties serve as the communities of comparison since they are the next largest geographic areas that encompass the study area.

The total minority population is calculated as the percent of the population that is categorized in one of six racial categories and those of Hispanic or Latino origin (without double counting those who report two or more races/origins) (CEQ 1997). The low-income population is calculated using data from the 2010 American Community Survey for individuals whose income in the past 12 months has been below the poverty level. **Table 5.7-6** presents the 2010 census data on the total minority and 2010 American Community Survey 5-Year Estimates data on low-income population for the study area.

Table 5.7-6. Minority and Low-Income Population

Jurisdiction	*Total Population*	*Minority Population*	*Percent Minority*	*Percent Low-Income**
City of Lemoore	24,531	14,463	59.0%	13.0%
Kings County	152,982	99,103	64.8%	19.3%
Fresno County	930,450	625,928	67.3%	22.5%
California	37,253,956	22,297,703	59.9%	13.7%

Source: US Census Bureau 2011a, US Census Bureau 2011b.
Note: * Includes all individuals for whom poverty status is determined.

5.7.1.5 Protection of Children

This section identifies the population under 18 that could be affected by the proposed action. Kings and Fresno counties serve as the communities of comparison since they are the next largest geographic areas that encompass the study area. **Table 5.7-7** presents the 2010 census data on the population less than the age of 18 in the study area.

Table 5.7-7. Percent Under the Age of 18, 2010

Jurisdiction	*< Age 18*
City of Lemoore	30.8%
Kings County	27.8%
Fresno County	29.8%
California	25.0%

Source: US Census Bureau 2011b.

The NAS Lemoore housing area is the closest location to the proposed action where children are present on a regular basis. This area contains Akers Elementary School and RJ Neutra Elementary School, which have a combined student capacity of 1,600. This area also contains single and multi-family homes, a youth center, restaurants, a hospital, a gymnasium, an equestrian center, and other community support facilities (DoN 2010). Currently, Akers and RJ Neutra Elementary Schools are exposed to aircraft noise levels of about 60 dB CNEL. No schools in the vicinity of NAS Lemoore are exposed to noise levels of 65 dB CNEL or above (Refer to Section 5.2, *Noise*).

5.7.2 Environmental Consequences for Alternative 2

Under Alternative 2, potential impacts to socioeconomics could occur from changes in military and civilian personnel and construction expenditures. Potential impacts from homebasing at NAS Lemoore are discussed in the next two sections in terms of effects at NAS Lemoore and effects at NAF El Centro.

This socioeconomic analysis focuses on impacts due to changes in military and civilian personnel and construction expenditures. Economic impacts are defined to include direct effects, such as changes to employment, payrolls, and expenditures that affect the flow of dollars into the local economy and secondary effects, which result from the “ripple effect” of spending and re-spending in response to the direct effects.

Socioeconomic impacts, particularly impacts such as those being evaluated in this EIS, are often mixed: beneficial in terms of gains in jobs, expenditures, tax revenues, etc., and adverse in terms of growth management issues such as demands for housing and community services.

This analysis also addresses potential changes in disproportionate adverse impacts to minority and/or low income population and environmental, health, and safety risks to children. Impacts to environmental justice populations would occur if there were increased disproportionately high and/or adverse risks for any minority or low-income populations. Impacts to children would occur if there was an increased disproportionate environmental, health, or safety risk to children.

5.7.2.1 Alternative 2 – NAS Lemoore Homebasing, Effects at NAS Lemoore

Population

Under Alternative 2, military personnel at NAS Lemoore would increase by 560 and contractor/civilian employees by 191. This would represent a 9 percent increase in 2015 military positions and a 12 percent increase in 2015 contractor/civilian positions. Total military dependents would increase by approximately 1,145 and contractor/civilian dependents by about 424. The total population of the affected environment would increase by approximately 2,320, or less than 1 percent of the 2010 and 2020 populations.

Employment and Income

Including their basic pay and housing and subsistence allowances, the total gain of personnel at NAS Lemoore would earn an estimated total of $36.5 million in direct annual income. Some of these earnings would be paid to taxes, and some would be saved and invested, but most would be spent on consumer goods and services in the region. This spending would represent final demand increases to numerous economic sectors.

Ongoing secondary impacts (direct, indirect, and induced effects) would total an estimated 471 jobs and an estimated $25.2 million in labor income (Minnesota IMPLAN Group, Inc. 2011). The jobs include full- and part-time positions, and the income includes both employee compensation and proprietors' income. These jobs—in addition to the primary impacts—would last as long as the personnel changes are in effect and the income would occur each year (though results are presented in 2012 dollars).

These 471 jobs represent less than 1 percent of the 366,900 people in the region's civilian labor force in 2011 (California Employment Development Department 2011). With an unemployment rate ranging from 15 percent to 17 percent in the region, it would be expected that many of the new jobs would be filled by this unemployed labor force. Other jobs would be filled by family members of the new personnel, by other regional workers taking second jobs, and by existing employees working extra hours. Therefore, it would not be likely that the employment impacts by themselves would trigger appreciable, if any, migration to the region, beyond the military and civilian personnel and dependents.

Additional taxes would accrue to the federal, state, and local governments as a result of this new economic activity. According to the social accounting framework used for this analysis (Minnesota IMPLAN Group, Inc. 2011), the federal government would collect an additional $3.6 million annually, and

California and local governments would collectively gain $3.2 million annually. Refer to Appendix F for additional information.

Military construction and demolition projects at NAS Lemoore for Alternative 2 would span multiple years. For analysis purposes, the projects are grouped together in representative construction years (CYs) (refer to Section 2.8.2, *Alternative 2 – Facility and Infrastructure*, for more information). As shown in **Table 5.7-8**, the peak year of impacts would be CY4, resulting in an estimated 661 full- and part-time jobs. Total labor income impacts in that peak year are estimated at $36 million.

Table 5.7-8. Employment and Income Impacts Associated with Military Construction Projects at NAS Lemoore under Alternative 2

Sector[1]	*CY1*	*CY2*	*CY3*	*CY4*	*CY5*
Employment Impacts[2]					
Direct	405	155	276	400	177
Indirect	89	74	58	97	43
Induced	164	71	110	164	73
Total	**658**	**300**	**444**	**661**	**293**
Labor Income Impacts[3]					
Direct	23.867	9.182	16.247	23.594	10.462
Indirect	4.646	3.188	2.998	5.038	2.234
Induced	6.867	2.974	4.634	6.896	3.058
Total	**35.380**	**15.344**	**23.879**	**35.528**	**15.754**

Source: Estimated for this study with IMPLAN (Minnesota IMPLAN Group 2011).
Notes: 1. Impacts due to MILCON projects, assuming all expenditures in region. May not add due to rounding.
2. Number of jobs.
3. Employee compensation plus proprietors' income (in millions of 2011 dollars).

Overall, the peak year total represents less than 1 percent of the region's civilian labor force in 2011 and the peak construction employment represents about 5 percent of the 11,800 total regional construction, mining, and logging jobs in 2011 (California Employment Development Department 2011). With the high rate of unemployment in Kings and Fresno counties, it would be expected that some of these positions would be filled by regional unemployed workers. It would also be likely that some construction workers would move into the region in response to the direct job impacts in construction, but these workers would most likely leave the region for other opportunities when the construction projects near completion.

Additional taxes from construction activities would result in the federal gain of $20.8 million over the course of the construction period. In addition, California and local governments would collectively gain $13.0 million over the course of construction (Minnesota IMPLAN Group, Inc. 2011). Refer to Appendix F for additional information.

Housing

Under Alternative 2, 560 additional military and 191 contractor/civilian personnel would be assigned to NAS Lemoore over 13 years. Under this alternative, a new Bachelor Enlisted Quarter would be constructed that would house 224 unaccompanied personnel. Under a conservative scenario, the

military personnel not accommodated in the proposed Bachelor Enlisted Quarter and the contractor/civilian personnel would seek community housing at the same time. This would represent approximately less than 1 percent of the current regional housing stock. The 2011 manpower update of the HRMA projected that there would be a military family housing deficit of 84 units and a bachelor housing deficit of 34 units in 2014 (SAIC 2011).

Under this alternative, the influx of new households would potentially strain the capacity of the existing housing market. Housing deficiencies at NAS Lemoore will be addressed by Public-Private Venture Housing agreements for 124 units. In addition, the phasing of the personnel transition over approximately 13 years, vacancy rates that range from 5 percent to 8 percent, plus the response of the private housing market to the proposed action would lessen the short- and long-term impacts to the local housing market. Furthermore, advance planning and coordination with Navy planners and community leaders in the NAS Lemoore area would also mitigate potential negative effects associated with the increase in personnel.

Environmental Justice

This section evaluates potential impacts on minority and low-income communities residing in areas near NAS Lemoore in accordance with the requirements of EO 12898. In order to analyze the potential for disproportionate impacts to minority populations and low-income populations, the estimated population within Noise Zones 2 and 3 (i.e., greater than 65 dB CNEL) was further analyzed using census data at the block group level. Section 3.2 and Appendix C detail the methodology used to estimate the population within the noise zones. Census data estimates for percent minority and low-income populations within the affected block groups were used to derive the estimated minority and low-income populations within Noise Zones 2 and 3. As the US Census Bureau no longer reports poverty data in the decennial census, the analysis relied on poverty data from the 2006-2010 American Community Survey 5-Year Estimates.

Table 5.7.9 presents the results of this analysis for the baseline and Alternative 2. Under Alternative 2, there would be 51.2 percent minority population within the 65 CNEL and greater noise zone. The estimated percent minority within the 65 CNEL and greater noise zone under Alternative 2 is slightly less than under the baseline, which is estimated at 52.3 percent. Both the baseline and Alternative 2 are lower than the minority population percentage in Kings and Fresno counties (64.8 percent and 67.3 percent, respectively) and California (59.9 percent).

Table 5.7-9. Baseline and Proposed Minority and Low-Income Populations Underlying NAS Lemoore Aircraft Noise Zones under Alternative 2

Noise Zones (dB CNEL)	*Total Population*	*Total Minority Population*	*Percent Minority*	*Total Low-Income Population*	*Percent Low-Income*
Baseline (2015)					
Noise Zone 2					
65-69	844	454	53.8%	119	14.1%
70-74	641	292	45.6%	72	11.2%
Noise Zone 3					
75-79	77	72	93.5%	41	53.3%
80-84	3	1	33.3%	1	33.3%
85+	0	0	-	0	-
Total	**1,565**	**819**	**52.3%**	**233**	**14.9%**
Proposed (2028)					
Noise Zone 2					
65-69	810	449	55.4%	119	14.7%
70-74	528	244	46.2%	60	11.4%
Noise Zone 3					
75-79	0	0	-	0	-
80-84	3	1	33.3%	1	33.3%
85+	0	0	-	0	-
Total	**1,341**	**694**	**51.2%**	**180**	**13.4%**
Net Change from Baseline	**-224**	**-125**	**-**	**-53**	**-**

A 13.4 percent low-income population is estimated within the 65 CNEL and greater noise zone under Alternative 2 as compared to an estimated 14.9 percent low-income population within the 65 CNEL and greater noise zone under baseline conditions. Both percentages are lower than the low-income populations for Kings County (19.3 percent) and Fresno County (22.5 percent). The low-income population percentage for California is 13.7 percent.

In conclusion, Alternative 2 would not have disproportionately high and adverse human health or environmental effects on minority populations and low-income populations compared to the communities of comparison, Kings and Fresno counties. Based on the analysis in this EIS, Navy concludes that Alternative 2 would not result in disproportionately high and adverse human health or environmental effects on minority populations and low-income populations in the NAS Lemoore area.

Protection of Children

This section evaluates potential impacts on the population under 18 residing in areas near NAS Lemoore in accordance with the requirements of EO 13045. **Table 5.7-10** presents the population under the age of 18 that would be affected by noise levels 65 dB CNEL or greater under Alternative 2. Approximately 104 fewer children would be affected by Alternative 2 than under the baseline. The percentage of the population aged 18 and under that would be affected under this alternative would be 44.3 percent, slightly less than under baseline conditions (44.6 percent). Both the baseline and Alternative 2 are greater than the percentages for Kings County (27.8 percent) and Fresno County (29.8 percent). The

percentage of the population under the age of 18 for California is 25.0 percent. Alternative 2 would not introduce significant new noise to children under the age of 18 because 104 fewer children would be affected by noise from Alternative 2 than under the baseline.

There are no schools within the 65 dB CNEL and greater noise zone for Alternative 2 (Refer to Section 5.2, *Noise*). There would be no disproportionate environmental health and safety risks to children from implementation of Alternative 2.

Table 5.7-10. Population Under the Age of 18 Underlying NAS Lemoore Aircraft Noise Contour Zones under Alternative 2

Noise Zones (dB CNEL)	*Total Population*	*Total < Age 18 Population*	*Percent < Age 18*
Baseline (2015)			
Noise Zone 2			
65-69	844	369	43.7%
70-74	641	292	45.6%
Noise Zone 3			
75-79	77	36	46.8%
80-84	3	1	33.3%
85+	0	0	-
Total	**1,565**	**698**	**44.6%**
Alternative 2 (2028)			
Noise Zone 2			
65-69	810	352	43.5%
70-74	528	241	45.6%
Noise Zone 3			
75-79	0	0	-
80-84	3	1	33.3%
85+	0	0	-
Total	**1,341**	**594**	**44.3%**
Net Change from Baseline	**-224**	**-104**	-

Conclusion

Overall, as discussed above, implementation of Alternative 2 at NAS Lemoore would not result in significant impacts to socioeconomic characteristics from facility development and increased personnel levels. There would be less than 1 percent increase in the projected 2020 population. Industry resources would likely be able to accommodate employment demand associated with proposed construction and demolition activities. Proposed facility development and personnel increases would result in short-term and long-term economic benefits to the region. There would be no disproportionate impact to minority or low-income populations or to children in the NAS Lemoore area.

5.7.2.2 Alternative 2 – NAS Lemoore Homebasing, Effects at NAF El Centro

Alternative 2 does not result in a significant change in personnel at NAF El Centro. Facility development at NAF El Centro would include construction of one facility and renovation of Hangars 3 and 4 to provide upgraded power. Therefore, impacts to population, employment and income, and housing are not

anticipated. (Please see Section 4.7.1, *Affected Environment* for a description of socioeconomics at NAF El Centro.)

Environmental Justice

The noise effects at NAF El Centro would increase under Alternative 2 since operations would increase. **Table 5.7.11** presents the results of the analysis for the baseline and Alternative 2.

Table 5.7-11. Baseline and Proposed Minority and Low-Income Populations Underlying NAF El Centro Aircraft Noise Zones under Alternative 2

Noise Zones (dB CNEL)	*Total Population*	*Total Minority Population*	*Percent Minority*	*Total Low-Income Population*	*Percent Low-Income*
Baseline (2015)					
Noise Zone 2					
65-69	779	543	69.7%	141	18.1%
70-74	55	31	56.4%	11	20.0%
Noise Zone 3					
75-79	18	10	55.6%	4	22.2%
80-84	0	0	-	0	-
85+	0	0	-	0	-
Total	**852**	**584**	**68.5%**	**156**	**18.3%**
Proposed (2028)					
Noise Zone 2					
65-69	720	586	81.4%	144	20.0%
70-74	39	22	56.4%	8	20.5%
Noise Zone 3					
75-79	36	21	58.3%	7	19.4%
80-84	0	0	-	0	-
85+	0	0	-	0	-
Total	**795**	**629**	**79.1%**	**159**	**20.0%**
Net Change from Baseline	**-57**	**+45**	**-**	**+3**	**-**

Under Alternative 2, there would be 79.1 percent minority population within the 65 CNEL and greater noise zone. The estimated percent minority within the 65 CNEL and greater noise zone under Alternative 2 is greater than under the baseline, which is estimated at 68.5 percent. Both the baseline and Alternative 2 are lower than the minority population percentage in Imperial County (86.3 percent). The minority population in California is 59.9 percent.

A 20.0 percent low-income population is estimated within the 65 CNEL and greater noise zone under Alternative 2 as compared to an estimated 18.3 percent low-income population within the 65 CNEL and greater noise zone under baseline conditions. Both percentages are lower than the low-income populations for Imperial County (21.4 percent). The low-income population percentage for California is 13.7 percent.

Therefore, Alternative 2 would not have disproportionately high and adverse human health or environmental effects on minority populations and low income populations compared to the community of comparison, Imperial County. Based on the analysis in this EIS, Navy concludes that Alternative 2

would not result in disproportionately high and adverse human health or environmental effects on minority populations and low-income populations in the NAF El Centro area.

Protection of Children

This section evaluates potential impacts on the population under 18 residing in areas near NAF El Centro in accordance with the requirements of EO 13045. **Table 5.7-12** presents the population under the age of 18 that would be affected by noise levels 65 dB CNEL or greater under Alternative 2.

Table 5.7-12. Population Under the Age of 18 Underlying NAF El Centro Aircraft Noise Contour Zones under Alternative 2

Noise Zones (dB CNEL)	*Total Population*	*Total < Age 18 Population*	*Percent < Age 18*
Baseline			
Noise Zone 2			
65-69	779	244	31.3%
70-74	55	17	30.9%
Noise Zone 3			
75-79	18	6	33.3%
80-84	0	0	-
85+	0	0	-
Total	**852**	**267**	**31.3%**
Alternative 2			
Noise Zone 2			
65-69	720	224	31.1%
70-74	39	12	30.8%
Noise Zone 3			
75-79	36	11	30.6%
80-84	0	0	-
85+	0	0	-
Total	**795**	**247**	**31.1%**
Net Change from Baseline	**-57**	**-20**	-

The percentage of the population aged 18 and under that would be affected under this alternative would be 31.1 percent, slightly less than under baseline conditions (31.3 percent). Both the baseline and Alternative 2 are greater than the percentages for Imperial County (29.3 percent). The percentage of the population under the age of 18 for California is 25.0 percent. Alternative 2 would not introduce significant new noise to children under the age of 18 because 20 fewer children would be affected by noise from Alternative 2 than under the baseline.

One school, Seeley Elementary School, would be affected by noise levels 65 dB CNEL or greater under Alternative 2 (Refer to Section 4.2, *Noise*).

Conclusion

Overall, as discussed above, implementation of Alternative 2 at NAF El Centro would not result in significant impacts to socioeconomic characteristics because no impacts to population, employment and

income, and housing are anticipated and because there would be no disproportionate impact to minority or low-income populations or to children in the NAF El Centro area.

5.7.3 Environmental Consequences for the No Action Alternative

Under the No Action Alternative, the proposed action would not be implemented and socioeconomic conditions described in Section 5.7 would remain unchanged.

5.8 COMMUNITY SERVICES

5.8.1 Affected Environment

The affected environment for community services includes NAS Lemoore, the City of Lemoore and Kings and Fresno counties. This section addresses schools and childcare, police and fire protection, health services, parks and recreation, and religious services.

5.8.1.1 Schools and Childcare

Kings County has 13 school districts and Fresno County has 35 school districts (California County Office of Education 2011a, 2011b). Families with school age children residing at NAS Lemoore attend one of two school districts: Central Union School District and Lemoore Union High School District. Lemoore Union Elementary School District, Pioneer Union School District, Hanford Elementary School District, Hanford Joint Unified School District, and Riverdale Joint Union School District are also in the vicinity of NAS Lemoore. Capacity, enrollment, and available space data were collected from the schools and in cases where the data was not available from the schools, the California Department of Education School Accountability Report Card was used. The School Accountability Report Card is information provided annually by the schools to provide the public with information regarding student achievement, school resources, and demographics. In cases where specific school capacity was not available, California Education Code § 17071.10-17071.46 was used to determine an approximate capacity. California Education Code § 17071.10-17071.46 defines school building capacity as 25 students per classroom for kindergarten through sixth grade, and 27 students per classroom for grades seven and higher. Many schools do not report their actual capacities; therefore, this requirement was used to estimate the potential capacity of schools not reporting capacity; estimated capacities are identified in **Table 5.8-1**. **Table 5.8-1** summarizes the schools in the NAS Lemoore vicinity school districts, the grades served, the enrollment, capacity, and available space.

Table 5.8-1. Capacity and Available Space in Schools Serving the NAS Lemoore Region Based on 2010-2011 Academic Year Enrollment

County	School District	School Name	Grades Served	Enrollment	Capacity	Available Space[1]
Kings County	Central Union School District	Admiral Akers School[2]	K-8	669	1,000	331
		Central School	K-8	369	600	231
		R.J. Neutra School[2]	K-5	565	850	285
		Stratford School	PreK - 8	284	500	216
	Lemoore Union High School District	Lemoore High School	9-12	1889	1,755	**-134**
		Lemoore Middle College High School	9-12	193	200[3]	7
		Donald C. Jamison High School	9-12	95	100	5
	Lemoore Union Elementary School District	Cinnamon Elementary School	K-6	581	630	49
		P.W. Engvall Elementary School	K-6	699	700	1
		Lemoore Elementary School	K-6	659	700	41
		Liberty Middle School	7-8	645	700	65
		Meadow Lane Elementary School	K-6	486	650	164
		University Charter School	5-8	239	240[3]	1
	Pioneer Union Elementary School District	Pioneer Elementary School	K-5	596	725	129
		Frontier Elementary School	K-5	387	650	263
		Pioneer Middle School	6-8	584	850	266
	Hanford Elementary School District	Hamilton Elementary School	K-6	578	625	47
		Lee Richmond Elementary School	K-6	378	575	197
		Lincoln Elementary School	K-6	468	600	132
		Martin Luther King Elementary School	K-6	585	700	115
		Monroe Elementary School	K-6	680	725	45
		Roosevelt Elementary School	K-6	527	625	98
		Simas Elementary	K-6	705	675	**-30**
		Washington Elementary	K-6	562	675	113
		John F Kennedy Jr. High	7-8	550	810	260
		Woodrow Wilson Jr. High	7-8	605	729[4]	100[4]
		Elementary Community Day School	K-6	24	729[4]	100[4]
	Hanford Joint Union High School District	Hanford High School	9-12	1,645	2,106	461
		Hanford West High School	9-12	1,518	2,079	561
		Sierra Pacific High School[5]	9-12	425	810	385
		Earl F. Johnson High School[6]	10-12	198	486	264
		Night Continuation School[6]	11-12	66	486	420
		Hanford Community Day School[6]	9-10	9	27	18

Table 5.8-1. Capacity and Available Space in Schools Serving the NAS Lemoore Region Based on 2010-2011 Academic Year Enrollment

County	School District	School Name	Grades Served	Enrollment	Capacity	Available Space(1)
Fresno County	Riverdale Joint Unified School District	Fipps Primary School	K-3	467	525	58
		Riverdale Elementary School	4-8	519	650	131
		Riverdale High School	9-12	530	675	145
		Horizon High School	10-12	18	27	9
		Community Day School	7-12	2	27	25
			Total(7)	**19,353**	**24,380**	**5,027**

Sources: Lemoore Union High School District 2012, Lemoore Union Elementary School District 2012, California Department of Education 2012, Pioneer Union Elementary School District 2012, Hanford Elementary School District 2012, Hanford Joint Union High School District 2011, Central Union School District 2012, Riverdale Joint Unified School District 2011. Capacity information for Lemoore Union Elementary School District and Lemoore Union High School District from City of Lemoore 2008.

Notes: 1. Capacity minus Enrollment
2. Located at NAS Lemoore
3. Capacity reflects enrollment capacity, not the facility capacity. Lemoore Middle College High School's facility capacity is 60 students; the enrollment capacity is substantially higher, as the school shares facilities with the West Hills College.
4. The Elementary Community Day School and Woodrow Wilson Junior High School share facilities. "Available Space" combines both schools.
5. Sierra Pacific High School opened in 2009. Enrollment data for all schools reflects the 2010-2011 academic year, which includes only 9th and 10th grades. The 2011-2012 academic year includes grades 9-11, but was not used here as it would be inconsistent with the academic year data for the other schools shown. Each year, new students will be added to the 9th grade until grades 9-12 are all active.
6. The Earl F. John School, Hanford Community Day School, and the Night Continuation School all share facilities. However, only 1 classroom at the school is set aside for the Hanford Community Day School. Thus, while the buildings are common the facilities used are separate.
7. "Total" enrollment value includes only traditional schools; charter schools and non-traditional schools are not included. On this table, Lemoore Middle College High School, Donald C. Jamison High School, University Charter School, Elementary Community Day School, Night Continuation School, Hanford Community Day School, Horizon High School, and Community Day School are excluded from the total count.

Currently, the Central Union School District is operating at 1,063 students below capacity. This differs substantially from the Lemoore Union High School District. Lemoore High School enrollment is over capacity, despite a decrease of 215 students since the 2006-2007 academic year. The school district has a long term plan of building an additional high school to satisfy existing and future demand (City of Lemoore 2008). Similarly, the Lemoore Middle College High School also appears to be at enrollment three times the capacity, as the building capacity is only 60 students. However, this school works in concert with the adjacent West Hills College, and students are required to enroll in coursework at the college. Because of these shared facilities, the Lemoore Middle College High School is able to enroll more students than its building capacity would suggest. The Lemoore Middle College High School aims to enroll 50 students in each grade, which is controlled by more restrictive enrollment requirements permitted by the school's status as a charter school (Lemoore Union High School District 2012). The University Charter School in the Lemoore Union Elementary School District aims to enroll 60 students in each grade, and, as a charter school, may also apply more restrictive enrollment requirements (Lemoore Union Elementary School District 2012). For both of these charter schools, the enrollment capacity, rather than the building capacity is used in **Table 5.8-1.**

Donald C. Jamison High Continuation School in the Lemoore Union High School District; Community Day School in the Hanford Elementary School District; Earl F. Johnson, Community Day School, and Night Continuation School in the Hanford Joint High School District; and Horizon High School and Community Day School in the Riverdale Joint Unified School District are all "non-traditional" schools. These schools are an alternative to suspension/expulsion, offer alternative educational opportunities for students at risk of not graduating or in need of a flexible schedule, or for adult education. These schools have lower student-teacher ratios for more focused attention, as well as a high turnover rate for students as they return to their traditional district school if behavioral concerns are resolved (Lemoore Union High School District 2012, Hanford Elementary School District 2009, Hanford Joint Union High School District 2011, Riverdale Joint Unified School District 2011). For the purposes of impact and capacity analysis, these schools will not be included as part of total available capacity.

The four elementary schools comprising the Central Union School District include the two public schools on the installation. There are no plans for expansion at this time. Occasionally, children who live off the installation may attend one of the schools on the installation (Akers or Neutra elementary schools) via an inter-district transfer.

NAS Lemoore provides full-time and part-time child care services for approximately 675 children of military families. The child development center is capable of handling up to 324 children on a full-time basis. Child care also is provided by Family Child Care, a program that certifies residents on the installation to provide child care from up to six children each. Additionally, the installation sponsors a School-age Care Program that currently serves 125 children on a part-time basis, with a capacity of 180.

5.8.1.2 Police Protection

Police Services within the boundaries of the installation are the responsibility of NAS Lemoore Security. Security for the site consists of drive-by patrols and responses to service calls. Four patrols are on duty at all times. The department is staffed by 81 military personnel and 21 civilian employees and maintains a 104-member auxiliary security force. Civilians arrested at NAS Lemoore are transferred to civil authorities.

Off the installation, police services consist of the Kings County Sheriff's department and local community police departments. The Sheriff's department is located in the City of Hanford, approximately 20 miles (32.2 kilometers) east of NAS Lemoore with five satellite substations within the county (Kings County 2010). The Sheriff's department can supply a Special Weapons and Tactics team and mobile command center to NAS Lemoore, if needed. The nearest municipal police services are located in the City of Lemoore. The Lemoore police force consists of 25 officers and several support personnel (Lemoore 2011).

NAS Lemoore uses Naval Security Forces standardized policies and procedures to enforce the law, maintain good order and discipline, investigate offenses, safeguard the rights of all persons, and provide service to the community. Security policies and procedures maintained at NAS Lemoore may include specific local issues beyond that of Navy requirements and are contained in supplemental instructions to the Navy regulations.

5.8.1.3 Fire Protection

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 (DoN 1994). 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 (DoN 1994).

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 a water truck. The City of Lemoore Fire Department has a volunteer fire fighting staff of 35 and maintains six fire engines, a rescue truck, and a medical truck. The City of Hanford Fire Department operates 2 stations, has 23 firefighters, and maintains four fire engines, a wildland squad, and a light-utility vehicle (DoN 1994).

5.8.1.4 Health Services

The hospital on NAS Lemoore provides services to all military beneficiaries, and provides access to URGENT care and after-hours urgent services. Naval Hospital Lemoore provides primary care and physical exams for personnel and specialty services, including laboratory, pharmacy, radiology, and audiology. Naval Hospital Lemoore has a staff of ten primary care providers, one flight surgeon, two nurse practitioners, three physicians' assistants, three Independent Duty Corpsman, and seven specialty care providers. The hospital serves approximately 10,000 patients per month, of which about 6,500 are military members. Naval Hospital Lemoore also coordinates health services with local area hospitals, of which there are three within a 60-mile radius of NAS Lemoore: Central Valley General Hospital and Adventist Medical Center Hanford in Hanford, and Kaweah Delta district Hospital in Visalia. These hospitals provide a full range of services, including emergency care.

5.8.1.5 Parks and Recreation

NAS Lemoore provides recreational services for all personnel. Services include ITT military ticket services, outdoor equipment rental (water craft, jet skis, picnic/party equipment, auto hobby, Liberty Center, theater, bowling center, and two fitness facilities.

Off the installation there are various wildlife and recreation areas nearby, including the federal and state parks in the Sierra Nevada Mountains, and the coastal open space parks along the Pacific Coast. Most opportunities off the installation are within a two-hour drive from the installation (DoN 1994d).

5.8.1.6 Religious Services

Religious services are provided by the NAS Lemoore Chaplain's Office and include Catholic masses and Protestant services. There are facilities for other denominations in the surrounding communities, including a Jewish Temple in Visalia, which is about 30 miles from NAS Lemoore.

5.8.2 Environmental Consequences for Alternative 2

Under Alternative 2, potential impacts to community services could occur from changes in military and civilian personnel and dependents. Potential impacts from homebasing at NAS Lemoore are discussed in the next two sections in terms of effects at NAS Lemoore and effects at NAF El Centro.

5.8.2.1 Alternative 2 – NAS Lemoore Homebasing, Effects at NAS Lemoore

Schools and Childcare

As discussed in Section 5.7, *Socioeconomics*, Alternative 2 would increase the military dependent population by approximately 1,145 and contractor/civilian dependents by approximately 424, for a total of 1,569. Of this population, 378 are expected to be school-age (i.e., between 6 and 18 years) children (NAVFAC Headquarters 2011). Assuming an even distribution of ages for school district impact, this approximates 262 additional students in grades kindergarten through eight, and 116 additional high school students.

The Admiral Akers and Neutra elementary schools on the installation have a combined capacity for up to 1,850 students, 616 more than were enrolled in the 2010-2011 academic year. Thus, the population growth predicted from the Lemoore Alternative could be absorbed by these two elementary schools. An administrator from Akers Elementary School submitted a comment in support of homebasing at NAS Lemoore during the public review period for the Draft EIS.

The Lemoore Union High School District is over capacity. This results in crowded classrooms, high student to teacher ratios, and reduced learning opportunity. The addition of 116 additional students would potentially exacerbate the over-crowding concerns. The City of Lemoore General Plan indicates that the Lemoore Union High School District is planning construction for an additional school to address current and future demands. However, the proposed additional school has not moved past this early notional stage as of yet. Parents who do not wish to use Lemoore High School may opt to apply for admission to the Lemoore Middle College High School, one of the local private or parochial schools, an inter-district transfer to a different public school district, or to simply move to a different school district. The adjacent Hanford Joint Union and Riverdale Joint Unified high school districts have the combined capacity to enroll 1,816 additional high school aged students over 2012-2011 enrollment values.

Of the total predicted increase in dependent population, 141 are expected to be children younger than 6 years (NAVFAC Headquarters 2011). It is anticipated that the NAS Lemoore child development center would have the capacity to accommodate an increase in enrollment if necessary. The center plus the Family Child Care program would be able to accommodate additional children no impacts would occur.

Police Protection

Kings County has a population of 152,982 (US Census Bureau 2011). In the United States, the average level of service for populations between 100,000 and 250,000 is 1.9 police officers per 1,000 people (Bureau of Justice Statistics 2011). Alternative 2 may increase the local population by approximately 2,320 people. Based on the national average, the proposed action would necessitate the addition of 2-3 more staff members at the municipal or county police level to address the increased population from

Alternative 2 alone. Additional personnel would also be required as the Kings County population continues to grow.

The installation has planned for and assessed all essential services to ensure that the existing security services can adequately accommodate the proposed increase of aircraft and personnel under Alternative 2.

Fire Protection

The Kings County Multi-Jurisdictional Multi-Hazard Mitigation Plan identifies much of the county as being at risk of fire. The plan identifies funding sources for expansion of existing facilities, but focuses on fire-safe development over fire-fighting capabilities (King's County 2007). Thus, those living off the installation would be subject to the changing development preferences and potential to reduce the likelihood of fire damage. Alternative 2 does not incorporate any additional fire protection services.

Health Services

Currently, the installation hospital operates at approximately 54 percent capacity. Alternative 2 proposes a local population increase of 2,320, or a less than 1 percent increase to the area population. This population increase should be absorbed into the 46 percent unused hospital capacity with little impact to health services on the installation.

Parks and Recreation

The existing recreational facilities would successfully accommodate the 9 percent increase in personnel and their family members associated with Alternative 2. Therefore, there would be no impacts. Recreation off the installation would not be impacted as the increase of people assigned to NAS Lemoore would represent an insignificant increase to the County.

Religious Services

As described above, religious services are provided by the NAS Lemoore Chaplain's Office and include Catholic masses and Protestant services. Under Alternative 2, there may be an increase of 2,320 people. However, existing religious services, plus facilities for other denominations in the surrounding communities, would continue to provide religious services for the military and their dependents. There would be no impacts to religious services under Alternative 2.

Conclusion

Overall, as discussed above, implementation of Alternative 2 at NAS Lemoore would not result in significant impacts to community services from increases in personnel and dependents. Adequate capacity exists in childcare facilities and Kings County schools for school age children. Fresno County schools are operating near or over their designated capacity and could be impacted. Additional police officers would be required in the region. Additional fire protection services would not be required at NAS Lemoore. Regional fire protection services would continue to focus on fire-safe development. Health services at NAS Lemoore would be expected to meet the increased demand. Recreational opportunities on and off the installation would continue to be available. Religious services would be able to accommodate the needs of increased personnel.

5.8.2.2 Alternative 2 – NAS Lemoore Homebasing, Effects at NAF El Centro

Alternative 2 does not involve an increase in personnel at NAF El Centro. Therefore, impacts to community services are not anticipated. (Please see Section 4.8.1, *Affected Environment* for a description of community services at NAF El Centro.)

5.8.3 Environmental Consequences for the No Action Alternative

Under the No Action Alternative, the proposed action would not be implemented and there would be no increases in operations at NAS Lemoore; therefore, there would be no increases in personnel and dependents and no impacts to community services.

5.9 GROUND TRAFFIC AND TRANSPORTATION

5.9.1 Affected Environment

The affected environment for ground traffic and transportation includes NAS Lemoore, the City of Lemoore and Kings and Fresno counties. This section addresses local and regional traffic circulation, traffic conditions at NAF El Centro, and public transit.

5.9.1.1 Local and Regional Traffic Circulation

NAS Lemoore is located approximately 35 miles south of Fresno and two miles west of the City of Lemoore, California. Several principal roadways provide local access to the installation including: State Route 198, State Route 41, Grangeville Boulevard, and Arsenal Cutoff Road (**Figure 5.9-1**). State Route 198 is an east-west highway that connects Interstate 5 (I-5), approximately 20 miles west of NAS Lemoore with Highway 99, approximately 33 miles to the east of NAS Lemoore. I-5 and Highway 99 are major highways that contribute to the regional traffic circulation. I-5 is the major north-south highway through central California. Highway 99 is a north-south highway that connects to Fresno to the north and Bakersfield to the south.

State Route 198 provides direct access to NAS Lemoore from the cities of Hanford and Lemoore. State Route 198 is four-lanes from the NAS Lemoore's main gate east to State Route 41. West of the main gate, State Route 198 is two-lanes. **Table 5.9-1** identifies current annual average daily traffic (ADT) volumes associated with State Route 198 within the project area. The annual ADT levels presented in **Table 5.9-1** show that the roadway segments are operating at adequate capacity.

Table 5.9-1. State Route 198 Local Roadway Annual ADTs

Roadway Segment	*Back Annual ADT**	*Ahead Annual ADT**
Main Gate NAS Lemoore	2,350	17,500
Avenal Cutoff Road	17,500	18,000
Junction State Route 41	18,000	18,500

Source: California Department of Transportation 2009.
Note: *Back annual ADT represents traffic south or west of the count location. Ahead annual ADT represents traffic north or east of the traffic location.

State Route 41 is a four-lane north-south highway which provides access to Lemoore and Fresno. A full diamond interchange connects State Route 41 with State Route 198, east of NAS Lemoore. State Route 41 is an important local and regional roadway as it connects Fresno to the north of Lemoore and

Kettleman City to the south where it intersects with I-5. **Table 5.9-2** identifies current annual ADT volumes associated with State Route 41 within the project area.

Table 5.9-2. State Route 41 Local Roadway Annual ADTs

Roadway Segment	*Back Annual ADT**	*Ahead Annual ADT**
Jackson Avenue	7,500	7,700
Junction State Route 198	7,700	14,100
Grangeville Boulevard	19,700	15,700

Source: California Department of Transportation 2009.
Note: *Back annual ADT represents traffic south or west of the count location. Ahead annual ADT represents traffic north or east of the traffic location

Jackson Avenue is a two-lane primary collector roadway that carries east-west traffic between State Route 198 and State Route 41. Avenal Cutoff Road is a two-lane, north-south arterial road that has a diamond interchange with State Route 198. Avenal Cutoff Road terminates at the interchange with State Route 198 and would carry traffic from south of NAS Lemoore. Grangeville Boulevard is an arterial two-lane, east-west road that provides direct access to NAS Lemoore from State Route 41. The intersection of Grangeville Boulevard and State Route 41 is signalized.

The annual ADT levels presented in **Table 5.9-2** show that roadway segments are operating at adequate capacity.

5.9.1.2 Public Transit

In addition to single occupancy vehicles traveling on local and regional roadways, Kings County has a public transit system, Kings Area Rural Transit (KART) that operates Monday through Friday. KART provides several routes and services the downtown areas of Hanford and Lemoore, as well as regular service between Hanford and Armona, Avenal, Corcoran, Fresno, Grangeville, Hardwick, Kettleman City, Laton, Lemoore, Stratford and Visalia (KART 2011). The Hanford-Lemoore and Hanford NAS Route provides service to NAS Lemoore between the hours of 6 a.m. and approximately 6 p.m., Monday through Friday.

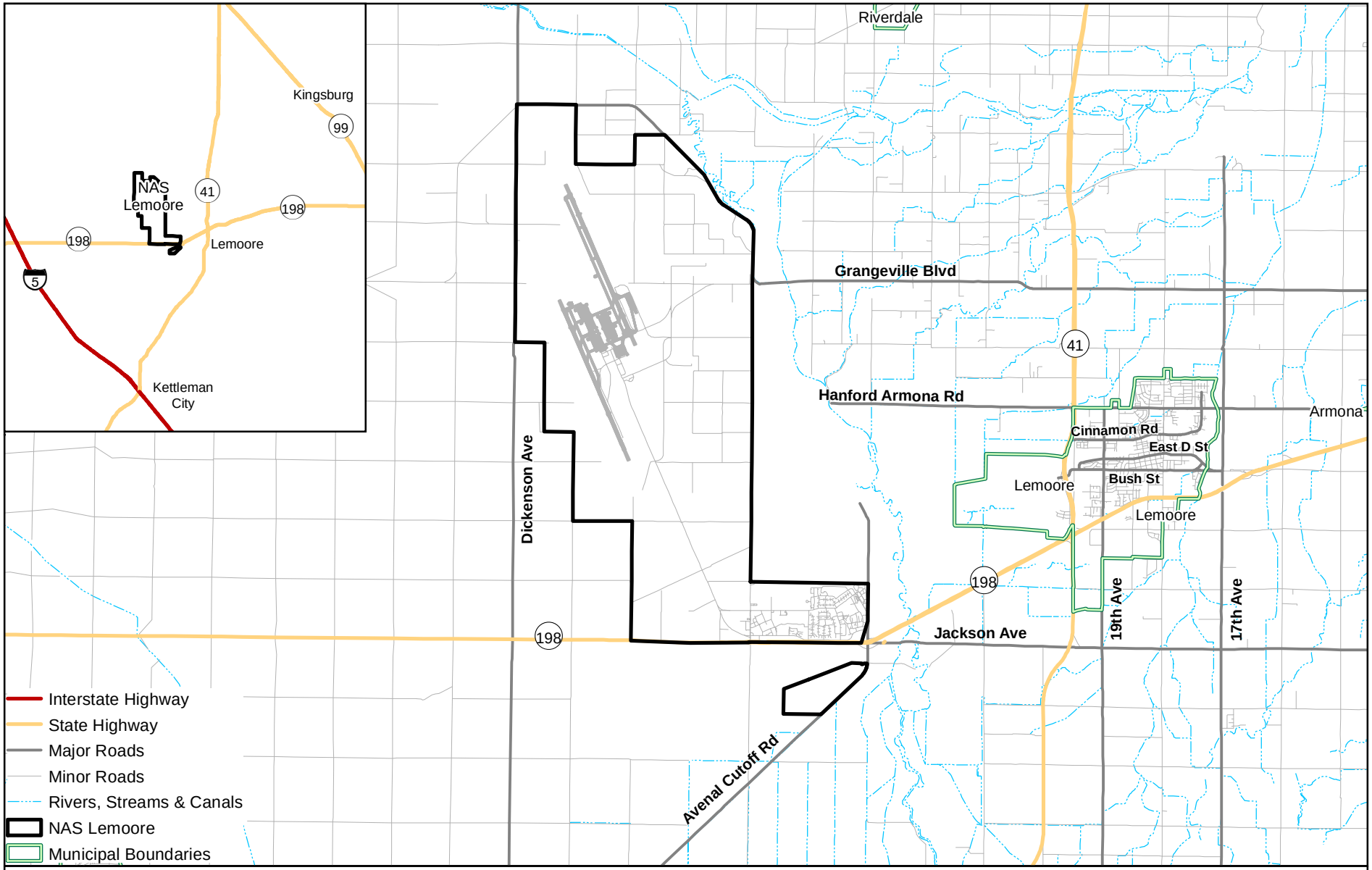


Figure 5.9-1
Local and Regional Traffic Circulation – NAS Lemoore

5.9.2 Environmental Consequences for Alternative 2

Under Alternative 2, potential impacts to ground traffic and transportation could occur from changes in military and civilian personnel. Potential impacts from homebasing at NAS Lemoore are discussed in the next two sections in terms of effects at NAS Lemoore and effects at NAF El Centro.

