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*Final*

**Environmental Assessment  
Supplement for  
C-17 Assault Landing Zone  
Articulated Concrete Block  
Shoulders  
Travis Air Force Base,  
Fairfield, California**

Contract No. GS-10F-0132K/SIN899-1

RFQ 620681

**The Air Force Center for Engineering and the Environment  
Travis Air Force Base, California**

March 2012

# Report Documentation Page

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**Final Finding of No Significant Impact (FONSI)**  
**Environmental Assessment Supplement for C-17 Southwest Landing Zone**  
**Articulated Concrete Block Shoulders**

**Travis Air Force Base, Fairfield, California**

**Introduction**

This Finding of No Significant Impact (FONSI) was prepared in accordance with the National Environmental Policy Act of 1969 (NEPA); the President's Council on Environmental Quality (CEQ) regulations for implementing the procedural provisions of NEPA, Title 40 Code of Federal Regulations (CFR) 1500–1508; and the *Environmental Impact Analysis Process*, 32 CFR 989. The decision in this FONSI is based on information contained in the *Environmental Assessment Supplement C-17 Southwest Landing Zone (LZ) Articulated Concrete Block (ACB) Shoulders at Travis Air Force Base (EA)*.

The EA Supplement is a modification to the *Permanent Western United States C-17 Landing Zone Draft Environmental Assessment (C-17 LZ EA)*. The EA Supplement was prepared because of a change in the Proposed Action Alternative project description in the C-17 LZ EA which is to construct ACB shoulders in place of soil shoulders adjacent to the runway shoulder. The EA Supplement evaluates the potential impacts that could result from constructing ACB and analyzes the potential environmental consequences of the Proposed Action and No Action alternatives on the affected environment, as well as possible cumulative impacts from other reasonably foreseeable actions.

The scope of the EA Supplement was limited to evaluating the potential impacts that could result from constructing and operating ACB in place of soil shoulders. Resources with the potential to be affected by constructing and operating ACB shoulders and, therefore, were considered in the EA Supplement, included air quality, water resources, biological resources, transportation system, and safety and occupational health.

**Description of Proposed Action and Alternatives**

The Proposed Action consists of constructing ACB on the sloped shoulders of the north and south sides of the SLZ runway at Travis AFB. The ACB shoulders will consist of 12- by 16-inch concrete blocks that will be cabled together to form ACB mats. An ACB mat is an open frame system that will allow grass to grow within the voids of the blocks, maintaining an appearance consistent with typical C-17 landing zones as an aid to training.

The ACB shoulders will be constructed in two phases. Phase 1 – North will consist of constructing ACB mats in two segments. The northwest segment will be approximately 35 feet wide by 1,800 feet long, and the northeast segment will be approximately 35 feet wide by 1,300 feet long, for a total of approximately 108,900 square feet of ACB (2.5 acres). The total area to be disturbed during construction for Phase 1 – North will be approximately 152,460 square feet (3.5 acres).

Phase 2 – South will also consist of constructing ACB mats in two segments. The southwest segment will be approximately 35 feet wide by 1,930 feet long, and the southeast segment will be approximately 35 feet wide by 1,430 feet long, for a total of approximately 117,550 square feet of ACB (2.7 acres). The total area to be disturbed during construction for Phase 2 – South will be approximately 165,530 square feet (3.8 acres).

The shoulders will be excavated and graded prior to installing ACB mats. Soil from grading activities will be used to fill the voids in the ACB, with any remaining soil being retained onsite.

The edge of the ACB shoulders to adjacent open areas will be graded and vegetated with a seed mix compatible with Base landscaping and maintenance requirements.

All alternatives considered for the action are analyzed in the EA. The No Action Alternative was analyzed in accordance with Air Force Regulation 32 CFR 989.8(d).

### **Decision**

After a review of the EA Supplement, the USAF has decided to proceed with construction of the Proposed Action. The potential impacts on the human and natural environment were evaluated relative to the existing environment. For each environmental resource or issue, anticipated direct and indirect effects were assessed, considering both short-term and long-term project effects.

Minor, short-term impacts expected from implementation of the Proposed Action are described in the EA Supplement. During construction the Proposed Action will result in less than significant impacts on air quality, water resources, transportation system, and safety and occupational health.

The U.S. Fish and Wildlife Service (USFWS) issued a Biological Opinion (BO) 81420-2008-F-1142-R001 for the Proposed Action on November 21, 2011. The BO found that the installation of ACB will also cause additional permanent effects to the California tiger salamander (CTS) not addressed in the original opinion and that the new construction activities proposed will adversely affect the CTS. The effects of the Proposed Action on CTS habitat include the direct effect of permanently removing an additional 2.7 acres of upland habitat located on the Phase 2 – South portion of the proposed action area. Potential impacts to CTS will be less than significant with implementation of conservation and minimization measures identified in the C-17 LZ EA. Therefore, with mitigation the Proposed Action will result in less than significant impacts on CTS. Mitigation measures required by the USFWS are listed in the C-17 LZ EA and the original BO.

Overall, the analysis for this EA Supplement indicates that the construction and operation of ACB shoulders will not result in or contribute to significant negative cumulative or indirect impacts to the resources in the region.

### **Mitigation**

The Air Force shall comply with conservation and minimization measures required in the original C-17 LZ BO 81420-2008-F-1142-R001 as well as protect an additional 8.1 acres of California Tiger Salamander upland habitat.

### **Finding of No Significant Impact**

In accordance with the CEQ regulations implementing NEPA and the Air Force Environmental Impact Analysis Process, the Air Force concludes that the Proposed Action will have no significant impact on the quality of the human environment and that the preparation of an environmental impact statement is not warranted.

After a public review period and consideration of the comments received, the Proposed Action will be implemented upon approval. In accordance with Air Force policy, a notice of availability (NOA) for the EA and FONSI was published in local newspapers and posted on Travis AFB's public website. The NOA provided a 30 day public comment period beginning 8 February 2012 and ending on 12 March 2012 for the documents made available to interested parties in local libraries, on Travis AFB's public website and through the state clearing house and direct mailings. No comments were received.

SIGNED:



For THE COMMANDER

DATE: 23 MAR 12

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**DWIGHT C. SONES, Colonel, USAF**  
**Commander, 60th Air Mobility Wing**

Attachment: *Environmental Assessment Supplement C-17 Southwest Landing Zone Articulated Concrete Block Shoulders at Travis Air Force Base*

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# Acronyms and Abbreviations

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60 AMW	60th Air Mobility Wing
ACB	articulated concrete block
AFB	Air Force Base
Air Force	U.S. Air Force
ALZ	Assault Landing Zone
AMC	Air Mobility Command
Base	Travis Air Force Base
BO	Biological Opinion
C-17 ALZ EA	<i>Environmental Assessment Permanent Western United States C-17 Landing Zone</i>
CAA	Clean Air Act
CFR	Code of Federal Regulations
CTS	California tiger salamander
DoD	Department of Defense
EA	environmental assessment
EIAP	Environmental Impact Analysis Process
FEMA	Federal Emergency Management Agency
FOD	foreign object debris
ft <sup>2</sup>	square feet
NEPA	National Environmental Policy Act
SIP	state implementation plan
USFWS	United States Fish and Wildlife Service

# Purpose of and Need for the Proposed Action

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## 1.1 Introduction and Background

This Environmental Assessment (EA) Supplement is a modification to the original *Permanent Western United States C-17 Landing Zone Environmental Assessment* (also known as C-17 ALZ EA) (Department of the Air Force, 2008a). The C-17 ALZ EA evaluated three alternatives, the Proposed Action Alternative, Southern California Logistics Airport Alternative, and the No Action Alternative. The Proposed Action Alternative evaluated impacts associated with constructing a 3,500-foot-long, 90-foot-wide C-17 assault landing zone (ALZ) on Travis Air Force Base (AFB or Base) (see Figure 1-1). Design of the ALZ included graded soil shoulders (adjacent to concrete shoulders) on both the north and south sides of the ALZ. A Finding of No Significant Impact/Finding of No Practicable Alternative was signed on September 19, 2008 (Department of the Air Force, 2008b). The C-17 ALZ is currently under construction at Travis AFB.

This EA Supplement has been prepared because of a change in the Proposed Action Alternative project description in the C-17 ALZ EA. Information regarding the instability of soil shoulders during C-17 operations at similar airfields has shown that jet engine blast could result in soil erosion and creation of foreign object debris (FOD). FOD could be pulled into C-17 engines and cause damage. Stabilizing soil shoulders at the ALZ on Travis AFB would be accomplished by installing permanent articulated concrete block (ACB) mats adjacent to the concrete shoulder of the ALZ. ACB mats would provide a hard surface to stabilize soil shoulders, would contain voids that could be planted with vegetation and would allow infiltration of water. The potential effects of ACB shoulders were not previously evaluated in the C-17 ALZ EA.

This EA Supplement evaluates the effects of constructing articulated concrete block (ACB) mats in place of soil shoulders on both the north and south sides of the ALZ (see Figure 1-2). Only resources not evaluated fully with respect to construction and operation of ACB shoulders are evaluated in detail in this EA Supplement.

Travis AFB, with the support of the Air Mobility Command (AMC) and the Air Force Center for Engineering and the Environment, has prepared this EA Supplement in accordance with National Environmental Policy Act (NEPA) implementing title 40 Code of Federal Regulations (CFR), Parts 1500 through 1508, Air Force Regulation 32 CFR 989, and Department of Defense (DoD) directives. This EA Supplement evaluates the potential environmental impacts that would result from implementing the Proposed Action.

## 1.2 Purpose and Need for the Proposed Action

Travis AFB proposes to construct ACB shoulders in place of soil shoulders on both the north and south sides of the ALZ runway at Travis AFB (see Figure 1-2). The purpose for constructing ACB shoulders is to decrease the potential for soil instability and erosion that

could result from C-17 jet engine blast. ACB shoulders are needed to stabilize the soil and contain loose debris that could cause foreign objects to be drawn into and potentially damage C-17 engines.

### **1.3 Objective of the Action**

The objective of the Proposed Action is to stabilize the ALZ runway shoulders to prevent soil erosion and instability that could generate FOD on the runway.

### **1.4 Scope of the Environmental Assessment**

The scope of this EA Supplement is limited to evaluating the potential impacts that could result from constructing and operating ACB in place of soil shoulders. This EA Supplement evaluates and analyzes the potential environmental consequences of the Proposed Action and No Action alternatives on the affected environment, as well as possible cumulative impacts from other reasonably foreseeable actions.

With the exception of the information provided in the following sections, the C-17 ALZ EA accurately represents the ALZ project's purpose and need, the analyses of the project's design alternatives, and the potential environmental impacts associated with each alternative.

Resources with the potential to be affected by constructing and operating ACB shoulders and, therefore, to be considered in this EA Supplement, include air quality, water resources, biological resources, transportation system, and safety and occupational health.

