

AUGUST 2004

DRAFT

**ENVIRONMENTAL ASSESSMENT OF THE PROPOSED TRANSFER
OF LAND FROM FORT HOOD TO THE TEXAS A & M
UNIVERSITY SYSTEM
BELL COUNTY, TEXAS**



PREPARED FOR:



**US Army Corps
of Engineers®**

FORT WORTH DISTRICT

FINDING OF NO SIGNIFICANT IMPACT

PROPOSED TRANSFER OF LAND FROM FORT HOOD TO THE TEXAS A & M UNIVERSITY SYSTEM, BELL COUNTY, TEXAS

1.0 NAME OF THE ACTION

Proposed Transfer of Land from Fort Hood to the Texas A&M University System (TAMUS),
Bell County, Texas

2.0 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

The Proposed Action Alternative involves the transfer of land from Fort Hood to the TAMUS. The subject property encompasses approximately 672.36 acres and is located in the northeastern portion of Fort Hood Training Area 27. The property is bounded by State Highway 195 on the east side, Airport Road on the north, and the Texas State Veteran's Cemetery to the south, and the remainder of Training Area 27 and Fort Hood property to the west.

In addition to the Proposed Action and the No-Action Alternatives, one other alternative was considered, but eliminated from further consideration since it was considered impractical and not feasible.

3.0 SUMMARY OF ENVIRONMENTAL EFFECT OF PROPOSED ACTION

Based on the Environmental Assessment (EA) prepared August 2004, which is hereby incorporated by reference, there would be no direct impacts on the environment associated with the real estate action of transferring the property from Fort Hood to TAMUS; however, there will be insignificant adverse impacts associated with the proposed TAMUS campus development. Short term, insignificant adverse impacts to air quality, noise, protection of children, hazardous and toxic materials are anticipated. Long-term, insignificant adverse impacts to land use, topography, aesthetics and visual resources, soils and prime farmlands, waters of the U.S, water quality, vegetation, fish and wildlife, threatened and endangered species, and transportation and utilities are anticipated. Construction of the proposed campus is expected to have no impacts on geology, groundwater, surface water, wetlands, floodplains, or environmental justice. There are

no sites eligible for listing on the National Register of Historic Places and concurrence on the eligibility has been received from the State Historic Preservation Office during previous consultations. There would be insignificant beneficial impacts to the natural environment associated with the cessation of grazing activities and military training activities upon completion of the transfer of property from Fort Hood to the TAMUS.

4.0 MITIGATION

Specific mitigation measures are detailed in the attached EA prepared August 2004, which is hereby incorporated by reference that would reduce or eliminate the impacts on the environment associated with the transfer of the property from Fort Hood to the TAMUS.

5.0 PUBLIC COMMENT/REVIEW

The EA and Finding of No Significant Impact (FNSI) are available for review and comment for 30 days, beginning August 15, 2004 through September 14, 2004. The EA and FNSI can be viewed on the following website: www.dpw.hood.army.mil. Copies have also been provided to the Killeen Public Library at 205 East Church Avenue, Killeen, Texas, 76541, and at the Sterling C. Evans Library on the main campus of Texas A&M University, Bryan-College Station, TX (phone 979-845-5741 for directions to the library). Comments on the EA and this FNSI should be submitted no later than September 14, 2004 to: U.S.Army, HQ III Corps and Fort Hood, Attn: AFZF-PW-ENV, Building 4219, 77th Street and Warehouse Avenue, Fort Hood, TX 76544-5028, Attn: Nancy Niemann, (phone 254-287-6499).

6.0 CONCLUSION

On the basis of the findings of the EA, no significant impact is anticipated from the Proposed Action on human health or the natural environment. A Finding of No Significant Impact (FNSI) is warranted and the preparation of an Environmental Impact Statement (EIS) is not required for this action.

**ENVIRONMENTAL ASSESSMENT OF THE PROPOSED
TRANSFER OF LAND FROM FORT HOOD TO THE
TEXAS A & M UNIVERSITY SYSTEM
BELL COUNTY, TEXAS**

Prepared for:

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August 2004

**ENVIRONMENTAL ASSESSMENT
OF THE PROPOSED TRANSFER OF LAND FROM FORT
HOOD TO THE TEXAS A & M UNIVERSITY SYSTEM
BELL COUNTY, TEXAS**

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August 2004

EXECUTIVE SUMMARY

ENVIRONMENTAL ASSESSMENT

OF THE PROPOSED TRANSFER OF LAND FROM FORT HOOD TO THE

TEXAS A & M UNIVERSITY SYSTEM

This Environmental Assessment (EA) addresses the potential for significant adverse or beneficial impacts of the proposed transfer of land from Fort Hood to the Texas A&M University System (TAMUS). The EA describes the purpose and need of the proposed action, alternatives considered, existing conditions of the environment, the anticipated impacts that would result from implementation of the proposed action, and any design measures needed to reduce potential impacts within the project area.

PURPOSE AND NEED:

TAMUS has requested land from Fort Hood in order to create a new permanent, upper level, stand-alone university campus. The facility would provide higher education for active soldiers, family members, and retirees, along with civilians. There is the potential for a partnership between Fort Hood and the TAMUS to provide educational opportunities to military personnel. The transfer would also control development along the installation boundary.

A land survey determined that approximately 672.36 acres of land on the perimeter of Fort Hood could be transferred to TAMUS. This transfer would occur through passing of special legislation. The 672.36-acre property is currently under utilized by Fort Hood for training exercises. The property lies on the perimeter of Fort Hood near two major roads and numerous residences. Due to these factors, training activities are limited, and the Army is unable to use the property to conduct necessary infantry and vehicle maneuvers required to keep their units at the required level of readiness. Therefore, Fort Hood proposes to transfer the property to TAMUS for the future development of a university.

PROPOSED ACTION:

The Proposed Action Alternative involves the transfer of land from Fort Hood to the TAMUS. The subject property encompasses 672.36 acres and is located in the northeastern portion of Fort Hood Training Area (TA) 27. The property has been used for cattle grazing and is undeveloped with no buildings located on the property. The only structures located on the property are a corral and several deer hunting stands.

TAMUS proposes to develop a 20,000-student university within the subject property. Current conceptual designs for the campus include approximately 40 buildings (comprised of academic, office, and residential) and three to four large parking lots with smaller parking areas scattered throughout the campus. Also included in the current design is the construction of several athletic facilities to include a football stadium/track and field complex, baseball stadium, baseball/softball complex, and two additional intramural fields. Numerous paved roadways and sidewalks will connect the facets of the campus, and exterior lighting will be installed for safety purposes. It is currently envisioned that the university will provide access to the property from Airport Road to the north and State Highway 195 on the east. Extension of municipal gas, electric, sewer, water, and communication utilities would be necessary. Current conceptual

designs show that the proposed university will utilize approximately 225 acres; however, this will change as the design process continues. The timeline for construction is unknown at this time as design plans are conceptual in nature and construction is not anticipated to begin for several years. Once construction commences, it will be incremental (on an as-needed basis), therefore taking many years to complete the entire campus.

After transfer of the property is complete and before construction is initiated, a 33-foot wide area will be cleared on the perimeter of the property to allow for the construction of a boundary fence typical to a military installation (*i.e.* 8-foot chain link fence with a three-strand barbed wire overhang). Upon completion of fence construction, vehicle access will be restricted to the 16 feet adjacent to the fence and the remaining area will be allowed to revegetate naturally. It is anticipated that periodic fence maintenance would occur.

ALTERNATIVES TO THE PROPOSED ACTION:

No Action Alternative

Under the No Action Alternative, the transfer of the subject property to the TAMUS would not occur. The subject property would continue to be used for grazing and limited training. Additional educational opportunities for soldiers at Fort Hood, their families, and civilians in the area would not be realized.

ENVIRONMENTAL CONSEQUENCES:

There would be no direct impacts on the environment associated with the real estate action of transferring the property from Fort Hood to TAMUS; however, there will be insignificant adverse impacts associated with the proposed TAMUS campus development. There would be insignificant beneficial impacts to the natural environment associated with the cessation of grazing activities and military training activities upon completion of the transfer of property from Fort Hood to the TAMUS. Indirect impacts associated with the construction of a campus are expected. Approximately 225 acres of prime farmland soils, vegetation, and wildlife habitat would be impacted because it would no longer be available for biological or agricultural use. Land use and topography are expected to change as a result of the proposed project. Short term, insignificant adverse impacts to air quality, noise, protection of children, hazardous and toxic materials are anticipated. Long-term, insignificant adverse impacts to land use, waters of the U.S., topography, aesthetics and visual resources, soils and prime farmlands, water quality, vegetation, fish and wildlife, threatened and endangered species, cultural resources, and transportation and utilities are anticipated during construction. Long-term, adverse impacts to threatened and endangered species as a result of the construction of the proposed campus are anticipated to be insignificant provided the incidental take statement, reasonable and prudent measures, and terms and conditions outlined in the BO are adhered to throughout the life of the project. A long-term beneficial impact to socioeconomics including local employment rates and local incomes is expected. Construction of the proposed campus is expected to have no impacts on geology, groundwater, surface water, floodplains, or environmental justice.

Depending upon design, the proposed university construction could have impacts on jurisdictional waters of the U.S. Any future development in the floodplain must adhere to state and local regulations in order to reduce the risks to human health and safety. Future analysis of impacts to transportation and utilities would be explored throughout the design phases.

There are two archaeological sites located within the area of potential effect of the proposed land transfer. Neither of these sites is eligible for listing on the NRHP. Concurrence on the eligibility of these sites has been received from the SHPO during previous consultations. The Fort Hood Cultural Resources Manager is currently in consultation with the Texas SHPO to confirm concurrence for this project and to determine if any mitigation measures are necessary.

CONCLUSIONS:

Based upon the results of the EA and given the identified environmental and archaeological mitigation measures, it has been concluded that the proposed action would not have a significant adverse impact on the environment. Therefore, based on the results of this Environmental Assessment, a Finding of No Significant Impact is warranted and an Environmental Impact Statement (EIS) is not required for this action.

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LIST OF ACRONYMS/ABBREVIATIONS

$\mu\text{g}/\text{m}^3$	microgram per cubic meter
APE	Area of Potential Effect
AQCR	Air Quality Control Region
AR	Army Regulation
BA	Biological Assessment
BCWCID	Bell County Water Control Improvement District
BMPs	Best Management Practices
CAA	Clean Air Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CO	Carbon Monoxide
CWA	Clean Water Act
DNL	day-night average sound level
E.O.	Executive Order
EA	Environmental Assessment
EBS	Environmental Baseline Survey
EDR	Environmental Data Resources, Inc.
EOD	Explosive Ordnance Disposal
ERNS	Emergency Response Notification System
ESA	Endangered Species Act

ESMP	Endangered Species Management Plan
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FPPA	Farmland Protection Policy Act
HAAF	Hood Army Airfield
INRMP	Integrated Natural Resources Management Plan
kcf	thousand cubic feet
mgd	million gallons/day
MS4	Municipal Separate Storm Sewer System
MSA	Metropolitan Statistical Area
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NESHAP	National Emissions Standards for Hazardous Air Pollutants
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NRHP	National Register of Historic Places
NOA	Notice of Availability
NOAA	National Oceanic and Atmospheric Administration
NO _x	Nitrogen Oxides
NPDES	National Pollution Discharge Elimination System
NPL	National Priority List
NRCS	Natural Resource Conservation Service
NRHP	National Register of Historic Places
NSR	New Source Review
O ₃	Ozone
OSHA	Occupational Safety and Health Administration
Pb	Lead
pCi/L	picoCuries per liter
PCBs	polychlorinated biphenyls
PCPI	Per Capita Personal Income
PL	Public Law
PM _{2.4}	Particulate Matter less than 2.4 micrometers in size
PM ₁₀	Particulate Matter up to 10 micrometers in size
POV	privately-owned vehicles
ppm	parts per million
PSD	Prevention of Significant Deterioration
RCRA	Resource Conservation and Recovery Act
RCRIS	Resource Conservation and Recovery Information System
RGAAF	Robert Gray Army Airfield
ROI	Region of Influence
SHPO	State Historic Preservation Office
SIP	State Implementation Plan
SO ₂	Sulfur Dioxide
SMAQMD	Sacramento Metropolitan Air Quality Management District
SWPPP	Storm Water Pollution Prevention Plan
TA	Training Area

TAAQS	Texas Ambient Air Quality Standards
TAMUS	Texas A&M University System
TCEQ	Texas Commission on Environmental Quality
TCP	Traditional Cultural Properties
TPDES	Texas Pollutant Discharge Elimination System
TPI	Total Personal Income
TPWD	Texas Parks and Wildlife Department
tpy	tons per year
TSCA	Toxic Substances Control Act
USACE	U.S. Army Corps of Engineers
USC	United States Code
USCB	U.S. Census Bureau
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
UXO	unexploded ordnance
VOCs	Volatile Organic Compounds
VMT	vehicle miles traveled

1.0 INTRODUCTION

1.1 Background

This Environmental Assessment (EA) has been prepared in compliance with the National Environmental Policy Act of 1969 (NEPA), to address the potential effects, beneficial and adverse, associated with the proposed transfer of land from Fort Hood to the Texas A&M University System (TAMUS). Fort Hood Military Reservation is a 217,300-acre U.S. Army installation located in central Texas, approximately 58 miles due north of Austin and 39 miles southwest of Waco (Figure 1-1). Fort Hood is one of the Army's premier training installations, and a full range of mission-related training activities are conducted, including maneuver exercises for armored units up to brigade level, firing of live weapons, and aviation training (U.S. Army Corps of Engineers [USACE] 2000). Fort Hood is the home of the U.S. Army's III Corps Headquarters (III Corps), 1st Cavalry Division, the 4th Infantry Division (Mechanized), and numerous other military commands. The installation supports a large population that includes 45,000 active-duty personnel (Endangered Species Management Plan [ESMP] 2001) and is currently the largest active U.S. installation in terms of assigned personnel. This EA was prepared by the USACE – Fort Worth District for Fort Hood's Department of Public Works.

1.2 Purpose of and Need for the Proposed Action

The TAMUS has requested land from Fort Hood in order to create a new permanent, upper level, stand-alone university. The facility would provide additional higher education opportunities for active soldiers, family members, and retirees, along with civilians in the region. There is the potential for a partnership between Fort Hood and the TAMUS to provide educational opportunities to military personnel.

A land survey determined that approximately 672.36 acres of land on the perimeter of Fort Hood could be transferred to TAMUS. This transfer would occur through passing of special legislation.

The 672.36-acre property is currently utilized by Fort Hood for maneuver training and as part of Fort Hood's rotational livestock grazing program. The property lies on the perimeter of Fort Hood near two major roads and numerous residences. Due to these factors, training activities are limited, and the Army is unable to use the property to conduct necessary infantry and vehicle maneuvers required to keep their units at the required level of readiness. Therefore, Fort Hood proposes to transfer the property to TAMUS for the future development of a university.

1.3 Applicable Environmental Statutes and Regulations

This EA is being prepared in accordance with requirements of the *National Environmental Policy Act* (NEPA) (Public Law [PL] 91-190, 1969). NEPA requires Federal agencies to consider the environmental consequences of all proposed actions in their decision-making process. The intent of the NEPA is to protect, restore, or enhance the environment through a well-informed decision-making process. The Council on Environmental Quality (CEQ) was established under the NEPA to implement and oversee Federal policy in this process. U.S. Army Regulation (AR) 200-2, *Environmental Affects of Army Actions*, implements the CEQ regulations within the Army. Table 1-1 summarizes the pertinent environmental requirements that guided the development of this EA.

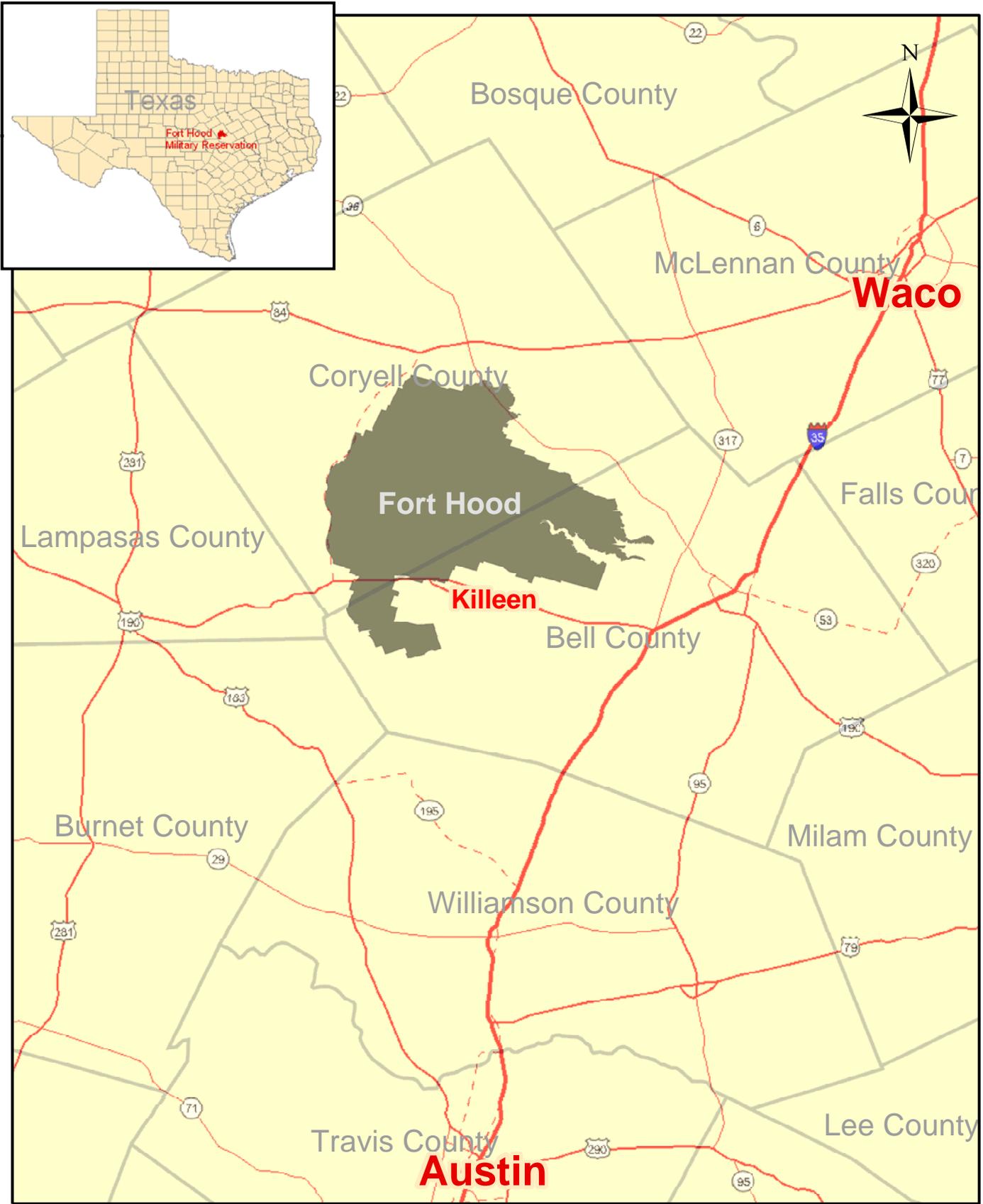


Figure 1-1. General Location of the Fort Hood Military Reservation.

Scale: 1:800,000

March 8, 2004

 **NEEL-SCHAFFER**

1
2

**Table1-1.
Applicable Environmental Statutes and Regulations**

Resource	Statutes
Land	<ul style="list-style-type: none"> ▪ <i>Engle Act of 1958 (43 United States Code [USC] 155)</i> ▪ <i>Military Lands Withdrawal Act (PL 99-606)</i> ▪ <i>Wilderness Act of 1964 (PL 88-577)</i> ▪ <i>National Forest Management Act of 1976 (PL 94-588)</i>
Water	<ul style="list-style-type: none"> ▪ <i>Federal Water Pollution Control Act of 1972 (PL 92-500) and Amendments</i> ▪ <i>Clean Water Act of 1977 (PL 95-217)</i> ▪ <i>Water Quality Act of 1987 (PL 100-4)</i> ▪ <i>Safe Drinking Water Act of 1972 (PL 95-523) and Amendments</i>
Wetlands and Floodplains	<ul style="list-style-type: none"> ▪ Section 401 and 404 of the <i>Federal Water Pollution Control Act of 1972 (PL 92-500)</i> ▪ <i>Floodplain Management – 1977 (Executive Order [E.O.]. 11988)</i> ▪ <i>Protection of Wetlands - 1977 (E.O. 11990)</i> ▪ <i>Emergency Wetlands Resources Act of 1986 (PL 99-645)</i> ▪ <i>North American Wetlands Conservation Act of 1989 (PL 101-233)</i>
Biological	<ul style="list-style-type: none"> ▪ <i>Migratory Bird Treaty Act of 1918</i> ▪ <i>Fish and Wildlife Coordination Act of 1958 (PL 85-654)</i> ▪ <i>Sikes Act of 1960 (PL 86-797) and Amendments</i> ▪ <i>Endangered Species Act of 1973 (PL 93-205) and Amendments</i> ▪ <i>Fish and Wildlife Conservation Act of 1980 (PL 96-366)</i> ▪ <i>Lacey Act Amendments of 1981 (PL 97-79)</i>
Air	<ul style="list-style-type: none"> ▪ <i>Clean Air Act of 1970 (PL 95-95), as amended in 1977 and 1990 (PL 91-604)</i>
Noise	<ul style="list-style-type: none"> ▪ <i>Noise Control Act of 1972 (PL 92-574) and Amendments of 1978 (PL 95-609)</i>
Cultural	<ul style="list-style-type: none"> ▪ <i>National Historic Preservation Act of 1966 (16 USC 470 et seq.) (PL 89-665) and Amendments</i> ▪ <i>Protection and Enhancement of the Cultural Environment - 1971 (E.O. 11593)</i> ▪ <i>Indian Sacred Sites – 1996 (E.O. 13007)</i> ▪ <i>Archaeological and Historic Preservation Act of 1974</i> ▪ <i>American Indian Religious Freedom Act of 1978 (PL 95-341)</i> ▪ <i>Antiquities Act of 1906</i> ▪ <i>Archaeological Resources Protection Act of 1979 (PL 96-95)</i> ▪ <i>Native American Graves Protection and Repatriation Act of 1990 (PL 101-601)</i>
Environmental Justice	<ul style="list-style-type: none"> ▪ <i>Federal Action to Address Environmental Justice in Minority Populations and Low-Income Populations (E.O. 12898)</i> ▪ <i>Protection of Children from Environmental Health Risks and Safety Risks (E.O. 13045)</i>
Hazardous and Toxic Materials	<ul style="list-style-type: none"> ▪ <i>Resource Conservation and Recovery Act of 1976 (PL 94-5800), as Amended</i> ▪ <i>Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (42 USC 9601) (PL 96-510)</i> ▪ <i>Toxic Substances Control Act (PL 94-496)</i> ▪ <i>Federal Insecticide, Fungicide, and Rodenticide Control Act (40 CFR 162-180)</i> ▪ <i>Emergency Planning and Community Right-to-Know Act (40 CFR 300-399)</i>

3

1 **1.4 Scope of the Document**

2 This EA has been developed in accordance with the guidance and restrictions outlined in Section
3 1.3. This EA should provide sufficient evidence and analysis to inform decision-makers and the
4 public of the likely environmental consequences of the proposed action and alternatives.
5

6 This EA identifies, documents, and evaluates the potential environmental effects of the proposed
7 property transfer. Section 2.0 describes the Proposed Action and the No Action Alternatives.
8 Section 3.0 describes existing environmental conditions at Fort Hood, and specifically the site
9 that could be affected by the proposed action. Section 4.0 identifies potential environmental
10 effects that could occur upon implementation of the proposed action and cumulative impacts of
11 the proposed action. Mitigation measures that are necessary to offset the impacts are also
12 included in this section. Section 5.0 provides a summary of the impacts of each alternative.