5.9.2.1 Alternative 2 – NAS Lemoore Homebasing, Effects at NAS Lemoore

Operations Traffic

Homebasing the F-35C at NAS Lemoore would require 751 additional personnel to support the F-35C operations. Existing Navy personnel at NAS Lemoore currently supporting the FA-18 squadrons would transition to provide support for the F-35C squadrons. For this analysis, it is assumed that the majority of the FA-18 personnel currently resides off the installation and commutes via the local and regional roadways to NAS Lemoore and would continue to make the same commute if transitioned to support the F-35C. The increase in personnel would result in increases to daily trips made to and from NAS Lemoore, however the traffic is anticipated to be dispersed between the three primary gates leading onto the installation and that military operations typically begin earlier and end earlier than traditional peak hour commute times.

Additionally, the 2011 Kings County Traffic Plan identifies several area roadways that are slated for improvements to the roadway infrastructure (resurfacing, new overlay, signals and approach work) and capacity. The plan also identifies level of service (LOS) for several roadways in the Lemoore area.

Bush Street from State Route 41 west, currently operates at a LOS C, which is an acceptable LOS. No additional improvements were identified for this section of roadway.

Cinnamon Drive, west of State Route 41, currently operates between a LOS A and B. These are acceptable levels of service and no capacity adding projects are planned. This is a major truck route and the plan identifies the need for roadway repairs to extend the lifespan of the roadway.

- East D Street, west of State Route 41, currently operates between a LOS B and C, which are acceptable levels of service. No infrastructure or capacity adding projects are planned.
- Hanford Armona Road connects State Route 41 to State Route 198 west of Lemoore. According to the traffic plan the road was recently widened to four-lanes to accommodate increases in traffic. The section of roadway between State Route 41 and 17th Avenue currently functions at a LOS B.
- The roadway segment between 18th and Lemoore Avenue (west of State Route 41) currently functions at a LOS B
- 19th Avenue between D Street and State Route 198 currently operates at LOS A.

Based on the information provided in the traffic plan, major roadways with in the City of Lemoore are operating at acceptable levels of service. This data in addition to the levels of service for roadways that access NAS Lemoore indicate that area roadways are currently functioning at acceptable levels of service. Under Alternative 2, there would be an increase of 751 personnel at NAS Lemoore. It is anticipated that the additional personnel and their dependents would live off the installation and would

reside in the Lemoore area. It is unlikely that the local roadway levels of service would be impacted based on four factors:

1. Personnel trips to NAS Lemoore would be distributed throughout the day.
2. Military personnel typically report earlier and leave earlier than traditional work hours that correlate with traditional AM and PM Peak Hours (7-9 a.m. and 4-6 p.m., respectively).
3. The majority of personnel and their dependents will reside in the Lemoore area. However, it is anticipated that their residences will be distributed throughout the region. Therefore, traffic associated with the trips generated from the personnel and their dependents should be dispersed throughout the area roadway network.
4. Trips made by military dependents are also anticipated to be dispersed throughout the day.

Therefore, the Alternative 2 is not anticipated to adversely impact traffic on local and regional roadways.

Construction Traffic

Temporary impacts to local and regional traffic would occur during construction and demolition activities. It is anticipated that construction vehicles would primarily use the main gate at State Route 198 which may result in minor congestion if significant numbers of construction vehicles are entering the main gate during peak commute times. However, it is anticipated that the construction vehicles entering and exiting the main gate would be dispersed over the course of the work day and therefore would not contribute to congestion and vehicle back logs at the main gate that may affect traffic on State Route 198.

Conclusion

Overall, as discussed above, implementation of Alternative 2 at NAS Lemoore would not result in significant impacts to traffic and transportation from increases in personnel and associated traffic on local roads. There would be temporary increases in traffic associated with construction and demolition activities. No significant impacts to levels of service are anticipated.

5.9.2.2 Alternative 2 – NAS Lemoore Homebasing, Effects at NAF El Centro

Under Alternative 2, a Special Access Program Facility would be constructed at NAF El Centro. This facility would not require additional personnel. There would be temporary increases in traffic associated with construction activities. However, no significant impacts to traffic and transportation are anticipated. (Please see Section 4.9.1, *Affected Environment* for a description of ground traffic and transportation at NAF El Centro.)

5.9.3 Environmental Consequences for the No Action Alternative

Under the No Action Alternative, the proposed action would not be implemented. There would be no change to the number of military personnel stationed at NAS Lemoore and baseline conditions would remain unchanged.

5.10 BIOLOGICAL RESOURCES

5.10.1 Affected Environment

The affected environment for biological resources includes those areas at NAS Lemoore that would be disturbed by demolition and construction activities and proposed aircraft operations. This section addresses vegetation, wildlife, and special-status species.

5.10.1.1 Vegetation

NAS Lemoore is located with the Panoche and Cantua Fans and Basin Eco-subregion within the Great Valley Section of the California Dry Steppe Province (Bailey 2008). However, most areas on NAS Lemoore have been actively altered through development, landscaping and pavement, and therefore contain little native vegetation. The predominant types of vegetation that occur on the installation include agricultural, mowed grasslands, developed (within the industrial section of the installation) and landscaped areas (**Figure 5.10-1** and **Table 5.10-1**) (DoN 2001).

Table 5.10-1. Vegetation Types on NAS Lemoore

Type	*Acres*
Agricultural	13,769
Mowed Grasslands	2,609
Landscaped	820
Industrial	535
Wastewater Treatment Ponds	416
Retired Agricultural Land	283
Wetland	213
Eucalyptus Grove Windbreaks	82
Disturbed Lands/Ruderal	61
Total	**18,788**

Source: Tierra Data 2011.

Nearly 75 percent (approximately 13,769 acres) of the total land area of NAS Lemoore is leased to farmers for agricultural purpose. These agricultural areas also serve for dust abatement and soil erosion control which is critical to the airfield maintenance and sustainability. The predominant crops are cotton (*Gossypium* spp.), wheat (*Triticum aestivum*), and sugar beets (*Beta vulgaris* ssp. *vulgaris*) (DoN 2001; NAS Lemoore 2011).

The vegetation found in the developed and landscaped areas consists of small lawns of Bermuda grass (*Cynodon dactylon)* and ornamental trees and shrubs such as Washingtonian palm (*Washingtonian* spp.), honey locust (*Gleditsia triacanthos inermis*), black locust (*Robinia pseudo-acacia*), oleander (*Nerium oleander*), and pyracantha (*Pyracantha* spp.) (DoN 2001).

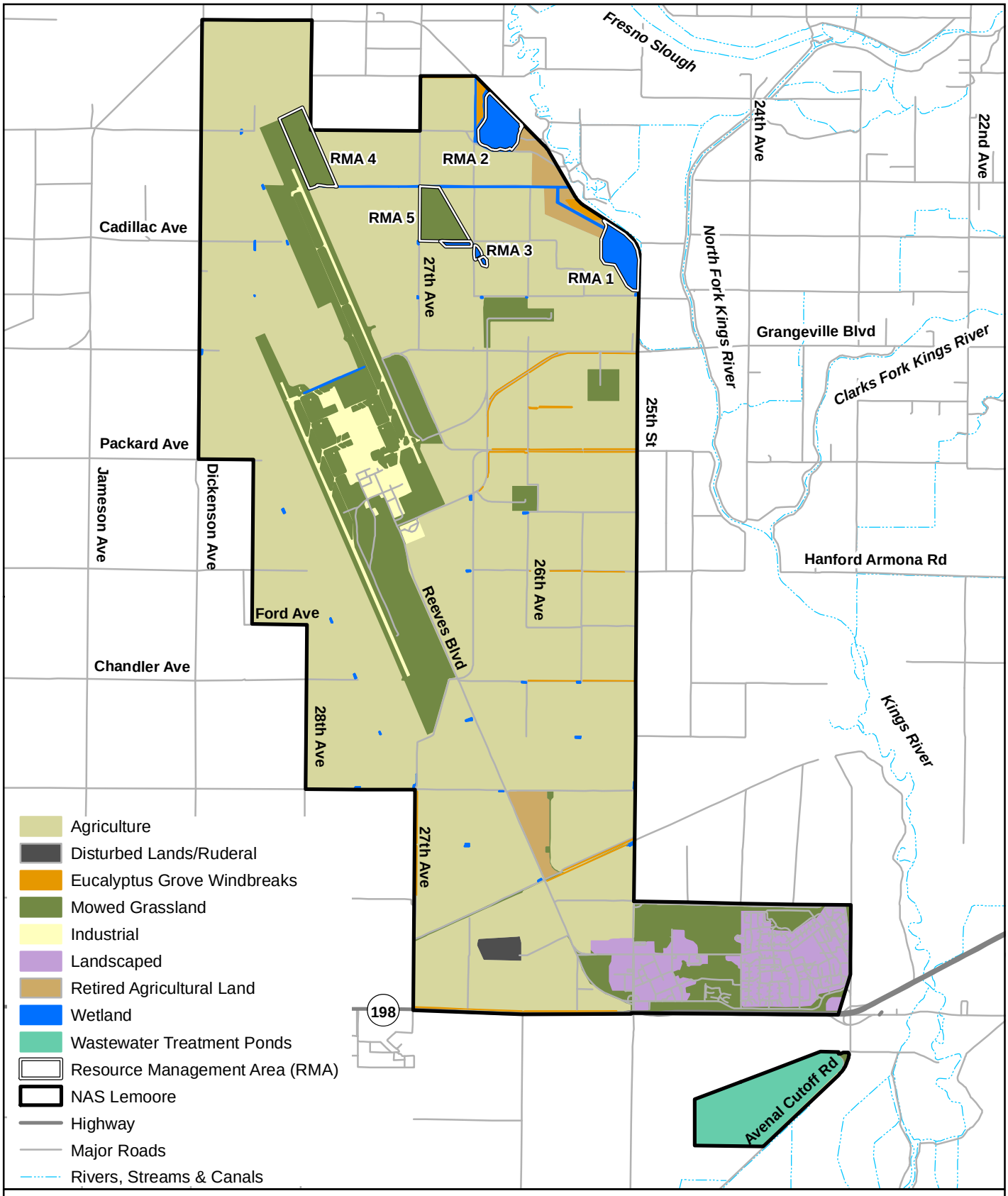


Figure 5.10-1
Vegetation Types at NAS Lemoore

Sources: DoN 2001; Tierra Data 2011

These developed and landscaped areas are surrounded by disturbed annual grasslands. The dominant annual grasses observed in this community include wild oats (*Avena fatua)*, ripgut brome (*Bromus diandrus*), soft brome (*Bromus hordaceus*), hare barley (*Hordeum murinum* ssp. *leporinum*), and rattail fescue (*Vulpia myuros* var. *myuros*). Approximately 10 percent of the grasslands contain native and non-native forbs, with the most widespread non-native species being prickly lettuce (*Lactuca serriola*), red-stemmed filaree (*Erodium cicutarium*), musky stork's bill (*Erodium moschatum*), annual yellow sweetclover (*Melilotus indica*), burclover (*Medicago polymorpha*), and winter vetch (*Vicia villosa* ssp. *varia*). Native forbs found in the grasslands include Indian paintbrush (*Castilleja* spp.), California goldfields (*Lasthenia californica*), and several clover species (*Trifolium* spp.) (DoN 2001).

In addition to naturally-occurring wetland communities, man-made wetlands are present along drainage ditches and other low-lying areas that receive runoff from the agricultural land surrounding the installation (DoN 2001).

Over 80 acres of windbreaks have been planted throughout NAS Lemoore in key areas such as roadways, railroad lines, and parcel boundaries. These consist primarily of eucalyptus (*Eucalyptus* spp.) and oleanders, and to a lesser degree, various atriplex species (*Atriplex* spp.), salt cedar (*Tamarix* spp.), and willow *(Salix* spp.) (DoN 2001).

NAS Lemoore contains five Resource Management Areas (RMAs) that are managed for the benefit of wildlife and native plant communities (**Figure 5.10-1**). One of these RMAs, RMA 1 supports vegetation that is uncommon or not found elsewhere on the installation. Native species found in this area include alkali mallow (*Malvella leprosa*); common tarweed (*Hemizonia pungens* ssp. *pungens*); Great Valley gumweed (*Grindelia camporum* var. *camporum*); common yarrow (*Achillea millefolium*); fourwing saltbush (*Atriplex canescens* ssp. *canescens*), a species which is particularly predominant in the southern portion of this area; and inland saltgrass (*Distichlis spicata*), a species dominant in the eastern portion of the area. Nonnative species include yellow star thistle (*Centaurea solstitialis*) and Russian knapweed (*Acroptilon repens*) (DoN 2001). The remaining RMAs contain habitat already described above. RMA 2 primarily consists of wetlands, including Sunset Lake, a grove of eucalyptus trees, and annual grassland habitat. RMA 3 contains an old irrigation reservoir forming a small wetland area. RMAs 4 and 5 primarily consist of annual grasslands.

5.10.1.2 Wildlife

Wildlife species diversity and abundance on NAS Lemoore is somewhat limited by the extensive existing development and lack of native habitat. Habitats on and near NAS Lemoore are typical of what one would expect for a small, somewhat isolated urbanized area in the arid region of the southern San Joaquin Valley.

<u>Mammals</u>

Common mammal species observed within the developed and landscaped areas of the installation include Mexican freetail bat (*Tadarida brasiliensis*), western pipistrelle (*Pipistrellus hesperus*), house mouse (*Mus musculus*), raccoon (*Procyon lotor*), California ground squirrel (*Spermophilus beecheyi*), and domestic cats and dogs. Mammals associated with annual grasslands and agricultural land on the

installation include the black-tailed jackrabbit, Virginia opossum (*Didelphis virginiana*), and coyote (NAS Lemoore 2010).

Reptiles and Amphibians

Common reptile and amphibian species commonly found in the annual grasslands on the installation include western whiptail, western fence lizard (*Sceloporus occidentailis*), side-blotched lizard (*Uta stansburiana*), and gopher snake (*Pituophis catenifer*). Reptiles and amphibians found within wetland habitats on the installation include bullfrog (*Rana catesbeiana*), California toad (*Anaxyrus boreas halophilus*), Pacific tree frog (*Pseudacris regilla*), western spadefoot toad (*Scaphiopus hammondii*), and California kingsnake (*Lampropeltis getula californiae*) (NAS Lemoore 2010).

NAS Lemoore has been actively managing for spadefoot toads, a California Species of Special Concern. The western spadefoot toad has been observed within the vicinity of RMAs 1, 2, and 3 (**Figure 5.10-2**). Surveys are routinely conducted for spadefoot toad on the installation to document its presence and to identify its preferred habitat conditions (DoN 2001; NAS Lemoore 2010).

Birds

Birds commonly using the sewage pond areas on the installation include the burrowing owl, American white pelican (*Pelecanus erythrorhynchos*), black tern (*Chlidonias niger*), loggerhead shrike (*Lanius ludovicianus*), northern harrier (*Circus cyaneus*), and whimbrel (*Numenius phaeopus*). Other common birds using the agricultural and developed areas include the greater sandhill crane (*Grus canadensis tabida*), olive-sided flycatcher (*Contopus cooperi*), short-eared owl (*Asio flammeus*), and white-tailed kite (*Elanus leucurus*) (NAS Lemoore 2010).

NAS Lemoore actively manages its burrowing owl populations scattered throughout the installation's grassland habitats. An updated burrowing owl management plan was prepared for NAS Lemoore in 2009 (Rosenberg et al. 2009). Although listed as a Species of Concern by the USFWS and a Species of Special Concern by the California Department of Fish and Game (CDFG), burrowing owls can also become a potential BASH problem as they occur along the installation's runways. Surveys conducted from 1997 through 2008 found active burrows along the runways, within the runway buffer strips, some of the RMAs, the capped landfill site, and the receiver station site (**Figure 5.10-2**) (Rosenberg et al. 2009). Nests have been located in all grassy areas of the installation at some point during the past surveys. Some conservation strategies described in the installation's INRMP that are being implemented for the benefit of burrowing owls include population monitoring, installing artificial burrows in selected areas to encourage owl use, and vegetation management such as using prescribed fire, mechanical mowing, and livestock grazing in select areas (Rosenberg et al. 2009).

Recent 2010 surveys observed 85 species of birds on the installation and all are protected under the Migratory Bird Treaty Act (MBTA) except 3 species: European starling, house sparrow, and rock dove (DoN 2001; NAS Lemoore 2010). Birds that are also listed under federal or state law are discussed below under Special-status Species.

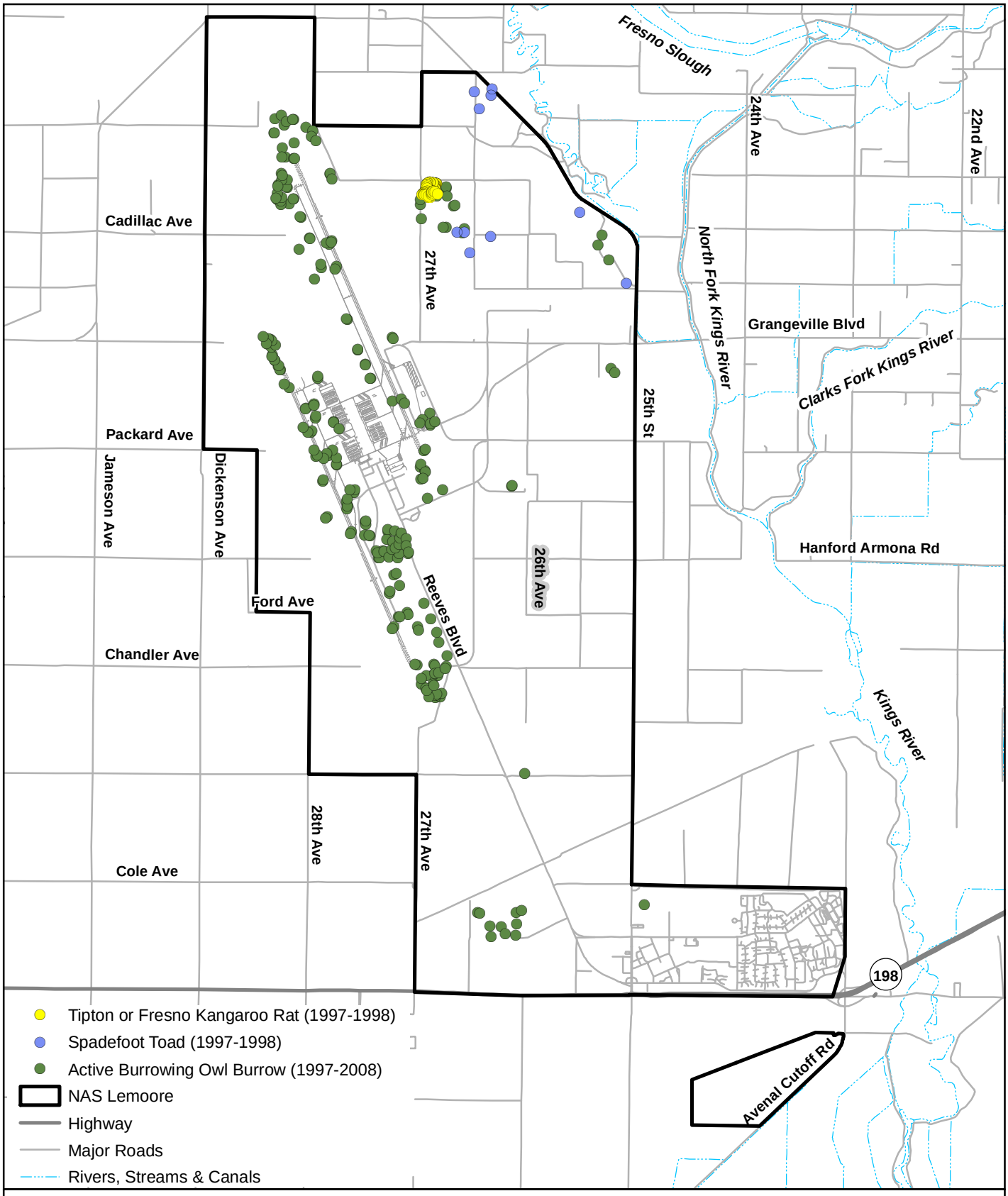


Figure 5.10-2
Occurrence of Kangaroo Rats, Spadefoot Toad, and Burrowing Owl Burrows at NAS Lemoore

Sources: DoN 2001; Rosenberg et al. 2009

5.10.1.3 Special-Status Species

Endangered Species Act-Listed Species and Critical Habitat

The California Natural Diversity Database (CNDDB) (CNDDB 2011), NAS Lemoore INRMP (DoN 2001), and a 2010 survey report (NAS Lemoore 2010) were reviewed to obtain prior and current records of special-status species occurrences on the installation. No designated critical habitat occurs on NAS Lemoore. Three federally endangered species have been observed on the installation: California least tern (*Sterna antillarum brownii*), Fresno kangaroo rat (*Dipodomys nitratoides exilis*), and Tipton's kangaroo rat (*Dipodomys n. nitratoides*). Although not confirmed as occurring on the installation, suitable habitat does occur on the installation for the following federally listed species: San Joaquin wooly threads (*Monolopia congdonii*), vernal pool fairy shrimp (*Branchinecta lynchi*), valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*), blunt-nosed leopard lizard (*Gambelia silus*), giant garter snake (*Thamnophis gigas*), western snowy plover (*Charadrius alexandrinus nivosus*), and San Joaquin kit fox (*Vulpes macrotis mutica*) (DoN 2001; NAS Lemoore 2011). **Table 5.10-2** provides a summary of the listing status and preferred habitats for special-status species known to occur or potentially occurring on the installation.

The California least tern is one of three subspecies that nests on sandy beaches and salt flats along the west coast of North America, from Baja California, Mexico, north to the San Francisco Bay area. The California least tern is considered a transient visitor to NAS Lemoore and has been observed foraging primarily within the wetland habitats on the installation; it has not been observed breeding on NAS Lemoore (DoN 2001; USFWS 2006).

Tipton and Fresno kangaroo rats have been observed only in Tumbleweed Park (RMA 5) on NAS Lemoore (**Figure 5.10-2**). The Fresno and Tipton kangaroo rats are two of three subspecies of the San Joaquin kangaroo rat. Both live in ground burrows and occupy similar geographic ranges of the Tulare Basin and southeastern half of the San Joaquin Basin in the San Joaquin Valley. Fresno kangaroo rats occupy sandy and saline sandy soils in chenopod scrub and annual grassland communities. Tipton kangaroo rats are typically found in sparsely scattered woody shrubs with a ground cover of introduced and native annual grasses and forbs. Loss of habitat to cultivation, grazing, and land conversion have been the most significant threats to these species (USFWS 1998). Since the early 1980s, NAS Lemoore has been managing for the two kangaroo rat subspecies including prescribed burning to manage vegetation condition, monitoring of irrigation flows by lessees, and contracting with a species specialist to study and monitor these species (DoN 2001). Tumbleweed Park is not in the vicinity of any proposed construction or renovation activities.

In 2010, biological surveys were conducted for the federally listed San Joaquin kit fox, blunt-nosed leopard lizard, western snowy plover, and valley elderberry longhorn beetle. None of these species were observed during this survey (NAS Lemoore 2010). No Endangered Species Act (ESA)-listed species are expected to occur in the proposed project areas associated with proposed construction activities due to lack of suitable habitat.

Table 5.10-2. Special-Status Species and California Species of Concern Known to Occur, or Potentially Occurring, at NAS Lemoore

Common Name	Scientific Name	Federal/State Status(1)	Presence Confirmed(2)	May Occur(2)	Habitat
Plants					
San Joaquin wooly threads	*Monolopia congdonii*	E/-	No	Yes	Vernal pools.
Invertebrates					
Vernal pool fairy shrimp	*Branchinecta lynchi*	T/-	No	Yes	Vernal pools.
Valley elderberry longhorn beetle	*Desmocerus californicus dimorphis*	T/-	No	Yes	Mature elderberry shrubs
Reptiles					
Blunt-nosed leopard lizard	*Gambelia silus*	E/E	No	Yes	Semi-arid grasslands, alkali flats, and washes.
Giant garter snake	*Thamnophis gigas*	T/T	No	Yes	Emergent marsh.
Birds					
California least tern	*Sterna antillarum brownii*	E/E	Yes	--	Salt pans, beaches, and dunes,
Burrowing owl	*Athene cunnicularia*	SC/CSC	Yes	--	Grasslands, deserts, farmlands, rangelands, golf courses, and vacant lots in urban areas.
Swainson's hawk	*Buteo swainsoni*	-/T	Yes	--	Nests in tall trees and feeds in croplands, and grasslands.
Golden eagle	*Aquila chrysaetos*	BGEPA/-	No	Yes	Nests in tall trees and cliffs; feeds in open, arid and grassland areas.
Bald eagle	*Haliaeetus leucocephalus*	BGEPA/E	No	Yes	Nests in trees near reservoirs, lakes, and rivers; forages along waterbodies.
Western snowy plover	*Charadrius alexandrinus nivosus*	T/CSC	No	Yes	Intertidal mudflats, beaches, dunes, salt flats, sand margins of rivers, lakes, and ponds.
Mammals					
Fresno kangaroo rat	*Dipodomys nitratoides exilis*	E/E	Yes	--	Grasslands and alkali dessert scrub.
Tipton kangaroo rat	*Dipodomys n. nitratoides*	E/E	Yes	--	Arid land with level terrain.
San Joaquin kit fox	*Vulpes macrotis mutica*	E/T	No	Yes	Grasslands and farm-field edges.

Notes: 1. BGEPA = protected under the Bald and Golden Eagle Protection Act; CS = California Sensitive Species; CSC = California Species of Special Concern; E = endangered; T = threatened.

2. Based on information provided in the NAS Lemoore INRMP (DoN 2001), 2010 biological surveys conducted on NAS Lemoore (NAS Lemoore 2010), a search of the 2011 CNDDB (CNDDB 2011), and Appendix C of the Kings County General Plan Update (Kings County Planning Agency 2008). Sensitive species in the region whose presence is unconfirmed, and the last known record of occurrence or sighting is more than 20 years old, have been excluded from this table. Also excluded are species of unknown occurrence that did not show up in the 3-quad search of the CNDDB.

California-Listed Species

In addition to federally listed species, one state-listed threatened species (Swainson's hawk [*Buteo swainsoni*]) has been observed nesting and foraging on NAS Lemoore (NAS Lemoore 2010). Swainson's hawks nest in tall trees and feed on rodents and ground squirrels in croplands, especially alfalfa. Swainson's hawks often nest at the edge of riparian areas, but also use lone trees in agricultural fields or pastures (CDFG 2011).

5.10.2 Environmental Consequences for Alternative 2

5.10.2.1 Alternative 2 – NAS Lemoore Homebasing, Effects at NAS Lemoore

Vegetation

Impacts to vegetation at NAS Lemoore due to the proposed demolition of an existing facility and construction of new facilities would not be significant. Construction of new facilities associated with Alternative 2 at NAS Lemoore would primarily occur on currently paved or actively managed (i.e., mowed and landscaped) areas, and would impact approximately 58 acres, resulting in an increase of 36 acres of impervious surfaces (**Figure 5.10-3**). Of these 58 acres, 47 acres would consist of actively managed areas (i.e., mowed grasslands) and 11 acres would consist of previously developed areas (i.e., industrial). Therefore, there would be no significant impacts to vegetation at NAS Lemoore under Alternative 2.

Wildlife

Proposed demolition and construction activities associated with Alternative 2 would primarily occur within areas that have been previously disturbed and are actively managed (i.e., mowed and landscaped). Most construction projects are anticipated to take about 12 months to complete; however, some projects may take up to 24 months. Project activities would result in short-term increases in noise levels within project areas temporarily displacing wildlife and migratory birds from the immediate area. While wildlife and migratory birds may experience short-term intermittent disturbance associated with noise from construction activities, this potential effect is lessened in context of the airfield environment, where the background noise and activity levels are high. Wildlife species including migratory birds in the area have adapted to a developed, urban setting and are therefore less likely to be affected by any short-term noise associated with the proposed construction projects because they would generally be tolerant/acclimated to these noise and activity levels. Impacts to wildlife and migratory birds would not be significant due to their habituation to relatively high noise levels and the limited areas of suitable habitat that would be impacted by proposed demolition and construction activities.

The burrowing owl is known to occur in the immediate vicinity of the proposed construction projects (i.e., actively managed, mowed grassland areas) (**Figure 5.10-4**). Burrowing owls are a migratory bird species that is well-known to be an adaptable species often occupying open space areas at airfields, apparently unperturbed by aircraft noise or human presence. However, burrowing owls can also become a potential BASH problem. NAS Lemoore, like many military airfields with a stable burrowing owl population, actively manages this species' potential habitat by mowing open space areas near the flightline to maintain very short grass conditions. It is unlikely that burrowing owls would be disturbed by either short-term construction noise under Alternative 2.

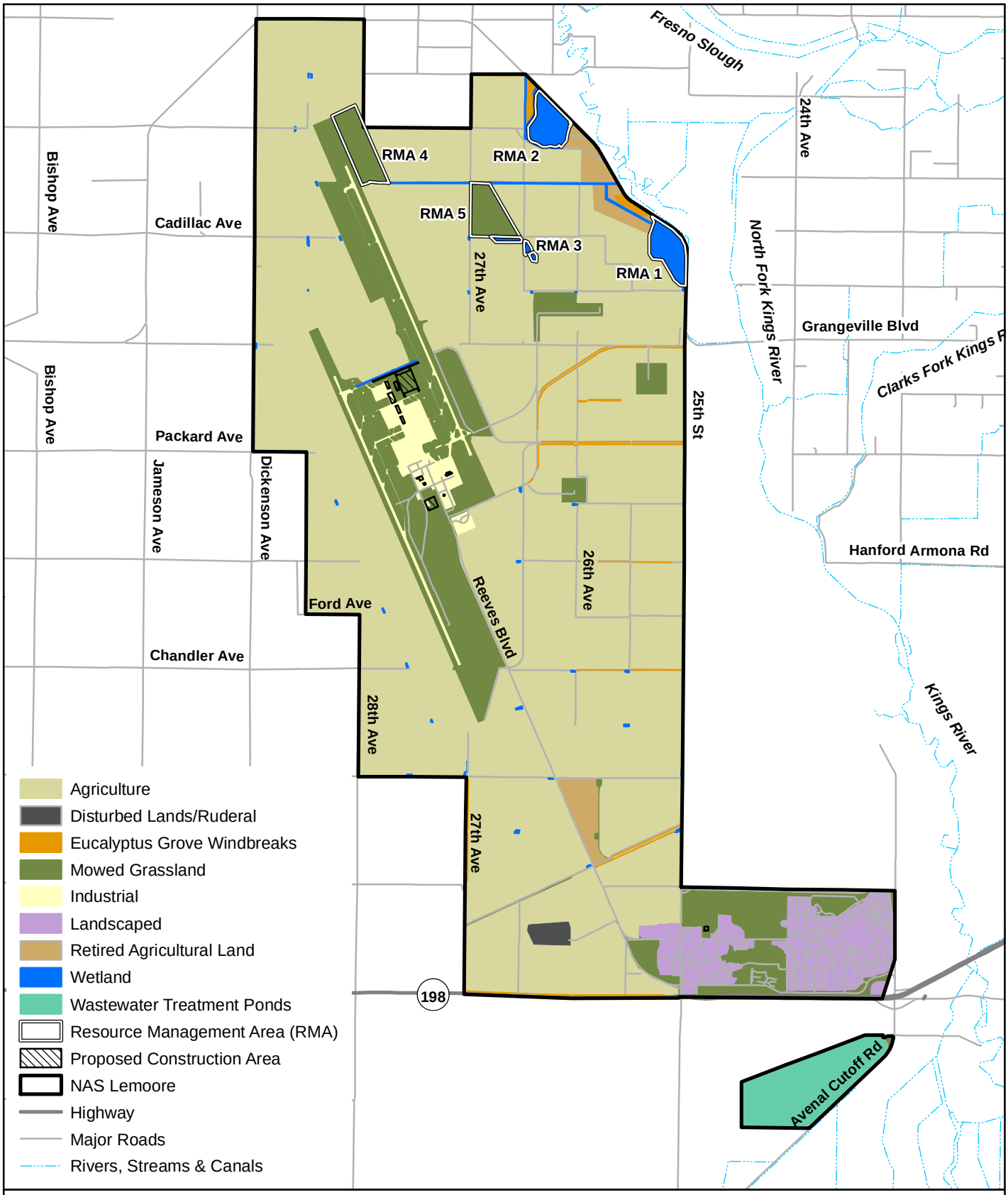


Figure 5.10-3
Potential Impacts to Vegetation Types at NAS Lemoore under Alternative 2

Sources: DoN 2001; Tierra Data 2011

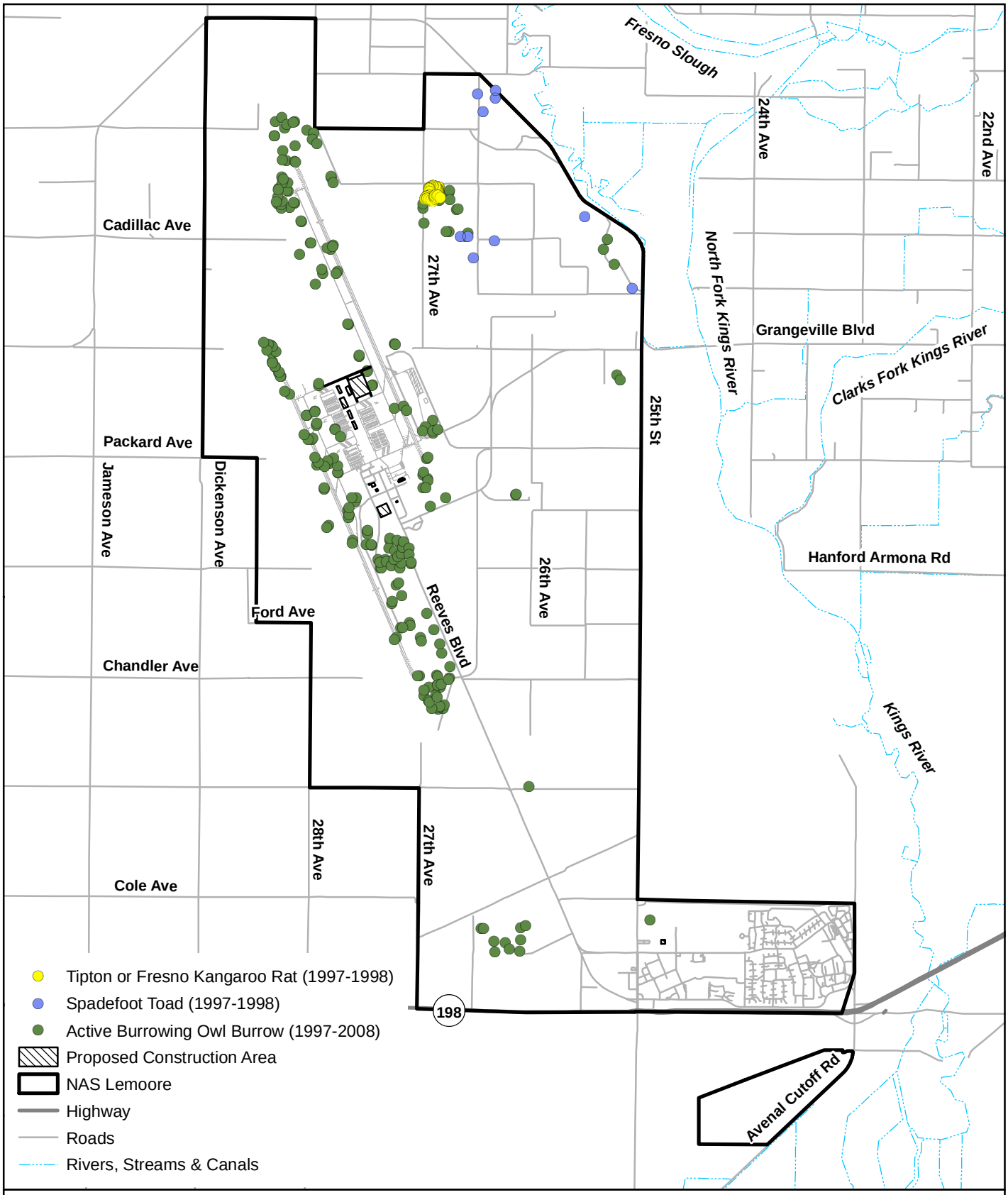


Figure 5.10-4
Potential Impacts to Kangaroo Rats, Spadefoot Toad, and Burrowing Owl Burrows at NAS Lemoore under Alternative 2

Sources: DoN 2001; Rosenberg et al. 2009

In order to avoid potential impacts to burrowing owls from ground disturbing construction activities, avoidance and minimization measures provided in the installation's INRMP would be implemented. These include but are not limited to, surveying all project areas prior to construction. If owls are found within the project area, they would be passively relocated outside the breeding season prior to construction in accordance with CDFG requirements (CDFG 2012). Implementation of these measures would ensure that potential impacts to burrowing owls would be avoided and minimized to the maximum extent practicable. With these measures in place, there would be no significant impacts to burrowing owls under Alternative 2 from construction activities.

Noise levels within the airfield environment are expected to change with the proposed increase in airfield operations (**Table 5.2-10, Figure 5.2-2**). Background information on noise, including its effect on many facets of the environment can be found in Appendix C. The increase in noise levels are not expected to have a significant impact on wildlife and migratory birds in the area due to the limited areas of suitable habitat within the airfield environment and because they are likely accustomed to current noise levels associated with ongoing aircraft operations at NAS Lemoore. Although noise levels would increase in some areas under Alternative 2, impacts to wildlife and migratory birds from increased aircraft operations are not expected to be significant.

In summary, under Alternative 2 potential impacts to wildlife and migratory birds would occur from proposed demolition and construction activities, construction noise, increased airfield operations, and increased noise levels within the airfield environment. These impacts to wildlife and migratory birds would not be significant due to the limited areas of suitable habitat that would be impacted and habituation to relatively high noise levels associated with ongoing aircraft operations at NAS Lemoore.

<u>Bird/Animal Aircraft Strike Hazard</u>

The presence of resident and migratory birds and other wildlife creates a BASH risk at NAS Lemoore. The airfield's proximity to expanses of grass, agricultural fields, and natural habitats on the installation intensify the BASH risk. NAS Lemoore's BASH Plan prescribes an ongoing process to reduce the potential for collisions between aircraft and birds or other animals (DoN 2007). This is accomplished by the distribution of information and active and passive measures to control how birds use critical areas around the airfields.

As part of its BASH-oriented wildlife management program to reduce or eliminate wildlife attractants near runways and taxiways, NAS Lemoore implements various habitat management and modification techniques including, but not limited to: removal of food sources, mowing tall grasses, cutting back shrubs, relocating perching and nesting structures, and preventing standing water in areas near the flightline (DoN 2007). Wildlife Hazard Assessment Status Reports are filed monthly for NAS Lemoore and provide a brief description of ongoing wildlife hazard assessments, bird and mammal survey resources, and control activities and take of wildlife within the airfield (US Department of Agriculture 2011). Further details on NAS Lemoore's BASH Program can be found in Section 5.4, *Safety*.

Under Alternative 2 there would be an increase of 68,400 airfield operations at NAS Lemoore, this increase in operations would also result in an increase in the potential for bird/animal aircraft strikes. Species involved in strikes aren't always identified; however common species reported in the past

include egrets, doves, herons, and raptors. This increased BASH potential and impacts to wildlife species and populations would be minimized by continued adherence to the comprehensive procedures used at NAS Lemoore to minimize BASH (DoN 2007b). NAS Lemoore is required to follow applicable procedures outlined in their BASH Plan (DoN 2007), including procedures designed to minimize the occurrence of bird/animal aircraft strikes, and detailed procedures to monitor and react to heightened risk of bird strikes. For example, when the BASH potential increases during periods of increased migratory bird movement (i.e., spring and fall migration), pilots receive special briefings highlighting the increased BASH potential, and limits are placed on low-altitude flight and some types of training (e.g., multiple approaches, closed pattern work) in the airport environment. Therefore, there would be no significant impacts to wildlife and migratory birds with regards to BASH under Alternative 2. See Section 5.4, *Safety*, for further detailed discussion of BASH.

Special-Status Species

Suitable habitat for special-status species on the installation would not be directly affected from Alternative 2 because no loss of habitat is anticipated. Any ground disturbance associated with Alternative 2 would be minor and would occur on areas already disturbed or developed (i.e., currently paved or actively mowed) (**Figure 5.10-3**). The ESA-listed Tipton and Fresno kangaroo rats have been observed only in Tumbleweed Park on NAS Lemoore which is not in the vicinity of any proposed construction activities (**Figure 5.10-4**). Suitable habitat for other special-status species known to occur on the installation (e.g., Swainson's hawk, least tern) is far enough away from proposed construction activities as to not be affected by any additional noise, ground disturbance, or human presence that would occur under Alternative 2.

As stated above, noise levels are expected to change with the proposed increase in airfield operations. The increase in noise levels is not expected to impact special-status species in the area because they are likely accustomed to noise levels associated with ongoing aircraft operations at NAS Lemoore. In addition, there would be no significant change in noise contours associated with the proposed increase in airfield operations compared to baseline conditions (see **Figure 5.2-2**).As a result, impacts to special-status species on or within the vicinity of NAS Lemoore from increased aircraft operations would not be significant because the ambient noise levels at NAS Lemoore would not significantly increase under Alternative 2. In addition, installation personnel would continue to manage habitats according to the INRMP, which is designed to protect and benefit special-status species. Therefore, there would be no significant impacts to special-status species and no effect to ESA-listed species under Alternative 2.

Conclusion

Overall, as discussed above, implementation of Alternative 2 at NAS Lemoore would not result in significant impacts to biological resources. Proposed demolition and construction activities would impact previously disturbed or actively managed areas. Short-term noise increases from demolition and construction would temporarily displace wildlife and migratory birds. Avoidance measures would be implemented to minimize potential impacts to burrowing owls from construction activities. Noise levels associated with proposed increases in aircraft operations would not result in significant impacts to wildlife and migratory birds because of high ambient noise levels within the airfield environment. The

NAS Lemoore BASH plan would continue to be implemented. There would be no impacts to special-status species and no effect on ESA-listed species.