### **1.5 Decision(s) That Must Be Made**

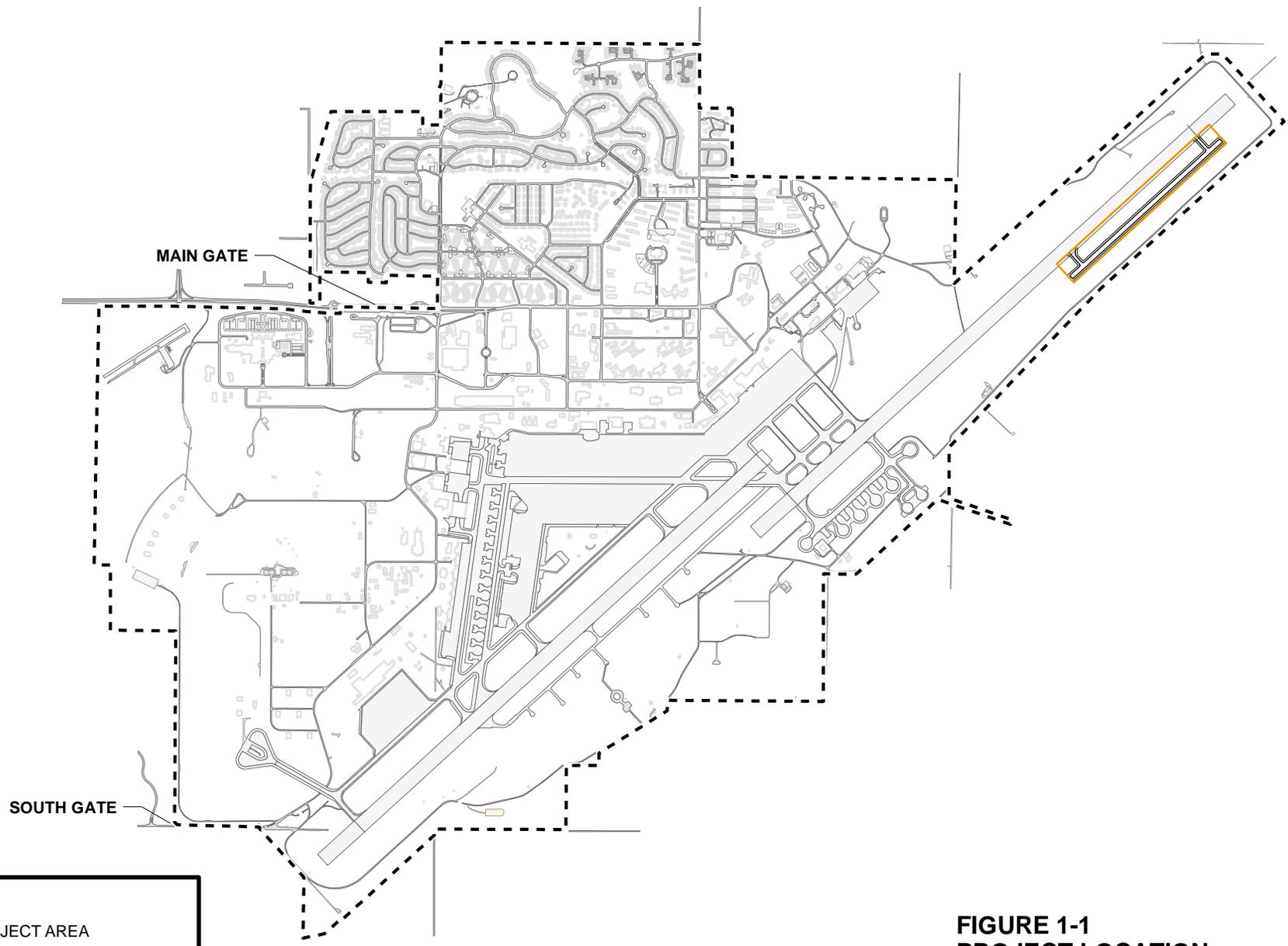
The Air Mobility Command is responsible for selecting an alternative to stabilize soil shoulders adjacent to the ALZ runway. A decision to take no action (Alternative 1) would result in no modification to the design of soil shoulders as presented in the C-17 ALZ EA. Jet engine blast from C-17 aircraft could cause soil erosion, potentially generating FOD on the runway. A decision to implement the Proposed Action (Alternative 2) would result in the construction of ACB on the shoulders of the ALZ runway, thereby taking action to prevent soil erosion and instability.

### **1.6 Summary of Key Environmental Compliance Requirements**

NEPA requires all federal agencies to use a systematic, interdisciplinary approach in decision making which may have an impact on human's environment. Therefore, NEPA directs agencies to assess expected environmental impacts of all federal actions and proposals. In turn, these data must be considered in the decision making process. Compliance with NEPA is accomplished through the guidance outlined in 32 Code of Federal Regulations (CFR) 989, Environmental Impact Analysis Process (EIAP).

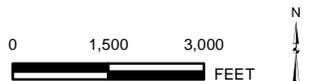
Other environmental regulatory requirements relevant to the Proposed Action but not addressed in the *C-17 ALZ EA* (Department of the Air Force, 2008a) will be identified as applicable in the following sections of this EA Supplement.

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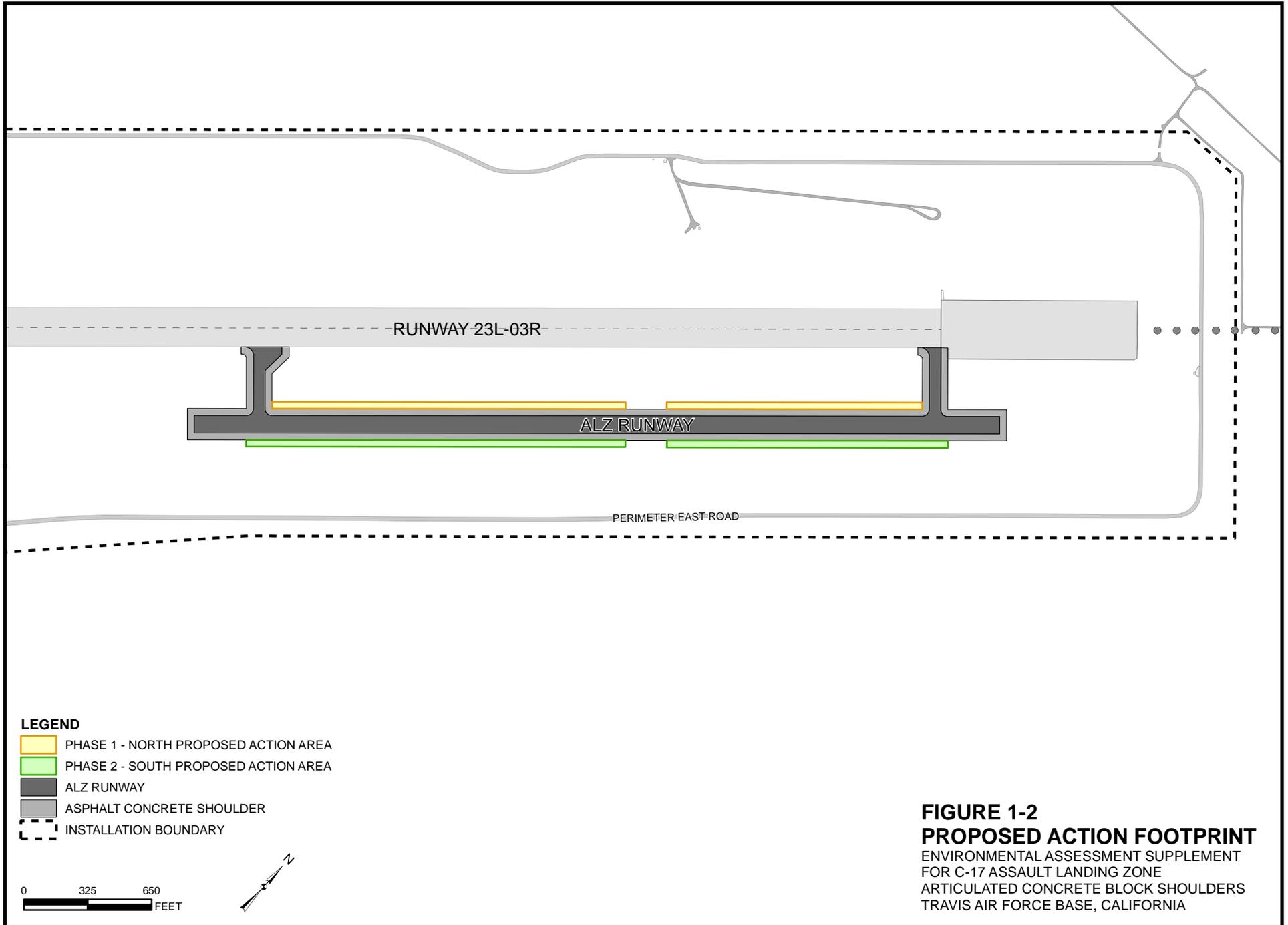
**LEGEND**

-  PROJECT AREA
-  INSTALLATION BOUNDARY



**FIGURE 1-1  
PROJECT LOCATION**

ENVIRONMENTAL ASSESSMENT SUPPLEMENT  
FOR C-17 ASSAULT LANDING ZONE  
ARTICULATED CONCRETE BLOCK SHOULDERS  
TRAVIS AIR FORCE BASE, CALIFORNIA



# Description of the Alternatives Including the Proposed Action

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## 2.1 Introduction

This section presents the criteria for selecting the alternatives and describes the alternatives to be carried forward for further analysis.

## 2.2 Selection Criteria for Alternatives

Reasonable alternatives for stabilizing the ALZ soil shoulders should accomplish the following in a cost-efficient and cost-effective manner, with minimal impact to human health and the environment:

- Prevent soil erosion and instability that could result from C-17 engine jet blast
- Maintaining an appearance consistent with typical C-17 landing zones as an aid to training
- Allow for a vegetated surface

## 2.3 Description of the Proposed Alternatives

### 2.3.1 Alternative 1 – No Action

A decision to take no action would result in no modification to the design of soil shoulders as presented in the C-17 ALZ EA.

### 2.3.2 Alternative 2 – Proposed Action

The Proposed Action consists of constructing ACB mats on the sloped shoulders of the north and south sides of the ALZ runway at Travis AFB (see Figure 1-2). The ACB shoulders would consist of 12- by 16-inch concrete blocks that would be cabled together to form ACB mats. An ACB mat is an open frame system that would allow grass to grow within the voids of the blocks, maintaining an appearance consistent with typical C-17 landing zones as an aid to training. The ACB mats would form a uniform surface that could be driven on by mowers for maintenance of the grass surface.

The ACB shoulders would be constructed in two phases. Phase 1 – North would consist of constructing ACB mats in two segments. The northwest segment would be approximately 35 feet wide by 1,800 feet long, and the northeast segment would be approximately 35 feet wide by 1,300 feet long, for a total of approximately 108,900 square feet of ACB (2.5 acres). The total area to be disturbed during construction for Phase 1 – North would be approximately 152,460 square feet (3.5 acres).

Phase 2 - South would also consist of constructing ACB mats in two segments. The southwest segment would be approximately 35 feet wide by 1,930 feet long, and the southeast segment would be approximately 35 feet wide by 1,430 feet long, for a total of approximately 117,550 square feet of ACB (2.7 acres). The total area to be disturbed during construction for Phase 1 - North would be approximately 165,530 square feet (3.8 acres).

The shoulders would be excavated and graded prior to installing ACB mats. Shoulders would be graded to a depth of approximately 12 inches; where the surface of the ACB would be level with the concrete shoulder of the runway. Approximately 6,150 cubic yards of soil would be excavated. Soil from grading activities would be used to fill the voids in the ACB, with any remaining soil being retained onsite. The edge of the ACB shoulders to adjacent open areas would be graded and vegetated with a seed mix compatible with Base landscaping and maintenance requirements.

The Proposed Action would be constructed concurrently with the ALZ runway project. The Proposed Action is estimated to require approximately 110 days to construct, and construction would begin in spring 2012.

Access and staging areas would be the same as identified in the C-17 ALZ EA. Approximately 16 construction personnel would be required for the Proposed Action. Equipment would consist of a semi truck and trailer, scraper, grader, crane, and backhoe.

## **2.4 Alternatives Considered but Eliminated from Analysis**

This EA Supplement analyzes the No Action and the Proposed Action. No other alternatives were considered because ACB is the only material that meets requirements for both a hard surface and grass. Installing ACB shoulders adjacent to the concrete shoulders of the ALZ is the only feasible alternative to the No Action Alternative.

# Affected Environment

## 3.1 Introduction

The following sections describe the affected environment at the Proposed Action site. Detailed descriptions of these resources as they relate to Travis AFB and the surrounding region are presented in the *C-17 ALZ EA* (Department of the Air Force 2008a).

## 3.2 Air Quality

Travis AFB is located in central Solano County, which is at the eastern edge of the San Francisco Bay Area Air Basin (Basin).

For state standards, the Basin is designated as nonattainment for ozone, particulate matter less than 10 micrometers in diameter (PM<sub>10</sub>) (i.e., fugitive dust), and particulate matter less than 2.5 micrometers in diameter (PM<sub>2.5</sub>) (CARB, 2011). For federal standards, the Basin is designated as nonattainment for 8-hour ozone and PM<sub>2.5</sub> and as maintenance for carbon monoxide. All other criteria pollutants are designated attainment or are unclassified (Table 3-1).