2.0 ALTERNATIVES CONSIDERED

This section describes the alternatives considered during the development of this EA. The Proposed Action Alternative is the transfer of land from Fort Hood to the TAMUS and is described in detail in Section 2.1. The No Action Alternative is described in Section 2.2 and other alternatives are described in Section 2.3.

2.1 Proposed Action Alternative

The Proposed Action Alternative involves the transfer of land from Fort Hood to the TAMUS. The subject property encompasses 672.36 acres and is located in the northeastern portion of Fort Hood Training Area (TA) 27 (Figure 2-1). The property is being used for cattle grazing and is undeveloped with no buildings located on the property. The only structures located on the property are a corral and several deer hunting stands. Representative site photographs are included in Appendix A.

TAMUS proposes to develop a 20,000-student campus within the subject property. Current conceptual designs for the campus include approximately 40 buildings (comprised of academic, office, and residential) and three to four large parking lots with smaller parking areas scattered throughout the campus. Also included in the current design is the construction of several athletic facilities to include a football stadium/track and field complex, baseball stadium, baseball/softball complex, and two additional intramural fields. Numerous paved roadways and sidewalks would connect the facets of the campus, and exterior lighting would be installed for safety purposes. It is currently envisioned that the campus would provide access to the property from Airport Road to the north and State Highway 195 on the east. Extension of municipal gas, electric, sewer, water, and communication utilities would be necessary. Current conceptual designs show that the proposed campus would utilize approximately 225 acres (Figure 2-2); however, this will change as the design process continues. The timeline for construction is unknown at this time as design plans are conceptual in nature and construction is not anticipated to begin for several years. Once construction commences, it would be incremental (on an as-needed basis), therefore taking many years to complete the entire campus.

After transfer of the property is complete and before construction is initiated, a 33-foot wide area would be cleared on the perimeter of the property to allow for the construction of a boundary fence typical to a military installation (*i.e.* 8-foot chain link fence with a three-strand barbed wire overhang). Upon completion of fence construction, vehicle access would be restricted to the 16 feet adjacent to the fence and the remaining area would be allowed to revegetate naturally. It is anticipated that periodic fence maintenance would occur.

2.2 No Action Alternative

Under the No Action Alternative, the transfer of the subject property to the TAMUS would not occur. The Army would continue to utilize the area for training because it is located near two major roads and numerous residences. Educational opportunities from the TAMUS for soldiers at Fort Hood, their families, and civilians in the area would not be available. The property would continue to be grazed as part of Fort Hood's rotational livestock grazing program.

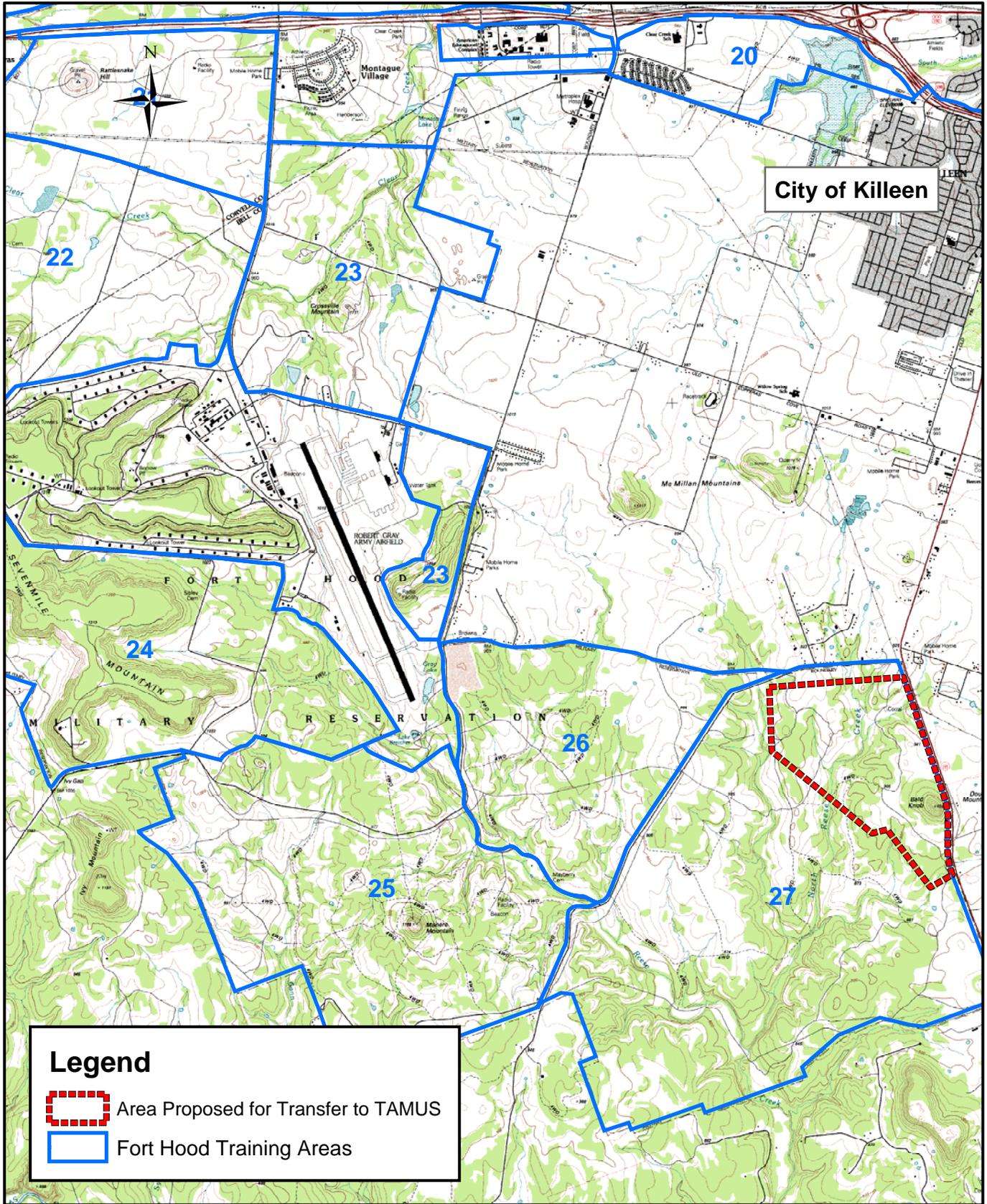
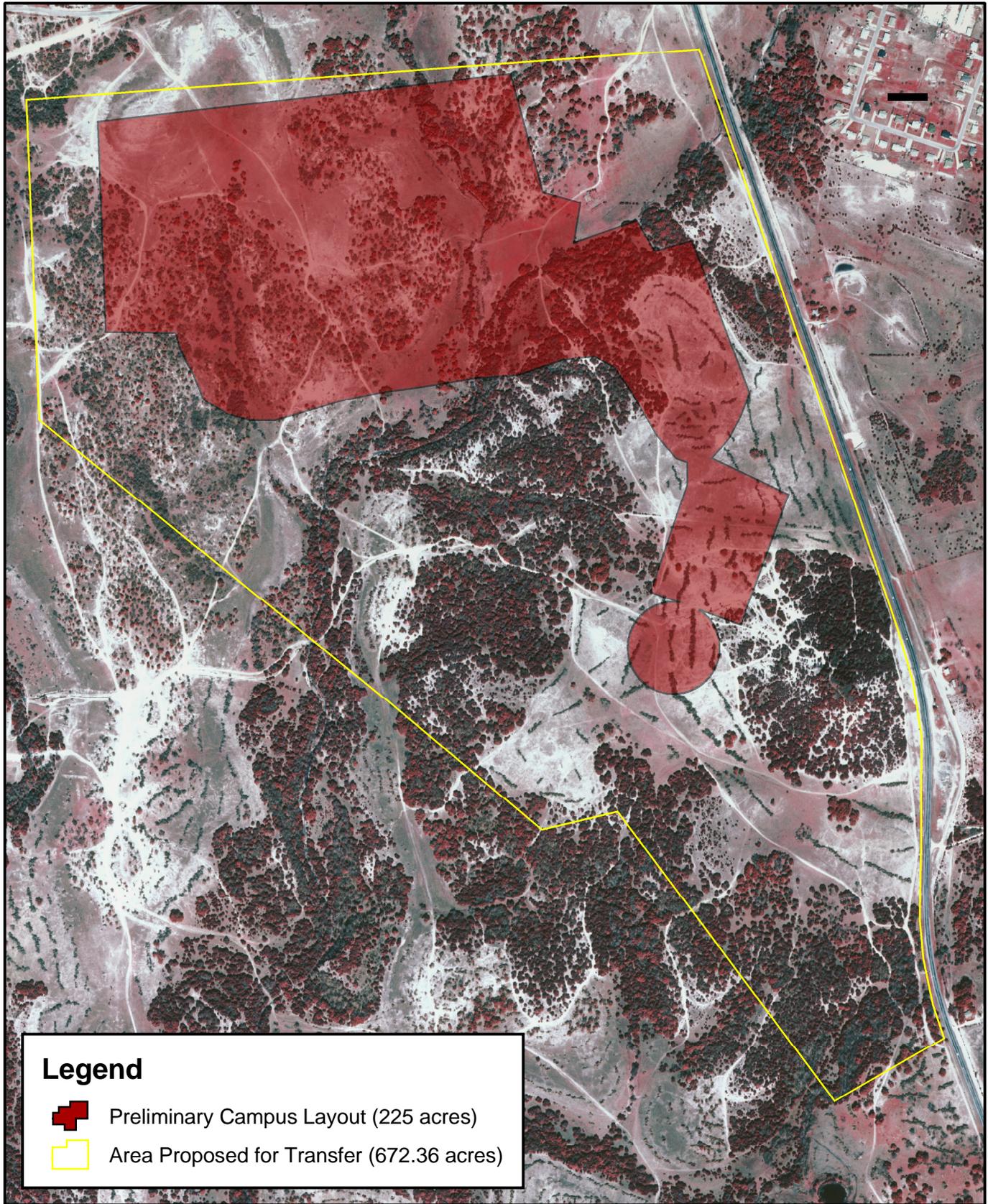


Figure 2-1. General Location of Area Proposed for Transfer to TAMUS, Bell County, Texas.

Scale: 1:60,000

March 8, 2004

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Legend

-  Preliminary Campus Layout (225 acres)
-  Area Proposed for Transfer (672.36 acres)

Figure 2-2. Proposed University Footprint Taken From the Preliminary Design Plans.

Scale: 1:12,000
March 15, 2004
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1 **2.3 Alternatives Considered and Eliminated from Further Analysis**

2 During the development of this EA, one other alternative was evaluated, but it did not meet the purpose
3 and need of this project. Detailed discussion of the alternative considered and eliminated from
4 consideration is discussed in the following paragraph.

5

6 **2.3.1 Lease Alternative**

7 An alternative considered during the development of the EA was the potential for Fort Hood to
8 lease the property to TAMUS for the development of a university system. Even though the State
9 of Texas has built individual university buildings on leased property; they have never built an
10 entire university campus on leased property. Construction of an entire university campus by the
11 State on lands not owned by the State was considered impractical and not feasible.

12

13

3.0 AFFECTED ENVIRONMENT

The affected environment is the baseline against which potential impacts caused by the proposed property transfer are assessed. In compliance with NEPA and the CEQ regulations, this chapter focuses on those resources and conditions that would be affected by activities resulting from the transfer. Some aspects of the affected environment are not present in the area, would not be affected by the Proposed Action, or were not identified as a resource of concern and, therefore, were not analyzed here.

3.1 Land Use

Fort Hood Military Reservation encompasses approximately 217,337 acres. Installation land use is divided among three cantonment areas, two airfields, maneuver areas, and live-fire training (impact) areas. The three cantonment areas are the Main Cantonment Area, West Fort Hood, and North Fort Hood. Combined, the cantonment areas occupy four percent of the installation land area. The maneuver and live-fire training areas, which comprise 120 ranges, are where combat training activities occur and occupy 61.3 and 28.5 percent of the installation land area, respectively. The Hood Army Airfield (HAAF) located adjacent to the Main Cantonment Area at South Fort Hood and Robert Gray Army Airfield (RGAAF) on West Fort Hood comprises 1.3 percent of the installation's land area. Other land uses on the installation occupy 4.9 percent of the land area and include the Lake Belton Recreation Area, roadways, easements, and cattle grazing (USACE 2003). Table 3-1 provides a summary of land uses at Fort Hood.

The project area is located in the northeast portion of TA 27 and encompasses approximately 672.36 acres. TA 27 is classified as a maneuver training area and is used for navigational and maneuver training only. No live-fire training is conducted in TA 27. Surrounding land use consists of light residential, rangeland, and undeveloped areas. The property is bounded by State Highway 195 on the east side, Airport Road on the north, and the Texas State Veteran's Cemetery to the south, and the remainder of TA 27 and Fort Hood property to the west. The area is essentially undeveloped with no buildings located on the property. The property is currently grazed as part of Fort Hood's rotational grazing program.

3.2 Aesthetics and Visual Resources

The project area exists as a natural environment in a generally undisturbed state. The area contains subtle elevation changes with the predominant landforms being North Reese Creek and the isolated hill "Bald Knob". Primitive roads traverse the site with portions existing as four-wheel drive only. The tops of several slopes have rock outcrops which are visually interesting. Visual interest is also added by the ephemeral creeks found in swales associated with the perennial North Reese Creek. Visually diverse vegetation found throughout the project area consists of areas with low grassy or forb ground cover, areas of scattered trees and brush, and dense shrub forest. Coniferous and deciduous tree species are found within the area.

No scenic highways or visually sensitive, protected areas have views to the project area, although the Texas State Veterans Cemetery is located adjacent to the southern border.

1
2

**Table 3-1.
Fort Hood Land Use Summary**

Primary Land Uses	Acreage
Training areas	
Maneuver	133,157
Live-fire	62,000
Cantonment Areas	
Main Cantonment Area (excluding HAAF)	5,862
West Fort Hood (excluding RGAAF)	1,342
North Fort Hood	1,400
Airfields	
HAAF	773
RGAAF	2,142
Belton Lake Recreation Area	862
Other land uses (roads, easements, etc.)	9,799
Total Acreage	217,337

Source: USACE 2003.

3
4
5

3.3 Geological Resources

3.3.1 Geology and Topography

8 The strata underlying Fort Hood, with the exception of the recent alluvium and river terrace
9 deposits, are consolidated sedimentary rocks of Cretaceous age and belong to the Comanche
10 Series. The erosion of these Cretaceous rocks over the past 70 million years and the deposition
11 of unconsolidated materials along the major streams have produced the present landscape of Fort
12 Hood (USACE 1987). The major strata beneath Fort Hood are the Glen Rose formation, Paluxy
13 Sand, Walnut Clay, Comanche Peak formation, Edwards Limestone-Kiamichi Clay complex,
14 Denton Clay-Fort Worth Limestone, and Duck Creek Limestone complex. The major
15 floodplains are filled with alluvium and river terrace deposits (USACE 1987).

16
17 The Balcones Fault Zone passes immediately east of the installation, trending north/southwest.
18 The land to the northwest of this zone (*i.e.* the land that Fort Hood currently occupies) has, over
19 geologic time, elevated as much as 500 feet. Subsequent erosion of this elevated land is what
20 created the relatively irregular, steeply sloping terrain on the installation (USACE 1987).

21

3.3.2 Soils

22
23 Soil types within the project area were determined using the U.S. Department of Agriculture
24 (USDA) – Natural Resources Conservation Service (NRCS) Bell County Soil Survey. Table 3-2
25 identifies and gives a brief description of the soils present within the project area.

26

3.3.3 Prime Farmlands

27
28 As required by Section 1541(b) of the Farmland Protection Policy Act (FPPA) of 1980 and 1995,
29 7 U.S.C. 4202(b), Federal and state agencies, as well as projects funded with Federal funds, are
30 required to (a) use the criteria to identify and take into account the adverse effects of their
31 programs on the preservation of farmland, (b) consider alternative actions, as appropriate, that
32 could lessen adverse effects, and (c) ensure that their programs, to the extent practicable, are

1
2

**Table 3-2.
Project Area Soil Information**

Map Symbol	Mapping Unit	Description
Bf	Bosque clay loam	Frequently flooded. Deep, nearly level, calcareous loamy soils on bottom lands. Soils formed in loamy alluvium. Occur in high bands parallel to stream channel. Well drained, moderate permeability, slow to medium runoff.
BRE	Brackett association	Gently sloping to strongly sloping and rolling, calcareous, loamy soils. Soils forming in loamy material underlain by soft limestone. Well drained, moderately slow permeability, rapid runoff.
DeB	Denton silty clay	Moderately deep, nearly level on broad flats or very gently rounded ridges. Clayey calcareous soils on uplands. Formed in clayey material underlain by limestone and interbedded marl. Well drained, slow permeability, medium to rapid runoff.
DPB	Denton association	Deep or moderately deep, occurring mostly on Fort Hood Military Reservation. Soil areas are in saddles between hills and on foot slopes. Underlain by limestone and interbedded marl. Well drained, slow permeability, medium to rapid runoff.
KVB	Krum-Lewisville association	Deep, nearly level to gently sloping and undulating calcareous soils. Mostly on the foot slopes of the higher limestone hills and in narrow valleys that are drainage ways from the hill country. Most occur on Fort Hood Military Reservation. Well suited to crops. Well drained, moderately slow permeability, slow to rapid runoff.
LeC	Lewisville silty clay	Deep, gently sloping and undulating clayey soils on stream terraces and foot slopes below limestone hills. Calcareous soils formed in alluvium. Well drained, moderate permeability, medium runoff. Suited to crops.
PrB	Purves silty clay	Very shallow to shallow, gently sloping to sloping and undulating clayey soils on uplands. Calcareous soil underlain by limestone, formed in material weathered from interbedded hard limestone and calcareous marl. Well drained, moderately slow permeability, slow to medium runoff.
PVD	Purves association	Shallow, stony, and gravelly, undulating clayey soils on uplands. Well drained, moderately slow permeability, slow to medium runoff.

1

Table 3-2. Continued.

Map Symbol	Mapping Unit	Description
TAD	Tarrant association	Very shallow to shallow, undulating, clayey soils on the top of limestone hills. Noncalcareous soils formed in interbedded chalk, marl, and marly material weathered mainly from limestone. Well drained, moderately slow permeability, slow to medium runoff.
TPF	Tarrant-Purves association	Very shallow to shallow, clayey soils on low, rolling hills. Well drained, moderately slow permeability, rapid runoff.

2
3

4 compatible with state and units of local government and private programs and policies to protect
5 farmland. The NRCS was contacted regarding prime farmland soils within the project area, and
6 a list was provided for Bell County. Denton silty clay, Denton association, and Lewisville silty
7 clay are all classified as prime farmland soils.

8

9 **3.4 Water Resources**

10 **3.4.1 Groundwater and Surface Water**

11 **Groundwater**

12 The Travis Peak formation is the deepest and hydrologically the most important stratigraphic
13 unit in the Fort Hood Region. The Hosston and Hensell members of the Travis Peak formation
14 comprise the aquifer system that is the major source of groundwater supply for Fort Hood. The
15 Pearsall Member, not an aquifer, separates these two strata. The primary sources of groundwater
16 recharge for the Hosston and Hensell members of the Travis Peak formation are rainfall on the
17 outcrop and seepage from streams that cross the outcrop. This outcrop area covers 1,732 square
18 miles and is located 60 to 80 miles to the northwest of Fort Hood, primarily in Comanche and
19 Erath Counties (USACE 1999). No major groundwater resources outside of the installation are
20 affected by recharge from within Fort Hood, and recharge that occurs within the installation
21 affects only the small, shallow groundwater supplies that remain on the installation (USACE
22 1999).

23

24 Potentially sensitive groundwater areas of the Fort Hood region are the outcrop areas of the
25 Paluxy formation and recent alluvial materials within and adjacent to Cowhouse Creek, Henson
26 Creek, and the Leon River, as well as the Karst or cave systems found throughout the
27 installation. The aquifers recharged by these areas are relatively shallow, therefore they could be
28 affected by hazardous material spills and seepage, but these waters are rarely used and the use is
29 primarily for livestock watering (USACE 1999).

30

31 **Surface Water**

32 Fort Hood is situated in the Brazos River Basin. The surface configuration of the land is
33 generally the result of the dissection of numerous small to moderate sized streams, which flow in
34 a southeasterly direction. The Leon River, Owl Creek, and Cowhouse Creek flow into Belton
35 Lake, while Reese Creek flows into the Lampasas River.

36

1 North Reese Creek is the only major drainage located within the property proposed for transfer.
2 The McMillian Mountains 7.5 minute Topographic Quadrangle shows North Reese Creek
3 entering the subject property in the northeast corner, flowing southwest through the property, and
4 continuing southwest through TA 27 approximately two miles before it joins Reese Creek.
5 Reese Creek then exits TA 27 to the south and eventually empties into the Lampasas River.
6

7 **3.4.2 Water Quality**

8 **Storm Water**

9 Storm water flows, which may be exacerbated by high proportions of impervious surfaces
10 associated with buildings, roads, and parking lots, are important to management of surface water.
11 Storm water is important to surface water quality also because of its potential to introduce
12 sediments and other contaminants into lakes, rivers, and streams.
13

14 Storm water systems convey precipitation away from developed sites to appropriate receiving
15 surface waters. Storm water systems may employ a variety of devices to slow the movement of
16 water. For instance, a large, sudden flow could scour a streambed and harm biological resources
17 in that habitat. Storm water systems provide the benefit of reducing amounts of sediments and
18 other contaminants that would otherwise flow directly into surface waters. Failure to size storm
19 water systems appropriately to either hold or delay conveyance of the largest predicted
20 precipitation event could lead to downstream flooding and the environmental and economic
21 damages associated with flooding. Generally, higher densities of development, such as those
22 found in urban areas, require greater degrees of storm water management because of the higher
23 proportions of impervious surfaces.
24

25 Soil erosion from Fort Hood has resulted in decreased water quality and substantial
26 sedimentation in portions of Belton Lake as well as the smaller water bodies on Fort Hood
27 (USACE 2003). Soil erosion improvements planned or implemented, in accordance with the
28 Fort Hood Integrated Natural Resources Management Plan (INRMP), would reduce the
29 sedimentation loads (USACE 2003).
30

31 Recent water quality concerns in the Brazos River Basin have focused on fecal coliform
32 contamination, believed to be contributed to by livestock raised in high densities on dairy farms.
33 Portions of the Leon and Lampasas Rivers and Nolan Creek were identified as exceeding the
34 acceptable contaminant loads for fecal coliform (USACE 2003). However, Cowhouse Creek,
35 the primary drainage for the majority of Fort Hood, including those areas most heavily grazed
36 and having the highest erosion rates, had fecal coliform loads within the acceptable standards
37 (USACE 2003).
38

39 **Wastewater**

40 Wastewater treatment systems may treat sanitary sewer, industrial, or both kinds of wastes.
41 Most systems are publicly owned treatment works. For regulatory purposes, there is a sub-
42 category of Federally owned treatment works. Wastewater treatment plants operate under
43 National Pollution Discharge Elimination System (NPDES) permits issued by the U.S.
44 Environmental Protection Agency or the states' pursuant to the *Clean Water Act (CWA)* of 1977.
45 In 1998 the TCEQ and USEPA entered into a Memorandum of Agreement that transferred the
46 permitting authority for the NPDES to the TCEQ. Assumption of this national program

1 eliminated the current dual permitting system, which required facilities to obtain both state
2 (Texas Pollutant Discharge Elimination System [TPDES]) and Federal (NPDES) water discharge
3 permits. The USEPA requirements for this program are contained in 40 CFR Part 123. Key
4 issues concerning wastewater systems typically involve the age of the system (either its
5 collection system and infiltration/inflow problems or the treatment plant itself), the capacity of a
6 treatment plant (usually expressed in millions of gallons per day), and a treatment plant's record
7 of violations of its TPDES permit.

8 9 **3.4.3 Waters of the U.S. and Wetlands**

10 The objective of the CWA is to maintain and restore the chemical, physical, and biological
11 integrity of the waters of the United States. Section 404 of the CWA authorizes the Secretary of
12 the Army, acting through the Chief of Engineers, to issue permits for the discharge of dredged or
13 fill material into waters of the U.S., including deepwater habitats, special aquatic sites, and
14 wetlands. The USACE has the authority to make decisions regarding the jurisdictional status of
15 waters, including wetlands. Therefore, the USACE should be contacted prior to disturbance of
16 any area investigated during this preliminary effort.

