Description of Proposed Action and Alternatives

Chapter 2

How to Use This Document

Our goal is to give you a reader-friendly document that provides an in-depth, accurate analysis of the proposed action, the alternative beddown locations, the no-action alternative, and the potential environmental consequences for each base. The organization of this Draft Environmental Impact Statement, or Draft EIS, is shown below.

Overall Proposal

Preface
Detailed Guide for Reading the Draft EIS

→ Go back to the Preface for a detailed guide for reading the Draft EIS.

Chapter 1
Purpose and Need for the Initial F-22 Operational Wing Beddown

→ Go back to Chapter 1 to learn about the purpose and need for the Initial F-22 Operational Wing Beddown.

Chapter 2

- **Overview of the Proposed Action and Alternatives**
- **Alternative Identification Process**
- **Summary Comparison of Proposed Action and Alternatives**

→ Chapter 2 provides an overview of the proposed action, which is to base the first Operational Wing of F-22 aircraft at Langley AFB, Virginia, or one of the four alternative bases: Eglin AFB, Florida; Elmendorf AFB, Alaska; Mountain Home AFB, Idaho; and Tyndall AFB, Florida.

This chapter also summarizes the process used to identify alternative locations for the F-22 beddown and provides an environmental summary and comparison of the proposed action and alternatives.

Information Specific to Each Base

Chapter 3
Five Base-Specific Sections

Langley AFB	Eglin AFB	Elmendorf AFB	Mtn Home AFB	Tyndall AFB
Section LA1 Proposed Action Overview	**Section EG1** Alternative Overview	**Section EL1** Alternative Overview	**Section MH1** Alternative Overview	**Section TY1** Alternative Overview
Section LA2 Base-Specific Project Details	**Section EG2** Base-Specific Project Details	**Section EL2** Base-Specific Project Details	**Section MH2** Base-Specific Project Details	**Section TY2** Base-Specific Project Details
Section LA3 Affected Environment and Environmental Consequences	**Section EG3** Affected Environment and Environmental Consequences	**Section EL3** Affected Environment and Environmental Consequences	**Section MH3** Affected Environment and Environmental Consequences	**Section TY3** Affected Environment and Environmental Consequences
Section LA4 Cumulative Effects, Irreversible, and Irretrievable Commitment of Resources	**Section EG4** Cumulative Effects, Irreversible, and Irretrievable Commitment of Resources	**Section EL4** Cumulative Effects, Irreversible, and Irretrievable Commitment of Resources	**Section MH4** Cumulative Effects, Irreversible, and Irretrievable Commitment of Resources	**Section TY4** Cumulative Effects, Irreversible, and Irretrievable Commitment of Resources
Section LA5 Summary of Proposed Management Actions	**Section EG5** Summary of Proposed Management Actions	**Section EL5** Summary of Proposed Management Actions	**Section MH5** Summary of Proposed Management Actions	**Section TY5** Summary of Proposed Management Actions

Overall Proposal

Chapter 4
References
Volume 2

Chapter 5
List of Preparers
Volume 2

Chapter 6
Index
Volume 2

Appendices
Volume 2

Glossary, Acronyms and Abbreviations

2 DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

The proposed action is to establish the Initial F-22 Operational Wing at Langley Air Force Base (AFB), Virginia, over a period of approximately five years. The Operational Wing will consist of 72 Primary Aircraft Inventory (PAI) operational F-22 aircraft, along with the personnel needed to operate and maintain the F-22. In addition, the United States Air Force (Air Force) proposes to demolish, construct, and modify facilities on Langley AFB to support the Initial F-22 Operational Wing. F-22 aircraft would conduct training flights from the base and in associated training airspace.

Langley AFB is defined as the proposed action for beddown of the Initial F-22 Operational Wing.

The Air Force has defined four alternative locations for the beddown: Eglin AFB, Florida; Elmendorf AFB, Alaska; Mountain Home AFB, Idaho; and Tyndall AFB, Florida. Each of these four alternative locations meets the basing and operational requirements, including facilities and access to quality training airspace, basic existing facilities to support sorties (e.g., takeoffs and landings), and the capability to expand facilities and accommodate personnel.

This chapter presents the elements common to the proposed action and the four alternatives in relation to the F-22 beddown. The specifics of the proposal relative to Langley AFB and each of the four alternative locations are presented at the beginning of each alternative discussion in Chapter 3.

The methodology used to identify the proposed action and alternatives analyzed in this Draft Environmental Impact Statement (EIS), and the alternatives considered but not carried forward for analysis, is explained in section 2.2. This chapter also discusses the no-action alternative, in conformance with the Council on Environmental Quality (CEQ) regulations (40 Code of Federal Regulations [CFR] 1502.14[d]).

Overview of Initial F-22 Operational Wing Beddown Proposal

The proposal for the Initial F-22 Operational Wing beddown would involve implementing several related elements at Langley AFB or one of the four alternative locations. These elements would occur at either a base or in its associated training airspace.

Elements Affecting the Base

- ✓ Beddown 72 PAI F-22 operational aircraft over a period of approximately five years and replace any existing operational F-15C aircraft at the base.
- ✓ Conduct sorties at the base for training and deployment.
- ✓ Construct the facilities and infrastructure necessary to support the Initial F-22 Operational Wing.
- ✓ Implement the personnel changes (increases or decreases) at the base to conform to the F-22 wing's requirements.

Elements Affecting Airspace

- ✓ Conduct F-22 training activities in Military Operations Areas (MOAs), Air Traffic Control Assigned Airspace (ATCAA), and Warning Areas, emphasizing air-to-air combat and supersonic flight (where authorized).
- ✓ Employ defensive countermeasures, such as chaff and flares, in airspace authorized for their use.
- ✓ Accomplish limited employment of Joint Direct Attack Munitions at approved ranges (Nellis Range Complex, Nevada; Utah Test and Training Range; Eglin AFB's over-water ranges).

2.1 Proposed Beddown: Elements Common to the Proposed Action and All Basing Alternatives

There are seven elements of the proposal common to the proposed action and all basing alternatives: four occurring at the base and three in training airspace. For the bases, the four common action elements include beddown of F-22s and replacement of existing F-15Cs (except at Tyndall AFB); sorties from the base by F-22s; construction; and personnel changes. In the bases' associated training airspace, the common action elements would be airspace use and use of defensive countermeasures. In airspace with approved ranges, the F-22 Operational Wing will accomplish limited employment of Joint Direct Attack Munitions.

2.1.1 Action Elements Affecting the Base

Beddown of the Initial F-22 Operational Wing

PAI consists of the F-22s authorized and assigned to perform the wing's missions. BAI includes F-22s used as substitutes for PAI aircraft undergoing maintenance or otherwise unable to fly.

The Air Force proposes to establish the Initial F-22 Operational Wing at Langley AFB or one of the four alternative locations. A total of 72 operational (PAI) F-22 aircraft, divided into three squadrons of 24 aircraft, would comprise the proposed wing. Two Backup Aircraft Inventory (BAI) aircraft would also be beddown with each squadron. The beddown (i.e., basing of aircraft) would start in September 2004, with delivery of the first F-22 to the base, and is scheduled to be completed by June 2007, when the full complement of 72 PAI F-22 aircraft would be at the base. The construction would begin about 2 years prior to the arrival of the first aircraft. The beddown process would occur in three phases, each associated with development of an operational squadron.

Phase	*Start*	*End*	*F-22s per Phase/Total F-22s*[1]
1st Operational Squadron	September 2004	August 2005	24/24
2nd Operational Squadron	September 2005	June 2006	24/48
3rd Operational Squadron	September 2006	June 2007	24/72

Note: 1. PAI aircraft only.

Beddown of the 2nd and 3rd operational squadrons would require less time than the 1st operational squadron due to increased delivery rates of F-22 aircraft from the manufacturer. The two BAI F-22s for each squadron would be in place by June 2007.

Since the F-22 represents the replacement for some F-15Cs, the Air Force proposes to drawdown (i.e., remove) F-15Cs in operational squadrons from the selected base during the same time as the F-22 beddown. Where an F-15C drawdown would occur, the timing differs for each of the bases, but the transition would be complete before beddown of all 72 PAI F-22s (Table 2.1-1). No plans or proposals for relocating or retiring the F-15Cs have been identified by the Air Force. If the Air Force defines such a proposal, the potential environmental consequences would be addressed in separate environmental analyses.

Table 2.1-1. Proposed F-15C Drawdown Schedule and Increase in Primary Assigned Aircraft at the Bases

Base	*Baseline Total F-15Cs/ Operational Squadrons*[1]	*Drawdown of F-15Cs Complete*	*F-22 Beddown*[2] *Increase in Based Aircraft/Squadrons*
Langley AFB	66/3	January-March 2007	+6/0
Eglin AFB	48/2	April-May 2007	+24/1
Elmendorf AFB	42/2	January-March 2007	+30/1
Mountain Home AFB	18/1	April-May 2007	+54/2
Tyndall AFB[3]	N/A	N/A	+72/3

Note: 1. PAI F-15C aircraft only.
2. PAI F-22 aircraft only.
3. By the time an Initial F-22 Operational Wing Beddown would occur, Tyndall AFB will operate 24 PAI (plus 3 BAI) F-15Cs and 54 PAI (plus 6 BAI) F-22s for advanced fighter pilot training.

At Langley AFB and each of the four alternative locations, the total aircraft inventory would increase as a result of the Initial F-22 Operational Wing beddown. With the exception of Tyndall AFB, F-15C aircraft (PAI and BAI) would be replaced by F-22s (72 PAI and 6 BAI). For the purpose of this Draft EIS, each base's inventory of aircraft other than F-15Cs or F-22s is assumed to remain at year 2000 levels (Table 2.1-2). Should an aircraft inventory change be proposed in the future, it would constitute a separate action and be addressed through a separate environmental analysis.

Table 2.1-2. Based Aircraft: Baseline and Projected

	Baseline						*Projected*					
	F-15Cs		*F-22s*				*F-15Cs*		*F-22s*			
Base	*PAI*	*BAI*	*PAI*	*BAI*	*Other Aircraft*	*Total All Aircraft*	*PAI*	*BAI*	*PAI*	*BAI*	*Other Aircraft*	*Total All Aircraft*
Langley	66	6	0	0	10 (F-16, C-21)	82	-66	-6	72	6	10	88
Eglin	48	5	0	0	34 (F-15, A-10, F-16, C-130, H-1)	87	-48	-5	72	6	34	112
Elmendorf	42	7	0	0	39 (F-15E, E-3, C-12, C-130)	88	-42	-7	72	6	39	117
Mountain Home	18	2	0	0	49 (F-15E, F-16, B-1B, KC-135)	69	-18	-2	72	6	49	127
Tyndall[1]	24	3	54	6	104 (F-16, E-9, Target Drones)	191	24	3	54/72[2] (126)	6/6[2] (12)	104	269

Notes: 1. No operational F-15Cs or F-22s are located at Tyndall AFB. Based F-15Cs and F-22s are advanced fighter pilot training aircraft.
2. Advanced fighter pilot training aircraft/Initial F-22 Operational Wing (combined total).

Establishment of the Initial F-22 Operational Wing would differ at Tyndall AFB since no F-15C drawdown would occur there. Tyndall AFB will continue to provide advanced fighter pilot training for one squadron of F-15Cs (24 PAI and 3 BAI), and it will begin to support advanced fighter pilot

training for the F-22 in 2003. The Air Force has already decided to base the 60 (54 PAI and 6 BAI) training F-22s at Tyndall AFB, so these 60 aircraft are included as part of the Tyndall AFB baseline conditions. The aircraft delivery schedule for the advanced pilot training F-22s begins with the first squadron being fielded February 2003 through September 2008, with 23 of 30 aircraft in-place by July 2004. The second training squadron will arrive between June 2007 and March 2008. These aircraft (and their flight operations) will be in-place at Tyndall AFB concurrent with the Initial F-22 Operational Wing beddown. All Operational Wing F-22s would be additive to the aircraft inventory at Tyndall AFB if it were selected.

Sorties

F-22 aircrews would fly training and deployment sorties to meet its readiness requirements and mission goals. A sortie consists of a take off, mission, and landing by a single aircraft from the base.

The Air Force anticipates that each operational F-22 would fly about 20 times per month, or 240 times per year. The Initial F-22 Operational Wing, with a total of 72 PAI F-22s, would fly 17,280 sorties per year (see Appendix AO-1). Based on the current and foreseeable F-22 training requirements and deployment patterns for existing F-15C squadrons from a three-squadron wing, about one-third of the sorties would occur at overseas airfields during deployments or at other locations in preparation for deployments. On average, each squadron (24 aircraft) would be deployed for 120 days per year (90 days as part of an Aerospace Expeditionary Force [AEF] and 30 days for pre- or post-AEF training); this equates to the equivalent of one squadron being deployed all year. This pattern of deployments applies to the operational F-15C squadrons at Langley, Eglin, and Elmendorf AFBs. At Mountain Home AFB, the single squadron of F-15Cs is part of the 366th Aerospace Expeditionary Wing (AEW). This AEW also deploys in response to crises. Since Tyndall AFB lacks operational F-15Cs, its training F-15Cs do not deploy. Table 2.1-3 presents a generalized deployment concept for the F-15Cs at the four locations with operational squadrons. This concept does not reflect actual deployment patterns, nor does it show pre- and post-deployment overlaps of squadrons at a base. In addition, variations in durations of deployments and in the numbers of aircraft involved can occur year-to-year. As noted above, the AEF deployment concept is expected to continue into the foreseeable future and includes the Initial F-22 Operational Wing. In addition to deployments, each squadron would participate in training exercises and operate out of another United States or overseas base for an average of one week per year. On average, these exercises would account for 333 annual sorties for all three squadrons. As a result of deployments and exercises, the F-22 operational squadrons would generate 11,187 annual sorties at the base.

In August 2000, the Air Force decided to convert two of the three existing F-15C pilot training squadrons to F-22 pilot training squadrons at Tyndall AFB.