5.10.2.2 Alternative 2 – NAS Lemoore Homebasing, Effects at NAF El Centro

Under Alternative 2, a Special Access Program Facility would be constructed at NAF El Centro between Hangar 3 and Hangar 4. This proposed construction area has already been disturbed and is in an operational area. Therefore no impacts to biological resources are anticipated. (Please see Section 4.10.1, *Affected Environment* for a description of biological resources at NAF El Centro.)

In addition, noise levels within the airfield environment are expected to change with the proposed increase of 800 airfield operations at NAF El Centro. The increase in noise levels is not expected to impact wildlife in the area because they are likely accustomed to current noise levels associated with ongoing aircraft operations at NAF El Centro and noise levels would not significantly increase under Alternative 2. Therefore, there would be no significant impacts to wildlife, including migratory birds, and special-status species and no effect to ESA-listed species due to the proposed increase in aircraft operations under Alternative 2 at NAF El Centro.

5.10.3 Environmental Consequences for the No Action Alternative

Under the No Action Alternative, the proposed action would not be implemented. Wildlife, migratory birds, and threatened and endangered species would continue to be managed in accordance with the NAS Lemoore June 2001 INRMP. Biological resource conditions would continue to be exposed to aircraft noise at their current levels as described in Section 5.10.

5.11 TOPOGRAPHY AND SOILS

5.11.1 Affected Environment

The affected environment for topography and soils includes those areas at NAS Lemoore that would be disturbed by demolition and construction activities. This section addresses topography, soils, and seismic activity.

NAS Lemoore is located in the San Joaquin Valley between the Sierra Nevada Mountains on the east and the California Coast Range on the west. The immediate landform is primarily flat, open, undeveloped lands and wildlife areas, irrigated agricultural fields, and the existing NAS Lemoore (California Department of Conservation 2007).

NAS Lemoore is located within the California Trough (Great Valley) Physiographic Section of the Pacific Province (USGS 2004). Soils within NAS Lemoore are from the Lethent series, as well as urban land (**Table 5.11-1**). Lethent series soils are considered Prime and Important Farmland soils (Natural Resources Conservation Service [NRCS] 2009).

Table 5.11-1. Soil Types Located within NAS Lemoore

Soil Series	*Prime/Important Farmland Soils*	*Description*
Lethent Clay Loam; 0-1% slopes	Yes	The Lethent series consists of very deep, moderately well drained soils on alluvial fan remnants derived from calcareous sedimentary rock.
Urban Land	No	Land covered by streets, parking lots, buildings, airstrips, and storage tanks that have so obscured or altered the landscape that identification of the soil is not possible.

Source: NRCS 2009.

Due to the minimal number of Central Valley waterways that have outlets to the Pacific Ocean, the accumulation of salts and nutrients have become a major issue in the region. The San Joaquin River is the only outlet for the San Joaquin River Basin. The Tulare Lake Basin has no outlet resulting in the amount of salt and nutrients accumulating in the Central Valley being greater than the export capacity of the San Joaquin River. This increasing accumulation of salt in the region poses a threat to surface and groundwater quality within the Central Valley, as well as to the soils. The result of this continued impairment is the potential for the loss of freshwater as well as decreases in viable prime agricultural land and food production. The Central Valley Salinity Coalition for Long-Term Sustainability is currently working on long-term solutions for managing the salt and nitrate discharges that may contribute to the accumulation of salt in the region. Management approaches amending the regional basin plans, amending limits in NPDES and Water Discharge Requirements, public education (Central Valley Salinity Coalition 2012).

NAS Lemoore is located within a region of known seismic activity. Although this portion of the California Trough does not contain fault lines, the mountain ranges on either side contain numerous active and inactive faults. The San Andreas Fault is located approximately 60 miles west of the installation. The San Andreas Fault is a right-lateral strike-slip fault that has been active in the recent past and has caused catastrophic earthquakes such as the 1906 San Francisco earthquake. In addition to the San Andreas Fault, there is a small active fault, the Nunez Fault, near the town of Coalinga, which is west of Lemoore in the foothills of the California Coast Range. This fault last had displacement in 1983. In addition, a number of low angle faults are also located in the mountains between Coalinga and the San Andreas Fault (Schulz and Wallace 1997; Jennings and Bryant 2010).

5.11.2 Environmental Consequences for Alternative 2

Under Alternative 2, potential impacts to topography and soils could occur from proposed facility development. Potential impacts from homebasing at NAS Lemoore are discussed in the next two sections in terms of effects at NAS Lemoore and effects at NAF El Centro.

5.11.2.1 Alternative 2 – NAS Lemoore Homebasing, Effects at NAS Lemoore

New construction would disturb approximately 58 acres of land. Of these 58 acres, 45 acres would consist of actively managed areas (i.e., mowed grasslands) and 13 acres would consist of previously developed areas (i.e., industrial). Demolition activities would cause short-term impacts to soils in the area near Bldg. 21. Areas of new construction, including the aircraft parking apron, hangars, and training facilities would also be subject to short-term impacts associated with clearing, grading, compaction, and potential erosion and sedimentation of exposed soils. In accordance with the USEPA NPDES General

Construction Permit (Permit CAS000002), a SWPP Plan would be prepared during the design phase of the project and submitted to the Regional Water Board for approval. The approved plan and permits would be obtained and other BMPs, such as temporary and permanent erosion and sediment control measures, would be implemented and monitored during construction activities. In addition, the relative flatness of the topography in conjunction with BMPs would prevent erosional soil impacts. BMPs in the SWPP Plan would consider regional saline soil issues. One Navy BMP has a goal of no net increase in stormwater volume, sediment and nutrient loading from major construction or renovation, as well as implementation of cost effective stormwater treatment techniques. Therefore, there would be no significant impacts to soils or topography under Alternative 2.

The project area contains soils classified as prime farmland soils which are protected under the Farmland Protection Policy Act (FPPA) (NRCS 2011). However, regulations relevant to the FPPA identify development with a density of 30 structures per 40 acres as being exempt from evaluation under the FPPA (7 C.F.R. PART 658). Therefore, no further coordination with regard to prime farmland soils would be required.

NAS Lemoore is not underlain by any active faults and the activities associated with the proposed demolition and construction activities would not increase the potential for seismic events to occur.

Conclusion

Overall, as discussed above, implementation of Alternative 2 at NAS Lemoore would not result in significant impacts to topography and soils from demolition or construction activities. A SWPP Plan and BMPs would be implemented to avoid and minimize erosion and sedimentation.

5.11.2.2 Alternative 2 – NAS Lemoore Homebasing, Effects at NAF El Centro

Under Alternative 2, a Special Access Program Facility would be constructed at NAF El Centro between Hangar 3 and Hangar 4. The soils in this proposed construction area have already been disturbed. It is anticipated that short-term impacts to soils could occur due to exposed soils during construction activities. BMPs would be implemented to reduce erosion and sedimentation. No-long term impacts to topography and soils are anticipated. (Please see Section 4.11.1, *Affected Environment* for a description of topography and soils at NAF El Centro.)

5.11.3 Environmental Consequences for the No Action Alternative

Under the No Action Alternative, the proposed action would not be implemented and there would be no construction or other activities that would affect geography, topography or soils.

5.12 WATER RESOURCES

5.12.1 Affected Environment

The affected environment for water resources includes those areas at NAS Lemoore that would be disturbed by demolition and construction activities, as well as the associated areas of the Tulare Lake Bed Basin in the San Joaquin Valley. This section addresses surface water, ground water, water quality, wetlands, and floodplains.

5.12.1.1 Surface Water

Figure 5.12-1 displays the major surface water features in the vicinity of NAS Lemoore, including wetlands, rivers, canals, ponds, and the 100-year floodplain. NAS Lemoore straddles the Murphy Slough-Fresno Slough and North Fork Kings River-Kings River watersheds in the Tulare-Buena Vista Lakes Basin of the Tulare Lake Hydrologic Region (NRCS 2009). Primary streams in the Tulare-Buena Vista Lakes Basin originate in the Sierra Nevada and flow to the Kings, Kaweah, and Tule rivers. NAS Lemoore is near the divergence of the North and Clarks forks of the Kings River on its alluvial fan. NAS Lemoore lies just west of the Kings River at the point where the river branches to the north and south. The North Fork flows north into the San Joaquin River drainage basin; the Clarks Fork runs east near the eastern boundary of NAS Lemoore to Tulare Lake, which has no outlets (DoN 2001) (**Figure 5.12-1**).

Average annual precipitation within the Tulare Lake Hydrologic Region varies from 6 to 11 inches. However, in the arid vicinity of NAS Lemoore, the average annual rainfall is only 6 to 8 in. Water supplied by natural sources is not sufficient to meet the needs of the region. Present day flows in the Kings River are depleted by upstream irrigation diversions, so that during most of the year, there is little flow in the Kings River as it passes NAS Lemoore. Therefore, much of the irrigation and potable water is obtained from northern California and transported via canal (California Department of Water Resources 2009).

The topography at NAS Lemoore is nearly level, with the elevation decreasing from 340 ft MSL in the southwest corner to about 310 ft MSL in the northeast and southeast corner of the installation (USGS 2009). Due to this relatively flat topography, drainage within NAS Lemoore is poor in some areas, occasionally resulting in ponding. Surface water on the installation includes approximately 400 acres of sewage treatment ponds (consisting of two wastewater treatment ponds and three evaporation ponds) in the southeastern corner of the installation, south of State Route 198 (**Figure 5.12-1**) (DoN 2001).

The stormwater runoff network at NAS Lemoore occurs primarily underground in the developed areas of the installation. In the less developed areas, the network consists primarily of swales and open ditches, where stormwater normally dissipates through evaporation and percolation. Stormwater runoff from developed areas of NAS Lemoore is diverted into three drainage ditches. One drainage ditch collects water from the Administration Area and discharges it eastward to the North Fork of the Kings River, just south of State Route 198. A second drainage ditch collects stormwater from the eastern edge of the Operations Area and discharges it to the North Fork of the Kings River, just north of its junction with the Clarks Fork. A third drainage ditch collects stormwater from the northern portion of the Operations Area and diverts it to a wildlife/wetlands area (RMA 1, managed for native wildlife and plant species) in the northeast portion of the installation (DoN 2001).

5.12.1.2 Groundwater

The southern portion of the San Joaquin Valley consists of late Pliocene to Holocene lake bed deposits containing low permeability clays interbedded with alluvial sediments. NAS Lemoore is located at the northeastern edge of the Tulare-Buena Vista Lakes Basin, where the clay deposits are thinner and frequently interspersed with coarser deltaic sediments and stream deposits (DoN 2001).

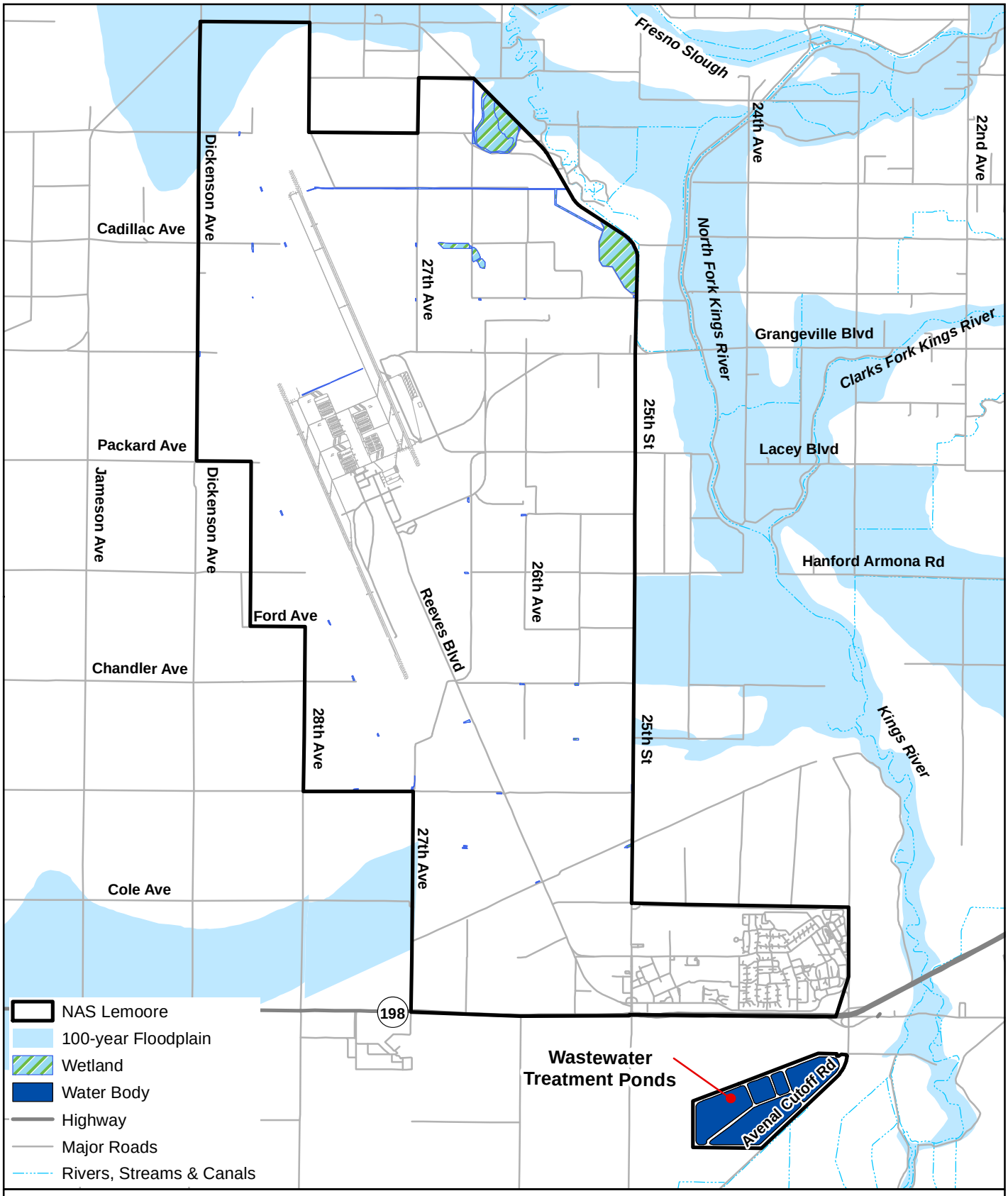


Figure 5.12-1
Major Surface Water Features at NAS Lemoore

Sources: DoN 2001; FEMA 2009

The Tulare-Buena Vista Lakes 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 freshwater aquifers at relatively great depths. The groundwater basin underlying and in the vicinity of NAS Lemoore is comprised generally of two waterbearing zones: (1) an upper zone above a nearly impervious Corcoran Clay layer containing the Coastal and Sierran aquifers and is within 2-3 ft of the ground surface in some areas of the installation, and (2) a lower zone below the Corcoran Clay containing the Sub-Corcoran aquifer at 150-200 ft below ground surface. The perched aquifer is highly saline-alkaline and is not suitable as a water resource due to its poor quality. In September 1992, the depth to the perched water zone ranged from about 19 ft beneath the western half of NAS Lemoore to less than 5 ft beneath the eastern half of the installation (DoN 2001; California Department of Water Resources 2009).

These aquifers are recharged by subsurface inflow from the east and northeast, percolation of groundwater, and imported and local surface water (Westlands Water District 2008). Most of the recharge to the regional confined aquifers results from precipitation in the Sierra Nevada to the east. Some recharge infiltrates locally through stream channels. The thick, extensive, shallow clay sediments underlying the region limit local recharge to the deeper aquifers. Instead, water used for crop irrigation (primarily cotton) contributes to the shallow perched water table. Drainage sumps and canals are needed to prevent flood irrigation recharge from saturated shallow soils and to keep the water table below the root zone of crops (California Department of Water Resources 2009).

5.12.1.3 Water Quality

Groundwater and local surface water are not a primary source of potable water for NAS Lemoore or the surrounding communities. In the western valley area of the Tulare Lake Hydrologic Region, groundwater quality is often poor, and availability is highly variable. In portions of Kings County, elevated concentrations of boron, arsenic, and selenium have historically occurred in groundwater, affecting drinking water supplies (DoN 2001).

5.12.1.4 Wetlands

Wetlands in the northeast part of NAS Lemoore that lie along the North Fork of the Kings River are fed in part by stormwater runoff from the installation and agricultural drainage (**Figure 5.12-1**). Nearly all NAS Lemoore wetlands are associated with irrigated agriculture, primarily from Westlands Water District irrigation valves and ditches. All but two wetland areas are in engineered excavations. Five of the inventoried wetlands are of sufficient size and permanence to be of significance to wildlife in the area. While the remaining wetlands 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. Standing water occurs in these locations due only to intermittently seeping irrigation pipes or pumped irrigation water.

The five larger wetlands are referred to as Sunset Lake wetland (within RMA 2), East Resource Management Area wetland (within RMA 1), parcels 55 and 56 wetland (within RMA 3), main drainage ditch wetland, and north drainage ditch wetland (within RMA 5). The Sunset Lake wetland includes both lacustrine and palustrine wetlands. Lacustrine wetlands have open water surface, unconsolidated beds,

and less than 30 percent vegetative cover. Although the Sunset Lake wetland is naturally occurring, it is impounded by a dike on one side and is permanently flooded. The eastern side of Sunset Lake is alkaline and vegetated during most of the growing season. Dominant plant species are perennials. Vegetation in this area includes alkali heath (*Frankenia salina*), canary grass (*Phalaris canariensis*), common spikeweed (*Hemizonia pungens* ssp.), alkali weed (*Cressa truxillensis*), heliotrope (*Heliotropium curassavicum*), saltgrass (*Distichlis spicata*), saltwort (*Batis maritima*), sickle grass (*Parapholis incurva*), and spear oracle (*Atriplex patula*).

The East Resource Management Area wetland, which is the second largest naturally occurring wetland at NAS Lemoore, is characterized by a mosaic of wetland and upland habitats. Dominant plant species in the southeastern area are fourwing saltbush (*Atriplex canescens*), canary grass, brome (*Bromus* sp.), and curly dock (*Rumex crispus*). The northwest and central portions of the site contain scattered mulefat (*Baccharis salicifolia*), fourwing saltbush, and black willows (*Salix gooddingii*), with an understory of saltgrass. Species observed in the northeastern portion of the site include spiny rush (*Juncus acutus*), blueweed (*Helianthus cilaris*), annual rabbitsfoot grass (*Polypogon monspeliensis*), narrow-leaf milkweed (*Asclepias fascicularis*), and star-thistle (*Centaurea* sp.).

Parcel 55 and 56 wetlands are the largest constructed wetland at NAS Lemoore and are considered RMA 3. It is temporarily flooded; the source of water is an irrigation drainage sump. The northern portion of the site is separated from RMA 5 by a dike. The dominant plant species in the inundated areas are saltgrass, heliotrope, and alkali weed. Blueweed, tamarisk (*Tamarix* sp.), yarrow (*Achillea millefolium*), canary grass, and annual rabbitsfoot grass are found in the areas that are not inundated.

The main drainage ditch wetland is a streambed type wetland with intermittent flow, as water flows for only part of the year. When water is not flowing, it may remain in isolated pools or surface water may be absent. The main drainage ditch wetland runs southeast to east along the northeast and east sides of Runway 32-R. This wetland site alternates between open water and freshwater marsh habitat. It carries runoff from the air operations area and agricultural land across NAS Lemoore toward the east to Kings River. It is heavily overgrown, containing such freshwater marsh species as cattails, umbrella sedge (*Cyperus* sp.), curly dock, and annual rabbitsfoot grass, along with blueweed, narrow-leaf milkweed, bush seepweed (*Suaeda moquinii*), foxtail brome (*Bromus madritensis rubens*), saltgrass, and alkali-mallow, which line the edges of the banks. This wetland site has trapped sediments and heavy metal residuals from numerous years of aircraft washdowns and has been declared an installation restoration site.

The north drainage ditch begins at the north end of the Air Operations Area, crosses outlease parcel 62, and runs east along the border between agricultural outlease parcels 13 and 57. The ditch ends on the north side of RMA 5, (also called Tumbleweed Park). This drainage ditch has areas of open water and freshwater marsh. Dominant vegetation includes cattails (*Typha* sp.), bulrush (*Scirpus californicus*), and narrow-leaf milkweed. In the eastern portion of the site, the ditch is densely vegetated with black and narrow-leaved willows (*Salix exigua*).

Three wetland sites near the NAS Lemoore Operations Area are associated with paved surface drainage ditches, are heavily overgrown, and alternate between open water and freshwater marsh habitats. The

main drainage ditch carries runoff from the Flight Operations Area and agricultural land across NAS Lemoore in an easterly direction to the Kings River.

5.12.1.5 Floodplains

Flooding potential exists at NAS Lemoore due to the potential overflow of streams to the southwest, east, and north (**Figure 5.12-1**). The natural 100-year 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 (DoN 2001).

5.12.2 Environmental Consequences for Alternative 2

5.12.2.1 Alternative 2 – NAS Lemoore Homebasing, Effects at NAS Lemoore

Surface Water

Under Alternative 2 construction activities associated with new facilities at NAS Lemoore would result in an increase of 36 acres of impervious surface. This would result in increases to surface water runoff and potential impacts to surface water quality. Projects resulting in increases to impervious surface would need to be included in NAS Lemoore's SWPP Plan to address BMPs that will reduce or eliminate stormwater that may carry non-point source pollutants to nearby surface waters. Additionally, excavation and grading activities would result in the potential for increased sediment to be carried to nearby surface waters. BMPs would be implemented to minimize these impacts during construction.

Groundwater

Alternative 2 does not involve the use of groundwater. Unrelated to Alternative 2, NAS Lemoore will install a groundwater supply well in 2013 to provide an emergency backup or possibly a secondary source of raw water that would need to be treated by the installation's water system. Under Alternative 2, there would be no significant impacts on groundwater resources at NAS Lemoore.

Water Quality

The Navy is required to comply with the requirements of the CWA to preclude nonpoint source discharges. To this end, all construction activities would be performed in compliance with California's General Construction Stormwater Permit. Proposed demolition and construction activities would require preparation of a SWPP Plan and use of BMPs to limit potential erosion and runoff. Construction-related erosion control measures would include, but not be limited to, erosion control blankets, soil stabilizers, temporary seeding, silt fencing, hay bales, sand bags, and storm drain inlet protection devices. Therefore, implementation of Alternative 2 would not have significant impacts on water quality at NAS Lemoore or the region.

Wetlands

There are no wetlands within or adjacent to the proposed project areas (**Figure 5.12-2**). The excess runoff resulting from the new site construction would follow existing drainage patterns and increase flow to the intermittent channels and drainages that support wetland ecosystems.

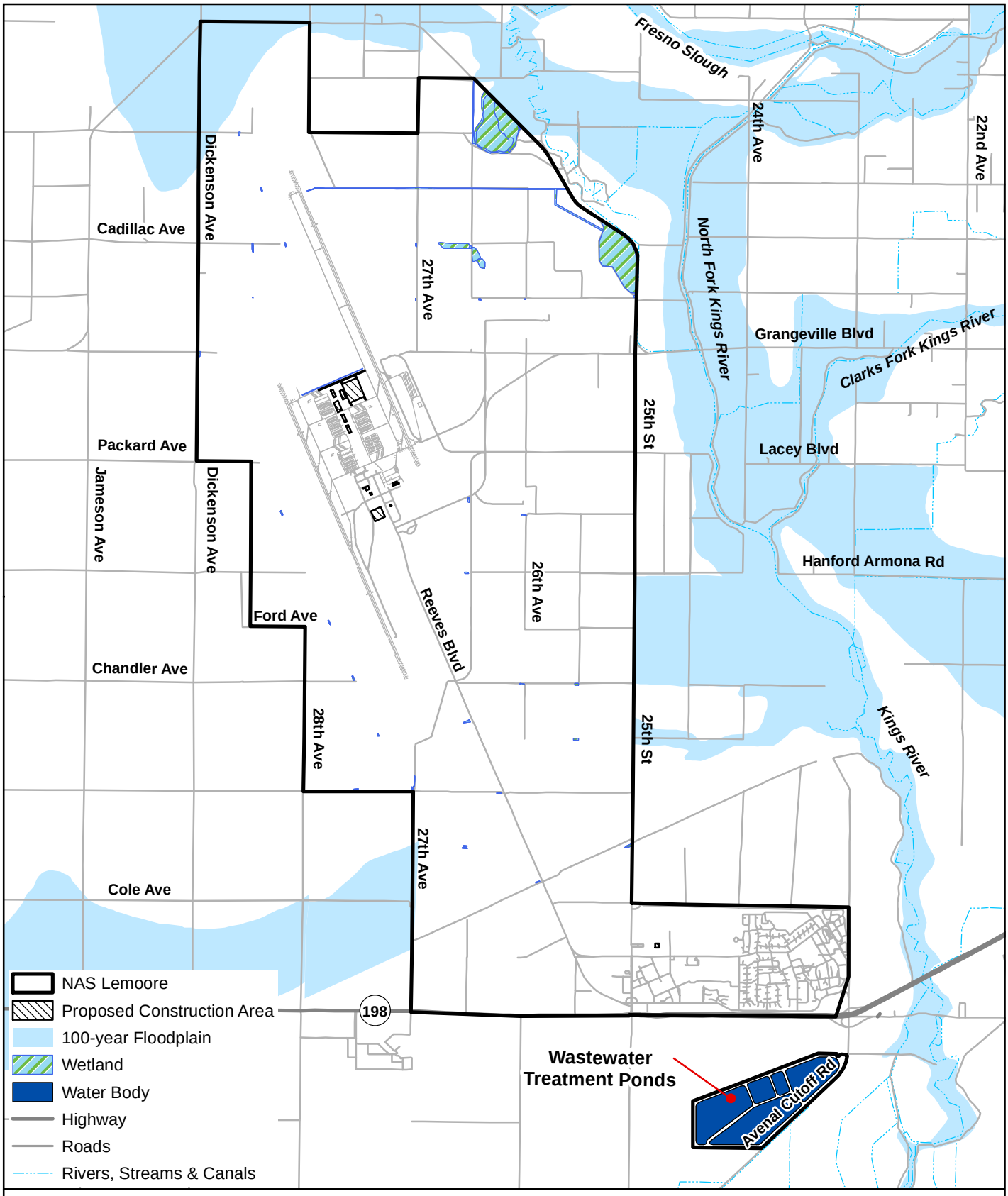


Figure 5.12-2
Major Surface Water Features at NAS Lemoore in the Vicinity of Proposed Construction Areas under Alternative 2

Sources: DoN 2001; FEMA 2009

Implementation of NAS Lemoore's SWPP Plan and associated BMPs would minimize the potential of excess runoff to adversely impact water quality and health within the receiving wetlands at RMAs 1, 2, 3, and 5. Therefore, there would be no impacts to wetlands at NAS Lemoore under Alternative 2.

Floodplains

Under Alternative 2, proposed project areas at NAS Lemoore would not be located on or in the vicinity of a designated 100-year floodplain (**Figure 5.12-2**). Therefore, Alternative 2 would have no significant impact on floodplains or floodplain management at NAS Lemoore.

Conclusion

Overall, as discussed above, implementation of Alternative 2 at NAS Lemoore would not result in significant impacts to water resources from proposed facility development. Groundwater, water quality, wetlands, and floodplains would not be impacted. Construction activities would be performed in compliance with California's General Construction Stormwater Permit. A SWPP Plan and BMPs would be implemented to limit erosion and runoff into surface waters.

5.12.2.2 Alternative 2 – NAS Lemoore Homebasing, Effects at NAF El Centro

Under Alternative 2, a Special Access Program Facility would be constructed at NAF El Centro between Hangar 3 and Hangar 4. No water resources are present within this area; therefore, no impacts to water resources are anticipated. Additionally, BMPs would be implemented during construction reducing sediment runoff into any nearby surface waters which could affect water quality. (Please see Section 4.12.1, *Affected Environment* for a description of water resources at NAF El Centro.)

5.12.3 Environmental Consequences for the No Action Alternative

Under the No Action Alternative, the proposed action would not be implemented and existing conditions of surface waters would remain the same, including stormwater management.

5.13 CULTURAL AND TRADITIONAL RESOURCES

5.13.1 Affected Environment

This section addresses architectural resources, archaeological resources, and traditional cultural properties (TCPs). For NAS Lemoore, the APE for architectural resources and TCPs includes the installation, areas adjacent to the installation, and SUA where noise from proposed aircraft operations may affect historic properties. For archaeological resources, the APE is considered to be the area on NAS Lemoore within which ground disturbance would take place from proposed facility development.

5.13.1.1 Architectural Resources

Six groups of architectural resources, totaling 45 individual buildings, have been inventoried and evaluated in the family housing area at NAS Lemoore. These resources, which were built between 1966 and 1971, were evaluated under Criteria Consideration G, which applies to resources less than 50 years old and evaluates those resources as to "exceptional significance." The resources were recommended

not eligible for inclusion in the National Register Historic Places (NRHP) as individual resources or collectively as a historic district (NAVFAC Southwest 2007).

An evaluation of the built environment of NAS Lemoore with regard to Cold War significance was completed for the 1997 Historic and Archaeological Resources Protection (HARP) Plan. At that time the buildings and structures on the installation were less than 50 years old, so the resources were evaluated under NRHP Criteria Consideration G. The evaluation concluded that the buildings and structures at NAS Lemoore do not possess exceptional significance for associations with the Cold War and were recommended not eligible for the NRHP (NAVFAC EFA West 1997). However, this recommendation was not supported by a formal inventory, and the California State Historic Preservation Office (SHPO) was not consulted with regard to the recommendation of non-eligibility, so no concurrence was received (NAVFAC Southwest 2012b). The NAS Lemoore Integrated Cultural Resource Management Plan (ICRMP) recommends that extant Cold War-era buildings and structures built by the Navy at NAS Lemoore should be formally inventoried and evaluated for NRHP eligibility when they reach 50 years of age (NAVFAC Southwest 2012b).

The Navy recently evaluated the NRHP eligibility of Hangars 1, 2, and 4, which would be renovated and/or expanded for the proposed Strike Fighter Realignment at NAS Lemoore. Referencing the recommendation of ineligibility from the previous evaluation for the 1997 HARP Plan, the Navy produced no new information that demonstrates the hangars have significant associations with Cold War-era themes and, therefore, concluded the buildings do not qualify for inclusion in the NRHP (DoN 2011). The California SHPO concurred with the determination of non-eligibility.

Six buildings would be affected by the NAS Lemoore Homebasing Alternative. They include: Hangars 3 and 5 (Bldgs. 270 and 330), a storage facility (Bldg. 21), a training facility (Bldg. 43), a parts and supplies warehouse (Bldg. 140), and an aircraft maintenance facility (Bldg. 170). In March 2012, NAVFAC Southwest inventoried and evaluated Bldgs. 43, 140, 170, 270, and 330 in March 2012, and Bldg. 21 was inventoried and evaluated in November 2012 as part of a base-wide survey of NAS Lemoore. Based on the conclusions of both evaluations, none of the six buildings is eligible for listing on the NRHP (NAVFAC Southwest 2012a, 2013). In correspondence dated August 13, 2012 and September 26, 2013, the California SHPO concurred with the finding of ineligibility (see Appendix H, *Cultural and Traditional Resources*).

5.13.1.2 Archaeological Resources

Fourteen archaeological surveys have been completed at NAS Lemoore, which contains 18,784 acres of Navy-owned land (NAVFAC Southwest 2012b).

Four archaeological sites have been recorded within the installation, including one historic site (CA-KIN-74H [P-16-000081]); two prehistoric isolates (P-16-000082 and P-16-000083); and a set of human remains that were not formally recorded (**Table 5.13-1**). The three recorded sites are located in the northeastern portion of the installation in the vicinity of Boggs Slough and are not within the APE for the proposed action. The human remains were recovered near Hangar 4 during remediation of contaminated soils in 2001. These remains were isolated and potentially in fill deposits associated with the construction of the Power Check Facility in the 1960s (NAVFAC Southwest 2012b).

Table 5.13-1. Archaeological Resources at NAS Lemoore

Primary No.	*Resource Type*	*NHRP Status*
CA-KIN-74H (P-16-000081)	Historic Refuse Scatter	Recommended Not Eligible
P-16-000082	Prehistoric Isolate	Not Eligible
P-16-000083	Prehistoric Isolate	Not Eligible
NA*	Native American skeletal remains	Not Eligible

Source: NAVFAC Southwest 2012b.
Note: *NA = Not applicable.

The 1997 HARP identified four archaeological high sensitivity zones within the installation (NAVFAC EFA West 1997). However, none of them is located within the APE for the proposed action. Subsequent survey of selected portions of the four sensitivity zones in 1999 identified and recorded the historic refuse scatter and two prehistoric isolates listed in **Table 5.13-1**. The conclusions of the survey indicate the likelihood of encountering a buried prehistoric site on the installation is low and there are no areas within NAS Lemoore designated as having high archaeological sensitivity (NAVFAC Southwest 2012b).

NAVFAC Southwest conducted a Phase I archaeological investigation of the APE for Alternative 2 in February and March 2012. The survey included systematic pedestrian survey and shovel test pits. One isolate was identified in the APE. The Navy determined the isolate is not eligible for listing on the NRHP (NAVFAC Southwest 2012a). The California SHPO concurred with the Navy's determination of ineligibility of the isolate in a letter dated August 13, 2012 (see Appendix H, *Cultural and Traditional Resources*).

5.13.1.3 Traditional Cultural Properties

Under Section 106 of the National Historic Preservation Act (NHPA), a federal agency is required to give consideration to issues of traditional religious or cultural areas concerning Native American groups. In 1994 and 2005, the Navy sent letters to Native American tribes and groups identified by the California Native American Heritage Commission and requested that they identify the presence of traditional religious or cultural properties on NAS Lemoore. None of the contacts registered concerns regarding the existence of such properties (NAVFAC Southwest 2012b).

On April 10, 2012, the Navy sent letters to initiate consultation with several Native American tribes with ties to the NAS Lemoore area regarding the proposed action. These tribes include: the Big Sandy Rancheria of Mono Indians, the Tule River Indian Tribe, the Table Mountain Rancheria Tribe, the Tachi-Yokut Tribe-Santa Rosa Rancheria, the Picayune Rancheria Chukchansi Indians, the Cold Springs Rancheria Tribe, and the North Fork Rancheria Tribal Office (see Appendix H for correspondence). The Table Mountain Rancheria Tribe did not indicate concern over the NAS Lemoore Homebasing Alternative and stated the project was beyond their area of interest (see page H-223 of Appendix H).

5.13.2 Environmental Consequences for Alternative 2

Under Alternative 1, potential impacts to cultural and traditional resources could occur from proposed facility development and F-35C aircraft operations. Potential impacts from homebasing at NAS Lemoore are discussed in the next two sections in terms of effects at NAS Lemoore and effects at NAF El Centro.

The potential impacts of the proposed action on identified historic properties within the APE were assessed by applying the Criteria of Adverse Effect [36 C.F.R. 800.5(a)(2)]. Refer to Section 3.13, *Cultural and Traditional Resources*, for these criteria. Impacts to TCPs can be determined only through consultation with the affected tribes. However, ground disturbance to archaeological sites and graves has often been cited as an adverse impact.

5.13.2.1 Alternative 2 – NAS Lemoore Homebasing, Effects at NAS Lemoore

Architectural Resources

Alternative 2 would include renovating and expanding Hangar 3, Hangar 5, Bldg. 43, and Bldg. 170; modifying the interior of Bldg. 140; and demolishing Bldg. 21. An evaluation of architectural resources at NAS Lemoore in 1997 concluded that no properties on the installation are eligible for the NRHP. However, because the California SHPO was not consulted on the results of this evaluation, the Navy reassessed the eligibility of Hangars 3 and 5 (Bldgs. 270 and 330) and Bldgs. 21, 43, 140, and 170 and communicated its determinations to the California SHPO. NAS Lemoore determined that none of these six buildings meets the NRHP eligibility criteria. The California SHPO concurred with these determinations.

Archaeological Resources

There are no previously recorded archaeological sites within the APE for proposed construction. One isolate was identified during the Phase I archaeological survey of the APE for proposed construction, and the Navy determined that it is ineligible for listing on the NRHP. The California SHPO concurred with this determination. NAS Lemoore determined there would be no effects to NRHP-eligible archaeological resources as a result of the proposed project. Should any inadvertent discoveries be made during construction activities, the Navy would follow procedures outlined in the ICRMP.

Airspace operations in the SUA do not involve ground disturbance from new construction or from landing aircraft. Therefore, there would be no effects to archaeological sites as a result of airspace operations under Alternative 2.

Traditional Cultural Properties

No TCPs have been identified within NAS Lemoore installation areas. Aircraft operations in NAS Lemoore SUA would increase under Alternative 2. However, the increase in aircraft operations would result in a minimal increase in noise (refer to Section 5.2.2.1, *SUA and MTRs*); thus, the NAS Lemoore Homebasing Alternative is not expected to affect the use of TCPs. There would be no change in the frequency of usage of MTRs under Alternative 2 compared to existing usage. Modeled noise levels from F-35C flights within MTRs compared to those of FA-18 aircraft would decrease (**Table 5.2-17**). Therefore, no impacts to TCPs would occur due to F-35C operations in MTRs.

Consultation and SHPO Concurrence

In accordance with Section 106 of the NHPA, NAS Lemoore consulted with the California SHPO regarding the potential effects to historic properties from the proposed NAS Lemoore Homebasing Alternative. In a letter dated April 5, 2012, NAS Lemoore presented a description of the undertaking; defined the APE; identified the efforts to identify historic properties within the APE, including the results of the archaeological and architectural surveys of the APE described in Section 5.13.1.1, *Architectural Resources*, and Section 5.13.1.2, *Archaeological Resources*; and the findings of the undertaking. As no historic properties were identified within the APE, NAS Lemoore presented a finding of "no historic properties affected" for the proposed NAS Lemoore Homebasing Alternative (NAS Lemoore 2012). In a response dated August 13, 2012, the California SHPO concurred with this finding. The letter of concurrence from the California SHPO is provided in Appendix H*, Cultural and Traditional Resources*.

The original consultation with the California SHPO inadvertently omitted Bldg. 21. To correct the oversight, the Navy continued consultation with the California SHPO and sent a letter on September 17, 2013 to modify the APE to include Bldg. 21 and provide their determination that adding Bldg. 21 to Alternative 2 and the APE is consistent with the original finding of "no historic properties affected." The California SHPO concurred with the Navy's finding of "no historic properties affected" for Alternative 2 in a response dated September 26, 2013. The correspondence from the California SHPO is provided in Appendix H, *Cultural and Traditional Resources*.

Conclusion

Overall, as discussed above, implementation of Alternative 2 at NAS Lemoore would not result in significant impacts to cultural and traditional resources. Buildings to be modified are not eligible for the National Register. There would be no impacts to archaeological sites or traditional cultural properties. The Navy would follow procedures in its ICRMP should any inadvertent discoveries be made during construction activities.

5.13.2.2 Alternative 2 – NAS Lemoore Homebasing, Effects at NAF El Centro

Under Alternative 2, a Special Access Program facility would be constructed at NAF El Centro. (Please see Section 4.13.1, *Affected Environment* for a description of cultural and traditional resources at NAF El Centro.) Construction of this new facility would not result in direct or indirect effects to historic properties because there are no NRHP-listed or eligible architectural or archaeological resources at the main installation of NAF El Centro. The proposed site of facility construction consists of areas that are previously disturbed. Should any inadvertent discoveries be made during construction, the Navy would follow procedures outlined in the NAF El Centro ICRMP.

5.13.3 Environmental Consequences for the No Action Alternative

Under the No Action Alternative no additional improvements or construction would occur at NAS Lemoore; therefore no impacts to NRHP-listed or eligible architectural resources would be impacted. Additionally, no TCPs would be impacted by the No Action Alternative.

5.14 HAZARDOUS MATERIALS AND WASTE

5.14.1 Affected Environment

The affected environment for hazardous materials and waste includes those areas at NAS Lemoore that would be disturbed by demolition and construction activities, as well as the areas where F-35C aircraft maintenance activities would occur. This section addresses hazardous materials management, hazardous waste management, and contaminated sites.

5.14.1.1 Hazardous Materials Management

Building 140 is the hazardous materials storage area at NAS Lemoore. Each Squadron stores their own hazardous materials for daily use. A variety of hazardous materials are used at NAS Lemoore including petroleum, oils and lubricants; solvents and thinners; caustic cleaning compounds and surfactants; cooling fluids (antifreeze); adhesives; acids and corrosives; paints; and herbicides, pesticides and fungicides. These materials are used for the operation and maintenance of facilities, aircraft, and vehicles at NAS Lemoore.

<u>Aboveground Storage Tanks and Underground Storage Tanks</u>

NAS Lemoore has a total of 49 aboveground storage tanks and 25 underground storage tanks located at various sites within the installation that hold a total of 39,764 gallons and 3,420,222 gallons of material (fuels, oils), respectively. These tanks are located throughout the installation at various locations and store fuels and oils for mobility use, emergency generators and other uses (DoN 2012). All underground storage tanks listed in the table meet the 1998 40 C.F.R. 280 standards for cathodic protection, spill and overfill control, and release detection. The major bulk fuel storage areas are described in detail below.

<u>Bulk Storage Fuel Farm</u>

Fuel storage area at the Fuel Farm has been in operation since 1962 and is managed by Fuel Branch personnel. Fuels stored include Jet Fuel (jet propellant [JP] type 5), automotive motor gas, diesel, and waste fuel. The Fuel Farm receives JP-5 from Fresno, California via an underground pipeline, which is owned by Kinder Morgan Energy Partners. JP-5 jet fuel can also be delivered by truck to a receiving island. No more than four trucks are unloaded at a time. Empty waste oil bowsers are stored within the island's containment before being returned to their respective accumulation areas.

<u>Hot Refueling Pad</u>

NAS Lemoore has five Hot Refueling Pads, one for each hangar. The hot refueling pads allow fuel to be pumped directly into aircraft without shutting down their engines, reducing reliance on fuel trucks. Each refueling pad includes a JP-5 underground storage tank or “ready issue” tank. Fuel supplied to the hot refueling pads passes through filters located in a filter room near each underground storage tank. Fuel extracted from the filters during regular testing is poured into waste oil drums provided outside each filter room. Each waste oil drum is placed within a plastic containment.

Navy Exchange Gas Station

The Navy Exchange operates two gas stations at NAS Lemoore. Each gas station is managed and maintained by the Navy Exchange General Manager who reports to the installation Commanding Officer. One station is located in the Administration area and the other in the Operations area.