17
18 Potential jurisdictional wetlands are delineated utilizing the three-parameter approach for a
19 routine on site determination as defined by the USACE (Environmental Laboratory 1987). In
20 order for an area to be considered a jurisdictional wetland by the USACE, it must have evidence
21 of hydrophytic vegetation, hydric soils, and wetland hydrology. Under normal circumstances
22 (site not altered in the last 5 years), the absence of any one of these three parameters results in a
23 non-wetland determination. If disturbed conditions are present, then consideration must be given
24 to what conditions would have been present had the disturbance not occurred.

25
26 A copy of the McMillian Mountains 7.5 minute Topographic Quadrangle, local hydric soils list,
27 and soil map of the area were used to determine which areas could potentially contain wetlands
28 and/or waters of the U.S. North Reese Creek and two small segments of unnamed tributaries are
29 located within the property proposed for transfer. The McMillian Mountains 7.5 minute
30 Topographic Quadrangle shows the main channel of North Reese Creek entering the subject
31 property in the northeast corner, flowing southwest through the property, and continuing
32 southwest through TA 27 approximately two miles before it joins Reese Creek. Reese Creek
33 then exits TA 27 to the south and eventually empties into the Lampasas River. The two small
34 unnamed segments are located in the southern portion of the subject property would be
35 considered waters of the U.S. by the USACE. North Reese Creek, its associated tributaries, and
36 the two unnamed segments flow approximately 13,586 linear feet (2.57 miles) through the
37 subject property (Figure 3-1).

38
39 The local hydric soils list indicates that the subject property has no hydric soils mapped by the
40 NRCS; however, Bosque clay loam can have hydric soil inclusions in depressional areas. Based
41 on field efforts conducted on February 23-26, 2004, no potential jurisdictional wetlands were
42 identified.

43 44 **3.4.4 Floodplains**

45 Floodplains are areas of low-elevation present along a river or stream channel. Such lands may
46 be subject to periodic or infrequent inundation due to rain. Risk of flooding typically hinges on

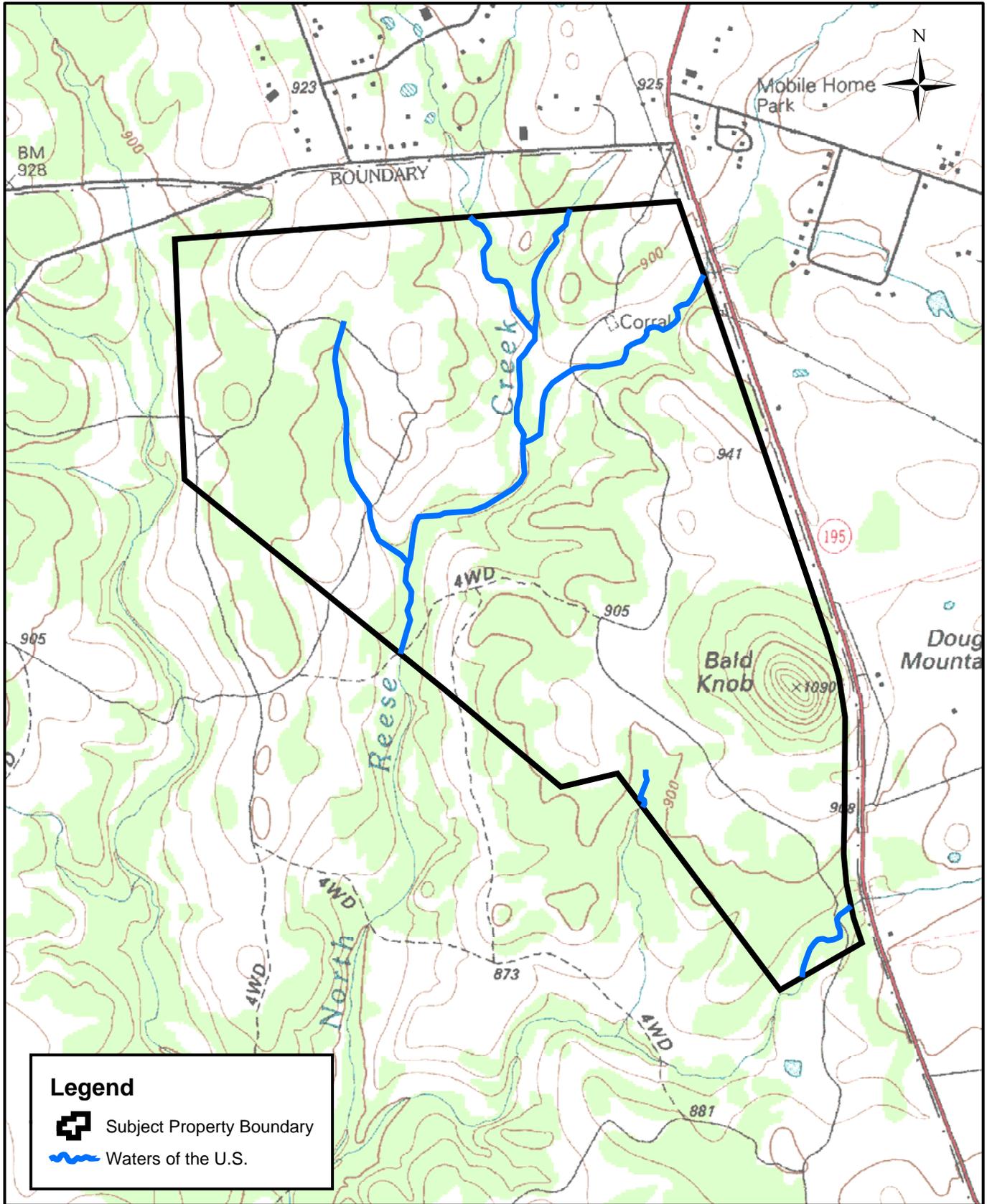


Figure 3-1. Location of Potential Jurisdictional Waters of the U.S. within Property Proposed for Transfer.

Scale: 1:16,000

March 8, 2004

NEEL SCHAFFER

1 local topography, the frequency of precipitation events, and the size of the watershed above the
2 floodplain. Flood potential is evaluated by the Federal Emergency Management Agency
3 (FEMA), which determines the floodplain for 100 and 500-year flood events. Federal, state, and
4 local regulations often limit floodplain development to passive uses such as recreational and
5 preservation activities in order to reduce the risks to human health and safety.

6
7 Executive Order (E.O.) 11988, “Floodplain Management”, was enacted May 24, 1977, in order
8 to set guidelines to avoid the long and short-term adverse impacts associated with the occupancy
9 and modification of floodplains and to avoid direct or indirect support of floodplain development
10 wherever there is a practicable alternative. A Flood Insurance Rate Map (FIRM) for Bell
11 County, Texas (Community Panel Number 480706 0195 B) was analyzed to establish the
12 locations of potential flood-prone areas. According to the FIRM, a narrow buffer along North
13 Reese Creek and its associated tributaries is classified as Zone A, indicating areas within the
14 100-year floodplain (Figure 3-2).

15 16 **3.5 Biological Resources**

17 **3.5.1 Vegetation**

18 The project area is typical of how previous training activities, extensive continuous utilization by
19 livestock, clearing of Ashe juniper (*Juniperus ashei*), and suppression of wild fires have altered
20 the vegetative communities on the installation over time. Training with tracked vehicles,
21 coupled with intensive and continuous grazing changes the perennial vegetation and promotes
22 invasion of annual plants and native woody species such as Ashe juniper. The result is a mixture
23 of grasslands and coniferous, deciduous, and mixed forest and shrub communities.

24
25 The combination of soils, topography, climate, and human activities has produced a diverse mix
26 of vegetation communities or habitats within the installation. Fort Hood is in the southernmost
27 extension of the Cross Timbers and Prairies region and the northwestern reaches of the Edwards
28 Plateau ecological region. The woodlands in the area are most closely representative of Edwards
29 Plateau vegetative associations. The grasslands, which comprised much of the area historically,
30 are representative primarily of the mid-grass associations of the Cross Timbers and Prairies
31 areas, with inclusions of the tall-grass associations of the Blackland Prairie. Frequent range fires
32 throughout the grasslands confined the woody vegetation to the riparian areas and the rocky
33 slopes and hills.

34
35 Grasslands occur throughout the project area, but are most common in areas with gently sloping
36 topography. Previous clearing activities have reduced the woody vegetation in the project area.
37 Grasslands in the project area are composed primarily of perennial herbaceous species, and may
38 include little bluestem (*Schizachyrium scoparium*), hairy grama (*Bouteloua hirsuta*), sideoats
39 grama (*Bouteloua curtipendula*), Texas wintergrass (*Nassella leucotricha*), blue grama
40 (*Bouteloua gracilis*), seep muhly (*Muhlenbergia reverchonii*), silver bluestem (*Bothriochloa*
41 *saccharoides*), prairie-tea (*Croton monanthogynus*), broomweeds (*Amphiachyris* sp.), ragweed
42 (*Ambrosia artemisiifolia*), three-awn (*Aristida* sp.), and snow-on-the-prairie (*Euphorbia bicolor*).
43 Much of the grasslands in the project area still contain large piles of Ashe juniper (commonly
44 referred to as “cedar”) that has been cleared in the past. Some small, isolated stands of prickly
45 pear cactus (*Opuntia engelmannii*) are also present on the site.

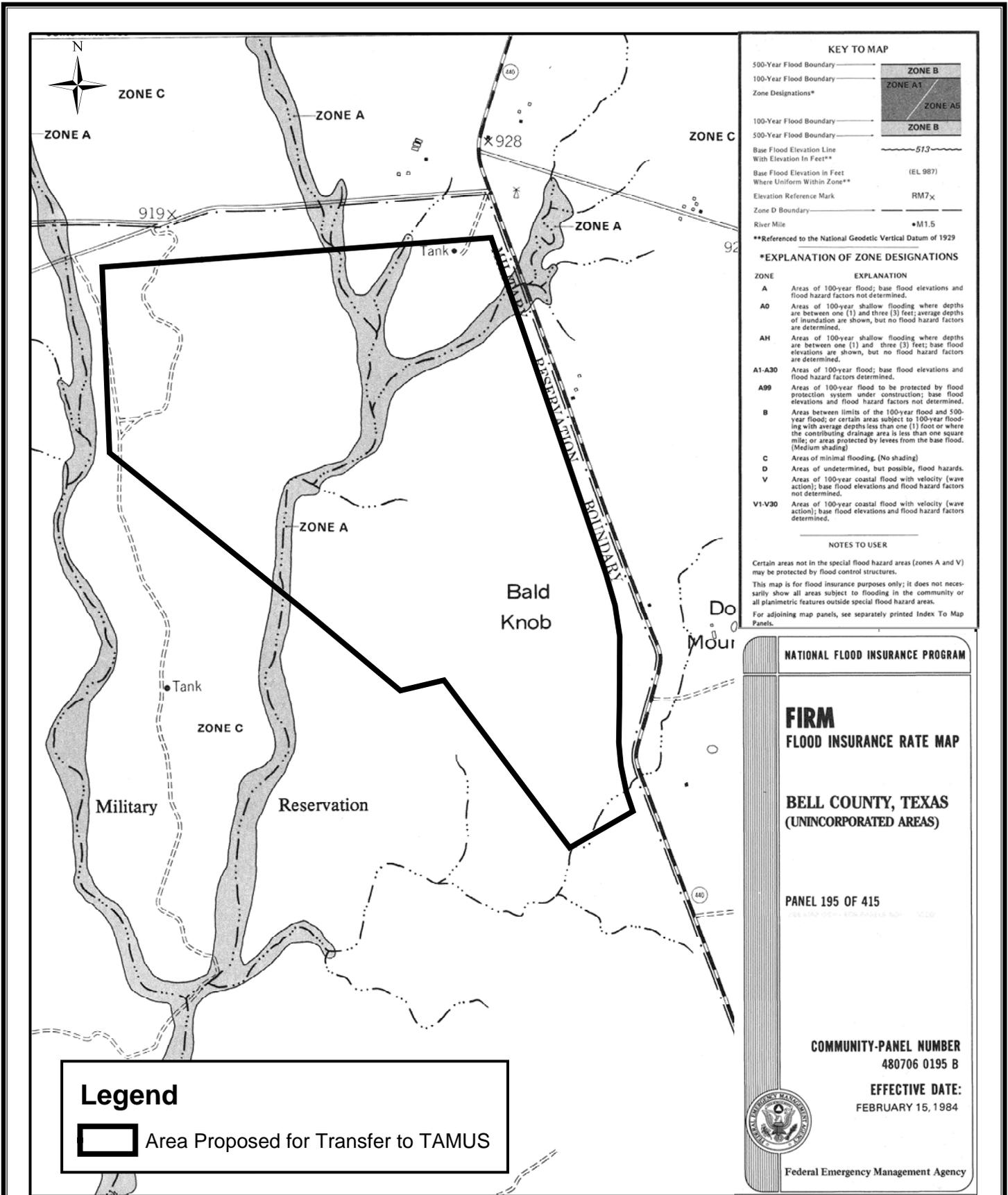


Figure 3-2. Flood Insurance Rate Map Depicting the 100-Year Floodplain (Zone A).

Scale: 1:20,000

February 9, 2004



1 The Forest and Shrub Communities are a major component of the project area and occur on the
2 rocky slopes and hillsides, and narrow bands along streams and in small monotypic stands.
3 Three distinct communities have been classified in this area: Coniferous Forest and Shrub,
4 Deciduous Forest and Shrub, and Mixed Forest and Shrub communities.

5
6 Small pockets of Coniferous Forest and Shrub Communities are found throughout the project
7 area and are primarily composed of Ashe juniper, the only coniferous species in the area. Other
8 species found in this community include flameleaf sumac (*Rhus lanceolata*), Texas ash
9 (*Fraxinus texensis*), plateau live oak (*Quercus fusiformis*), a variety of grasses, and broomweeds
10 (*Amphiachyris* sp.).

11
12 Some smaller sections of the project area, primarily north of Reese Creek, contain the Deciduous
13 Forest and Shrub Community. This community is composed of broad-leaf trees and shrubs and
14 is found in lowlands and on protected slopes. Tree species representative of this community
15 include plateau live oak, post oak (*Quercus stellata*), and pecan (*Carya illinoensis*). Understory
16 species include supple-jack (*Berchemia scandens*), common buttonbush (*Cephalanthus*
17 *occidentalis*), Texas persimmon (*Diospyrus texana*), saw greenbriar (*Smilax bona-nox*), hairy
18 grama, Texas grama (*Bouteloua rigidiseta*), prairie-tea, broomweed, silver bluestem, prairie
19 three-awn (*Aristida oligantha*), and mist-flower (*Eupatorium coelestinum*).

20
21 The most common vegetation community in the project area is the Mixed Forest and Shrub
22 Community. In some areas Ashe juniper dominates over either plateau live oak or Texas oak
23 (*Quercus buckleyi*), and in others the oaks dominate the Ashe juniper depending on previous
24 clearing activities. Understory species are a combination of the species found in the other two
25 communities (USACE 1999, 2000).

26 27 **3.5.2 Fish and Wildlife**

28 The various habitat types in the project area provide for wildlife communities characteristic of the
29 Edwards Plateau, Blackland Prairie, and the Cross Timbers and Prairies areas. Terrestrial wildlife
30 habitats closely follow the vegetation communities described above, but also follow clines from
31 upland down to riparian habitats.

32
33 The most widespread and abundant passerine species observed in the project area are the cardinal
34 (*Cardinalis cardinalis*), mourning dove (*Zenaida macroura*), Carolina chickadee (*Poecile*
35 *carolinensis*), mockingbird (*Mimus polyglottos*), and turkey vulture (*Cathartes aura*). Mammal
36 species observed included white-tailed deer (*Odocoileus virginianus*), black-tailed jackrabbit
37 (*Lepus californicus*) and cottontail rabbit (*Sylvilagus* sp.). Other wildlife that could inhabit the
38 project area but were not observed include the wild turkey (*Meleagris gallopavo*), quail (*Colinus*
39 *virginianus*), raccoon (*Procyon lotor*), mice and rats, frogs, toads, snakes, and lizards.

40 The only aquatic habitats in the project area are North Reese Creek and its smaller tributaries.
41 Fish species that could occur in these waterways include members of the minnow (Cyprinidae)
42 family.

43 44 **3.5.3 Threatened and Endangered Species**

45 The Endangered Species Act (ESA) [16 U.S.C. 1532 et. seq.] of 1973, as amended, was enacted
46 to provide a program for the preservation of endangered and threatened species and to provide

1 protection for the ecosystems upon which these species depend for their survival. All Federal
2 agencies are required to implement protection programs for designated species and to use their
3 authorities to further the purposes of the act. Responsibility for the identification of a threatened
4 or endangered species and development of any potential recovery plans lies with the Secretary of
5 the Interior and the Secretary of Commerce.

6
7 The U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service
8 (NMFS) are the primary agencies responsible for implementing the ESA. The USFWS is
9 responsible for all terrestrial and aquatic species, while the NMFS is responsible for all other
10 marine species. The USFWS's responsibilities under the ESA include: (1) the identification of
11 threatened and endangered species; (2) the identification of critical habitats for listed species; (3)
12 implementation of research on, and recovery efforts for, these species; and (4) consultation with
13 other Federal agencies concerning measures to avoid harm to listed species.

14
15 An endangered species is a species in danger of extinction throughout all or a significant portion
16 of its range. A threatened species is a species likely to become endangered within the
17 foreseeable future throughout all or a significant portion of its range. Proposed species are those
18 that have been formally submitted to Congress for official listing as threatened or endangered.
19 Species may be considered endangered or threatened when any of the five following criteria
20 occurs: (1) the current/imminent destruction, modification, or curtailment of their habitat or
21 range; (2) overuse of the species for commercial, recreational, scientific, or educational
22 purposes; (3) disease or predation; (4) the inadequacy of existing regulatory mechanisms; and (5)
23 other natural or human-induced factors affect continued existence.

24
25 In addition, the USFWS has identified species that are candidates for listing as a result of
26 identified threats to their continued existence. The candidate designation includes those species
27 for which the USFWS has sufficient information on hand to support proposals to list as
28 endangered or threatened under the ESA. However, proposed rules have not yet been issued
29 because such actions are precluded at present by other listing activity.

30
31 The ESA also calls for the conservation of what is termed critical habitat - the areas of land, water,
32 and air space that an endangered species needs for survival. Critical habitat also includes such
33 things as food and water, breeding sites, cover or shelter, and sufficient habitat area to provide for
34 normal population growth and behavior. One of the primary threats to many species is the
35 destruction or modification of essential habitat by uncontrolled land and water development.

36
37 The Federally listed and candidate species and species of concern for Bell County are listed in
38 Table 3-3. Currently, there are no designated critical habitats on Fort Hood. A discussion of
39 species occurrence on Fort Hood and in the project area follows. A Biological Assessment (BA)
40 has been prepared to address potential impacts to these species.

41
42 **Federally Listed and Candidate Species**

43 The whooping crane is a rare migrant to the area. Five whooping cranes were sighted in TA 15
44 during December 1986. They may fly over or near Fort Hood during spring (1 to 20 April) and
45 fall (1 to 20 October) migration and may stop at Belton Lake during migration (Diersing et al.

1
2

**Table 3-3.
Protected, Candidate, and Species of Concern and Their Occurrence on Fort Hood**

Common Name	Scientific Name	Federal Status	Status on Fort Hood ¹ *
FEDERALLY LISTED SPECIES			
whooping crane	<i>Grus americana</i>	E	B
bald eagle	<i>Haliaeetus leucocephalus</i>	T	A
black-capped vireo	<i>Vireo atricapillus</i>	E	A
golden-cheeked warbler	<i>Dendroica chrysoparia</i>	E	A
CANDIDATE SPECIES			
Salado Springs salamander	<i>Eurycea chisholmensis</i>	C	C
SPECIES OF CONCERN			
texabama croton	<i>Croton alabamensis</i>	N/A	A
salamander (new species)	Under taxonomic review	N/A	A
cave-associated species	Multiple species	N/A	A

Legend: Federal status: **E**=endangered, **T**=threatened, **C**=candidate, **N/A**=Not Applicable.

¹ Status refers to population status on Fort Hood according to these definitions:

A = Population established on Fort Hood. Recent information documents an established breeding population (even if small) or regular occurrence, on the installation. This includes those species for which research and management is ongoing and several endemic cave invertebrates.

B = Recently recorded on Fort Hood, but there is no evidence of an established population. This includes species considered to be transient, accidental, or migratory (e.g., some migrating birds may use the installation as a stopover site during migration to and from their wintering grounds). For some species in this category, further inventory may reveal breeding populations.

C = Not known to occur on or near Fort Hood, but there is some possibility of occurrence.

* Updated from the ESMP (2001)

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1985). The bald eagle has been recorded during winters at Belton Lake on and adjacent to Fort Hood (ESMP 2001). The bald eagle does not nest on the installation.

Black-capped vireos nest in an early-successional deciduous scrub community. This habitat is generated as the result of various disturbances, including wildfire or mechanical removal of woody top growth. Good nesting habitat for black-capped vireos includes a wide diversity of hardwoods in a patchy, low-growing configuration with open, grassy spaces between patches of woody vegetation. Managing habitat for black-capped vireos requires active management, as habitat will decrease in quality as it ages, until it is no longer used. Black-capped vireos are found nesting in suitable habitat throughout the installation. The Fort Hood ESMP designates 10,340 acres of black-capped vireo habitat as core habitat for the species. The project area is not located within designated core habitat. According to the official habitat map (ESMP 2001), there are approximately 10.14 acres of non-core habitat for the black-capped vireo on the subject property (Figure 3-3). Fort Hood personnel conduct annual surveys of the project area. Surveys in 2002 found two locations of black-capped vireo pairs on the property; however, none were observed on the subject property during the 2003 surveys.

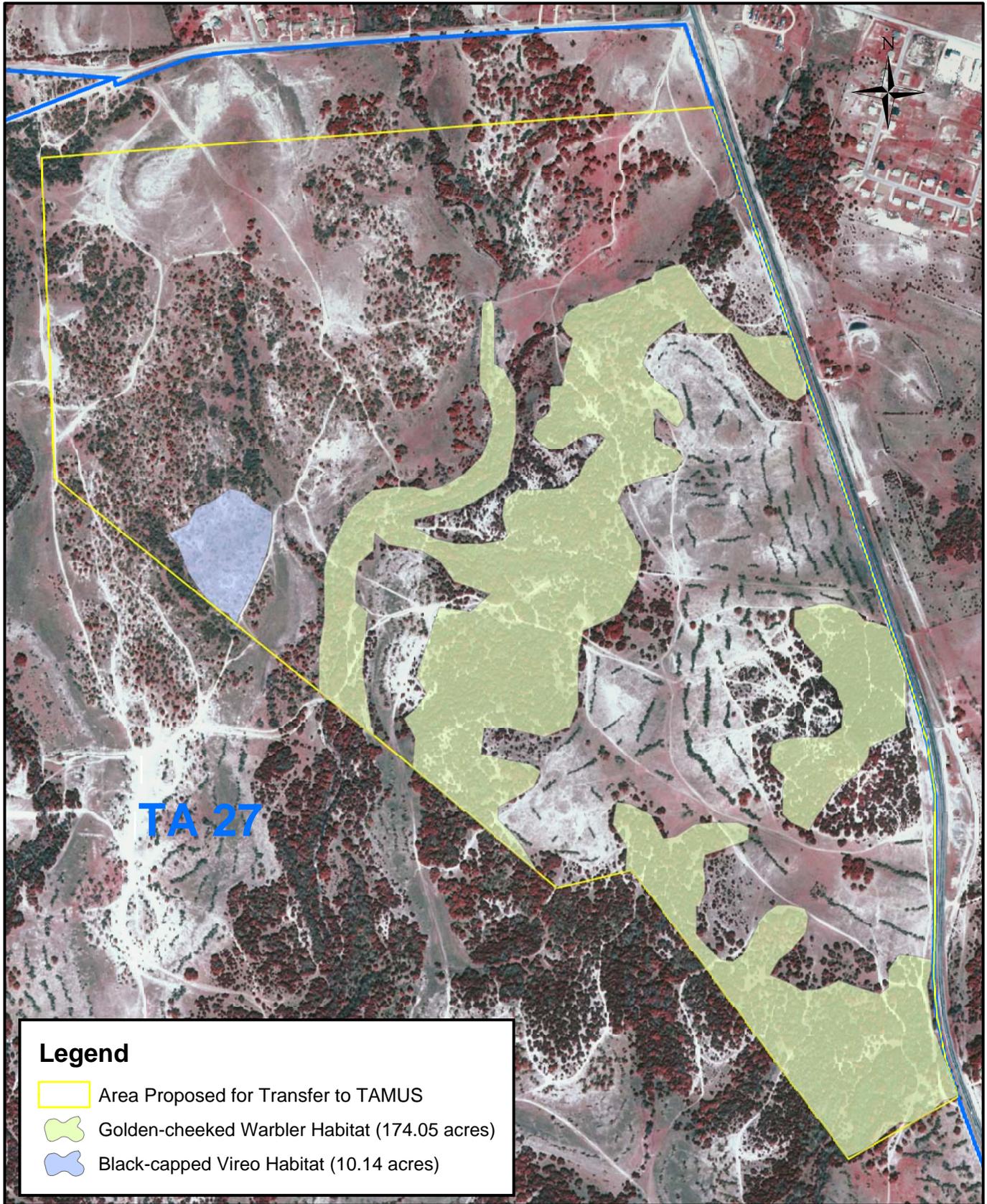


Figure 3-3. Golden-cheeked Warbler and Black-capped Vireo Habitat on the Property Proposed for Transfer from Fort Hood to the Texas A & M University System.