Table 2.1-3. Generalized AEF Deployment Concept for Operational F-15C Squadrons and Projected F-22 Operational Squadrons

BASE		DAYS		
		0-120	*120-240*	*240-360*
Langley	F-15C Squadron 1	Deployed	At Base	At Base
	F-15C Squadron 2	At Base	Deployed	At Base
	F-15C Squadron 3	At Base	At Base	Deployed
Eglin	F-15C Squadron 1	Deployed	At Base	At Base
	F-15C Squadron 2	At Base	Deployed	At Base
Elmendorf	F-15C Squadron 1	Deployed	At Base	At Base
	F-15C Squadron 2	At Base	At Base	Deployed
Mountain Home	F-15C Squadron 1	At Base	Deployed	At Base
Tyndall	No Operational F-15C	NA	NA	NA
Selected Beddown Base	F-22 Squadron 1	At Base	At Base	Deployed
	F-22 Squadron 2	At Base	Deployed	At Base
	F-22 Squadron 3	Deployed	At Base	At Base

Each of the bases already supports a considerable number of sorties (Table 2.1-4). Baseline sorties reflect the status of activities prior to the proposed Initial F-22 Operational Wing beddown. For operational F-15Cs at Langley, Eglin, Elmendorf, and Mountain Home AFBs, baseline sorties represent an annual average based on the number of PAI aircraft times the average number of sorties by an F-15C aircraft per month (18) times 12 months (see Appendix AO-1). An equivalent of one-third of the aircraft would be absent from the base due to deployment and associated activities, so a commensurate proportion of sorties would occur off base. For example, Eglin AFB supports 48 PAI F-15C aircraft, so they would fly, on average, a total of 6,912 annual baseline sorties at the base ([48 aircraft x 2/3 aircraft not deployed] x 18 sorties per month x 12 months). Because Langley AFB supports two squadrons of 24 PAI F-15Cs and one squadron of 18 PAI F-15Cs, an average of 46 F-15Cs are at the base (not deployed) during any given time period (personal communication, Day 2000). This pattern of activity results in 9,936 total annual F-15C sorties at the base (46 aircraft x 18 sorties per month x 12 months). At Tyndall AFB, where the F-15Cs support advanced fighter pilot training but do not deploy, operations data (i.e., tower counts, flying schedules, and pilot interviews) provide the basis for calculating annual baseline F-15C sorties. Operational data from each base were also used to define the numbers of sorties by all other aircraft (based and transient), irrespective of organization or service affiliation.

Table 2.1-4. Comparison of Baseline and Projected Sorties

Base	Baseline Annual Total Sorties	Baseline F-15C Sorties	Projected F-22 Sorties	Projected Total	Percent Change
Langley AFB	17,531	9,936	11,187	18,782	7%
Eglin AFB	27,086	6,912	11,187	31,361	16%
Elmendorf AFB	20,025	6,048	11,187	25,164	26%
Mountain Home AFB	14,758	2,592	11,187	23,353	58%
Tyndall AFB	26,248	6,299[1]	11,187	37,435	43%

Note: 1. F-15C training squadron sorties -- not operational sorties.

For the proposed action at Langley AFB, total sorties would increase by 7 percent because the F-15Cs fly fewer monthly sorties per aircraft (18 versus 20) than would the F-22s, and the base would support six more PAI aircraft. Increases in total sorties at Eglin (16 percent), Elmendorf (26 percent), Mountain Home (58 percent), and Tyndall (43 percent) AFBs would result from the increased number of aircraft at the base (refer to Table 2.1-1) and from the increased sortie rate of the F-22s. At Tyndall AFB, the sorties by the Initial F-22 Operational Wing would be additive to the baseline total without eliminating any sorties.

Current F-15C sorties, which include departures, multiple approaches, and landing procedures, are unique at each of the five bases and reflect the nature of base-specific training requirements, safety considerations, noise reduction practices, and other factors. The Air Force anticipates that the F-22s would fly in the base airfield environment in much the same way as the F-15Cs do today. F-22 operations would adhere to all the same restrictions, avoidance procedures, and quiet-hours programs.

How the F-22s operate at the bases would, however, vary somewhat from the current patterns of F-15Cs in operational units. First, due to thrust-to-weight relationships and variable factors such as temperature and humidity, the F-15C may take off with afterburners from 5 to 60 percent of the time depending upon the base and the particular mission. In contrast, the substantial increase in thrust of the F-22 enables this aircraft to take off using afterburners 5 percent of the time or less. Second, the F-22's power would allow it to accelerate more quickly to climb speed and reduce power sooner past the departure end of the runway. In contrast, the F-15Cs maintain higher power settings throughout their climb. This capability of the F-22 results in lower noise exposure as the aircraft exits the airfield airspace.

Environmental night (10:00 pm to 7:00 am) is the period when the effects of aircraft noise on people are accentuated.

The F-15Cs and the F-22s have a training requirement to fly after dark about 30 percent of the time due to the Air Force's initiative to enhance flying skills in support of readiness. For the purpose of meeting this requirement, 1 hour after sunset is generally considered to be after dark, so the hours of flight activity vary from season to season and at different locations. Currently, approximately 5 percent (part of the total 30 percent) of the time, the F-15Cs fly at night after 10:00 pm and before 7:00 am, or the period known as "environmental night." Environmental night receives special consideration

for analysis because it represents a period when the effects of aircraft noise on people are accentuated (see Appendix AO-2).

Construction

To accommodate the Initial F-22 Operational Wing, each base must provide the necessary facilities and infrastructure. Major facility requirements necessary to support the beddown include the following:

- Three combined squadron operations/maintenance facilities, each large enough for the personnel in a 24 PAI aircraft squadron
- Three hangars, each with bays for six F-22s
- A facility for the washrack, repair, and restoration of the F-22's low-observable (i.e., stealth) components
- An F-22 simulator facility
- Base communications infrastructure
- Other base support facilities, such as an engine repair shop, hush house (for engine testing), and aircraft parking aprons, which varies from base to base

Any base selected for the Initial F-22 Operational Wing beddown will need specific hangar, repair, and other facilities.

Each base being considered for beddown has existing facilities that support an air dominance fighter mission.

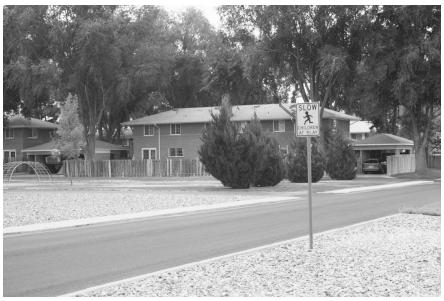
While they all offer the basic necessary facilities for the beddown, none of the five bases has all of the required infrastructure and facilities. Construction of new facilities and modification of existing facilities would be necessary at each base, although the nature and magnitude of these efforts would differ among the five bases depending on the availability of existing facilities. At Langley AFB, demolition of four existing facilities would be required. Table 2.1-5 presents an overview of the amount of construction and modification needed at each base, including total estimated costs and affected acres. Affected acres represent the area covered by the footprints of the proposed facilities, plus the surrounding lands where construction-related clearing and grading would occur. Infrastructure upgrades, such as connecting new facilities to water and power systems, would also add to the affected areas on the bases.

Table 2.1-5. Comparison of Proposed On-Base Construction and Modification		
Base	***Affected Area (acres)***	***Total Estimated Costs***
Langley AFB	16	$98.2M
Eglin AFB	10	$65.5M
Elmendorf AFB[1]	30 to 46	$150 to $305.7M
Mountain Home AFB	440	$395.2M
Tyndall AFB	73	$305.4M

Note: 1. Two construction options are under consideration; see section EL2.1.3 for details.

Proposed development on the bases would range from internal modifications or additions affecting less than 0.1 acre to construction of a new runway or housing area covering more than 150 acres. Demolition, construction, and modifications would precede beddown of the aircraft and extend through 2004.

Personnel Changes



Personnel changes associated with F-22 beddown would increase total personnel at any of the four alternative bases under consideration, but not for the proposed action at Langley AFB.

Beddown of the Initial F-22 Operational Wing would also require basing sufficient and appropriate personnel to operate and maintain the wing and to provide necessary support services. Overall, 1,846 personnel would be required to support the F-22 wing: 169 officers, 1,598 enlisted personnel, 25 civilian government employees, and 54 contractor personnel. For the bases with existing F-15C operational squadrons (all except Tyndall AFB), the F-22 personnel positions would be drawn from the equivalent positions associated with existing F-15C manpower authorizations. As such, the manpower authorizations for the F-22 wing would represent a combination of reassigned F-15C positions and new F-22 positions. At Eglin, Elmendorf, Mountain Home, and Tyndall AFBs, the personnel changes associated with the F-22 beddown would increase total personnel at the base (Table 2.1-6). At Langley AFB, total personnel would decrease due to the almost one-for-one replacement of the F-15Cs with the F-22s. Fewer personnel, particularly for maintenance, would be needed for the F-22 wing than for an equivalent F-15C wing.

Table 2.1-6. Summary of Personnel Changes by Base

	Baseline		Projected			Change per Beddown Phase		
Base	Total Base Personnel	Based Personnel: F-15C	Personnel: F-22	Total Base Personnel	Total Change in Personnel	September 2004 – August 2005	September 2005 –June 2006	September 2006 – June 2007
Langley	10,694	2,089	1,846	10,451	-243	-81	-81	-81
Eglin	15,324	1,628	1,846	15,542	+218	+72	+73	+73
Elmendorf	8,698	1,560	1,846	8,984	+286	+95	+95	+96
Mountain Home	4,993	645	1,846	6,194	+1,201	+399	+400	+402
Tyndall	6,232	0[1]	1,846	8,078	+1,846	+614	+615	+617

Note: 1. The F-15Cs at Tyndall AFB are associated with advanced pilot training, not with an operational unit.

The Air Force expects that changes in personnel needed for the beddown would occur in three phases coincident with the establishment of the three squadrons (refer to Table 2.1-1), starting in September 2004 and ending by June 2007. The increase or decrease in the number of personnel would be equally distributed over each of the three phases of the beddown.

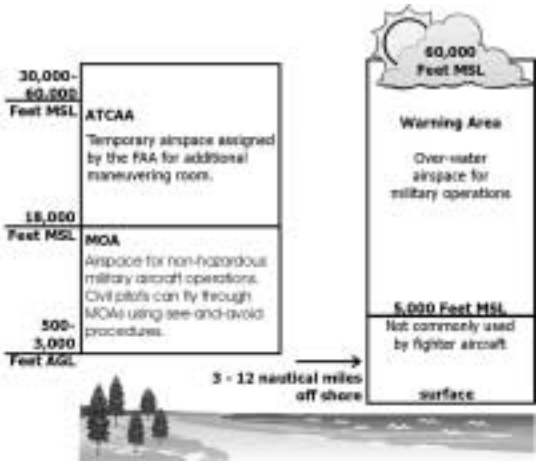
2.1.2 Action Elements Affecting Training Airspace

Airspace Use

The Initial F-22 Operational Wing would conduct the same missions and training programs as the operational F-15C. The Air Force expects that the F-22 would operate in the airspace associated with Langley AFB and each of the four alternative bases in a manner similar to the F-15Cs from operational squadrons now using that airspace.

All F-22 flight activities would take place in existing airspace used by the F-15C; no airspace modifications would be required for the F-22.

Training for the F-22s, like the F-15Cs, requires airspace such as MOAs, ATCAAs, and Warning Areas. MOAs are special use airspace designated by the Federal Aviation Administration (FAA) to identify those areas where nonhazardous military operations are being conducted and to separate certain military flight activities from nonparticipating air traffic. MOAs, which generally extend up to 18,000 feet above mean sea level (MSL), provide substantial vertical and horizontal maneuvering room for military aircraft training. When a MOA is active, the FAA routes other air traffic around it. Nonparticipating (those not using the MOA for training) military and civil aircraft flying under visual flight rules may transit an active MOA by employing see-and-avoid procedures. When flying under



Representative types of military airspace associated with F-15C and F-22 operations

instrument flight rules, nonparticipating aircraft must obtain an air traffic control clearance to enter an active MOA.

An ATCAA is airspace, often overlying a MOA, extending from 18,000 feet MSL to the altitude assigned by the FAA. Assigned on an as-needed basis and established by a letter of agreement between a military unit and the local FAA Air Route Traffic Control Center, each ATCAA provides additional airspace for training, especially air combat activities. ATCAAs are released to military users by the FAA only for the time they are to be used, allowing maximum access to the airspace by civilian aviation.

Warning Areas provide offshore airspace for military aircraft training and serve to warn nonparticipating aircraft of the potential danger. Warning Areas commonly extend from the surface to unlimited altitudes, although fighter aircraft rarely operate below 5,000 feet MSL. These large airspace units may overlie domestic or international waters, or both.

For the airspace associated with the Langley, Eglin, and Tyndall AFB alternatives, MOAs, ATCAAs, and Warning Areas would be involved. Warning Areas would comprise the type of airspace most used for these locations. Only MOAs and overlying ATCAAs would be used for the Elmendorf AFB and Mountain Home AFB alternatives.

F-22 training flights would closely match those performed by operational F-15Cs in terms of nature and duration. Both the F-15C and the F-22 are tasked with providing air superiority as its primary mission. To fulfill its mission requirements, the F-22 would conduct numerous related training activities (Table 2.1-7). These activities are derived from current operational F-15C programs and applied to the F-22.

Like the F-15C aircraft, the F-22 would fly approximately 90-minute-long missions, including takeoff, transit to and from the training airspace, training activities, and landing. Depending upon the distance and type of training activity, the F-22 (and F-15C) would spend between 20 to 60 minutes in the training airspace. On occasion during an exercise, the F-22 may spend up to 90 minutes in one or a set of airspace units.

The F-22 would use the full, authorized capabilities of the airspace units used for training, operating from 500 feet above ground level (AGL) up to 60,000 feet MSL. The F-22 would rarely (5 percent or less) fly below 5,000 feet AGL and consistently flies from 10,000 feet AGL to above 30,000 feet MSL (refer to Table 2.1-8). Actual flight altitudes would depend upon the lower and upper limits of specific airspace units.