The Navy Exchange gas station in the Administration area has been in operation since 1962 and contains three underground storage tanks, which are permitted by Kings County (Facility ID FA0000007). One diesel fuel aboveground storage tank is also located to the west of the vehicle maintenance shop. Waste oil from vehicle maintenance is currently stored in a tank inside the vehicle maintenance shop.

The Navy Exchange gas station in the Operations area has been in service since 1962 and also contains three underground storage tanks, which are permitted by Kings County (Facility ID FA0001851). These tanks supply fuel to two fuel pump islands. No vehicle maintenance is performed at this facility.

Transportation Branch

Transportation Branch (TB), Facility Management Airfield Support Department is used as a vehicle maintenance shop for Navy vehicles. The facility contains an aboveground storage tank, two underground storage tanks, and a refueling pump station, which are permitted by Kings County (Facility ID FA0001607 and FA0001608).

Jet Engine Test Cell

The Jet Engine Test Cells are located in Buildings 175 and 176. Each building has a corresponding underground storage tank that contains JP-5, which are permitted by Kings County (Facility ID FA0001610).

Asbestos-containing Material

Asbestos is a common constituent of building materials manufactured prior to 1978 when a federal ban on its use in building materials became effective. Asbestos may be contained in plaster, acoustic ceiling tiles, wallboard, and floor tiles/carpeting mastic and asbestos particles may be present in building ductwork. Asbestos-containing materials have been classified as a HAP by the USEPA, in accordance with Section 112 of the CAA (USEPA 2008). Asbestos-containing material surveys have been conducted at NAS Lemoore and areas of asbestos-containing materials have been identified. Only friable asbestos that was a human health hazard was removed as a result of the surveys (DoN 2011a). Therefore, asbestos-containing materials may be present in any building proposed for demolition or expansion that was constructed prior to 1978.

Lead-based Paint

Lead-based paint may also be present in buildings or structures that would be demolished or expanded under Alternative 2. Lead is a common constituent of paint manufactured prior to 1980 when a federal ban on lead paint became fully effective. No surveys for lead-based paint are known to have been conducted at NAS Lemoore, but lead paint is assumed to be present in any buildings or structures constructed prior to 1978.

Polychlorinated Biphenyls

PCBs are common constituents of oils used as dielectric fluids or coolants in electrical equipment manufactured prior to 1979 when a federal ban of the manufacture of PCBs became effective. Although banning their manufacture, the USEPA allowed equipment containing PCBs to remain in use for the remainder of their useful lives. The installation maintains oil-filled items of electrical equipment, including transformers, at various locations throughout the installation; however, none are known to contain PCBs (DoN 2011a).

5.14.1.2 Hazardous Waste Management

NAS Lemoore is classified as a large quantity generator of hazardous waste, thus greater than 2,200 pounds total hazardous waste are generated per month, on average as defined by the Resource Conservation and Recovery Act (RCRA).

Hazardous waste is managed on site in accordance with NAS Lemoore's Hazardous Waste Management Plan (HWMP). Adherence to the management procedures provided in the HWMP is required so that hazardous wastes generated by on-site activities will be managed in a cost effective manner that will not violate any federal regulations or Navy instructions and will safeguard the environment.

There are four types of hazardous waste accumulation at NAS Lemoore; Satellite Accumulation Areas, Hazardous Waste Main Accumulation Compound, Used Oil Storage Tank and JP Jet Fuel Bowsers. These areas are described in detail below.

Satellite Accumulation Areas

Hazardous waste is accumulated in designated satellite accumulation areas throughout NAS Lemoore. Each activity that generates hazardous waste (listed above) is required to designate an area for temporary accumulation of hazardous waste and conform this area to the requirements of the Hazardous Waste Management Plan. This plan assumes only one collection point per generator. Additional sites may be permitted. The location of satellite accumulation areas must be in compliance with any additional requirements established by the NAS Lemoore Occupational Safety and Health Department and the Fire Prevention Department. Hazardous wastes managed in Satellite Accumulation Areas are removed within one work day. Exceptions to this procedure require approval from the Hazardous Waste Manager.

Hazardous Waste Main Accumulation Compound

Hazardous waste managed at the satellite accumulation areas is collected daily by Environmental Site Office personnel and delivered to and managed at the Hazardous Waste Main Accumulation Compound at Building 45 where it is accumulated for no longer than 90-days before shipment off the installation. The 90-day accumulation period begins for each container when the first drop or item is placed inside.

Used Oil Storage Tank

The used oil storage tank at the Fuel Farm holds used oil collected from used oil bowsers and green 5-gallon buckets. Prior to being collected, the used oil is tested for contamination. If the used oil passes testing it is collected by vacuum truck and pumped into the used oil tank at the Fuel Farm. The used oil

is then tested a second time prior to being pumped and transported off the installation for recycling. If the used oil fails testing it is disposed as hazardous waste.

Red Portable JP-5 Bowsers

Used JP-5 fuel is collected in red portable bowsers outside each hangar area. The fuel is tested prior to being pumped, transported and placed in a "reuse" tank at Taxiway B. This fuel is reused in the ground support equipment.

5.14.1.3 Pollution Prevention

The NAS Lemoore HWMP outlines spill contingency plan procedures to prevent pollution from accidental release of hazardous waste. EPA's Final Oil Pollution Prevention Regulation (40 C.F.R. 112) requires facilities to have a fully prepared and implemented Spill Prevention Control and Countermeasures (SPCC) Plan. The NAS Lemoore SPCC Plan addresses the existing facilities located at NAS Lemoore that have the potential for an oil spill; the existing containment and diversionary structures constructed to control oil spill occurrences; a conformance evaluation of existing facilities compliance relative to SPCC guidelines; responsibilities for record keeping, inspections, personnel training, security, and notifications; and operational changes implemented, and projects submitted for facility modifications required reducing the probability of a spill event. The SPCC Plan identifies storage locations on the installation and describes proper management and handling procedures needed to minimize potential spills at the point of use (DoN 2000).

The NAS Lemoore SWPP Plan (DoN 2006) describes and assesses the risk to water bodies from potential pollution sources at each activity across the installation. The SWPP Plan describes the installation, identifies potential sources of stormwater pollution, recommends appropriate BMPs to control and eliminate the discharge of pollutants in stormwater and provides periodic review of the SWPP Plan. The SWPP Plan applies to stormwater discharges from industrial areas within the property of NAS Lemoore.

5.14.1.4 Contaminated Sites

Environmental Restoration Program

Twenty Installation Restoration sites were identified at NAS Lemoore (16 Comprehensive Environmental Response, Compensation, and Liability Act [CERCLA] sites, two petroleum sites, and two RCRA sites). In 1986, the Navy combined Site 5 and Site 9 because the sites were close to each other and contained similar contaminants, which resulted in a total of 19 Installation Restoration sites (**Figure 5.14-1**). The Navy, with concurrence from the state, has closed 9 of the 19 sites leaving 10 active Installation Restoration sites. Eight of the nine closed sites require no further action and can be used by NAS Lemoore for any future military needs. The Navy is addressing contamination at the ninth closed site, a former hazardous waste Underground Storage Tank 01 (188-1), with ongoing remedial activities associated with Site 14.

Eight of the ten active Installation Restoration sites at NAS Lemoore are being addressed under CERCLA: Sites 1, 2, 3, 4, 5/9, 8, 14, and 16. Two of the ten active Installation Restoration sites at NAS Lemoore are

being addressed according to state law and regulations for the release of petroleum: Site 17 and Underground Storage Tank 03.

The proposed construction associated with Alternative 2 would affect or has the potential to affect two active Installation Restoration sites, as summarized in **Table 5.14-1**. These sites are described in detail below.

Table 5.14-1. Installation Restoration Sites within the Project Area at NAS Lemoore

Site Number	*Site Name*	*Site Description*	*Chemicals of Concern*	*Current Status*	*Notes*
5/9	Fire Fighting School, Sludge Drying Ponds, and Navy Exchange Gas Station	Two sites combined due to proximity. Fuel on water firefighting practice, wastewater treatment sludge, and gasoline leaks from underground storage tanks	JP-4 or 5, fuel (auto gas and diesel), wastewater treatment plant sludge	Exposure Area A: Remedial Investigation Addendum sampling (2009-2011); indoor air sampling (2010) Exposure Area B: Remedial Investigation Addendum sampling (2009)	Underground storage tank – combined Remedial Investigation Addendum (including a human health risk assessment) and Feasibility Study currently being completed
14	Jet Engine Test Cells	Several aircraft maintenance and supply buildings, industrial wastewater lines, storm drain, manhole, wash rack 6 underground storage tanks	Two commingled plumes of chlorinated solvent and fuel in groundwater and soil	Aquifer investigations (2011)	A remedial investigation addendum and a human health risk assessment are currently being completed.

Source: (DoN 2012).

Site 5/9

Site 5/9 is located in the Operations Area of NAS Lemoore. Site 5/9 is separated into Exposure Area A, which includes Installation Restoration Sites 5 and 9, and Exposure Area B, which includes the Navy Exchange gas station. These separate exposure areas were delineated based on different historical uses and current site activities (DoN 2012). Contaminants associated with historical operations at Site 5 primarily include jet petroleum fuel (JP-4 and JP-5). Waste solvents and other flammable liquids were occasionally mixed with the jet fuels before 1975. Contaminants associated with historical operations at Site 9 reportedly include wastes generated by aircraft washing, paint residue, electroplating, and photo processing. One abandoned sludge pond, located south of the Industrial wastewater treatment plant, is also included as part of Site 9. Contaminants associated with the Navy Exchange gas station include leaded and unleaded gasoline (DoN 2012). Phase 3 of the remedial investigation at Site 5/9 is currently in progress (DoN 2012).

Site 14

Site 14 is located in the south-central portion of the Operations Area at NAS Lemoore. Two commingled plumes of chlorinated solvents and fuel exist in groundwater, as well as several associated source areas in soil. The contamination present at this Installation Restoration site likely resulted from inadequate storage capacity for industrial wastewater, six former underground storage tanks, and other practices associated with aircraft maintenance. Storage capacity was corrected to prevent the discharge of industrial wastewater, the underground storage tanks were removed, and the industrial wastewater lines have been repaired or replaced (DoN 2012).

A Remedial Investigation addendum and human health risk assessment are currently being completed for Site 14. A contamination source and beneficial use of the intermediate aquifers investigation is also currently being conducted at Site 14. The data obtained will be used in conjunction with and to supplement the Remedial Investigation addendum. The information obtained will also be included in the Feasibility Study and will be used to evaluate remedial alternatives (DoN 2012).

Military Munitions Response Program Sites

No Military Munitions Response Program (MMRP) sites are known to occur in the vicinity of the proposed construction sites. The areas proposed for construction activities are located near active runaways and operational areas. No firing or bombing ranges are located in the vicinity nor is any ordnance handled or stored nearby (DoN 2011a). A trap and skeet range is located to the southeast of the area and is well outside any proposed construction areas (**Figure 5.14-1**).

5.14.2 Environmental Consequences for Alternative 2

Under Alternative 2, potential impacts to hazardous materials and waste could occur from proposed demolition and construction, as well as aircraft maintenance activities. Potential impacts from homebasing at NAS Lemoore are discussed in the next two sections in terms of effects at NAS Lemoore and effects at NAF El Centro.

5.14.2.1 Alternative 2 – NAS Lemoore Homebasing, Effects at NAS Lemoore

Hazardous Materials Management

Under Alternative 2, hangars are proposed for construction and renovation and a new engine repair facility, training facilities and communications security additions are proposed. In addition, Bldg. 21 would be demolished. During demolition and construction, contractors would be required to comply with all applicable requirements concerning handling of hazardous substances on, near, or away from the site. The contractor would use BMPs and engineering controls to prevent or minimize any adverse impact to the environment from any unexpected spills or releases of hazardous materials.

Hazardous materials associated with the F-35C program would not impact installation management programs. Existing facilities and established procedures are in place for the safe handling, use, and disposal of hazardous materials at NAS Lemoore, and implementation of the Alternative 2 would not result in significant hazardous materials related impacts. Management protocols for hazardous substances related to the F-35C would follow existing regulations and procedures for like materials.

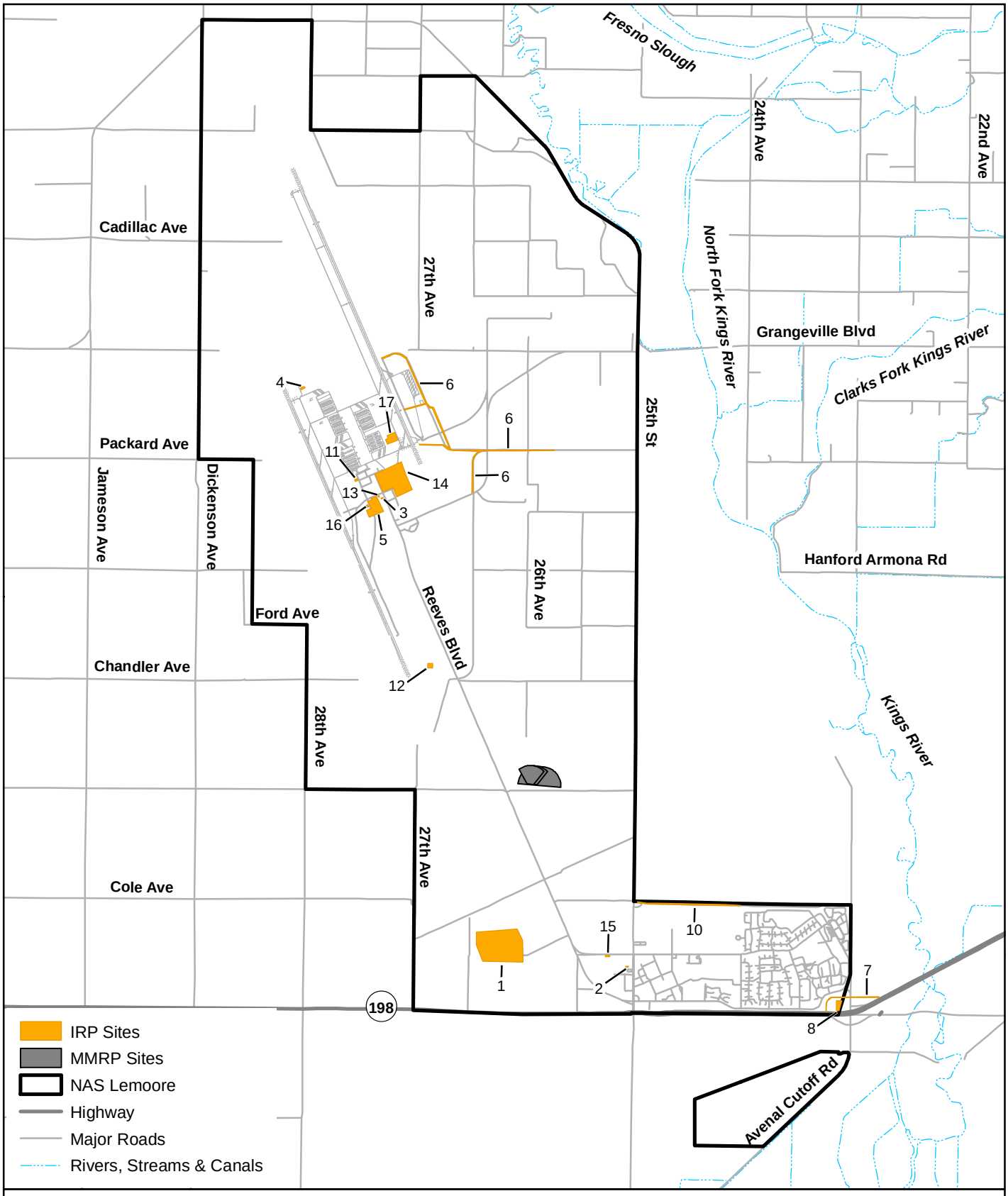


Figure 5.14-1
Installation Restoration and MMRP Sites at NAS Lemoore

Source: NAVFAC Southwest 2010

F-35C operations are expected to be similar to the legacy aircraft they are replacing with respect to many of the types and volumes of hazardous materials required to operate and maintain them, especially regarding adhesives and sealants and support equipment. The F-35 Program includes an Air System Lifecycle Plan, which focuses on hazardous materials reduction and elimination initiatives (Fetter 2006). Some of the materials substitutions that have been implemented in the development of the F-35 include reducing or eliminating the use of many heavy metals and other environmentally sensitive materials. The F-35 has implemented the use of titanium or stainless steel fasteners instead of traditional, cadmium-plated screws and rivets. A new Integrated Power Package has replaced a toxic hydrazine system that is used in F-16 legacy aircraft to restart stalled engines at altitude. The F-35 employs a high velocity oxygenated fuel technology that uses a powder to coat the parts, improving the function and extending the lifespan of F-35 actuators, wear surfaces, and landing gear without use of chrome plating.

The F-35 uses non-chrome primers that do not require the use of traditional cadmium and hexavalent chromium-based material, as well as top-coat paints that comply with volatile organic compound (VOC) requirements. In addition, new materials are being used where feasible in place of the copper-beryllium bushings formerly used in high-load actuators, such as the tail and landing gear (Fetter 2006; Luker 2009).

Additionally, a detection device has been developed that will alert F-35 maintenance teams to corrosion issues in the aircraft, thereby eliminating the need for whole-aircraft stripping and reducing repainting to an as-needed procedure (Fetter 2006; Luker 2009). Any repair-related paint removal operation will be localized and completed through the use of scuff sanding instead of chemical strippers (Luker 2009). Therefore, hazardous materials associated with F-35 painting operations and hazardous waste volumes would be substantially reduced relative to legacy aircraft.

Although flight activities are expected to remain consistent, maintenance operations for all new airframes may decline since newer aircraft should not require the extensive repairs currently necessary to maintain older aircraft. This would further reduce the materials required to conduct these repairs (Luker 2009). Traditional maintenance programs were automatically triggered based on flight hours, whereas, modern maintenance is performed on an as-needed basis determined by actual aircraft condition. This change generally translates into fewer maintenance operations and their associated use of hazardous materials. The elimination and/or reduction of the hazardous substances discussed above would reduce the overall amount of hazardous materials used, thus reducing the overall potential impacts to the environment. Therefore, there would be negligible impacts from hazardous materials with the implementation of Alternative 2.

Underground and Aboveground Storage Tanks

Aboveground storage tank/underground storage tank removal and relocation may be required as a result of construction activities. All aboveground storage tank/underground storage tank removals/relocations would be conducted in accordance with applicable regulations and the installation Spill, Prevention, Control and Countermeasures Plan to eliminate/minimize potential adverse impacts.

Any subsequent remedial activities would be conducted in accordance with the cleanup and disposal procedures outlined in the installation Spill, Prevention, Control and Countermeasures Plan.

Asbestos-containing Materials

Asbestos-containing materials may be present in structures proposed to be demolished or renovated. Previous asbestos-containing material surveys would be reviewed and additional surveys would be conducted for asbestos-containing materials prior to remodeling or demolishing of unsurveyed structures and structures known to contain asbestos-containing materials. Asbestos-containing material would be removed, as required by 40 C.F.R. 61.145, prior to renovation or demolition of the structures. A California licensed asbestos abatement contractor would characterize the material and determine the proper technique for removing the asbestos-containing materials and demolishing the facilities. Asbestos-containing materials would be removed, characterized, managed, transported, and disposed according to applicable state, federal, and local requirements for protecting human health and safety and the environment. Therefore, impacts associated with asbestos-containing materials would be beneficial in nature.

Lead-based Paint

Surveys for lead-based paint would be conducted on structures prior to renovation or demolition activities. Lead-based paint sampling and analysis would be conducted in accordance with USEPA TCLP methodology. Based on this federal testing methodology, the paint would be considered hazardous if lead is detected in concentrations greater than five milligrams per liter (mg/l). If lead-based paint were detected in hazardous concentrations, these materials would be removed and disposed of as appropriate. Lead-based paint would be characterized, managed, transported, and disposed of according to applicable state, federal, and local requirements for protecting human health and safety and the environment. Therefore, impacts associated with lead-based paint would be beneficial in nature.

Polychlorinated Biphenyls

Any buildings or portions thereof constructed prior to 1979 would receive a full PCB survey prior to renovation or demolition. PCB containing materials would be handled and disposed of in accordance with all applicable federal, state and local regulations. PCBs would be characterized, managed, transported, and disposed of according to applicable state, federal, and local requirements for protecting human health and safety and the environment. PCB-containing materials are classified according to the concentration of PCBs present. There are three classifications of PCB-containing materials: (a) PCBs (>500 parts per million [ppm]), (b) PCB-contaminated (5-500 ppm) and (c) non-PCB (<5 ppm). Any PCB or PCB-contaminated material would be disposed of at an approved disposal facility within one year from the date when the item is declared a waste or is no longer fit for use in accordance with applicable regulations. The removal of PCB-containing equipment from the installation would have a beneficial impact on hazardous wastes at the installation.

Hazardous materials associated with the F-35C program would not impact installation management programs. Existing facilities and established procedures are in place for the safe handling, use, and disposal of hazardous materials at NAS Lemoore, and implementation of the Alternative 2 would not

result in significant hazardous materials related impacts. Management protocols for hazardous substances related to the F-35C would follow existing regulations and procedures for like materials.

F-35C operations are expected to be similar to the legacy aircraft they are replacing with respect to many of the types and volumes of hazardous materials required to operate and maintain them, especially regarding adhesives and sealants and support equipment. The F-35 Program includes an Air System Lifecycle Plan, which focuses on hazardous materials reduction and elimination initiatives (Fetter 2006). Some of the materials substitutions that have been implemented in the development of the F-35 include reducing or eliminating the use of many heavy metals and other environmentally sensitive materials. The F-35 has implemented the use of titanium or stainless steel fasteners instead of traditional, cadmium-plated screws and rivets. The F-35 employs a high velocity oxygenated fuel technology that uses a powder to coat the parts, improving the function and extending the lifespan of F-35 actuators, wear surfaces, and landing gear without use of chrome plating. The F-35 uses non-chrome primers that do not require the use of traditional cadmium and hexavalent chromium-based material, as well as top-coat paints that comply with volatile organic compound (VOC) requirements. In addition, new materials are being used where feasible in place of the copper-beryllium bushings formerly used in high-load actuators, such as the tail and landing gear (Fetter 2006; Luker 2009).

Additionally, a detection device has been developed that will alert F-35 maintenance teams to corrosion issues in the aircraft, thereby eliminating the need for whole-aircraft stripping and reducing repainting to an as-needed procedure (Fetter 2006; Luker 2009). Any repair-related paint removal operation will be localized and completed through the use of scuff sanding instead of chemical strippers (Luker 2009).

Therefore, hazardous materials associated with F-35 painting operations would be substantially diminished relative to legacy aircraft. Although flight activities are expected to remain consistent, maintenance operations for all new airframes may decline since newer aircraft should not require the extensive repairs currently necessary to maintain older aircraft. This would further reduce the materials required to conduct these repairs (Luker 2009).

Hazardous Waste Management

Under the Alternative 2, hangars are proposed for construction and renovation and a new engine repair facility, training facilities and communications security additions are proposed. During construction, contractors would be required to comply with all applicable requirements concerning disposing of hazardous waste on, near, or away from the site.

The types of hazardous wastes generated by F-35 operations are expected to be fewer than for legacy aircraft since painting operations, cadmium and hexavalent chromium primers, chrome, hydrazine, and various heavy metals would be eliminated or greatly reduced for the F-35 (Fetter 2006; Luker 2009). As with hazardous materials, the wastes that are targeted for omission, substitution, or reduction would decrease as compared to amounts currently generated in support of legacy aircraft operations. Implementation of Alternative 2 would not result in significant hazardous waste related impacts at NAS Lemoore.

Pollution Prevention

During construction, contractors would be required to comply with all applicable requirements concerning the management and disposal of hazardous materials and wastes on, near, or away from the site. Construction contractors would use BMPs and engineering controls to prevent or minimize any adverse impact to the environment from any unexpected spills or releases of hazardous materials and wastes.

Management protocols for hazardous materials related to the F-35C would follow existing regulations and procedures for like materials and would not result in pollution related impacts. The hazardous waste associated with the F-35C program operations would not impact installation management programs. Existing facilities and established procedures are in place for the safe handling, use, and disposal of hazardous waste at NAS Lemoore. Therefore, the implementation of the Alternative 2 would not result in pollution related impacts.

Contaminated Sites

Environmental Restoration Program

Two active Installation Restoration sites have the potential to be affected by construction activities associated with Alternative 2 (**Figure 5.14-2**). These impacts would be managed and minimized similar to as described in Section 4.14.

Operational activities associated with Alternative 2 would have no impact on Installation Restoration sites at NAS Lemoore. All currently active sites would continue to be remediated and monitored in accordance with current plans, policies and procedures

Military Munitions Response Program Sites

No MMRP sites are known to be present within the construction areas associated with Alternative 2 (**Figure 5.14-2**). Therefore, Alternative 2 would have no impact on MMRP sites at NAS Lemoore.

Operational activities associated with Alternative 2 would have no impact on MMRP sites at NAS Lemoore. All currently active sites would continue to be remediated and monitored in accordance with current plans, policies and procedures.

Conclusion

Overall, as discussed above, implementation of Alternative 2 at NAS Lemoore would not result in significant impacts to public health and safety from hazardous materials and waste related to proposed F-35C operations and facility development. Hazardous waste management activities would follow existing procedures for the safe handling, use, and disposal of hazardous substances and waste. There would be a beneficial impact to hazardous waste generation as volumes of hazardous wastes generated by aircraft operations would decrease compared to amounts currently generated in support of legacy aircraft operations. Two Installation Restoration sites would be disturbed during construction, which would be conducted in accordance with CERCLA requirements. Hazardous materials associated with the F-35C would not impact installation management programs at NAS Lemoore.

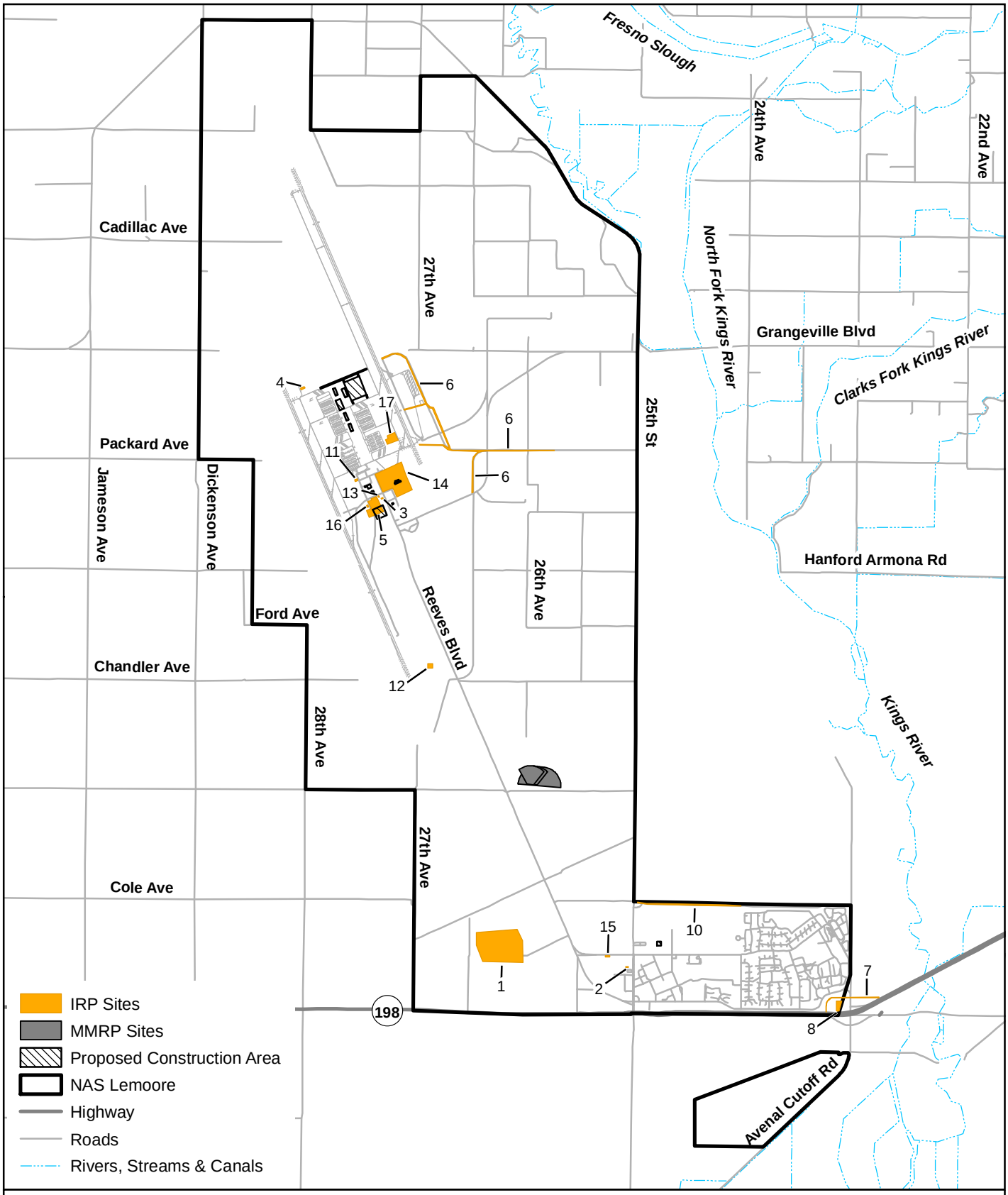


Figure 5.14-2
Installation Restoration and MMRP Sites within the Vicinity of Proposed Construction Activities at NAS Lemoore under Alternative 2

Source: NAVFAC Southwest 2010

5.14.2.2 Alternative 2 – NAS Lemoore Homebasing, Effects at NAF El Centro

Under Alternative 2, construction of the Special Access Program Facility would occur in an area between existing Hangar 3 and Hangar 4. There are no known hazardous wastes or materials in this area; therefore hazardous waste or materials would not impact the proposed construction.

5.14.3 Environmental Consequences for the No Action Alternative

Under the No Action Alternative, operations at NAS Lemoore would continue at current levels and all regulations and plans that pertain to hazardous material, hazardous waste, toxic substances, and contaminated sites would continue to be followed and existing conditions would remain unchanged.

6. CUMULATIVE IMPACTS FOR ALTERNATIVE 1 – NAF EL CENTRO HOMEBASING

This chapter assesses the potential cumulative impacts with the implementation of Alternative 1 and includes: 1) a description of past, present, and reasonably foreseeable future actions relevant to cumulative impacts; 2) an analysis of the incremental interactions Alternative 1 may have with other regional actions; and, 3) an evaluation of the cumulative impacts potentially resulting from these interactions. The definition of cumulative impacts was provided in Section 3.15.

6.1 PAST, PRESENT, AND REASONABLY FORESEEABLE FUTURE ACTIONS

This section identifies past, present, and reasonably foreseeable future actions not related to Alternative 1 that have the potential to cumulatively impact the resources in the affected environment for Naval Air Facility (NAF) El Centro and its regionally affected area. An overview of these actions is presented to emphasize components of the activities that are relevant to the impact analyses for the affected environment of NAF El Centro. Geographic distribution, intensity, duration, and historical effects of similar activities were considered when determining whether a particular activity may contribute cumulatively and significantly to the impacts of Alternative 1 on the resources identified in this Environmental Impact Statement (EIS). **Table 6.1-1** lists the projects assessed in this section, as well as any National Environmental Policy Act (NEPA) or environmental analysis that has been prepared or is anticipated to occur. **Figure 6.1-1** depicts the locations of these projects near NAF El Centro.

Table 6.1-1. Other Actions Relevant to Cumulative Impacts Analysis under Alternative 1

Action	*Environmental Analysis*	*Federal Action*
Past Actions		
NAF El Centro Facility and Infrastructure Improvements	Categorical Exclusions	✓
Present Actions		
United States (US) Marine Corps F-35B West Coast Basing	EIS, Record of Decision (ROD)	✓
West Coast Basing of the MV-22	EIS, ROD	✓
Reasonably Foreseeable Future Actions		
Navy El Centro Ranges	Environmental Assessment (EA), Finding of No Significant Impact (FONSI)	✓
Implementation of Wildland Fire Management Plan, NAF El Centro	EA	✓
Renewal of the Chocolate Mountain Aerial Gunnery Range Land Withdrawal	EIS complete	✓
West Chocolate Mountains Renewable Energy Evaluation Area	EIS, ROD	✓
US Border Patrol El Centro Sector and Yuma Sector Tactical Infrastructure Construction Projects	Environmental Stewardship Plan	✓
Cabeza Prieta National Wildlife Refuge Comprehensive Conservation Plan and Wilderness Stewardship Plan	EIS, ROD	✓
Imperial Valley Solar Project	Environmental Impact Report (EIR)/EA, FONSI	
Desert Springs Resort	EIR in progress	
Alder 70 Development	EIR in progress	

Table 6.1-1. Other Actions Relevant to Cumulative Impacts Analysis under Alternative 1

Action	*Environmental Analysis*	*Federal Action*
McCabe Ranch II Development	EIR	
Mosaic Development	EIR in progress	
Procalamos Development	EIR	
Rancho Los Lagos Development	EIR	
101 Ranch Development	EIR	
Pacific Ethanol Production Facility	EIR	
US Gypsum Manufacturing Facility	EIS/EIR	
East Brawley Geothermal Development	EIR	
Imperial Solar Energy Center West	EIR	
Mesquite Lake Industrial Development	EIR	

6.1.1 Past Actions Relevant to Alternative 1 - NAF El Centro Homebasing

While routine improvements to facilities and infrastructure have been made over the years at NAF El Centro, there have been no large-scale past actions involving major increases in aircraft, facilities, personnel, and aircraft operations. Examples of facility and infrastructure improvements that have been made include runway and taxiway repairs, recreational vehicle park expansion, alternate access gate construction, and advanced metering of utility infrastructure. These facilities and infrastructure improvements are reflected in the 2015 baseline conditions for this F-35C West Coast Homebasing EIS. The cumulative impacts of these past actions are assessed along with Alternative 1 in the environmental consequences sections for each resource in Chapter 4, *Alternative 1 - NAF El Centro Homebasing*.

6.1.2 Present Actions Relevant to Alternative 1 - NAF El Centro Homebasing

The following present actions are relevant to the cumulative impacts analysis of airspace in the vicinity of NAF El Centro.

- **Final EIS for US Marine Corps F-35B West Coast Basing** (Department of the Navy [DoN] 2010a) – This project involves the basing of 96 F-35 aircraft at MCAS Miramar, California and 88 F-35 aircraft Marine Corps Air Station (MCAS) Yuma, Arizona, the construction and/or renovation of airfield facilities and infrastructure, and changes in personnel levels and the number of aircraft operations. The Marine Corps transition from legacy aircraft to the F-35 is planned over a 10-year timeframe, starting as early as 2012. Marine Corps F-35 aircraft would conduct increased operations in the following Special Use Airspace (SUA) as is proposed for use by Navy F-35C aircraft: Restricted Area (R-) 2301 (R-2301) West (7 percent increase), R-2306/R-2308 (34 percent increase), R-2507 (38 percent increase), Abel Military Operations Area (MOA) (74 percent increase), Kane MOA (0.2 percent increase), and R-2512 (47 percent increase). This project also involves the construction and operation of a new Auxiliary Landing Field within R-2301 West, Barry M. Goldwater Range – West. The ROD for the F-35B EIS was signed in December 2010 (DoN 2010b). This F-35 basing action has potential to interact with impacts to airspace and air quality from Alternative 1 due to increased aircraft operations.

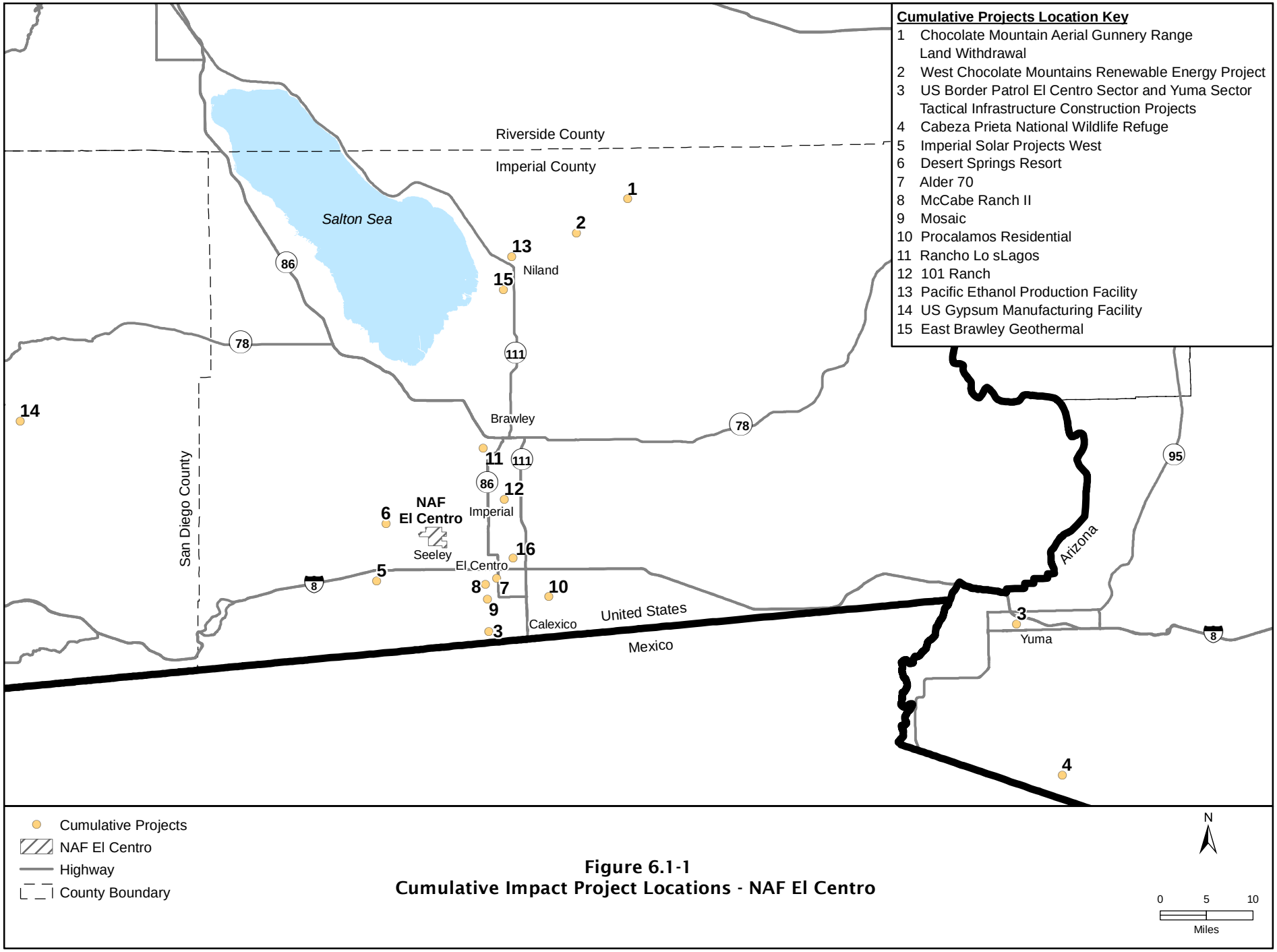


Figure 6.1-1
Cumulative Impact Project Locations - NAF El Centro

- **Final EIS for the West Coast Basing of the MV-22** (DoN 2009a) - This project involves basing of eight MV-22 squadrons at MCAS Miramar and two squadrons at MCAS Pendleton for a combined total of 120 aircraft on the West Coast. These squadrons will replace nine helicopter squadrons (114 aircraft), which the Marine Corps plans to remove from service. MV-22 aircraft from MCAS Miramar and MCAS Pendleton will perform training and readiness operations within Department of Defense (DoD)-controlled airspace and Navy/Marine Corps-controlled training ranges located on the West Coast. They include Barry M. Goldwater Range West (R-2301/W) in Yuma County, Arizona, and Chocolate Mountain Aerial Gunnery Range (R-2507), R-2510, and R-2512 in Imperial and Riverside Counties, California. The MV-22s will fly about 46,000 operations annually, replacing approximately 27,000 annual operations being conducted by the helicopter squadrons (DoN 2009). Transition from the helicopters to the MV-22s was scheduled to occur between 2010 and 2020. The ROD for this EIS was signed on November 18, 2009 (DoN 2009b). The MV-22 basing action has potential to interact with impacts to airspace and air quality from Alternative 1 due to increased aircraft operations.

6.1.3 Reasonably Foreseeable Future Actions Relevant to Alternative 1 - NAF El Centro Homebasing

- **EA for the Navy El Centro Ranges** (DoN 2013a) – This project involves training activities on the El Centro Ranges, range enhancements, and construction of a digital airport surveillance radar (DASR) station at NAF El Centro. The proposed action would allow the Navy to increase training tempo over current conditions for the five-year planning period of 2013-2017; accommodate changes in personnel, weapons systems, and support systems; and enhance the capabilities of the Ranges, as necessary, to ensure that the El Centro Ranges continue to support Navy and Marine Corps training and readiness objectives. The DASR installation would provide real-time radar images and aircraft data, allowing pilots to train more safely and efficiently, and increasing readiness. Public meetings were held July 15-16, 2009 in El Centro, California. This project has the potential to interact with impacts from Alternative 1 because an increase in training operations may result in potential impacts to regional airfields and airspace, and air quality. However, the proposed DASR project would have a beneficial impact on airspace management. A Finding of No Significant Impact for this EA was signed in October 2013 (DoN 2013b).
- **Implementation of Wildland Fire Management Plan, NAF El Centro** (DoN 2008) – To comply with federal and DoD policies, the Navy prepared an EA to analyze the potential environmental impacts from implementing the 2006 Wildland Fire Management Plan within 58,519 acres of target ranges and other wildland areas controlled by NAF El Centro. Fully implementing the plan would involve the periodic use of recommended pre-suppression strategies, the use of fire resistant materials in any future facility construction, aerial spraying of fire retardant around targets, and periodic small-scale brush pile burning. The fire management strategies would apply to five training range target areas within R-2510 and R-2512, and an isolated parcel (Tract 40) located to the west. Implementation of the wildland fire management implementation plan has potential to interact with impacts from Alternative 1 because the fire pre-suppression and suppression practices on NAF El Centro lands may have beneficial effects on air quality, biological resources, water resources, and management of hazardous materials and waste.