Scale: 1:12,000

March 1, 2004

NEEL SCHAFFER

1 Golden-cheeked warblers nest in mixed oak-juniper woodlands, preferring older stands with tall,
2 old (approximately 40 year old) trees and closed canopies (USFWS 1992). Golden-cheeked
3 warblers nest in suitable habitat throughout the installation. The Fort Hood ESMP designates
4 areas of core habitat for the species, and activities in the core habitat area are tightly restricted to
5 minimize impacts to the species (ESMP 2001). The project area is not located within designated
6 core habitat. According to the official habitat map (ESMP 2001), there are approximately
7 174.05 acres of non-core habitat for the endangered golden-cheeked warbler on the subject
8 property (see Figure 3-3). Fort Hood conducts annual surveys of the project area and the golden-
9 cheeked warbler has not been observed on the subject property since 1997.

10
11 The Salado Springs salamander is a candidate species for listing. The Salado Springs
12 salamander is endemic to a few springs in Bell County but is not known from Fort Hood.

13 14 **Species of Concern**

15 The Texabama croton (*Croton alabamensis* var. *texensis*) is a plant shrub species of concern that
16 was formerly a Category 2 candidate species. Category 2 candidate species are those species for
17 which existing information suggests listing may be warranted, but for which substantial
18 biological information to support a proposed rule is lacking. Texabama croton is only known
19 from a few locations in Texas, including the Eastern Training Area of Fort Hood, another
20 location in Coryell County, and one location in Travis County. It was once believed that the
21 species was endemic to three counties in Tennessee and Alabama. The true distribution of this
22 shrub species in Texas is unknown. Threats to the species are unknown because the species is
23 relatively unknown (USACE 2000).

24
25 Several endemic and currently undescribed cave invertebrate species and one undescribed
26 salamander (*Plethodon* sp.) occur in the Karst systems beneath Fort Hood. Studies are ongoing
27 to confirm the taxonomic status of these organisms (USACE 2000; USFWS 2000). These Karst
28 features are associated with the groundwater system that is the source of spring waters and are
29 protected from public and military activities. No caves or Karst systems are known to occur in
30 the project area.

31 32 **State Listed Species**

33 Six observations of the Texas horned lizard (*Phrynosoma cornutum*), a species listed as
34 threatened by the State of Texas, have been documented in the western portion of the installation
35 (The Nature Conservancy of Texas 1999; USACE 2000). The species prefers arid to semi-arid
36 habitats with minimal vegetation. Specific threats to this species on Fort Hood have not been
37 identified and the species has not been observed in the project area. No legal requirement exists
38 to study or manage the species; however, a literature review and feasibility study are currently
39 underway to determine whether a status survey may be conducted in-house or with minimal
40 outside funding (Horne 1999).

41 42 **3.6 Air Quality**

43 In accordance with Federal Clean Air Act (CAA) requirements, the air quality in a given region
44 or area is measured by the concentration of various pollutants in the atmosphere. The
45 measurements of these “criteria pollutants” in ambient air are expressed in units of parts per
46 million (ppm) or in units of micrograms per cubic meter ($\mu\text{g}/\text{m}^3$). The air quality in a region is a

1 result not only of the types and quantities of atmospheric pollutants and pollutant sources in an
2 area, but also surface topography, the size of the topological “air basin,” and the prevailing
3 meteorological conditions.

4
5 The USEPA developed numerical concentration-based standards, or National Ambient Air
6 Quality Standards (NAAQS) [both primary and secondary NAAQS], for pollutants that have
7 been determined to impact human health and the environment. NAAQS are currently established
8 for six criteria air pollutants including: ozone (O₃), carbon monoxide (CO), nitrogen dioxide
9 (NO₂), sulfur dioxide (SO₂), respirable particulate matter (including particulates equal to or less
10 than 10 microns in diameter [PM₁₀]) and particulate matter equal to or less than 2.5 microns in
11 diameter (PM_{2.5}), and lead (Pb). The primary NAAQS represent maximum levels of
12 background air pollution that are considered safe, with an adequate margin of safety to protect
13 public health. Secondary NAAQS represent the maximum pollutant concentration necessary to
14 protect vegetation, crops, and other public resources along with maintaining visibility standards.
15 The State of Texas has adopted the NAAQS and has titled them the Texas Ambient Air Quality
16 Standards (TAAQS). Table 3-4 presents the primary and secondary NAAQS and TAAQS that
17 apply to the air quality in Texas.

18
19 General conformity regulations are designed to ensure that Federal actions do not impede local
20 efforts to achieve or maintain attainment with the NAAQS. The General Conformity Rule and
21 the promulgated regulations found in 40 CFR Part 93, exempt certain Federal actions from
22 conformity determinations (e.g., contaminated site clean-up and natural emergency response
23 activities). Other Federal actions are assumed to conform if total indirect and direct project
24 emissions are below *de minimis* levels presented in 40 CFR Part 93.153. The threshold levels (in
25 tons of pollutant per year) depend upon the non-attainment status that the USEPA has assigned
26 to a non-attainment area. Once the net change in non-attainment pollutants is calculated, the
27 Federal agency must compare them to the *de minimis* thresholds.

28 29 **Existing Air Quality Conditions**

30 Fort Hood is located in Bell and Coryell Counties, which are within the Austin-Waco Intrastate
31 Air Quality Control Region (AQCR) (40 CFR 81.175). Each AQCR is classified as an
32 attainment area or non-attainment area for each of the criteria pollutants depending on whether it
33 meets or fails to meet the NAAQS for the pollutant. Ambient air quality for the Austin-Waco
34 Intrastate AQCR is classified as an unclassifiable/attainment area for all criteria pollutants.
35 Unclassifiable areas are those areas that have not had ambient air monitoring and are assumed to
36 be in attainment with NAAQS.

37
38 Currently, the Texas Commission on Environmental Quality (TCEQ) is participating in an Early
39 Action Compact with the USEPA to develop air quality plans to ensure that the Austin-Waco
40 area attains and maintains compliance with the new 8-hour O₃ standard. Through participation
41 in the Early Action Compact, the Austin-Waco area can avoid a possible non-attainment
42 designation, so long as the region complies with the rules and milestones defined in the air
43 quality plan. TCEQ has proposed to the USEPA that the entire State of Texas should be
44 classified as an attainment area for the new O₃ and PM_{2.5} standards.

1
2

**Table 3-4.
National and Texas Ambient Air Quality Standards**

Pollutant	Standard Value	Standard Type
Carbon Monoxide (CO)		
8-hour Average	9.5 ppm	(10 mg/m ³) ² Primary
1-hour Average	35 ppm	(40 mg/m ³) ² Primary
Nitrogen Dioxide (NO₂)		
Annual Arithmetic Mean	0.053 ppm	(100 µg/m ³) ² Primary & Secondary
Ozone (O₃)		
1-hour Average ¹	0.12 ppm	(235 µg/m ³) ² Primary & Secondary
8-hour Average ¹	0.08 ppm	(157 µg/m ³) ² Primary & Secondary
Lead (Pb)		
Quarterly Average		1.5 µg/m ³ Primary & Secondary
Particulate < 10 micrometers (PM₁₀)		
Annual Arithmetic Mean		50 µg/m ³ Primary & Secondary
24-hour Average		150 µg/m ³ Primary & Secondary
Particulate < 2.5 micrometers (PM_{2.5})		
Annual Arithmetic Mean		15 µg/m ³ Primary & Secondary
24-hour Average		65 µg/m ³ Primary & Secondary
Sulfur Dioxide (SO₂)		
Annual Arithmetic Mean	0.03 ppm	(80 µg/m ³) ² Primary
24-hour Average	0.14 ppm	(365 µg/m ³) ² Primary
3-hour Average	0.5 ppm	(1,300 µg/m ³) ² Secondary

Notes:

¹ In July of 1997, the 8-hr O₃ standard was promulgated and the 1-hour O₃ standard was remanded for all areas, except those designated non-attainment with the 1-hour standard when the O₃ 8-hour standard was adopted. In July of 2000, the O₃ 1-hour standard was re-instated as a result of the Federal lawsuits that were preventing the implementation of the new 8-hour O₃ standard. USEPA currently plans to designate 8-hour O₃ attainment status on April 15 2004 (ref: Federal Register, 16 December 2003, page 70108). In the interim, no areas can be deemed definitively non-attainment with the new 8-hr standard.

² Parenthetical value is an approximately equivalent concentration.

ppm – parts per million
 mg/m³ – milligrams per cubic meter
 µg/m³ – micrograms per cubic meter

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Fort Hood, considered a major source for criteria pollutants because of its calculated potential to emit certain criteria pollutants including CO, NO_x, SO₂, VOC, and PM₁₀, is under the jurisdiction of USEPA Region VI and the TCEQ. It is also currently designated as a major source of hazardous air pollutants; therefore, existing air emission sources are subject to Maximum Achievable Control Technology standards. The TCEQ approved Fort Hood's Title V Federal Operating Permit on October 29, 2001, and currently conducts annual compliance inspections at

1 Fort Hood. Based on this audit mechanism, the installation has implemented the required
2 programs to maintain compliance with Federal and state air regulations.

3 4 **3.7 Noise**

5 Noise is described as unwanted sound, which is measured and perceived by its characteristic
6 amplitude and frequency. Amplitude is a measure of the strength of the sound and is directly
7 measured in terms of changes in the pressure of a sound wave. Frequency, commonly perceived
8 as pitch, is the number of times per second the sound causes air molecules to oscillate. Sound is
9 represented on a logarithmic scale in decibel (dB) units. The threshold of human hearing is
10 approximately 0 dB, and the threshold of pain is around 120 dB.

11
12 Frequency of measured sound is adjusted to correspond to the frequency sensitivity of the human
13 ear if measuring community response to noise. Sound levels that have been adjusted are referred
14 to as A-weighted sound levels and are represented as dBA units. Noise levels are computed over
15 a 24-hour period and adjusted for nighttime annoyances to produce the day-night average sound
16 level (DNL).

17
18 DNL is the community noise metric recommended by the U.S. Environmental Protection Agency
19 (USEPA) (USEPA 1972) and has been adopted by most Federal agencies (Federal Interagency
20 Committee on Noise 1992). A DNL of 65 dB is the level most commonly used for noise
21 planning purposes and represents a compromise between community impact and the need for
22 activities that do cause noise. Areas exposed to DNL above 65 dB are generally not considered
23 suitable. A DNL of 55 dB was identified by USEPA as a level below which there is effectively
24 no adverse impact (USEPA 1972).

25
26 The primary noise sensitive receptors near the project area are residential neighborhoods and
27 isolated residences such as farms and ranches. The most common public noise complaints
28 throughout Fort Hood are caused by aircraft, followed by range activity. The complaints are not
29 usually due to the effect of the noise on humans, but instead the effect to livestock spooked by
30 sudden noise who damage facilities or structures (USACE 1999).

31
32 There are two airports within relatively close proximity to the project area, the RGAAF and the
33 Killeen Municipal Airport. Existing air space agreements allow Fort Hood aircraft a 500-foot
34 ceiling. Historically Fort Hood is used by approximately 36,000 flight operations a month which
35 creates approximately 30 noise complaints per year (USACE 1999). Fort Hood completed an
36 Installation Compatible Use Zone study in 1990 which establishes noise “contours” as a method
37 of coordination compatible land use with neighboring communities. The property proposed for
38 transfer is located outside of the noise “contour” zones for RGAAF and no special requirements
39 or conditions are applicable. The Killeen Municipal Airport is located further from the project
40 area than RGAAF; therefore, no noise impacts from either of these airports are anticipated.

41 42 **3.8 Cultural Resources**

43 Cultural resources are defined by the National Historic Preservation Act (NHPA) as prehistoric
44 and historic sites, structures, districts, or any other physical evidence of human activity
45 considered important to a culture, a subculture, or a community for scientific, traditional,
46 religious, or any other reason. Depending on the condition and historic use, such resources may

1 provide insight into living conditions in previous civilizations and/or may retain cultural and
2 religious significance to modern groups.

3
4 Several Federal laws and regulations govern protection of cultural resources, including the
5 NHPA of 1966, the Archaeological and Historic Preservation Act of 1974, the American Indian
6 Religious Freedom Act of 1978, the Archaeological Resources Protection Act of 1979, and the
7 Native American Graves Protection and Repatriation Act of 1990.

8
9 The EA process and the consultation process proscribed in Section 106 of the NHPA requires an
10 assessment of the potential impact of an undertaking on historic properties that are within the
11 proposed project's Area of Potential Effect (APE), which is defined as the geographic area(s)
12 "within which an undertaking may directly or indirectly cause alterations in the character or use
13 of historic properties, if any such properties exist." In accordance with EO 12372,
14 *Intergovernmental Review of Federal Programs*, determinations regarding the potential effects
15 of an undertaking on historic properties are presented to the state historic preservation office
16 (SHPO).

17 18 **3.8.1 Existing Cultural Resource Conditions**

19 There are 22 known, relatively small, (less than 50 interments) cemeteries on the base. These are
20 not automatically considered cultural resources and Fort Hood regulation 210-190, not the
21 NHPA, specifies the Army's role in their upkeep and the conditions for future interments.

22
23 Historic structure inventories have resulted in the recordation of five historic structures (2 Okay
24 Community buildings, The Reynolds House, The North Fort Hood Swimming Pool, and the
25 Killeen Base Nuclear Warhead Storage Facility). There are no historic buildings near or within
26 the APE for the proposed action. Fort Hood contains no inventoried historic districts or historic
27 landscapes.

28
29 No formal assessments of Traditional Cultural Properties (TCP) have been completed at Fort
30 Hood. However, two properties have been identified through other projects. The Leon River
31 Medicine Wheel was identified during an archeological survey in 1990 and has since been
32 recognized as a TCP by various tribal representatives and is currently being used for ceremonial
33 purposes. The other TCP, the Comanche National Indian Cemetery, is a repatriation cemetery
34 established in 1991 as a location for reburial of repatriated remains discovered at Fort Hood
35 (Huckerby 2001). Neither of these TCPs is located within the APE.

36
37 The Cultural Resources Management Plan for Fort Hood states that 98.6 percent of the Training
38 and Cantonment areas and 71.1 percent of the live-fire area have been surveyed for archeological
39 resources. Roughly 44 percent of the un-surveyed portions of the live-fire areas are in the
40 permanently duded zone (Huckerby 2001). Through surveys, archeologists have identified 2,219
41 archeological sites (1,100 pre-historic, 1,119 historic) at Fort Hood. Currently Fort Hood
42 protects 1,178 of the sites due to National Register of Historic Places (NRHP) eligibility (eligible
43 or potentially eligible) covering approximately 13,500 acres. Including buffers, the total acreage
44 requested for avoidance is 33,500 acres. In addition, military and civilian digging is controlled
45 in un-surveyed areas and alluvial terraces. Ineligible sites are monitored, as well (Huckerby
46 2001).

1 Fort Hood Cultural Resources Management Program personnel have surveyed and made
2 determinations for the area currently encompassed by the potential TAMUS transfer. Two
3 cultural resource sites are located within the APE for the property proposed for transfer to
4 TAMUS.

5
6 Archaeological site, 41BL332, was identified within the APE that had the potential to be affected
7 by the proposed property transfer. 41BL332 is a prehistoric archaeological site consisting of a
8 shallow burned rock mound with little other cultural material on an upland type surface. The site
9 was first recorded in 1980 and it was reported that looting activities had impacted 10 percent of
10 the mound. Since 1980, a variety of monitoring reports have relocated the degrading mound but
11 no other archaeological materials. Review of the local cut banks did not reveal any further
12 cultural materials. In 2000, Fort Hood's Cultural Resources Management Staff reviewed the site
13 in depth as part of the NHPA 106 Review for the RGAAF joint-use project with the City of
14 Killeen. During that review, Fort Hood's Cultural Resource Management staff proposed that
15 41BL332 did not meet contextual integrity criteria under criteria D of 36 CFR Part 800 and
16 concurrence was received from the SHPO.

17
18 A second site, site 41BL349, is also located within the APE for the proposed property transfer.
19 Site 41BL349 is a burned rock midden. The site was tested during the 1999 field season and the
20 results indicated that site 41BL349 does not meet eligibility criteria for listing on the National
21 Register of Historic Places and concurrence was received from the SHPO. This information has
22 been forwarded to the SHPO and Fort Hood is currently awaiting concurrence on these sites.

23 24 **3.9 Socioeconomics**

25 The socioeconomic Region of Influence (ROI) of the project area encompasses a portion of
26 Fort Hood in Bell County, Texas. Bell County is part of the Killeen-Temple-Fort Hood
27 Metropolitan Statistical Area (MSA) with a 2002 population of 319,163 (Real Estate Center
28 2004).

29
30 The total population of Bell County was estimated to be 244,668 in 2002. This is a slight
31 increase over the 2001 census population of 241,501 (U.S. Census Bureau [USCB] 2003). The
32 racial mix is mainly comprised of Caucasians (57.3 percent), followed by African-Americans
33 (20.4 percent) and Hispanic or Latino (16.7 percent). The remaining 5.6 percent is split between
34 Asians, American Indians and Alaska natives, and Native Hawaiian and other Pacific Islander
35 (USCB 2000a).

36
37 The total number of jobs in Bell County in 2000 was 121,181, a 25 percent increase over the
38 1990 figure of 96,935 jobs (USCB 2000b, USCB 1990). The 2000 unemployment rate was 3.7
39 percent, which is slightly lower than the state unemployment rate of 3.8 percent (USCB 2000b,
40 USCB 2000c). Approximately 12.1 percent of the total population lives in poverty. This is
41 slightly less than the estimated 15.4 percent of the state population that lives in poverty (USCB
42 2003).

43
44 The 2001 annual Total Personal Income (TPI) for Bell County was \$6,133,123. Bell County's
45 TPI ranked 17th in the state and accounted for 1 percent of the state total. The Per Capita
46 Personal Income (PCPI) for Bell County was \$25,396 in 2001. Bell County's PCPI ranked 49th

1 in the state and was 89 percent of the state average (\$28,472) and 84 percent of the national
2 average (\$30,413) (U.S. Bureau of Economic Analysis 2004).

3
4 In 2000 there were 92,782 housing units in Bell County with 85,507 of these houses currently
5 occupied. Approximately 56,282 of the housing units are currently one-unit, detached structures
6 with the rest existing as multi-unit housing, mobile homes, or boat, recreational vehicles, or vans
7 (USCB 2000d).

8 9 **3.10 Environmental Justice/ Protection of Children from Health and Safety Risks**

10 E.O. 12898 “Federal Actions to Address Environmental Justice in Minority Populations and
11 Low-Income Populations”, dated February 11, 1994, requires all Federal agencies to identify and
12 address disproportionately high and adverse effect of its programs, policies, and activities on
13 minority and low-income populations. Since the project area exhibits a large population of
14 minorities, particularly groups claiming African American and Hispanic or Latino origin and
15 low-income populations, E.O. 12898 will be considered in this EA.

16
17 E.O. 13045 “Protection of Children from Environmental Health Risks” dated April 21, 1997
18 requires Federal agencies to identify and address the potential to generate disproportionately high
19 environmental health and safety risks to children. This E.O. was prompted by the recognition
20 that children, still undergoing physiological growth and development, are more sensitive to
21 adverse environmental health and safety risks than adults. Since the project area is located near
22 residential areas where children may be present, E.O. 13045 will be considered in this EA.

23 24 **3.11 Hazardous and Toxic Materials**

25 Specific environmental statutes and regulations govern hazardous material and hazardous waste
26 management activities at Fort Hood. AR 710-2 and AR 200-1 and Federal, state, and local laws
27 have increased the requirements for managing hazardous materials at Army installations. For the
28 purpose of this analysis, the terms *hazardous waste*, *hazardous materials*, and *toxic substances*
29 include those substances defined as hazardous by the Comprehensive Environmental Response,
30 Compensation, and Liability Act (CERCLA), the Resource Conservation and Recovery Act
31 (RCRA), or the Toxic Substances Control Act (TSCA). In general, they include substances that,
32 because of their quantity, concentration, or physical, chemical, or toxic characteristics, may
33 present substantial danger to public health or welfare or to the environment when released.

34
35 To identify areas where possible storage, release, or disposal of hazardous substances or
36 petroleum products or their derivatives has occurred, the Army, through contractor support,
37 prepared an Environmental Baseline Survey (EBS) of the TAMUS transfer property. The EBS
38 also identified any existing non-CERCLA-related environmental or safety issues (e.g., asbestos-
39 containing material and lead-based paint) that would limit or preclude use of the property. Data
40 was also collected on the presence of hazardous wastes on and within one-mile of the property
41 from Environmental Data Resources, Inc. (EDR) (e²M 2004). Some of the important Federal
42 databases searched by EDR include National Priority List (NPL) sites, Proposed NPL sites, the
43 Comprehensive Environmental Response, Compensation, and Liability Information System
44 (CERCLIS), Resource Conservation and Recovery Information System (RCRIS), and the
45 Emergency Response Notification System (ERNS) A summary of the findings contained in the
46 EBS have been included in the following sections.

1 **3.11.1 Uses of Hazardous Materials**

2 The project area investigated as part of the EBS was undeveloped. The only structures
3 encountered on the premises were a small corral, many deer stands, and watering basins for the
4 cattle that graze on-site. These structures were simple and constructed of metal, lumber, or
5 poured concrete. Based on the materials utilized and a visual investigation of these structures, no
6 asbestos-containing materials, lead-based paint, or polychlorinated biphenyls (PCBs) are likely
7 to be present.

8
9 Potential hazardous materials that may have been used on site are “cattle dips.” Cattle dips
10 consist of insecticides applied to cattle for delousing. It is not known that this has occurred on-
11 site, but due to the presence of grazing cattle and a corral, the possibility exists. The most likely
12 area this application may or may not have occurred is in the vicinity of the corral on the northern
13 portion of the transfer property. An empty 50 gallon drum of unknown contents was observed in
14 the treeline due south of the corral.

15
16 **3.11.2 Storage and Handling Areas**

17 The property is previously undeveloped and no storage or handling areas were observed on-site.

18
19 **3.11.3 Hazardous Waste Disposal**

20 The property is previously undeveloped and no hazardous waste disposal areas were observed
21 on-site.

22
23 **3.11.4 Site Contamination and Cleanup**

24 Upon personal communications with Ms. Nancy Niemann (Niemann 2004) and Mr. Steve
25 Burrow (Burrow 2004) of Fort Hood’s Directorate of Public Works, no contamination is
26 documented or known to exist on site. This is consistent with field observations during the EBS
27 site investigation.