**TABLE 3-1**

Bay Area Air Quality Management District Attainment Status as of December 2011

*Environmental Assessment Supplement for C-17 Assault Landing Zone Articulated Concrete Block Shoulders*

Travis Air Force Base, California

Pollutant	Averaging Time	CAAQS		NAAQS	
		Standard	State Attainment Status	Standard	Federal Attainment Status
O <sub>3</sub>	8 hour	0.07 ppm	Nonattainment	0.075 ppm	Nonattainment (marginal)
	1 hour	0.09 ppm		NA	
CO	8 hour	9.0 ppm	Attainment	9.0 ppm	Attainment/maintenance
	1 hour	20.0 ppm		35.0 ppm	
NO <sub>2</sub>	Annual	0.03 ppm	Attainment	0.053 ppm	Attainment/unclassified
	1 hour	0.18 ppm		0.100 ppm	
SO <sub>2</sub>	Annual	NA	Attainment	0.03 ppm	Attainment/unclassified
	24 hour	0.04 ppm		0.14 ppm	
	3 hour			NA	
	1 hour	0.25 ppm			
PM <sub>10</sub>	Annual	20 µg/m <sup>3</sup>	Nonattainment	NA	Attainment/unclassified
	24 hour	50 µg/m <sup>3</sup>		150 µg/m <sup>3</sup>	
PM <sub>2.5</sub>	Annual	12 µg/m <sup>3</sup>	Nonattainment	15 µg/m <sup>3</sup>	Nonattainment
	24 hour	NA		35 µg/m <sup>3</sup>	

**Notes:**

- µg/m<sup>3</sup> = micrograms per cubic meter
- CO = carbon monoxide
- NA = Not applicable
- NO<sub>2</sub> = nitrogen dioxide
- O<sub>3</sub> = ozone
- ppm = parts per million
- SO<sub>2</sub> = sulfur dioxide

Sources: CARB, 2011; EPA, 2011

## 3.3 Water Resources

### 3.3.1 Stormwater

Approximately 38 percent of Travis AFB consists of impervious areas. To prevent flooding, runoff from the impervious areas enters the Base stormwater drainage system, which consists of a series of underground storm drains and open ditches. The stormwater drainage system is designed to accommodate a 10-year, 24-hour storm (Travis AFB, 2002).

### 3.3.2 Floodplains

A Flood Insurance Rate Map issued by the Federal Emergency Management Agency (FEMA) indicates that Travis AFB is in an area “with possible but undetermined flood hazards (FEMA, 2011a). The map showed that only a small portion of the Base near the main gate is associated with the western branch of Union Creek and lying within the 100-year floodplain (i.e., having a 1 percent chance of annual flooding) (FEMA, 2011b).

## 3.4 Biological Resources

Since completion of the C-17 ALZ EA there has been no change to vegetation and wildlife communities, special-status species and critical habitats, and wetland and vernal pool resources, with the exception of the following:

- In 2009 an adult California tiger salamander (CTS) occurrence was confirmed by Travis AFB biologist Ray Hasey, as occurring within the action area as defined in the C-17 ALZ EA (Travis AFB, 2011).

In addition, in December 2010 it was reported that there are no CTS breeding sites on Travis AFB with the exception of the Castle Terrace Pond Complex (Travis AFB, 2011).

In October 2006 the Air Force initiated formal consultation on the original designed C-17 ALZ with the U.S. Fish and Wildlife Service (USFWS), under Section 7 of the Endangered Species Act. The USFWS issued a Biological Opinion (BO) on June 12, 2008 for the C-17 ALZ project. As a result of the design change to construct ACB shoulders, the Air Force re-initiated formal consultation with the USFWS in November 2011 (Travis AFB, 2011) (see Appendix A). In November 2011, the USFWS issued a *Reinitiation of the Biological Opinion for the Travis Air Force Base C-17 Assault Landing Strip Project (Service File Number 81420-2008-F-1142-1), Solano County, California* (USFWS, 2011) (see Appendix B).

## 3.5 Transportation System

The road network serving Travis AFB consists of several major thoroughfares including Travis Avenue, Ragsdale Street/Cannon Drive, Burgan Boulevard, Parker Road, Hickam Avenue, and Hangar Avenue. Minor streets branching off from these main roadways are Skymaster Drive, Broadway Street, W Street, Cordelia Avenue, and 1st Street, which serve as collector facilities for the Base. The maximum design capacity of on-base roads is 14,000 lbs (Highway Class).

## 3.6 Safety and Occupational Health

Safety and occupational health is managed by BioEnvironmental (60AMDS/SGPB). Construction site safety and accident prevention are ongoing activities at any Air Force job site. As part of the contracts for construction services, standard terms and conditions include safety as a priority. Areas of concern include compliance with regulations typical for construction projects, such as confined-space regulations, handling of hazardous materials, minimum personal protection equipment standards, and limited access to the construction area.

# Environmental Consequences

## 4.1 Introduction

This section evaluates potential impacts of the alternatives described in Section 2. Potential impacts to the human and natural environments were evaluated by comparing the Proposed Action (Alternative 2) to the No Action Alternative. The subsection for each environmental resource or issue assesses the anticipated direct and indirect impacts, considering short- and long-term project effects.

As described in this section, no significant adverse environmental impacts would occur for Alternative 2.

## 4.2 Air Quality

### 4.2.1 Alternative 1 – No Action

Under the No Action Alternative, construction of ACB would not occur and air pollutant emissions associated with construction would not be generated in excess of those identified in the C-17 ALZ EA. Therefore, under the No Action Alternative, no air quality impacts would occur.

### 4.2.2 Alternative 2 – Proposed Action

**Construction Emissions:** Installation of ACB and the associated construction activities would take approximately 110 working days from approximately March 2012 through August 2012. The total construction footprint would be approximately 7.3 acres. Construction emissions are expected from engine exhaust from the additional vehicle trips by construction workers, delivery trucks, and offroad construction equipment. These emissions would primarily consist of carbon monoxide, nitrogen oxide, PM<sub>10</sub>, PM<sub>2.5</sub>, sulfur dioxide, and VOC. Table 4-1 lists a summary of the estimated construction emissions for the Proposed Action. Detailed construction emission calculations are provided in Appendix C.

**TABLE 4-1**

Estimated Construction Emissions for Proposed Action

*Environmental Assessment Supplement for C-17 Assault Landing Zone Articulated Concrete Block Shoulders*

Travis Air Force Base, California

Emission Source	VOC (ton/yr)	CO (ton/yr)	NO <sub>x</sub> (ton/yr)	SO <sub>2</sub> (ton/yr)	PM <sub>10</sub> (ton/yr)	PM <sub>2.5</sub> (ton/yr)	CO <sub>2</sub> (ton/yr)
Phase 1 – North	0.101	0.489	0.904	0.0003	0.200	0.137	116.8
Phase 2 – South	0.101	0.494	0.918	0.0003	0.218	0.148	118.9
Total	<b>0.202</b>	<b>0.983</b>	<b>1.822</b>	<b>0.0006</b>	<b>0.418</b>	<b>0.284</b>	<b>235.7</b>

Note:

NA = not applicable

The Proposed Action would cause temporary, short-term air quality impacts as a result of construction emissions. Construction-related impacts are expected to be local (i.e., confined to the construction site area) and limited to the duration of the construction activities.

**Operation Emissions:** No operation emissions are expected after the Proposed Action is constructed. Therefore, operation of the Proposed Action would not cause adverse air quality impacts, and no further analysis is required.

**General Conformity Applicability:** The Proposed Action would be within the Basin in Solano County, which attains or is unclassified for all criteria pollutants except the 8-hour ozone and PM<sub>2.5</sub> NAAQS. In addition, the urbanized areas of Solano County (which include the area occupied by Travis AFB) are maintenance areas for carbon monoxide. As a result, carbon monoxide, PM<sub>2.5</sub>, and ozone precursors (nitrogen oxide and VOC) are subject to general conformity requirements. The annual emission increases associated with the Proposed Action and the comparisons with the *de minimis* thresholds are shown in Table 4-2. Detailed discussion of the general conformity applicability discussion is presented in Appendix D.

Emissions of carbon monoxide, nitrogen oxide, sulfur dioxide, PM<sub>2.5</sub>, and VOC during construction are below the *de minimis* thresholds. On the basis of the conformity applicability criteria, the Proposed Action conforms to the most recent EPA-approved state implementation plan (SIP); therefore, the project is exempt from the Clean Air Act (CAA) conformity requirements and does not require a detailed conformity determination.

**TABLE 4-2**

General Conformity Applicability for Proposed Action

*Environmental Assessment Supplement for C-17 Assault Landing Zone Articulated Concrete Block Shoulders*  
Travis Air Force Base, California

Activity	Annual Emissions (tons/year)				
	VOC	CO	NO <sub>x</sub>	SO <sub>2</sub>	PM <sub>2.5</sub>
Construction (2012)	0.202	0.983	1.822	0.0006	0.284
Operation (2012 and after)	0	0	0	0	0
<i>De minimis</i> threshold	100	100	100	100	100

**Climate Change and Greenhouse Gases (GHG):** Greenhouse gas (GHG) emissions are regulated at the federal and state level. Laws and regulations, as well as plans and policies, have been adopted to address global climate change issues. On February 18, 2010, Council on Environmental Quality (CEQ) released draft guidance on the consideration of GHG in NEPA documents for federal actions. The draft guidelines include a presumptive threshold of 25,000 metric tons of carbon dioxide equivalent (CO<sub>2</sub>e) emissions from a proposed action to trigger a quantitative analysis. CEQ has not established when GHG emissions are “significant” for NEPA purposes but posed that question to the public (CEQ, 2010).

A summary of the project construction emission of CO<sub>2</sub> is listed in Table 4-3. The total construction emission of CO<sub>2</sub> is 235.7 tons (approximately 214 metric tons) for the Proposed Action, much lower than the 25,000 metric tons of GHG emission threshold defined in the

CEQ guidance for quantitative analysis of impacts. Construction emission of GHG is negligible compared to the 2008 California state inventory of 477.7 metric tons.

**TABLE 4-3**

Estimated Construction Emissions of GHG for Proposed Action  
*Environmental Assessment Supplement for C-17 Assault Landing Zone Articulated Concrete Block Shoulders*  
 Travis Air Force Base, California

<b>Emission Source</b>	<b>CO<sub>2</sub> (ton/yr)</b>
Phase 1 – North	116.8
Phase 2 – South	118.9
<b>Total</b>	<b>235.7</b>

## 4.3 Water Resources

### 4.3.1 Alternative 1 – No Action

Under Alternative 1, no changes to the stormwater drainage system or in the management of stormwater would occur in addition to those identified in the C-17 ALZ EA.

### 4.3.2 Alternative 2 – Proposed Action

The Proposed Action would install ACB mats on approximately 5.2 acres of permeable surface. ACB consists of concrete blocks with voids between the blocks that would allow water to pass through to the soil beneath. Therefore, ACB is a hardscaped surface that is constructed in a way that allows permeability within the ACB mat structure.

It is anticipated that ACB would preserve preconstruction stormwater flows to areas adjacent to the ALZ by slowing the flow of water from runway surfaces and increasing absorption (percolation) of runoff into native soil along runway edges. Slowing the flow of water from runway surfaces would also serve to retain contaminants from the runway within the ACB structure, thereby minimizing the migration of contaminants to the surrounding area. Because water flowing off the ALZ runway could permeate to the ground through the ACB structure, it is anticipated that there would be no net change to peak flow rates and runoff volumes as a result of construction of the Proposed Action. Therefore, impacts to stormwater drainage in the proposed action area are less than significant.

Neither construction nor operation of the Proposed Action would affect the floodplain. Large, permanent structures, such as buildings or walls, have the potential to impede or divert floods. The Proposed Action would not involve new vertical structures that could impede or divert floods. Impacts to the floodplain from installation of ACB would not change from current conditions and therefore is considered less than significant.

## **4.4 Biological Resources**

### **4.4.1 Alternative 1 – No Action**

Under the No Action Alternative, installation of ACB would not occur. The No Action Alternative would not result in any construction or other changes to biological resources in addition to those identified in the C-17 ALZ EA.

### **4.4.2 Alternative 2 – Proposed Action**

Re-initiation of formal consultation with the USFWS under the Federal Endangered Species Act regarding impacts that would result from installation of ACB has been completed, and Biological Opinion 81420-2008-F-1142-R001 was issued for the project on November 21, 2011 (see Appendix B). The BO found that the installation of the ACB would cause additional permanent effects to CTS not addressed in the original opinion and that the new construction activities proposed would adversely affect the CTS.

The effects of the Proposed Action on CTS habitat include the direct effect of permanently removing an additional 2.7 acres of upland habitat located on the Phase 2 – South portion of the proposed action area (see Figure 1-2). Potential impacts to CTS would be less than significant with implementation of both the conservation and minimization measures identified in the C-17 ALZ EA and within the original BO.

The Proposed Action of installing 2.5 acres of ACB on the Phase 1 – North portion of the proposed action area (see Figure 1-2) remains a permanent impact and therefore there is no change for this area regarding CTS habitat as discussed in the C-17 ALZ EA.

## **4.5 Transportation System**

### **4.5.1 Alternative 1 – No Action**

Under the No Action Alternative, an increase in construction traffic on Base and near the Base would not change. Current traffic levels and patterns on Travis AFB would continue.