Table 2.1-7. Projected F-22 Training Activities

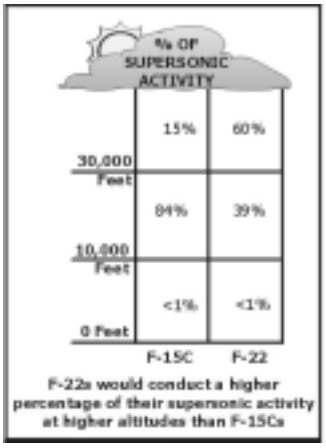
Activity	*Description*	*Airspace Type*	*Altitude (feet)*	*Time in Airspace*
Aircraft Handling Characteristics	Training for proficiency in use and exploitation of the aircraft's flight capabilities (consistent with operational and safety constraints) including, but not limited to high/maximum angle of attack maneuvering, energy management, minimum time turns, maximum/optimum acceleration and deceleration techniques, and confidence maneuvers.	Warning Area, MOA, and ATCAA	5,000 AGL to 60,000 MSL	0.5 to 1.0 hour
Basic Fighter Maneuvers (BFM)	Training designed to apply aircraft (1 versus 1) handling skills to gain proficiency in recognizing and solving range, closure, aspect, angle, and turning room problems in relation to another aircraft to either attain a position from which weapons may be launched, or defeat weapons employed by an adversary.	Warning Area, MOA, and ATCAA	5,000 AGL to 30,000 MSL	0.5 to 1.0 hour
Air Combat Maneuvers (ACM)	Training designed to achieve proficiency in formation (2 versus 1 or 2 versus 1+1) maneuvering and the coordinated application of BFM to achieve a simulated kill or effectively defend against one or more aircraft from a pre-planned starting position. This may be accomplished from a visual formation or short-range beyond visual range.	Warning Area, MOA, and ATCAA	5,000 AGL to 60,000 MSL	0.5 to 1.0 hour
Low-Altitude Training	Aircraft offensive and defensive operations at low altitude, G-force awareness at low altitude, aircraft handling, turns, tactical formations, navigation, threat awareness, defensive response, defensive countermeasures (chaff/flares) use, low-to-high and high-to-low altitude intercepts, missile defense, combat air patrol against low/medium altitude adversaries.	Warning Area, MOA, and ATCAA	500 AGL to 5,000 AGL	0.5 to 1.0 hour
Tactical Intercepts	Training (1 versus 1 up to 4 versus X) designed to achieve proficiency in formation tactics, radar employment, identification, weapons employment, defensive response, electronic countermeasures, and electronic counter countermeasures.	Warning Area, MOA, and ATCAA	500 AGL to 60,000 MSL	0.5 to 1.0 hour
Night Operations	Aircraft intercepts (1 versus 1 up to 4 versus X) flown between the hours of sunset and sunrise, including tactical intercepts, weapons employment, offensive and defensive maneuvering, chaff/flare, and electronic countermeasures.	Warning Area, MOA, and ATCAA	2,000 AGL to 60,000 MSL	0.75 to 1.5 hour
(Dissimilar) Air Combat Tactics (D)ACT	Multi-aircraft and multi-adversary (2 versus X to # versus X) conducting offensive and defensive operations, combat air patrol, defense of airspace sector from composite force attack, intercept and destroy bomber aircraft, destroy/avoid adversary fighters, strike-force rendezvous and protection.	Warning Area, MOA, and ATCAA	500 AGL to 60,000 MSL	0.5 to 1.0 hour
Large Force Employment (LFE)/Mission Employment	Multi-aircraft and multi-adversary composite strike force exercise (day or night), air refueling, strike-force rendezvous, conducting strike force defense and escort, air intercepts, electronic countermeasures, electronic counter-counter measures, combat air patrol, defense against composite force, bomber intercepts, destroy/disrupt/avoid adversary fighters, defensive countermeasure (chaff/flare) use.	Warning Area, MOA, and ATCAA	500 AGL to 60,000 MSL	0.5 to 1.0 hour

Table 2.1-8. General F-15C and F-22 Altitude Use

Altitude (feet)	*Percent of Flight Hours: F-15C*	*Percent of Flight Hours: F-22*
>30,000[1]	8%	30%
10,000-30,000	67%	50%
5,000-10,000	14%	15%
2,000-5,000	8%	3.75%
1,000-2,000	2.75%	1%
500-1000	0.25%	0.25%

Note: 1. Operations by F-22s would emphasize use of higher altitudes more often than F-15Cs.

On average, the F-22 would fly the same percentage of time after dark (30 percent) as does the F-15C currently using the airspace. With the exception of the airspace units associated with Elmendorf AFB in Alaska, the F-22 would conduct training in the airspace approximately 5 percent of the time (out of 30 percent) during environmental night (10:00 pm to 7:00 am). In the Alaskan airspace, training after dark can be accomplished during the winter months without flying after 10:00 pm or before 7:00 am.



F-22s would conduct a higher percentage of their supersonic activity at higher altitudes than F-15Cs

To train with the full capabilities of the aircraft, the F-22 would employ supersonic flight. All supersonic flight would occur at altitudes and within airspace already authorized for such activities. Due to the mission of the F-22 and the aircraft's capabilities, the Air Force anticipates that approximately 25 percent of the time spent in air combat training would involve supersonic flight. The F-22 would fly at supersonic speeds more often during air combat training for several reasons. First, its power permits supercruise, which is supersonic flight without the use of afterburners. This means that F-22 pilots could attain supersonic speeds in the course of normal maneuvering without employing a separate procedure (i.e., lighting the afterburner). Second, because of supercruise, the F-22 can fly at supersonic speeds with less expenditure of fuel. As such, pilots would be able to use the F-22's supersonic capability more consistently with less concern for fuel use. Third, improved aerodynamics in the F-22 make it "cut through" the air easily. While this reduces noise caused by the interaction of the airframe and the atmosphere, it also enables the F-22 to fly faster (i.e., supersonic) with less resistance. Finally, in terms of its air dominance mission, more frequent use of supersonic speeds would provide an advantage when engaging enemy aircraft. Supersonic speed would enable the F-22 to "close on" (fly toward) and set up to fire a missile more rapidly than an aircraft with less supersonic capability. After "taking the shot," the F-22 could use its speed to evade adversary missiles and aircraft. More than 99 percent of supersonic flight would be conducted above 10,000 feet MSL, with 60 percent occurring above 30,000 feet MSL (in authorized airspace, supersonic flight could infrequently occur below 10,000 feet MSL). In comparison, the F-15Cs commonly conduct supersonic flight for about 7.5 percent of the time spent in air combat training;

84 percent of such flights are performed between 10,000 feet AGL and 30,000 feet MSL. Other aircraft already using the airspace would continue to fly supersonic as they do today.

By the completion of the proposed beddown in 2007, the Initial F-22 Operational Wing would fly training flights that would use one or more of the airspace units associated with the selected base. Activities in the training airspace are termed *sortie-operations*. A *sortie-operation* is defined as the use of one airspace unit by one aircraft. Each time a single aircraft flies in a different airspace unit, one sortie-operation is counted for that unit. Thus, a single aircraft can generate several sortie-operations in the course of a mission.

Sortie-operation:
A sortie-operation is the use of one airspace unit by one aircraft. If an F-22 flies through two MOAs, it would generate two sortie-operations.

F-22 flight activities would generate varying numbers of sortie-operations in the different training airspaces associated with the Langley AFB proposed action and the four alternative locations (Table 2.1-9). Variation in the number of sortie-operations among the five bases results from the differences in the number, size, arrangement, and proximity of the airspace units to a base. For example, sortie-operations would increase the most in the airspace associated with Mountain Home AFB because of two factors. First, the proposed beddown would increase the number of aircraft using the airspace by 54 (from 18 baseline PAI F-15Cs to 72 proposed PAI F-22s), and these additional aircraft would account for substantially more sortie-operations. Second, the airspace units associated with Mountain Home AFB abut one another, so aircraft commonly schedule and fly in more than one unit on each training flight. In contrast, the large airspace units, such as the off-shore Warning Areas associated with Langley, Eglin, and Tyndall AFBs, allow aircraft to conduct training in a single airspace unit during a training flight.

Table 2.1-9. Comparison of Baseline F-15C and Projected F-22 Annual Sortie-Operations

Base	*Baseline Total Sortie-Operations: F-15C*	*Baseline Percent Total Sortie-Operations*	*Baseline Total*	*Projected Total Sortie-Operations: F-22*	*Projected Percent Total Sortie-Operations*	*Projected Total*	*Projected Increase in Sortie-Operations*
Langley	7,970	8%	95,170	11,186	11%	98,854	3,217
Eglin	13,643	27%	50,320	11,200	22%	51,520	1,200
Elmendorf	11,666	28%	41,048	14,762	33%	44,144	3,156
Mountain Home	5,818	22%	26,022	17,087	46%	37,291	11,269
Tyndall	14,537[1]	28%	52,016	11,188	18%[2]	63,204	11,188

Note: 1. Reflects use of airspace by F-15Cs from Eglin AFB operational squadrons and advanced fighter pilot training at Tyndall AFB. F-15C use at Eglin AFB would not decrease under this alternative.
2. While an apparent decrease, this represents an additional 11,188 sortie-operations without a decrease in any other aircraft operations in the airspace.

The F-15C shares, and the F-22 would share, the training airspace associated with a base with many other users. Under baseline conditions, F-15Cs represent 8 to 28 percent of total use of the airspace under consideration depending upon the base. Representative other types of aircraft using the airspace include the Navy F-14 and F-18; Air Force F-15E, F-22, A-10, F-16, and E-3; and the Coast Guard C-130 and helicopters. These other users would continue sortie-operations after the

beddown, and the F-22s of the Initial Operational Wing would account for 11 to 46 percent of total activity in the airspace, depending upon the base.

Eglin AFB and Tyndall AFB share use of several of the same airspace units. Operational squadrons of F-15Cs from Eglin AFB use the offshore Warning Areas and overland MOAs, and advanced fighter pilot training F-15Cs and F-22s from Tyndall AFB also fly in the same airspace units. Since the beddown proposal would not alter the airspace use for advanced fighter pilot training, comparisons in this Draft EIS focus on only the sortie-operations by the operational squadrons.

Despite the differences among the numbers of projected sortie-operations at Langley AFB and the four alternative locations, the general flight activities by the F-22s would be the same sets of airspace units with comparable features. For example, F-22 flight activities in Warning Areas associated with Langley AFB or Eglin AFB would be similar in terms of duration and events. While operational F-15Cs already perform similar events in the airspace units, the F-22s would use a generally higher flight regime (refer to Table 2.1-7) and fly at somewhat faster speeds. F-22s would be able to conduct one to two more set-ups for air combat training during a sortie.

Priority training for the F-22 is expected to focus on its air dominance mission.

Both the F-15C and F-22 use missiles and cannons in air-to-air engagements. Training for the use of these weapons is predominantly simulated; actual firing of missiles or cannons is rare. Simulating air-to-air attacks uses all the radar and targeting systems available on the aircraft, but nothing is fired. Live-fire training occurs during specialized training or exercises at the few ranges authorized for these activities.

Unlike the F-15C, the F-22 has the capability to perform air-to-ground missions. For the Initial F-22 Operational Wing, air-to-ground training would represent a minor, secondary part of the program, with air dominance mission training as the priority. Projected training activities for this Initial F-22 Operational Wing (refer to Table 2.1-7) clearly focus on air dominance.

Most air-to-ground training would be simulated, where nothing is released from the aircraft. The F-22s use avionics to simulate ordnance delivery on a target. This type of training could be conducted in any of the airspace units (e.g., MOAs, Warning Areas) and would not require an air-to-ground range.

The F-22 air-to-ground mission training would include ordnance delivery training during exercises or special training cycles at Nellis, Eglin, or Utah Test and Training Range.

Air-to-ground training also includes occasional ordnance delivery training. Actual ordnance delivery training would occur during the times when F-22 squadrons would be at exercises or during special training cycles. Locations for such training could include the Nellis Range Complex in Nevada, the Utah Test and Training Range, and the over-water ranges associated with Eglin AFB. Each of these locations currently supports activities of this type. The minor amount of use by F-22s would represent less than 1 percent of total activities

at these ranges. An estimated 333 annual missions (approximately 3 percent of total F-22 missions) would be flown by the F-22s at exercises and training away from their home base. A portion of these missions would involve ordnance delivery training. The negligible level of use of these remote ranges and the current level of use by others, suggest that project activities by F-22s do not warrant additional detailed environmental analysis for these ranges.

The primary air-to-ground ordnance carried by the F-22 is expected to be the guided bomb unit-32 variant of the Joint Direct Attack Munition (JDAM), which uses a 1,000-pound general-purpose Mark-83 bomb. JDAMs are guided to the target by an attached Global Positioning System (GPS) receiver. These weapons, commonly released between 20,000 and 40,000 feet MSL, require no laser guidance. Use of the JDAMs would occur only on ranges and targets previously approved for that training activity. All ordnance delivery training would adhere to the requirements and restrictions of the ranges.

Defensive Countermeasures

Chaff and flares are the principal defensive countermeasures dispensed by military aircraft to avoid detection or attack by enemy air defense systems. Although the F-22's stealth features reduce its detectability, pilots must train to employ defensive countermeasures. A bundle of chaff consists of approximately 0.5 to 5.6 million fibers smaller than the size of a hair that reflect radar signals and, when dispensed in sufficient quantities from aircraft, form a "cloud" that breaks the radar signal and temporarily hides the maneuvering aircraft from radar detection. Flares ejected from aircraft provide high-temperature heat sources that mislead heat-sensitive or heat-seeking targeting systems. Chaff and flares are used to keep aircraft from being successfully targeted by weapons such as surface-to-air missiles, anti-aircraft artillery, and other aircraft.

Effective use of chaff and flares in combat requires frequent training in use by aircrews to master the timing of deployment and the capabilities of the devices, and by ground crews to ensure safe and efficient handling. Chaff and flare deployment in authorized airspace associated with Langley AFB and the four alternative bases is governed by a series of regulations based on safety and environmental considerations and limitations. These regulations establish procedures governing the use of chaff and flares over ranges, other government-owned and controlled lands, and nongovernment-owned or controlled areas. Air Combat Command (ACC) has set standard minimum-release altitudes (ACC Supplement to Air Force Instruction 11-214) for flares over government-owned and controlled lands. These standards, which vary from 400 to 900 feet AGL according to aircraft type, are designed to allow the flares to burn out completely by at least 100 feet above the ground. For F-15Cs and F-22s, the minimum release altitude for flares is 700 feet AGL. Over nongovernment-controlled lands, flare release is restricted to a minimum of 2,000 feet AGL and above for all aircraft. More restrictive altitude restrictions are followed for specific airspace units in response to local considerations. Chaff and flares can also be dispensed in the offshore Warning Areas without altitude restrictions.

The General Accounting Office (GAO) has reviewed the available information on environmental effects and health risks of chaff (GAO 1998). The Air Force also evaluated chaff in relation to the environment (Air Force 1997). These reviews and studies indicated that chaff poses no significant health risks nor does it adversely affect livestock, wildlife, land use, or visual resources.