28
29 **3.11.5 Special Hazards**

30 **PCBs**

31 PCBs are industrial compounds used in electrical equipment, primarily capacitors and
32 transformers, because they are electrically nonconductive and stable at high temperatures. PCBs
33 persist in the environment, bioaccumulate in organisms, and become concentrated in the food
34 chain because of their chemical stability. The disposal of PCBs is regulated by TSCA, which
35 regulates the removal and disposal of contaminated equipment containing PCBs at
36 concentrations greater than 50 parts per million (ppm).

37
38 During site reconnaissance, several pole-mounted transformers were observed along the utility
39 pole right-of-way. These transformers showed no indication of leaks, spills or other evidence of
40 a release.

41
42 **Asbestos**

43 Remediation for asbestos-containing material is regulated by USEPA and the Occupational
44 Safety and Health Administration (OSHA). Asbestos fiber emissions into the ambient air are
45 regulated in accordance with Section 112 of the Clean Air Act, which established the National

1 Emissions Standards for Hazardous Air Pollutants (NESHAP). These standards address the
2 demolition or renovation of buildings with asbestos-containing material.

3
4 The structures located on the TAMUS transfer property consist of a steel corral fence and metal
5 shack, several deer stands, and concrete water retainment basins. Based on the materials utilized
6 and a visual investigation of these structures, no asbestos-containing material was present.

7 8 **Lead-based paint**

9 Though no samples were collected, it is unlikely that the structures observed contained lead-
10 based paint.

11 12 **Pesticides**

13 Since the project area has remained undeveloped, it is unlikely that extensive pesticide use has
14 occurred on the land. If pesticide use occurred, it most likely involved “cattle dips” to delouse
15 cattle on-site.

16 17 **Radon**

18 Radon is a naturally occurring, colorless, and odorless radioactive gas that is produced by the
19 decay of naturally occurring radioactive material (e.g., potassium, uranium, etc.). Atmospheric
20 radon is diluted to insignificant levels; however, when concentrated in enclosed areas, radon can
21 present human health risks.

22
23 The TAMUS transfer property is located in an area that borders from USEPA designated Zone 3
24 (less than 2 picoCuries per liter (pCi/L)) to a Zone 2 (from 2 to 4 pCi/L) (USEPA 2003a). While
25 the levels would likely remain below the USEPA action level of 4 pCi/L, all enclosed areas of
26 any new construction should be monitored.

27 28 **3.12 Transportation and Utilities**

29 Interstate 35, U.S. Highway 190, U.S. Highway 183, U.S. Highway 84, and State Highway 36
30 serve the Fort Hood/Killeen area. These arteries provide transportation routes from the Waco
31 and Dallas/Fort Worth area in the north, the Austin/San Antonio region to the south, and western
32 Texas. The project area can be accessed from U.S. Highway 190 via State Highway 195 South
33 (borders project area to the east) and Airport Road (borders project area to the north). State
34 Highway 195 is a divided, four-lane highway, and Airport Road is a two-lane facility that was
35 recently constructed. There are no paved roads within the project area, but there are numerous
36 substandard, unpaved roads.

37 38 **Water Supply**

39 Potable water on Fort Hood is obtained from the Bell County Water Control Improvement
40 District (BCWCID) #1, which guarantees a delivery of 16.0 million gallons/day (mgd) (USACE
41 2003). BCWCID #1 obtains its water from Lake Belton.

42 43 **Sanitary Sewer**

44 Fort Hood and the City of Killeen are served by Treatment Plants #1 and #2 of the BCWCID #1.
45 Half of Treatment Plant #1’s capacity of 15.0 mgd is reserved for Fort Hood. Treatment plant #2

1 has an additional reserve capacity of 3.0 mgd and adjacent land is available to construct another
2 treatment plant with a capacity of 6.0 mgd (USACE 2003).

3
4 **Solid Waste Disposal**

5 Fort Hood operates a 154-acre Type I landfill under Permit #1866 issued on March 25, 1991.
6 The landfill is capable of serving the needs of Fort Hood for approximately 30 more years
7 (USACE 2003).

8
9 **Electric Power**

10 Texas Utilities Electric Company provides electricity to Fort Hood through two 138,000-volt
11 transmission lines (USACE 1999).

12
13 **Natural Gas**

14 The Lone Star Gas Company provides a guaranteed annual delivery of 8,468 million thousand
15 cubic feet (kcf) to Fort Hood (USACE 1999).

16
17 Because of the undeveloped nature of the project area, there are no direct utility hookups;
18 although water, sewer, and gas lines may be present in the in-situ soil. Several electrical power
19 lines traverse the project area.

4.0 ENVIRONMENTAL CONSEQUENCES

1
2
3 This section assesses the direct and indirect impacts of the proposed action. Direct impacts are
4 caused by the action and occur at the same time and place. For the purposed of this EA, direct
5 impacts are those caused by the immediate real estate action of transferring the property from
6 Fort Hood to TAMUS. Indirect impacts are caused by the action and are later in time or farther
7 removed in distance, but are still reasonably foreseeable. For the purposes of this EA, indirect
8 impacts are those subsequent impacts associated with TAMUS campus development. For the
9 purposes of this EA, “short-term” impacts are defined as those impacts which would occur prior
10 to or during construction. “Long-term” impacts are those expected to last beyond the duration of
11 construction. The proposed action, as defined in this EA, involves the transfer of land from Fort
12 Hood to the TAMUS. However, as the construction would be a reasonably foreseeable future
13 action (directly related to the proposed action), indirect impacts associated with construction of
14 the proposed campus are also discussed.
15

16 For the purposes of this EA, the NEPA Team utilized a conservative approach to quantify the
17 maximum cumulative impacts that are anticipated to occur. It was calculated that with current
18 conceptual designs a maximum area of 225 acres would be cleared for the proposed campus;
19 however, this would change as the design process continues. In many areas the actual impacts
20 would depend on design of the proposed campus, available funding, student enrollment, and
21 many other factors. Therefore, the following sections assume that the maximum impact of the
22 proposed university construction would be 225 acres. It should also be noted, that the timeline
23 for construction is unknown at this time and construction is not anticipated to begin for several
24 years, possibly distributing impacts over long periods of time. Once construction commences, it
25 would be incremental (on an as-needed basis), therefore taking many years to complete the entire
26 campus.
27

28 Only those resources that could potentially be impacted as a result of construction activities are
29 addressed in the following sections. Mitigation measures that are necessary to offset the impacts
30 are discussed at the end of each subsection, where applicable and summarized at the end of this
31 section.
32

4.1 Land Use

4.1.1 No Action Alternative

35 Under the No Action Alternative, the property transfer would not occur, and the property would
36 remain under the ownership of Fort Hood. The property would continue to be utilized for cattle
37 grazing and a limited amount of training. There would be no impacts, either beneficial or
38 adverse, to land use as a result of the No Action Alternative.
39

4.1.2 Proposed Action Alternative

41 Under the Proposed Action Alternative, no direct impacts to land use would result from the
42 proposed property transfer alone. However, the indirect (future) impact would be the
43 development of a 20,000-student campus over approximately the next 20 years.
44

45 Insignificant, long-term impacts to land use are anticipated as a result of TAMUS construction
46 activities because portions of the property would change from undeveloped rangeland/grassland

1 to a fully functional university. Construction activities are proposed on approximately 225 of the
2 672.36 total acres that the TAMUS would acquire from Fort Hood, resulting in approximately
3 447 acres of the property untouched and left in its current state. Surrounding land use to the
4 south and west of the property would not be impacted or changed, since they are owned by the
5 State of Texas and Fort Hood, respectively. Land use to the north and east could potentially
6 change following completion of the university, as commercial and/or residential development
7 would more than likely increase in the area. All zoning requirements would have to be finalized
8 and approved by Bell County and/or the City of Killeen prior to any construction activities.
9

10 **4.2 Aesthetics and Visual Resources**

11 **4.2.1 No Action Alternative**

12 Under the No Action Alternative, the property transfer would not occur, and the property would
13 remain under the ownership of Fort Hood. There would be no impacts, either beneficial or
14 adverse, to aesthetic and visual resources as a result of the No Action Alternative.
15

16 **4.2.2 Proposed Action Alternative**

17 Under the Proposed Action Alternative, no direct impacts to aesthetics and visual resources
18 would result from the proposed property transfer.
19

20 This alternative would result in the loss of natural aesthetic features found throughout the project
21 area. The construction of facilities and infrastructure associated with the university would
22 infringe upon the predominately undisturbed visual resources currently found on the site.
23 However, the facilities would be designed to be visually appealing and non-intrusive to the
24 surrounding environment's aesthetics. Also, as phases of construction are completed native
25 vegetation would be used in the landscaping to enhance the visual interest of the campus. As a
26 result, insignificant long-term indirect impacts to aesthetics and visual resources would occur.
27

28 **4.3 Geological Resources**

29 **4.3.1 No Action Alternative**

30 Under the No Action Alternative, the property transfer would not occur, and the property would
31 remain under the ownership of Fort Hood. There would be no impacts, either beneficial or
32 adverse, to geology, topography, or prime farmlands, as a result of the No Action Alternative.
33 Grazing and military training activities can increase soil compaction, reduce water infiltration,
34 and increase soil erosion; however, the severity of the impact is generally driven by the intensity,
35 frequency, and duration of the activities. If grazing and military activities are properly managed,
36 soils would not be degraded over time. Therefore, there would be no impacts, either beneficial
37 or adverse, to soils as a result of the No Action Alternative.
38

39 **4.3.2 Proposed Action Alternative**

40 **Geology and Topography**

41 Under the Proposed Action Alternative there would be no direct impacts to geology from the
42 land transfer or construction of the proposed university. Topography is expected to change as
43 grading is performed during construction to accommodate the buildings and features of the
44 campus. The resulting changes to topography are expected to be adverse and long-term but
45 insignificant.
46

1 **Soils**

2 Under the Proposed Action Alternative, construction activities are proposed on approximately
3 225 of the 672.36 total acres that the TAMUS would acquire from Fort Hood, resulting in
4 approximately 447 acres of the property untouched and left in its current state. Under these
5 conditions, cessation of livestock grazing would have a beneficial impact on soils in the project
6 area. Cessation of grazing and military training activities would reduce soil compaction,
7 increase water infiltration, and decrease soil erosion. The intensity of the beneficial impacts are
8 unquantifiable because they would be based upon the soils present in the project area as well as
9 intensity, frequency, and duration of these activities; however, the benefits are anticipated to be
10 insignificant.

11
12 The proposed university would involve standard construction activities, which would eventually
13 disturb approximately 225 acres of soils within the project area. The project area would be
14 cleared, graded, and paved to permit construction, removing these soils from future biological
15 and agricultural production. All construction activities must be evaluated to determine the
16 erosion potential of the soils and erosion control designs incorporated into the construction plans.

17
18 In the long-term, increased runoff and erosion would occur during site construction due to
19 removal of vegetation, exposure of soil, and increased susceptibility to wind and water erosion.
20 However, these effects would be minimized by the use of appropriate Best Management
21 Practices (BMPs) for controlling runoff, erosion, and sedimentation. These measures are
22 discussed below. Consequently, long-term, insignificant impacts to soils are expected.

23
24 **Mitigation Measures**

25 Recommended BMPs to reduce soil erosion and sedimentation include, but are not limited to, silt
26 fences, straw (containing native grass species) bale dikes, diversion ditches, rip-rap channels,
27 water bars, and water spreaders. In addition, all work would cease during heavy rains and would
28 not resume until conditions are suitable for the movement of equipment and material. A Storm
29 Water Pollution Prevention Plan (SWPPP) would be prepared in accordance with TPDES
30 regulations. This SWPPP would describe the use of and implementation procedures for the
31 suggested BMPs.

32
33 **Prime Farmlands**

34 Under the Proposed Action Alternative, no direct impacts to prime farmlands would result from
35 the proposed property transfer.

36
37 According to the NRCS, Denton silty clay, Denton association, and Lewisville silty clay are all
38 classified as prime farmland soils. Construction of the proposed university would disturb up to
39 approximately 225 acres of prime farmland soils. The impacted soils are currently in agricultural
40 production growing forage for livestock; however, the entire project area would be removed
41 from agricultural production upon completion of the land transfer. All construction activities
42 (*i.e.* clearing, grading) would be limited to the proposed location of the university (225 acres),
43 and the remainder of the property would be left in its natural state. These 672.36-acres, with
44 soils common to Fort Hood, comprise a very small percentage of the overall acreage on the
45 military reservation (0.002 percent). Therefore, the proposed action would result in insignificant,
46 long-term impacts to prime farmlands.

1 **4.4 Water Resources**

2 **4.4.1 Groundwater and Surface Water**

3 **4.4.1.1 No Action Alternative**

4 Under the No Action Alternative, the property transfer would not occur, and the property would
5 remain under the ownership of Fort Hood. There would be no impacts, either beneficial or
6 adverse, to groundwater as a result of the No Action Alternative. The primary impacts to surface
7 waters would continue as a result of cattle grazing and mechanized training. Continued grazing
8 and military training could increase potential sediment loading caused by erosion of soils and
9 increase the potential risk of nutrient or pathogen contamination of surface waters. The intensity
10 of the impacts are unquantifiable because they would be based upon the soils present in the
11 project area as well as intensity, frequency, and duration of these activities; however, if grazing
12 and military activities are properly managed, no impacts to surface waters are anticipated.

13
14 **4.4.1.2 Proposed Action Alternative**

15 **Groundwater**

16 Under the Proposed Action Alternative, no direct impacts to groundwater would result from the
17 proposed property transfer.

18
19 No indirect impacts on the groundwater supply in the project area are anticipated from proposed
20 construction activities because of the great depth to groundwater. No groundwater would be
21 used during construction. Prior to any construction activities, TAMUS should coordinate with
22 the BCWCID to ensure they have capacity to supply the university with the required water
23 supply. The project area is not located in a designated USEPA sole-source aquifer (USEPA
24 2003b); therefore, no impacts to these features are anticipated.

25
26 **Surface Water**

27 Under the Proposed Action Alternative, insignificant beneficial impacts to surface water would
28 result from the proposed property transfer. Discontinuing grazing and military training would
29 reduce potential sediment loading caused by erosion of soils and eliminate the potential risk of
30 nutrient or pathogen contamination of surface waters. The intensity of the beneficial impact are
31 unquantifiable because they would be based upon the soils present in the project area as well as
32 intensity, frequency, and duration of these activities; however, the benefits are anticipated to be
33 insignificant.

34
35 Surface waters within the project area are not controlled by a man-made drainage system and
36 flow naturally via several ephemeral drains into North Reese Creek. Hardening of surfaces
37 through construction of buildings and parking areas could increase storm flows through the
38 downstream reaches of the creek. Design plans should incorporate an underground drainage
39 system and/or aboveground drainage ditches that would be constructed for effective drainage
40 within the project area, and should consider the effects of increased runoff to North Reese Creek,
41 due to construction of the campus, and should incorporate appropriate measures to prevent
42 downstream impacts. With the implementation of such measures, no impacts to surface waters
43 are expected.

44

1 **4.4.2 Water Quality**

2 **4.4.2.1 No Action Alternative**

3 Under the No Action Alternative, the property transfer would not occur, and the property would
4 remain under the ownership of Fort Hood. There would be no impacts, either beneficial or
5 adverse, to water quality including storm water and wastewater as a result of the No Action
6 Alternative.

7
8 **4.4.2.2 Proposed Action Alternative**

9 **Storm water**

10 Under the Proposed Action Alternative, no direct impacts to storm water would result from the
11 proposed property transfer.

12
13 Construction activities planned for future development would have long-term, insignificant
14 effects from increased impervious surface area and a subsequent increase in storm water runoff.
15 Adherence to proper storm water management engineering practices; applicable regulations,
16 codes, and permit requirements; and low-impact development techniques would reduce storm
17 water runoff-related impacts to a level of insignificance.

18
19 **Wastewater**

20 Under the Proposed Action Alternative, no direct impacts to wastewater would result from the
21 proposed property transfer.

22
23 The BCWCID is capable of treating 21 mgd of wastewater. In an average year, the District
24 treats 4.4 billion gallons of wastewater, including 1.3 billion gallons of wastewater from Fort
25 Hood. The average daily wastewater production by Fort Hood is 3.6 mgd. In addition to Fort
26 Hood, the District also serves Killeen, with an average of 3.1 billion gallons a year. Therefore,
27 the District should have adequate capacity to meet future development needs and there should be
28 no significant impacts from university operation. However, prior to any construction activities,
29 TAMUS should coordinate with the BCWCID to ensure they have adequate capacity to meet the
30 university's needs.

31
32 **Mitigation Measures**

33 The project area is undeveloped; therefore, there is currently no permit for the discharge of storm
34 water and wastewater on the property. Development of the property would require a TPDES
35 Construction General permit and a Municipal Separate Storm Sewer System (MS4) permit may
36 also be required for the operation of the facility's sewer system. Therefore, TAMUS is required
37 to notify TCEQ in order to obtain any necessary permits (including a TPDES permit) prior to
38 commencement of construction activities.

39
40 Erosion and sedimentation controls would also be required and would be in place during
41 construction to reduce and control siltation or erosion impacts to areas outside of the construction
42 site. A Storm water Pollution Prevention Plan (SWPPP) should be developed for the site
43 describing the use of and implementation procedures for the suggested BMPs. Examples of
44 BMPs includes silt fencing and sediment traps, the application of water sprays, and the
45 revegetation of disturbed areas would also reduce potential impacts. Implementation of sediment
46 and erosion controls during construction activities would maintain water runoff quality at levels

1 comparable to existing conditions and would limit potential impacts to soils resulting from future
2 development. Fugitive dust from construction activities would be minimized by watering and
3 soil stockpiling, thereby reducing the total amount of soil impacted.

4 5 **4.4.3 Waters of the U.S. and Wetlands**

6 **4.4.3.1 No Action Alternative**

7 Under the No Action Alternative, the property transfer would not occur, and the property would
8 remain under the ownership of Fort Hood. There would be no impacts, either beneficial or
9 adverse, to wetlands as a result of the No Action Alternative. The primary threat to waters of the
10 U.S. would continue to be cattle grazing and mechanized training. Continued grazing and
11 military training could increase potential sediment loading caused by erosion of soils. The
12 intensity of the impacts are unquantifiable because they would be based upon the soils present in
13 the project area as well as intensity, frequency, and duration of these activities; however, if
14 grazing and military activities are properly managed, no impacts to waters of the U.S. are
15 anticipated.

16 17 **4.4.3.2 Proposed Action Alternative**

18 Under the Proposed Action Alternative, completion of the proposed property transfer would
19 result in discontinued grazing and military training. This would reduce potential sediment
20 loading and the resulting impact on waters of the U.S. The intensity of the beneficial impacts are
21 unquantifiable because they would be based upon the soils present in the project area as well as
22 intensity, frequency, and duration of these activities; however, the benefits are anticipated to be
23 insignificant.

24
25 Biologists conducted an on-site inspection of the subject property on February, 23 - 26 2004.
26 Jurisdictional waters of the U.S. (North Reese Creek, its associated tributaries, and two unnamed
27 tributaries) are identified on the McMillian Mountains 7.5 minute Topographic Quadrangle and
28 verified during the field effort (see Figure 3-1). No jurisdiction wetlands were observed during
29 the field survey.

30
31 Based on our findings, the proposed university construction could adversely impact 13,586 linear
32 feet (2.57 miles) of jurisdictional waters of the U.S. The functions of these waters are flood
33 conveyance, flood storage, and habitat for fish, wildlife, and plant species. Values are primarily
34 open space and aesthetic.

35
36 The USACE has the authority to make the final decision regarding the jurisdictional status of a
37 waters, including wetlands; therefore, areas identified as potentially jurisdictional in this
38 document should be verified by the USACE Regulatory Department prior to any construction
39 activities. The USACE should also be contacted prior to construction activities to obtain any
40 required Federal and/or state permits (*i.e.* Section 404(b) and a State Water Quality
41 Certification). If applicable permits and mitigation measures are employed, impacts from the
42 Proposed Action Alternative on waters of the U.S. are expected to be long-term and
43 insignificant.

1 **Mitigation Measures**

2 If construction is to occur in a jurisdictional area, coordination regarding wetland and/or stream
3 mitigation would be conducted with the appropriate USACE District. All necessary Department
4 of the Army permits (*i.e.* Section 404) would be obtained prior to commencement of construction
5 activities.
6

7 **4.4.4 Floodplains**

8 **4.4.4.1 No Action Alternative**

9 Under the No Action Alternative, the property transfer would not occur, and the property would
10 remain under the ownership of Fort Hood. There would be no impacts, either beneficial or
11 adverse, to floodplains as a result of the No Action Alternative.
12

13 **4.4.4.2 Proposed Action Alternative**

14 Under the Proposed Action Alternative, no direct impacts to floodplains would result from the
15 proposed property transfer.
16

17 According to the FIRM map for Bell County, a narrow buffer along North Reese Creek and its
18 associated tributaries are classified as Zone A, indicating areas within the 100-year floodplain. If
19 future development in floodplain areas is required, construction plans must adhere to state and
20 local regulations in order to reduce the risks to human health and safety.
21

22 All work in a floodplain must meet all state and local floodplain and wetland regulations. The
23 public must be informed of construction activities located within a floodplain. A public hearing
24 must be held to allow public comment, and plans must be available for public review. Once
25 impacts to the floodplain have been determined, mitigation measures must be developed to
26 minimize harm to lives and property. If the proposed project would affect flooding on North
27 Reese Creek and/or Reese Creek, mitigation for floodplain impacts would be necessary. If all
28 local floodplain and wetland regulations are satisfied, the Proposed Action Alternative would not
29 impact the floodplain.
30

31 **4.5 Biological Resources**

32 **4.5.1 Vegetation**

33 **4.5.1.1 No Action Alternative**

34 Under the No Action Alternative, the property transfer would not occur, and the property would
35 remain under the ownership of Fort Hood. The land would continue to be utilized for cattle
36 grazing and military training, which (if properly managed) would not degrade the vegetation
37 community over time. Therefore, there would be no impacts, either beneficial or adverse, to
38 vegetation as a result of the No Action Alternative.
39

40 **4.5.1.2 Proposed Action Alternative**

41 Under the Proposed Action Alternative, no direct impacts to vegetation would result from the
42 proposed property transfer.
43

44 Long-term, insignificant impacts from construction activities would include the direct loss of
45 approximately 225 acres of vegetation. This loss of vegetation would be comprised of
46 grasslands and Coniferous Forest and Shrub, Deciduous Forest and Shrub, and Mixed Forest and

1 Shrub communities. No long-term effects on adjacent vegetation communities are anticipated
2 because a large portion of the project area would remain in a natural state and vegetation would
3 not be disturbed. Alteration of the landscape during construction phases is not anticipated to
4 result in any significant impacts on species diversity or significant impacts to the quality of the
5 vegetative community within the project area. Beneficial long-term impacts to vegetation
6 communities are expected for the remaining communities as a result of the cessation of grazing
7 activities once the property is transferred. The ecological condition of the grasslands and
8 riparian areas are expected to improve, potentially benefiting an array of vegetation, including
9 aquatic species.

10 **4.5.2 Fish and Wildlife**

11 **4.5.2.1 No Action Alternative**

12 Under the No Action Alternative, the property transfer would not occur, and the property would
13 remain under the ownership of Fort Hood. Grazing and military training would continue to
14 affect fish and wildlife habitat under this alternative which could result in long-term impacts to
15 the fish and wildlife on the installation; however, if grazing and military activities are properly
16 managed, no impacts to fish and wildlife are anticipated.

17 **4.5.2.2 Proposed Action Alternative**

18 Under the Proposed Action Alternative, no direct impacts to fish and wildlife would result from
19 the proposed property transfer.