### **4.5.2 Alternative 2 – Proposed Action**

Under the Proposed Action, transport of materials (soil, slurry, and ACB) during construction would require approximately 520 truck trips. Vehicles would enter the Base via the South Gate and exit the Base via the Main Gate. Perimeter Road and existing access roads would be used to access the ALZ for construction.

The road to the west of the South Gate entrance is mostly used for access to Travis AFB and is not frequently traveled by the general public. The road to the west side of the Main Gate is used by residential and commercial traffic leaving Travis AFB as well as traveling between Vacaville and Fairfield/Suisun via Peabody Road. Perimeter Road is on Base, but is not frequently used by on Base personnel; therefore, access by construction traffic from off Base and Perimeter Road would be temporary, and would result in a less than significant impact to transportation systems.

Implementation of Alternative 2 would result in a less than significant impact to transportation systems because on- and off-base roads can accommodate the anticipated construction traffic and construction traffic would be temporary.

## 4.6 Safety and Occupational Health

### 4.6.1 Alternative 1 – No Action

Implementing the No Action Alternative could affect safe operation of the ALZ because soil could become unstable due to C-17 jet engine blast creating FOD on the runway. FOD could be drawn in and potentially damage C-17 engines. Operation of the runway under the No Action Alternative could adversely affect human health if an accident occurred as a result of damage to C-17 engines.

### 4.6.2 Alternative 2 – Proposed Action

Implementing Alternative 2 would require construction activities, such as excavation, grading, and operation of construction equipment. Implementation of Alternative 2 would follow all applicable rules and regulations regarding safety and occupational health. A health and safety plan for construction would be prepared that would include requirements such as securing construction areas to prevent unauthorized personnel from entering the work sites. In addition, all workers would be provided with appropriate personal protective equipment including, but not limited to, approved hard hats, safety shoes, gloves, goggles, eye/face protection, safety belts, harnesses, respirators, hearing protection, and traffic safety vests. With implementation of the health and safety plan, the potential for adverse impacts to safety and occupational health are expected to be minor and limited to the duration of construction.

Implementation of Alternative 2 would result in a beneficial impact to health and safety because the potential for damage to C-17 engines and risk to human health and safety that could result from damage caused by FOD would be reduced.

## 4.7 Cumulative Effects

Cumulative effects are defined by the CEQ in 40 CFR 1508.7 as “impacts on the environment that result from the incremental impact of the action when added to other past, present, and reasonable foreseeable future actions regardless of what agency (federal or nonfederal) or person undertakes such other actions.”

Projects considered for the cumulative impacts assessment have been recently completed, are ongoing, or are planned to begin within the next 2 years. Projects that are under consideration by the Base that would occur beyond 3 years are too uncertain to be evaluated. The following actions, organized by fiscal year, are the foreseeable future actions that could occur at Travis AFB:

- **Fiscal Year 2011**
  - Completed Contingency Response Wing Global Support Squadron Facility
  - Completed C-17 Two-Bay Hangar

- Completed South Gate Improvement Project
- Completed Georgetown Perimeter Fence Project
- **Fiscal Year 2012**
  - Construct KC-10 Combat Load Trainer
  - Construct Fire Station
  - Construct C-5 Reserves Squad Operations Facility
  - Construct Runway Repair
  - Construct C-17 Assault Landing Zone
  - Construct Military Working Dog Kennels
- **Fiscal Year 2013**
  - Construct New School Age Facility
  - Construct New 144 Room Dormitory

Potential cumulative impacts on the resource areas caused by the implementation of Alternatives 2 are discussed in the following section.

#### **4.7.1 Air Quality**

The potential for cumulative impacts attributable to air quality would be from multiple construction projects occurring simultaneously. The potential impacts to air quality from construction are discussed in Sections 3.2 and 4.2. Not all of the actions listed would be constructed simultaneously. The Proposed Action would conform to the SIP and not be regionally significant. After construction is complete, the Proposed Action would not contribute to long-term cumulative impacts to air quality because no operations would occur.

#### **4.7.2 Biological Resources**

Construction of the Proposed Action would result in permanent removal of 2.7 acres of CTS upland habitat. This impact requires agency approval and implementation of permit requirements, including conservation and minimization measures such as enhancing or restoring habitats or participating in mitigation banks. Formal re-initiation of consultation with the USFWS under the ESA regarding expected impacts resulting from installation of ACB has been completed, and Biological Opinion 81420-2008-F-1142-R001 was issued for the project on November 21, 2011 (see Appendix B). Several projects, including the Proposed Action, the C-17 ALZ project, the Taxiway M project, the Georgetown Perimeter Fence project, and the South Gate project, would result in impacts to CTS. With implementation of permit requirements and associated mitigation requirements, the permanent impacts to biological resources would not be cumulatively significant.

SECTION 5

# List of Preparers

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<b>Name</b>	<b>Education</b>	<b>Experience</b>	<b>Role</b>
Marjorie Eisert	B.S., Wildlife and Fisheries Biology	22 years	Project Manager
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Alfred Farber	M.A., Anthropology	31 years	Technical Publications Specialist

SECTION 6

# List of Agencies and People Consulted or Provided Copies

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The following people were consulted during preparation of this EA:

- David Musselwhite, 60 CES/CEA
- Chris Krettecoc, 60 CES/CEAO
- Steven Cabral NAVFAC SW

Travis AFB coordinated distribution of this EA to the following public and regulatory agencies and libraries:

- **Federal**

U.S. Environmental Protection Agency, Region 9  
Director, Officer of Federal Activities  
75 Hawthorne Street  
San Francisco, California 94105

U.S. Department of the Interior  
U.S. Fish and Wildlife Service  
California/Nevada Operations Office  
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- **U.S. Air Force**

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- **Libraries**

Fairfield-Suisun Community Library  
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Fairfield, California 94533

Suisun City Library  
333 Sunset Avenue  
Suisun City, California 94585

Mitchell Memorial Library  
510 Travis Avenue (Building 436)  
Travis Air Force Base, California 94535

Vacaville Public Library  
1020 Ulatis Drive  
Vacaville, California 95687

The EA Supplement and FONSI were available for public review from February 8 to March 12, 2012. No comments were received. Proof of Publication is provided in Appendix E.

## SECTION 7

# References

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U.S. Fish and Wildlife Service (USFWS). 2011. *Reinitiation of the Biological Opinion for the Travis Air Force Base C-17 Assault Landing Strip Project (Service File Number 81420-2008-F-1142-1), Solano County, California*. November 21, 2011.

**Appendix A**  
**Re-initiation of Consultation C-17 Assault**  
**Landing Zone Articulated Concrete**  
**Block Shoulder**

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Re-initiation of Consultation  
C-17 Assault Landing Zone  
Articulated Concrete Block Shoulder

Department of the Air Force  
60th Air Mobility Wing  
Travis Air Force Base, California



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## SECTION 1 INTRODUCTION

### 1.1 Purpose for Reinitiation of Consultation

Reinitiation of Consultation with the Service is required due to changes to the design of the C-17 Assault Landing Zone on Travis AFB resulting in permanent impacts California tiger salamander (CTS) upland habitat. The areas affected by these changes were originally assessed in a 12 June 2008 United States Fish and Wildlife Service (USFWS) Biological Opinion (BO) (81420-2008-F-1142-1) as temporarily impacted. Permanent removal of this salamander upland habitat was not assessed, nor was the mitigation to address the permanent removal assessed.

### 1.2 Purpose and Need of the Proposed Changes

The Air Force is constructing a C-17 Assault Landing Zone (ALZ) at Travis AFB, Solano County, California (the Base). The original design required that vegetative mats be placed on top of graded shoulders along each side of the ALZ. Once established, vegetation would provide soil stabilization and prevent foreign object debris (FOD) from jeopardizing aircraft safety. Recently, similar vegetative mats at another airfield failed to provide adequate protection, resulting in unacceptable erosion and prompting the Air Force to propose the installation of articulated concrete blocks (ACB) in the soil along the edges of the ALZ at Travis AFB. Installation of ACB instead of vegetated mats will allow for the following:

- **Provide Erosion Control.** ACB will provide a permeable foundation for soil and vegetation that resists erosion from jet blast and vortex created by landing and taking off C-17 aircraft. Open faced ACB will slow the flow of storm water runoff from runway surfaces, allow storm water to be absorbed by underlying soil and resist erosion caused by direct impact of heavy rains and channeled flow.
- **Enhance Human Health and Safety by reducing Foreign Objects & Debris.** Erosion results in loosened soil and vegetation which can be drawn up with intake air into jet engines. These Foreign Objects and Debris (FOD) pose a significant threat to jet engine components, operation and human health and safety. Reducing this risk is the primary purpose for the design changes.
- **Avoid Effects to Wetlands and California Tiger Salamander Breeding Habitat.** Nearby wetlands and CTS breeding habitat may be impacted by contaminants washed or blown into them by runway operations. ACB will minimize the potential for this occurrence by maintaining soil and vegetation in place, providing a barrier to migration of these contaminants to surrounding habitat. ACB will also preserve preconstruction storm water flows to these areas by slowing the flow from runway surfaces and increasing absorption (percolation) of runoff into native soil along runway edges.

### **1.3 Prior Section 7 Consultation**

The Air Force initiated informal consultation on the original designed C-17 ALZ with the USFWS under Section 7 of the ESA during a meeting on 13 October 2006. A Biological Assessment (BA) was prepared and submitted on 5 February 2008, beginning the formal consultation period. The USFWS issued a BO on June 12, 2008 in response to the C-17 ALZ BA. The BO concluded that the Travis AFB C-17 LZ project, as proposed, is not likely to jeopardize the continued existence of the CTS. The BO also stated that the proposed project is not located within designated critical habitat for the salamander; therefore, critical habitat for this species will not be affected. The BO contains a history of consultation.

## **SECTION 2 DESCRIPTION OF THE PROPOSED ACTION**

### **2.1 Project Description**

The C-17 ALZ is currently under construction and approximately 60% complete. Approximately 2.5 acres of ACB is proposed for installation in the graded dirt shoulder along the north side of the ALZ. This area was included in the 35.1 acres of permanent loss of CTS habitat assessed in the BO and for which 105.3 acres of upland CTS credits were purchased as the mitigation method. Approximately 2.7 acres of ACB is proposed for installation in the graded dirt shoulder along the south side of the ALZ (Figure 1). This area of the project was included as part of the 23.0 acres assessed in the BO as temporarily disturbed habitat that would be restored to pre-project conditions after construction. Under the new requirement for installation of ACB, these 2.7 acres will now result in permanent impact of CTS upland habitat.

Shoulder design requires the construction of a gradual slope to prevent the accumulation of standing water on the ALZ. Surface dimension of the ACB on the south side of the ALZ will be approximately 35 feet wide and 3,060 linear feet in length. There will be no appreciable increase in construction vehicles, personnel, or land disturbing activities since construction of the ALZ is already underway and installation of the ACB will be within the existing grading plan. Access to the site will remain unchanged from the ALZ construction and material laydown will remain within the current construction footprint.

## **SECTION 3 CONSERVATION MEASURES**

Proposed Conservation and Minimization Measures include all measures cited in the 12 June 2008 BO and will be followed for construction of the ACB

## **SECTION 4 DESCRIPTION OF THE ACTION AREA**

### **4.1 Changes to the Action Area**

The Action Area is unchanged.

### **4.2 Wetlands**

No additional wetlands are affected by the proposed changes.

### **4.3 Hydrology**

This revised design will allow the underlying soil to retain the same amount of water that it would retain if not developed.

## **SECTION 5 STATUS OF SPECIES IN THE ACTION AREA**

### **5.1 Technical Support & Studies Relevant to the Proposed Action since 29 OCT 2009**

- 13 October 2009 an adult CTS within the Action Area was discovered (Hasey pers. obs., 2009) which confirmed it is upland habitat.
- 13 December 2010 Johnson and Shaffer reported that there are no CTS breeding sites on base except for the Castle Terrace Pond Complex. (Johnson & Shaffer, 2010)

### **5.2 California Tiger Salamander - Status within the Action Area**

The Action Area is upland habitat, except where paved.

## **SECTION 6 EFFECTS OF THE PROPOSED ACTION ON LISTED SPECIES**

There are no proposed project changes that would negatively affect any wetland, federally listed species, proposed species or critical habitat other than additional permanent removal of upland habitat for the CTS.

## **6.1 California Tiger Salamander Effects**

### **6.1.1 Permanent direct, indirect, or cumulative effects – California tiger salamander**

Design requirement changes result in the permanent loss of 2.7 acres of CTS upland habitat previously identified as temporary direct effects in the BA.