Langley AFB training airspace and training airspace associated with each of the four alternative locations include units authorized for the Air Force use of chaff and flares. Total use of these defensive countermeasures varies among the five locations, and records defining the amount of use are not complete or comparable. For the purposes of the Draft EIS, previously identified (Air Force 1997) patterns of chaff and flare use by operational F-15C aircraft will be used. F-15Cs do not dispense chaff and flares on every sortie. About 15 percent of F-15C sorties employ 25 bundles of chaff per flight and 25 percent employ 8 flares per flight. For the purpose of this analysis, F-22s can be expected to use similar or lesser amounts of chaff and flares per sortie. Although F-22 missions and training match those of the F-15C (Table 2.1-10), mission tactics and training scenarios are evolving and continue to evolve. Similarly, the use of defensive countermeasures will likely change. Because of its speed and stealth characteristics, F-22s are expected to use fewer defensive countermeasures per sortie than F-15Cs. However, such a decrease cannot be defined at this time. Therefore, the amount of chaff and flares projected for the F-22s is assumed to match that for F-15Cs on a per-sortie basis. Based on this assumption, overall chaff and flare use would increase in the training airspace associated with Langley AFB and the four alternative locations. Additional chaff and flare use correlates directly to increases in sorties for the F-22 relative to current F-15C activities.

Table 2.1-10. Comparison of Baseline (F-15C) and Projected (F-22) Chaff and Flare Use

	Baseline (Operational F-15C)		Projected (Operational F-22)		Projected Change	
Base	***Chaff***	***Flares***	***Chaff***	***Flares***	***Chaff***	***Flares***
Langley	37,250	19,872	41,951	22,374	+4,701	+2,502
Eglin	25,925	13,824	41,951	22,374	+16,026	+8,550
Elmendorf	22,675	12,096	41,951	22,374	+19,276	+10,278
Mountain Home	9,725	5,184	41,951	22,374	+32,226	+17,190
Tyndall	0	0	41,951	22,374	+41,951	+22,374

Under the beddown proposal, F-22s would use up to 42,000 bundles of chaff per year (in 2007 and after) in the airspace units associated with the selected base. Use by the F-22s would follow all existing altitude and location restrictions for those airspace units.

The F-22 would release up to 22,374 flares per year. Flare use by the F-22 would conform to existing altitude restrictions to ensure safety. The minimum altitudes provide sufficient time for complete combustion and consumption of the flares before contact with the ground. Based on the emphasis on flight at higher altitudes for the F-22, roughly 80 percent of F-22 flare release throughout the authorized airspace units would occur above 10,000 feet AGL.

2.1.3 Reviews and Permits Required to Implement the Proposed Action or an Alternative

This Draft EIS has been prepared in compliance with the National Environmental Policy Act (NEPA); other federal statutes, such as the Endangered Species Act, the Clean Air Act, the Clean Water Act, and the National Historic Preservation Act; executive orders; and other applicable state

statutes and regulations. In order to implement the proposed action or any of the alternatives, various federal and state reviews and permits would be required. These reviews and permits vary depending on the location and nature of the action. Table 2.1-11 lists these reviews and permits for the proposed action and for alternative locations.

2.2 ALTERNATIVE IDENTIFICATION PROCESS

2.2.1 Alternative Identification Process Methodology

Identification of alternative bases for the Initial F-22 Operational Wing beddown involved reviewing operational requirements, environmental considerations, and input from public scoping.

Operational Requirements

The Air Force F-22 program defined the operational and physical elements needed to support the beddown. Six primary requirements were identified as the focus of the alternative identification process. To be considered a viable base for the F-22 beddown, a base must fulfill these six requirements:

1. **Air Force Base with an Existing F-15C Mission** – As an Air Force asset and responsibility, the Initial F-22 Operational Wing must be established at an Air Force base to maintain positive command and control and to ensure mission priority. If located at a base under non-Air Force command and control, the potential exists for conflicts to arise among competing missions and responsibilities. The beddown also needs to occur at a base that supports an F-15C mission. Since the F-22 would supplement and replace the F-15C and take over its operational mission responsibilities, beddown of the F-22 at an F-15C base would result in the least disruption in operations and combat capability. It would also least affect the transition of pilots from the F-15C to the F-22. In addition, the organizational structure, training regimes, mission planning capabilities, and support functions (e.g., weapons handling, security) at an F-15C base would already match those needed for the Initial F-22 Operational Wing.

The F-22 would supplement and replace the F-15C and take over most air dominance mission requirements.

2. **Established Support for Fighter Aircraft** – An operational fighter wing, like that proposed for the F-22, needs a base already conformed and organized to support fighter aircraft. Requirements (e.g., infrastructure, organization) for fighter aircraft differ markedly from those for bombers, tankers, and transports. Fighter aircraft commonly generate more sorties, but have shorter duration missions. Maintenance and support crew organization and logistics must fit the tempo and nature of fighter operations. To impose a fighter wing like the Initial F-22 Operational Wing upon a base without established fighter support would engender

Table 2.1-11. Reviews and Permits Required to Implement Each Alternative
(Page 1 of 3)

Review/ Permit	*Responsible Agency(ies)*	*Action Requiring Analysis, Permit Review, and/or Permit*	*Langley AFB*	*Eglin AFB*	*Elmendorf AFB*	*Mountain Home AFB*	*Tyndall AFB*
FEDERAL							
NEPA	Air Force	Beddown of the Initial F-22 Operational Wing	X	X	X	X	X
Air Conformity Review under the Clean Air Act Amendments	APCD/Air Force	Federal action (i.e., beddown of F-22 Operational Wing) potentially changing of air emissions in an area designated as nonattainment for one or more criteria pollutants designated under the Clean Air Act	X	X	X	X	X
Section 7 of the Federal Endangered Species Act	U.S. Fish and Wildlife Service/Air Force	Construction and operational changes associated with beddown of the F-22 Operational Wing	X	X	X	X	X
Section 7 of the Federal Endangered Species Act	U.S. National Marine Fisheries Service/Air Force	Increase in air operations in coastal training areas	X	X	X		X
VIRGINIA							
Permit to Construct and Operate New Stationary Source	Virginia Department of Environmental Quality/Air Force	Composite Repair Facility and other structures	X				
Review for effects to resources on National Register of Historic Places (National Register-eligible resources) under Section 106 of the National Historic Preservation Act	Virginia Department of Historic Resources/Air Force	Demolition of hangars and construction of new facilities and structures	X				
Amendment to Virginia Pollution Discharge Elimination System Permit	Virginia Department of Environmental Quality/Air Force	Land alteration of more than 5 acres	X				

Table 2.1-11. Reviews and Permits Required to Implement Each Alternative
(Page 2 of 3)

Review/ Permit	*Responsible Agency(ies)*	*Action Requiring Analysis, Permit Review, and/or Permit*	*Langley AFB*	*Eglin AFB*	*Elmendorf AFB*	*Mountain Home AFB*	*Tyndall AFB*
Federal Facilities Agreement with U.S. Environmental Protection Agency	Virginia Department of Environmental Quality/U.S. Environmental Protection Agency/Air Force	Construction near Environmental Restoration Program sites	X				
FLORIDA							
Permit to Construct and Operate New Stationary Source	Florida Department of Environmental Protection/Air Force	Construction and operation of new Low Observable Composite Repair Facility and other structures		X			X
Stormwater Management Permit - amendment to Florida Pollution Discharge Elimination System Permit	Florida Department of Environmental Protection/Air Force	Land alteration of more than 5 acres		X			X
Wetland Mitigation Plan Approval	Florida Department of Environmental Protection/Air Force	Mitigation of impacts to federally defined jurisdictional wetlands under the Clean Water Act					X
Review for effects to resources on the National Register of Historic Places (or National Register-eligible resources) under Section 106 of the National Historic Preservation Act	Florida Department of Historic Resources/Air Force	Renovation of hangars and construction of new facilities and structures.		X			X

Table 2.1-11. Reviews and Permits Required to Implement Each Alternative
(Page 3 of 3)

Review/ Permit	*Responsible Agency(ies)*	*Action Requiring Analysis, Permit Review, and/or Permit*	*Langley AFB*	*Eglin AFB*	*Elmendorf AFB*	*Mountain Home AFB*	*Tyndall AFB*
ALASKA							
Permit to Construct and Operate New Stationary Source	Alaska Department of Environmental Conservation/ Air Force	Construction and operation of new Low Observable Composite Repair Facility and other structures			X		
Alaska Pollution Discharge Elimination System Permit	Alaska Department of Environmental Conservation/ Alaska Department of Fish and Game/Air Force	Land alteration of more than 5 acres. Potential discharge into a salmon stream			X		
IDAHO							
Permit to Construct and Operate New Stationary Source	Idaho Department of Environmental Quality/Air Force	Construction and operation of new Low Observable Composite Repair Facility and other structures				X	
Wetland Mitigation Plan Approval	Idaho Department of Environmental Quality/Air Force	Mitigation of impacts to federally defined jurisdictional wetlands under the Clean Water Act				X	
Idaho Pollution Discharge Elimination System Permit	Idaho Department of Environmental Quality/Air Force	RCRA Closure of the Wastewater Treatment plant and construction of new facilities				X	
Idaho Land Application Permit	Idaho Department of Environmental Quality/Air Force	Closure of two water wells				X	
Federal Facilities Agreement with U.S. Environmental Protection Agency	Idaho Department of Environmental Quality/U.S. Environmental Protection Agency/Air Force	Construction near Environmental Restoration Program sites				X	

unnecessary organizational modifications, potentially slow the beddown process, and would likely increase the costs of the beddown.

3. **Access to Airspace for Training** – The base must have access to existing airspace that supports training activities needed by the Initial F-22 Operational Wing to achieve and maintain readiness. Such airspace must be sufficient in size and vertical dimensions to accommodate the breadth of training required for the air superiority mission, including multi-aircraft, air-to-air combat engagements, and supersonic flight. While the base need not control or manage the airspace, it must have consistent access to meet training programs without disrupting schedules or degrading training quality. Furthermore, the airspace must be located within sufficient proximity to the base to support unrefueled F-22 training.

Quality training requires training that mirrors combat for all aircrews and support personnel.

4. **Support Varied Training Opportunities** – Varied training must provide aircrews with the opportunity to encounter the wide range of situations that mirror combat as closely as possible. Such training requires the F-22 pilots to face and defeat threats from the air and the ground. Air threats consist of other aircraft acting as adversaries, flying in a manner and using techniques that would be employed by enemies in combat situations. Realism and quality in such situations involve a range of training activities including multi-aircraft engagements, identifying and targeting adversaries from long distances, and using the full capabilities of the F-22 to evade and overcome opposing aircraft. Ground threats would enhance combat training. Areas under the airspace would provide better training for the F-22 if they contained electronic combat systems that realistically simulate the breadth of ground threats the F-22 could face. Similarly, some part of the available airspace must provide a system for monitoring aircraft activities to provide detailed feedback to pilots as a way to improve their skills. Such systems, like Air Combat Maneuvering Instrumentation, track and record every move by the aircraft in the airspace, allowing the pilots to critically review their performance immediately after the sortie. The Air Force offers a variety of systems and locations for these capabilities. For defeating both air and ground threats, the ability to use chaff and flares as defensive countermeasures forms an important quality of the airspace.

5. **Available Infrastructure** – To maximize the efficiency of the F-22 beddown, and to offer the ability to integrate the F-22 mission immediately, the base must provide adequate infrastructure. The existing infrastructure (e.g., fueling, runways) of a base must be designed and oriented around a fighter mission. Beddown of an air dominance wing into a base with a completely different mission would not allow immediate integration of the F-22 wing, and substantial changes would take longer to become mission-ready. Infrastructure requirements include an 8,000 by 150-foot medium-load runway, a runway arresting system, ramp space to park 78 PAI and BAI aircraft, base and flightline security systems, and capacity to store sufficient fuel.

Available infrastructure for fighter aircraft was an important consideration in selection of alternative bases.

6. **Existing Communications Links** – Any base considered suitable for the beddown must have the existing communication capability to accommodate the requirements of an air dominance wing. Bases must have the ability to receive secure communications and have secure internet capability. Connectivity to the wide area network, expandability of the telephone system, and connections to the base computer network backbone by radio frequency are functions necessary to support an air superiority fighter mission.

These six requirements were used to assess 43 candidate Air Force bases. The following summarizes the results of the evaluation process for the candidate alternatives.

Requirement	*Candidates Eliminated*	*Candidates Remaining*
1. Existing F-15C Mission	37	6
2. Established Support for Fighter Aircraft	0	6
3. Access to Training Airspace	0	6
4. Quality Training	0	6
5. Available Infrastructure	0	6
6. Communications Links	0	6
Total Alternatives	**37**	**6**

Based on the identification and evaluation process, six bases met the operational requirements: (1) Langley AFB, Virginia; (2) Eglin AFB, Florida; (3) Elmendorf AFB, Alaska; (4) Mountain Home AFB, Idaho; (5) Tyndall AFB, Florida; and (6) Nellis AFB, Nevada.

Nellis AFB met the six requirements for F-22 basing but was excluded from consideration as a location for the Initial F-22 Operational Wing. Nellis AFB has a unique tasking to support Air Force weapons systems and tactics testing and training. Nellis AFB supports the Air Warfare Center, Air Force Weapons School, and other training, testing, and evaluation units. One of Nellis AFB's primary functions is to host and conduct numerous large-force exercises (e.g., Red Flags and Green Flags) involving up to hundreds of aircraft of different types. Testing and evaluation for an array of aircraft (e.g., F-15Cs, F-15Es, F-16s, F-22s) form other essential and unique functions served by Nellis AFB. This tasking limits Nellis AFB's ability to accommodate all facilities and operational requirements associated with the Initial Operational Wing of 72 F-22s. Adding 72 F-22s under the Initial Operational Wing, and adding or allocating the necessary facilities, infrastructure, organizational structure, and airspace needed to support the Initial Operational Wing of three squadrons would affect Nellis AFB's ability to fulfill its unique and important functions. To maintain the existing missions at Nellis and to ensure combat readiness of the Initial Operational Wing, the Air Force eliminated Nellis AFB from further consideration as an alternative location.

As is the case with Tyndall AFB, F-22 aircraft are already scheduled to be based at Nellis AFB. Unlike Tyndall AFB, the Nellis AFB aircraft are assigned for Air Force Weapons School and for Warfare Center tactics development and testing, not for training or operational missions. Although Nellis AFB meets the basing criteria for an Initial F-22 Operational Wing, the unique nature of existing Nellis AFB missions would impact the essential requirements of the first Operational Wing to access airspace and facilities for initial wing missions and training programs. The five bases

retained for detailed analysis in the EIS meet the basing criteria but do not have the unique constraints of Nellis AFB.

Environmental Considerations

Each of the five remaining candidate bases that met the operational requirements were reviewed using a set of environmental considerations. These considerations ranged from current noise conditions at the base and in associated training airspace to existing personnel populations. This effort focused on the environmental issues and constraints with the potential to affect the manner in which the F-22 beddown would occur. Application of environmental considerations revealed no initial constraints at any of the five locations.