20 Long-term, insignificant impacts to fish and wildlife from construction activities would include
21 the direct loss of approximately 225 acres of habitat. It is anticipated that planning of the
22 proposed university and landscaping with native species would allow portions of the 225 acres to
23 be utilized by fish and wildlife. Impacts would result from the temporary displacement of
24 wildlife due to disturbance from ground clearing operations and construction operations. Similar
25 habitat would remain in the area; therefore, proposed activities would not significantly affect
26 wildlife communities on a regional basis. Beneficial long-term impacts to fish and wildlife are
27 expected once grazing activities are stopped allowing habitat to improve in the undisturbed areas.
28 The ecological condition of the grasslands and riparian areas are expected to improve, potentially
29 benefiting an array of fish and wildlife, including aquatic species.

30 **4.5.3 Threatened and Endangered Species**

31 **4.5.3.1 No Action Alternative**

32 Under the No Action Alternative, the property transfer would not occur, and the property would
33 remain under the ownership of Fort Hood. With continued cattle grazing activities, this
34 alternative could have an impact on the golden-cheeked warbler and the black-capped vireo in
35 the form of brown-headed cowbird parasitism; however, continuation of Fort Hood's cowbird
36 trapping program would mitigate this impact. With cowbird control measures in place, no
37 impacts to threatened and endangered species are anticipated.

38 **4.5.3.2 Proposed Action Alternative**

39 Under the Proposed Action Alternative, the proposed property transfer and subsequent cessation
40 of grazing could have a beneficial impact on the golden-cheeked warbler and the black-capped
41 vireo in the form of reduced brown-headed cowbird parasitism; however, due to the small size of
42

1 the parcel and with Fort Hood's existing cowbird control program, the benefits are anticipated to
2 be insignificant.

3
4 Only the golden-cheeked warbler and black-capped vireo are anticipated to occur in the project
5 area. The remaining species are migratory or transient species and are not anticipated to occur in
6 the project area and/or the project area does not contain suitable habitat for the species. A BA
7 was prepared to address the impacts to the golden-cheeked warbler and black-capped vireo. The
8 BA provides sufficient detail of the impacts of the proposed action to determine to what extent
9 the proposed action may affect any of the threatened, endangered, proposed, or sensitive species.
10 As a result of consultation with Fort Hood, the USFWS issued a Biological Opinion (BO) of the
11 project which is found in Appendix B and summarized in the following paragraphs.

12
13 The potential impacts of the proposed construction of the university include the direct loss and
14 take in the form of harassment of golden-cheeked warbler and black-capped vireo habitat. The
15 BO estimated that the proposed action would result in the take of approximately 10 pairs or 20
16 individual golden-cheeked warblers. It also estimated that the proposed project could result in
17 the take in the form of harassment of 2 pairs or 4 individual black-capped vireos. The conclusion
18 of the BO found that the proposed project is not likely to jeopardize the continued existence of
19 the golden-cheeked warbler or black-capped vireo. If the mitigation measures identified in the
20 USFWS's BO are implemented, the long-term impacts to threatened and endangered species are
21 expected to be insignificant.

22 23 **Mitigation Measures**

24 A number of measures for minimization and reduction of impacts to threatened and endangered
25 species have been identified in the USFWS's BO issued as a result of correspondence with Fort
26 Hood during the Section 7 consultation process. The measures identified in the BO would be
27 followed as a condition of the endangered species take permit as follows:

- 28 1 Clearing of golden-cheeked warbler habitat on the property outside of the No-build Zones
29 will be scheduled outside of the major portion of the golden-cheeked warbler breeding
30 and nesting season (July through February). All vegetation clearing will be consistent
31 with the current practices recommended by the Texas Forest Service to prevent the
32 spread of oak wilt.
- 33 2 The buffer area within the No-build Zones will be planted and/or maintained as native
34 vegetation to create a transitional area between the proposed university and remaining
35 habitat. These areas will have restricted access limited to education activities and
36 scientific research. The No-build Zone will be clearly marked prior to construction,
37 vegetation removal, or other earth-disturbing activities to prevent accidental clearing by
38 work crews.
- 39 3 The right-of-way for perimeter fence construction will be a maximum of 21 feet where it
40 crosses golden-cheeked warbler habitat.
- 41 4 Impacts related to lighting generated by the university will be minimized by the use of
42 directional lighting and buffers around golden-cheeked warbler and black-capped vireo
43 habitat. Available lighting designs and methods will be investigated and used as
44 appropriate to reduce impacts to birds.

- 1 5 Trails developed within the No-build Zone will be designed as nature trails with no hard
2 surface and minimal vegetation removal. The No-Build Zones will be managed as
3 golden-cheeked warbler and black-capped vireo habitat as appropriate.
- 4 6 The Army will develop and implement an appropriate monitoring plan for reporting
5 progress in development of the property and implementation of the reasonable and
6 prudent measures. The content, schedule, and format of the monitoring plan will be at
7 the discretion of the Army.

8
9 The following additional measures for protection of fish and wildlife habitat would also be
10 followed.

11
12 The design plans should consider the effects of increased runoff to North Reese Creek, due to
13 construction of the campus, and should incorporate appropriate measures to prevent downstream
14 impacts to fish and riparian habitats.

15
16 E.O. 13112 regarding invasive species would be followed and the introduction of invasive
17 species would be prevented and monitored. Invasive non-native plant species would be
18 controlled in a cost-effective and environmentally sound manner. All surface disturbing
19 activities would be subject to BMPs that eliminate or severely reduce the potential for
20 introducing invasive species. As practicable, native vegetation and seed mixtures would be
21 utilized and incorporated into the development of the proposed university.

22 23 **4.6 Air Quality**

24 **4.6.1 No Action Alternative**

25 Under the No Action Alternative, the property transfer would not occur, and the property would
26 remain under the ownership of Fort Hood. There would be no impacts, either beneficial or
27 adverse, to air quality as a result of the No Action Alternative.

28 29 **4.6.2 Proposed Action Alternative**

30 Under the Proposed Action Alternative, no direct impacts to air quality would result from the
31 proposed property transfer.

32
33 Since Fort Hood is located within an unclassifiable/attainment area for all criteria pollutants,
34 General Conformity Rule requirements are not applicable. It has been determined that the
35 potential sources of NO_x and VOC pollutant emissions would be from construction activities.
36 The scope of the analysis was limited to those operations or activities that result in temporary
37 emissions that would be directly or indirectly attributable to university construction. The
38 potential air quality impacts have been assessed and are presented below.

39
40 **Construction Activities.** The Proposed Action is expected to lead to the development of a
41 student university campus. The development would consist of constructing various campus
42 facilities and pavements. Transportation to/from the proposed campus would be provided by
43 privately-owned vehicles (POV). Campus facilities and pavements could include the
44 construction of approximately 40 buildings; three to four large parking lots with smaller parking
45 lots scattered throughout the campus; several athletic fields including baseball stadium/softball

1 complex, football stadium/track and field, and intramural fields; numerous paved roadways and
2 sidewalks to connect facets of the campus.

3
4 An analysis was performed to estimate fugitive dust and all other criteria pollutant emissions
5 related to the proposed construction. These emissions would produce slightly elevated short-
6 term PM₁₀ ambient air concentrations. However, the effects would be temporary, and would fall
7 off rapidly with distance from the construction site.

8
9 Anticipated construction projects would generate total suspended particles (TSP) and PM₁₀
10 emissions as fugitive dust from ground disturbing activities (e.g., grading, soil piles, etc.) in
11 addition to the emissions of all criteria pollutants from the combustion of fuels in construction
12 equipment. Fugitive dust emissions would be greatest during the initial site preparation activities
13 and would vary from day-to-day depending on the construction phase, level of activity, and
14 prevailing weather conditions. The quantity of uncontrolled fugitive dust emissions from a
15 construction site is proportional to the area of land being worked and the level of construction
16 activity.

17
18 Fugitive dust emissions for anticipated construction activities were calculated using emission
19 factors and assumptions published in USEPA's AP-42 Section 11.9 dated July 1998 and Section
20 13.2 dated September 1998. These estimates assume that 230 working days are available per
21 year for construction (accounting for weekends, weather, and holidays). Using data from
22 National Oceanic and Atmospheric Administration (NOAA), the average soil percent moisture
23 was estimated to be an average of 80 percent (NOAA 2003). Wind speed of greater than 12 mph
24 is recorded 12 percent of the time based on average wind rose data and measured speed (NRCC
25 2004) for the Austin Municipal Airport, Texas.

26
27 Construction operations would also result in emissions of criteria pollutants as combustion
28 products from construction equipment as well as evaporative emissions from architectural
29 coatings and asphalt paving operations. These emissions would be of a temporary nature. The
30 emission factors and estimates were generated based on guidance provided in *Air Quality*
31 *Thresholds of Significance* from the Sacramento Metropolitan Air Quality Management District
32 (SMAQMD 1994).

33
34 Specific information describing the types of construction equipment required for a specific task,
35 the hours the equipment is operated, and the operating conditions vary widely from project to
36 project. For purposes of analysis, these parameters were estimated using established
37 methodologies for construction and experience with similar types of construction projects.
38 Combustion by-product emissions from construction equipment exhausts were estimated using
39 USEPA's AP-42 emissions factors for heavy-duty diesel-powered construction equipment.

40
41 The construction emissions include the estimated annual emissions from construction equipment
42 exhaust associated with the anticipated development. As with fugitive dust emissions,
43 combustion emissions would produce slightly elevated air pollutant concentrations. Early phases
44 of construction projects involve heavier diesel equipment and earthmoving, resulting in higher
45 NO_x and PM₁₀ emissions. Later phases of construction projects involve more light gasoline
46 equipment and surface coating, resulting in more CO and VOC emissions. However, the effects

1 would be temporary, fall off rapidly with distance from the proposed construction site, and
2 would not result in any long-term impacts.

3
4 According to 40 CFR 81, the only Class I areas in Texas are Big Bend National Park and
5 Guadalupe Mountain National Park. These Class I areas are located more than 250 miles to the
6 west of Fort Hood. Therefore, no impacts to Federal Class I areas would be anticipated.

7
8 **Vehicle Operations.** Calculations of air pollutant emissions from POV commuting can be
9 estimated based on the vehicle miles traveled (VMT), vehicle category or classification (e.g.,
10 light-duty gasoline vehicle), average vehicle speed measured in mph, average vehicle occupancy
11 rate, and the USEPA approved pollutant emission factors. It was assumed that the campus
12 would consist of approximately 5,000 commuters in its first year and would eventually reach
13 20,000. The number of commuters could be lower, but is unlikely to be higher.

14
15 Table 4-1 provides a summary of possible criteria pollutant emissions for each year of the
16 proposed construction years (beginning with year 1). Emissions include construction of facilities
17 and pavements and commuting of POVs. Table 4-2 shows air quality emissions of the proposed
18 construction for each calendar year and compares it to overall Austin-Waco Intrastate AQCR
19 regional emissions. For a more detailed description of air quality emissions see Appendix C.

20
21 Regulated pollutant emissions from development anticipated as a result of the Proposed Action
22 Alternative are not expected to affect local or regional attainment status with NAAQS. The
23 anticipated development would generate air pollutant emissions as a result of grading, filling,
24 compacting, and construction operations but these emissions would be temporary and would not
25 be expected to generate any off-site impacts. In addition, the anticipated development would
26 generate air pollutant emissions from the increase in POV operations; however, the increased
27 operation of POV in this area would not have impacts on local or regional air quality.

28 **4.7 Noise**

29 **4.7.1 No Action Alternative**

30 Under the No Action Alternative, the property transfer would not occur, and the property would
31 remain under the ownership of Fort Hood. There would be no impacts, either beneficial or
32 adverse, to noise as a result of the No Action Alternative.

33 **4.7.2 Proposed Action Alternative**

34 Under the Proposed Action Alternative, no direct impacts to noise would result from the
35 proposed property transfer. The property proposed for transfer is located outside of the noise
36 “contour” zones identified in the ICUZ for RGAAF and no special requirements or conditions
37 are applicable. The Killeen Municipal Airport is located further from the project area than
38 RGAAF; therefore, no noise impacts are anticipated.

39
40
41 This alternative would result in construction noise; however, construction would occur in phases
42 over a long period of time, normally be short in nature, and generally occur away from sensitive
43 noise receptors.
44

1
2

**Table 4-1.
Potential Air Quality Emissions from Proposed Construction Activities**

Year	NO _x	VOC	CO	SO ₂	PM ₁₀
1	29.20	8.84	25.14	1.46	22.06
2	18.26	5.98	14.93	0.93	21.26
3	18.26	5.98	14.93	0.93	21.26
4	18.26	5.98	14.93	0.93	21.26
5	18.26	5.98	14.93	0.93	21.26
6	19.78	9.93	85.72	3.05	47.72
7	21.74	11.21	102.25	3.58	55.11
8	23.71	12.49	118.79	4.12	62.50
9	25.68	13.77	135.32	4.66	69.89
10	27.65	15.05	151.85	5.19	77.28
11	29.61	16.34	168.39	5.73	84.67
12	31.58	17.62	184.92	6.27	92.07
13	33.55	18.90	201.45	6.80	99.46
14	35.52	20.18	217.99	7.34	106.85
15	37.49	21.46	234.52	7.88	114.24
16	39.45	22.74	251.05	8.41	121.63
17	41.42	24.03	267.58	8.95	129.02
18	43.39	25.31	284.12	9.49	136.41
19	45.36	26.59	300.65	10.03	143.80
20	46.41	27.73	316.98	10.50	144.90

All emissions are in tons per year.

3
4
5

**Table 4-2.
Emissions from Proposed Construction Activities in Relation to
Regional Significance Threshold**

Year	NO _x	VOC	CO	SO ₂	PM ₁₀
1999 Baseline	231,564	139,443	865,780	270,283	103,908
1	0.0126%	0.0063%	0.0029%	0.0005%	0.0212%
2-5	0.0079%	0.0043%	0.0017%	0.0003%	0.0205%
6	0.0085%	0.0071%	0.0099%	0.0011%	0.0459%
7	0.0094%	0.0080%	0.0118%	0.0013%	0.0530%
8	0.0102%	0.0090%	0.0137%	0.0015%	0.0601%
9	0.0111%	0.0099%	0.0156%	0.0017%	0.0673%
10	0.0119%	0.0108%	0.0175%	0.0019%	0.0744%
11	0.0128%	0.0117%	0.0194%	0.0021%	0.0815%
12	0.0136%	0.0126%	0.0214%	0.0023%	0.0886%
13	0.0145%	0.0136%	0.0233%	0.0025%	0.0957%
14	0.0153%	0.0145%	0.0252%	0.0027%	0.1028%
15	0.0162%	0.0154%	0.0271%	0.0029%	0.1099%
16	0.0170%	0.0163%	0.0290%	0.0031%	0.1171%
17	0.0179%	0.0172%	0.0309%	0.0033%	0.1242%
18	0.0187%	0.0181%	0.0328%	0.0035%	0.1313%
19	0.0196%	0.0191%	0.0347%	0.0037%	0.1384%
20	0.0200%	0.0199%	0.0366%	0.0039%	0.1395%

Regional significance threshold is 10%

1 Construction activities would increase noise levels temporarily at locations immediately adjacent
2 to the project area. Noise levels created by construction equipment would vary greatly
3 depending on factors such as the type of equipment, the specific model, the operation being
4 performed, and the condition of the equipment. The equivalent sound level of the construction
5 activity also depends on the fraction of time that the equipment is operated over the time period
6 of the construction. Heavy equipment such as backhoes and cement and dump trucks would
7 cause short-term, localized, insignificant increases in noise levels during construction.
8

9 Most construction activities resulting from this alternative would produce only short-term noise
10 level increases. Construction would occur only during daylight hours, thus reducing the DNLs
11 and the chances of causing annoyances. Since construction would only occur during daylight
12 hours, these short-term increases are not expected to substantially affect adjacent noise sensitive
13 receptors or wildlife areas. If the use of dynamite, pile drivers, or any extreme noise making
14 device associated with construction were to become prevalent a noise study and mitigation
15 measures should be considered.
16

17 Increased traffic and activities of the university would not significantly increase the ambient
18 DNL of the area. The project area is primarily in rural areas, and state highways and local roads
19 separate the project area from residential areas.
20

21 **Mitigation Measures**

22 No mitigation measures are necessary for aircraft noise because the property proposed for
23 transfer is located outside of the noise “contours” requiring special construction techniques or
24 special conditions on land use as identified in the existing ICUZ. Because of the increased noise
25 sensitivity during construction activities, time limits are warranted for use of heavy equipment.
26 On-site activities should be restricted to daylight hours, except in emergencies. Additionally, all
27 construction equipment would possess properly working mufflers and be kept in a proper state of
28 tune to reduce backfires. Implementation of these measures would reduce the noise impact to an
29 insignificant level.
30

31 **4.8 Cultural Resources**

32 **4.8.1 No Action Alternative**

33 Under the No Action Alternative, the property transfer would not occur, and the property would
34 remain under the ownership of Fort Hood. There would be no impacts, either beneficial or
35 adverse, to cultural resources as a result of the No Action Alternative.
36

37 **4.8.2 Proposed Action Alternative**

38 Under the Proposed Action Alternative, no direct impacts to cultural resources would result from
39 the proposed property transfer.
40

41 The most relevant impacts to cultural resources at Fort Hood would be related to the impacts
42 from ground disturbing activities associated with the anticipated construction of buildings,
43 parking lots, athletic facilities, and paved roadways and sidewalks.
44

45 There are two archaeological sites located within the APE of the proposed land transfer. Neither
46 of these sites that could be affected by proposed construction activities planned at and
47 immediately near the site are eligible for listing on the NRHP. Concurrence on the eligibility of

1 these sites has been received from the SHPO during previous consultation. The Fort Hood
2 Cultural Resources Manager is currently in consultation with the Texas SHPO to confirm
3 concurrence for this project and to determine if any mitigation measures would be necessary.
4 Moreover, TAMUS has indicated that they would inherit cultural resource management
5 responsibilities associated with the site. Therefore, the effect on cultural resources would be long-
6 term and insignificant. Any mitigation measures developed in coordination with the SHPO
7 would be followed during construction and as a condition of the proposed property transfer.

8
9 No NRHP eligible or potentially eligible districts or landscapes are within the subject property.
10 Therefore historic districts or landscapes would not be affected.

11
12 No NRHP eligible or potentially eligible structures are within the subject property. Therefore
13 historic structures would not be affected.

14 15 **Mitigation Measures**

16 The TAMUS would inherit management responsibilities, if necessary, for the archeological sites
17 on the parcel. This responsibility includes continued Section 106 consultation with the Texas
18 SHPO and, as applicable, general site protection, monitoring, testing, and data recovery, if
19 applicable. Specific levels of mitigation, which are formulated in consultation with the Texas
20 SHPO, are related to the nature and scope of any actions potentially affecting the site. Specific
21 mitigation measures would be determined as part of the consultation process with the Texas
22 SHPO.

23 24 **4.9 Socioeconomics**

25 **4.9.1 No Action Alternative**

26 Under the No Action Alternative, the property transfer would not occur, and the property would
27 remain under the ownership of Fort Hood. There would be no adverse impacts to
28 socioeconomics as a result of the No Action Alternative. Under the No Action alternative, no
29 construction would take place and the proposed university would not be built. As a result, there
30 would be no temporary direct benefits from construction through purchasing of construction
31 materials and other project expenditures.

32 33 **4.9.2 Proposed Action Alternative**

34 Under the Proposed Action Alternative, no direct impacts to socioeconomics would result from
35 the proposed property transfer.

36
37 The labor for the construction of the proposed university would be provided by local and/or
38 regional contractors, resulting in long-term, insignificant increases in the population of the
39 project area. Materials and other project expenditures would predominantly be obtained through
40 merchants in the local community giving direct economic benefits. No structures are located in
41 the project area; therefore, no displacement would result. The proposed university would not be
42 expected to increase burdens on local social resources. Safety buffer zones would be designated
43 around all construction sites to ensure public health and safety. No residential or
44 commercial/industrial facilities would be displaced by the proposed action. No displacement
45 would result from this action and, therefore, there would be no impacts to housing in the area.
46 Consequently, no long-term adverse impacts to socioeconomics are expected.

1 Texas A&M’s ability to retain and attract technical professors and researchers is likely to benefit
2 Fort Hood and the City of Killeen. Benefits include additional educational opportunities for the
3 local community and soldiers stationed at Fort Hood. Due to the long duration of construction,
4 impacts to housing are anticipated to be insignificant over the life of the project. Long-term
5 beneficial impacts to local employment rates and local incomes would occur as a result of this
6 project. The construction of a university would also increase the tax base of the area.
7

8 **4.10 Environmental Justice/Protection of Children from Health and Safety Risks**

9 **4.10.1 No Action Alternative**

10 Under the No Action Alternative, the property transfer would not occur, and the property would
11 remain under the ownership of Fort Hood. There would be no impacts, either beneficial or
12 adverse, to environmental justice or protection of children as a result of the No Action
13 Alternative.
14

15 **4.10.2 Proposed Action Alternative**

16 **Environmental Justice**

17 Under the Proposed Action Alternative, no direct impacts to environmental justice would result
18 from the proposed property transfer.
19

20 Even though minorities account for a large portion of the local population, particularly groups
21 claiming African American and Hispanic or Latino origin and low-income populations,
22 construction of the university is expected to have a beneficial effect on all populations regardless
23 of race, origin, or income level. This conclusion is based on the fact that no significant adverse
24 environmental effects have been identified for any resource area or population (minority, low-
25 income, children, or otherwise) analyzed in this EA. The proposed university would be
26 constructed and operated under the guidelines of E.O. 12898. The proposed project would
27 benefit all populations within the project area by adding additional tax base to the area and
28 provide increased educational opportunities. Texas A&M’s ability to retain and attract highly
29 technical professors and researchers is likely to benefit the City of Killeen and surrounding
30 communities. The proposed transfer of property and subsequent construction of a TAMUS
31 campus at this location would be in compliance with E.O. 12898 and have no impacts on
32 environmental justice.
33

34 **Protection of Children from Health and Safety Risks**

35 Under the Proposed Action Alternative, no direct impacts to protection of children would result
36 from the proposed property transfer.
37

38 Short-term insignificant impacts on the protection of children would be expected. Numerous
39 types of construction equipment such as backhoes, bulldozers, graders, and dump trucks, and
40 other large construction equipment would be used throughout the duration of construction of the
41 proposed university. In the short-term, because construction sites and equipment can be enticing
42 to children, construction activity could create an increased safety risk. During construction,
43 safety measures would be followed to protect the health and safety of residents as well as
44 construction workers. Barriers and “No Trespassing” signs would be placed around construction
45 sites to deter children from playing in these areas, and construction vehicles and equipment
46 would be secured when not in use. Since the construction area would be flagged or otherwise

1 fenced, issues regarding Protection of Children are not anticipated. This conclusion is based on
2 the fact that no significant adverse environmental effects have been identified for any resource
3 area or population (minority, low-income, children, or otherwise) analyzed in this EA.
4 Furthermore, because of the relatively low population surrounding the project area and low
5 housing density in the immediate area, construction projects would occur away from residential
6 areas where children would likely be encountered.

7 8 **4.11 Hazardous and Toxic Materials**

9 **4.11.1 No Action Alternative**

10 Under the No Action Alternative, the property transfer would not occur, and the property would
11 remain under the ownership of Fort Hood. There would be no impacts, either beneficial or
12 adverse, to hazardous and toxic materials as a result of the No Action Alternative.

13 14 **4.11.2 Proposed Action Alternative**

15 Under the Proposed Action Alternative, no direct impacts to hazardous and toxic materials would
16 result from the proposed property transfer.

17
18 Short-term insignificant impacts to hazardous and toxic materials would be expected as a result
19 of construction activities. The area is undeveloped and potentially hazardous materials would
20 likely be on-site during construction such as paints, asphalt, fuels, and motor oils for construction
21 vehicles. Persons working with or near fresh paint and asphalt should protect themselves by
22 wearing appropriate clothing, washing their hands before eating or smoking, and bathing at the
23 end of each workday. Construction equipment that could be used contains fuel, lubricating oils,
24 hydraulic fluid, and coolants that could be a regulated hazardous substance if they spilled or
25 leaked on the construction site. The construction contractors would be responsible for the
26 prevention of spills of paint and fuels. Spills could be prevented by proper storage and handling
27 of these materials, attention to the task at hand, and safe driving.