The proposed project changes are not expected to result in any other permanent direct, indirect, or cumulative effects to this species.

### **6.1.2 Temporary direct, indirect, or cumulative effects – California tiger salamander**

The proposed project changes are not expected to result in any temporary direct, indirect, or cumulative effects to this species.

## **6.2 Impacts to waters of the U.S.**

The proposed project changes are not expected to result in any additional direct, indirect, or cumulative effects to the Waters of the United States.

## **6.3 Effects Outside the Action Area**

The proposed project changes are not expected to have any significant effects outside of the Action Area.

# **SECTION 7**

## **CONSERVATION MEASURES TO OFFSET DIRECT AND INDIRECT EFFECTS**

### **7.1.1 Compensatory Mitigation**

The Proposed Action will include as compensatory mitigation purchase of 8.1 acres of upland CTS mitigation bank credits (at the same 3 to 1 ratio as assessed in the 12 June 2008 ALZ BO) to offset the loss of 2.7 acres of CTS upland habitat.

## **SECTION 8 CONCLUSION**

Although additional CTS upland habitat will be removed as a result of the change from vegetative mats to ACB, the level of the anticipated take from the Proposed Action is not likely to change. There are large areas of suitable CTS upland habitat adjacent to the project site and the loss of 2.7 acres is not expected to result in jeopardizing the continued existence to the California tiger salamander or result in destruction or adverse modification of critical habitat.

## **SECTION 9**

### **WORKS CITED**

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**Appendix B**  
**Re-initiation of the Biological Opinion for the**  
**Travis Air Force Base C-17 Assault Landing**  
**Strip Project**

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## United States Department of the Interior

### FISH AND WILDLIFE SERVICE

Sacramento Fish and Wildlife Office  
2800 Cottage Way, Room W-2605  
Sacramento, California 95825-1846



In reply refer to:  
81420-2008-F-1142-R001

NOV 21 2011

Mr. David H. Musselwhite  
Department of the Air Force  
60<sup>th</sup> Civil Engineer Squadron  
411 Airmen Drive  
Travis Air Force Base, California 94535

Subject: Reinitiation of the Biological Opinion for the Travis Air Force Base C-17  
Assault Landing Strip Project (Service File Number 81420-2008-F-1142-1),  
Solano County, California

Dear Mr. Musselwhite:

This letter responds to the U.S. Department of the Air Force (Air Force) November 4, 2011, electronic message (e-mail) request for a re-initiation of the formal consultation for the proposed Travis Air Force Base (AFB) C-17 Assault Landing Strip Project (proposed project). The U.S. Fish and Wildlife Service (Service) analyzed the proposed project's effects on the federally-threatened Central California distinct population segment (DPS) of the Central California tiger salamander (*Ambystoma californiense*) (Central California tiger salamander) and issued a biological opinion (opinion) on June 12, 2008 (Service file number 81420-2008-F-1142-1). The Air Force requested re-initiation for the proposed project due to a change in the proposed project description to add permanent articulated concrete block (ACB) instead of vegetative mats as described in the original opinion. Similar vegetative mats at other airfields have recently shown to not provide adequate protection from foreign object debris and resulted in unacceptable erosion. This prompted Travis AFB to install ACB around the perimeter of the C-17 instead of the vegetative mats. The installation of the ACB will cause additional permanent effects to the salamander not addressed in the original opinion. This response is in accordance with section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*) (Act).

After review of the information provided, the Service has determined that the new construction activities proposed in your reinitiation are likely to adversely affect the Central California tiger salamander. The action area remains the same as the original opinion.

Therefore, please replace the following paragraphs of the June 12, 2008, biological opinion:

**Pages 3 and 4 in the Project Description, Replace Paragraph:**

Landing Zone Construction

The new landing zone will be constructed east and parallel to the northeastern terminus of an existing runway (Runway 03Right-21Left [03R-21L]). The entire area between the proposed and existing runway will be disturbed due to construction. The 58.5 acre landing zone construction area includes: the 9.6-acre new landing zone which includes connector taxiways at both ends of the new runway; 23.0 acres of grading activities that extend 125 to 145 feet around the new runway perimeter; and 25.9 acres of land between Runway 03R-21L and the new landing zone that will be used for staging and other ground disturbance activities. The 9.6-acre runway will be the only new hardscape associated with the Landing Zone construction component. The proposed C-17 runway will be raised and elevated 18 inches higher than the adjacent and existing Runway 03R-21L. The new runway will be designed to prevent any accumulation of rainwater. Stormwater runoff from the proposed runway will be collected and directed towards existing drainage features on the northeastern corner of Travis AFB. These drainage features also contain runoff from Runway 03R-21L which is directed to Denverton Creek and then flows south beyond Travis AFB and on to the Wilcox Ranch.

**With: (language bolded and underlined has been changed or added)**

Landing Zone Construction

The new landing zone will be constructed east and parallel to the northeastern terminus of an existing runway (Runway 03Right-21Left [03R-21L]). The entire area between the proposed and existing runway will be disturbed due to construction. The 58.5 acre landing zone construction area includes: the 12.3-acre new landing zone which includes connector taxiways at both ends of the new runway **and installation of ACB around the perimeter of the C-17 runway; 20.3** acres of grading activities that extend 125 to 145 feet around the new runway perimeter; and 25.9 acres of land between Runway 03R-21L and the new landing zone that will be used for staging and other ground disturbance activities. The 9.6-acre runway **and 2.7 acres of ACB** will be the only new hardscape associated with the Landing Zone construction component. The proposed C-17 runway will be raised and elevated 18 inches higher than the adjacent and existing Runway 03R-21L. The new runway will be designed to prevent any accumulation of rainwater. Stormwater runoff from the proposed runway will be collected and directed towards existing drainage features on the northeastern corner of Travis AFB. These drainage features also contain runoff from Runway 03R-21L which is directed to Denverton Creek and then flows south beyond Travis AFB and on to the Wilcox Ranch.

**Page 5 in the Conservation Measures, Replace Paragraph:**

1. To minimize the adverse effects of the proposed project on the California tiger salamander the Air Force will protect a combined total of 105.3 acres of upland. This habitat compensation can be achieved by: 1) purchase of compensation credits at an existing Service approved bank or banks, as appropriate for the species in Solano County, 2) or purchase and preservation of a Service approved parcel and establishment of a conservation easement, development of a management plan, and provision of a perpetual endowment sufficient to cover management and maintenance of protected lands for the benefit and recovery of California tiger salamander), or 3) a combination of these two approaches. The project proponents will also restore 23.0 acres of disturbed upland within one year from the start of construction for tiger salamander upland dispersal habitat. Temporarily disturbed areas that are not restored within one year of construction will be considered permanently impacted by the Service.

**With: (language bolded and underlined has been changed or added)**

1. To minimize the adverse effects of the proposed project on the California tiger salamander the Air Force will protect a combined total of 113.4 acres of upland. This habitat compensation can be achieved by: 1) purchase of compensation credits at an existing Service approved bank or banks, as appropriate for the species in Solano County, 2) or purchase and preservation of a Service approved parcel and establishment of a conservation easement, development of a management plan, and provision of a perpetual endowment sufficient to cover management and maintenance of protected lands for the benefit and recovery of California tiger salamander), or 3) a combination of these two approaches. The project proponents will also restore 20.3 acres of disturbed upland within one year from the start of construction for tiger salamander upland dispersal habitat. Temporarily disturbed areas that are not restored within one year of construction will be considered permanently impacted by the Service.

**Page 17 in the Status and Baseline, Replace Section:**

The California tiger salamander is known to be present in much of the undeveloped areas surrounding the base. The California Department of Fish and Game's California Natural Diversity Database includes one reported California tiger salamander observation within 1.3 miles east of the C-17 runway action area (CDFG 2008) and the Biological Assessment references seven California tiger salamander observed on the adjacent Wilcox Ranch and Muzzy Ranch properties with at least one observation within 0.25 miles of the action area (Air Force 2007). The action area is within the known California tiger salamander dispersal range from these salamander-occupied properties and there are no significant artificial, hydrological, or landscape barriers between these occupied areas and the action area.

**With: (language bolded and underlined has been changed or added)**

The California tiger salamander is known to be present in much of the undeveloped areas surrounding the base. The California Department of Fish and Game's California Natural Diversity Database includes one reported California tiger salamander observation within 1.3 miles east of the C-17 runway action area (CDFG 2008) and the Biological Assessment references seven California tiger salamander observed on the adjacent Wilcox Ranch and Muzzy Ranch properties with at least one observation within 0.25 miles of the action area (Air Force 2007). **On October 13, 2009, an adult salamander was identified within the action area by the Travis AFB biologist Ray Hasey.** The action area is within the known California tiger salamander dispersal range from these salamander-occupied properties and there are no significant artificial, hydrological, or landscape barriers between these occupied areas and the action area.

**Pages 18 and 19 in the Effects Section, Replace Paragraph:**

The proposed project is likely to result in a number of adverse effects to the California tiger salamander. The proposed project will eliminate salamander habitat and likely cause direct mortality, injury, or harassment of individual juveniles and adults. Implementation of the proposed action would result in the permanent loss of 35.1 acres of upland habitat due to: grading and paving of the 9.6 acre runway and connector taxiways; staging and maintenance activities within the 25.3 acres between Runway 03R-21L and the proposed C-17 runway; use of Perimeter Road for access; and construction and use of a 0.11 acre access spur from Perimeter Road to the C-17 runway construction area. Implementation of the proposed action would result in the temporary loss of 23.0 acres of upland habitat due to grading activities on the proposed 23.0 acre C-17 runway perimeter. In terms of wetlands, the areas of effects include the permanent loss of 0.18 acres of vernal pool habitat and 0.24 acres of seasonal wetlands, as well as the temporary loss of 0.64 acres of seasonal wetlands and the rerouting of a 0.45 acre drainage ditch. Discharge of additional stormwater and materials associated with construction, equipment fluids, and runway maintenance could indirectly adversely affect salamanders on and off Travis AFB by compromising downstream water quality. The proposed project would result in the permanent loss of 35.1 acres and the temporary loss of approximately 23.0 acres of suitable upland habitat of the California tiger salamander. No permanent or seasonal wetlands or ponds appropriate for the listed amphibian breeding would be directly lost from implementation of the proposed action.

**With: (language bolded and underlined has been changed or added)**

The proposed project is likely to result in a number of adverse effects to the California tiger salamander. The proposed project will eliminate salamander habitat and likely cause direct mortality, injury, or harassment of individual juveniles and adults. Implementation of the proposed action would result in the permanent loss of **37.8** acres of upland habitat for the salamander due to: grading and paving of the 9.6 acre runway and connector taxiways; **grading and placement of the 2.7 acres of ACB around the perimeter of the C-17 runway;** staging

and maintenance activities within the 25.3 acres between Runway 03R-21L and the proposed C-17 runway; use of Perimeter Road for access; and construction and use of a 0.11 acre access spur from Perimeter Road to the C-17 runway construction area. Implementation of the proposed action would result in the temporary loss of 20.3 acres of upland habitat due to grading activities on the proposed 23.0 acre C-17 runway perimeter. In terms of wetlands, the areas of effects include the permanent loss of 0.18 acres of vernal pool habitat and 0.24 acres of seasonal wetlands, as well as the temporary loss of 0.64 acres of seasonal wetlands and the rerouting of a 0.45 acre drainage ditch. Discharge of additional stormwater and materials associated with construction, equipment fluids, and runway maintenance could indirectly adversely affect salamanders on and off Travis AFB by compromising downstream water quality. No permanent or seasonal wetlands or ponds appropriate for the listed amphibian breeding would be directly lost from implementation of the proposed action.

**Pages 26 in the Amount of extent of take, Replace Paragraph:**

The Service expects that incidental take of the California tiger salamander, may occur during this action. The extent of the take will be difficult to detect or quantify because of the ecology and biology of this species. Additionally, their size and cryptic nature makes the finding of a dead specimen unlikely. Seasonal population fluctuations also may mask the ability to determine the exact extent of take. Due to the difficulty in quantifying the number of tiger salamanders that will be taken as a result of the proposed action, the Service is quantifying take incidental to the project as the number of acres of upland tiger salamander habitat that will become unsuitable for tiger salamanders due to direct or indirect effects as a result of the action. Therefore, the Service estimates that the proposed action will result in the take of all California tiger salamanders inhabiting or utilizing 58.1 acres of appropriate upland habitat (35.1 permanent, 23.0 temporary) identified in the action area. Upon implementation of the following reasonable and prudent measures, incidental take associated with the proposed Travis AFB C-17 Assault Landing Strip Project on the listed amphibian, in the form of harm, harassment, injury, or mortality from habitat loss or degradation will become exempt from the prohibitions described under section 9 of the Act.