The initial operational wing of three F-22 squadrons will include developing many mission capabilities. Much of the synergy and personal communication benefits at one base would be lost if the initial wing squadrons were located at two or more bases.

Public Input from Scoping

The Phase-One and Phase-Two Scoping meetings helped identify local issues and concerns regarding selection of the bases for further analysis in the Initial F-22 Operational Wing Beddown Draft EIS. Issues raised by the public and agencies fall under the category of either operational or environmental considerations. Issues relevant to individual bases are presented throughout this Draft EIS and in the Chapter 3 base-specific sections.

2.2.2 Alternatives Considered But Not Carried Forward

Thirty-eight bases were eliminated during the alternatives identification process and were not carried forward for further detailed analysis. Nellis AFB was not carried forward due to its unique taskings and the comprehensive requirements of the Initial F-22 Operational Wing.

Another potential alternative, split basing, was evaluated but failed to meet the fundamental requirements of the beddown. Scoping raised the concept of split basing -- placing the three squadrons at more than one base and dividing the wing among two or three geographically separate locations. Paired or geographically nearby locations like Elmendorf and Eielson AFBs in Alaska or Eglin and Tyndall AFBs in Florida were raised as possibilities for this alternative basing approach. However, split-basing would present limitations affecting the readiness of the Initial F-22 Operational Wing and the effectiveness of the F-22 program overall.

The proposed action and each alternative has the Initial F-22 Operational Wing based at one location. This one location provides several important benefits. First, the development of the first F-22 squadron at the selected base would serve as a building block for the subsequent squadrons. Processes for operations, maintenance, and other support functions would evolve and the knowledge gained by one squadron would be readily passed on to the others through day-to-day interaction. Such interaction and synergy would not occur if the squadrons were located at separate bases. Even with formal exchanges of information, the gains available through daily interaction would be lost. Second, a three-squadron wing at a single base would offer efficiency and cost effectiveness with regard to specialized facilities and equipment such as a low-observable/

composite maintenance facility and the specialized full-mission trainer simulator. By splitting basing of the squadrons, these unique and costly facilities would need to be duplicated at each base. If not, pilots from one base would need to travel to the base with the simulator or not receive adequate training. Last, the personnel (operations and maintenance) from the first squadron would form the foundation for the second and third if all were based at one location. In contrast, this foundation would not be available should the squadrons be located at two or three bases. For these reasons, the split-basing approach was eliminated from further analysis.

2.2.3 Proposed Action and Alternatives Carried Forward for Detailed Analysis

The proposed action and four basing alternatives were carried forward for further detailed analysis in this Draft EIS. To provide a context for the proposed action and basing alternatives, the following is a brief description of each base and its mission:

Langley AFB (Proposed Action): Langley AFB, Virginia, currently supports three squadrons (66 aircraft) of F-15Cs. Consisting of ACC's 1st Fighter Wing (FW), these F-15Cs have an operational mission. Covering 2,883 acres, the base also supports a National Aeronautics and Space Administration research facility that uses aircraft operating from the airfield. Langley AFB has a 10,000-foot runway with arresting system, plus a shorter cross-runway. The F-15Cs from Langley primarily use extensive over-water Warning Areas above the Atlantic Ocean to conduct training. These Warning Areas, shared with the Navy and other units, provide quality training and permit the full range of training activities, including supersonic flight and chaff and flare use. Smaller overland MOAs also receive some use, but offer limited training opportunities.

Langley AFB is the proposed action because it provides good existing facilities and the least disruption of wing organization.

The Air Force identified Langley AFB as the proposed action for the Initial F-22 Operational Wing beddown. A Langley AFB beddown would result in the least disruption to overall ACC and Air Force readiness. The almost one-for-one replacement of F-22s for F-15Cs (refer to Table 2.1-1) would permit a smoother and more efficient transition from one aircraft type to the other. Conditions at the other four bases would not allow for such an efficient transition.

Eglin AFB: Situated in Florida's Panhandle, Eglin AFB has two operational squadrons of F-15Cs (48 aircraft), as well as a mix of 29 other aircraft including F-15 test and F-16 fighter aircraft. Eglin is an Air Force Materiel Command base, with boundaries encompassing 463,118 acres. The main base covers 10,500 acres and features one 12,000-foot runway and one 10,000-foot runway. This area, which includes the airfield, houses facilities for the 33rd FW, the 46th Test Wing, and the 9th Special Operations Squadron, along with the Okaloosa County Air Terminal. The F-15Cs from Eglin AFB share the use of extensive over-water Warning Areas in the Gulf of Mexico with aircraft from Tyndall AFB, Navy units, and other units in the region. These Warning Areas offer the full range of training

Eglin AFB has space for three squadrons and provides extensive over-water ranges.

opportunities needed by the F-15Cs. Inland MOAs also support training, but receive less use.

Elmendorf AFB: Elmendorf AFB, located near Anchorage, Alaska, is a Pacific Air Forces (PACAF) base, which is the home of the Alaskan Command, 11th Air Force, and Alaskan North American Air Defense region. The 3rd Wing encompasses two squadrons of F-15Cs (42 aircraft), 18 F-15E aircraft, 16 C-130 transports, and a limited number of C-12 and E-3 aircraft. The entire base covers 13,103 acres, with the improved grounds covering 3,713 acres, including a 10,000-foot main runway and a smaller 7,500-foot cross-runway. Large overland MOAs provide sufficient training airspace for the F-15Cs. Many of these MOAs permit supersonic flight and allow the use of chaff and flares.

Elmendorf AFB had multiple air superiority squadrons at different times during its history.

Mountain Home AFB: Mountain Home AFB, in Idaho, is an ACC base and the home of the 366th AEW, which includes a squadron of F-15Cs (18 aircraft) and squadrons of F-15Es, F-16s, B-1B bombers, and KC-135 tankers. The 366th AEW has an operational mission for rapid deployment to conflicts and trouble spots around the world. Mountain Home AFB, which covers about 8,200 acres, has a single 12,000-foot runway. Airspace used by the F-15Cs and the rest of the wing consists of MOAs south and west of the base. These MOAs accommodate all required training activities, and some MOAs are authorized for supersonic flight and chaff and flare use.

The unique 366th AEW at Mountain Home AFB requires rapid deployment of multiple aircraft types, including the B-1B pictured here.

Tyndall AFB: Tyndall AFB, Panama City, Florida, is an Air Education and Training Command base, and the primary base for advanced fighter pilot training for the F-15C and F-22. Based on a recent decision by the Air Force, Tyndall will operate two squadrons of F-22s (60 total aircraft) and one squadron of F-15Cs (27 total aircraft) for fighter pilot training. None of these squadrons will have operational missions. Tyndall AFB encompasses more than 20,000 acres, with 3,900 developed acres. Its 11,700-foot main and parallel second runway accommodate both F-15Cs and F-22s. A separate runway is used for drones. Many of the airspace units (Warning Areas and MOAs) used by Tyndall aircraft are the same as those used by Eglin AFB operational F-15Cs. Additionally, Tyndall AFB also uses local Work Areas (airspace units scheduled together) for training.

Tyndall AFB is the home of F-15Cs (pictured here) and F-22s for advanced fighter pilot training.

2.2.4 No-Action Alternative

Analysis of the no-action alternative provides a benchmark, enabling decisionmakers to compare the magnitude of the environmental effects of the proposed action or alternatives. Section 1502.14(d) of NEPA requires an EIS to analyze the no-action alternative. No-action means that an action would not take place, and the resulting environmental effects from taking no action would be compared with the effects of allowing the proposed activity to go forward. No-action for this Draft EIS reflects the *status quo,* where no beddown of the Initial F-22 Operational Wing would occur at

one of these bases at this time. No aircraft would be bed down or drawn down in conjunction with the F-22s, no F-22 personnel changes or construction would be performed, and no training activities by the Initial F-22 Operational Wing would be conducted in the airspace associated with Langley AFB or one of the four alternative locations. Taking no action could negatively affect the overall program for integrating the F-22 into the Air Force inventory and delay the fielding of the F-22 for operations and deployment. Delaying taking action could also add cost to the overall program.

At each alternative location, there are ongoing and currently planned activities and programs that would continue, whether or not the location is chosen for the beddown of the Initial F-22 Operational Wing. These activities have been approved by the Air Force and supported by existing NEPA documentation. In this Draft EIS, the no-action alternative will be evaluated for the proposed action and each alternative. This approach will provide the means to compare the effects of implementing the F-22 beddown to the effects of the no-action alternative at each installation and for each resource group. Chapter 3 presents a description of the affected environment at each location and the environmental consequences of the no-action alternative.

2.3 Past and Ongoing Actions

Baseline operational and environmental conditions for Langley AFB and the four alternative locations are associated with past and ongoing actions. The following lists those relevant actions and the related NEPA documentation.

Base	*Action(s)*	*Date*	*NEPA Documentation*
Langley	Beddown of 6 additional (PAI) F-15Cs	1998	Final Environmental Assessment Proposed Force Structure Change
Eglin	F-15 Drawdown	1992	Final Environmental Assessment Drawdown of F-15 Aircraft at Eglin AFB
Elmendorf	Establishment and modification of Military Training Airspace in Alaska	1995	Final Environmental Impact Statement Alaska Military Operations Areas
Mountain Home	Beddown of 7 B-1B Bombers	1996	Final Environmental Assessment for Proposed Relocation of 34th Bomb Squadron
	Establishment of training range and modification to training airspace	1998	Final Environmental Impact Statement Enhanced Training in Idaho
Tyndall	Beddown of F-22s for advanced fighter pilot training	2000	Final Environmental Impact Statement Conversion of Two Fighter Squadrons to F-22 Squadrons

Each of these relevant actions and NEPA analysis are, as appropriate, incorporated by reference in this Draft EIS.

2.4 Summary of Environmental Consequences

2.4.1 Introduction

This summary of environmental consequences is designed to provide an overview for the public, as well as Air Force decisionmakers who will be selecting a beddown location for the Initial F-22 Operational Wing. The following NEPA activities have been completed to ensure that decisionmakers have a comprehensive understanding of the potential environmental consequences of their decision:

This comparative analysis summarizes the environmental consequences at each base. Details of the analysis are presented in the base-specific sections of Chapter 3.

- **Extensive scoping, with multiple public meetings, conducted over an 8-month period.** This helped focus the environmental analysis for the five broad resource groups considered important to the public and agencies. These resources are defined in section 2.4.2.

- **Detailed discussions with Air Force and contractor personnel who are developing, testing, and will train to fly the F-22 on operational missions.** These inputs became the specifics that describe the proposed action and alternatives and provide specifics explaining how the F-22 would fit into each base and potentially affect local and regional environmental resources.

- **Documentation of existing environmental conditions for each base.** Public and agency input during scoping identified important resources. The existing conditions for these resources relied heavily on recent environmental materials and state and federal databases prepared at and near each base. These existing conditions also are the consequences of a no-action decision for that base.

- **Base-specific assessments of environmental consequences of the Initial F-22 Operational Wing beddown.** Each assessment overlaid the project details upon the existing conditions to estimate potential base-specific environmental consequences. The public and agencies expressed a desire to see a direct relationship between a project action and potential environmental consequence. This Draft EIS responds to that desire by presenting the resource for each base followed by a direct explanation of the potential environmental consequence to that resource.

- **Comparative summary of the potential environmental consequences.** An evaluation of the potential environmental consequences that compares each base and each environmental resource is presented in section 2.4.3.

2.4.2 Resource Definition

Aircraft Operations

Activities involving aircraft operations by F-22 fighters form a focus of the beddown proposal. These activities would occur near a base and in training airspace such as over-water Warning Areas, overland MOAs, and ATCAAs. Airspace in the United States is administered by the FAA, whose rules govern all civilian and military airspace

use. Aircraft operations in the base airfield environment and in training airspace generate noise and exhaust emissions. Flight safety is also a public concern for aircraft operations.

Natural Resources

Natural resources in this Draft EIS include all native and non-native plants and animals, the habitats where they are found, the communities they form, and the soil and water features necessary for these resources to function. The physical and biological features required to sustain these plant and animal species comprise their habitat. When linked together by ecological processes, these species assemblages are referred to as communities.

Cultural and Traditional Resources

Cultural and traditional resources are any prehistoric or historic district, site, or building, structure, or object considered important to a culture, subculture, or community for scientific, traditional, religious, or other purposes. Cultural and traditional resources include archaeological resources (both prehistoric and historic), historic architectural resources, and traditional resources. Significant cultural resources are considered for potential adverse impacts. Significant resources are those that are eligible for inclusion in the National Register of Historic Places or that are identified as important to traditional groups. Significant traditional resources are identified by Native American or Alaska Native groups or other traditional groups. According to the Department of Defense's (DoD) *American Indian and Alaska Native Policy* (October 20, 1998), "the military services must assess, through consultation, the effect of proposed DoD actions that may have the potential to significantly affect protected tribal resources, tribal rights, and Indian lands before decisions are made."

Base cultural resources include historic buildings.

Visual resources are usually defined as areas with unique features that are a result of the combined characteristics of the natural and human aspects of land use. Examples of the natural aspects of land include wild and scenic rivers, topography, and geologic landforms. Examples of human aspects of land use include scenic highways and historic districts. The assessment of visual and aesthetic value involves a characterization of visual features in the study area.

Human Resources

Land use addresses existing uses at each installation, areas surrounding each base affected by aircraft noise, and areas under the training airspace. Proposed activities that could potentially affect existing land use include construction of new on-base facilities and changes in noise levels around the base and in airspace due to aircraft operations.

Socioeconomics addresses employment and earnings, population totals and trends, and housing stock and residential building trends for each installation and for those jurisdictions whose economics are closely associated with activities at the base.

Under Executive Orders 12898 and 13045, federal agencies must consider the environmental and health impacts of their programs on minority and low-income populations and children, respectively. Within the context of this Draft EIS, the analysis addresses the potential for a proposed federal action or alternatives to result in disproportionately high and adverse environmental and health impacts, specifically noise impacts, on low-income populations, minority populations, and children.

Community and Infrastructure

Community and infrastructure resources include public services such as potable water, wastewater treatment, electric and natural gas utilities, hazardous materials and waste, and solid waste management. It also includes public schools and transportation. The Initial F-22 Operational Wing beddown would affect both on- and off-base employment which, in turn, may potentially affect community and infrastructure resources. A change in population would result in either an increase at an alternative base or a decrease at the proposed action in the utilization rate of on- and off-base services and utilities. An increase in population can impact traffic volumes where employment increases, and may result in congestion at gates and key intersections. Hazardous materials and waste are more directly affected by the increase or decrease in the number of aircraft associated with the Initial F-22 Operational Wing beddown and are, therefore, less dependent upon population changes than other community and infrastructure resources.