- **Legislative EIS for the Renewal of the Chocolate Mountain Aerial Gunnery Range Land Withdrawal** (DoN 2013c) – The Navy and Marine Corps, with the cooperation of the Bureau of Land Management, have prepared a Legislative EIS for the proposed renewal of the withdrawal of approximately 226,711 acres of public land in Imperial and Riverside Counties, California for continued military use of the Chocolate Mountain Gunnery Range (79 *Federal Register* 4158). The California Military Lands Withdrawal and Overflights Act of 1994 authorized the withdrawal of these lands for a period of 20 years. Under the terms of the Act, the Navy may seek a renewal of the withdrawal. The_Final Legislative EIS, published in January 2014, evaluates the environmental effects of a number of land withdrawal renewal alternatives. The renewal of the Chocolate Mountain Aerial Gunnery Range land withdrawal has potential to interact with impacts to airspace from Alternative 1 due to continued aircraft operations. Congress approved the renewal of the land withdrawal in the 2014 National Defense Authorization Act.

- **EIS for the West Chocolate Mountains Renewable Energy Evaluation Area** (Bureau of Land Management 2012) – The Bureau of Land Management prepared an EIS evaluating the potential environmental impacts associated with facilitating renewable energy development, including geothermal, solar, and wind, on public lands within the West Chocolate Mountains area in north-central Imperial County, northeast of El Centro, California. This proposed action would expedite the permitting of renewable energy projects. The area of Bureau of Land Management-managed public lands considered for renewable energy projects covers approximately 20,762 acres of land that contain federal surface and 19,162 acres of land of the federal mineral estate. The evaluation area extends from the Imperial/Riverside County line approximately 27 miles southeast, along the southwest border of the Chocolate Mountain Aerial Gunnery Range. A Final EIS was published in November 2012 and a ROD was issued in August 2013 (Bureau of Land Management 2013).

  The proposed renewable energy project action has potential to interact with impacts from Alternative 1 because renewable energy projects generally may not be compatible with military training operations on and around the Chocolate Mountain Aerial Gunnery Range, and thus, create public safety concerns. This action also has potential to interact with impacts from Alternative 1 because it may result in changes to regional air quality, biological resources, water resources, and cultural resources.

- **US Border Patrol El Centro Sector and Yuma Sector Tactical Infrastructure Construction Projects** (US Customs and Border Protection 2008a, b) – The US Customs and Border Protection developed an environmental stewardship plan as the result of studying the environmental effects of the proposed construction, operation, and maintenance of 44.6 miles of tactical infrastructure within the US Border Patrol El Centro Sector in Imperial County, California and Yuma Sector in Yuma County, Arizona and Imperial County, California. The infrastructure construction projects consist of fences, patrol and access roads, lighting, gates, and barriers. Construction was expected to be completed by the end of 2008. This action would increase border security, improve enforcement proficiency, and deter illegal entries. The final environmental stewardship plans were completed in May 2008. The US Border Patrol

infrastructure construction action has potential to interact with impacts of Alternative 1 by enhancing security near the United States-Mexico international border, thereby providing a beneficial community service. In addition, the project has the potential to interact with impacts from Alternative 1 because it may result in changes to air quality due to construction activities.

- **EIS for Cabeza Prieta National Wildlife Refuge Comprehensive Conservation Plan and Wilderness Stewardship Plan** (US Fish and Wildlife Service [USFWS] 2006) – The USFWS prepared an EIS to establish the wilderness and conservation management and administration framework for Cabeza Prieta National Wildlife Refuge for 15 years (USFWS 2007). The EIS addressed a variety of issues facing the USFWS as stewards of the refuge, including military aircraft operations within R-2301 overlying the refuge. The management plan provides beneficial effects to traditional cultural properties (TCPs) by protecting, maintaining, and interpreting in cooperation with Tribal governments. The USFWS released the Final EIS in August 2006 and a ROD was issued in September 2007 (USFWS 2007). This action also has potential to interact with impacts from Alternative 1 due to impacts to biological resources and cultural resources.

- **Imperial Valley Solar Project** – The Imperial Valley Solar Project is located in southwestern Imperial County, south of Evan Hewes Highway and north of Interstate 8 (I-8). The proposed project would be located on approximately 6,500 acres of vacant land of which Bureau of Land Management owns approximately 6,140 acres. The project would be a primary power generating facility that would be constructed in two phases. Phase I would result in the construction and operation of a 300-megawatt facility and Phase II would result in the construction and operation of facilities to generate an additional 450 megawatts.

  It is anticipated that this project has potential to interact with impacts from Alternative 1 because it would have impacts to air quality, biological resources, and cultural resources, as a result of construction and operation activities.

- **Desert Springs Resort** (Imperial County Planning and Development Services 2010a) – An application to amend the General Plan and Land Use Ordinance has been submitted to Imperial County for this proposed outdoor recreational resort community located approximately 4 miles northwest of NAF El Centro. The 1,105 acre site is west of the intersection of Boley and Westmoreland Roads, and is bordered on the west by Bureau of Land Management's Plaster City Open Area outdoor recreational vehicle lands and on the north by NAF El Centro lands underlying R-2510A on which a bombing target is located. The development would consist of up to 1,475 lots for water sport, recreational vehicles, estates, vacation villas, and garage villas; interconnecting lakes for water sport recreation; a navigable waterway connecting residential areas with a clubhouse, restaurant, pool, and other amenities; and a race track/road course.

  The proposed resort community development action has potential to interact with impacts from Alternative 1 because the development may result in impacts to air quality, safety, land use, infrastructure and utilities, socioeconomics, community services, and traffic and transportation.

- **Planned Residential and Commercial Developments, Southern Imperial County** – Six different master planned residential and commercial communities are proposed for development in

southern Imperial County over the next one to three decades. One is east of El Centro, one is east of Calexico, two are in Heber, and two are south of Brawley. They range in size from 75 acres to 1,895 acres and all consist of a mix of large numbers of residential units with some commercial uses and parks. **Table 6.1-2** describes these proposed developments.

Table 6.1-2. Proposed Residential and Commercial Developments in Southern Imperial County

Name	*Location*	*Acreage*	*Anticipated Period of Development*	*Description*
Alder 70	East of El Centro, South of Evan Hewes Highway	76	3–4 years; start date unknown	392 dwelling units; commercial/ retail center; park and open space
McCabe Ranch II	East side of State Route 86 in Heber	457	12 years; start date unknown	2,300 single- and multifamily housing units; schools; commercial areas; community facilities; parks
Mosaic	South side of State Route 86 in Heber	202	Unknown	Up to 1,154 dwelling units; commercial center; parks; bike and pedestrian paths
Procalamos	State Route 7, 1 mile north of Calexico Port of Entry	180	5–10 years; start date unknown	841 single-family houses; five parks; pedestrian paths; RV storage; mini storage
Rancho Los Lagos	East side of State Route 86, south of Brawley	1,076	Unknown	3,830 dwelling units; business park; commercial; parks and recreation facilities; elementary school; warehouse industrial
101 Ranch	Between State Route 86 and State Route 11, 1 mile south of Brawley	1,895	25–30 years; start date unknown	6,986 houses; commercial center; parks and recreation facilities; four elementary schools and one junior high school; RV storage

Sources: Imperial County Planning and Development Services 2008, 2009a, 2009b, 2010b, 2010c, 2011b.

The proposed community development actions have the potential to interact with impacts from Alternative 1 as each development may result in changes to air quality, land use, infrastructure and utilities, socioeconomics, community services, and traffic and transportation.

- **Alder 70 Development** – The proposed Alder 70 development has potential to interact with impacts from Alternative 1 because the development may result in changes to air quality, land use, socioeconomic factors, and the demand for certain infrastructure and utilities, as well as community services, and traffic and transportation.
- **McCabe Ranch Development** – The proposed McCabe Ranch development has potential to interact with impacts from Alternative 1 because the development may result in changes to socioeconomics and the demand for certain infrastructure and utilities, as well as community services and transportation and traffic. This project proposes the development of residential, commercial and educational uses. It is anticipated that short-term air quality impacts would result from construction activities and long-term air quality impacts would result from increases in traffic associated with the development. Residential would include single and multi-family homes. Small grocery store, coffee shop and restaurants are proposed as part of the commercial development

along with a small business park component. Two schools are also proposed as part of the development of McCabe Ranch.

- **Mosaic Development** – The proposed Mosaic development has the potential to interact with impacts from Alternative 1 are similar to those described for the Alder 70 development. Short and long-term impacts to air quality associated with construction vehicles and construction activities.

  The project would also impact surrounding area roadways and mitigation has been proposed to offset these impacts.

  Impacts to land use and infrastructure and utilities are anticipated to be similar to those described for Alder 70. Socioeconomic beneficial impacts would also be similar to those identified for the Alder 70 project. Traffic impacts are anticipated to be similar as those for Alder 70.

- **Procalamos Development** – This project includes the proposed development of 841 single-family residential units, parks, retention basin, recreational vehicle storage, mini storage, and pedestrian paths.

  Impacts associated with the Procalamos development that have the potential to interact with impacts from Alternative 1 are similar to those described for the Alder 70 development. Short and long-term impacts to air quality associated with construction vehicles and construction activities. Increases in noise would also result in short and long-term effects associated with construction vehicles and construction activities, as well as the permanent increase in residential traffic.

  Increased demand on utilities would also occur as a result of this project. Increases in traffic would likely impact area roadways.

- **Rancho Los Lagos Development** – This project is a mixed-use development that would contain residential, age restricted residential, a golf course and a business park. Warehouse industrial, commercial, retail, parks and schools are also proposed uses.

  Impacts associated with the Rancho Los Lagos development that may interact with those impacts associated with Alternative 1 are similar to those described for the Alder 70 development. Short and long-term impacts to air quality associated with construction vehicles and construction activities. Increases in noise would also result in short and long-term effects associated with construction vehicles and construction activities, as well as the permanent increase in residential traffic. Impacts to biological and archaeological resources, soils, utilities, and land use would also be impacted by this project.

  Biological resources including the burrowing owl, freshwater habitat and foraging habitat for sensitive species, have the potential to be impacted by this project. Short and long-term impacts to hydrological resources in the area have also been identified.

Mitigation measures have been put in place to avoid or minimize impacts to these resources.

This project has the potential to impact historical, archaeological and paleontological resources. Archaeological and paleontological mitigation monitoring plans would be established for this project.

- **101 Ranch Development** – The proposed project would include residential neighborhoods, schools, retail, parks, and recreational vehicle storage. Short and long-term impacts to air quality associated with construction vehicles and construction activities. Increases in noise would also result in short and long-term effects associated with construction vehicles and construction activities, as well as the permanent increase in residential traffic.

  Impacts associated with the 101 Ranch development that may interact with those impacts associated with Alternative 1 are similar to those described for the Alder 70 development.

- **Pacific Ethanol Production Facility** – This proposed project involves construction and operation of an ethanol and distiller grain manufacturing facility on a 92.2-acre parcel on State Route 111 on the south side of Calipatria, which underlies the Kane East MOA. The facility, which was scheduled to begin operation in August 2008, would receive corn, grain, and other raw products via rail to produce ethanol for use as a motor vehicle fuel additive and distiller grains for use as cattle feed (Imperial County Planning and Development Services 2007).

  The proposed ethanol facility action has potential to interact with impacts from Alternative 1 due to potential impacts to land use, infrastructure and utilities, socioeconomics, and traffic and transportation. The proposed ethanol facility action also has potential to interact with impacts from Alternative 1 because construction and operation of the facility may result in changes to population and employment in Imperial County. Short-term air quality impacts are likely to occur due to construction equipment. Long-term air quality impacts would result from on-site operations and may include emissions from diesel equipment. However, there are several mitigation measures in place to offset these impacts.

- **US Gypsum Manufacturing Facility** (Imperial County Planning and Development Services and Bureau of Land Management 2008) – The US Gypsum Company proposed modernizing and expanding its gypsum manufacturing plant in Plaster City and expanding its mining operations at its quarry near Ocotillo Wells. In order to expand production operations, the action also included increasing water usage for quarrying and production activities. The necessary water would be supplied in part from the company's existing wells in Ocotillo and in part by the Imperial Irrigation District. Water supplied to the plant from the Imperial Irrigation District was anticipated to begin sometime between 2010 and 2012, and would continue through 2025, the estimated termination of the plant's operations. As of 2013, a ROD has not been issued for the EIS.

The proposed gypsum manufacturing action has potential to interact with impacts from Alternative 1 due to potential changes in regional air quality, land use, infrastructure and utilities, socioeconomics, traffic and transportation, and water resources.

- **East Brawley Geothermal Development** (Imperial County Planning and Development Services 2011a) – A 50 megawatt geothermal power plant is proposed to be constructed on a 33.7-acre site located 2 miles northeast of Brawley. Associated facilities and infrastructure, such as wells, pipelines, and ditches, would also be constructed. The construction period of the plant would last 15 months; an estimated start date for construction of the plant was not identified.

  The proposed geothermal development action has potential to interact with impacts from Alternative 1 because plant construction and operation may result in changes in air quality, land use, infrastructure and utilities, socioeconomics, community services, water resources and cultural resources.

- **Imperial Solar Energy Center West** (Imperial County Planning and Development Services and Bureau of Land Management 2011) – The proposed project involves the construction and operation of a 250 megawatt photovoltaic solar energy facility. The facility and associated equipment and infrastructure would occupy a 1,130-acre site, which straddles the north and south sides of I-8 between the Dunaway Road interchange and the Westside Main Canal. Included in the project is the construction and operation of 5-mile-long electrical transmission line to connect the solar facility to the existing utility grid.

  The proposed solar energy action has potential to interact with impacts from Alternative 1 because construction and operation of the solar energy facility would result in impacts air quality, land use, and cultural resources.

- **Mesquite Lake Industrial Development** – The proposed Mesquite Lake Development encompasses a 1,420-acre site between State Routes 86 and 111, approximately 3 miles south of Brawley. The development would contain light, medium, and heavy industrial uses and the necessary infrastructure to serve the project (Imperial County Planning and Development Services 2006). The development would accommodate the expansion of an existing sugar plant and alternative energy production plant, and support new manufacturing, warehousing, and distribution uses. The period of development of this project is unknown. It is likely there would be an increase in truck traffic to the industrial portions of this development as well as additional traffic associated with employees.

  The proposed industrial development action has potential to interact with impacts from Alternative 1 due to potential changes in air quality, land use, socioeconomics, and traffic and transportation.

6.2 CUMULATIVE IMPACTS ANALYSIS FOR ALTERNATIVE 1 – NAF EL CENTRO HOMEBASING

This section analyzes the incremental interaction Alternative 1 may have with the actions described in the previous section and evaluates cumulative impacts potentially resulting from these interactions. **Table 6.2-1** summarizes which past, present, and reasonably foreseeable future projects have the potential for cumulative impacts to the resources affected by Alternative 1.

Table 6.2-1. Summary of Projects and Resources for Cumulative Impacts Analysis at NAF El Centro

Project	*Airfields and Airspace*	*Noise*	*Air Quality*	*Safety*	*Land Use*	*Infrastructure and Utilities*	*Socioeconomics*	*Community Services*	*Traffic and Transportation*	*Biological Resources*	*Topography and Soils*	*Water Resources*	*Cultural Resources*	*Hazardous Materials and Waste*
US Marine Corps F-35B West Coast Basing	X	X	X											
West Coast Basing of the MV-22	X	X	X											
Navy El Centro Ranges	X		X											
Implementation of Wildland Fire Management Plan, NAF El Centro			X							X		X		X
Renewal of the Chocolate Mountain Aerial Gunnery Range Land Withdrawal	X													
West Chocolate Mountains Renewable Energy Evaluation Area			X							X		X	X	
US Border Patrol El Centro Sector and Yuma Sector Infrastructure Construction Projects			X					X						
Cabeza Prieta National Wildlife Refuge Comprehensive Conservation Plan and Wilderness Stewardship Plan										X			X	
Imperial Valley Solar Project			X							X			X	
Desert Springs Resort			X	X	X	X	X	X	X					
Alder 70 Development			X		X	X	X	X	X					
McCabe Ranch II Development			X		X	X	X	X	X					
Mosaic Development			X		X	X	X	X	X					
Procalamos Development			X		X	X	X	X	X					
Rancho Los Lagos Development			X		X	X	X	X	X		X			
101 Ranch Development			X		X	X	X	X	X	X			X	
Pacific Ethanol Production Facility			X		X	X	X		X					
US Gypsum Manufacturing Facility			X		X	X	X		X			X		
East Brawley Geothermal Development			X		X	X	X	X				X	X	
Imperial Solar Energy Center West			X		X								X	
Mesquite Lake Industrial Development			X		X		X		X					

6.2.1 Airfields and Airspace – Potential Cumulative Impacts for Alternative 1

The study area for airfields and airspace cumulative impacts includes the NAF El Centro airfield and SUA in the vicinity of NAF El Centro. The present and reasonably foreseeable future actions that have the potential to interact with Alternative 1 and cumulatively impact SUA in the vicinity of NAF El Centro include the following.

US Marine Corps F-35B West Coast Basing

The F-35B basing action would result in increased aircraft operations in SUA as shown in **Table 6.2-2**.

Table 6.2-2. Changes in Annual Operations in SUA with Implementation of the US Marine Corps F-35B West Coast Basing

SUA	Number of Operations				Change
	Baseline	Proposed F-35B Operations	Legacy Operations Eliminated	Post-Basing Total	
R2306A/B/C and R-2308A/B	6,422	2,315	-140	8,597	+2,175
R-2507N/S/E	7,376	8,636	-5,864	10,148	+2,772
R-2512	2,609	2,834	-1,618	3,825	+1,216
Kane East MOA/ATCAA	3,444	3,141	-3,134	3,451	+7
Abel N/S MOA/ATCAA	2,092	2,834	-1,956	2,970	+878
Abel East MOA/ATCAA	147	302	-147	302	+155
R-2301W	19,044	10,286	-8,909	20,421	+1,377
Total	**41,134**	**30,348**	**-21,768**	**49,714**	**+8,580**

Sources: DoN 2010a.

West Coast Basing of the MV-22

The MV-22 basing action would result in increased aircraft operations in SUA as shown in **Table 6.2-3**. The transition to MV-22 is scheduled to occur with one or two squadrons transitioning each year between 2011 and 2020.

Table 6.2-3. Changes in Annual Operations in SUA with Implementation of the West Coast Basing of the MV-22

SUA	Number of Operations		Change
	Addition of MV-22	Reduction of CH-46	
R-2301W	17,942	-5,879	+12,063
R-2507	5,111	-862	+4,249
R-2510/R-2512	148	-78	+70
Total	**23,201**	**-6,819**	**+16,382**

Source: DoN 2009a.

Navy El Centro Ranges

The increase in training levels and installation of a DASR on the El Centro Ranges have the potential to interact with impacts from Alternative 1 because the increase in training may result in potential changes to regional airspace usage. However, the installation of the DASR would be a beneficial impact to all present and reasonably foreseeable future projects as the DASR would provide real-time radar images and aircraft data, allowing pilots to train more safely and efficiently, and increasing readiness.

Renewal of the Chocolate Mountain Aerial Gunnery Range Land Withdrawal

With regard to aircraft operations in the Chocolate Mountain Aerial Gunnery Range, there would be a cumulative scheduling burden when considering the additional F-35C operations proposed for R-2507, which would require further scheduling coordination between users of the Chocolate Mountain ranges.

Alternative 1 – NAF El Centro Homebasing

Homebasing the F-35C at NAF El Centro would increase operations in SUAs as shown in **Table 6.2-4**.

Table 6.2-4. Changes in Annual Operations in Special Use Airspace under Alternative 1

SUA	Number of Operations					
	Baseline (2015)(1)	Proposed Navy F-35C(2)	Navy Legacy FA-18 Eliminated	USMC F-35B/C Net Increase	USMC MV-22 Net Increase	Proposed End State (2028)
R-2301 West	30,630	960	-804	1,377	12,063	44,226
R-2306/R-2308	2,419	1,080	0	2,175	0	5,674
R-2507/Abel/Kane MOAs	36,884	2,879	-2,134	3,812	4,249	45,690
R-2512	4,402	388	-360	1,216	70	5,716
R-2510	6,765	922	-722	0	0	6,965
Total	**81,100**	**6,229**	**-4,020**	**8,580**	**16,382**	**108,271**

Sources: DoN 2009a, 2010a, 2012, 2013; ATAC 2012a, 2012b, 2012c.

Note: 1. The number of operations shown in this table differs from the number of operations shown in the USMC F-35B West Coast Basing EIS (DoN 2010) because the baseline years are different.

2. Flights to a particular range are based on range availability and weather. Flights may be distributed between the ranges listed. Many of the proposed F-35C local operations may be re-scheduled to W-291; as many as 17,571 total F-35C operations may be re-scheduled to W-291. Operations are based on average of five F-35C Fleet squadrons and FRS at homebase with two Fleet squadrons deployed.

6.2.1.1 Combined Impacts to Airfields and Airspace from Past, Present, and Reasonably Foreseeable Actions

The F-35B/C basing action and the MV-22 basing action are analyzed together with proposed F-35C operations under Alternative 1 in Section 4.1.2, Environmental Consequences. These cumulative impacts also take into consideration the number of Navy FA-18 operations that would be eliminated. Overall, there would be a change from the baseline of 81,100 operations in 2015 to 108,271 operations for the end state in 2028. The DASR installation from the El Centro Range project would allow pilots to train more efficiently. The increases in operations in SUA would be scheduled to accommodate the different military missions and operations.

The cumulative total increase in SUA operations does not equate to a proportional increase of aircraft that would require Combined En-Route Radar Approach Control handling. Several of the training areas are handled through local controllers; only flights headed to R-2301 West, R-2306/2308, and six Yuma-controlled IRs and VRs would require Combined En-Route Radar Approach Control assistance. In addition to the 832 and 1,080 F-35C operations in those areas, USMC F-35B and MV-22 aircraft would increase by 3,552 and 12,063, respectively. The total cumulative increase of operations for those areas is 15,615, which equates to 60 per day, based on an annual schedule of 260 flying days. Over the course of a typical flying day it would mean an increase of about 5 per hour during the daytime (7:00 a.m. to 7:00 p.m.) or even fewer when adding night operations. Significant cumulative impacts to SUA are not anticipated with implementation of Alternative 1. However, when considered cumulatively with the USMC F-35B and MV-22 actions, operations in these five complexes increase collectively by nearly a

third, so the owners/operators of these ranges may need to consider their Approach and Range Control procedures and manning.

6.2.2 Noise – Potential Cumulative Impacts for Alternative 1

The study area for noise cumulative impacts includes the land and population under the noise zones of NAF El Centro and SUA in the vicinity of NAF El Centro.

Only the US Marine Corps F-35B West Coast Basing and West Coast Basing of the MV-22 actions have the potential for cumulative impacts when combined with the proposed action. However, these actions are included as part of the environmental consequences analyzed in Section 4.2.2. None of the other past, present, or reasonably foreseeable future actions would have the potential for cumulative impacts to noise near the NAF El Centro airfield and proposed construction and demolition areas. Construction and demolition noise is very localized to the area of construction and although some of the activities could occur simultaneously with the construction activities under Alternative 1, they would be too distant to have a cumulative impact. Other than the noise impacts from Alternative 1, there would be no cumulative change to the overall noise levels at NAF El Centro. It is not anticipated that noise generated by the F-35C and the proposed construction and demolition projects under Alternative 1 would result in significant cumulative impacts to noise.

6.2.3 Air Quality – Potential Cumulative Impacts for Alternative 1

The study area for air quality cumulative impacts is the area of the Imperial County Air Pollution Control District (APCD) in the vicinity of NAF El Centro that would experience an increase in air emissions from construction and operations actions associated with Alternative 1. Actions that have a potential to interact with Alternative 1 and cumulatively impact air quality primarily include projects that would increase or decrease operations at NAF El Centro, increase vehicle traffic in the area, or require new construction. There have been no large-scale past actions involving increases in aircraft, facilities, or personnel at NAF El Centro. The past, present, or reasonably foreseeable future actions that have the potential to interact with Alternative 1 and cumulatively impact air quality in the study area include the following.

<u>US Marine Corps F-35B West Coast Basing</u>

This project may increase transient operations at the NAF El Centro airfield with associated increases in criteria pollutants and greenhouse gas (GHG) emissions. Increased transient operations for NAF El Centro are in included in the analysis for Alternative 1 and 2.

<u>West Coast Basing of the MV-22</u>

This project may increase transient operations at the NAF El Centro airfield with associated increases in criteria pollutants and GHG emissions. Increased transient operations for NAF El Centro are in included in the analysis for Alternative 1 and 2.

<u>Navy El Centro Ranges</u>

This project may cause a temporary increase of emissions from mobile sources and ground disturbance during construction with associated increases in criteria pollutants and GHG emissions. Additionally, the

proposed increased training activities may increase aircraft operations and the air emissions associated with the operations below 3,000 ft. Annual emissions of air pollutants from training activities would be up to approximately 28 percent greater than baseline conditions and would be insignificant relative to County and Air Basin emissions.

Implementation of Wildland Fire Management Plan, NAF El Centro

Improved fire management strategies would in theory decrease the wildland fires. Decrease in wildland fires would decrease the annual emissions of particulate matter and combustion by-products including soot and carbon monoxide (CO) into the atmosphere, having a beneficial impact to regional air quality.

West Chocolate Mountains Renewable Energy Evaluation Area

This project may cause a temporary increase of emissions from mobile sources and ground disturbance during construction. The introduction of renewables, if used in place of conventionally generated power has the potential to reduce criteria pollutant and GHG emissions from the conventionally generated power plants (e.g., coal and natural gas).

US Border Patrol El Centro Sector and Yuma Sector Tactical Infrastructure Construction Project

These projects may cause temporary increases of criteria pollutant and GHG emissions from mobile sources during construction. Operation of patrols through the proposed infrastructure could result in increased emissions from motor vehicles if patrols were to increase from baseline.

Imperial Valley Solar Project

This project may cause a temporary increase of criteria pollutant and GHG emissions from mobile sources and ground disturbance during construction. The introduction of renewables, if used in place of conventionally generated power has the potential to reduce both criteria pollutant and GHG emissions from the conventionally generated power plants (e.g., coal and natural gas). Other emission sources include emissions from motor vehicles from staff commuting, maintenance of the solar arrays, and back-up diesel generators. Criteria pollutant and GHG emissions from these sources could increase for the project from baseline, though the overall impact of project implementation would be beneficial to regional air quality.

Desert Springs Resort

If this project is developed, this project may cause a temporary increase of criteria pollutant and GHG emissions from mobile sources and ground disturbance during construction. Increases in local emissions from commuters living in the development and increased population in the area would be expected to increase, as would emissions from recreational marine and off-road vehicles.

Planned Residential and Commercial Developments, Southern Imperial County

This project may cause a temporary increase of criteria pollutant and GHG emissions from mobile sources and ground disturbance during construction. Increases in local emissions from commuters living in the development and increased population in the area would be expected to increase, as would emissions from recreational marine and off-road vehicles.

Pacific Ethanol Production Facility

This project may cause a temporary increase of criteria pollutant and GHG emissions from mobile sources and ground disturbance during construction. Additionally, operational air quality impacts that would be long term would be associated with the operation of the production facility. Increased emissions from a population increase to work at the production facility would be expected. Increased emissions from heavy-duty diesel trucks used for shipping and receiving would be expected as a result of the manufacturing facility. Additional facility emissions may include diesel equipment. It is anticipated that mitigation measures would be implemented to offset air quality impacts.

US Gypsum Manufacturing Facility

This project may cause a temporary increase of criteria pollutant and GHG emissions from mobile sources and ground disturbance during construction. Additionally, operational air quality impacts that would be long term would be associated with the operation of the increased manufacturing facility. Increased emissions from heavy-duty diesel trucks used for shipping and receiving would be expected as a result of the manufacturing facility.

East Brawley Geothermal Development

This project may cause a temporary increase of criteria pollutant and GHG emissions from mobile sources and ground disturbance during construction. The introduction of renewables, if used in place of conventionally generated power has the potential to reduce criteria pollutant and GHG emissions from the conventionally generated power plants (e.g., coal and natural gas). Other emission sources include emissions from motor vehicles from staff commuting, maintenance of the solar arrays, and back-up diesel generators. Emissions from these sources could increase for the project from baseline.

Imperial Solar Center West

This project may cause a temporary increase of criteria pollutant and GHG emissions from mobile sources and ground disturbance during construction. The introduction of renewables, if used in place of conventionally generated power has the potential to reduce greenhouse gas emissions from the conventionally generated power plants (e.g., coal and natural gas). Other emission sources include emissions from motor vehicles from staff commuting, maintenance of the solar arrays, and back-up diesel generators. Emissions from these sources could increase for the project from baseline, though the overall impact of project implementation would be beneficial to regional air quality.

Mesquite Lake Industrial Development

This project may cause a temporary increase of criteria pollutant and GHG emissions from mobile sources and ground disturbance during construction. Increased worker population and increased heavy-duty diesel truck traffic to the various businesses is expected, and would increase emissions from those mobile sources. New manufacturing facilities may have the potential to impact air quality depending on the type of manufacturing.

6.2.3.1 Combined Impacts to Air Quality from Past, Present, and Reasonably Foreseeable Future Actions

When past, present, and reasonably foreseeable future projects are analyzed together with Alternative 1, significant cumulative impacts to air quality are not anticipated as a result of the construction that is associated with several of the projects, as each construction project is either completed before implementation of Alternative 1, or is unlikely to generate significant emissions. It is not possible to estimate construction emissions and timeframes for all of the projects that may or could occur in the near future, but it is unlikely that the combined emissions from any set of ongoing projects would result in significant emissions for any of the criteria pollutants. Each of the construction projects would be required to adhere to Imperial County APCD regulations regarding heavy equipment operations, fugitive dust, and other air quality requirements. Emissions would be short-term and abate as the various construction projects are completed.

A number of projects are associated with renewable energy and will produce a long-term beneficial air quality impact for the region. Projects with long-term operational emissions include the operations at the Navy El Centro Ranges, the US Border Patrol infrastructure projects, the gypsum manufacturing facility operations, and those associated with population increases as a result of development. As indicated in the project discussions, none of these projects are expected to be sources of significant emissions. Stationary source emissions, such as those from manufacturing facilities, would have to be approved and permitted by the Imperial Valley APCD. Thus the combination of these projects, along with Alternative 1, would not be anticipated to result in significant regional emissions.

6.2.3.2 Greenhouse Gases

The potential effects of proposed GHG emissions are by nature global and cumulative impacts, as individual sources of GHG emissions are not large enough to have an appreciable effect on climate change. Therefore, an appreciable impact on global climate change would only occur when proposed GHG emissions combine with GHG emissions from other man-made activities on a global scale.

On February 23, 2010 the Council on Environmental Quality published a memorandum, *Draft NEPA Guidance on Consideration of the Effects of Climate Change and Greenhouse Gas Emissions*. This memorandum provides "draft guidance for public consideration and comment on the ways in which Federal agencies can improve their consideration of the effects of GHG emissions and climate change in their evaluation of proposals for Federal actions under NEPA." The draft memorandum further advises Federal agencies to consider the direct and indirect GHG emissions from proposed actions. If a proposed action may be reasonably anticipated to cause direct emissions of 25,000 metric tons or more of carbon dioxide equivalent (CO_2e) emissions on an annual basis, then agencies should consider this an indicator that a quantitative and qualitative assessment could be meaningful to decision makers and the public. The discussion that follows is based on the analysis of GHG emissions that have been estimated as a result of implementation of the proposed action.

Currently, there are no formally adopted or published NEPA thresholds of significance for GHG emissions stemming from proposed actions. Formulating such thresholds is problematic, as it is difficult to determine what level of proposed emissions would substantially contribute to global climate change.

Individual sources of GHG emissions are not large enough to have an appreciable effect on climate change. Therefore, an appreciable impact on global climate change would, if currently accepted predictions are accurate, only occur when proposed GHG emissions combine with other GHG emissions from other man-made activities on a global scale.

The cumulative effects for GHG emissions were evaluated jointly for Alternative 1 and Alternative 2 at both NAF El Centro and NAS Lemoore. The cumulative GHG emissions for each alternative includes the emissions associated with both installations because GHGs have global rather than localized impacts. Every activity associated with the alternatives that burns fuel emits GHGs. The aircraft operations, ground support equipment, privately owned vehicles, and Fleet vehicles all contribute to GHG emissions.

Although military aircraft operations are excluded from required GHG reduction goals within Executive Order (EO) 13514, the Navy continues to assess possibilities for GHG reductions in these operations, including use of alternative fuels and/or other renewable energy sources that may be available and suitable for these applications. Specific reduction goals for each region and installation would be evaluated based on location and identified potential for GHG reductions.

The Navy has established several goals for reducing GHG emissions. These goals include the following:

- Pursue opportunities with vendors and contractors to reduce GHG emissions.
- Cut petroleum use by half in the Navy's fleet of commercial vehicles by 2015 by replacing existing trucks with new hybrid ones.
- Procure half the power needed at Navy shore installations from alternative energy sources by 2020, and, supply electricity back to the grid wherever possible.
- Procure half of the Navy's energy requirements for operation of mobile sources from alternative energy sources by 2020.

Table 6.2-5 compares the annual GHG emissions for Alternative 1 and Alternative 2 in 2028 with the baseline 2015 emissions. Only carbon dioxide (CO_2) emissions are calculated for most equipment and activities because of the negligible quantity of methane (CH_4) and nitrous oxide (N_20) emitted by aircraft. The result is a net increase in emissions. Additional information on the calculations and additional years are available in Appendix D.

Table 6.2-5. 2028 GHG Emissions Compared to Baseline (2015)

Action	*CO_2e (metric tons)*
Baseline	281,337
2028 with Alternative 1 implemented	380,456
2028 with Alternative 2 implemented	350,255
Net Change Alternative 1	99,119
Net Change Alternative 2	68,918

Note: Calculated values listed in Appendix D.

Annual GHG emissions associated with the proposed action operations from implementation of Alternatives 1, and 2 are compared to United States 2010 GHG emissions in **Table 6.2-6**. The estimated CO_2 emissions from the baseline, Alternative 1, and Alternative 2 are less than a hundredth of 1 percent

of the total CO_2 emissions generated by the United States in 2010. The estimated cumulative CO2e emissions for Alternative 1 at both installations represents an increase of 35% over the baseline and the estimated cumulative CO2e emissions for Alternative 2 at both installations represents an increase of 24% over the baseline.

Table 6.2-6. Comparison of Baseline, Alternative 1, and Alternative 2 GHG Emissions to United States 2010 GHG Emissions

Condition	*CO_2e per Year (metric tons)*	*Percentage of US 2010 GHG Emissions*
Baseline	281,337	0.0041%
Alternative 1	380,456	0.0056%
Alternative 2	350,255	0.0051%
US 2010 Total GHG Emissions	$6{,}821.8 \times 10^6$	-

Source: USEPA 2012.

Emissions of GHGs from the proposed action alone would not cause appreciable global warming that would lead to climate changes. However, these emissions would increase the atmosphere's concentration of GHGs, and, in combination with past and future emissions from all other sources, contribute incrementally to the global warming that produces the adverse effects of climate change. At present, no methodology exists that would enable estimating the specific impacts (if any) that this increment of warming would produce locally or globally.

Although implementation of Alternative 1 or Alternative 2 would result in an increase in cumulative GHG emissions, this important topic warrants discussion by DoN leadership of broad-based programs to reduce energy consumption and shift to renewable and alternative fuels, thereby reducing emissions of CO_2 and other GHGs. Executive Order 13423 requires a reduction in GHG emissions through 30 percent agency reductions of energy intensity by 2015, compared to a Fiscal Year (FY) 2003 baseline. Additionally, EO 13514 provides early strategic guidance to federal agencies in the management of GHG emissions. The early strategy directs agencies to increase renewable energy use to achieve general GHG emission reductions. The Navy in California has a broad ranging effort to reduce GHG emissions in California. Since 2003 energy use has decreased 18%. Since 2009, Navy Region Southwest has invested $100 million in renewable energy projects including solar power infrastructure and geothermal infrastructure. This has increased renewable energy production by 6%. Water conservation measures have reduced consumption by 400 million gallons from 2008-2009. Region-wide, 79% of all construction waste is diverted from the landfill. Navy Region Southwest was selected as a winner of the California State Governor's Environmental and Economic and Leadership Award. Navy Region Southwest is working with the California Legislature and Executive Branch for changes in California law (AB 2649) that will enable the military to further increase development of new renewable energy development on California military installations. Navy Region Southwest is on track for compliance with applicable federal requirements and Navy policies on GHG reductions.

According to provisions in EO 13514, federal agencies are required to develop a 2008 baseline for Scope 1 GHG emissions (direct emissions from sources that are owned or controlled by DoD) and Scope 2 GHG emissions (emissions resulting from the generation of electricity, heat, or steam purchased by DoD), and to develop a percentage reduction target for agency-wide reductions of Scope 1 and Scope 2 GHG

emissions by FY 2020. As part of this effort, federal agencies are actively evaluating sources of GHG emissions, and developing, implementing, and annually updating integrated Strategic Sustainability Performance Plans that prioritize agency actions based on lifecycle return on investment. The intent is to evaluate GHG emissions on a lifecycle basis and to identify feasibility of sustainability strategies on that basis.

The DoD publishes an annual *Strategic Sustainability Performance Plan* that serves as a guide to reducing GHG emissions (DoD 2011). The DoD set a target to reduce Scope 1 and 2 GHG emissions from facilities by 34 percent from FY 2008 to FY 2020. The DoD is planning to achieve this goal through energy efficiency in facilities, reducing fossil fuel use by non-tactical vehicle fleets, and the use of renewable energy. In addition, the DoD would reduce its Scope 3 GHG emissions (emissions that result from DoD activities but are from sources not owned or directly controlled by DoD) by 13.5 percent from FY 2008 to FY 2020. However, the Scope 3 GHG emissions are limited to transmission and delivery losses from purchased electricity, contracted waste disposal, and employee travel (DoD 2011).

In addition to assessing the GHG emissions that would come from Alternative 1 or Alternative 2 and the potential impact on climate change, the effect of climate change on Alternative 1 or Alternative 2 and what adaptation strategies would be developed in response is also assessed. This is a global issue for the DoD. As is clearly outlined in the *Quadrennial Defense Review Report* of February 2010 (DoD 2010), the DoD will need to adjust to the impacts of climate change on facilities and military capabilities. The DoD already provides environmental stewardship at hundreds of DoD installations throughout the United States and around the world, working diligently to meet resource efficiency and sustainability goals set by relevant laws and executive orders. Although the United States has significant capacity to adapt to climate change, it will pose challenges for civil society and DoD alike, particularly in light of the nation's extensive coastal infrastructure. In 2008, the National Intelligence Council judged that more than 30 US military installations were already facing elevated levels of risk from rising sea levels. DoD operational readiness hinges on continued access to land, air, and sea training and test space. Consequently, DoD must complete a comprehensive assessment of all installations to assess the potential impacts of climate change on its missions and adapt as required (DoD 2010).

The *Quadrennial Defense Review Report* goes on to illustrate that DoD will work to foster efforts to assess, adapt to, and mitigate the impacts of climate change. Domestically, DoD will leverage the Strategic Environmental Research and Development Program, a joint effort among DoD, the Department of Energy, and the US Environmental Protection Agency (USEPA), to develop climate change assessment tools.

The US Global Climate Research Program report, *Global Climate Change Impacts in the US*, reviewed the unique impacts of climate change on the United States (Karl et al. 2009). According to the report, human-induced climate change appears to be well underway in the Southwest. Recent warming is among the most rapid in the nation, significantly more than the global average in some areas. This is driving declines in spring snowpack and Colorado River flow. Projections suggest continued strong warming, with much larger increases under higher emissions scenarios compared to lower emissions scenarios. Projected summertime temperature increases are greater than the annual average increases in some parts of the region, and are likely to be exacerbated locally by expanding urban heat island

effects. Further water cycle changes are projected, which, combined with increasing temperatures, signal a serious water supply challenge in the decades and centuries ahead.

As climate science advances, the Navy will regularly reevaluate climate change risks and opportunities in order to develop policies and plans to manage its effects on the Navy's operating environment, missions, and facilities.

6.2.4 Safety – Potential Cumulative Impacts for Alternative 1

The study area for safety cumulative impacts is NAF El Centro, its immediate vicinity, and the SUA in the vicinity of NAF El Centro. With the exception of one project, none of the past, present, or future actions would have the potential for cumulative impacts to safety at the NAF El Centro airfield and proposed construction areas.

Desert Springs Resort

The creation of water features that could be attractive to birds at this development may create an area of bird concentration, particularly during migration periods. There are aircraft arrival and departure tracks that either overfly this area or are in the vicinity. If the resort is completed, aircraft using NAF El Centro would be subjected to increased Bird/Animal Aircraft Strike Hazard (BASH) potential within approximately 4 miles of NAF El Centro and there would be potentially significant cumulative impacts to arrival and departure operations at NAF El Centro. The Navy has provided comments on the public draft EIS for the Desert Springs Resort that addresses their concerns, including flight safety.

Alternative 1 – NAF El Centro Homebasing

Implementation of Alternative 1 at NAF El Centro would construct a new runway which would alter airfield activities and add a new clear zone and accident potential zones. However, these activities would be consistent with existing airfield usage since the new runway would be parallel to the existing runway and operations would be conducted consistent with current practices. Airspace activity around NAF El Centro would increase due to Alternative 1, but types of operations would remain consistent. In addition, there would be no change to the size of the airspace.

In addition to the clear zones and accident potential zones, the area for the proposed second runway currently contains ordnance storage facilities and associated Explosive Safety Quantity Distance (ESQD) arcs. The ESQD arcs associated with the existing ordnance facilities overlap the second runway; therefore, relocation of the ordnance facilities would be required. To accommodate the new clear zones, accident potential zones, and relocation of the ordnance facilities and associated ESQD arcs, additional land would be required. The necessary land would either be purchased or obtained through restrictive easements. In either case the land use associated with the clear zones, accident potential zones, and ESQD arcs would be restricted as a safety measure. Currently the additional land is in agriculture or irrigation use and no habitable dwellings are located on the properties. Therefore, there are no anticipated safety or security issues associated with the necessary land acquisition.

Alternative 1 would have a slight increase in BASH potential, which would be minimized by continued adherence to the comprehensive procedures used at NAF El Cento to reduce incidences of bird/animal-aircraft strikes.

6.2.4.1 Combined Impacts to Safety from Past, Present, and Reasonably Foreseeable Actions

There would be potentially cumulative impacts to safety associated with BASH risk with implementation of Alternative 1 in conjunction with the Desert Springs Resort. However, these potential impacts would be minimized by implementing the standard procedures and protocols of the NAF El Centro BASH Plan and increased awareness of potential seasonal increase in BASH potential if the Desert Springs Resort is completed.