28
29 During construction activities, vehicle and equipment would be inspected to ensure correct and
30 leak-free operation, and maintenance activities would not be conducted on the site. Appropriate
31 spill containment material would be kept on site. All fuels and other materials that would be
32 used will be contained in the equipment or stored in appropriate containers. All materials would
33 be removed from the site upon completion of construction activities.

34
35 Some materials, while essentially inert under normal conditions, can be potentially hazardous in
36 specific circumstances. Wood and dry concrete can generate airborne particulate as they are cut
37 or sanded. To protect against the impacts of such particulates, workers should wear face masks
38 and safety glasses when performing these tasks. Wood and other construction materials are also
39 flammable. Establishing dedicated smoking areas and prohibiting open flames near flammable
40 materials would greatly reduce the risk of fire.

41 42 **4.12 Transportation and Utilities**

43 **4.12.1 No Action Alternative**

44 Under the No Action Alternative, the property transfer would not occur, and the property would
45 remain under the ownership of Fort Hood. There would be no impacts, either beneficial or
46 adverse, to transportation and utilities as a result of the No Action Alternative.

1 **4.12.2 Proposed Action Alternative**

2 Under the Proposed Action Alternative, no direct impacts to transportation and utilities would
3 result from the proposed property transfer.

4
5 Short-term, insignificant impacts to traffic volumes would be expected during construction
6 activities. State Highway 195 is well designed and is capable of handling a large volume of
7 vehicles. However, during construction, traffic congestion could occur, particularly during the
8 morning and evening rush hour as construction vehicles enter and exit the project area, or
9 transport construction debris to the landfill.

10
11 Long-term impacts to traffic volumes could be realized once construction is complete and the
12 university is in operation. Traffic volumes on State Highway 195 would more than likely
13 increase, as the university is expected to eventually serve 20,000 students, the majority of which
14 would be commuters. It is recommended that a traffic model be conducted during the initial
15 design phase to determine whether or not the existing road network can sustain the increase in
16 traffic volumes and if road improvements would be necessary.

17
18 Impacts to utilities are unquantifiable at this early phase. Water, sewer, electrical, and gas lines
19 would have to be installed in the project area, and solid waste disposal would have to be
20 incorporated. Prior to any construction activities, the TAMUS should coordinate with the
21 appropriate utility suppliers and transportation officials to ensure they have capacity to
22 incorporate the university into the required systems.

23
24 **4.13 Cumulative Impacts**

25 CEQ regulations implementing the procedural provisions of NEPA require Federal agencies to
26 consider the cumulative impacts of a proposal (40 CFR 1508.25(c)). A cumulative impact on the
27 environment is the impact that results from the incremental impact of an action when added to
28 other past, present, and reasonably foreseeable future actions, regardless of what agency (Federal
29 or non-Federal) or person undertakes such other actions (40 CFR 1508.7). This type of an
30 assessment is important because significant cumulative impacts can result from several smaller
31 actions that by themselves do not have significant impacts.

32
33 **4.13.1 No Action Alternative**

34 Under the No Action Alternative there would be no cumulative impacts associated with the
35 transfer of property to the TAMUS or subsequent development of a 20,000-student university.
36 Bell County, however, may continue to grow at its current rate of approximately 1.3 percent per
37 year. As a result of the population increase in the metropolitan area, impacts associated with
38 developing urban environments would occur, and would be similar in nature to those described
39 in the following section for the Proposed Action Alternative.

40
41 **4.13.2 Proposed Action Alternative**

42 The majority of cumulative impacts anticipated with the land transfer and subsequent
43 construction of a university campus would be induced development of the surrounding area.
44 Surrounding properties to the south and west of the subject property would not be developed
45 since they are owned by the State of Texas (Texas State Veterans Cemetery) and Fort Hood
46 (Training Areas), respectively. Properties to the north and east of the subject property could be

1 developed as commercial (i.e., restaurants, gas stations, convenience stores) and/or multifamily
2 residential (apartments) facilities to support the campus. This type of development would affect
3 the aesthetics of the area by removal of vegetation and conversion to an urban landscape. Soils,
4 including Prime Farmland Soils, would be impacted through their direct disturbance, with
5 increased potential for erosion during construction periods, and long-term or permanent removal
6 as potential agricultural production areas.

7
8 Construction activities of future development could impact surface waters through increased
9 impervious surface area and a subsequent increase in storm water runoff. Adherence to proper
10 storm water management practices; applicable regulations, codes, and permit requirements; and
11 low-impact development techniques would reduce storm water runoff-related impacts.
12 Implementation of sediment and erosion controls during construction activities would maintain
13 water runoff quality at levels comparable to existing conditions. As is typical with developing
14 areas, increases in impervious surfaces contribute to changes in floodplains associated with
15 creeks and streams. Developers in the region should plan projects away from flood prone areas,
16 and incorporate designs that will compensate for increased runoff from hardened surfaces (slow
17 water movements).

18
19 Impacts from future construction activities would include the direct loss of vegetation. This loss
20 of vegetation would be comprised of grasslands and coniferous forest and shrub, deciduous
21 forest and shrub, and mixed forest and shrub communities. Impacts to fish and wildlife from
22 future construction activities would include the direct loss of habitat. Impacts would result from
23 the temporary displacement of wildlife due to disturbance from ground clearing operations and
24 construction operations. Although similar habitat would remain in the area, local species would,
25 in some cases, be permanently displaced to adjacent properties, and some individuals may not
26 survive. However, changes to the overall characteristics of the fish and wildlife communities
27 would not be anticipated.

28
29 The induced development around the campus could have an adverse impact on threatened and
30 endangered species through the direct loss of golden-cheeked warbler and black-capped vireo
31 habitat. If future construction activities occur during the breeding season (February-October)
32 direct take and/or harassment of these species could occur. All future developments on lands
33 containing Federally listed threatened or endangered species, or designated critical habitat,
34 would be subject to consultation with the U.S. Fish and Wildlife Service under the ESA.
35 Therefore, future impacts to Federally listed species would be minimized.

36
37 Construction of commercial and/or residential developments would produce slightly elevated
38 short-term PM₁₀ ambient air concentrations. However, the effects would be temporary, and
39 would fall off rapidly with distance from the construction site. Anticipated construction projects
40 would generate total suspended particles (TSP) and PM₁₀ emissions as fugitive dust from ground
41 disturbing activities in addition to the emissions of all criteria pollutants from the combustion of
42 fuels in construction equipment. However, no long-term air quality impacts would be expected.
43 Regulated pollutant emissions from university-induced development would not be expected to
44 affect local or regional attainment status with NAAQS. In addition, the anticipated development
45 would generate air pollutant emissions from the increase in personal vehicle operations;

1 however, the increased operation in this area would not have an impact on local or regional air
2 quality.

3
4 The most relevant impacts to cultural resources associated with future developments would be
5 related to the impacts from ground disturbing activities associated with the anticipated
6 construction of buildings, parking lots, and paved roadways and sidewalks. The areas adjacent
7 to Fort Hood have not been surveyed for cultural resources, therefore; potential impacts to this
8 resource are unknown at this time.

9
10 Long-term impacts to hazardous and toxic materials would be expected because of construction
11 activities. The area is undeveloped and potentially hazardous materials would likely be on-site
12 during construction such as paints, asphalt, fuels, and motor oils for construction vehicles.
13 Construction equipment that could be used contains fuel, lubricating oils, hydraulic fluid, and
14 coolants that could be a regulated hazardous substance if they spilled or leaked on the
15 construction site. The construction contractors would be responsible for the prevention of spills
16 of paint and fuels. The long-term presence of hazardous and/or toxic materials would be
17 expected within developed areas (petroleum products, paints, solvents, etc). These would not be
18 expected at higher densities than other developed areas.

19
20 Short-term, impacts to traffic volumes would be expected during future construction activities.
21 State Highway 195 is well designed and is capable of handling a large volume of vehicles.
22 However, during construction, traffic congestion could occur, particularly during the morning
23 and evening rush hour as construction vehicles enter and exit the area, or transport construction
24 debris to the landfill. Long-term impacts to traffic volumes could be realized once the various
25 developments are in operation. Traffic volumes on State Highway 195 would more than likely
26 increase, as the university is expected to serve 20,000 students. The increase of traffic in the
27 vicinity would likely require additional safety and/or traffic control measures.

28
29 Impacts to utilities are unquantifiable at this early phase. Water, sewer, electrical, and gas lines
30 would have to be installed, and solid waste disposal would have to be incorporated. Prior to any
31 construction activities, developers should coordinate with the appropriate utility suppliers to
32 ensure they have capacity to incorporate their developments into the systems.

33
34 The presence of a 20,000-student university at the location proposed by the TAMUS would
35 undoubtedly influence growth patterns in the local area. However, the greater metropolitan area
36 is currently experiencing growth, and will likely continue to do so. Many of the cumulative
37 impacts described herein would not be avoided by selection of the No Action Alternative.
38 Selection of the Proposed Action Alternative would have an insignificant cumulative impact to a
39 developing urban community, and would have the long-term cumulative impact of providing
40 additional higher educational and job opportunities to the local area.

41 42 **4.14 Mitigation Measures Summary**

43 Table 4-3 presents a summary of the mitigation measures for each resource as identified in this
44 section. These measures will be incorporated into the Finding of No Significant Impact (FNSI).
45 As a condition of the permits received for this project, Fort Hood and TAMUS would be
46 responsible for ensuring their implementation. The parties, to include all of its contractors and

1 subcontractors, are responsible for obtaining and complying with all required local, state, and
 2 Federal permits and regulations prior to initiation of construction.

3
 4
 5
 6

**Table 4-3.
 Summary of Mitigation Measures**

Resource	Mitigation Measures
Soils	<ul style="list-style-type: none"> • Implement Best Management Practices (BMPs) to reduce soil erosion and sedimentation including, but are not limited to, silt fences, straw (containing native grass species) bale dikes, diversion ditches, rip-rap channels, water bars, and water spreaders. • All work would cease during heavy rains and would not resume until conditions are suitable for the movement of equipment and material. • A Storm Water Pollution Prevention Plan (SWPPP) would be prepared in accordance with TPDES regulations. This SWPPP would describe the use of and implementation procedures for the suggested BMPs.
Storm water and Wastewater	<ul style="list-style-type: none"> • Development of the property would require a TPDES Construction General permit and a Municipal Separate Storm Sewer System (MS4) permit may also be required for the operation of the facility's sewer system. • TAMUS is required to notify TCEQ in order to obtain any necessary permits prior to commencement of construction activities. • Erosion and sedimentation controls would be required and would be in place during construction to reduce and control siltation or erosion impacts to areas outside of the construction site. • A Storm water Pollution Prevention Plan (SWPPP) should be developed for the site describing the use of and implementation procedures for the suggested BMPs. Examples of BMPs includes silt fencing and sediment traps, the application of water sprays, and the revegetation of disturbed areas. • Fugitive dust from construction activities would be minimized by watering and soil stockpiling.
Waters of the U.S. and Wetlands	<ul style="list-style-type: none"> • If construction is to occur in a jurisdictional area, coordination regarding wetland and/or stream mitigation would be conducted with the appropriate USACE District. • All necessary Department of the Army permits (<i>i.e.</i> Section 404(b)) would be obtained prior to commencement of construction activities.

Resource	Mitigation Measures
Threatened and Endangered Species	<p>All measures identified in the BO (Appendix B) would be followed as a condition of the endangered species take permit as outlined below:</p> <ul style="list-style-type: none"> • Clearing of golden-cheeked warbler habitat on the property outside of the No-build Zones will be scheduled outside of the major portion of the golden-cheeked warbler breeding and nesting season (July through February). All vegetation clearing will be consistent with the current practices recommended by the Texas Forest Service to prevent the spread of oak wilt. • The buffer area within the No-build Zones will be planted and/or maintained as native vegetation to create a transitional area between the proposed university and remaining habitat. These areas will have restricted access limited to education activities and scientific research. The No-build Zone will be clearly marked prior to construction, vegetation removal, or other earth-disturbing activities to prevent accidental clearing by work crews. • The right-of-way for perimeter fence construction will be a maximum of 21 feet where it crosses golden-cheeked warbler habitat. • Impacts related to lighting generated by the university will be minimized by the use of directional lighting and buffers around golden-cheeked warbler and black-capped vireo habitat. Available lighting designs and methods will be investigated and used as appropriate to reduce impacts to birds. • Trails developed within the No-build Zone will be designed as nature trails with no hard surface and minimal vegetation removal. The No-Build Zones will be managed as golden-cheeked warbler and black-capped vireo habitat as appropriate. • The Army will develop and implement an appropriate monitoring plan for reporting progress in development of the property and implementation of the reasonable and prudent measures. The content, schedule, and format of the monitoring plan will be at the discretion of the Army. <p>Additional mitigation measures include:</p> <ul style="list-style-type: none"> • The design plans should consider the effects of increased runoff to North Reese Creek, due to construction of the campus, and should incorporate appropriate measures to prevent downstream impacts to fish and riparian habitats. • E.O. 13112 regarding invasive species would be followed and the introduction of invasive species would be prevented and monitored. Invasive non-native plant species would be controlled in a cost-effective and environmentally sound manner. All surface disturbing activities would be subject to BMPs that eliminate or severely reduce the potential for introducing invasive species. As practicable, native vegetation and seed mixtures would be utilized and incorporated into the development of the proposed university.

Resource	Mitigation Measures
Noise	<ul style="list-style-type: none"> • Because of the increased noise sensitivity during construction activities, time limits are warranted for use of heavy equipment. On-site activities should be restricted to daylight hours, except in emergencies. All construction equipment would possess properly working mufflers and be kept in a proper state of tune to reduce backfires.
Cultural Resources	<ul style="list-style-type: none"> • TAMUS would inherit management responsibilities, if necessary, for the archeological sites on the parcel. This responsibility includes continued Section 106 consultation with the Texas SHPO and, as applicable, general site protection, monitoring, testing, and data recovery, if applicable. Specific levels of mitigation, which are formulated in consultation with the Texas SHPO, are related to the nature and scope of any actions potentially affecting the site. Specific mitigation measures would be determined as part of the consultation process with the Texas SHPO.

5.0 SUMMARY OF IMPACTS

1
2
3 The purpose of this section is to compare and contrast the environmental effects of the
4 alternatives. Potential impacts to biological and physical resources resulting from the No Action
5 Alternative and Proposed Action Alternative are briefly described below. Figure 5-1 provides a
6 summary and comparison of the consequences of the proposed action versus the no action
7 alternative, which are discussed in detail in Section 4.0.
8

9 5.1 No Action Alternative

10 Under the No Action Alternative, the property transfer would not occur, and the property would
11 remain under the ownership of Fort Hood. The property would continue to be utilized for cattle
12 grazing and for maneuver training; however, if cattle grazing and military training activities are
13 properly managed, no impacts are anticipated to the natural environment including soils, surface
14 waters, vegetation, fish and wildlife, and waters of the U.S. and wetlands.
15

16 No impacts to land use, aesthetics, prime farmlands, geology, topography, groundwater, surface
17 water, water quality, floodplains, noise, cultural resources, hazardous materials, or transportation
18 and utilities are anticipated as a result of the No Action Alternative. The No Action Alternative
19 would not affect any listed species as threatened or endangered pursuant to the ESA. According
20 to Title 40 CFR Part 93, "Determining Conformity of Federal Actions to State or Federal
21 Implementation Plans", transfers of ownership, interests, and titles in land, facilities, and real and
22 personal properties, regardless of the form or method of the transfer, are exempt from air quality
23 analysis. In addition, the Proposed Action Alternative is in compliance with E.O. 11988,
24 "Federal Action to Address Environmental Justice in Minority Populations and Low-Income
25 Populations", and E.O. 13045, "Protection of Children from Environmental Health Risks and
26 Safety Risks."
27

28 5.2 Proposed Action Alternative

29 There would be no direct impacts on the environment associated with the real estate action of
30 transferring the property from Fort Hood to TAMUS; however, there will be insignificant
31 adverse impacts associated with the proposed TAMUS campus development. There would be
32 insignificant beneficial impacts to the natural environment associated with the cessation of
33 grazing activities and military training activities upon completion of the transfer of property from
34 Fort Hood to the TAMUS. Indirect impacts associated with the construction of a campus are
35 expected. Approximately 225 acres of land would be impacted because it would no longer be
36 available for biological or agricultural use. Long-term, insignificant adverse impacts to land use,
37 waters of the U.S., topography, aesthetics and visual resources, soils and prime farmlands, water
38 quality, vegetation, fish and wildlife, threatened and endangered species, cultural resources, and
39 transportation and utilities are anticipated during construction. Short-term, insignificant adverse
40 impacts to air quality, noise, protection of children, hazardous and toxic materials are
41 anticipated. Long-term, adverse impacts to threatened and endangered species as a result of the
42 construction of the proposed campus are anticipated to be insignificant provided the incidental
43 take statement, reasonable and prudent measures, and terms and conditions outlined in the BO
44 are adhered to throughout the life of the project. A long-term beneficial impact to
45 socioeconomics including local employment rates and local incomes is expected. Construction
46 of the proposed campus is expected to have no impacts on geology, groundwater, surface water,

	Proposed Action		No Action		Proposed Action		No Action
	Direct	Indirect			Direct	Indirect	
Land Use	○	●	○	Fish and Wildlife	○	●	○
Aesthetics and Visual Resources	○	●	○	Threatened and Endangered Species	○	●	○
Geology and Topography	○	●	○	Air Quality	○	●	○
Soils	○	●	○	Noise	○	●	○
Prime Farmlands	○	●	○	Cultural Resources	○	●	○
Groundwater and Surface Water	○	○	○	Socioeconomics	○	●	○
Water Quality	○	●	○	Environmental Justice	○	○	○
Waters of the U.S. and Wetlands	○	●	○	Protection of Children	○	●	○
Floodplains	○	○	○	Hazardous and Toxic Materials	○	●	○
Vegetation	○	●	○	Transportation and Utilities	○	●	○

Legend:

○ No Impacts

● Beneficial Impacts (insignificant)



Long-Term Impact

● Adverse Impacts (insignificant)



Short-Term Impact

Figure 5-1. Alternatives Comparison Matrix

1 floodplains, or environmental justice. Land use and topography are expected to change as a
2 result of the proposed project.

3
4 There are two archaeological sites located within the APE of the proposed land transfer. Neither
5 of these sites is eligible for listing on the NRHP. Concurrence on the eligibility of these sites has
6 been received from the SHPO during previous consultations. The Fort Hood Cultural Resources
7 Manager is currently in consultation with the Texas SHPO to receive concurrence regarding their
8 NRHP eligibility and information regarding any necessary mitigation measures. The level of effect
9 is unknown at this time and is dependent upon SHPO findings and mitigation requirements.

10

1 **6.0 PUBLIC INVOLEMENT**

3 **6.1 Agency Coordination**

4 This section discusses consultation and coordination that have and will occur during preparation
5 of this document. This would include contacts that are made during the development of the
6 proposed action and writing of the EA. Formal and informal coordination will be conducted
7 with the following agencies:

- 8 ➤ U.S. Fish and Wildlife Service (USFWS)
- 9 ➤ U.S. Environmental Protection Agency (USEPA)
- 10 ➤ U.S. Army Corps of Engineers (USACE)
- 11 ➤ Natural Resource Conservation Service (NRCS)
- 12 ➤ Texas State Historic Preservation Office (SHPO)
- 13 ➤ Texas Parks and Wildlife Department (TPWD)
- 14 ➤ Texas Commission on Environmental Quality (TCEQ)
- 15 ➤ Texas A & M University System (TAMUS)

17 **6.2 Public Review**

18 The draft EA will be made available for public review for a period of 30 days, and the Notice of
19 Availability (NOA) will be published in the local newspaper. Proof of publication will be
20 included in Section 6.0 of the final document. Comments received concerning the draft will also
21 be included as Appendices of the final document, and changes will be incorporated into the final
22 EA.

7.0 REFERENCES

1
2
3 Burrow, Steve. 2004. Steve Burrow. DPW. Fort Hood Military Reservation. Personal
4 Communication. February 24, 2004.

5
6 Diersing, V.E., W.D. Severinghaus, and E.W. Novak. 1985. Annotated Directory of
7 Endangered Wildlife on Selected U.S. Army Installations West of the Mississippi River.
8 TR N-85/08/ADA154623 (USACERL, March 1985).

9
10 e²M 2004. engineering-environmental Management, Inc., (e²M), 2004. Environmental Baseline
11 Study on the Proposed Land Transfer from Fort Hood to Texas A&M University System,
12 Texas. March 2004.

13
14 Endangered Species Management Plan (ESMP) for Fort Hood, Texas; FY01-05 (2001). Hayden,
15 T.J., Cornelius, J.D., Weinberg, H.J., Jette, L.L., and R.H. Melton. U.S. Army Corps of
16 Engineers, Engineer Research and Development Center/Construction and Engineer
17 Research Center. ERDC/CERL TR-01-26

18
19 Environmental Laboratory. 1987. Corps of Engineers Wetlands Delineation Manual. Technical
20 Report Y-87-1. U.S. Army Engineer Waterways Experiment Station, Vicksburg,
21 Mississippi. 100 pp. + append.

22
23 Federal Interagency Committee on Noise (FICON). 1992. Federal Agency Review of
24 Selected Airport Noise Analysis Issues. Federal Interagency Committee on Noise.
25 August 1992.

26
27 Horne, J.S. 1999. Status and management of Texas horned lizards on Fort Hood, Texas. Pages
28 313-322 in. P.M. Cavanagh, editor, Endangered Species Monitoring and Management on
29 Fort Hood, Texas: 1999 Annual Report. The Nature Conservancy of Texas.

30
31 Huckerby, Cheryl L. 2001. *Fort Hood Integrated Cultural Resources Management Plan*, Fort
32 Hood TX, 2001.

33
34 Niemann, Nancy. 2004. Nancy Niemann. DPW. Fort Hood Military Reservation. Personal
35 Communication. February 24, 2004.

36
37 NOAA. 2003. National Oceanic and Atmospheric Administration (NOAA). 2003. Calculated
38 Soil Moisture Ranking Percentile.

39 http://www.cpc.noaa.gov/products/soilmst/drought_composite.html#CSMRP. Site
40 visited on March 2, 2004.

41
42 National Regional Climate Center (NRCC). 2004. Monthly Wind Roses for the Austin
43 Municipal Airport, Texas.

44 <ftp://ftp.wcc.nrcs.usda.gov/downloads/climate/windrose/texas/austin/>. Site visited on
45 March 8, 2004.