**With: (language bolded and underlined has been changed or added)**

The Service expects that incidental take of the California tiger salamander, may occur during this action. The extent of the take will be difficult to detect or quantify because of the ecology and biology of this species. Additionally, their size and cryptic nature makes the finding of a dead specimen unlikely. Seasonal population fluctuations also may mask the ability to determine the exact extent of take. Due to the difficulty in quantifying the number of tiger salamanders that will be taken as a result of the proposed action, the Service is quantifying take incidental to the project as the number of acres of upland tiger salamander habitat that will become unsuitable for tiger salamanders due to direct or indirect effects as a result of the action. Therefore, the Service estimates that the proposed action will result in the take of all California tiger salamanders inhabiting or utilizing 58.1 acres of appropriate upland habitat (37.8 permanent, 20.3 temporary) identified in the action area. Upon implementation of the following reasonable and prudent measures, incidental take associated with the proposed Travis AFB C-17 Assault Landing Strip

Mr. Dave Musslewhite

6

Project on the listed amphibian, in the form of harm, harassment, injury, or mortality from habitat loss or degradation will become exempt from the prohibitions described under section 9 of the Act.

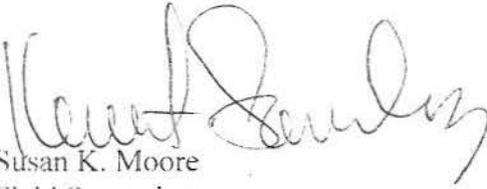
All other portions of the June 12, 2008 biological opinion remain the same.

#### RE-INITIATION - CLOSING STATEMENT

This concludes formal consultation with the Air Force on the re-initiation of the C-17 Assault Landing Strip Project. As provided in 50 CFR §402.16, re-initiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been maintained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action.

If you have questions regarding our response, please contact Michelle Tovar, Senior Fish and Wildlife Biologist ([Michelle\\_Tovar@fws.gov](mailto:Michelle_Tovar@fws.gov)) or Kellie Berry, Chief, Sacramento Valley Division ([Kellie\\_Berry@fws.gov](mailto:Kellie_Berry@fws.gov)), of my office at (916) 414-6645.

Sincerely,

  
Susan K. Moore  
Field Supervisor

**Appendix C**  
**Construction Emission Calculations**

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# Air Emission Calculations

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Construction and installation of the articulated concrete blocks (ACBs) would take approximately 110 working days starting approximately March 2012. The total construction footprint would be approximately 7.3 acres. Construction emissions are expected from engine exhaust from the additional vehicle trips by construction workers, delivery trucks, and offroad construction equipment. These emissions would primarily consist of carbon monoxide (CO), nitrogen oxide (NO<sub>x</sub>), particulate matter less than 10 micrometers in diameter (PM<sub>10</sub>), particulate matter less than 2.5 micrometers in diameter (PM<sub>2.5</sub>), sulfur dioxide (SO<sub>2</sub>), and volatile organic compounds (VOCs). In addition, vehicle travel on unpaved roads would result in fugitive dust emissions. The following sections describe construction emission calculation assumptions and methodologies for the Proposed Action.

Information used for emission calculations, such as construction phases and duration, amount of excavation, vehicles miles traveled, etc. are shown in Table C-1 of this appendix. A summary of the total construction emissions is shown in Table C-2. Detailed construction emission calculations are shown in Tables C-3 and C-4 for activities on North site and South site, respectively.

## **Offroad Construction Equipment Emissions:**

The offroad construction equipment emissions of NO<sub>x</sub>, SO<sub>2</sub>, PM<sub>10</sub>, PM<sub>2.5</sub>, CO, and VOC were estimated using CARB's URBEMIS2007 model (CARB, 2007a) based on projected construction duration and estimated number of pieces of equipment. Default equipment settings in URBEMIS2007 were used, and additional project-specific equipment was added for each construction phase of site excavation, grading, and installation of the ACBs. Detailed assumptions used in the URBEMIS modeling are shown in URBEMIS output files that are included in this appendix.

## **On-road Vehicle Emissions:**

Emissions associated with workers' commute and material hauling trucks were estimated based on estimated number of trips and vehicle miles traveled. Emission factors were obtained from EMFAC2007 (CARB, 2007b) for the Bay Area Air Quality Management District (BAAQMD) for calendar year 2012. Assumptions used for vehicle travel emissions are shown in Table C-1.

The EMFAC2007 emission factors for passenger cars and heavy heavy-duty diesel trucks were used to calculate workers' commute emissions and material hauling truck emissions, respectively.

## C.1 Fugitive Dust Emissions from Unpaved Road

Fugitive dust emissions from vehicle travel on unpaved roads were estimated using the equation in Appendix B of the URBEMIS2007 User's Guide (Jones & Stokes Associates, 2007).

$$EF = k (s/12)^{1.0} (S/30)^{0.5} / ((M/0.5)^{0.2}) \quad (1)$$

Where:

EF: PM<sub>10</sub> emission factor, lb/vehicle mile traveled (VMT)

k = the fraction of particles less than or equal to the particle size cutoff of 10 microns

s = surface material silt content (%)

S = the average vehicle speed (mph)

M = surface moisture content (%)

It was assumed that the vehicle miles traveled (VMT) by soil- and slurry-hauling vehicles would be on unpaved roads, and VMTs by ACBs hauling vehicles would be on paved roads. To be conservative, fugitive PM<sub>2.5</sub> emissions were assumed to be the same as the PM<sub>10</sub> emissions.

## C.2 References

California Air Resources Board (CARB). 2007a. *URBEMIS 2007 for Windows, Version 9.2*. <http://www.arb.ca.gov/planning/urbemis/urbemis2007/urbemis2007.htm>. Accessed February 2011.

California Air Resources Board (CARB). 2007b. *EMFAC2007 Release*. [http://www.arb.ca.gov/msei/onroad/latest\\_version.htm](http://www.arb.ca.gov/msei/onroad/latest_version.htm). Accessed February 2011.

Jones & Stokes Associates. 2007. *URBEMIS2007 for Windows User's Guide*.

**TABLE C-1**

## Construction Information

*Environmental Assessment Supplement for C-17 Assault Landing Zone Articulated Concrete Block Shoulders**Travis Air Force Base, California – Air Emission Calculations***Area to be Disturbed (acres): GIS to Calculate**

North side	3.5
South side	3.8
Total	7.3

**Duration of the Construction Phases (days)**

	Excavate	Grade	Installation	Total North
North side	13	7	35	55
South side	13	7	35	55
Total				110

**Estimated Amount of Soil Excavated (cubic yards)**

North side	2950
South side	3200
Total	6150

**Estimated Vehicle Trips and Round Trip Distance**

		Number of Trips Per Day	Total Number of Trips	Round Trip	
				Distance (miles)	Distance on Unpaved Road Per Round Trip
North side	Soil	11	114	3	3
	Slurry	4	18	1	1
	ACB	11	114	100	0
	Worker Commute	16	880	30	0
South side	Soil	12	125	3	3
	Slurry	5	22	1	1
	ACB	12	125	100	0
	Worker Commute	16	880	30	0

**TABLE C-2****Summary of Total Construction Emissions***Environmental Assessment Supplement for C-17 Assault Landing Zone Articulated Concrete Block Shoulders**Travis Air Force Base, California – Air Emission Calculations*

	<b>Emissions (ton)</b>						
	<b>VOC</b>	<b>CO</b>	<b>NO<sub>x</sub></b>	<b>SO<sub>x</sub></b>	<b>PM<sub>10</sub></b>	<b>PM<sub>2.5</sub></b>	<b>CO<sub>2</sub></b>
<b>Travis Air Force Base, Fairfield, California – Air Emission Calculations</b>							
Assault Landing Zone North	0.101	0.489	0.904	0.0003	0.200	0.137	116.8
Assault Landing Zone South	0.101	0.494	0.918	0.0003	0.218	0.148	118.9
<b>Project Total</b>	<b>0.202</b>	<b>0.983</b>	<b>1.822</b>	<b>0.0006</b>	<b>0.418</b>	<b>0.284</b>	<b>235.7</b>

**TABLE C-3**

Construction Emission Calculations – Travis AFB ALZ North  
 Environmental Assessment Supplement for C-17 Assault Landing Zone Articulated Concrete Block Shoulders  
 Travis Air Force Base, California – Air Emission Calculations

**Construction Emissions – Offroad Equipment: ALZ North**

Emission Source	Emissions (ton)						
	VOC	CO	NO <sub>x</sub>	SO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	CO <sub>2</sub>
Excavation	0.023	0.114	0.166	0.0000	0.053	0.018	18.8
Grading	0.014	0.061	0.110	0.0000	0.036	0.012	11.3
ACB Installation	0.055	0.208	0.481	0.0000	0.022	0.020	56.0
<b>Total</b>	<b>0.091</b>	<b>0.382</b>	<b>0.757</b>	<b>0.000</b>	<b>0.111</b>	<b>0.050</b>	<b>86.1</b>

Note:

1. Emissions from offroad construction equipment were modeled using URBEMIS2007. URBEMIS default equipment settings were used for each phase, with additional equipment specified by Travis AFB for the construction.

**Construction Emissions – Vehicle Emission Factors: ALZ North**

Emission Source	Vehicle Emission Factors (g/mile)						
	VOC	CO	NO <sub>x</sub>	SO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	CO <sub>2</sub>
Worker Commute to Site	0.044	1.774	0.156	0.003	0.028	0.014	297.1
Soil Hauling	0.646	4.245	10.996	0.016	0.401	0.332	1702.12
Slurry Hauling	0.646	4.245	10.996	0.016	0.401	0.332	1702.12
ACB Hauling	0.646	4.245	10.996	0.016	0.401	0.332	1702.12

1. Emission factors are from the EMFAC2007 v. 2.3 model for BAAQMD for the year 2012. Vehicles are assumed to be traveling at a speed of 40 mph.  
 2. Passenger vehicle emission factors were used for worker commute emissions. All other trucks were assumed to be heavy heavy duty trucks to be conservative.

**Construction Emissions – Vehicle Emissions: ALZ North**

Emission Source	Round Trip during Construction		Emissions (ton)						
	Period	VMT/Round trip	VOC	CO	NO <sub>x</sub>	SO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	CO <sub>2</sub>
Worker Commute to Site	880	30	0.0013	0.0516	0.0045	0.0001	0.0008	0.0004	8.65
Soil Hauling	114	3	0.0002	0.0016	0.0041	0.0000	0.0002	0.0001	0.64
Slurry Hauling	18	1	0.0000	0.0001	0.0002	0.0000	0.0000	0.0000	0.03
ACB Hauling	114	100	0.0081	0.0533	0.1382	0.0002	0.0050	0.0042	21.39
<b>Total</b>			<b>0.010</b>	<b>0.11</b>	<b>0.1471</b>	<b>0.00029</b>	<b>0.0060</b>	<b>0.0047</b>	<b>30.71</b>

**TABLE C-3**

Construction Emission Calculations – Travis AFB ALZ North  
 Environmental Assessment Supplement for C-17 Assault Landing Zone Articulated Concrete Block Shoulders  
 Travis Air Force Base, California – Air Emission Calculations

**Vehicle travel on Unpaved Surfaces: ALZ North.**

Emission Factor (URMEMIS default):

$$EF^{(1)} = (k (s/12)^{1.0} (S/30)^{0.5}) / ((M/0.5)^{0.2}) \text{ lb/vehicle mile traveled (vmt)}$$

	<b>k</b>	<b>s</b>	<b>S</b>	<b>M</b>	<b>Emission factor (lb/VMT)</b>
	1.8	4.3	15	0.5	0.46

1. Emission factors were calculated using unpaved fugitive dust emission calculation equation and default parameters from Appendix C of the URBEMIS2007 Users Guide (Jones & Stokes , 2007).

k = the fraction of particles less than or equal to the particle size cutoff of 10 microns

s = surface material silt content (%)

S = the average vehicle speed (mph)

M = surface moisture content (%)

**Fugitive Dust Emissions**

Total Miles on Unpaved

Road 360 miles

Fugitive Dust Emissions 0.082 tons

**Summary of Construction Emissions: ALZ North**

	<b>Emissions (ton)</b>						
	<b>VOC</b>	<b>CO</b>	<b>NO<sub>x</sub></b>	<b>SO<sub>x</sub></b>	<b>PM<sub>10</sub></b>	<b>PM<sub>2.5</sub></b>	<b>CO<sub>2</sub></b>
Construction Equipment/ Fugitive Dust	0.091	0.382	0.757	0.0000	0.111	0.050	86.1
Onroad Vehicles	0.010	0.107	0.147	0.0003	0.006	0.005	30.7
Fugitive Dust from Unpaved Roads	NA	NA	NA	NA	0.082	0.082	NA
<b>Total</b>	<b>0.101</b>	<b>0.489</b>	<b>0.904</b>	<b>0.0003</b>	<b>0.200</b>	<b>0.137</b>	<b>116.8</b>

Note:

Unpaved road PM<sub>2.5</sub> emissions were assumed to be the same as PM<sub>10</sub>, to be conservative.