6.2.5 Land Use – Potential Cumulative Impacts for Alternative 1

The study area for land use cumulative impacts includes NAF El Centro and portions of Imperial County, the City of Imperial, the City of El Centro, and the unincorporated community of Seeley. There are several past, present, or reasonably foreseeable future actions that have the potential, when combined with Alternative 1 to result in cumulative impacts to land use in the study area. The projects and potential cumulative impacts are discussed below.

<u>Desert Springs Resort</u>

The land use associated with the Desert Springs Resort project is not compatible with the Imperial County General Plan. An amendment to the Imperial County General Plan land use and zoning designations of the project site would be required.

<u>Alder 70 Development</u>

The Alder 70 development would convert agricultural land to urban and suburban land use, resulting in changes to land use in the area.

<u>McCabe Ranch II Development</u>

Changes in land use from agricultural to residential would occur as a result of this project, resulting in changes to land use in the area.

<u>Mosaic Development</u>

The proposed project is consistent with the Imperial County General Plan and the Heber Urban Area Plan. The proposed land use is consistent with the surrounding land use and no impacts are anticipated.

<u>Procalamos Development</u>

This project would result in the conversion of agricultural land to a residential development resulting in changes to land use in the area.

Rancho Los Lagos Development

The project site is currently under agricultural use; however, the Imperial County General Plan classifies the area of the proposed site as urban. Therefore, the project is consistent with the growth and development planned for the county.

101 Ranch Development

The 101 Ranch development is not currently compatible with surrounding land use and would require an amendment to the Imperial County General Plan, as well as changes to the zoning ordinance. The site is currently in agricultural use and zoned for agricultural use. This project would result in a change of land use from agriculture to a mixed land use. The project proposes residential, commercial, recreational, and educational land uses.

Pacific Ethanol Production Facility

The Imperial County General Plan currently identifies this site as agricultural. The site would be converted to an ethanol and distiller grain production/manufacturing facility. The General Plan would require an amendment to allow the ethanol plant to occupy the proposed site. This would change the existing land use from agriculture to industrial/manufacturing. The project would not be consistent with surrounding land uses.

US Gypsum Manufacturing Facility

The expansion of the existing gypsum manufacturing facility would be incompatible with surrounding land uses; however, this is an existing facility and would not change the actual land use at the site or in the surrounding area.

East Brawley Geothermal Development

This project is consistent with the Imperial County General Plan for future development and meets their strategy for providing a geothermal project in the region. The project would be inconsistent with surrounding land use, which is primarily agricultural, and would convert existing agriculture to an industrial use.

Imperial Solar Energy Center West

This project would convert an agricultural use to a non-agricultural use; however, the solar energy project would be considered a compatible land use with agriculture according to the Imperial County General Plan.

Mesquite Lake Industrial Development

This project is incompatible with the Imperial County General Plan designated land use for the area. The area is designated as agricultural and the proposed project is industrial. The General Plan identifies a one-mile buffer between these land uses should be implemented to avoid incompatibility. There would be a conversion of land in agricultural use to an industrial use. This project is anticipated to contribute to cumulative impacts to land use.

Alternative 1 – NAF El Centro Homebasing

Implementation of Alternative 1 at NAF El Centro would not significantly alter existing land uses within the installation. New structures would be consistent with existing land use patterns. The majority of new construction would take place mainly in areas that have been previously disturbed. Although some facilities would be built in undeveloped areas within the installation, new construction of noise-sensitive uses would be located outside high noise areas and/or incorporate noise level reduction measures and sound attenuation features into the construction.

Under Alternative 1, existing local and regional land uses outside of NAF El Centro would be altered due to the need for additional housing and services for incoming personnel. It is currently unknown what these housing requirements may be and where housing would be constructed, but they would remain consistent with local zoning ordinances. All construction, demolition, and renovation activities associated with Alternative 1 would take place within NAF El Centro and no changes to local and regional land uses or designations would occur. Lands bordering the facility would remain agricultural and continue to be part of the agricultural outlease program.

Under Alternative 1, NAF El Centro would require the construction of a second runway for safety purposes. The second runway would be constructed on land currently owned by NAF El Centro. The area for the proposed second runway currently contains ordnance storage facilities which would require relocation. The second runway would not require additional land; however, to meet clear zone requirements the Navy would look to purchase the land underlying the clear zone. If this is not possible the Navy will look to restrict incompatible uses within the clear zones through the use of restrictive easements. In either scenario the agricultural use of the land would remain the same; however, land use would change from a private owner to government ownership. The relocation of the ordnance storage facilities would require additional land for the buildings to meet the ESQD arc requirements. Relocation of the ordnance storage facilities would require an approximately 161 acre parcel to accommodate the new facilities and new ESQD Arcs. Land use would remain the same for the parcels acquired in terms of remaining in agricultural use. However, the land use would change from privately owned land to government owned land.

6.2.5.1 Combined Impacts to Land Use from Past, Present, and Reasonably Foreseeable Future Actions

When past, present, and reasonably foreseeable future projects are analyzed together, there would be changes to land use from proposed projects in the surrounding communities. The Imperial County General Plan identifies the areas where these projects are proposed to occur as agricultural use. Alternative 1 does not result in incompatible development or in the conversion of land to a different use other than potential ownership. While there is the potential for cumulative impacts to land use in the area, the proposed action does not result in impacts to land use; therefore, the proposed action would not contribute to cumulative impacts to land use.

6.2.6 Infrastructure and Utilities – Potential Cumulative Impacts for Alternative 1

The study area for infrastructure and utilities cumulative impacts includes NAF El Centro, Imperial County, and the City of El Centro along with its outlying areas. The past, present, or reasonably foreseeable future actions that have a potential to interact with Alternative 1, and cumulatively impact infrastructure and utilities include those that would add personnel to NAF El Centro adding demand, as well as other development projects and operations that increase demand.

Desert Springs Resort

If the Desert Springs Resort project were to be developed, it is anticipated to have impacts to infrastructure and utilities due to significant demands on electricity, water, sewer, natural gas, and wastewater. The project would require 5 water connections for the numerous types of services that would be offered at this resort, significantly increasing the demand for water, sewer, electrical, natural gas, and telecommunications usage resulting in significant increases in demand that would require additional infrastructure be extended to the resort to accommodate the utility needs. The project would receive electricity from Imperial Irrigation District; however, there is limited capacity. Therefore, the project would require an upgrade of an existing substation and construction of a new substation to meet the electrical needs of the proposed development. The development will utilize two sources of water: raw water, provided by the Imperial Irrigation District, and recycled water. The development will have its own on-site water treatment facility and the raw water will be used for the recreational areas and navigable waters and the recycled water will be used for recreational areas, as well as for irrigation. The proposed development does not anticipate the need for water lines to tap into the public water system. The proposed development will include a wastewater collection and treatment facility on-site. Therefore, no impact to the public wastewater treatment system would occur if the project were developed. It is anticipated that solid waste generated in both the short-term, by construction activities, and long-term, from residential and commercial solid waste will be accommodated by the landfills that service Imperial County.

Alder 70 Development

Impacts to utilities associated with the proposed project include water, sewer, electrical and solid waste. Raw water will be provided by Imperial Irrigation District and will be treated on-site at a water treatment package plant constructed by the developer to service the proposed project. A package plant to treat sewage will also be developed for the project. Electricity consumption would impact the local provider. Therefore, the developer will construct a substation to provide power to the development. Solid waste will impact the existing Allied Imperial Landfill, which has approximately 5-years of remaining capacity. The existing landfill will need to be expanded or a transfer station constructed and solid waste collected at the transfer station and taken to a landfill approximately 80 miles away. This landfill has approximately 90 years of capacity remaining.

According to a Draft Environmental Impact Report (DEIR) that was prepared for this project, Alder 70 would have its own package plant for water and sewer treatment and would not put added demand on the local treatment facilities. The project would require an extension of infrastructure for electrical and natural gas to service the development and would put added capacity demands on these utilities.

McCabe Ranch II Development

This project would impact the water supply and would require new water supplies and construction of new water facilities to meet the consumption needs of the project. The proposed project would also result in an increase in demand for sewer capacity that would require an expansion of the existing wastewater system to accommodate the added capacity. Electrical infrastructure would need to be extended to the proposed project site to provide the needed electrical services on-site. Natural gas capacity for the proposed project was not identified in the EIR; however, it is anticipated that there would be a need for natural gas at the site and infrastructure to service the site with natural gas would be necessary.

Mosaic Development

Heber Public Utility District would provide the development with water and sewer service. The development would require some additional infrastructure to connect to the existing water and sewer lines; however, Heber Public Utility District capacity will not be impacted by the project. The development would also rely on the Imperial Irrigation District for electrical power and natural gas would be provided by the Southern California Gas Company. An electrical substation may be required as part of the development. No impacts associated with natural gas capacity are anticipated however, the development would need to provide the infrastructure to connect with the natural gas lines. Procalamos Development

Implementation of the proposed project would result in additional demands on infrastructure, including water and wastewater. It is anticipated that electricity, natural gas, and telecommunications and cable service would continue to expand and be upgraded as needed to accommodate the future growth and development of the region; therefore, no impacts to electricity or natural gas are expected. Contributions from the developer to the Gateway Water Treatment Plant for expansion is planned to help offset the additional increase in water treatment demand. Wastewater treatment would also require the expansion of the Gateway WWTP.

Procalamos Development

Impacts to utilities associated with the proposed project include water, sewer, electrical and solid waste. Water would be provided by Gateway of the Americas Service Area, a Community Service Area which is the nearest potable water district to the development. The development is expected to contribute to future expansion of the Gateway Water Treatment Plant and pay development impact fees, which would allow the Gateway of the Americas Services Area and the treatment plant to provide service to existing and future development. It is anticipated that the project would therefore result in less than significant impacts to water supply and water treatment. Wastewater treatment for the development would be treated by the Gateway wastewater treatment plant. The development would contribute to the expansion of the Gateway wastewater treatment plant to provide additional capacity; therefore, impacts to wastewater treatment would be less than significant. Solid waste from the development would be transported to the Mesquite Regional Landfill. Capacity of the landfill is anticipated to be sufficient; therefore less than significant impacts to solid waste would occur.

Rancho Los Lagos Development

This development would increase demand on water and sewer within the region. However, the Rancho Los Lagos project would be developed on existing agricultural land, which has a current water usage of 5.36 million gallons per day (mgd). The proposed development would require 3.29 mgd of water; therefore, water consumption is anticipated to decrease. Currently there are no wastewater treatment facilities that can accommodate the proposed development. However, a wastewater treatment facility is planned for 2 miles south of the proposed project and could accommodate the proposed development. A water treatment plant would also be necessary to provide water to the proposed development. The Keystone Specific Plan identifies two proposed water treatment plants that could provide the development with water. Electrical supply in the area is limited and the proposed development would require an electrical power substation. The Keystone Specific Plan identifies the construction of a substation that would service the Rancho Los Lagos development. Southern California Gas Company provides natural gas for the proposed development and no impacts to the utility are anticipated.

101 Ranch Development

The 101 Ranch development is anticipated to result in an increase in demand for water and sewer services within the region. It is expected that electricity, natural gas, and telecommunications and cable service would continue to expand and be upgraded as needed to accommodate the future growth and development of the region; therefore, no impacts to electricity or natural gas are expected.

Pacific Ethanol Production Facility

This facility would increase the demand on the water supply, electricity, and telecommunications within the region. An on-site sewage treatment plant would be constructed as part of the project; therefore, no impacts to sewage treatment facilities are anticipated.

US Gypsum Manufacturing Facility

Operation of the manufacturing facility has the potential to impact the regional water supply due to the amount of water that will be required for quarrying and production activities.

East Brawley Geothermal Development

Utility impacts associated with the project include wastewater treatment, and increased demand on water supply. The project would require upgrades to the Brawley WWTP to accommodate the additional treatment for the water needed at the facility. Water would be supplied by Imperial Irrigation District and it is anticipated that Imperial Irrigation District has sufficient water supplies to accommodate the proposed project needs. Mesquite Lake Industrial Development

This development would include light, medium, and heavy industrial services and would require the necessary infrastructure to support these services. Impacts to water, sewer, electricity, natural gas, and telecommunications would occur.

Alternative 1 – NAF El Centro Homebasing

The homebasing of the F-35C at NAF El Centro would increase personnel by 2,973, the majority of who would reside off-base. It is expected that this increase in personnel living in the nearby communities would increase demand for water and sewer treatment, as well as increase demand on electricity, natural gas, telecommunications and power.

6.2.6.1 Combined Impacts to Infrastructure and Utilities from Past, Present, and Reasonably Foreseeable Future Actions

When past, present, and reasonably foreseeable future projects are analyzed together, there would be an overall increase to the demand on utilities that service NAF El Centro and the surrounding communities. Alternative 1 combined with several of the planned projects would result in cumulative impacts to utilities and infrastructure. However, based on improvements planned for these utilities, it is anticipated that electricity, natural gas, and telecommunications and cable service would continue to expand and be upgraded as needed to accommodate the future growth and development of the region. Many of the future projects have proposed infrastructure improvements including upgrades to existing facilities or package plants constructed within the developments to offset the additional demand. In addition, NAF El Centro proposes to construct a new wastewater treatment plant that will increase capacity for the installation. Therefore, based on the planned utility improvements likely to be implemented along with the future projects, there would be no significant cumulative impact to utilities.

6.2.7 Socioeconomics – Potential Cumulative Impacts for Alternative 1

The study area for socioeconomic cumulative impacts includes NAF El Centro and Imperial County. The past, present, or reasonably foreseeable future actions that have the potential to interact with Alternative 1 and cumulatively impact socioeconomics in the study area include the following.

Desert Springs Resort

If the Desert Springs project is ultimately constructed, the development is likely to bring both short-term and long-term impacts to the socioeconomics of the area. Based on the long-term buildout of approximately 15 - 20 years, future market conditions, and the associated cost of providing public services such as schools, emergency services, and transportation improvements, it is difficult with the information available at this time to determine whether the net socioeconomic impacts from the project would be positive.

Alder 70, McCabe Ranch II, Mosaic, Procalamos, Rancho Los Lagos, and 101 Ranch Development

Construction of these development projects would likely create construction jobs and generate spending for goods and services in the region. It is anticipated that some of the construction workers would be from the local area, resulting in a positive impact on employment and the local economy. Workers that are not local may require lodging and would likely spend a percentage of their income in the local communities, resulting in positive short-term impacts to the local and regional economy. Some of the development projects would require hiring employees to service the various amenities offered by the developments. It is expected that the majority of the employees would come from the region;

therefore, it would help with employment opportunities. Long-term positive impacts to the local and regional economy would result from the influx of residents anticipated to purchase homes within these communities. It is expected that some of the new home owners would be from the local area; however, it is also expected that residents from outside the area would move into these homes and contribute to the local and regional economy. It is anticipated that there would be a positive impact to the local and regional economies as a result of this project. The development is likely to bring both short-term and long-term positive impacts to the economy of the area. It is anticipated construction would be done by local firms thereby contributing to the local economy during the construction of the project. It is expected that local contractors hired for construction would obtain construction materials from local businesses resulting in money spent in the community and positive short-term impacts to the local economy. Completion of the project is anticipated to bring additional residents to the area and it is anticipated that these residents would shop (food, clothing, gas, household goods, restaurants, etc.) in the local community thereby contributing to positive impacts on the local economy.

Pacific Ethanol Production Facility

This project would require approximately 200 construction workers to complete the project. Although not long-term, there would be employment opportunities for the region. The facility would require 35 permanent staff and 25 trucking related employees. It is anticipated that some of these jobs would be available to the local community and would increase job opportunities in the area. For those relocating from other areas to work at the facility, it is anticipated they would have a positive impact on the local economy in terms of requiring housing and other services provided by local businesses.

US Gypsum Manufacturing Facility

Construction of this facility would create construction jobs and generate spending for goods and services in the region It is assumed that that this would create temporary employment opportunities within the region and that if construction workers are not local, spending on food, lodging and other goods would have a short-term, positive impact on the local economy. It is assumed that there would be permanent employees needed to run the facility. It is anticipated that some of these jobs would be available to the local community and would increase job opportunities in the area. For those relocating from other areas to work at the facility, it is anticipated they would have a positive impact on the local economy in terms of requiring housing and other services provided by local businesses.

East Brawley Geothermal Development

This project would require approximately 200 construction workers during the peak of the development period. This would provide temporary employment opportunities in the region. Once the facility is constructed, only 25 permanent employees would be required. This project would not contribute significantly to the long-term local and regional economies.

Mesquite Lake Industrial Development

This project proposes to construct light, medium, and heavy industrial improvements, which would provide a diverse array of job opportunities within the region. It is anticipated that the project would

contribute on a large scale to the local and regional economies in terms of job opportunities, opportunity for infrastructure improvements, and increased tax base.

Alternative 1 – NAF El Centro Homebasing

Alternative 1 would have positive impacts on the local and regional economy. Alternative 1 would require numerous construction projects that would likely be awarded to local and regional contractors. It is anticipated that, although short-term in nature, contractors would utilize local services resulting in positive impacts to the socioeconomics of the area. Additionally, with the increase in personnel, housing would be needed for the personnel and their dependents. It is expected that personnel would reside in the local communities resulting in positive impacts to the housing market. It is also expected that the personnel and their dependents would utilize local and regional services resulting in positive impacts to the area's economy.

6.2.7.1 Combined Impacts to Socioeconomics from Past, Present, and Reasonably Foreseeable Future Actions

When past, present, and reasonably foreseeable future projects are analyzed together with Alternative 1, there would be an overall positive impact to the socioeconomics of the region. The proposed development projects would increase the supply of housing in the area which would likely help offset deficits in housing as a result of the proposed action. The proposed projects would also increase employment opportunities, as well as increase residents who would likely spend money in the local area resulting in beneficial cumulative impacts to socioeconomic resources within the area, including available housing.

6.2.8 Community Services – Potential Cumulative Impacts for Alternative 1

The study area for community services cumulative impacts is Imperial County. The past, present, or reasonably foreseeable future actions that have a potential to interact with Alternative 1, and cumulatively impact community services include those that would result in additional personnel at NAF El Centro and those that would increase the county population. Projects with the potential for increase in personnel or county population include, but are not limited to Desert Springs Resort, Alder 70, McCabe Ranch II, Mosaic, Procalamos, Rancho Los Lagos, 101 Ranch, and East Brawley Geothermal Development.

US Border Patrol Yuma Sector Infrastructure Construction Project

The proposed border patrol project is anticipated to improve security along the United States-Mexico border. As a result of security enhancements there would be a beneficial impact to security in this area.

Desert Springs Resort

If the Desert Springs Resort project were to be developed, it would provide new recreational opportunities to the members and residents of the resort. These consist primarily of golf and water sports. Community services such as fire, police, and postal service would require expansion due to an increase in population.

Alder 70, McCabe Ranch II, Mosaic, Procalamos, Rancho Los Lagos, and 101 Ranch Development

These planned residential and commercial communities are proposed for development in southern Imperial County over the next one to three decades. Alder 70 (75.8 acres) is east of El Centro, Procalamos (180.2 acres) is north of Calexico, McCabe Ranch II (457 acres) and Mosaic (201.5 acres) are in Heber, and Ranchos Los Lagos (1,076 acres) and 101 Ranch (1,894.7 acres) are south of Brawley. All projects consist of a mix of large numbers of residential units with some commercial uses and parks, and Ranchos Los Lagos and 101 Ranch include addition of one elementary school and four elementary schools and one junior high school, respectively. There would be an influx of residents anticipated to purchase homes within these communities. It is expected that some of the new home owners would be from the local area; however, it is also anticipated that residents from outside the area would move into these homes and contribute to the population. The new development has the potential to produce changes to county population and housing which would place additional demands on police and fire protection and health services. It is expected that there would be an increase in recreational opportunities, resulting in beneficial impacts to parks and recreation. The 101 Ranch development would require new water treatment and distribution facilities to provide a water supply for the proposed project. The developer will work with the County to build necessary water lines from the Keystone Planning Area facilities to the project location. The project would result in an increased demand on sewer capacity and would require the extension of the existing system. The developers of these projects would be responsible for all on-site sewer infrastructure.

East Brawley Geothermal Development

This project would require approximately 200 construction workers during the peak development period of this project. This would provide temporary employment opportunities in the region and an increase to the demand on community services. Once the project is constructed it would only require 25 permanent employees. This project is not anticipated to significantly impact community services.

Alternative 1 – NAF El Centro Homebasing

The homebasing of the F-35C at NAF El Centro would increase personnel by 2,973 and dependents by 6,147. It is anticipated that this increase in personnel would increase demand for some community services. The percentage of school age children represented in the dependent population estimate is unknown. However, the population growth resulting from Alternative 1 would be absorbed by the existing school districts that have the capacity to enroll more students. The additional population would put pressure on police and fire protection services and health services. However, because the personnel would be phased in over a 13 year period, the base and surrounding community would have time to accommodate the future growth and increased demands on these services. There would be no significant impacts to parks and recreation or religious services under Alternative 1.

6.2.8.1 Combined Impacts to Community Services from Past, Present, and Reasonably Foreseeable Future Actions

When past, present, and reasonably foreseeable future projects are analyzed together with Alternative 1, there would be an overall increase in demand for community services at NAF El Centro and in the

surrounding communities. Alternative 1 combined with several of the planned projects may result in changes to the county population and cause the demand for community services to increase; therefore, causing the potential for cumulative impacts to community services. However, it is anticipated that schools would be able to accommodate the growth and development in the region as they are currently operating under capacity. Police protection would also be able to accommodate future growth by adding additional officers on staff to the City of El Centro and additional officers in the region surrounding NAF El Centro. The El Centro Fire Department Service Area Plan anticipates population growth within the department's service area and has already planned for the development of two additional fire stations, as well as staffing increases associated with the stations. The City of Imperial Service Area Plan anticipates the addition of one fire station that jointly serves the City of Imperial and Imperial County to accommodate future growth. Based on the agreements between NAF El Centro and the surrounding cities on emergency response fire protection services, cumulative impacts to these services would not be significant.

Health services at NAF El Centro are limited. Personnel on base often go off base to seek dental and urgent care needs through private practitioners. With the increase in personnel as a result of implementing Alternative 1 and in combination with several other planned projects, there is the potential for cumulative impacts on health services in the region. However, the increase in population would occur over a long timeframe, from 2015 to 2028, allowing NAF El Centro and surrounding communities to respond to the increase in demand for health services.

There are no potentially significant cumulative impacts anticipated to parks and recreation as there are ample public recreational amenities on base and outside NAF El Centro. In addition, the proposed Desert Springs Resort development, located northwest of El Centro would add numerous opportunities for outdoor recreation. Last, cumulative impacts are not anticipated to religious services. It is expected that these services would be expanded on an as needed basis to accommodate future growth and development of the region. The proposed border patrol project would result in beneficial impact to security in this area. There are no foreseen significant cumulative impacts to community services with implementation of Alternative 1.

6.2.9 Ground Traffic and Transportation – Potential Cumulative Impacts for Alternative 1

The study area for ground traffic and transportation cumulative impacts is NAF El Centro, the City of El Centro and Imperial County. The past, present, or reasonably foreseeable future actions that have a potential to interact with Alternative 1 and cumulatively impact transportation are limited to those projects that would add personnel and increase ground traffic in the vicinity of NAF El Centro. These include several proposed projects: Desert Springs Resort, Alder 70, McCabe Ranch II, Mosaic, Procalamos, Rancho Lagos, 101 Ranch, Pacific Ethanol Production Facility, US Gypsum Manufacturing Facility, and the Mesquite Lake Industrial Development.

<u>Desert Springs Resort</u>

The proposed Desert Springs Resort project is a recreational resort development located approximately 4 miles northwest of NAF El Centro and adjacent to the NAF El Centro range complex. According to the DEIR prepared for the project, if the resort were constructed, the project would generate approximately

7,275 average daily trips (ADT). Significant transportation improvements were identified in the DEIR to address the impacts on local roadways as a result of the additional ADT. In addition to the ADT, the resort will introduce a significant increase in off-road vehicle use and potential incompatible development into NAF El Centro ranges that cannot be mitigated, thereby impacting air operations at NAF El Centro ranges.

Alder 70 Development

Alder 70 is a planned 392-unit commercial and retail center located east of El Centro and south of Evan Hewes Highway. It is anticipated that this project would contribute to an increase in traffic on local roadways. The project would take between three and four years to develop; however, the start date is not known. This project is expected to generate 7,260 daily trips according to the Draft Environmental Impact Report prepared for this project in 2009. Mitigation measures were identified in the DEIR to address the impacts on local roadways as a result of the additional traffic (Imperial County Planning and Development Services 2009a).

McCabe Ranch II Development

McCabe Ranch II is located on the east side of State Route 86 in Heber. This proposed project consists of a 2,300 single and multifamily housing development with commercial areas, community facilities, and parks. The project is anticipated to take 12 years to complete; however, a start date has not been determined.

Mosaic Development

The Mosaic project is proposed to occur south of State Route 86 in Heber. The anticipated period of development is not known at this time; however, it is estimated that up to 1,154 residential units would be built when the project is implemented. The project would also include a commercial center, parks, and bike and pedestrian paths. According to the EIR prepared for this project in 2008 it was expected that the project, when completed, would generate approximately 11,585 ADT (Imperial County Planning and Development Services 2008).

Procalamos Development

Procalamos is an 841 single-family home project. The project is located one mile north of Calexico Port of Entry off State Route 7. In addition to residential development, Procalamos would also have five parks, pedestrian paths, and RV and mini storage. Development of the project is estimated to take 5–10 years and the start date has not yet been determined.

Rancho Los Lagos Development

Rancho Los Lagos is located on the east side of State Route 86, south of Brawley. The development would consist of 3,830 residential units, a business park, commercial development, parks and recreation facilities, an elementary school and an industrial warehouse area. The schedule for development is not known. Based on the traffic analysis in the DEIR prepared for the project, the Rancho Los Lagos development is expected to generate 56,378 ADT (Imperial County Planning and Development Services 2009b).

101 Ranch Development

The proposed 101 Ranch project would consist of 6,986 residential units, a commercial center, parks and recreation facilities, four elementary schools and one junior high school, and RV storage. The project is located between State Route 86 and State Route 111, one mile south of Brawley. The project is anticipated to take 25–30 years for development and a project start date has not yet been identified. According to the DEIR, when the project is completed it would generate approximately 84,007 ADT.

Pacific Ethanol Production Facility

The Pacific Ethanol Facility is anticipated to have daily truck traffic associated with the facility. This is likely to result in added capacity to the area roadways.

US Gypsum Manufacturing Facility

The US Gypsum facility is anticipated to have regular truck traffic associated with the operation of the facility. The truck traffic is likely to increase traffic on area roadways, potentially resulting in congestion on area roadways.

Mesquite Lake Industrial Development

It is anticipated that there would be increases in traffic on area roadways due to the industrial component of the development which would likely result in increases in daily truck traffic, as well as increases in personal vehicles of employees traveling to and from the site.

Alternative 1 – NAF El Centro Homebasing

The homebasing of the F-35C at NAF El Centro would increase personnel by 2,973 and 6,731 dependents, the majority of who would reside off base. This increase in traffic would result in major increases to traffic volumes on local roadways with some intersections having a failing level of service (LOS). Projects to offset these traffic impacts are proposed and anticipated to reduce congestion as a result of Alternative 1.

6.2.9.1 Combined Impacts to Ground Traffic and Transportation from Past, Present, and Reasonably Foreseeable Future Actions

When past, present, and reasonably foreseeable future projects are analyzed together with Alternative 1, there would be an overall increase in traffic accessing NAF El Centro and the surrounding communities. The potential increase in personnel accessing NAF El Centro would be approximately 2,973. When combined with several of the planned projects and their contributions to additional traffic, the cumulative impacts to traffic and roadway congestion would potentially be significant. It is anticipated that the past, present, and reasonably foreseeable future actions would implement appropriate mitigation measures to offset their impacts to traffic and congestion on nearby roadways With these roadway improvements, the cumulative traffic impacts of Alternative 1 would not be significant.

6.2.10 Biological Resources – Potential Cumulative Impacts for Alternative 1

The study area for biological resources cumulative impacts is NAF El Centro and the surrounding vicinity. The past, present, or reasonably foreseeable future actions that have a potential to interact with Alternative 1 and cumulatively impact biological resources are limited to those projects that would require clearing and grading for construction at NAF El Centro or the surrounding community or may increase noise levels. Projects with the potential for ground disturbance actions or increases in noise levels are discussed below.

Implementation of Wildland Fire Management Plan, NAF El Centro

Biological resources would not be impacted significantly by implementing the Wildland Fire Management Plant at NAF El Centro target ranges. Actions taken under the fire management plan would reduce fire potential, rehabilitate native habitat, and preserve native vegetation, resulting in a positive effect on vegetation communities. Ground disturbance would be limited, and no federally protected plant species would be cleared. There would have negligible impacts on wildlife from implementing the fire management plan. Small mammals, birds, and reptiles would be displaced during a fire event, but most would relocate to similar habitat surrounding the cleared area. The plan would be kept up to date regarding sensitive biological resources and critical habitats.

West Chocolate Mountains Renewable Energy Evaluation Area

The development of renewable energy projects in the area of the West Chocolate Mountains is anticipated to have impacts on wildlife, including special status species, from increased noise levels. Impacts from noise would be short-term during the exploration, construction, and decommissioning phases of geothermal development, and during construction of solar and wind energy facilities. However, long-term effects on wildlife from noise would be expected to occur during operation and maintenance of geothermal and wind energy facilities (but not solar energy facilities). Increased noise levels could affect nesting, foraging, and breeding activities. In addition to noise impacts, wind energy projects could result in mortality or injury to birds or bats collide with turbines or meteorological towers, or mortality of wildlife from electrocution or collision with transmission lines. The Bureau of Land Management adopted a series of mitigation measures and Best Management Practices (BMPs) to minimize impacts to biological resources from renewable energy projects.

Cabeza Prieta National Wildlife Refuge Comprehensive Conservation Plan and Wilderness Stewardship Plan

The USFWS concluded that military jet aircraft that overfly the refuge at low altitudes (between 500 and 1,500 feet [ft] above ground level [AGL]) result in noise impacts to the refuge wilderness. These noise impacts, although short in duration, are recurrent in nature and therefore, were considered significant, long-term impacts for the life of the management plan. The Conservation Plan for the Cabeza Prieta National Wildlife Refuge would have a beneficial impact on biological resources. The refuge would modify its vegetation monitoring program for invasive plants and implement new procedures and programs to conserve, protect, and/or recover federally endangered species and species of conservation concern on the refuge.

101 Ranch Development

Construction of the proposed development would result in the potential loss of burrowing owl habitat, raptor foraging habitat, mountain plover habitat and suitable nesting habitat for birds protected under the Migratory Bird Treaty Act (MBTA). Appropriate mitigation measures have been outlined in the draft environmental impact report to offset impacts to the burrowing owl. These mitigation measures include:

- Preconstruction surveys for burrowing owl habitat no more than 30 days prior to construction.
- No disturbance of identified burrows during the nesting season (February 1 through August 31). Construction during this period must be at least 250 ft from occupied burrows.
- Thirty artificial replacement burrows will be created on-site and relocation of owls will be using passive relocation techniques.
- During the non-breeding season (September 1 through January 31) whenever possible construction activities should not occur within 160 ft of occupied burrows. All mitigation activities such as relocation or construction of new burrows should also take place during this time frame.

Imperial Valley Solar Project

Impacts to biological resources as a result of construction vehicles and construction would occur as a result of this project; however, these impacts are anticipated to be temporary and only last for the duration of the project. This project is anticipated to begin in 2013 and be completed in 2015. Construction associated with this and the proposed action would have the potential to overlap during 2015.

Alternative 1 – NAF El Centro Homebasing

Alternative 1 would involve ground disturbing activities for construction of new facilities. The total area that would be disturbed by construction and demolition is approximately 196 acres. The total new impervious surface area would be approximately 151 acres. Proposed construction and demolition projects associated with Alternative 1 would occur within areas that have been previously disturbed and are actively managed (i.e., mowed and landscaped). Project activities would result in short-term noise level increases, which could temporarily displace wildlife from the immediate area, including birds that are protected under the MBTA. No special-status species are known to occur on NAF El Centro. In addition, potential habitat for special-status species on NAF El Centro is not located within the proposed construction footprints. Therefore, there would be no impact to special-status species under Alternative 1.

Noise levels are expected to change with the proposed increase in airfield operations. Background information on noise, including its effect on many facets of the environment, can be found in Appendix C. The increase in noise levels is not expected to impact wildlife in the area because they are likely accustomed to noise levels associated with aircraft and military operations. As a result, impacts from increased aircraft operations are expected to be minimal because the ambient noise levels at NAF El Centro are high under existing conditions and would not significantly increase with implementation of Alternative 1.

6.2.10.1 Combined Impacts to Biological Resources from Past, Present, and Reasonably Foreseeable Future Actions

Some actions at NAF El Centro include ground disturbing activities for construction of facilities at or in the vicinity of NAF El Centro target ranges that would result in surface disturbance. Such additive disturbance could affect biological resources, including direct (e.g., mortality) and indirect (e.g., habitat loss) impacts to wildlife and vegetation. It is anticipated that the NAF El Centro wildland fire management plan projects would be consistent with its Integrated Natural Resources Management Plan, thus such impacts would be expected to be less than significant. Alternative 1 would result in minimal ground disturbance in locations that have been previously disturbed. Any construction noise impacts would be short-term and localized.

The cumulative noise from potential increases in the number of aircraft operations could impact wildlife species in the vicinity of the airfield. However, wildlife in the vicinity is likely accustomed to noise levels associated with aircraft and military operations. Therefore, no significant impacts to biological resources are expected.

The past, present, and reasonably foreseeable future actions discussed in this section have the potential to cumulatively impact biological resources. However, these projects propose to implement best management practices or mitigation measures to offset the anticipated impacts to biological resources. Therefore, when combined with past, present, and reasonably foreseeable future actions, the proposed action would not result in cumulative impacts to biological resources.

6.2.11 Topography and Soils – Potential Cumulative Impacts for Alternative 1

The study area for topography and soils cumulative impacts is NAF El Centro and vicinity. The past present, and reasonably foreseeable future projects would not impact topography. Terrain in the area of these projects is relatively flat and would not require significant cut and fill to prepare the sites for development. Alternative 1 would also be implemented in an area that is relatively flat and would not require significant site preparation that would result in changes to the topography.

<u>Rancho Los Lagos</u>

Potential problems associated with the soils in the area have been identified. These issues include potential for subsidence, corrosion, liquefaction, and heave. Mitigation has been identified for this project and numerous mitigation measures have been identified for implementation including observation of the grading, excavation of foundations and soil improvements by a state certified geologist.

6.2.11.1 Combined Impacts to Topography and Soils from Past, Present, and Reasonably Foreseeable Future Actions

The past, present, and reasonably foreseeable future projects would impact soils. Erosion and sedimentation plans would be developed for each project and the impacts would be managed through the use of appropriate BMPs for each site. Alternative 1 would also impact soils and erosion and sedimentation plans would be developed and the use of BMPs would be used to manage impacts to soils. Alternative 1 in conjunction with past, present, and reasonably foreseeable future projects would not result in significant cumulative impacts to topography or soils.

6.2.12 Water Resources – Potential Cumulative Impacts for Alternative 1

The study area for water resources cumulative impacts includes NAF El Centro and the surrounding area. The past, present, and reasonably foreseeable future actions that have a potential to interact with Alternative 1 and cumulatively impact water resources are limited to those projects that may break ground at NAF El Centro or the surrounding community.

Implementation of Wildland Fire Management Plan, NAF El Centro

This project would implement the Wildland Fire Management Plan to protect personnel, facilities, natural and cultural resources from the impact of wildland fire. The plan is designed to decrease the likelihood of wildfires at NAF El Centro. To implement the plan clearing of some vegetated areas would be necessary. These areas would be left with bare soil which is prone to erosion and sedimentation; however, the areas are anticipated to be small 0.7 acres per clearing. The management plan also includes the application of two chemical treatments to prevent vegetation from growing. There are no surface water features in the areas where these treatments would be applied; therefore, no impacts to water resources would occur. The management plan is intended to prevent the spread of wildfire, ultimately protecting water resources from sedimentation and erosion. Therefore, it is anticipated that the project would have a beneficial impact to water resources downstream.

West Chocolate Mountains Renewable Energy Evaluation Area

Development of this project has the potential to have impacts to water resources within the project area. It is assumed that design of the project would take into consideration water resources and avoidance and minimization measures would be taken to reduce impacts. Additionally, an erosion and sedimentation plan would be developed and BMPs followed to protect surface waters from polluted runoff and runoff containing heavy sediment loads. It is anticipated that impacts to water resources as a result of this project would be minimal.

US Gypsum Manufacturing Facility

This project would require the withdrawal of groundwater for operation of the facility that would result in an increase in the rate of drawdown. Groundwater levels would be monitored to determine if there are adverse effects. If it is determine that there are adverse effects, there are several BMPs that would be utilized to offset the adverse impacts. The drawdown can also affect the water quality of the groundwater. Groundwater quality would be monitored and appropriate actions would be taken if it is determine that the operations of the facility are degrading groundwater quality conditions. Impacts to groundwater have the potential to be significant. Short-term impacts to water quality could occur as a result of construction activities however, BMPs would be utilized to minimize erosion and sedimentation that would result in degraded water quality. The project does not propose to use groundwater or affect groundwater as a result of construction activities. Impacts to water resources have the potential to be significant.

East Brawley Geothermal Development

Stormwater would be collected and diverted to water quality treatment facilities on-site. Stormwater would be treated to remove pollutants and sediment prior to being discharged off-site. Short-term

impacts to water quality could occur as a result of construction activities; however, BMPs would be utilized to minimize erosion and sedimentation that would result in degraded water quality. The project does not propose to use groundwater or affect groundwater as a result of construction activities. Impacts to water resources have the potential to be significant.

Alternative 1 – NAF El Centro Homebasing

Alternative 1 would increase impervious surfaces at NAF El Centro which would result in increased stormwater runoff. This additional stormwater would be managed through detention or retention basins where pollutants and sediment could be filtered out prior to discharge into an adjacent irrigation channel. The increase in impervious surface is not anticipated to have a significant impact to groundwater recharge. Construction activities are expected to have short-term impacts to water quality as a result of erosion and sedimentation. These impacts would be managed using BMPs to reduce impacts to surface water quality. Construction activities and water usage is not expected to impact ground water.

6.2.12.1 Combined Impacts to Water Resources from Past, Present, and Reasonably Foreseeable Future Actions

When all past, present, and reasonably foreseeable future actions are examined together, there is the potential for impacts to water resources. Many of the proposed development projects have identified improvements that, if implemented, would reduce impacts to water resources. However, if these improvements are not implemented, a significant cumulative impact to water resources would occur. It is likely that these improvements will be implemented and impacts to surface waters will be minimal. The proposed action would not have impacts to water resources; therefore, the proposed action would not contribute to cumulative impacts to water resources.

6.2.13 Cultural and Traditional Resources – Potential Cumulative Impacts for Alternative 1

The study area for cultural and traditional resources cumulative impacts is NAF El Centro, areas adjacent to the installation, and areas underlying SUA where noise from proposed aircraft operations may affect historic properties. The past, present, or reasonably foreseeable future actions that have the potential to interact with Alternative 1 include the following renewable energy projects.

West Chocolate Mountains Renewable Energy Evaluation Area

Renewable energy projects have the potential to cause visual impacts to cultural resources as a result of construction, installation, and operation of the facilities. These impacts would be considered long-term, lasting the duration of the life of the facility, but the visual impacts would be mostly removed once the facility has been decommissioned. For each renewable energy project proposed on Bureau of Land Management-managed public lands in the West Chocolate Mountains area, consultation with the California State Historic Preservation Office (SHPO), affected Native American tribes, and other consulting parties would take place to identify any adverse effects. Consultation would be conducted to resolve any adverse effects that could not be avoided or minimized through project redesign or other means.

Cabeza Prieta National Wildlife Refuge Comprehensive Conservation Plan and Wilderness Stewardship Plan

The management plan provides beneficial effects to TCPs by protecting, maintaining, and interpreting them in cooperation with Tribal governments.

101 Ranch Development

There is potential for impacts to cultural resources associated with the development of this proposed project. Mitigation techniques have been identified in the draft EIS for this project.

Imperial Valley Solar Project

This project has the potential to result in impacts to cultural resources as a result of construction and operation activities.

East Brawley Geothermal Development

This project has the potential to impact archaeological resources associated with Native American activities. Although there are no documented TCPs in the area, members of the Quechan Indian Nation and the Kwaaymii Laguna Band of Mission Indians indicated tribal interests due to historical occupation in this area. Mitigation measures to address potential impacts to cultural resources by development of the project included retaining a Native American tribal monitor to observe all excavation activities for unanticipated discoveries.

Imperial Solar Energy Center West

This project has the potential to result in visual impacts to cultural resources as a result of construction, installation, and operation of the facility. Noise generated by the development, both short- and long-term, has the potential to impact TCPs. The Bureau of Land Management conducted consultation with the SHPO and affected Native American tribes and developed mitigation measures to reduce impacts to known archaeological resources.

Alternative 1 – NAF El Centro Homebasing

F-35C overflights in SUA in the vicinity of NAF El Centro are unlikely to affect cultural resources or TCPs because aircraft would primarily fly at high altitudes. Native American tribes may perceive any overflights as intrusive to use of sacred sites or conducting traditional practices. Consultation with the tribes in this area did not indicate concerns with noise from overflights.

6.2.13.1 Combined Impacts to Cultural Resources from Past, Present, and Reasonably Foreseeable Future Actions

When past, present, and reasonably foreseeable future projects are analyzed together with Alternative 1, there would be potential for cumulative impacts to cultural resources. On- and off-base projects that include ground disturbance, demolition/modifications of buildings, construction of new facilities in undeveloped areas (potential visual impacts), or aircraft operations (i.e., noise) associated with other cumulative projects could impact prehistoric and historic archaeological resources or historic buildings and structures. Federal and state projects with potential for impacts on cultural resources would

undergo Section 106 review under the National Historic Preservation Act (NHPA), which includes consultation with the California SHPO and affected Native American tribes. Any potentially significant impacts to cultural resources would be mitigated. For these reasons, it is expected that any cumulative impacts on cultural resources would be less than significant.