2.4.3 Comparison of Proposed Action and Alternatives

The comparative analysis is designed to assist the public and decisionmakers in the identification of differences among the basing alternatives.

Readers reviewing this Draft EIS can read about project elements in this chapter and the environmental analysis for each base in Chapter 3. This section presents the results of the environmental analysis for each base from Chapter 3 in a comparative analysis (Table 2.4-1).

Each location was compared using base-specific environmental consequences. No individual environmental resource received more "weight" than any other. Future review may determine that weighting of certain criteria would result in a more relevant evaluation. The results of the comparisons presented in Table 2.4-1 focus on requirements and conditions applicable only to the initial beddown of three operational squadrons of F-22s. Reduced numbers of squadrons or modifications to the basing concept would not meet the purpose and need for the Initial Operational Wing as defined in Chapter 1. As such, comparisons presented during this process have no bearing on the suitability of these bases for future F-22 beddowns with different numbers of aircraft or squadrons.

Reviewers of this Draft EIS have the ability to identify those factors they consider important and then comment on those factors during the Draft EIS review period.

Short comparative summaries addressing the five potential basing locations are also presented in Chapter 3 for each resource.

Table 2.4-1. Comparative Summary of Environmental Consequences (Page 1a)

		Langley AFB	Eglin AFB
	Aircraft Operations		
BASE	Airspace Management and Use 3.1.1	Sorties increase by 7%; no changes to airspace management/ procedures. Negligible effects, same as other bases.	Projected 16% increase in sorties; no changes to airspace management/procedures. Negligible effects, same as other bases.
	No-Action Alternative	Base supports 17,531 total aircraft sorties per year. Three squadrons of F-15Cs would remain. No impacts to airspace management; no change in airspace.	Base supports 27,086 total aircraft sorties per year. Two squadrons of F-15Cs would remain. No impacts to airspace management; no change in airspace.
	Noise 3.2.1	Total off-base area (land and water) affected by noise levels of 65 DNL or greater decreases by 521 acres. Only base where reduction in affected area occurs; consequences about the same as Elmendorf.	Total off-base area (land and water) affected by noise levels of 65 DNL or greater increases by 1,623 acres. Affected lands are mostly over water, but include 122 acres of residential uses (see Land Use). Highest potential for impacts of all bases.
	No-Action Alternative	13,768 total acres affected by noise levels of 65 DNL or greater. No change in current operations; no change to noise baseline. Existing departure and arrival routes established for safety and noise abatement.	12,137 total acres affected by noise levels of 65 DNL or greater. No change in current operations; no change to noise baseline.
	Air Quality 3.3.1	No regulatory thresholds exceeded; contribution of beddown to annual regional emission is -0.06% to 0.01%.	No regulatory thresholds exceeded; contribution of beddown to annual regional emissions is <0.1%.
	No-Action Alternative	Base total emissions: 775.4 tons/year CO; 271 tons/year NO_x; 12.7 tons/year PM_{10}; 6.6 tons/year SO_2; 137.6 tons/year VOCs. No change in current operations; no increase in air pollutant emissions.	Base total emissions: 1,050.2 tons/year CO; 382.7 tons/year NO_x; 117.4 tons/year PM_{10}; 26.2 tons/year SO_2; 221.4 tons/year VOCs. No change in current operations; no increase in air pollutant emissions.
	Aircraft Safety 3.4.1	Development encroaching into safety zones. Impacts minor, but slightly greater than alternative bases.	Negligible potential effects; same as other alternative bases.

Table 2.4-1. Comparative Summary of Environmental Consequences (Page 1b)

Elmendorf AFB	Mountain Home AFB	Tyndall AFB
Projected 26% increase in sorties; no changes to airspace management/procedures. Negligible effects, same as other bases.	Projected 58% increase in sorties; construction and use of a second runway may require adjustment to airspace management procedures in coordination with FAA. Negligible management effects; slightly higher than other bases.	Projected 43% increase in sorties; no changes to airspace management/procedures. Negligible effects, same as other bases.
Base supports 20,025 total aircraft sorties per year. Two squadrons of F-15Cs would remain. Under baseline, airspace is managed to support military and civilian joint use. No impacts to airspace management; no change in airspace.	Base supports 14,758 total aircraft sorties per year. No impacts to airspace management. One operational squadron of F-15Cs would remain at the base.	Base supports 26,248 total aircraft sorties per year. No impacts to airspace management. Tyndall AFB would continue to use airspace for training purposes.
Total off-base area (land and water) affected by noise levels of 65 DNL or greater increases by 607 acres. All affected area over water or military land (see Land Use). Least potential for impacts.	Total off-base area affected by noise levels of 65 DNL or greater increases by 2,455 acres. Affected area predominantly agricultural/grazing lands (see Land Use). Potential impacts minimal, but greater than Langley or Elmendorf.	Total off-base area (land and water) affected by noise levels of 65 DNL or greater increases by 2,141 acres. Although the affected area is mostly water, 23 acres of off-base lands have residential uses (see Land Use). Less potential impact than Eglin, but more than other bases.
9,178 total acres affected by noise levels of 65 DNL or greater. No change in current operations; no change to noise baseline.	16,224 total acres affected by noise levels of 65 DNL or greater. No change in current operations; no change to noise baseline.	20,362 total acres affected by noise levels of 65 DNL or greater. No change in current operations; no change to noise baseline.
No regulatory thresholds exceeded; contribution of beddown to annual regional emissions is <1%.	No regulatory thresholds exceeded; contribution of beddown to annual regional emissions is 0.1% to 10%.	No regulatory thresholds exceeded; contribution of beddown to annual regional emissions is 0.01% to 1%.
Base total emissions: 1,107.5 tons/year CO; 808.6 tons/year NO_x; 201.6 tons/year PM_{10}; 31.5 tons/year SO_2; 297.2 tons/year VOCs. No change in current operations; no increase in air pollutant emissions.	Base total emissions: 719.3 tons/year CO; 263 tons/year NO_x; 31.5 tons/year PM_{10}; 10.2 tons/year SO_2; 123.7 tons/year VOCs. No change in current operations; no increase in air pollutant emissions.	Base total emissions: 1,052 tons/year CO; 311 tons/year NO_x; 55.8 tons/year PM_{10}; 11.5 tons/year SO_2; 195 tons/year VOCs. No change in current operations; no increase in air pollutant emissions.
Negligible potential effects; same as other alternative bases.	Negligible potential effects; same as other alternative bases.	Negligible potential effects; same as other alternative bases.

Table 2.4-1. Comparative Summary of Environmental Consequences (Page 2a)

		Langley AFB	Eglin AFB
BASE	No-Action Alternative	Current development encroaching into safety zones. Thirteen bird-aircraft strikes per year. Existing ground safety procedures sufficient. No change in current operations; no increase in safety concerns.	Five bird-aircraft strikes per year. Existing ground safety procedures sufficient. No change in current operations; no increase in safety concerns.
AIRSPACE	Airspace Management and Use 3.1.2	Measurable net increase in daily average sortie-operations of 7 in one airspace unit and 4 in another. No changes to airspace structure; no anticipated conflicts with civil or commercial aviation. No substantive differences among alternative locations.	The lowest relative increase (2 to 3 per day) in total sortie-operations characterizes primary airspace units. No changes to airspace structure; no anticipated conflicts with civil or commercial aviation. No substantive differences among alternative locations.
	No-Action Alternative	No impediments to civil and commercial aviation. No change in current operations; no impacts to airspace management.	No impediments to civil and commercial aviation. No change in current operations; no impacts to airspace management.
	Noise 3.2.2	Subsonic noise levels in all seven primary airspace units would remain below 45 DNL. No substantive difference exists among the locations relative to subsonic noise in training airspace. Sonic booms would range from 1 to 56 per month, all supersonic activity offshore in over-water airspace. Low potential for impact; similar to Eglin and Tyndall.	Subsonic noise levels in 6 primary airspace units would remain at or below baseline levels and 5 would remain below 45 DNL. No substantive difference exists among the locations relative to subsonic noise in training airspace. Sonic booms would range from 3 to 130 per month, all supersonic activity offshore in over-water airspace. Low potential for impact; similar to Langley and Tyndall.
	No-Action Alternative	Sonic booms under baseline conditions would range from <1 to 37 per month. Supersonic flight is generally above 10,000 feet MSL in Warning Areas. No change in current operations; no change to noise baseline.	Sonic booms under baseline conditions would range from 1 to 86 per month. Supersonic flight is generally above 10,000 feet MSL in Warning Areas. No change in current operations; no change to noise baseline.

Table 2.4-1. Comparative Summary of Environmental Consequences (Page 2b)

Elmendorf AFB	Mountain Home AFB	Tyndall AFB
Fifteen F-15C bird aircraft strikes have occurred in the past 5 years. Existing ground safety procedures sufficient. No change in current operations; no increase in safety concerns.	Two bird-aircraft strikes per year. Existing ground safety procedures sufficient. No change in current operations; no increase in safety concerns.	Thirteen bird-aircraft strikes per year. Existing ground safety procedures sufficient. No change in current operations; no increase in safety concerns.
Total sortie-operations would increase by 4 per day in 3 of the MOAs. Concerns exist regarding civil aviation, using visual flight rules, that commonly transit the MOAs in Alaska and represent an important transportation mode. Airspace structure would require no change with F-22 beddown. No substantive differences among alternative locations.	Total sortie-operations in training airspace would increase on average by 5 to 12 per day depending on the MOA. No changes to airspace structure; no anticipated conflicts with civil or commercial aviation. No substantive differences among alternative locations.	Average daily sortie-operations would increase by 1 to 22 in the airspace units. Potential for increased use of available airspace. No changes to airspace structure; no anticipated conflicts with civil or commercial aviation. The increase is greater than other bases but would not have a substantive impact on airspace use.
No impediments to civil and commercial aviation. No change in current operations; no impacts to airspace management.	No impediments to civil and commercial aviation. No change in current operations; no impacts to airspace management.	No impediments to civil and commercial aviation. No change in current operations.
Subsonic noise levels in 7 primary airspace units would remain below 45 DNL. Noise levels in secondary MOAs would not change due to few additional F-22 sortie-operations. No substantive difference exists among the locations relative to subsonic noise in training airspace. Sonic booms would range from 5 to 42 per month, all over land. Moderate to high level of impacts, similar to Mountain Home.	Subsonic noise levels in 4 of 5 airspace units would not perceptibly change. Jarbidge MOA would increase by 1 dB. No substantive difference exists among the locations relative to subsonic noise in training airspace. Sonic booms would be 72 per month in the Owyhee and Jarbidge MOAs. Moderate to high level of impacts, similar to Elmendorf.	Subsonic noise levels would remain below 45 DNL in 4 of 8 primary airspace units. In another 3 units, noise levels would be 50 DNL but not change from baseline. One unit, W-470, would experience an increase of 1 dB (47 to 48 DNL). No substantive difference exists among the locations relative to subsonic noise in training airspace. Sonic booms would range from 5 to 130 per month. All supersonic activity offshore in over-water airspace. Low potential for impact; similar to Langley and Eglin.
Sonic booms under baseline conditions would range from 4 to 20 per month. Supersonic flight is generally above 10,000 feet MSL in MOAs and follows seasonal restrictions. No change in current operations; no change to noise baseline.	Sonic booms under baseline conditions are 17 per month. Supersonic flight is above 10,000 feet AGL in MOAs and follows seasonal restrictions. No change in current operations; no change to noise baseline.	Sonic booms under baseline conditions would range from 1 to 86 per month. Supersonic flight is generally above 10,000 feet MSL in Warning Areas. No change in current operations; no change to noise baseline.

Table 2.4-1. Comparative Summary of Environmental Consequences (Page 3a)

		Langley AFB	Eglin AFB
AIRSPACE	Air Quality 3.3.2	Emissions at base and in airspace minimal. No substantive difference exists among the bases or training airspace units.	Emissions in airspace minimal. No substantive difference exists among the alternative locations.
	No-Action Alternative	No change in current operations; no increase in air emissions.	No change in current operations; no increase in air emissions.
	Aircraft Safety 3.4.2	No substantive difference in safety exists among training airspaces for Langley, Eglin, and Tyndall; negligible potential for impacts.	No substantive difference in safety exists among the bases or training airspace for Langley, Eglin, and Tyndall; negligible potential for impacts.
	No-Action Alternative	No change in current operations; no increase in safety consequences.	No change in current operations; no increase in safety consequences.
	Natural Resources		
BASE	Soils and Water 3.5.1 3.5.2	Disturbance to 16 acres with slight potential for sedimentation. Most of base is within 100-year floodplain. No practical alternative to development in floodplain. Negligible consequences.	Disturbance to 10 acres with slight potential for sedimentation. Area above 100-year floodplain. Similar negligible consequences as Langley.
	No-Action Alternative	No change in current operations; no increase in water consumption or soil erosion and sedimentation.	No change in current operations; no increase in water consumption or soil erosion and sedimentation.
	Terrestrial Communities 3.6.1	Construction impacts would occur on a small area of developed land exhibiting low biodiversity. Individual and population effects to native plants and animals are anticipated to be negligible.	Construction on small area of developed or disturbed land. Similar negligible terrestrial community effects as Langley.
	No-Action Alternative	No change in current operations; no impacts to terrestrial communities.	No change in current operations; no impacts to terrestrial communities.