**TABLE C-4**

Construction Emission Calculations – Travis AFB ALZ South  
 Environmental Assessment Supplement for C-17 Assault Landing Zone Articulated Concrete Block Shoulders  
 Travis Air Force Base, California – Air Emission Calculations

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**Construction Emissions – Offroad Equipment: ALZ South**


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Emission Source	Emissions (ton)						
	VOC	CO	NO <sub>x</sub>	SO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	CO <sub>2</sub>
Excavation	0.023	0.114	0.166	0.000	0.061	0.020	18.8
Grading	0.014	0.061	0.110	0.000	0.039	0.012	11.3
ACB Installation	0.055	0.208	0.481	0.000	0.022	0.020	56.0
Total	0.091	0.382	0.757	0.000	0.121	0.052	86.1

Note:

1. Emissions from offroad construction equipment were modeled using URBEMIS2007. URBEMIS default equipment settings were used for each phase, with additional equipment specified by Travis AFB for the construction.

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**Construction Emissions – Vehicle Emission Factors: ALZ South**


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Emission Source	Vehicle Emission Factors (g/mile)						
	VOC	CO	NO <sub>x</sub>	SO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	CO <sub>2</sub>
Worker Commute to Site	0.044	1.774	0.156	0.003	0.028	0.014	297.1
Soil Hauling	0.646	4.245	10.996	0.016	0.401	0.332	1702.12
Slurry Hauling	0.646	4.245	10.996	0.016	0.401	0.332	1702.12
ACB Hauling	0.646	4.245	10.996	0.016	0.401	0.332	1702.12

1. Emission factors are from the EMFAC2007 v. 2.3 model for BAAQMD for the year 2012. Vehicles are assumed to be traveling at a speed of 40 mph.

2. Passenger vehicle emission factors were used for worker commute emissions. All other trucks were assumed to be heavy heavy duty trucks to be conservative.

**TABLE C-4**

Construction Emission Calculations – Travis AFB ALZ South  
 Environmental Assessment Supplement for C-17 Assault Landing Zone Articulated Concrete Block Shoulders  
 Travis Air Force Base, California – Air Emission Calculations

**Construction Emissions – Vehicle Emissions: ALZ South**

Emission Source	Round Trip during Construction	VMT/Round trip	Emissions (ton)						
	Period		VOC	CO	NO <sub>x</sub>	SO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	CO <sub>2</sub>
Worker Commute to Site	880	30	0.0013	0.0516	0.0045	0.0001	0.0008	0.0004	8.65
Soil Hauling	125	3	0.0003	0.0018	0.0045	0.0000	0.0002	0.0001	0.70
Slurry Hauling	22	1	0.0000	0.0001	0.0003	0.0000	0.0000	0.0000	0.04
ACB Hauling	125	100	0.0089	0.0585	0.1515	0.0002	0.0055	0.0046	23.45
<b>Total</b>			0.010	0.11	0.1609	0.00031	0.0065	0.0051	32.84

**Vehicle travel on Unpaved Surfaces: ALZ South**

Emission Factor (URMEMIS default):

$$EF^{(1)} = (k (s/12)^{1.0} (S/30)^{0.5}) / ((M/0.5)^{0.2}) \text{ lb/vehicle mile traveled (vmt)}$$

k	s	S	M	Emission factor (lb/VMT)
1.8	4.3	15	0.5	0.46

1. Emission factors were calculated using unpaved fugitive dust emission calculation equation and default parameters from Appendix C of the URBEMIS2007 Users Guide (Jones & Stokes , 2007).

k = the fraction of particles less than or equal to the particle size cutoff of 10 microns

s = surface material silt content (%)

S = the average vehicle speed (mph)

M = surface moisture content (%)

**Fugitive Dust Emissions**

Total Miles on Unpaved Road	397	miles
Fugitive Dust Emissions	0.091	tons

**Summary of Construction Emissions: ALZ South**

	Emissions (ton)						
	VOC	CO	NO <sub>x</sub>	SO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	CO <sub>2</sub>
Construction Equipment/ Fugitive Dust	0.091	0.382	0.757	0.000	0.121	0.052	86.1
Onroad Vehicles	0.010	0.112	0.161	0.0003	0.007	0.005	32.8
Fugitive Dust from Unpaved Roads	NA	NA	NA	NA	0.091	0.091	NA
<b>Total</b>	0.101	0.494	0.918	0.0003	0.218	0.148	118.9

Note:

Unpaved road PM<sub>2.5</sub> emissions were assumed to be the same as PM<sub>10</sub>, to be conservative.

## **URBEMIS Outputs**

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Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\project\Travis\SLZ EA\SLZ EA Construction Emissions North.urb924

Project Name: Travis SLZ EA Supplement North

Project Location: Bay Area Air District

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10 Dust</u>	<u>PM10 Exhaust</u>	<u>PM10</u>	<u>PM2.5 Dust</u>	<u>PM2.5 Exhaust</u>	<u>PM2.5</u>	<u>CO2</u>
2012 TOTALS (tons/year unmitigated)	0.09	0.76	0.40	0.00	0.05	0.04	0.09	0.01	0.03	0.05	87.92

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10 Dust</u>	<u>PM10 Exhaust</u>	<u>PM10</u>	<u>PM2.5 Dust</u>	<u>PM2.5 Exhaust</u>	<u>PM2.5</u>	<u>CO2</u>
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12/14/2011 1:32:52 PM

2012	0.09	0.76	0.40	0.00	0.05	0.04	0.09	0.01	0.03	0.05	87.92
Demolition 03/01/2012-03/19/2012	0.02	0.17	0.13	0.00	0.02	0.01	0.03	0.00	0.01	0.01	20.10
Fugitive Dust	0.00	0.00	0.00	0.00	0.04	0.00	0.04	0.01	0.00	0.01	0.00
Demo Off Road Diesel	0.02	0.17	0.11	0.00	0.00	0.01	0.01	0.00	0.01	0.01	18.78
Demo On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Demo Worker Trips	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.33
Fine Grading 03/20/2012-03/28/2012	0.01	0.11	0.07	0.00	0.03	0.01	0.04	0.01	0.01	0.01	11.81
Fine Grading Dust	0.00	0.00	0.00	0.00	0.03	0.00	0.03	0.01	0.00	0.01	0.00
Fine Grading Off Road Diesel	0.01	0.11	0.06	0.00	0.00	0.01	0.01	0.00	0.01	0.01	11.27
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.54
Building 03/29/2012-05/17/2012	0.05	0.48	0.21	0.00	0.00	0.02	0.02	0.00	0.02	0.02	56.01
Building Off Road Diesel	0.05	0.48	0.21	0.00	0.00	0.02	0.02	0.00	0.02	0.02	56.01
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Building Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Phase Assumptions

- Phase: Demolition 3/1/2012 - 3/19/2012 - excavation
- Building Volume Total (cubic feet): 80000
- Building Volume Daily (cubic feet): 8000
- On Road Truck Travel (VMT): 0
- Off-Road Equipment:
- 1 Concrete/Industrial Saws (10 hp) operating at a 0.73 load factor for 8 hours per day
- 4 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day
- 1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 1 hours per day

Page: 3

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2 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 6 hours per day

Phase: Fine Grading 3/20/2012 - 3/28/2012 - grading

Total Acres Disturbed: 3.5

Maximum Daily Acreage Disturbed: 0.88

Fugitive Dust Level of Detail: Default

10 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

3 Graders (174 hp) operating at a 0.61 load factor for 6 hours per day

1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 6 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Building Construction 3/29/2012 - 5/17/2012 - ACB installation

Off-Road Equipment:

7 Cranes (399 hp) operating at a 0.43 load factor for 4 hours per day

2 Forklifts (145 hp) operating at a 0.3 load factor for 6 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\project\Travis\SLZ EA\SLZ EA Construction Emissions South.urb924

Project Name: Travis SLZ EA Supplement South

Project Location: Bay Area Air District

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10 Dust</u>	<u>PM10 Exhaust</u>	<u>PM10</u>	<u>PM2.5 Dust</u>	<u>PM2.5 Exhaust</u>	<u>PM2.5</u>	<u>CO2</u>
2012 TOTALS (tons/year unmitigated)	0.09	0.76	0.40	0.00	0.06	0.04	0.09	0.01	0.03	0.05	87.92

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10 Dust</u>	<u>PM10 Exhaust</u>	<u>PM10</u>	<u>PM2.5 Dust</u>	<u>PM2.5 Exhaust</u>	<u>PM2.5</u>	<u>CO2</u>
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2012	0.09	0.76	0.40	0.00	0.06	0.04	0.09	0.01	0.03	0.05	87.92
Demolition 05/18/2012-06/05/2012	0.02	0.17	0.13	0.00	0.02	0.01	0.03	0.00	0.01	0.01	20.10
Fugitive Dust	0.00	0.00	0.00	0.00	0.05	0.00	0.05	0.01	0.00	0.01	0.00
Demo Off Road Diesel	0.02	0.17	0.11	0.00	0.00	0.01	0.01	0.00	0.01	0.01	18.78
Demo On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Demo Worker Trips	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.33
Fine Grading 06/06/2012-06/14/2012	0.01	0.11	0.07	0.00	0.03	0.01	0.04	0.01	0.01	0.01	11.81
Fine Grading Dust	0.00	0.00	0.00	0.00	0.03	0.00	0.03	0.01	0.00	0.01	0.00
Fine Grading Off Road Diesel	0.01	0.11	0.06	0.00	0.00	0.01	0.01	0.00	0.01	0.01	11.27
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.54
Building 06/15/2012-08/03/2012	0.05	0.48	0.21	0.00	0.00	0.02	0.02	0.00	0.02	0.02	56.01
Building Off Road Diesel	0.05	0.48	0.21	0.00	0.00	0.02	0.02	0.00	0.02	0.02	56.01
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Building Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Phase Assumptions

- Phase: Demolition 5/18/2012 - 6/5/2012 - excavation
- Building Volume Total (cubic feet): 86500
- Building Volume Daily (cubic feet): 8650
- On Road Truck Travel (VMT): 0
- Off-Road Equipment:
- 1 Concrete/Industrial Saws (10 hp) operating at a 0.73 load factor for 8 hours per day
- 4 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day
- 1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 1 hours per day

Page: 3

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2 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 6 hours per day

Phase: Fine Grading 6/6/2012 - 6/14/2012 - grading

Total Acres Disturbed: 3.8

Maximum Daily Acreage Disturbed: 0.95

Fugitive Dust Level of Detail: Default

10 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

3 Graders (174 hp) operating at a 0.61 load factor for 6 hours per day

1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 6 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Building Construction 6/15/2012 - 8/3/2012 - ACB installation

Off-Road Equipment:

7 Cranes (399 hp) operating at a 0.43 load factor for 4 hours per day

2 Forklifts (145 hp) operating at a 0.3 load factor for 6 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

**Appendix D**  
**Clean Air Act Conformity Applicability Analysis**

# Clean Air Act Conformity Applicability Analysis for Travis Air Force Base ACBs Installation

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## D.1 Purpose

The U.S. Air Force is required to perform a general conformity applicability analysis to determine whether the construction and installation of the articulated concrete blocks (ACBs) at Travis Air Force Base (AFB), California, will comply with the U.S. Environmental Protection Agency (EPA) Final Conformity Rule, 40 Code of Federal Regulations (CFR) 93, Subpart B (for federal agencies), and 40 CFR 51, Subpart W (for state requirements) of the amended Clean Air Act (CAA).

## D.2 Background

EPA has issued regulations addressing the applicability and procedures for ensuring that federal activities comply with the amended CAA. The EPA Final Conformity Rule implements Section 176(c) of the CAA, as amended in 42 United States Code (USC) 7506(c). This rule was published in the *Federal Register* on November 30, 1993, and took effect on January 31, 1994. In March 2010, EPA revised the Final Conformity Rule, which was published in the *Federal Registry* in April 2010. The revised rule, which took effect in July 2010, improves the process federal entities use to demonstrate that their actions will not contribute to a violation of a national air quality standard. The analysis presented in this appendix follows the revised rule, which requires comparison of project emissions to *de minimis* thresholds. The regional significance analysis is no longer required.