6.2.14 Hazardous Materials and Waste – Potential Cumulative Impacts for Alternative 1

The study area for hazardous materials and waste cumulative impacts is NAF El Centro and vicinity. The past, present, and reasonably foreseeable future actions that have a potential to use hazardous materials or generate hazardous waste at NAF El Centro include those projects that require building demolition/modification that may require disposal of small quantities of asbestos-containing material or lead-based paint. Projects with the potential for cumulative impacts to hazardous materials and waste include those with ground disturbance and demolition/modification.

Implementation of Wildland Fire Management Plan, NAF El Centro

To comply with federal and DoD policies, the Navy prepared an EA to analyze the potential environmental impacts from implementing the 2006 Wildland Fire Management Plan within 58,519 acres of target ranges and other wildland areas controlled by NAF El Centro (DoN 2008). Fully implementing the plan would involve the periodic use of recommended pre-suppression strategies, the use of fire resistant materials in any future facility construction, aerial spraying of fire retardant around targets, and periodic small-scale brush pile burning. The fire management strategies would apply to five training range target areas within R-2510 and an isolated parcel (Tract 40) located to the west.

Alternative 1 – NAF El Centro Homebasing

Under Alternative 1, homebasing of the F-35C at NAF El Centro would generate hazardous materials or wastes by construction. Since no legacy aircraft are permanently based at NAF El Centro, Alternative 1 would result in a minor increase in hazardous material use and subsequent hazardous waste generation. The hazardous materials associated with the F-35C program would not impact installation management programs (Hazardous Waste Management Plan, Spill Prevention Control and Countermeasure [SPCC] Plan, and Stormwater Pollution Prevention [SWPP] Plan). Existing facilities and established procedures are in place for the safe handling, use, and disposal of hazardous waste at NAF El Centro, and implementation of Alternative 1 would not result in significant hazardous materials related impacts.

6.2.14.1 Combined Impacts to Management of Hazardous Materials and Waste from Past, Present, and Reasonably Foreseeable Future Actions

Because the effects of hazardous material-related impacts are site-specific, they relate primarily to potential exposure of hazardous materials/waste to on-site personnel during demolition and construction or to on-site personnel following construction (e.g., aircraft refueling). None of the other actions would involve construction or demolition at NAF El Centro. Thus, no cumulative impacts would occur.

Alternative 1, in combination with other construction/demolition projects, would not result in adverse cumulative hazardous material-related impacts at NAF El Centro. NAF El Centro would continue to

implement established plans, policies, and procedures for handling and disposing of materials and waste and surveys would be conducted for both asbestos-containing materials and lead-based paint prior to demolition activities. If, present, these materials would be characterized, managed, transported, and disposed according to applicable state and federal requirements for protecting human health and safety and the environment. Any Installation Restoration sites and Military Munitions Response Program (MMRP) sites with the potential to be affected by construction and demolition activities would be managed in compliance with all applicable federal, state, and local regulations to reduce the potential for adverse impacts from contaminants. Furthermore, any potential impacts to surface or groundwater quality through the accidental release of chemicals during operations would be addressed by implementation of a National Pollutant Discharge Elimination System (NPDES)-mandated SWPP Plan in association with an existing Industrial NPDES permit. Compliance with federal, state, and local statutes and regulations regarding stormwater retention/treatment and soil and groundwater contamination would continue to be required. Therefore, cumulative construction and operational impacts would be minimal with respect to hazardous materials and wastes.

Similarly, each of the related cumulative actions discussed in Section 6.1 would be required to incorporate similar types of plans, policies, and procedures into project design, and comply with similar regulations, as described above. Therefore, other actions in the vicinity of NAF El Centro would not result in cumulative impacts related to regulations, health, safety, or procedures.

7. CUMULATIVE IMPACTS FOR ALTERNATIVE 2 – NAS LEMOORE HOMEBASING

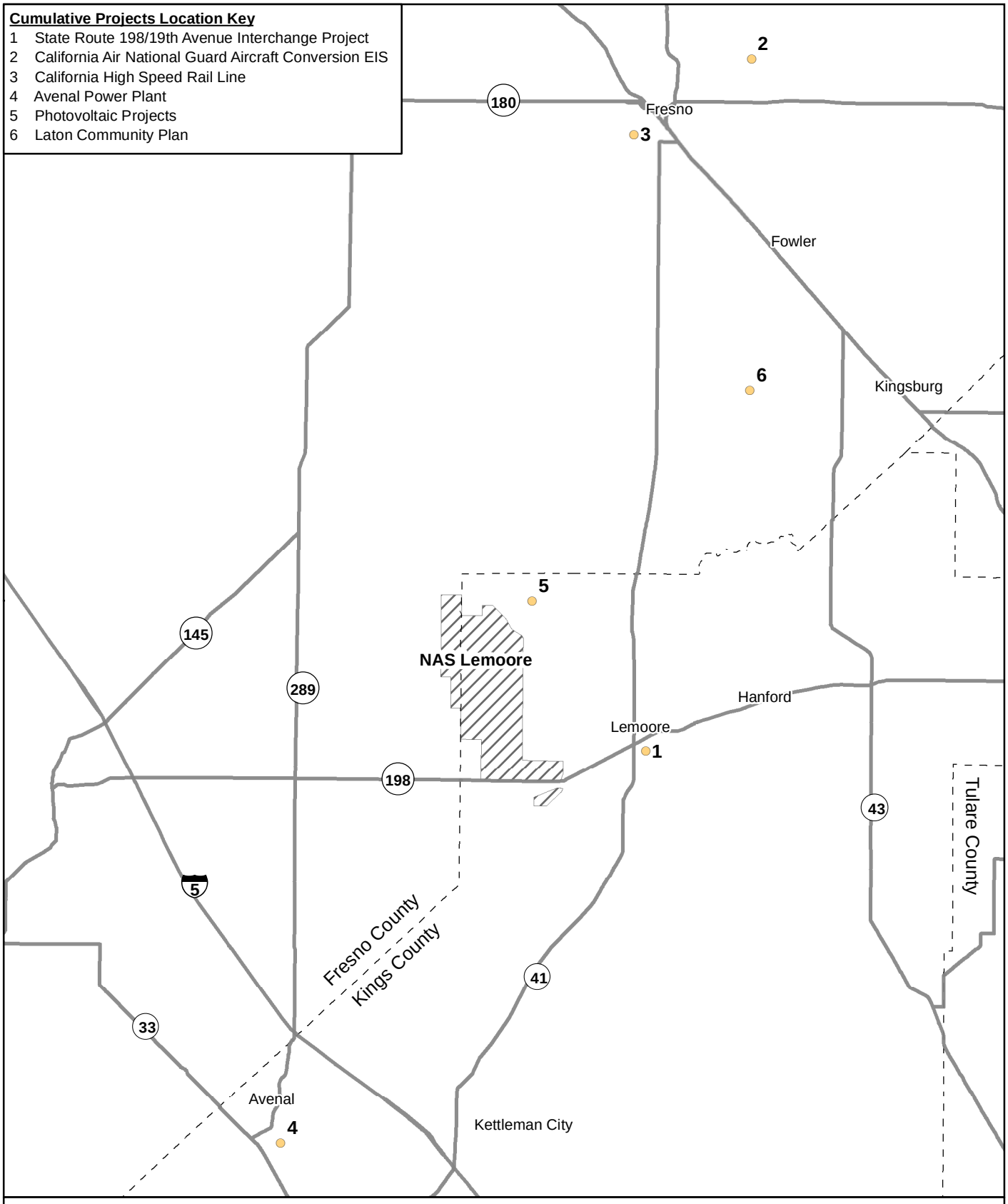
This chapter assesses the potential cumulative impacts with the implementation of Alternative 2 and includes: 1) a description of past, present, and reasonably foreseeable future actions relevant to cumulative impacts; 2) an analysis of the incremental interactions Alternative 2 may have with other regional actions; and 3) an evaluation of the cumulative impacts potentially resulting from these interactions. The definition of cumulative impacts was provided in Section 3.15.

7.1 PAST, PRESENT, AND REASONABLY FORESEEABLE FUTURE ACTIONS

This section identifies past, present, and reasonably foreseeable future actions not related to Alternative 2 that have the potential to cumulatively impact the resources in the affected environment for Naval Air Station (NAS) Lemoore and its regionally affected area. An overview of these actions is presented to emphasize components of the activities that are relevant to the impact analyses for the affected environment of NAS Lemoore. Geographic distribution, intensity, duration, and historical effects of similar activities were considered when determining whether a particular activity may contribute cumulatively and significantly to the impacts of Alternative 2 on the resources identified in this Environmental Impact Statement (EIS). **Table 7.1-1** lists the projects assessed in this section, along with any National Environmental Policy Act (NEPA) or environmental analysis that has been prepared or is anticipated to occur. **Figure 7.1-1** depicts the locations of these projects near NAS Lemoore.

Table 7.1-1. Other Actions Relevant to Cumulative Impacts Analysis under Alternative 2

Action	*Environmental Analysis*	*Federal Action*
Past Actions		
Base Realignment of NAS Lemoore	EIS, Record of Decision (ROD)	✓
Development of Facilities to Support Basing US Pacific Fleet FA-18E/F Aircraft on the West Coast of the United States (US)	EIS, ROD	✓
Present Actions		
Strike Fighter Realignment at NAS Lemoore	EA, Finding of No Significant Impact	✓
State Route 198/19th Avenue Interchange	Negative Declaration	
Reasonably Foreseeable Future Actions		
F-15 Aircraft Conversion, 144th Fighter Wing, California Air National Guard, Fresno-Yosemite International Airport	EIS, ROD	✓
NAS Lemoore Aircraft Ready Jet Fuel Storage and Distribution System	To be determined	✓
NAS Lemoore Recreational Facilities/Golf Course	To be determined	✓
NAS Lemoore Religious Education Facility	To be determined	✓
NAS Lemoore Bachelor Enlisted Quarters	To be determined	✓
NAS Lemoore Missile Support Facility	To be determined	✓
California High-Speed-Rail Line	EIS, ROD	✓
Avenal Power Plant Project	To be determined	
Photovoltaic Solar Plants	To be determined	
Laton Community Plan Update	To be determined	
Naval Air Weapons Station China Lake Land Withdrawal	EIS, Legislative EIS	✓



Cumulative Projects
NAS Lemoore
Highway
County Boundary

N

0 3 6
Miles

Figure 7.1-1
Cumulative Impact Project Locations-NAS Lemoore

7.1.1 Past Actions Relevant to Alternative 2 – NAS Lemoore Homebasing

The two past actions relevant to the analysis of cumulative impacts at NAS Lemoore are described below.

- **Final EIS for Base Realignment of NAS Lemoore** (Department of the Navy [DoN] 1994a) – This project involved the relocation of Navy aircraft, equipment, and personnel from NAS Miramar, California to NAS Lemoore. The EIS analyzed impacts at NAS Lemoore from the relocation of 84 aircraft (56 F-14s, 16 E-2s, and 12 FA-18s), 98 new construction projects, increases of approximately 3,993 military personnel and 484 civilians, and an increase in annual aircraft operations from 209,500 to 312,760. The ROD for this EIS was signed in 1994 (DoN 1994b).
- **Final EIS for Development of Facilities to Support Basing US Pacific Fleet FA-18E/F Aircraft on the West Coast of the United States** (DoN 1998a) – This project involved development of facilities at NAS Lemoore to support the West Coast basing of the Navy's FA-18E/F aircraft. The EIS analyzed impacts at NAS Lemoore from homebasing 164 FA-18E/F Super Hornets, 12 construction projects, increases of 1,856 military personnel and 3,044 family members, an increase of approximately 87,410 annual aircraft operations at the NAS Lemoore airfield, and an increase of approximately 12,420 annual aircraft operations in Special Use Airspace (SUA) in the vicinity of NAS Lemoore. The ROD for this EIS was signed in 1998 (DoN 1998b).

These two past actions occurred at NAS Lemoore well before the 2015 timeframe. As a result, the increases in aircraft, facilities, personnel, and aircraft operations from these two past actions are reflected in the 2015 baseline conditions for this F-35C West Coast Homebasing EIS. Accordingly, the cumulative impacts of these past actions are assessed along with Alternative 2 in the environmental consequences sections for each resource in Chapter 5, *NAS Lemoore Homebasing*.

7.1.2 Present Actions Relevant to Alternative 2 – NAS Lemoore Homebasing

The following present actions are relevant to the analysis of cumulative impacts at NAS Lemoore.

- **Environmental Assessment (EA) for Strike Fighter Realignment at NAS Lemoore, California** (DoN 2011) – This project involved the relocation of 24 FA-18E/F Super Hornet aircraft from the East Coast to NAS Lemoore and the transition of up to five squadrons of older FA-18C Hornet aircraft based at NAS Lemoore to newer FA-18E/F Super Hornets. During the same timeframe as this action, the Navy proposed to reduce the Fleet Replacement Squadron (FRS) to eliminate FA-18C/D aircraft and associated personnel from NAS Lemoore. Although the FRS reduction was not part of this action, the number of FRS aircraft was reduced by 30 aircraft during the 2012-2013 timeframe. By 2015, this action results in an overall decrease of 4 aircraft at NAS Lemoore; modifications to Hangars 1, 2, and 4; an increase of 182 personnel; and a 24 percent decrease in aircraft operations. A Finding of No Significant Impact for the Strike Fighter Realignment at NAS Lemoore was signed in October 2011.

  The Strike Fighter realignment is scheduled to occur at NAS Lemoore between 2012 and 2015. As a result, the decrease in aircraft, modifications to three hangars, increase in personnel, and decrease in aircraft operations are reflected in the 2015 baseline conditions for this F-35C West

Coast Homebasing EIS. Therefore, the cumulative impacts of this present action are assessed along with Alternative 2 in the environmental consequences sections for each resource in Chapter 5, *NAS Lemoore Homebasing*.

- **State Route 198/19th Avenue Interchange -** State Route 198 is a major travel corridor and the main commuter route providing access to NAS Lemoore. A construction project is proposed to create an interchange where State Route 198 and 19th Avenue meet in the City of Lemoore, approximately 4.5 miles east of NAS Lemoore (Kings County Association of Governments 2010). It is anticipated that this interchange would spur industrial development in the city and facilitate the closure of two uncontrolled crossings of State Route 198 that have high accident rates. Planning for this project has been completed and construction began in spring 2013; construction is expected to be completed in spring 2015 (California Department of Transportation 2013).

  The proposed State Route 198 interchange action has potential to interact with impacts from Alternative 2 because the interchange would affect air quality, traffic and transportation, biological resources, water resources, and management of hazardous materials and waste.

7.1.3 Reasonably Foreseeable Future Actions Relevant to Alternative 2 – NAS Lemoore Homebasing

The following reasonably foreseeable future actions relevant to the analysis of cumulative impacts at NAS Lemoore are described below.

- **F-15 Aircraft Conversion EIS, 144th Fighter Wing, California Air National Guard, Fresno-Yosemite International Airport** (National Guard Bureau [NGB] 2012) – This project involves the California Air National Guard 144th Fighter Wing converting 18 F-16 aircraft to 18 F-15 aircraft and minor construction, alteration, and demolition projects at the Fresno-Yosemite International Airport. Fifteen F-15s would be located at the Fresno-Yosemite International Airport and three F-15s would be located at March Air Reserve Base, Riverside County, California. The F-15 aircraft would conduct operations in Restricted Area (R-) 2508 (R-2508) Complex, which is proposed for increased use by Navy F-35C aircraft. However, the F-15 aircraft conversion for the 144th Fighter Wing would not change the frequency and duration of use, or number of operations conducted in R-2508. This F-15 conversion has potential to interact with impacts to airspace and air quality from Alternative 2 due to increased aircraft operations.
- **Master Plan Projects at NAS Lemoore** – There are a number of projects proposed at NAS Lemoore that might interact directly or indirectly with Alternative 2 because of geographic proximity to proposed construction areas. These projects consist of military construction projects or other ongoing projects identified in the Master Plan. These include the following:
  - **Aircraft Ready Jet Fuel Storage and Distribution System** - Construction of an aboveground jet fuel storage and distribution system at NAS Lemoore would increase jet fuel inventory by 32 percent to 4.4 million gallons, providing NAS Lemoore with a fuel storage and distribution system that would support existing tactical air forces and potential future requirements.

Construction would eliminate environmental concerns that are typically associated with underground storage tank systems and would provide the installation reliable fuel distribution for the future. All supply and return JP-5 fuel pipeline (33,380 linear ft) would be replaced. Existing pipeline would be abandoned in-place in compliance with federal, state, and county regulations. All underground structures would be properly removed. Replacement tanks would use a concrete pit configuration. The project would include replacement of six existing fuel farms' 2,500 to 13,500 barrel (105,000 to 567,000 gallon) underground storage tanks with three new 30,000 barrel (1,260,000 gallon) vertical, aboveground storage tanks, and replacement of the five existing 2,500 barrel (105,000 gallon) operating day tanks with new horizontal vaulted storage tank(s) in a concrete pit. Each concrete pit would comprise one or more day tank(s) with a capacity of 3,000 barrels (126,000 gallons). This project also would include replacement fuel distribution pipeline (transfer lines), valves, filter/separators, cathodic protection, grounding, leak detection, and other miscellaneous items associated to the fuel distribution system.

- **Recreational Facilities, Golf Course** - This project would involve construction of a new 18-hole championship golf course to include a club house, starter hut, golf cart storage, and maintenance buildings.
- **Religious Education Facility** – This project would provide a new 16,146-square foot (ft^2) religious education facility.
- **Bachelor Enlisted Quarters** – Each project would include construction of a 59,675-ft^2 two-story apartment Bachelor Enlisted Quarters to meet Chief of Naval Operations 1+1 module criteria. This project would provide billeting for 118 enlisted personnel per project for a total of approximately 708 billets if all quarters were constructed.
- **Missile Support Facility** – Construction of a 19,117-ft^2 missile maintenance/assembly facility and demolition of Building 472 (approximately 8,784 ft^2) is planned.

All these proposed Master Plan projects have somewhat limited potential to substantially interact with impacts from Alternative 2 because the impacts from Alternative 2 result primarily from noise and air emissions changes associated with newer aircraft engines or with changes in population at NAS Lemoore. Due to the proposed construction activities, these projects have the potential to interact with impacts of Alternative 2 because construction and operation activities may result in potential impacts to noise, air quality, land use, infrastructure and utilities, socioeconomics, community services, biological resources, topography and soils, water resources, cultural resources, and management of hazardous materials and waste. Several of the Master Plan projects have potential to interact with impacts of Alternative 2 in a positive manner by providing additional base support infrastructure and by implementing sustainable design features, such as solar thermal technologies.

- **California High-Speed Rail Line** (California High Speed Rail Authority and Federal Railroad Administration 2012) – The California High-Speed-Rail Authority is proposing high-speed train route that would eventually connect the San Francisco Bay Area to Los Angeles, with numerous

stations in between. The train would travel up to 220 miles per hour and allow travel between the two areas in under three hours. This project is made up of several different sections, each receiving separate environmental analysis. The 114-mile Fresno to Bakersfield section would pass through the Central Valley and the town of Hanford, approximately 15 miles east of the project area of NAS Lemoore. This section of the rail line is anticipated to serve approximately 4,500 riders boarding daily in Fresno and 5,100 in Bakersfield. Construction of the Fresno to Bakersfield section is anticipated to begin in 2013 and operation would begin in 2019.

The proposed Fresno-Bakersfield high-speed rail project has the potential to interact with impacts from Alternative 2 because of short- and long-term impacts to noise, air quality, land use, infrastructure and utilities, community services, traffic and transportation, biological resources, topography and soils, water resources, and management of hazardous materials and waste.

- **Avenal Power Plant Project -** The Avenal power plant is a 600-megawatt, natural gas-fired plant that would provide electricity for up to 450,000 homes in the San Joaquin Valley. This power plant would be located in the northeast corner of the City of Avenal, approximately 24 miles southwest of NAS Lemoore. The California Energy Commission approved this project in December 2009 and the US Environmental Protection Agency (USEPA) approved the license in May 2011. The USEPA granted the project a Prevention of Significant Deterioration Clean Air Act permit in August 2011. However, this permit decision was appealed to the Ninth Circuit Court of Appeals in November 2011 and the Court has not yet issued its final decision (USEPA 2013).

  Implementation of the Avenal Power Plant project has the potential to impact to interact with impacts from Alternative 2 because of short- and long-term impacts to air quality, land use, infrastructure and utilities, biological resources, and the management of hazardous materials and waste.

- **Photovoltaic Solar Plants** (Kings County Community Development Agency 2011b) - The Kings County Community Development Agency is reviewing initial studies and applications for 13 photovoltaic solar plants in Kings County. Of these 13 proposed renewable energy projects, nine are located within or in the vicinity of NAS Lemoore's AICUZ noise zones and/or Accident Potential Zones. Although the sizes of the facilities vary, each one consists of: a field of solar panels; inverters and transformers; a tie line to connect the facility to a local electrical power line; and other associated infrastructure (e.g., access roads, water and septic systems). Other project components may also include a control and maintenance building or a substation. The time frame of construction for each of these projects is unknown, but according to the study for one of these facilities, the operational life of a photovoltaic solar plant is estimated to be 30 years (Kings County Community Development Agency 2010, 2011a).

  The nine photovoltaic solar plant projects are in various stages of planning and study and the environmental studies for just two of the projects were available. A review of the two available studies reveals that the proposed photovoltaic solar projects have potential to interact with impacts from Alternative 2 due to potential impacts to air quality, safety, land use,

infrastructure and utilities, and biological resources. The photovoltaic solar projects also have potential to interact with impacts from Alternative 2 because the solar projects may affect certain biological resources or their habitat.

- **Laton Community Plan Update -** The community of Laton, located 20 miles northeast of NAS Lemoore, updated their community plan to accommodate and guide growth in the town for the period 2010 to 2029. Implementation of the updated community plan would increase the planning area of Laton by 109 acres, the majority of which would be designated new growth areas for low- and medium-density residential development (Fresno County Department of Public Works and Planning 2010).

  The proposed Laton Community Plan Update project has potential to interact with impacts from Alternative 2 because implementation of the plan and the resultant associated development may produce changes in infrastructure and utilities, community services, traffic and transportation, biological resources, water resources, and management of hazardous materials and waste.

Naval Air Weapons Station China Lake Land Withdrawal EIS/Legislative EIS – This project addresses the Navy's withdrawal and reservation of the 1,045,000 acres of California public lands in Kern, Inyo, and San Bernardino counties. The land withdrawn is reserved for use by the Navy for the following purposes: (1) Use as a research, development, test, and evaluation laboratory; (2) Use as a range for air warfare weapons and weapon systems; (3) Use as a high-hazard testing and training area for aerial gunnery, rocketry, electronic warfare and countermeasures, tactical maneuvering and air support, and directed energy and unmanned aerial systems, and; (4) Geothermal leasing, development, and related power production activities. These lands were formerly administered by the Bureau of Land Management. Through a Memorandum of Understanding between the Navy and Bureau of Land Management, the lands have been administered by the Navy. On October 31, 2014, the legislative land withdrawal will expire (DoN 2012). An EIS/Legislative EIS was prepared and submitted to Congress to support legislation renewing the withdrawal. On December 26, 2013, Congress passed the National Defense Authorization Act Fiscal Year 2014, P.L. 113-66 that contained a provision withdrawing these lands.

The Naval Air Weapons Station China Lake Land Withdrawal project has the potential to contribute to cumulative impacts to airspace when evaluated in conjunction with Alternative 2.

7.2 CUMULATIVE IMPACTS ANALYSIS FOR ALTERNATIVE 2-NAS LEMOORE HOMEBASING

This section analyzes the incremental interaction Alternative 1 may have with the actions described in the previous section and evaluates cumulative impacts potentially resulting from these interactions. **Table 7.2-1** summarizes which past, present, and reasonably foreseeable future projects have the potential for cumulative impacts to the resources affected by the proposed action.

Table 7.2-1. Summary of Projects and Resources for Cumulative Impacts Analysis at NAS Lemoore

Project	***Airfields and Airspace***	***Noise***	***Air Quality***	***Safety***	***Land Use***	***Infrastructure and Utilities***	***Socioeconomics***	***Community Services***	***Traffic and Transportation***	***Biological Resources***	***Topography and Soils***	***Water Resources***	***Cultural Resources***	***Hazardous Materials and Waste***
State Route 198/19th Avenue Interchange			X						X	X		X		X
F-15 Aircraft Conversion, 144th Fighter Wing, California Air National Guard, Fresno-Yosemite International Airport	X		X											
NAS Lemoore Aircraft Ready Jet Fuel Storage and Distribution System		X	X		X	X	X			X	X	X	X	X
NAS Lemoore Recreational NAS Lemoore Facilities/Golf Course		X	X		X	X	X	X		X	X	X	X	X
NAS Lemoore Religious Education Facility		X	X		X	X	X	X		X	X	X	X	X
NAS Lemoore Bachelor Enlisted Quarters		X	X		X	X	X	X		X	X	X	X	X
NAS Lemoore Missile Support Facility		X	X		X	X	X			X	X	X	X	X
California High-Speed-Rail Line		X	X		X	X		X	X	X	X	X		X
Avenal Power Plant Project			X		X	X				X				X
Photovoltaic Solar Plants			X	X	X	X				X				
Laton Community Plan Update						X		X	X	X		X		X
Naval Air Weapons Station China Lake Land Withdrawal	X													

7.2.1 Airfields and Airspace – Potential Cumulative Impacts for Alternative 2

The study area for airfields and airspace cumulative impacts includes the NAS Lemoore airfield and SUA in the vicinity of NAS Lemoore.

<u>F-15 Aircraft Conversion EIS</u>

One reasonably foreseeable future project, the F-15 Aircraft Conversion EIS, 144th Fighter Wing, California Air National Guard, Fresno-Yosemite International Airport, has the potential to interact with impacts to SUA from Alternative 2 due to increased aircraft operations.

<u>Naval Air Weapons Station China Lake Land Withdrawal EIS/Legislative EIS</u>

Airfield flight events addressed in this EIS include an increase in operations, the replacement of EA-6B Prowler flights with the EA-18G Growler flights, introduction of F-35C flights, and the reduction of FA-18C/D Hornet and AV-8B Harrier II flights. Annual aircraft flights in R-2524 Superior Valley would increase 25 percent from the baseline of 3,155 flights to a proposed 3,944 flights under the Proposed Action. In addition, a 25 percent proposed increase in flight events at Armitage Airfield would result in increased use of either the Naval Air Weapons Station China Lake ranges or other locations within the R-

2508 Complex or other ranges and airfields. There could be a cumulative scheduling burden when considering the additional F-35C operations proposed for R-2524 and R-2508, which may require further scheduling coordination between users.

Alternative 2 – NAS Lemoore Homebasing

Homebasing the F-35C at NAS Lemoore would increase operations in R-2508 by 2,380 operations per year.

7.2.1.1 Combined Impacts to Airfields and Airspace from Past, Present, and Reasonably Foreseeable Future Actions

The F-15 aircraft conversion for the 144th Fighter Wing would involve a change in aircraft, but no changes in the frequency of use, duration of use, or number of operations conducted in R-2508. The China Lake Land Withdrawal would involve a 25 percent increase in aircraft operations in R-2524 and additional flight events in R-2508.

When past, present, and reasonably foreseeable future projects are analyzed together with Alternative 2, there would be no cumulative impact to SUA as a result of the proposed action, because the use of R-2524 and R-2508 would be scheduled to accommodate the different military missions and operations.

7.2.2 Noise – Potential Cumulative Impacts for Alternative 2

The study area for noise cumulative impacts is land and people under the noise zones of NAS Lemoore and SUA in the vicinity of NAS Lemoore.

NAS Lemoore Master Plan Projects

Numerous construction projects are proposed at NAS Lemoore in the reasonably foreseeable future. These projects may cause a temporary increase in noise from construction-related activities at NAS Lemoore.

California High Speed Rail Line

Noise and vibration are anticipated to present short and long-term impacts to sensitive receptors within the project area. Noise and vibration mitigation guidelines for the high-speed rail line address measures that could be implemented to reduce these impacts, such as constructing sound barriers along the rail line.

Alternative 2 – NAS Lemoore Homebasing

Homebasing the F-35C at NAS Lemoore would result in an increase of 68,400 annual operations at the NAS Lemoore airfield. Noise Zone 65 decibels (dB) and above would increase by 24 acres from the increase in aircraft operations. A total of 16 proposed construction/modification projects at NAS Lemoore phased over multiple years would result in construction-related noise.

7.2.2.1 Combined Impacts from Noise from Past, Present, and Reasonably Foreseeable Future Actions

Proposed demolition, construction, and Master Plan projects at NAS Lemoore could contribute cumulatively to the potential impacts associated with the facility upgrades that would occur under Alternative 2. However, it is assumed that demolition- and construction-related noise generated from projects would be short in duration and dominated by the noise generated from aircraft operations. The potential for the construction-related noise to overlap both in time and geographic extent of impact is remote.

It is anticipated that noise from F-35C operations under Alternative 2 and the proposed demolition, construction, and Master Plan construction projects would not result in significant cumulative impacts to noise.

7.2.3 Air Quality – Potential Cumulative Impacts for Alternative 2

The study area for air quality cumulative impacts is the area of the San Joaquin Valley Air Pollution Control District (APCD) in the vicinity of NAS Lemoore that would experience an increase in air emissions from construction and operations actions associated with Alternative 2. The past, present, and reasonably foreseeable future projects that have the potential to interact with Alternative 2 and result in cumulative impacts to air quality include: State Route 198/19th Avenue Interchange; F-15 Aircraft Conversion EIS, 144th Fighter Wing, California Air National Guard, Fresno-Yosemite International Airport; master plan projects at NAS Lemoore; California High-Speed Rail Line; Avenal Power Plant Project; and Photovoltaic Solar Plants.

<u>State Route 198/19th Avenue Interchange</u>

This project may cause a temporary increase of criteria pollutant and GHG emissions from mobile sources and ground disturbance during construction. Increased worker population and increased heavy-duty diesel truck traffic in the area may occur if development occurs as anticipated, and would increase emissions from those mobile sources. New industrial facilities may have the potential to impact air quality depending on the type of industries that locate in the area. Any new stationary sources would be regulated by the San Joaquin Valley APCD.

<u>F-15 Aircraft Conversion EIS, 144th Fighter Wing, California Air National Guard, Fresno-Yosemite International Airport</u>

This project may cause a small increase of criteria pollutant and GHG emissions of criteria pollutants from airfield operations at Fresno-Yosemite International Airport, which is within the San Joaquin Valley APCD. Therefore, there would be a regional additive impact to any emission increases associated with Alternative 2 at NAS Lemoore.

<u>Master Plan Projects at NAS Lemoore</u>

Numerous construction projects are proposed at NAS Lemoore in the reasonably foreseeable future. These projects may cause a temporary increase of criteria pollutant and GHG emissions from mobile sources and ground disturbance during construction. Regulatory requirements for control of fugitive

dust and construction equipment emissions would be adhered to during the course of the project activities.

California High-Speed Rail Line

There would be a temporary increase of criteria pollutant and GHG emissions from mobile sources and ground disturbance during construction, but long-term regional benefits would be expected as rail transportation would displace motor vehicle transportation, with approximately 10,000 regional daily users.

Avenal Power Plant Project

Construction of the power plant would result in a temporary increase of criteria pollutant and GHG emissions from mobile sources and ground disturbance during construction. It is anticipated that the emissions due to operation of the proposed Avenal Power Plant would result in regional air quality impacts. The California Energy Commission determined that the project will, as mitigated, neither result in, nor contribute substantially to, any significant direct, indirect, or cumulative adverse environmental impacts (California Energy Commission 2009).

Photovoltaic Solar Plants

Construction of the photovoltaic solar plant would result in a temporary increase of criteria pollutant and GHG emissions from mobile sources and ground disturbance during construction. There would be no notable air emissions as a result of operation of the solar plant facilities.

7.2.3.1 Combined Impacts to Air Quality from Past, Present, and Reasonably Foreseeable Future Actions

When past, present, and reasonably foreseeable future projects are analyzed together with Alternative 2, significant cumulative impacts to air quality are not anticipated as a result of construction activities associated with several of the projects, as each construction project is either completed before implementation of Alternative 2, or is unlikely to generate significant emissions. It is not possible to estimate construction emissions and timeframes for all of the projects that may or could occur in the near future, but it is unlikely that the combined emissions from any set of ongoing projects would result in significant emissions for any of the criteria pollutants with the possible exception of NOx which has a significance threshold of 10 tons per year. Each of the construction projects would be required to adhere to San Joaquin Valley APCD regulations regarding heavy equipment operations, fugitive dust, and other air quality requirements. Emissions would be short term and abate as the various construction projects are completed.

Projects with long-term operational emissions include the F-15 aircraft conversion, some of the NAS Lemoore Master Plan projects, and the Avenal Power Plant. The F-15 conversion project would result in an increase in NOx emissions slightly above 10 tons per year, but the San Joaquin Valley APCD has evaluated the emissions and provided a preliminary conclusion that the aircraft and related equipment, as well as commuter emissions are each included in the State Implementation Plan growth allowances. The NAS Lemoore Master Plan projects would generate minimal emissions and these are not anticipated

to exceed any significance criteria. The USEPA granted the Avenal Power Plant project a Prevention of Significant Deterioration Clean Air Act permit in August 2011. The Avenal Power Plant, if operated according to current permits, would generate regional air quality emissions. However, this permit decision was appealed to the Ninth Circuit Court of Appeals in November 2011 and the Court has not yet issued its final decision (USEPA 2013). It is anticipated that the permitting appeals process will result in the approval of the Avenal Power Plant to operate in a manner that does not contribute to significant cumulative impacts to air quality. Thus, the combination of these projects, along with Alternative 2, would not result in significant cumulative air quality emissions.

7.2.3.2 Greenhouse Gases

The potential effects of proposed greenhouse gas (GHG) emissions are by nature global and cumulative impacts, as individual sources of GHG emissions are not large enough to have an appreciable effect on climate change. Therefore, an appreciable impact on global climate change would only occur when proposed GHG emissions combine with GHG emissions from other man-made activities on a global scale.

On February 23, 2010 the Council on Environmental Quality published a memorandum, *Draft NEPA Guidance on Consideration of the Effects of Climate Change and Greenhouse Gas Emissions*. This memorandum provides "draft guidance for public consideration and comment on the ways in which Federal agencies can improve their consideration of the effects of GHG emissions and climate change in their evaluation of proposals for Federal actions under NEPA." The draft memorandum further advises Federal agencies to consider the direct and indirect GHG emissions from proposed actions. If a proposed action may be reasonably anticipated to cause direct emissions of 25,000 metric tons or more of carbon dioxide equivalent (CO_2e) emissions on an annual basis, then agencies should consider this an indicator that a quantitative and qualitative assessment could be meaningful to decision makers and the public. The discussion that follows is based on the analysis of GHG emissions that have been estimated as a result of implementation of the proposed action.

Currently, there are no formally adopted or published NEPA thresholds of significance for GHG emissions stemming from proposed actions. Formulating such thresholds is problematic, as it is difficult to determine what level of proposed emissions would substantially contribute to global climate change.

Individual sources of GHG emissions are not large enough to have an appreciable effect on climate change. Therefore, an appreciable impact on global climate change would, if currently accepted predictions are accurate, only occur when proposed GHG emissions combine with other GHG emissions from other man-made activities on a global scale.

The cumulative effects for GHG emissions were evaluated for Alternative 1 and Alternative 2 at NAS Lemoore. Every activity associated with the alternatives that burns fuel emits GHGs. Aircraft operations, ground support equipment, privately owned vehicles, and Fleet vehicles all contribute to GHG emissions.

Although military aircraft operations are excluded from required GHG reduction goals within Executive Order (EO) 13514, the Navy continues to assess possibilities for GHG reductions in these operations,

including use of alternative fuels and/or other renewable energy sources that may be available and suitable for these applications. Specific reduction goals for each region and installation would be evaluated based on location and identified potential for GHG reductions.

The Navy has established several goals for reducing GHG emissions. These goals include the following:

- Pursue opportunities with vendors and contractors to reduce GHG emissions.
- Cut petroleum use by half in the Navy's fleet of commercial vehicles by 2015 by replacing existing trucks with new hybrid ones.
- Procure half the power needed at Navy shore installations from alternative energy sources by 2020, and, supply electricity back to the grid wherever possible.
- Procure half of the Navy's energy requirements for operation of mobile sources from alternative energy sources by 2020.

Table 7.2-2 compares the annual GHG emissions for for Alternative 1 and Alternative 2 in 2028 with the baseline 2015 emissions. Only carbon dioxide (CO_2) emissions are calculated for most equipment and activities because of the negligible quantity of methane (CH_4) and nitrous oxide (N_20) emitted by aircraft. The result of implementing the proposed action is a net decrease in GHG emissions for Alternative 1 and a net increase in emissions for Alternative 2. Additional information on the calculations and additional years are available in Appendix D.

Table 7.2-2. 2028 GHG Emissions Compared to Baseline (2015)

Action	*CO_2e (metric tons)*
Baseline	281,337
2028 with Alternative 1 implemented	380,456
2028 with Alternative 2 implemented	350,255
Net Change Alternative 1	-99,119
Net Change Alternative 2	68,918

Note: Calculated values listed in Appendix D.

Annual GHG emissions associated with the proposed action operations from implementation of Alternatives 1, and 2 are compared to United States 2010 GHG emissions in **Table 7.2-3**. The estimated CO_2 emissions from the baseline, Alternative 1, and Alternative 2 are less than a hundredth of 1 percent of the total CO_2 emissions generated by the United States in 2010. The estimated cumulative CO2e emissions for Alternative 1 at both installations represents an increase of 35% over the baseline and the estimated cumulative CO2e emissions for Alternative 2 at both installations represents an increase of 24% over the baseline.

Table 7.2-3. Comparison of Existing, Alternative 1, and Alternative 2 GHG Emissions to United States 2010 GHG Emissions

Alternative	*CO_2e per Year (metric tons)*	*Percentage of US 2010 GHG Emissions*
Baseline	281,337	0.0041%
Alternative 1	380,456	0.0056%
Alternative 2	350,255	0.0051%
US 2010 Total GHG Emissions	$6{,}821.8 \times 10^6$	-

Source: USEPA 2012.

Emissions of GHGs from the proposed action alone would not cause appreciable global warming that would lead to climate changes. However, these emissions would increase the atmosphere's concentration of GHGs, and, in combination with past and future emissions from all other sources, contribute incrementally to the global warming that produces the adverse effects of climate change. At present, no methodology exists that would enable estimating the specific impacts (if any) that this increment of warming would produce locally or globally.

Although implementation of Alternative 1 or Alternative 2 would result in an increase in cumulative GHG emissions, this important topic warrants discussion by DoN leadership of broad-based programs to reduce energy consumption and shift to renewable and alternative fuels, thereby reducing emissions of CO_2 and other GHGs. EO 13423 requires a reduction in GHG emissions through 30 percent agency reductions of energy intensity by 2015, compared to a Fiscal Year (FY) 2003 baseline. Additionally, EO 13514 provides early strategic guidance to federal agencies in the management of GHG emissions. The early strategy directs agencies to increase renewable energy use to achieve general GHG emission reductions. The Navy in California has a broad ranging effort to reduce GHG emissions in California. Since 2003 energy use has decreased 18%. Since 2009, Navy Region Southwest has invested $100 million in renewable energy projects including solar power infrastructure and geothermal infrastructure. This has increased renewable energy production by 6%. Water conservation measures have reduced consumption by 400 million gallons from 2008-2009. Region-wide, 79% of all construction waste is diverted from the landfill. Navy Region Southwest was selected as a winner of the California State Governor's Environmental and Economic and Leadership Award. Navy Region Southwest is working with the California Legislature and Executive Branch for changes in California law (AB 2649) that will enable the military to further increase development of new renewable energy development on California military installations. Navy Region Southwest is on track for compliance with applicable federal requirements and Navy policies on GHG reductions.

According to provisions in EO 13514, federal agencies are required to develop a 2008 baseline for Scope 1 GHG emissions (direct emissions from sources that are owned or controlled by Department of Defense [DoD]) and Scope 2 GHG emissions (emissions resulting from the generation of electricity, heat, or steam purchased by DoD), and to develop a percentage reduction target for agency-wide reductions of Scope 1 and Scope 2 GHG emissions by FY 2020. As part of this effort, federal agencies are actively evaluating sources of GHG emissions, and developing, implementing, and annually updating integrated Strategic Sustainability Performance Plans that prioritize agency actions based on lifecycle return on investment. The intent is to evaluate GHG emissions on a lifecycle basis and to identify feasibility of sustainability strategies on that basis.

The DoD publishes an annual *Strategic Sustainability Performance Plan* that serves as a guide to reducing GHG emissions (DoD 2011). The DoD set a target to reduce Scope 1 and 2 GHG emissions from facilities by 34 percent from FY 2008 to FY 2020. The DoD is planning to achieve this goal through energy efficiency in facilities, reducing fossil fuel use by non-tactical vehicle fleets, and the use of renewable energy. In addition, the DoD would reduce its Scope 3 GHG emissions (emissions that result from DoD activities but are from sources not owned or directly controlled by DoD) by 13.5 percent from FY 2008 to

FY 2020. However, the Scope 3 GHG emissions are limited to transmission and delivery losses from purchased electricity, contracted waste disposal, and employee travel (DoD 2011).

In addition to assessing the GHG emissions that would come from Alternative 1 or Alternative 2 and the potential impact on climate change, the effect of climate change on Alternative 1 or Alternative 2 and what adaptation strategies would be developed in response is also assessed. This is a global issue for the DoD. As is clearly outlined in the *Quadrennial Defense Review Report* of February 2010 (DoD 2010), the DoD will need to adjust to the impacts of climate change on facilities and military capabilities. The DoD already provides environmental stewardship at hundreds of DoD installations throughout the United States and around the world, working diligently to meet resource efficiency and sustainability goals set by relevant laws and executive orders. Although the United States has significant capacity to adapt to climate change, it will pose challenges for civil society and DoD alike, particularly in light of the nation's extensive coastal infrastructure. In 2008, the National Intelligence Council judged that more than 30 United States military installations were already facing elevated levels of risk from rising sea levels. DoD operational readiness hinges on continued access to land, air, and sea training and test space. Consequently, DoD must complete a comprehensive assessment of all installations to assess the potential impacts of climate change on its missions and adapt as required (DoD 2010).

The *Quadrennial Defense Review Report* goes on to illustrate that DoD will work to foster efforts to assess, adapt to, and mitigate the impacts of climate change. Domestically, DoD will leverage the Strategic Environmental Research and Development Program, a joint effort among DoD, the Department of Energy, and the USEPA, to develop climate change assessment tools.