Table 2.4-1. Comparative Summary of Environmental Consequences (Page 3b)		
Elmendorf AFB	**Mountain Home AFB**	**Tyndall AFB**
Emissions in airspace minimal. No substantive difference exists among the alternative locations.	Emissions in airspace minimal. No substantive difference exists among the alternative locations.	Emissions in airspace minimal. No substantive difference exists among the alternative locations.
No change in current operations; no increase in air emissions.	No change in current operations; no increase in air emissions.	No change in current operations; no increase in air emissions.
No difference at the base; flare use over land requires restrictions to avoid fire risk; other safety factors same as other bases; low potential for impacts, similar to Mountain Home.	No difference at the base; flare use over land requires restrictions to avoid fire risk; other safety factors same as other bases; low potential for impacts, similar to Elmendorf.	No substantive difference in safety exists among the bases or in training airspace for Langley, Eglin, and Tyndall; negligible potential for impacts.
No change in current operations; no increase in safety consequences.	No change in current operations; no increase in safety consequences.	No change in current operations; no increase in safety consequences.
Disturbance to 46 acres with slight potential for sedimentation. Not in 100-year floodplain. Approximately the same negligible consequences as Langley.	Disturbance to 440 acres with slight potential sedimentation in two ephemeral streams and two drainage ditches. Relocation of sewage lagoons required. High erosion potential. No floodplain impacts. Affects greatest area of all alternatives.	Direct disturbance to 73 acres. Much of area within 100-year floodplain. Somewhat lower potential for consequences than Mountain Home.
No change in current operations; no increase in water consumption or soil erosion and sedimentation.	No change in current operations; no increase in water consumption or soil erosion and sedimentation.	No change in current operations; no increase in water consumption or soil erosion and sedimentation.
Construction on a larger, more diverse area than Langley and Eglin. Local wildlife displaced but impacts to populations expected to be negligible.	Biodiversity of the proposed construction area is low; however, the area of disturbance is an order of magnitude greater than Langley and represents the largest disturbance area of any alternative. Consequences somewhat greater than Eglin but less than Tyndall.	Construction at Tyndall would impact less area than Mountain Home. However, natural biological diversity is intrinsically higher in the Florida panhandle than southwest Idaho.
No change in current operations; no impacts to terrestrial communities.	No change in current operations; no impacts to terrestrial communities.	No change in current operations; no impacts to terrestrial communities.

Table 2.4-1. Comparative Summary of Environmental Consequences (Page 4a)

		Langley AFB	Eglin AFB
BASE	Wetland/Freshwater Aquatic Communities 3.7.1	No direct impacts to wetlands or other Waters of the U.S. would occur. No Section 404 permit expected to be required. Lowest potential for impacts.	No direct impacts to wetlands or other Waters of the U.S. would occur. No Section 404 permit expected to be required. Similar to Langley.
	No-Action Alternative	Base has 652 acres of wetlands. No change in current operations; no impacts to wetlands or aquatic communities.	Base has 49,700 acres of wetlands. No change in current operations; no impacts to wetlands or aquatic communities.
	Special Status Species/Communities 3.8.1	No special status species or critical habitats would be impacted by construction on base. Lowest potential for consequences.	One species, least tern, unlikely to be affected by ongoing or future base noise. Approximately the same as Elmendorf and Mountain Home.
	No-Action Alternative	Ten special status species occur or have the potential to occur. One federally listed threatened species (bald eagle) occurs. No change in current operations; no impacts to special status species or communities.	On this base with the largest land area among locations, there are 77 special status species and 14 federally listed species. No change in current operations; no impacts to special status species or communities.

Table 2.4-1. Comparative Summary of Environmental Consequences (Page 4b)		
Elmendorf AFB	**Mountain Home AFB**	**Tyndall AFB**
No direct impacts to wetlands or other Waters of the U.S. would occur. No Section 404 permit expected to be required. Similar to Langley AFB.	No direct impacts to wetlands or other Waters of the U.S. are anticipated based on existing information; however, a jurisdictional delineation of the proposed construction area has not been performed. Potential consequences slightly greater than Langley.	Impacts to 26 acres of potential wetlands. The potential for impacting wetlands at Tyndall is substantially greater than Langley. A Section 404 permit may be required; wetland mitigation may be necessary.
Base has 1,534 acres of wetlands. No change in current operations; no impacts to wetlands or aquatic communities.	Base has 33 potential wetland areas, two are potentially jurisdictional. No change in current operations; no impacts to wetlands or aquatic communities.	Base has 11,284 acres of wetlands. No change in current operations; no impacts to wetlands or aquatic communities.
No federal T&E species; 6 state species of concern potentially in construction zone. No critical habitat. The Cook Inlet population of beluga whale (which is protected by MMPA) occurs in Knik Arm and may be found along margins of the base. Approximately the same as Eglin AFB.	No T&E species or critical habitat affected. Burrowing owl habitat and foraging area in construction zone. Slightly greater potential for consequences than Langley, similar to Eglin.	Seven state listed, 5 special status species, and the threatened flatwoods salamander potentially occur in construction zone. Greatest potential for consequences.
Seven special status species. No change in current operations; no impacts to special status species or critical habitat.	Twenty-seven special status species have the potential to occur in the county. One federally listed threatened species and one candidate species potentially occur on base. No change in current operations; no impacts to special status species or communities.	Thirty-five special status species. Nine federally listed species. No change in current operations; no impacts to special status species or communities.

Table 2.4-1. Comparative Summary of Environmental Consequences (Page 5a)

		Langley AFB	Eglin AFB
AIRSPACE	Terrestrial Communities, Wetlands, and Special Status Terrestrial Species 3.6.2 3.7.2	Approximately 20% of overland airspace includes wetland and/or sensitive habitats with 14 T&E species. Twenty-five state listed or special status species are primarily terrestrial. No perceptible increase in noise level from subsonic activity. No supersonic overland flights. Negligible impacts to wildlife, including sensitive species.	Approximately 20% of overland airspace overlies wetlands and/or sensitive habitats with 10 T&E species and 23 state listed or special status species. Part of airspace includes the highly biologically diverse Apalachicola River and Apalachicola National Forest. No perceptible increase in subsonic noise levels in this area and negligible impacts to wildlife including sensitive species. No supersonic flights in overland airspace units. Slightly greater than Langley due to sensitive habitats overflown.
	No-Action Alternative	No change in current operations; no change to terrestrial communities, wetlands, or special status terrestrial species.	No change in current operations; no change to terrestrial communities, wetlands, or special status terrestrial species.
	Marine Communities and Special Status Marine Species 3.8.2 3.9.2	Most air-to-air training and all supersonic activity over offshore Warning Areas with 12 marine T&E, and 4 state listed or special status species. Includes 100-square miles of right whale critical habitat calving area. 119,730 square miles of marine mammal and sea turtle pelagic habitat under airspace. No subsonic impacts to MMPA species and little supersonic impacts. Little potential for impacts to sensitive marine species. Lowest level of potential consequences when marine communities are overflown.	Offshore training areas contain 14 marine T&E and 22 state listed or special status species. 29,000 square miles of marine mammal and sea turtle habitat nearby. Area includes frequent sperm whale occurrence. No critical habitat directly affected. One state listed species possibly minimally affected. No significant impacts anticipated (to MMPA species) due to emphasis on higher altitude training. Slightly greater consequences than Langley due to number of protected species.

Table 2.4-1. Comparative Summary of Environmental Consequences (Page 5b)		
Elmendorf AFB	**Mountain Home AFB**	**Tyndall AFB**
Approximately 20% of airspace includes wetlands and/or tundra. No changes to wetlands or tundra communities expected. One special status species occurs under training airspace. Denali National Preserve and 5 other special use areas including extensive waterfowl areas, and caribou and moose calving areas, winter range, and migratory corridors. No perceptible increase in subsonic noise levels expected; negligible impacts to wildlife. Increase of 1 to 28 sonic booms per month is not expected to have an adverse long-term effect on wildlife. Slightly greater impacts than Eglin.	Approximately 30% of airspace includes wetlands and/or sensitive areas with 8 T&E, 2 candidate, and 19 special status species. Canyonlands under airspace support important shrubsteppe habitat and special use status natural resource areas. California bighorn sheep and sage grouse occur under airspace. Minimal to no perceptible increase in subsonic noise levels expected. Increase of 55 sonic booms per month has a higher potential for noise consequences than Elmendorf.	Approximately 20% of overland airspace includes wetlands and/or sensitive habitats with 10 T&E species and 23 state listed or special status species. Aircraft use existing training areas near barrier islands with proposed critical habitat for the piping plover, 5 federally listed species, 4 state only listed species, and 11 other sensitive species. Part of airspace includes the highly biologically diverse Apalachicola River and Apalachicola National Forest. No perceptible increase in subsonic noise levels over the barrier islands expected. No supersonic flights in overland airspace units. Approximately the same consequences as Eglin AFB.
No change in current operations; no change to terrestrial communities, wetlands, or special status terrestrial species.	No change in current operations; no change to terrestrial communities, wetlands, or special status terrestrial species.	No change in current operations; no change to terrestrial communities, wetlands, or special status terrestrial species.
No impact; no marine communities under airspace.	No impact; no marine communities under airspace.	Offshore training areas contain 14 marine T&E and 22 state listed or special status species. 29,000 square miles of marine mammal and sea turtle habitat nearby. Area includes frequent sperm whale occurrence. No critical habitat directly affected. One state listed species possibly minimally affected. F-22 operations would be additive to airspace already used by Eglin F-15Cs. Potential for some marine impacts due to increased use; however, altitude should keep consequences from being significant. Slightly greater potential for consequences than Eglin.

Table 2.4-1. Comparative Summary of Environmental Consequences (Page 6a)

		Langley AFB	Eglin AFB
AIRSPACE	No-Action Alternative	Twelve federally-listed species could occur under the marine airspace. No change in current operations; no impacts to marine communities, and special status marine species.	Fourteen federally-listed species could occur under marine airspace. No change in current operations; no impacts to marine communities, and special status marine species.
	Cultural, Traditional, and Visual Resources		
BASE	Visual Resources (No Airspace) 3.10.1	Greatest potential for impacts to visual resources due to historic building demolition and renovation.	Visual impacts from building construction are unlikely. Less likelihood of impacts compared to Langley and Elmendorf. Similar to Tyndall and Mountain Home.
	No-Action Alternative	Base is a combination of historic structures associated with NASA, industrial areas typical of a base, and open coastal areas and wooded areas. No change in current operations; no impacts to visual resources.	Base is located on the Gulf of Mexico and includes large forested areas and wetlands and coastal areas. No change in current operations; no impacts to visual resources.
	Archaeological Resources 3.11.1	Little likelihood of impacts - low probability area for intact archaeological resources.	Unlikely to contain intact cultural deposits; similar to Langley.
	No-Action Alternative	Thirteen archaeological sites have been identified within the base. No change in current operations; no impacts to archaeological resources.	Over 900 archaeological sites have been recorded on base. No change in current operations; no impacts to archaeological resources.
	Architectural Resources 3.11.1	Greatest potential for impacts to architectural resources due to demolition and construction within historic district.	Potential for impacts to NRHP-eligible buildings. Fewer impacts compared to Langley; comparable to Elmendorf.
	No-Action Alternative	Five properties are listed on the NRHP. Surveys have identified several potential historic districts. No change in current operations; no impacts to architectural resources.	Six sites are listed on the NRHP. No change in current operations; no impacts to architectural resources.

Table 2.4-1. Comparative Summary of Environmental Consequences (Page 6b)		
Elmendorf AFB	**Mountain Home AFB**	**Tyndall AFB**
No impacts; no marine communities under airspace.	No impacts; no marine communities under airspace.	Fourteen federally-listed species could occur under marine airspace. No change in current operations; no impacts to marine communities, and special status marine species.
Somewhat greater potential for impacts to buildings (due to construction in a historic district) than Tyndall or Mountain Home. Somewhat less potential than Langley.	Very low likelihood of impacts. No historic district and few historic buildings on base. Similar to Eglin and Tyndall.	Less likelihood of impacts compared to Langley and Elmendorf. Similar to Eglin and Mountain Home.
Large base with many forested and coastal areas. No change in current operations; no impacts to visual resources.	Base is located in the relatively flat Basin and Range province. No change in current operations; no impacts to visual resources.	Base is located on the Gulf of Mexico. Views of the base are limited and consist of large areas of wetlands. No change in current operations; no impacts to visual resources.
Low to moderate probability for historic archaeological resources. Slightly greater potential than Eglin and Tyndall.	Archaeological survey is complete. No NRHP-eligible resources on base; no impacts. Lowest potential for impacts.	Little likelihood of impacts - low probability area for intact archaeological resources. Similar to Langley.
Nine archaeological sites have been recorded on base. No NRHP-listed sites. No change in current operations; no impacts to archaeological resources.	Five historic archaeological sites recorded on base; none are considered eligible for listing on the NRHP. No change in current operations; no impacts to archaeological resources.	Ninety-five recorded archaeological sites on base. No NRHP-listed archaeological sites. No change in current operations; no impacts to archaeological resources.
Potential for impacts to a NRHP-eligible building in a historic district. Fewer impacts than Langley; comparable to Eglin.	No historic district on base. Possibly impacts to an NRHP-eligible building. Low likelihood of impacts. Comparable to Tyndall.	No potentially historic buildings expected to be affected. Low likelihood of impacts. Comparable to Mountain Home.
More than 50 buildings are considered eligible for the NRHP; three historic districts are considered eligible. No change in current operations; no impacts to architectural resources.	No NRHP-listed resources. Six are potentially eligible. No change in current operations; no impacts to architectural resources.	No NRHP-listed resources. Nineteen are potentially eligible. No change in current operations; no impacts to architectural resources.

Table 2.4-1. Comparative Summary of Environmental Consequences (Page 7a)			
		Langley AFB	**Eglin AFB**
	Cultural and Traditional Resources 3.11.2	Least likelihood of impacts to traditional resources; no impacts to cultural resources.	Little likelihood of impacts to traditional or cultural resources. No traditional resources have been identified under the airspace units. Comparable to Tyndall AFB.
	No-Action Alternative	No change in current operations; no impacts to cultural or traditional resources.	No change in current operations; no impacts to cultural or traditional resources.
	Human Resources		
BASE	Land Use 3.12.1	No consequences due to on-base construction. Change in off-base noise levels includes decrease of approximately 88 residential acres exposed to 65 DNL or greater. Some areas under 65 DNL or greater experience increased noise levels. One additional sensitive receptor occurs; two other sensitive receptors experience higher noise levels. Low potential for consequences, but slightly greater potential than Mountain Home and Elmendorf.	No consequences due to on-base construction. One additional sensitive receptor would occur. Greatest potential for increased off-base residential areas exposed to 65 DNL or greater including 123 acres of residential use.
	No-Action Alternative	Surrounding area includes commercial, residential, and industrial uses. Seven sensitive receptors occur. No change in current operations.	Surrounding area includes commercial, residential, agricultural, and industrial uses. Two sensitive receptors occur. No change in current operations.