The EPA Final Conformity Rule requires federal agencies to ensure that a federal action resulting in nonattainment or maintenance criteria pollutant emissions conforms with an approved or promulgated state or federal implementation plan. Conformity means compliance with the purpose of attaining or maintaining National Ambient Air Quality Standards (NAAQS). Specifically, this means ensuring that the federal action will not 1) cause a new violation of NAAQS, 2) increase the frequency or severity of existing violations of NAAQS, or 3) delay the timely attainment of NAAQS interim or other attainment milestones.

The EPA Final Conformity Rule applies only to federal actions in NAAQS nonattainment or maintenance areas.

## D.3 Summary of Air Pollutant Emissions and Regulatory Standards

The Proposed Action would be implemented in Solano County, California, under the jurisdiction of the California Air Resources Board (CARB), the Bay Area Air Quality

Management District (BAAQMD), and EPA Region 9. The area is designated as nonattainment (marginal) for 8-hour ozone (O<sub>3</sub>) and particulate matter less than 2.5 micrometers in diameter (PM<sub>2.5</sub>) for NAAQS. In addition, the urbanized areas of Solano County, which include the area occupied by Travis AFB, are designated as maintenance for carbon monoxide (CO) under the 2004 Revision to the California State implementation Plan for Carbon Monoxide, Updated Maintenance Plan for Ten Federal Planning Areas (CARB, 2004). The county is in attainment of NAAQS for all other criteria pollutants.

The EPA Final Conformity Rule requires that total direct and indirect emissions of nonattainment and maintenance criteria pollutants, including O<sub>3</sub> precursors (volatile organic compounds [VOC] and nitrogen oxides [NO<sub>x</sub>]), be considered in determining conformity. The rule does not apply to actions where total direct and indirect emissions of nonattainment and maintenance criteria pollutants do not exceed their thresholds established in 40 CFR 93.153(b). Tables D-1 and D-2 present the *de minimis* thresholds of nonattainment and maintenance areas, respectively. If a federal action meets *de minimis* requirements, detailed conformity analyses are not required pursuant to 40 CFR 93.153(c). The applicable *de minimis* thresholds for the Proposed Action are 100 tons per year (tpy) for emissions of O<sub>3</sub> precursors (VOC and NO<sub>x</sub>), PM<sub>2.5</sub>, sulfur dioxide (SO<sub>2</sub>) (precursor of PM<sub>2.5</sub>), and CO.

**TABLE D-1**

*De Minimis* Thresholds in Nonattainment Areas  
 Environmental Assessment Supplement for C-17 Assault Landing Zone Articulated Concrete Block Shoulders  
 Travis Air Force Base, California – Clean Air Act Conformity Applicability Analysis for Travis Air Force Base ACBs  
 Installation

Pollutant	Degree of Nonattainment	<i>De Minimis</i> Threshold <sup>a</sup>
O <sub>3</sub> (VOC and NO <sub>x</sub> )	Serious	50
	Severe	25
	Extreme	10
	Other ozone – outside an O <sub>3</sub> transport region	<b>100</b>
O <sub>3</sub> (VOC)	Marginal and moderate – inside an O <sub>3</sub> transport region:	50
O <sub>3</sub> (NO <sub>x</sub> )	Marginal and moderate – inside an O <sub>3</sub> transport region:	100
CO	All	100
PM <sub>10</sub>	Moderate	100
	Serious	70
PM <sub>2.5</sub>	Direct emissions	<b>100</b>
	NO <sub>x</sub>	<b>100</b>
	SO <sub>2</sub>	<b>100</b>
	VOC or ammonia	100
SO <sub>2</sub> or NO <sub>2</sub>	All	100
Lead	All	25

<sup>a</sup>*De minimis* thresholds are listed in tons per year. The bold numbers reflect *de minimis* thresholds used in this analysis.

Note:

NO<sub>2</sub> = nitrogen dioxide

Source: 40 CFR 93.153(b)

**TABLE D-2**

*De Minimis* Thresholds in Maintenance Areas  
Environmental Assessment Supplement for C-17 Assault Landing Zone Articulated Concrete Block Shoulders  
Travis Air Force Base, California – Clean Air Act Conformity Applicability Analysis for Travis Air Force Base ACBs  
Installation

Pollutant	Maintenance Area	<i>De Minimis</i> Threshold <sup>a</sup>
O <sub>3</sub> (NO <sub>x</sub> )	All	100
O <sub>3</sub> (VOC)	Inside an O <sub>3</sub> transport region	50
	Outside an O <sub>3</sub> transport region	100
CO	All	<b>100</b>
PM <sub>10</sub>	All	100
PM <sub>2.5</sub>	Direct emissions	100
	NO <sub>x</sub>	100
	SO <sub>2</sub>	100
	VOC or ammonia	100
SO <sub>2</sub> or NO <sub>2</sub>	All	100
Lead	All	25

<sup>a</sup>*De minimis* thresholds are listed in tons per year. The bold number reflects the *de minimis* threshold used in this analysis.

Note:

NO<sub>2</sub> = nitrogen dioxide

Source: 40 CFR 93.153(b)

## D.4 Emission Calculations

### D.4.1 Construction Emissions

Site preparation and installation of the ACBs would take approximately 55 working days for each north and south site. Construction is expected to start in March 2012 for a total of 110 working days. The total construction footprint would be approximately 7.3 acres. Construction emissions are expected from engine exhaust from the additional vehicle trips by construction workers, delivery trucks, and offroad construction equipment. These emissions would primarily consist of CO, NO<sub>x</sub>, PM<sub>10</sub>, PM<sub>2.5</sub>, SO<sub>2</sub>, and VOC. In addition, vehicle travel on unpaved roads would result in fugitive dust emissions. The offroad construction equipment emissions were estimated using URBEMIS2007 (CARB, 2007a). Fugitive dust emissions from unpaved roads were estimated using the equation and default parameters in Appendix B of the URBEMIS2007 User’s Guide (Jones & Stokes Associates, 2007).

Emissions associated with worker commutes were estimated by using the expected number of vehicle miles traveled by the workers. To be conservative, material hauling trucks used for the construction were assumed to be heavy-duty trucks. Vehicle emission factors were calculated using EMFAC2007 (CARB, 2007b) for BAAQMD for calendar year 2012.

Table D-3 summarizes the emissions associated with the Proposed Action construction.

**TABLE D-3**

Summary of Construction Emissions for Proposed Action  
*Environmental Assessment Supplement for C-17 Assault Landing Zone Articulated Concrete Block Shoulders  
 Travis Air Force Base, California – Clean Air Act Conformity Applicability Analysis for Travis Air Force Base ACBs  
 Installation*

Emission Type	Annual Emissions (ton/year)				
	VOC	CO	NO <sub>x</sub>	SO <sub>2</sub>	PM <sub>2.5</sub>
Assault Landing Zone North	0.101	0.489	0.904	0.0003	0.137
Assault Landing Zone South	0.101	0.494	0.918	0.0003	0.148
<b>Project Total</b>	0.202	0.983	1.822	0.0006	0.284

## D.4.2 Operation Emissions

No operation emissions are expected after the perimeter fences are constructed. Therefore, operation of the Proposed Action would not cause adverse air quality impacts, and no further analysis is required.

## D.4.3 Emissions Summary and Comparison to *De Minimis* Levels

Table D-4 shows the annual emission increases associated with the Proposed Action and the comparisons with the *de minimis* thresholds. As shown, emissions of VOC, NO<sub>x</sub>, PM<sub>2.5</sub>, SO<sub>2</sub>, and CO during construction of the project are well below their *de minimis* thresholds. On the basis of the conformity applicability criteria, the project conforms to the most recent EPA-approved state implementation plan (SIP); therefore, the project is exempt from the CAA conformity requirements and does not require a detailed conformity demonstration.

**TABLE D-4**

General Conformity Analysis for Proposed Action  
*Environmental Assessment Supplement for C-17 Assault Landing Zone Articulated Concrete Block Shoulders  
 Travis Air Force Base, California – Clean Air Act Conformity Applicability Analysis for Travis Air Force Base ACBs  
 Installation*

Activity	Annual Emission (tpy)				
	VOC	CO	NO <sub>x</sub>	SO <sub>2</sub>	PM <sub>2.5</sub>
Construction (2012)	0.202	0.983	1.822	0.0006	0.284
Operation (2012 and after)	0	0	0	0	0
<i>De Minimis</i> Threshold	100	100	100	100	100
Exceeds <i>De Minimis</i> Threshold?	No	No	No	No	No

## D.5 Works Cited

California Air Resources Board (CARB). 2004. *2004 Revision to the California State Implementation Plan for Carbon Monoxide, Updated Maintenance Plan for Ten Federal Planning Areas.*

California Air Resources Board (CARB). 2007a. *URBEMIS 2007 for Windows, Version 9.2*. <http://www.arb.ca.gov/planning/urbemis/urbemis2007/urbemis2007.htm>. Accessed February 2011.

California Air Resources Board (CARB). 2007b. *EMFAC2007 Release*. [http://www.arb.ca.gov/msei/onroad/latest\\_version.htm](http://www.arb.ca.gov/msei/onroad/latest_version.htm). Accessed February 2011.

Jones & Stokes Associates. 2007. *URBEMIS2007 for Windows User's Guide*.

**Appendix E**  
**Proof of Publication**

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# Vacaville Reporter

916 Cotting Lane  
Vacaville, CA 95501  
707 453-8104  
@thereporter.com

TAFB 60 CES/CEV  
411 AIRMEN DRIVE  
Fairfield CA 94535

## PROOF OF PUBLICATION (2015.5 C.C.P.) STATE OF CALIFORNIA COUNTY OF SOLANO, S.S.

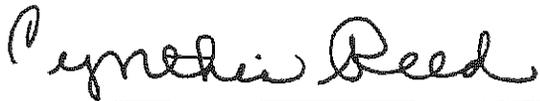
### FILE NO. ArticulatedCement Block

I am a citizen of the United States and a resident of the county of Solano. I am over the age of 18 years, and not a party to or interested in the above-entitled matter. I am the principal clerk of the printer of THE VACAVILLE REPORTER, a newspaper of general circulation, printed in the city of Vacaville and published daily in the cities of Vacaville and Dixon and throughout the county of Solano. The Reporter has been adjudged a newspaper of general circulation for the cities of Vacaville and Dixon, pursuant to Decree No. 25888 on June 30, 1952, and Decree No. 1006329 on March 20, 1996. The notice of which the attached is a printed copy (set in type not smaller than non-pareil), has been published in each regular and entire issue of THE VACAVILLE REPORTER. And not in any supplement thereof, on the following dates, to wit:

2/10/2012

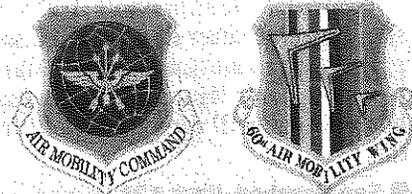
I certify (or declare) under penalty of perjury that the foregoing is true and correct.

Dated at Vacaville, California, this  
10th day of February 2012

  
\_\_\_\_\_  
ature)

Cynthia Reed

Legal No. 0004328754



### NOTICE OF AVAILABILITY DRAFT ENVIRONMENTAL ASSESSMENT (EA) AND FINDING OF NO SIGNIFICANT IMPACT (FONSI) TO CONSTRUCT ARTICULATED CONCRETE BLOCK SHOULDERS, C-17 ASSAULT LANDING ZONE, TRAVIS AFB, FAIRFIELD, CALIFORNIA

The 60th Air Mobility Wing at Travis Air Force Base (TAFB) proposes to construct articulated concrete block shoulders along the C-17 Assault Landing Zone on Travis Air Force Base. Articulated concrete blocks form stable shoulders that resist erosion and minimize loose material that can be drawn up into jet engines potentially causing damage.

The Draft EA and FONSI are available at the Fairfield Civic Center Library, the Vacaville Public Library Cultural Center, the Suisun City Library and the Mitchell Memorial Library on TAFB. The documents are also posted on the Travis AFB public website at <http://www.travis.af.mil/enviro>

Written comments may be mailed to:

Department of the Air Force  
Attn: Mr. Chris Krettecoc  
60 CES/CEAO  
411 Airman Drive  
Travis AFB, CA 94535

Comments may also be faxed to the attention of Mr. Krettecoc at (707) 424-5105. All comments must be received by 12 March 2012. E-mailed comments will not be accepted. If you have questions, please contact Mr. Krettecoc at (707) 424-7517.