The US Global Climate Research Program report, *Global Climate Change Impacts in the US*, reviewed the unique impacts of climate change on the United States (Karl et al. 2009). According to the report, human-induced climate change appears to be well underway in the Southwest. Recent warming is among the most rapid in the nation, significantly more than the global average in some areas. This is driving declines in spring snowpack and Colorado River flow. Projections suggest continued strong warming, with much larger increases under higher emissions scenarios compared to lower emissions scenarios. Projected summertime temperature increases are greater than the annual average increases in some parts of the region, and are likely to be exacerbated locally by expanding urban heat island effects. Further water cycle changes are projected, which, combined with increasing temperatures, signal a serious water supply challenge in the decades and centuries ahead.

As climate science advances, the Navy will regularly reevaluate climate change risks and opportunities in order to develop policies and plans to manage its effects on the Navy's operating environment, missions, and facilities.

7.2.4 Safety – Potential Cumulative Impacts for Alternative 2

The study area for safety cumulative impacts is NAS Lemoore, its immediate vicinity, and the SUA in the vicinity of NAS Lemoore. One of the past, present, or future actions has the potential for cumulative impacts to safety at the NAS Lemoore airfield and proposed construction areas. The proposed photovoltaic solar projects have potential to interact with impacts from Alternative 2 because the field or solar panels may be a source of glare that could affect aviation safety for NAS Lemoore pilots

performing flight operations. However, the location of the solar projects will be included in pilot briefings and in-flight avoidance procedures would be implemented as necessary. There would be no cumulative change to the overall safety risk in the study area, impacts to Accident Potential Zones (APZs), or change in the potential for aircraft mishaps, Bird/Animal Aircraft Strike Hazard (BASH), and the other flight safety considerations discussed in Section 5.4. There are other no foreseen cumulative impacts to safety with implementation of Alternative 2.

7.2.5 Land Use – Potential Cumulative Impacts for Alternative 2

The study area for land use cumulative impacts includes NAS Lemoore and portions of Kings County and Fresno County, as well as portions of the western edge of the City of Lemoore. The past, present, and reasonably foreseeable future projects that have the potential to interact with Alternative 2 and result in cumulative impacts to land use include: the master plan projects at NAS Lemoore, the California High-Speed-Rail Line, Avenal Power Plant Project, and the Photovoltaic Solar Plant.

Master Plan Projects at NAS Lemoore

Numerous construction projects are proposed at NAS Lemoore in the reasonably foreseeable future. NAS Lemoore conducts planning activities to prevent incompatible land uses as a result of necessary development. It is anticipated that these projects would be compatible with land uses on base and that the projects would be evaluated in the future for incompatible land uses off base.

California High-Speed-Rail Line

This proposed project will convert hundreds of acres of agricultural land to a transportation use. This conversion to a transportation use may not be compatible with other land uses adjacent to the proposed project and would likely result in impacts to land use.

Avenal Power Plant Project

The power plant project would result in the conversion of farmland to an industrial use. This conversion may not be compatible with other surrounding land uses and would likely result in impacts to land use.

Photovoltaic Solar Plants

The solar plant projects are anticipated to convert farmland to an industrial use. This conversion may not be compatible with other surrounding land uses resulting in impacts to land use.

Alternative 2 – NAS Lemoore Homebasing

Alternative 2 would not significantly alter existing land uses within the NAS Lemoore installation. New structures would be consistent with existing land use patterns. The majority of new construction would take place mainly in areas that have been previously disturbed and would not impact lands currently utilized as agricultural outlease areas. Although some facilities would be built in undeveloped areas within the installation, new construction of noise-sensitive uses would be located outside high noise areas and/or incorporate noise level reduction measures and sound attenuation features into the construction.

7.2.5.1 Combined Impacts to Land Use from Past, Present, and Reasonably Foreseeable Future Actions

When past, present, and reasonably foreseeable future projects are analyzed together, there would be changes to land use from proposed projects in the surrounding communities. The Joint Land Use Study (JLUS) prepared for the City of Lemoore identifies the areas where specific types of projects can occur and remain compatible with land use associated with clear zones and APZ's. Should the City of Lemoore approve development in these areas, they would be allowing incompatible development that may constrain Navy operations, resulting in impacts to land use. Under Alternative 2, all proposed construction and renovation activities would take place within NAS Lemoore and no changes to local and regional land uses or designations would occur. Lands bordering the installation would remain agricultural. New structures at NAS Lemoore would be sited to be consistent with existing land use designations. While there is the potential for cumulative impacts to land use in the area, the proposed action does not result in impacts to land use; therefore, the proposed action would not contribute to cumulative impacts to land use.

7.2.6 Infrastructure and Utilities – Potential Cumulative Impacts for Alternative 2

The study area for infrastructure and utilities cumulative impacts includes NAS Lemoore and the City of Lemoore, along with its outlying areas. The past, present, and reasonably foreseeable future projects that have the potential to interact with Alternative 2 and result in cumulative impacts to infrastructure and utilities include the master plan projects at NAS Lemoore.

<u>Master Plan Projects at NAS Lemoore</u>

The proposed development of these Master Plan projects would result in short-term impacts on utility usage; however, these impacts would be temporary and are not anticipated to have adverse impacts to long-term utility usage. It is assumed that a more detailed analysis of utility usage and capacity would be conducted during project planning and design phases of each project and appropriate measures would be taken to avoid or minimize impacts to utilities.

<u>California High-Speed-Rail Line</u>

This project would require temporary increases in water, electric and solid waste disposal. It is not anticipated that these increases would require development of additional infrastructure. Additionally, the long-term impacts to utilities are anticipated to be minor and would likely not result in the development of additional utility infrastructure.

<u>Avenal Power Plant</u>

The Avenal power plant would replace aging transmission lines and support a growing demand for electricity in the San Joaquin Valley. The project is also anticipated to minimize electrical outages. Therefore, with the increase in electrical capacity, the project would have a beneficial impact to electrical services at NAS Lemoore and the surrounding community.

The Avenal power plant project would impact water if it is constructed in previously undisturbed areas which could result in changes to drainage patterns or increase surface water run off due to an increase

in impermeable surfaces. Additionally, operation of the power plant would require 12.4 gallons of water per minute; approximately 18,000 gallons a day. Water for the power plant operation would come from the City of Avenal. It is not anticipated that this increase in water demand would result in a need for improvements to the existing infrastructure or new water treatment facilities. Additionally, it is anticipated that the increase in demand can be supported by the City of Avenal. Implementation of the Avenal Power Plant project would result in beneficial impacts to regional infrastructure and utilities.

Photovoltaic Solar Plants

The photovoltaic solar plant projects would likely require increases in electricity usage during construction, as well as increases in water consumption. It is anticipated that after these projects are complete, they would have a beneficial impact to utilities in the region; providing a source of renewable energy and decreasing the demand for electricity.

Laton Community Plan Update

The main project identified in the plan is for 109 acres of low- and medium-density residential development. If this development occurs, there would be an impact to utilities. It is anticipated that there would be an increase demand for electricity, water, natural gas, and solid waste disposal.

Alternative 2 – NAS Lemoore Homebasing

The homebasing of the F-35C at NAS Lemoore would increase personnel by 751, the majority of who would reside off base. It is anticipated that this increase in personnel living in the nearby communities would have a minor increase on the demand for water and sewer treatment as well as increase demand on electricity, natural gas, and telecommunications.

7.2.6.1 Combined Impacts to Infrastructure and Utilities from Past, Present, and Reasonably Foreseeable Future Actions

When past, present, and reasonably foreseeable future projects are analyzed together, there would be an increase in demand for utilities associated with the implementation of Alternative 2 at NAS Lemoore and the surrounding communities. Alternative 2 along with several of the planned projects have the potential to have a cumulative impact to utilities. However, one of the future projects is anticipated to increase electrical capacity in the area and would likely offset potential cumulative impacts to utilities.

7.2.7 Socioeconomics – Potential Cumulative Impacts for Alternative 2

The study area for socioeconomic cumulative impacts includes NAS Lemoore and Kings and Fresno counties. The past, present, or reasonably foreseeable future actions that have the potential to interact with Alternative 2 and cumulatively impact socioeconomics in the study area include the Master Plan projects at NAS Lemoore.

Master Plan Projects at NAS Lemoore

The proposed construction associated with these projects would likely be awarded to local contractors and is anticipated to have a beneficial impact on regional jobs and income. These projects are expected to have a minor, positive cumulative impact to the local and regional economy.

Alternative 2 – NAS Lemoore Homebasing

The homebasing of the F-35C at NAS Lemoore would increase the number of personnel by 751. It is expected that the additional personnel and their dependents would live off base in nearby communities. This would require renting or buying living space, which would contribute to the local economy. Additionally, the added income generated by this increase in personnel is anticipated to be spent locally in the community and therefore would have a positive effect on the local and regional economy. There are also construction projects associated with Alternative 2 that would require the military to contract with local and regional companies. The construction projects would have a short-term beneficial impact on the local and regional economy.

7.2.7.1 Combined Impacts to Socioeconomics from Past, Present, and Reasonably Foreseeable Future Actions

When the projects identified above are examined together with Alternative 2, there would be impacts to socioeconomic resources. However, it is expected that cumulatively, the impacts would be positive and provide both short-term and long-term benefits through job creation and contributions to the local and regional economy.

7.2.8 Community Services – Potential Cumulative Impacts for Alternative 2

The study area for community services cumulative impacts includes NAS Lemoore, the City of Lemoore and Kings and Fresno counties. The past, present, or reasonably foreseeable future actions that have a potential to interact with Alternative 2 and cumulatively impact community services (schools and childcare, police protection, fire protection, health services, parks and recreation, and religious services) are those that would result in changes to personnel numbers at NAS Lemoore or result in construction of new facilities on base or in the surrounding community. Projects that involve the replacement of existing facilities would generally result in no change and therefore would not cumulatively impact community services. The non-federal actions off-base would also not result in any cumulative impacts at NAS Lemoore or the surrounding community.

Master Plan Projects at NAS Lemoore

Three Master Plan projects (Recreational Facilities/Golf Course, Religious Education Facility, and Bachelor Enlisted Quarters) would result in a minor increase in the number of facilities potentially requiring police and fire protection on base. Two projects would enhance such capabilities as NAS Lemoore would expand its Security Building and construct a new Fire Department training facility. Furthermore, some of the projects would increase the number of recreational and community opportunities on the installation thereby having a beneficial impact at NAS Lemoore.

California High Speed Rail Line

It is anticipated that beneficial impacts to socioeconomics within the region would occur as a result of the construction of the high-speed rail, as well as the potential growth that may develop, including support services.

Laton Community Plan Update

The community of Laton, located 20 miles northeast of NAS Lemoore, updated their community plan to accommodate and guide growth in the town for the period 2010 through 2029. Implementation of the updated plan would increase the planning area of Laton by 109 acres, the majority of which would be designated new growth areas for low- and medium-density residential development. The new development has the potential to produce changes to county population and housing and therefore place additional demands on community services.

Alternative 2 – NAS Lemoore Homebasing

The F-35C Homebasing would result in an increase of 751 personnel and their dependents, totaling approximately 2,320 persons in the Lemoore area. The percentage of school age children represented in the dependent population estimate is unknown. Some population growth resulting from Alternative 2 could be absorbed by the schools in Kings County. It is anticipated that while there would be impacts to the Fresno County School District, the influx of dependents and school age children would occur over a 13-year period. The distribution of school age children coming into the area would minimize these potential impacts. Additional personnel would be required for police protection to accommodate the increase in population, but fire protection and health services would remain the same. The existing parks and recreation services and religious services would successfully accommodate the increase in personnel and their family members associated with the implementation of Alternative 2. Overall, if Alternative 2 were implemented, any additional demands on community services would change gradually, allowing NAS Lemoore and the surrounding community to respond to needs over time. In addition, given sufficient advance planning and preparation to accommodate the influx of personnel, no significant impacts are anticipated to community services.

7.2.8.1 Combined Impacts to Community Services from Past, Present, and Reasonably Foreseeable Future Actions

Past, present, and reasonably foreseeable future projects at NAS Lemoore would contribute incrementally to the cumulative impacts on community services. The potential population growth at NAS Lemoore would be less than significant and occur over a long timeframe (2015 through 2028), allowing NAS Lemoore and the local community to respond to needs over time. Several currently anticipated master plan projects are already being planned to address current and future needs for community services on NAS Lemoore. Additionally, the proposed future projects in the area are not anticipated to have negative impacts to community services. These projects are not anticipated to result in the need for additional police force, fire protection, and emergency services. These projects are also not anticipated to result in an increase in students which could place additional burdens on the existing school system. Therefore, while Alternative 2 would have impacts to community services, other projects would not impact community services and no cumulative impact to community services would occur.

7.2.9 Ground Traffic and Transportation – Potential Cumulative Impacts for Alternative 2

The study area for ground traffic and transportation cumulative impacts includes NAS Lemoore, the City of Lemoore and Kings and Fresno counties. The past, present, and reasonably foreseeable future

projects that have the potential to interact with Alternative 2 and result in cumulative impacts to transportation include the California High-Speed Rail line and the State Route 198/19th Avenue Interchange.

California High-Speed Rail Line

The high-speed rail project would connect Los Angeles with San Francisco, with stops in Fresno and Bakersfield. This project is anticipated to provide beneficial impacts to regional traffic conditions; however, it has the potential to impact local intersections and roadways near the individual rail stations, therefore, impacts to local traffic are expected.

State Route 198/19th Avenue Interchange

This project proposes to create an interchange where State Route 198 and 19th Avenue meet in the City of Lemoore. The project is approximately 4.5 miles east of NAS Lemoore; however, State Route 198 is a major travel corridor and the main commuter route to NAS Lemoore. Changes in traffic patterns may result in impacts to the traffic movements of personnel entering and exiting the installation. Development of the interchange is also likely to facilitate the closure of two, high-accident rate, uncontrolled crossings of State Route 198, resulting in beneficial changes to traffic patterns on area roadways and the potential for increased capacity on area roadways. Construction began in spring 2013 and is expected to be completed in spring 2015 (California Department of Transportation 2013). Implementation of the 19th Avenue Interchange project would result in beneficial impacts to regional traffic and transportation.

Laton Community Plan Update

The development identified in the community plan would be expected to create increases in traffic and congestion on area roadways. It is likely that roadway improvements would occur to offset these impacts to traffic.

Alternative 2 – NAS Lemoore Homebasing

The homebasing of the F-35C at NAS Lemoore would increase the number of military personnel by 751. The additional trips generated by this increase are anticipated to be spread out over the course of the day and would not all occur during peak hours. Additionally, the military begins their work day earlier than the typical AM Peak Hours and leaves earlier than the PM Peak Hours; therefore it is anticipated that the increase in personnel accessing the installation would not add to the peak hour traffic on roadways around NAS Lemoore.

7.2.9.1 Combined Impacts to Ground Traffic and Transportation from Past, Present, and Reasonably Foreseeable Future Actions

When past, present, and reasonably foreseeable future actions are examined together, it is anticipated that there would be a minor increase in traffic at NAS Lemoore, as well as the surrounding communities. When assessed in conjunction with other projects with the potential for impacts to traffic, it is expected that there would be an increase in traffic in the area; however, through roadway improvements (e.g.,

198/19th Avenue Interchange) the potential impacts to traffic would be mitigated and the cumulative increase in traffic and congestion is anticipated to be minor.

7.2.10 Biological Resources – Potential Cumulative Impacts for Alternative 2

The study area for biological resources cumulative impacts is the area at NAS Lemoore that would be disturbed by demolition and construction activities and surrounding areas that may experience an increase in noise levels. The past, present, or reasonably foreseeable future actions that have a potential to interact with Alternative 2 and cumulatively impact biological resources are limited to those projects that would require demolition or clearing and grading for construction at NAS Lemoore or surrounding community or may increase noise levels. Projects with the potential for ground disturbance actions or increases in noise levels include, but are not limited to, several construction projects, the California High-Speed Rail Line, and the State Route 198/19th Avenue Interchange.

Master Plan Projects at NAS Lemoore

The numerous Navy construction projects planned within the reasonably foreseeable future are discussed as a single group because there is a common potential for the siting of the projects to interact with Alternative 2 and potentially impact biological resources. While the designs of all potential Master Plan projects have not yet been completed, the base conducts planning activities to prevent incompatible land uses and maximize the preservation of sensitive habitats on the installation. It is anticipated that all of the Master Plan projects would be consistent with the NAS Lemoore Integrated Natural Resources Management Plan. Any impacts from construction noise would be short-term and localized. As a result, it is not expected that the proposed Master Plan projects would have significant impacts on biological resources.

California High-Speed Rail Line

The section of the line closest to NAS Lemoore is the Fresno to Bakersfield section which would run through Hanford. The proposed construction of the California high-speed rail line would have the potential to impact biological resources from the loss of habitat. The noise from construction could also impact wildlife; however this would be short-term and localized. Operation of the rail line would likely result in a long-term increase of noise levels which could also impact wildlife species.

State Route 198/19th Avenue Interchange

The proposed construction of the State Route 198/19th Avenue interchange would have the potential to impact biological resources if it is constructed in a previously undisturbed area. The noise from the construction would also impact wildlife; however, this would be short-term and localized.

Avenal Power Plant

The proposed construction of the Avenal Power Plant would have the potential to impact biological resources if it constructed in a previously undisturbed area. The noise from the construction would also impact wildlife; however, this would be short-term and localized. The operation of this power plant would also potentially result in noise that impacts wildlife species.

Photovoltaic Solar Plants

The nine photovoltaic solar plants are in various stages of planning and study. A review of the two available studies reveals that the proposed photovoltaic solar projects have the potential to impact noise and biological resources due to installation of field or solar panels.

Laton Community Plan Update

Implementation of the updated plan would increase the planning area of Laton by 109 acres, the majority of which would be designated new growth areas for low - and medium - density residential development. Impacts to biological resources from the loss of habitat could occur from construction in undisturbed areas. Additionally, the noise from construction could impact wildlife species.

Alternative 2 – NAS Lemoore Homebasing

Implementation of Alternative 2 at NAS Lemoore would include ground-disturbing activities for construction of facilities. New construction would consist of one new training facility and five new operations and maintenance facilities and infrastructure. The proposed construction would occur within areas that have been previously disturbed and are actively managed. Project activities would result in short-term noise level increases which could temporarily displace wildlife from the immediate area, including birds that are protected under the Migratory Bird Treaty Act (MBTA). The increase in noise levels associated with the increase in airfield operations are not expected to impact wildlife in the area because they are likely accustomed to elevated noise levels associated with aircraft and military operations. As a result, impacts from increased aircraft operations are expected to be minimal because the ambient noise levels within the air station are high under existing conditions and would not significantly increase with implementation of Alternative 2.

7.2.10.1 Combined Impacts to Biological Resources from Past, Present, and Reasonably Foreseeable Future Actions

Several of the cumulative actions described include ground disturbing activities for demolition and construction of new or modification of existing facilities at NAS Lemoore that would result in surface disturbance. Such additive disturbance could affect biological resources, including direct (e.g., mortality due to the direct impact to a species during construction or operation activities) and indirect (e.g., habitat loss due to construction and removal of habitat) impacts to wildlife and vegetation. It is anticipated that all of the Master Plan projects would be consistent with the NAS Lemoore Integrated Natural Resources Management Plan, thus such impacts would be expected to be less than significant. Alternative 2 would result in minimal ground disturbance in locations that have been previously disturbed. Any construction noise impacts would be short-term and localized.

The cumulative noise from potential increases in the number of aircraft operations could impact wildlife species in the vicinity of the airfield. However, ambient noise levels at NAS Lemoore are high under existing conditions and wildlife in the vicinity are likely accustomed to noise levels associated with aircraft and military operations. Therefore, no significant impacts to biological resources are expected.

The combined federal and non-federal past, present, and reasonably foreseeable future actions would not result in significant cumulative impacts to biological resources because the non-federal actions

would occur at a distance from NAS Lemoore; as a result, their impacts would be unlikely to overlap with the impacts from federal actions at NAS Lemoore. Additionally, other projects at NAS Lemoore are anticipated to have minor impacts, if any, to biological resources. Therefore, it is anticipated that Alternative 2 would not result in minor cumulative impacts to biological resources.

7.2.11 Topography and Soils – Potential Cumulative Impacts for Alternative 2

The study area for topography and soils cumulative impacts is includes NAS Lemoore and vicinity. The past, present, and reasonably foreseeable future projects identified above would not impact topography. Terrain in the area of these projects is relatively flat and would not require significant cut and fill to prepare the sites for development. Alternative 2 would also be implemented in an area that is relatively flat and would not require significant site preparation that would result in changes to the topography.

The past, present, and reasonably foreseeable future projects with the potential to impact soils include the master plan projects at NAS Lemoore.

Master Plan Projects at NAS Lemoore

Master Plan Projects at NAS Lemoore would occur in previously disturbed areas. Erosion and sedimentation plans would be developed for each project. Standard Best Management Practices (BMPs) would be implemented during construction to avoid and minimize potential impacts to soils for each site.

California High Speed Rail Line

Geology and soils would be impacted as a result of construction activities including grading, grubbing, clearing, as well as potential blasting to reach bedrock.

Alternative 2 – NAS Lemoore Homebasing

Alternative 2 would also impact soils and erosion and sedimentation plans would be developed and the use of BMPs would be used to manage impacts to soils.

7.2.11.1 Combined Impacts to Topography and Soils from Past, Present, and Reasonably Foreseeable Future Actions

Alternative 2 in conjunction with past, present, and reasonably foreseeable future projects would not result in significant cumulative impacts to topography or soils.

7.2.12 Water Resources – Potential Cumulative Impacts for Alternative 2

The study area for water resources cumulative impacts includes NAS Lemoore and the surrounding area. The past, present, and reasonably foreseeable future actions that have a potential to interact with Alternative 2 and cumulatively impact water resources are limited to those projects constructed at NAS Lemoore or the surrounding community.

Master Plan Projects at NAS Lemoore

The numerous Navy construction projects planned within the reasonably foreseeable future are discussed as a single group because there is a common potential for the siting of the projects to interact

with the water resources at NAS Lemoore. While the designs of all potential Master Plan projects have not yet been completed, the base conducts construction activities to minimize impacts to water resources. During construction, there would be a potential for increased erosion and sedimentation which may impact surface water. Projects could require preparation of Stormwater Pollution Prevention (SWPP) Plans and would be implemented using best management practices (BMPs) to avoid and minimize potential erosion and runoff.. As a result, it is expected that the Master Plan projects would not have significant impacts on water resources.

California High-Speed Rail Line

The California high-speed rail line is a large-scale project with the potential for water resources to be impacted by changes to drainage patterns, redirecting of storm water runoff, increases in storm water runoff, increases to erosion and sedimentation, and impacts to irrigation distribution systems.

State Route 198/19th Avenue Interchange

The State Route198/19th Avenue interchange project would potentially require construction in previously undisturbed areas. This would potentially result in increased surface water runoff, erosion, and sedimentation of nearby water sources.

Laton Community Plan Update

The community of Laton, located 20 miles northeast of NAS Lemoore, updated their community plan to accommodate and guide growth in the town for the period 2010 through 2029. Implementation of the updated plan would increase the planning area of Laton by 109 acres, the majority of which would be designated new growth areas for low-and medium density residential development. During construction, there would be a potential for increased erosion and sedimentation which may impact surface water. All construction would implement BMPs to minimize the impacts. Therefore, it is not expected that the proposed development would have significant impacts on water resources.

Alternative 2 – NAS Lemoore Homebasing

Under Alternative 2, the homebasing of the F-35C would result in an increase of 751 personnel and corresponding increase in military/civilian dependents, the expansion and modification of existing facilities, and construction of new facilities and infrastructure at NAS Lemoore. The Navy is required to comply with the requirements of the Clean Water Act to preclude nonpoint source discharges. To this end, all construction activities would be performed in compliance with California's General Construction Stormwater Permit. Projects would require preparation of a SWPP Plan and implementation of BMPs to limit erosion and runoff. There are no wetlands or floodplains in the vicinity of the proposed project areas. Therefore, it is anticipated that Alternative 2 would not significantly impact water resources at NAS Lemoore.

7.2.12.1 Combined Impacts to Water Resources from Past, Present, and Reasonably Foreseeable Future Actions

All construction activities would be performed in compliance with California's General Construction Stormwater Permit. All proposed construction projects would require preparation of a SWPP Plan and

implementation of BMPs to limit erosion and runoff. There would be no changes in drainage patterns or increases in stormwater runoff due to increases in impervious surfacesTherefore, when past, present, and reasonably foreseeable future actions are examined together with Alternative 2, there would be no cumulative impacts to local water resources.

7.2.13 Cultural and Traditional Resources – Potential Cumulative Impacts for Alternative 2

The study area for cultural and traditional resources cumulative impacts is NAS Lemoore, areas adjacent to the installation, and areas underlying SUA where noise from proposed aircraft operations may affect historic properties. The past, present, and reasonably foreseeable future actions that have the potential to interact with Alternative 2 include NAS Lemoore Master Plan projects, utility-scale solar energy projects, geothermal leasing on Bureau of Land Management public lands, and wind energy development on Bureau of Land Management public lands.

Master Plan Projects at NAS Lemoore

Master Plan projects at NAS Lemoore would be located in areas of the installation that have been previously disturbed or are currently developed. An environmental review of each project would be completed prior to construction to determine if the project is located in an area of the installation with a high potential for cultural resources. The review of buildings that would require modifications or demolition would follow the guidelines established in the NAS Lemoore Integrated Cultural Resources Management Plan (ICRMP). Consultation with the State Historic Preservation Office (SHPO) on the National Register of Historic Places (NRHP) eligibility of Cold War-era architectural resources may be necessary before construction could proceed.

Alternative 2 – NAS Lemoore Homebasing

This project would require demolition of Bldg. 21 and several construction projects; however, these projects are in areas that are already disturbed. There would be no adverse effects to archaeological resources from Alternative 2. The demolition and modifications of buildings under Alternative 2 are not eligible for listing on the NRHP. There would be no adverse effects to architectural resources from Alternative 2.

7.2.13.1 Combined Impacts to Cultural Resources from Past, Present, and Reasonably Foreseeable Future Actions

When past, present, and reasonably foreseeable future projects are analyzed together with Alternative 2, there would be no potential for cumulative impacts to cultural resources. Projects that include ground disturbance, demolition/modifications of buildings, construction of facilities in undeveloped areas (potential visual impacts), or aircraft operations (i.e., noise) associated with other projects would not result in adverse effects to archaeological resources or historic buildings and structures. A review of each project on the installation would be completed prior to construction to determine if the project is located in an areawith a high potential for archaeological resources. Prior to the initiation of any demolition, modifications, renovations, or other physical changes, buildings would need to be surveyed and evaluated for NRHP eligibility. Any potential impacts to eligible resources would be resolved

through the Section 106 process. Therefore, there would be no cumulative impacts on cultural resources.

7.2.14 Hazardous Materials and Waste – Potential Cumulative Impacts for Alternative 2

The study area for hazardous materials and waste cumulative impacts is NAS Lemoore and vicinity. The past, present, and reasonably foreseeable future actions that have a potential to use hazardous materials or generate hazardous waste include those projects that require building demolition/modification that may require disposal of small quantities of asbestos-containing material or lead-based paint at NAS Lemoore. Projects with the potential for ground disturbance and demolition/modification include, but are not limited to, NAS Lemoore Master Plan projects and several non-federal actions off-base.

Master Plan Projects at NAS Lemoore

The numerous Navy construction projects planned within the reasonably foreseeable future are discussed as a single group because there is a common potential for these project to use hazardous materials or generate hazardous waste. Construction of these facilities would potentially require the use of some hazardous materials. The demolition of existing structures associated with these projects would have the potential to generate hazardous waste that would need to be disposed of properly. The new jet fuel storage and distribution system would replace an aging, underground system and would therefore reduce the potential for future hazardous material spills, thereby having a beneficial, long-term impact.

California High-Speed Rail Line

Construction of the California high-speed rail line through the San Joaquin Valley would potentially require the use of hazardous materials. In addition, some hazardous wastes may be generated for its operation. However, the trains would be electrically powered, and therefore would reduce the potential for fuel spills, as well as potentially from the reduction of motor vehicles traveling through the area.

State Route 198/19th Avenue Interchange

Construction of the State Route 198/19th Avenue interchange would potentially require the use of small quantities of hazardous materials. No hazardous wastes are anticipated to be generated from its operation. Improving the safety at this interchange would reduce the potential for vehicle accidents, which would also reduce the potential for the release of hazardous materials from accidents.

Avenal Power Plant

The construction of the Avenal power plant would potentially require the use of hazardous materials. As this power plant would be natural gas powered, no hazardous wastes are anticipated to be generated from its operation.

Laton Community Plan Update

Implementation of the updated plan would increase the planning area of Laton by 109 acres, the majority of which would be designated new growth areas for low-and medium density residential

development. It is anticipated that all new construction would require some quantities of hazardous materials. All of the construction would occur in accordance with existing regulations relating to hazardous materials. Therefore, it is not expected that the proposed development would have significant impacts on hazardous materials and wastes.

Alternative 2 – NAS Lemoore Homebasing

Under Alternative 2, homebasing of the F-35C at NAS Lemoore would generate hazardous materials or wastes by construction and demolition. Hazardous materials associated with F-35 painting operations and hazardous waste volumes would be substantially diminished relative to legacy aircraft. Although flight activities are expected to remain consistent, maintenance operations for all new airframes may decline since newer aircraft should not require the extensive repairs currently necessary to maintain older aircraft. The types of hazardous waste streams generated by proposed F-35C operations at NAS Lemoore are expected to be fewer than for legacy aircraft since painting operations, cadmium and hexavalent chromium primers, chrome, hydrazine, and various heavy metals would be eliminated or greatly reduced for the F-35. The hazardous materials associated with the F-35C program would not impact existing installation hazardous materials and waste management programs. Existing facilities and established procedures are in place for the safe handling, use, and disposal of hazardous materials and waste at NAS Lemoore, and implementation of Alternative 2 would not result in significantimpacts to hazardous materials and waste management.

7.2.14.1 Combined Impacts to Management of Hazardous Materials and Waste from Past, Present, and Reasonably Foreseeable Future Actions

The combined past, present, and reasonably foreseeable future actions with Alternative 2 are expected to result in a small increase in the amount of hazardous materials use or hazardous wastes generated. The increase in hazardous materials and wastes would generally be limited to the demolition and construction period for the majority of these projects and would not result in any long-term increase of hazardous materials. For those projects where long-term hazardous waste generation would occur the impacts would be limited to the immediate area and the sites would be managed so as to minimize or eliminate potential impacts to the environment. Existing facilities and established procedures are in place for the safe handling and use of these materials, and any increase in hazardous waste generated at NAS Lemoore would be removed and disposed in accordance with applicable federal, state and local regulations, as outlined in the Hazardous Waste Management Plan (DoN 2007). No cumulatively significant impacts concerning the management of hazardous materials and wastes are anticipated.

8. OTHER CONSIDERATIONS REQUIRED BY NEPA

8.1 CONSISTENCY WITH OTHER FEDERAL, STATE, AND LOCAL PLANS, POLICIES, AND REGULATIONS

An assessment of the proposed action indicates that the action alternatives would not conflict with the objectives of other applicable plans, policies, and regulations. A summary of this compliance status is provided in **Table 8.1-1**.

Table 8.1-1. Summary of Applicable Environmental Regulations and Regulatory Compliance

Plans, Policies, and Controls	*Regulatory Authority*	*Compliance Status*	*EIS Section*
National Environmental Policy Act (NEPA) (42 United States Code [U.S.C.] 4341 *et seq*.), Council on Environmental Quality (CEQ) regulations implementing NEPA (Code of Federal Regulations [C.F.R.] Parts 1500-1508) and Department of the Navy Procedures for Implementing NEPA (32 C.F.R. 775)	Department of the Navy (DoN)	This Environmental Impact Statement (EIS) has been prepared in accordance with NEPA, CEQ regulations implementing NEPA, and DoN NEPA procedures. Public participation and review are being conducted in compliance with NEPA.	Entire EIS
Noise Control Act of 1972 and Quiet Communities Act of 1978	DoN	Due consideration to noise impacts presented in this EIS ensured consistency with these acts.	4.2 and 5.2
Clean Air Act (42 U.S.C. 7401 *et seq*.), California Ambient Air Quality Standards, San Joaquin Valley Air Pollution Control District Rules and Regulations for Title V and non-Title V sources	US Environmental Protection Agency (USEPA) and California Air Resources Board	The air quality analysis in the EIS concludes that proposed emissions under Alternatives 1 and 2: a) would not create a major regional source of air pollutants or affect the current attainment status at Naval Air Facility (NAF) El Centro or Naval Air Station (NAS) Lemoore, and b) would comply with all applicable state and regional air agency rules and regulations.	4.3 and 5.3
Executive Order (EO) 12898, *Environmental Justice*, 59 *Federal Register* 7629 (1994)	DoN	Based on the analysis in this EIS, Navy concludes that neither Alternative 1 nor 2 would result in disproportionately high and adverse human health or environmental effects on minority populations and low-income populations.	4.7 and 5.7
EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, 62 *Federal Register* 19883 (1997)	DoN	Based on the analysis in this EIS, Navy concludes Alternative 1 would result in environmental health risks and safety risks that may disproportionately affect children. Alternative 2 would not result in environmental health risks and safety risks that may disproportionately affect children.	4.7 and 5.7
National Historic Preservation Act, as amended (16 U.S.C. 470 *et seq*.)	California State Historic Preservation Office (SHPO)	No impacts to traditional cultural properties are expected at NAF El Centro or NAS Lemoore. Consultation completed with California SHPO, who concurred with Navy finding of "no historic properties affected" for NAF El Centro (Alternative 1) and NAS Lemoore (Alternative 2).	4.13 and 5.13

Table 8.1-1. Summary of Applicable Environmental Regulations and Regulatory Compliance

Plans, Policies, and Controls	*Regulatory Authority*	*Compliance Status*	*EIS Section*
Archaeological Resources Protection Act of 1979, 16 U.S.C. 470 *et seq.;* Final Uniform Regulations, 32 C.F.R. 229 (1997).	California SHPO	The proposed action would not affect archaeological resources.	4.13 and 5.13
Clean Water Act (CWA) (33 U.S.C. 1251 *et seq.*) Safe Drinking Water Act (42 U.S.C. 300f *et seq.*)	USEPA, US Army Corps of Engineers (USACE), and California State Water Resources Control Board	Construction Permit may require CWA Sections 401 and 404 permits to address stormwater in actual facility design plans. Stormwater runoff during construction of infrastructure improvement aspects of the proposed action and ongoing operational activities would be performed in compliance with California's General Construction Permit. Proposed demolition and construction activities would require preparation of a Stormwater Pollution Prevention Plan and use of Best Management Practices to limit potential erosion and runoff.	4.12 and 5.12
EO 11990, *Protection of Wetlands*, 42 *Federal Register* 26961 (1977)	USACE	Proposed construction activities at NAF El Centro are approximately 300 ft from a 12-acre wetland. Specific measures would be taken during the design process to avoid and minimize impacts to this wetland. If the construction footprint extends to the wetland, the Navy would be required to obtain a Section 404 permit. The proposed action would not impact wetlands at NAS Lemoore.	4.12 and 5.12
EO 11988, *Floodplain Management*, 42 *Federal Register* 26951(1979)	Federal Emergency Management Agency	The proposed action would not impact floodplains or floodplain management at NAF El Centro or NAS Lemoore.	4.12 and 5.12
Endangered Species Act (16 U.S.C. 1531 *et seq.*)	US Fish and Wildlife Service (USFWS)	Alternative 1 would not affect ESA-listed species, as no ESA-listed species have been observed within the project areas. Alternative 2 would not affect ESA-listed species or suitable habitat for ESA-listed species at NAS Lemoore. Critical habitat has not been designated on NAF El Centro or NAS Lemoore.	4.10 and 5.10
Migratory Bird Treaty Act (16 U.S.C. 703 *et seq.*)	USFWS	The proposed action would not increase impacts to migratory birds.	4.10 and 5.10
Resource Conservation and Recovery Act (42 U.S.C. 6901 *et seq.*)	USEPA and Title 22 California Code of Regulations (CCR)	Homebasing the F-35C at NAF El Centro or NAS Lemoore would not result in significant hazardous materials related impacts. Management protocols for hazardous substances related to the F-35C Program would follow existing regulations and procedures for like materials.	4.14 and 5.14
Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (42 U.S.C. 9601 *et seq.*)	USEPA and CCR	Alternative 1 has the potential to impact several Installation Restoration sites. Contaminated soil or groundwater could be encountered during demolition or constructed-related activities; however as required by CERCLA, a Health and Safety Plan would be implemented. In addition,	4.14 and 5.14

Table 8.1-1. Summary of Applicable Environmental Regulations and Regulatory Compliance

Plans, Policies, and Controls	*Regulatory Authority*	*Compliance Status*	*EIS Section*
		construction in contaminated areas would be conducted in accordance with National Contingency Plan (40 C.F.R. 300, CERCLA Section 105) and other regulations and Navy guidance manuals. Alternative 2 would have no effect on known active or closed Installation Restoration sites.	

8.2 UNAVOIDABLE ADVERSE IMPACTS AND CONSIDERATIONS THAT OFFSET THESE IMPACTS

No mitigation measures were identified during the development of this EIS. As the NEPA process progresses, mitigation measures may emerge and management actions may be altered based on comments received during public and regulatory agency review of the Final EIS. If mitigation measures were identified for the selected alternative, they would be identified in the Record of Decision. These measures would be funded, and efforts to ensure their successful completion or implementation are treated as compliance requirements.

Avoidance and minimization of adverse impacts to natural, cultural, and other environmental resources were integrated into the action alternatives to the greatest extent possible and practicable. However, adverse impacts may not always be completely avoided and/or minimized. Adverse impacts for each resource are discussed in the environmental consequences section for the action alternatives and are summarized below.

8.2.1 Alternative 1 – NAF El Centro Homebasing

Under Alternative 1, the noise impacts from proposed F-35C aircraft operations within and adjacent to the installation would be significant. Alternative 1 would result in adverse impacts to traffic conditions because several intersections near NAF El Centro would have failing levels of service during morning and evening peak hours. These failing intersections would result in congestion to local roadway segments. There are several measures that could be taken to reduce the identified impacts to levels of service. These measures are described in detail in Section 4.9, *Ground Traffic and Transportation,* and include: signalization, additional turning lanes, relocated traffic signal and utility poles, railroad preemption phasing, and partially enclosing irrigation channels. With the measures identified above, the impacts to intersections and roadway segments would be reduced and traffic would flow at acceptable levels of service.

8.2.2 Alternative 2 – NAS Lemoore Homebasing

Under Alternative 2, there would be no significant impacts.

8.3 RELATIONSHIPS BETWEEN SHORT-TERM USES OF THE ENVIRONMENT AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

Homebasing the F-35C is not expected to result in the types of impacts that would reduce environmental productivity, have long-term impacts on sustainability, affect biodiversity, or narrow the

range of long-term beneficial uses of the environment. As discussed in Chapters 4 and 5, the action alternatives would result in both short- and long-term environmental effects.

Short-term uses of the environment associated with the proposed action would include improvements to existing military lands for both action alternatives. Aircraft operations and personnel stationing would change under Alternative 1, but would remain relatively unchanged under Alternative 2. Short-term effects would include localized disruptions and higher noise levels in some areas. Project-related construction activities would temporarily increase air pollution emissions and noise in the immediate vicinity of the affected area(s). Depending upon their location, humans and animals could experience somewhat increased levels of noise due to airfield operations. Noise from construction activities would be short-term and would not be expected to result in permanent damage of long-term changes in wildlife productivity or habitat use. Proposed F-35C operations in SUA and MTRs would be consistent with existing FA-18 operations in SUA and MTRs and would comply with the established range and land use management plans. Sustainability principles would be incorporated into building design and practices in accordance with NAVFAC Instruction 9830.1, Sustainable Development Policy (DoN 2003).

8.4 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

NEPA requires that environmental analysis include identification of "…any irreversible or irretrievable commitments of resources that would be involved if the proposed action is implemented." The term "resources" (both renewable and nonrenewable) means the natural and cultural resources committed to, or lost by, the action, as well as labor, funds, and materials committed to the action.

The permanent use and subsequent loss of non-renewable resources, such as oil, natural gas, and iron ore, are considered irreversible because non-renewable resources cannot be replenished by natural means. An action that causes a loss in the value of an affected resource, which cannot be restored (e.g., disturbance of a cultural site), is considered an irretrievable commitment of resources. Similarly, the consumption of a renewable resource that would be lost for a period of time is also considered an irretrievable commitment of resources. Renewable natural resources include water, lumber, and soil, all of which can be replenished by natural means within a reasonable timeframe.

Alternative 1 and Alternative 2 would both involve irretrievable commitments of both non-renewable and renewable resources. Facility development involving demolition, construction, and renovation activities would expend fuel, construction materials, and labor. The operation and maintenance of new and existing facilities required to support F-35C homebasing would require energy to heat, cool, and light the buildings. The increase in personnel under Alternative 1 would result in additional residential construction in and around El Centro, which would also expend fuel, construction materials, and labor. Conducting aircraft operations, maintenance activities, and office operations would require the expenditure of fuel and certain types of materials.

All new construction would comply with EO 13423, *Strengthening Federal Environmental, Energy, and Transportation Management*, and EO 13514, *Federal Leadership in Environmental, Energy, and Economic Performance*. EO 13423 sets goals for federal agencies in areas such as energy efficiency, renewable energy, toxic chemical reduction, recycling, sustainable buildings, electronics stewardship, and water conservation. EO 13514 expands on the EO 13423 requirements with mandates for federal agencies to

meet numerical and non-numerical targets. For example, EO 13514 requires that 95 percent of all new contracts require the use of water-efficient fixtures, low-flow fixtures, non-toxic or less toxic products, and energy-efficient products. EO 13514 also requires that all new construction comply with the *Guiding Principles for Federal Leadership in High Performance and Sustainable Buildings*. This includes employing design and construction strategies that increase energy efficiency, eliminate solid waste, and reduce stormwater runoff.

When comparing the data presented, Alternative 1 would require more construction materials and energy at NAF El Centro than Alternative 2 would require at NAS Lemoore. Nonetheless, the total amount of construction materials (e.g., concrete, insulation, wiring, etc.) required for this action is relatively small when compared to the resources available in the region. The construction materials and energy required for facility development and operations are not in short supply. Moreover, the use of construction materials and energy would not have an adverse impact on the continued availability of these resources. The commitment of energy resources to implement the proposed action is not anticipated to be excessive in terms of region-wide usage. Furthermore, compliance with EO 13514 and EO 13423 requirements would minimize irreversible or irretrievable effects to multiple non-renewable and renewable resources.

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