Table 2.4-1. Comparative Summary of Environmental Consequences (Page 7b)		
Elmendorf AFB	**Mountain Home AFB**	**Tyndall AFB**
Little likelihood of impacts to historic properties or visual resources. Likelihood of impacts to traditional cultural resources under airspace may be slightly less than Mountain Home (refer to sections EL3.6 and EL3.14).	Little likelihood of impacts to historic properties or visual resources. Potentially greatest impacts to traditional cultural resources.	Little likelihood of impacts to traditional or cultural resources. No traditional resource have been identified under the airspace units. Comparable to Eglin AFB.
No change in current operations; consultation continues to avoid seasonal overflights of sensitive areas.	No change in current operations; seasonal overflight restrictions for sensitive areas.	No change in current operations; no impacts to cultural or traditional resources.
No adverse impacts to land use on-base or in base environs. No residential use within areas affected by noise. No sensitive receptors occur. Less potential for impacts than Langley.	No adverse impacts to land use on base or in base environs. Within areas affected by noise uses are rangeland with scattered residences. No sensitive receptors occur. Greater potential for impact than Elmendorf.	No adverse impacts to on-base land use. Approximately 23 acres of medium-density residential land affected by higher noise levels. No sensitive receptors occur. Greater potential for impacts than Elmendorf or Mountain Home but less than Eglin.
No change in current operations; no impacts to land use.	Surrounding primarily agricultural use. No change in current operations; no impacts to land use.	Surrounding area includes commercial, residential, agricultural, and industrial uses. No change in current operations; no impacts to land use.

Table 2.4-1. Comparative Summary of Environmental Consequences (Page 8a)

		Langley AFB	Eglin AFB
BASE	Socioeconomics (No Airspace) 3.13.1	During construction, 1,025 new jobs and $30 million of earnings in peak year. Operations employment would decrease by 358 direct and secondary jobs and earnings by $12 million. Population would decrease by 568 persons during operations. Decreased demand for 206 housing units may increase vacancies slightly. Langley AFB is the only alternative that would experience a decrease in operations employment and earnings and the only base with a reduction in project-related population and housing demand.	During construction, 772 new jobs and $21 million of earnings in peak year. Operations employment would increase by 325 direct and secondary jobs and earnings by $10 million. Population would increase by 503 persons during operations. Increased demand for 187 housing units may decrease vacancies slightly. Eglin AFB would create the smallest increase in operations employment and earnings and no substantive impacts. Eglin would be somewhat greater than Langley but have the smallest increase in population growth and the smallest decrease in housing vacancies of the alternatives.
	No-Action Alternative	10,690 total baseline personnel. Langley AFB created approximately 5,750 secondary jobs. No change in current operations; no impacts to socioeconomics.	15,320 total baseline personnel. Eglin AFB created approximately 10,250 secondary jobs. No change in current operations; no impacts to socioeconomics.
	Environmental Justice 3.14.1	No disproportionate noise impacts to minority or low-income populations or children. No additional schools exposed to 65 DNL or greater.	Greatest potential for increased noise. No disproportionate noise impacts on minority populations. One additional school exposed to 65 DNL or greater. Slight but not substantial disproportionate impact on children or low-income populations.
	No-Action Alternative	38.9% of region is minority; 12.3% is low-income. Three schools exposed to 65 DNL or greater. No change in current operations; no impacts to environmental justice.	14.8% of region is minority; 10.3% is low-income. Two schools exposed to 65 DNL or greater. No change in current operations; no impacts to environmental justice.

Table 2.4-1. Comparative Summary of Environmental Consequences (Page 8b)

Elmendorf AFB	Mountain Home AFB	Tyndall AFB
During construction, 3,273 new jobs and $124 million of earnings in peak year. Operations employment would increase by 390 direct and secondary jobs and earnings by $13 million. Population would increase by 658 persons during operations. Increased demand for 240 housing units may decrease vacancies slightly. Greater increase in operations employment and earnings than Eglin, but less than Mountain Home and Tyndall. Population growth and resulting housing demand created by this alternative is not expected to significantly impact the housing market.	During construction, 6,821 new jobs and $177 million of earnings in peak year. Operations employment would increase by 1,560 direct and secondary jobs and earnings by $57 million. Population would increase by 2,761 persons during operations. Increased demand for 278 off-base housing units. Proposed on-base housing units would offset a large portion of the project-related housing demand. Mountain Home would have a greater increase in operations employment and earnings than either Eglin or Elmendorf. The population growth and housing demand would be concentrated in the city of Mountain Home which could experience growth pressures.	During construction, 4,737 new jobs and $134 million of earnings in peak year. Operations employment would increase by 2,392 direct and secondary jobs and earnings by $80 million. Population would increase by 4,208 persons during operations. Increased demand for 1,363 off-base housing units. Proposed new dorms would offset a portion of the project-related housing demand. Tyndall would have the greatest increase in operations employment and earnings. Population growth and resulting housing demand created by this alternative would be greater than each of the other alternatives. Smaller communities such as Callaway, Parker, and Springfield, located close to the base, could experience notable growth pressures.
8,690 total baseline personnel. Elmendorf AFB created approximately 3,232 secondary jobs. No change in current operations; no impacts to socioeconomics.	5,000 total baseline personnel. Mountain Home AFB created approximately 1,571 secondary jobs. No change in current operations; no impacts to socioeconomics.	5,640 total baseline personnel. Tyndall AFB created approximately 2,250 secondary jobs. No change in current operations; no impacts to socioeconomics.
No disproportionate noise impacts on minority or low-income populations or children. Similar to Langley.	No disproportionate noise impacts on minority or low-income populations or children. Similar to Langley.	Increased noise impacts, but less than Eglin. No disproportionate noise impacts on minority or low-income populations or children.
21.3% of region is minority; 7.1% is low-income. No schools exposed to 65 DNL or greater. No change in current operations; no impacts to environmental justice.	13.8% of region is minority; 12.7% is low-income. No schools exposed to 65 DNL or greater. No change in current operations; no impacts to environmental justice.	14.9% are minority and 14.4% are low-income. No schools exposed to 65 DNL or greater. No change in current operations; no impacts to environmental justice.

Table 2.4-1. Comparative Summary of Environmental Consequences (Page 9a)

		Langley AFB	Eglin AFB
AIRSPACE	Land Use 3.12.2	No consequences to overland MOA.	Similar to Langley with no adverse impacts within airspace units or training areas.
	No-Action Alternative	No change in current operations; no impacts to land use.	No change in current operations; no impacts to land use.
	Environmental Justice 3.14.2	No disproportionate impacts on minority populations, low-income populations, or children from airspace noise. Very low potential for environmental justice consequences.	No disproportionate impacts on minority populations, low-income populations, or children from airspace noise. Very low potential for environmental justice consequences. Similar to Langley.
	No-Action Alternative	No change in current operations; no impacts to environmental justice.	No change in current operations; no impacts to environmental justice.
	Community and Infrastructure (No Airspace)		
	Public Services 3.15.1	Only installation where beddown results in a decrease in utility demand. Only installation where beddown reduces public school system students by 150 students.	Of the alternative bases that would experience a population increase, Eglin's impact on utilities is the smallest. Increase of 121 students, lower than other alternatives. Somewhat greater potential for consequences than Langley.

Table 2.4-1. Comparative Summary of Environmental Consequences (Page 9b)		
Elmendorf AFB	**Mountain Home AFB**	**Tyndall AFB**
Supersonic activity would increase noticeably. Alaska Native groups have expressed concern that supersonic noise would impact traditional land uses. Fewer consequences than Mountain Home.	Special use areas under airspace could be impacted by increased sonic booms. Native American concerns about effects on traditional land uses. Greatest potential for consequences.	Within airspace units similar to Langley and Eglin, there are no adverse impacts to special use areas or water areas under airspace.
No change in current operations; Alaska Natives expressed concern about existing impacts to land use.	No change in current operations; Native Americans expressed concern about existing impacts to land use.	No change in current operations; no impacts to land use.
Continued exposure of Alaska Native populations to both subsonic and supersonic noise. Supersonic noise impacts would increase. Less consequences than Mountain Home.	Continued concerns by Native Americans and others about airspace sonic booms. Airspace restrictions somewhat reduce potential for impacts on Native Americans. Greatest potential for consequences.	No disproportionate impacts on minority populations, low-income populations, or children from airspace noise. Very low potential for environmental justice consequences. Similar to Langley.
No change in current operations.	No change in current operations.	No change in current operations; no impacts to environmental justice.
Both on-base and municipal utilities have sufficient capacity to accommodate the population increase of 658. Given the size of Anchorage, impacts to utilities, including wastewater treatment and landfill capacity, are insignificant. On-base electrical power constraints may be a concern for construction and F-22 beddown. Increase of 161 students not expected to adversely impact school system. Approximately the same as Eglin.	Though the base and community of Mountain Home have the utility capacity to accommodate 2,761 persons, the relative demand would be greater at Mountain Home than at other bases given the relatively small size of the community. Long-term water demand would require new wells. School overcrowding could occur as a result of the beddown. The city of Mountain Home is much smaller than the surrounding communities associated with the other base locations. Mountain Home is less able to absorb the increase of 686 students. Greatest potential for impacts.	The base and community are projected to have the capacity to accommodate the increased population. On-base electrical power supply is currently insufficient for F-22 operation and would require upgrading. Overall, utility demand would be less than Mountain Home but larger than other bases. School overcrowding likely in specific schools due to increase of 1,063 students. Increase represents 68% of projected growth by 2008. Potential for school overcrowding could be accommodated by planned school district growth. Potential impacts generally similar, but less than, Mountain Home.

Table 2.4-1. Comparative Summary of Environmental Consequences (Page 10a)

		Langley AFB	Eglin AFB
BASE	No-Action Alternative	Potable water resources, wastewater treatment services, electric power, schools are adequate. No change in current operations; no impacts to public services.	Potable water resources, wastewater treatment services, electric power, schools are adequate. No change in current operations; no impacts to public services.
	Transportation 3.16.1	Decrease of 243 peak hour vehicle trips. Approximately a 2.7% decrease in travel demand. No effect on congestion. Only installation where beddown results in a decrease in traffic volume.	Increase of 218 peak hour vehicle trips. Approximately 1.4% increase in travel demand. Little effect on congestion at unsignaled ACC gate. Large installation with greatest flexibility in traffic routing to different gates. Somewhat greater than Langley.
	No-Action Alternative	No change in current operations; no impacts to transportation.	There are several planned transportation improvements. No impacts to transportation.
	Hazardous Materials and Waste 3.17.1	Generates the smallest increase (less than 10%) in hazardous waste as compared to other bases.	Increase in hazardous waste of 30% over baseline. Greater than Langley but lower than other alternative bases in hazardous waste generation. No change to permits or management.
	No-Action Alternative	Base is a large-quantity hazardous waste generator. No change in current operations; no impacts to hazardous materials and waste.	Base is a large-quantity hazardous waste generator. No change in current operations; no impacts to hazardous materials and waste.

Table 2.4-1. Comparative Summary of Environmental Consequences (Page 10b)		
Elmendorf AFB	**Mountain Home AFB**	**Tyndall AFB**
Potable water resources, wastewater treatment services, schools are adequate. Base power plant is near capacity and may require upgrade. No change in current operations; no impacts to public services.	Potable water resources, wastewater treatment services, electric power, schools are adequate. No change in current operations; no impacts to public services.	Potable water resources, wastewater treatment services, electric power, schools are adequate. No change in current operations; no impacts to public services.
Increase of 286 peak hour vehicle trips. Approximately 6.3% increase in traffic. Minimal impact on base traffic flow. Approximately the same as Mountain Home.	Increase of 220 peak hour vehicle trips. Approximately 9.2% increase in off-base travel demand. Intersection capacity would continue to be problematic in the city of Mountain Home. Higher potential for consequences than Eglin.	Potential increase of 1,500 peak hour vehicle trips and one-third increase in base worker travel demand. Potential significant impact on already "deficient" Florida DOT roadway. Largest increase in induced traffic volumes of all the basing locations, with potential to degrade traffic flow at some intersections. Greatest potential for consequences.
No change in current operations; however, measures have been identified to reduce congestion and increase traffic flow.	Intersection improvements are planned at several locations; no impacts to transportation.	There are several planned transportation improvements.
Increase in hazardous waste of 40% over baseline, which is a moderate increase in hazardous waste generation. No change to permits or management. Similar to Eglin.	Increase of 50% in hazardous waste generation. No change to permits or management. Potentially greater environmental consequences than other bases except Tyndall due to volume of materials from runway construction.	Tyndall would have a 100% increase in hazardous waste over baseline. No change to permits or management. Greatest potential for consequences.
Base is a large-quantity hazardous waste generator. No change in current operations; no impacts to hazardous materials and waste.	Base is a large-quantity hazardous waste generator. No change in current operations; no impacts to hazardous materials and waste.	Base is a large-quantity hazardous waste generator. No change in current operations; no impacts to hazardous materials and waste.

2.4.4 Environmental Comparison

This section builds upon the information in section 2.4.3 and the base-specific analyses in Chapter 3 to produce a summary table. This summary in Table 2.4-2 presents a simplified, color-coded depiction of the relative environmental consequences associated with implementing the beddown proposal at Langley AFB or one of the four basing alternatives.

This Draft EIS evaluates the environmental consequences of the Air Force proposal to beddown the Initial F-22 Operational Wing, comprised of three squadrons of 24 aircraft each, at Langley AFB in comparison with the alternative locations and the no-action alternative. Any comparisons made among the proposed action and the alternatives are to assist the decisionmaker with respect to this action. Any future weapon system beddown decision will consider the future action in comparison to whatever other reasonable action alternatives may be appropriate at that time.

The comparison of the environmental considerations in Table 2.4-2 uses a gradated color scale, with green as the least potential for environmental consequences and yellow as the greatest potential for environmental consequences resulting from the initial beddown of three operational squadrons of F-22s.

Table 2.4-2. The Initial F-22 Operational Wing Beddown Summary of Environmental Comparison[1]

		Langley AFB	*Eglin AFB*	*Elmendorf AFB*	*Mountain Home AFB*	*Tyndall AFB*
Aircraft Operations	Base	🟢	🔵	🟢	🔵	🔵
	Airspace	🟢	🟢	🟡	🟡	🟢
Natural Resources	Base	🟢	🟢	🔵	🔵	🟡
	Airspace	🟢	🔵	🔵	🟡	🔵
Cultural and Traditional Resources	Base	🟡	🔵	🔵	🟢	🟢
	Airspace	🟢	🟢	🔵	🟡	🟢
Human Resources	Base	🔵	🔵	🟢	🔵	🔵
	Airspace	🟢	🟢	🟡	🟡	🟢
Community and Infrastructure	Base	🟢	🟢	🟢	🟡	🔵
	Airspace	NA	NA	NA	NA	NA

Least impact 🟢 → 🔵 → 🟡 Most impact

Note: 1. Refer to Table 2.4-1 for an explanation of the no-action alternative/environmental consequences. The Initial Operational Wing is comprised of three squadrons (72 PAI).