1 Real Estate Center. 2004. Killeen-Temple Market Overview 2003 Demographics. Internet
2 Website: <http://recenter.tamu.edu/mreports/KilleenTemple12.asp>
3

4 Sacramento Metropolitan Air Quality Management District (SMAQMD). 1994. *Thresholds of*
5 *Significance*. December 1994.
6

7 The Nature Conservancy of Texas. 1999. Endangered Species Monitoring and Management at
8 Fort Hood, Texas: 1999 Annual Report. The Nature Conservancy of Texas Fort Hood
9 Project.
10

11 U.S. Army Corps of Engineers (USACE). 1987. The Installation Master Plan for Fort Hood,
12 Texas, Master Plan Report, Future Development Plan. Prepared by Nakata Planning
13 Group, Inc. for the III Corps and Fort Hood.
14

15 USACE. 1992. Final Environmental Impact Statement Base Realignment and Closure.
16 Realignment of the 5th Infantry Division (Mechanized) from Fort Polk, Louisiana to
17 Fort Hood, Texas.
18

19 USACE. 1999. Department of the Army Headquarters III Corps and Fort Hood Environmental
20 Baseline, Fort Hood, Texas.
21

22 USACE. 2000. Endangered Species Management Plan for Fort Hood, Texas; FY00-04.
23

24 USACE. 2003. *Supplemental Environmental Assessment for Fort Hood Livestock Grazing*
25 *Outlease*. U.S. Army Corps of Engineers, Fort Worth District, and Directorate of Public
26 Works, Fort Hood, Texas. November.
27

28 U.S. Bureau of Economic Analysis. 2004. BEA Regional Facts. Regional Economic Accounts.
29 Internet Website: <http://www.bea.doc.gov/bea/regional/bearfacts/action.cfm?fips=22093>
30

31 U.S. Census Bureau (USCB). 1990. DP-3. Profile of Selected Economic Characteristics: 1990.
32 Bell County, Texas.
33

34 USCB. 2000a. State and County Quickfacts: Bell County, Texas. Internet Website:
35 <http://www.census.gov/>
36

37 USCB. 2000b. DP-3. Profile of Selected Economic Characteristics: 2000. Bell County, Texas.
38

39 USCB. 2000c. DP-3. Profile of Selected Economic Characteristics: 2000. Texas.
40

41 USCB. 2000d. DP-4. Profile of Selected Housing Characteristics: 2000. Bell County, Texas.
42

43 USCB. 2003. Texas County Population Estimates and Population Change: July 1, 2001 to July
44 1, 2002. Prepared by the Population Division. Table CO-EST2002-02-48. Release Date
45 April 17, 2003.
46

- 1 U.S. Environmental Protection Agency (USEPA). 1972. Information on Levels of Environmental
2 Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety.
3 Report 550/9-74-004.
4
- 5 USEPA. 2003a. USEPA Map of Radon Zones. Texas. Last Updated March 24, 2003. Internet
6 Website: <http://www.epa.gov/iaq/radon/zonemap/texas.htm>
7
- 8 USEPA. 2003b. Sole Source Aquifer Protection Program National Summary of Sole Source
9 Aquifer Designations. Internet Website: <http://www.epa.gov/safewater/swp/sumssa.html>
10
- 11 USEPA. 2004. AirData NET Tier Report <http://www.epa.gov/air/data/nettier.html>. Site visited
12 on March 8, 2004.
13
- 14 U.S. Fish and Wildlife Service (USFWS). 1992. Golden-Cheeked Warbler Recovery Plan.
15
- 16 USFWS. 2000. Biological Opinion between Fort Hood and the USFWS.

8.0 LIST OF PREPARERS

The following people were primarily responsible for the preparation of this EA.

Name	Organization	Discipline/ Expertise	Experience	Role in Preparing EA
Linda Ashe	Environmental Resources Group	Project Management	6 years NEPA experience	ERG Project Manager, Report Review, Soils
Chris Baker	e ² M	Historian	5 years of NEPA experience	Cultural Resources
Jerry Bolton	Neel-Schaffer, Inc.	Biology/Ecology	17 years NEPA experience	Senior review and NSI Project Manager
Tonya Bolton	Neel-Schaffer, Inc.	Biology/Wildlife Management	4 years NEPA experience	Field reconnaissance, Land Use, Geological Resources, Transportation and Utilities
Scott Guidry	Neel-Schaffer, Inc.	Forestry	2 years NEPA experience	Aesthetic and Visual Resources, Socioeconomics, and Noise
Ron Lamb	e ² M	Environmental Science	11 years of NEPA experience	Report review and preparation
Sean McCain	e ² M	Air Quality/ Natural Resources	9 years experience	Air Quality
Christopher Roche	e ² M	Environmental Studies	4 years of experience	Environmental Baseline Survey and Hazardous and Toxic Materials
Rachel Schneider	e ² M	Chemistry/ Environmental Studies	1 year NEPA experience	Water Quality
Mike Schulze	Neel-Schaffer, Inc.	Environmental Science	5 years NEPA experience	Field reconnaissance, Biological Resources, Prime Farmlands, Environmental Justice
Stephen Smith	Neel-Schaffer, Inc.	Biology/Wildlife Management	9 years NEPA experience	Report review, Groundwater and Surface Water, Waters of the U.S. and Wetlands, Floodplains

APPENDIX A
Site Photographs



Appendix A. Site Photographs



Photo 1. Corral located on the northern end of the project area.



Photo 2. Typical heavily grazed area on the site.



Photo 3. North Reese Creek.



Photo 4. Typical primitive road through Ashe juniper stand.



Photo 5. Grassland in the project area.



Photo 6. Ashe juniper brush piles that have been cleared on the site.



Photo 7. Typical regrowth of Ashe juniper.



Photo 8. Monotypical stand of Ashe juniper.

APPENDIX B
Biological Opinion





United States Department of the Interior

FISH AND WILDLIFE SERVICE

Ecological Services
WinSystems Center Building
711 Stadium Drive, Suite 252
Arlington, Texas 76011

2-12-04-F-270

July 15, 2004

Colonel Randall J. Butler
Department of the Army
Headquarters, U.S. Army Garrison
ATTN: Directorate of Public Works
Building 1001, Room W321
Fort Hood, Texas 76544-5000

Dear Colonel Butler:

This document transmits the U.S. Fish and Wildlife Service's (Service) biological opinion based on our review of the U.S. Department of Army's proposed transfer of approximately 272 hectares (672 acres) of property at Fort Hood Military Installation in Bell County, Texas, and its effects on the federally listed black-capped vireo (*Vireo atricapilla*) (BCV) and golden-cheeked warbler (*Dendroica chrysoparia*) (GCW). The property would be transferred to the Texas A&M University System for the construction of a central Texas campus.

This biological opinion has been prepared in accordance with section 7 of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.) The biological opinion is based on the Biological Assessment included with your letter initiating consultation, information provided by Fort Hood Environmental staff, and other sources of information. A complete administrative record of this consultation is on file at the Service's Arlington, Texas, Ecological Services Field Office.

Consultation History

December 1, 2003: Initial meeting hosted by Fort Hood with representatives of Texas A&M University to discuss proposed transfer of property and future construction of central Texas campus. Fort Hood environmental personnel provided information on habitat occurring on the property and presence of listed species. Service representatives discussed the consultation process, including timelines and biological assessment content, and provided guidelines on minimization measures.

- February 15, 2004: Received draft sections of the Biological Assessment from Linda Ashe (Environmental Research Group, LLC) via electronic mail for preliminary review. Sections received included an effects analysis and maps of the project area with habitat delineated.
- February 18, 2004: Meeting hosted by Service's Arlington Field Office with Linda Ashe and Michael Schultz (Neel-Schaffer, Inc., via telephone) to discuss the effects analysis of the draft Biological Assessment. The Service advised the consultants on assessing potential take, effects determinations, minimization measures, and inclusion of habitat and species data collected by Fort Hood.
- March 12, 2004: Arlington Field Office received written request from Fort Hood initiating formal consultation on the proposed action. Written acknowledgement of the initiation package was sent to Fort Hood on March 23, 2004.

BIOLOGICAL OPINION

I. Description of Proposed Action

The Department of the Army's (Army) Fort Hood Military Reservation (Fort Hood) proposes to transfer land to the Texas A&M University System (TAMUS) for the development of a 20,000-student university campus. The property proposed for transfer is approximately 272 hectares (672 acres) within Training Area (TA) 27 in South Fort Hood (Figure 1). The property is essentially undeveloped and bounded on the east by State Highway 195, Airport Road on the north, and the Texas State Veterans Cemetery to the south (Figure 2). The west side of the property borders the remainder of TA 27 and Fort Hood property.

Following the transfer of the property, a chain link fence will be constructed around the perimeter of the property. The campus will be constructed on an incremental basis and is expected to take several years; therefore, specific design of the associated facilities is not available. However, current conceptual designs for the campus include approximately 40 buildings (academic, office, and resident) and three to four large parking lots with smaller parking areas scattered throughout the campus. Also included in the current design is the construction of several athletic facilities to include a football stadium/track and field complex, baseball stadium, baseball/softball complex, and two additional intramural fields. Numerous paved roadways and sidewalks will connect the campus facilities and exterior lighting will be installed for safety purposes. It is anticipated that access to the university would be through Airport Road to the north and State Highway 195 to the east. Associated with the construction, operation, and maintenance of the university would be the extension of gas, electric, sewer, water, and communication utilities as necessary. The campus conceptual design is anticipated to utilize approximately 91 hectares (225 acres) of the property.

The proposed action also includes a minimization measure in the form of preservation of existing GCW and BCV habitat on the property. The proposed university would be designed to utilize

the property closest to the existing roadways and 'No-build Zones' would be established to preserve the BCV habitat and portions of the GCW habitat that is contiguous with the habitat on Fort Hood. The 'No-build Zones' would encompass approximately 57.62 hectares (142.39 acres) plus a 50 meter (164 ft) buffer area. Construction would only be permitted outside of the established 'No-build Zones.'

The action area for the proposed project includes the anticipated extent of the direct and indirect effects. The Service has determined the action area to include the proposed 272 hectare (672 acre) property and an approximately 20.16 hectare (49.82 acre) area immediately adjacent to the property for reasons that are discussed in the 'Effects of the Action' section of this opinion.

II. Status of the Species

The current list of federally threatened (T), endangered (E), and candidate (C) species that are known to occur, or have been documented in Bell County consists of the following:

- black-capped vireo (*Vireo atricapilla*) – E
- golden-cheeked warbler (*Dendroica chrysoparia*) – E
- whooping crane (*Grus americana*) – E
- bald eagle (*Haliaeetus leucocephalus*) – T
- Salado salamander (*Eurycea chisholmensis*) – C
- smalleye shiner (*Notropis buccula*) - C

Candidate species are not afforded federal protection under the Endangered Species Act; however, the Service recommends that potential impacts to these species be considered during project planning. Currently, there are no known populations of the Salado salamander or smalleye shiner on Fort Hood. Additionally, habitat for these species does not occur within the action area.

The whooping crane and bald eagle are known to occur in Bell County, but are not expected to occur in the action area due to the lack of habitat. For this reason, the Army has determined that the proposed action would have no effect on the whooping crane or bald eagle. Therefore, these species will not be discussed further in this biological opinion, and no take of these species is authorized.

Two federally listed endangered species that do occur in the action area and that may be affected by the proposed action are the BCV and GCW. The BCV was listed by the Service in 1987 (52 FR 37423). The Service emergency listed the GCW on May 4, 1990 (55 FR 18844) and published a final rule on December 27, 1990 (55 FR 53160). Critical habitat has not been designated for either of these species. The recovery plans for the BCV and for the GCW were finalized on September 30, 1991, and September 30, 1992, respectively.

Black-capped Vireo - The BCV is an 11.4 centimeter (4.5 inch) long, insect-eating songbird. Mature males are olive green above and white below with faint greenish-yellow flanks. The crown and upper half of the head is black with a partial white eye-ring. The iris is brownish-red

and the bill black. The plumage of the female is duller than the male. Females have a dark slate gray head (USFWS 1991).

BCVs arrive in Texas from mid-March to mid-April, while BCVs in Oklahoma arrive there approximately 10 days later. They nest from Oklahoma south through central Texas to the Edwards Plateau, then south and west to central Coahuila, Mexico. In Texas, BCVs have been reported in at least 40 counties (USFWS 1996). A pair will most often be monogamous for the breeding season, selecting a nest site together, while the female completes nest construction in two to three days. BCVs suspend their nests in the forks of shrubs in dense underbrush, from 0.3 to 0.9 meters (1 to 6 feet) above the ground; most nests are found around one meter (3.3 feet) above ground. Three to four eggs are usually laid in the first nesting attempt, but later clutches may only contain two to three eggs. The first egg is usually laid one day after nest completion, with one egg being laid each subsequent day. Incubation takes 14 to 17 days, and is shared by both the male and female. BCV chicks are fed by both adults as well, and leave the nest 10 to 12 days after hatching (Campbell 1995).

Although BCV habitat throughout Texas is quite variable with respect to plant species, soils, and rainfall, all habitat types have a similar overall appearance. BCVs typically inhabit shrublands and open woodlands with a distinctive patchy structure. The shrub vegetation generally extends from the ground to about 1.8 meters (6 feet) above ground and covers about 30% to 60% of the total area. Open grassland separates the clumps of shrubs. In the eastern portion of the BCV's range, the shrub layer is often combined with an open, sparse to moderate tree canopy. In the Edwards Plateau and Cross Timbers regions, common plants in BCV habitat include Texas red oak (*Quercus buckleyi*), Lacey oak (*Quercus glaucoides*), white shin oak (*Quercus sinuata* var. *breviloba*), Durand oak (*Quercus durandii*), Plateau live oak (*Quercus fusiformis*), Texas mountain laurel (*Sophora secundiflora*), evergreen sumac (*Rhus virens*), skunkbush sumac (*Rhus trilobata*), flameleaf sumac (*Rhus lanceolata*), Texas redbud (*Cercis canadensis* var. *texensis*), Texas persimmon (*Diospyros texana*), honey mesquite (*Prosopis glandulosa*), and agarita (*Berberis trifoliolata*). Densities of Ashe junipers (*Juniperus ashei*) are usually low. In the western Edwards Plateau and Trans-Pecos regions, BCVs are often found in canyon bottoms and slopes containing plants such as sandpaper oak (*Quercus pungens*), white shin oak, Texas kidneywood (*Eysenhardtia texana*), Mexican walnut (*Juglans microcarpa*), fragrant ash (*Fraxinus cuspidata*), mountain laurel, and guajillo (*Acacia berlandieri*). BCV habitat is related to disturbance, and thought to have been created by natural disturbances (e.g., fires) in areas with rocky substrates and shallow soils, which generates successional habitat (Kolozsar et al. 2000).

Threats to the BCV include habitat loss and degradation due to development, habitat succession, poor grazing practices, brown-headed cowbird (*Molothrus ater*) parasitism, and low reproductive success. Throughout the Hill Country, much of the BCV's habitat has been destroyed or degraded by residential and commercial development, grazing practices, and fire suppression.

BCVs may live for more than five years, and usually return year after year to the same territory. The birds begin to migrate to wintering grounds on Mexico's western coast in July, and are gone from Texas by mid-September (Campbell 1995).

Golden-cheeked Warbler - The GCW is a small, insectivorous songbird, 11.4 to 12.7 centimeters (4.5 to 5 inches) long, with a wingspan of about 20 centimeters (7.9 inches). The male has a black back, throat, and cap, and yellow cheeks with a black stripe through the eye. Females are similar, but less colorful. The lower breast and belly of both sexes are white with black streaks on the flanks (USFWS 1992).

The GCW nests in the juniper-oak woodlands of the Texas Hill Country and winters in the pine-oak woodlands of southern Mexico, Guatemala, Honduras, and Nicaragua. Its entire nesting range is confined to 33 counties in central Texas. Typical nesting habitat is found in tall, dense, mature stands of Ashe juniper mixed with deciduous trees such as Texas oak, Lacey oak, white shin oak, live oak, post oak (*Quercus stellata*), Texas ash (*Fraxinus texensis*), cedar elm (*Ulmus crassifolia*), hackberry (*Celtis occidentalis*), bigtooth maple (*Acer grandidentatum*), sycamore (*Platanus occidentalis*), Arizona walnut (*Juglans major*), escarpment cherry (*Prunus serotina*), and pecan (*Carya illinoensis*). This type of woodland is often found in relatively moist areas such as steep-sided canyons and slopes. GCWs are also occasionally found in drier, upland juniper-oak, i.e., live oak, post oak, blackjack oak (*Quercus marilandica*) woodlands over flat topography. Although the composition of woody vegetation may vary from place to place, Ashe juniper, which is necessary for nest construction, is always present.

The males arrive in central Texas in early March and begin to establish breeding territories, which they defend against other males by singing from visible perches within their territories. The females arrive a few days later but are more difficult to detect in the dense woodland habitat. Usually three or four eggs are laid. The average nest height is five meters (16.4 feet) above ground. Eggs are generally incubated in April and, unless there is a second nesting attempt, nestlings fledge in May to early June. By early August, GCWs begin their migration south.

The primary threats to the GCW are habitat loss and urban encroachment. Other factors include the loss of deciduous oaks (used for foraging) to oak wilt, nest parasitism by brown-headed cowbirds, and predation and competition by blue jays (*Cyanocitta cristata*) and other urban-tolerant birds (USFWS 1992).

III. Environmental Baseline

a. Status of the species within the action area.

Fort Hood encompasses approximately 87,890 hectares (217,180 acres) and is located in Bell and Coryell Counties in central Texas. This area lies within the Lampasas Cut Plains subregion of Texas. This subregion is typically vegetated with oaks such as Texas oak, live oak, and white shin oak on the rocky Edwards limestone summits of small divides (Diggs et al. 1999). On large divides, areas of deeper soil typically support the westward extension of the Washita Prairie (Hayward et al. 1992). On the chalky thin soiled slopes derived from the underlying Comanche Peak limestone, white shin oak, sumac species, and Ashe juniper may be seen; these dry rocky areas have a distinctly desert-like microclimate (Hayward et al. 1992) and thus support plants with xerophytic adaptations. Below these slopes, on benches in valleys or on the summits of uplands lacking caprock, extensive areas of prairie can be found on the clay soils derived from

the Walnut formation where it is exposed (Diggs et al. 1999). The basal Trinity Group sands (Paluxy, Antlers, Twin Mountains-Travis Peak) underlying the Walnut formation developed typical Cross Timbers vegetation such as post oak and blackjack oak (Hill 1901).

The topographic diversity and deeply cut streams found in various parts of the Lampasas Cut Plain provide important microhabitat variation. In particular, the diverse microhabitats allow the northward extension of many species otherwise found primarily on the Edwards Plateau. Some plants that were traditionally considered Edwards Plateau endemics can be found in the Lampasas Cut Plain. These include big-tooth maple, plateau gerardia (*Agalinis edwardsiana*), wild mercury (*Argythamnia aphoroides*), Wright's milk-vetch (*Astragalus wrightii*), plateau false nightshade (*Chamaesaracha edwardsiana*), scarlet clematis (*Clematis texensis*), Lindheimer's silktassel (*Garrya ovata* var. *lindheimeri*), plateau milkvine (*Matelea edwardsensis*), Lindheimer's muhly (*Muhlenbergia lindheimeri*), devil's-shoestring (*Nolina lindheimeriana*), Heller's marbleseed (*Onosmodium helleri*), Lindheimer's rock daisy (*Perityle lindheimeri*), escarpment cherry, turnip-root scurfpea (*Pediomelum cyphocalyx*), plateau spiderwort (*Tradescantia edwardsiana*), Colorado Venus'-looking-glass (*Triodanis coloradoensis*), Lindheimer's crownbeard (*Verbesina lindheimeri*), and twisted-leaf yucca (*Yucca rupicola*). When considering vegetation, soils, geologic layers, and general aspects of the landscape, some parts of the Lampasas Cut Plain are remarkably similar to the Edwards Plateau (Diggs et al. 1999).

Data obtained from the Army's Land Condition Trend Analysis (LCTA) Program at Fort Hood indicate that the installation is divided mainly into perennial grassland (65 percent) and woodland (31 percent) community types (Tazik et al. 1992), with relatively little shrubland. Most of the grasslands exhibit a dense or closed vegetative cover (83 percent). As a result of a history of grazing and military activity, the installation's grasslands are dominated by Texas wintergrass (*Stipa leucotricha*) (29 percent) and prairie dropseed (*Sporobolus heterolepis*) (18 percent), with little bluestem (*Schizachyrium scoparium*) grasslands comprising only nine percent of the grassland area (Tazik et al. 1993). Broadleaf woodlands comprise about 39 percent of LCTA woodland sites and typically are dominated by oaks. Coniferous and mixed woodlands comprise 61 percent and are dominated by Ashe juniper or a mixture of juniper and various oaks.

Black-capped Vireo

Monitoring and research activities for the BCV on Fort Hood were initiated in 1987 and continue to the present. Research and conservation efforts include an inventory and monitoring program, remote camera studies of nest depredation and assessment of training activities in habitat, a habitat restoration program, and a cowbird control program.

Estimates of available BCV habitat on Fort Hood range from 5,319 hectares (13,143 acres) (Hayden et al. 2001) to 6,971 hectares (17,225 acres) (Cimprich 2003). BCVs are typically found in isolated territories within GCW habitat. Initial reports of territorial male BCVs numbered 85 in 1987 (Tazik 1991) and increased to 357 in 1997 (TNC 1998). During the 2002 and 2003 breeding season, Cimprich (2003) detected 2,047 adult BCVs at Fort Hood. Current studies indicate 90% of suitable BCV habitat to be occupied, resulting in approximately 6,275

hectares (15,505 acres) of occupied habitat on Fort Hood (Cimprich 2003). The current population of the BCV on Fort Hood has not been estimated, but recent surveys suggest a population of several thousand may be present.

There are approximately 4.1 hectares (10.1 acres) of suitable BCV habitat on the property proposed for transfer (Figure 3). Surveys of the property in 2002 resulted in the detection of two BCV pairs utilizing the property.

Golden-cheeked Warbler

Monitoring and research activities for the GCW on Fort Hood were initiated in 1991 and continue to the present. Research and conservation efforts include assessment of population trends, demographic and reproductive monitoring, habitat selection studies, habitat fragmentation and wildfire studies, and population viability analyses.

Currently, it is estimated that approximately 21,496 hectares (53,117 acres) of GCW habitat occur on Fort Hood (Hayden et al. 2001). GCW occurrence has been documented in all training areas that have suitable habitat. In 1996, 915 singing males were documented on Fort Hood. An analysis of point count survey data show the abundance of GCWs on Fort Hood has increased from 1992 to 2003 (Peak 2003). Using GCW densities from intensively studied areas, the population on Fort Hood is estimated to range from 2,901 to 6,040 singing males.

There are approximately 70.44 hectares (174.05 acres) of suitable GCW habitat occurring on the property proposed for transfer to TAMUS (Figure 3). TA 27 is not intensively surveyed by Fort Hood; however, six GCWs have been reported at TA 27 within the last five years, and one recorded on the property in 1996 (John Cornelius, pers. comm.).

b. Factors affecting species environment within the action area

Fort Hood was established in 1942 (as Camp Hood) for military training during World War II. Currently, Fort Hood provides resources and training facilities for active and reserve units in support of the Army's mission. Mission-related training activities conducted include maneuver exercises for units up to the brigade level, firing of live weapons, and aviation training (Hayden et al. 2001). Military activities occurring at TA 27 consist of dismounted and land navigation training. TA 27 is also used for recreation and is designated as a hunting area.

Fort Hood is currently operating under a biological opinion signed in July 2000, which established 'core' habitat areas for both the GCW and the BCV. No core habitat areas exist within TA 27. The opinion authorizes the incidental take of 230 hectares (568.3 acres) of BCV habitat and 519 hectares (1282.4 acres) of GCW habitat resulting from military activities under the current Endangered Species Management Plan.

In 2002, the Army transferred approximately 79 hectares (195 acres) of property within TA 27 for the establishment of the Texas State Veterans Cemetery. The cemetery is adjacent to the southern boundary of the proposed transfer property. The transfer of the cemetery property did

not adversely affect the BCV or GCW due to a lack of suitable habitat within its boundaries (John Cornelius, pers. comm.).

IV. Effects of the Action

The proposed action consists of the transfer of property from the Army to TAMUS for the future development of a university campus. It is anticipated that direct and indirect effects to the BCV and GCW would result from the action as discussed below.

The direct effects consist of the subsequent construction, operation, and maintenance of a 20,000-student university campus. The construction of the university is expected to directly remove approximately 16.82 hectares (41.57 acres) of GCW habitat and 0.09 hectares (0.23 acres) of BCV habitat (Figure 4). The conversion of GCW habitat to a college campus makes it no longer suitable for GCWs, thus harming the birds that may utilize the habitat during the breeding season. Additional GCW habitat would be removed for perimeter fence right-of-way; but, it is anticipated that this right-of-way would not harm GCWs if it is narrow and constructed outside of the breeding season (Campbell 1995, Horne 2000). However, the regular maintenance of the fence and its right-of-way would contribute to the disturbance effects discussed further in this section. The removal of BCV habitat is related to the construction of the fence and right-of-way around the perimeter of the property. The linear nature and small size of the BCV habitat that would be removed is not anticipated to result in harm to the birds.

The effects of human disturbance related to the construction, operation, and maintenance of the university include, but are not limited to, elevated noise levels, human and machinery presence, lighting, and increased predator presence. The adverse effects of urban development and human activities on avian communities have been well studied (e.g., Blair 1996, Friesen, et al. 1995, Gutzwiller et al. 1998, Riffell et al. 1996, Wilcove 1988). GCWs are especially sensitive to the effects of urbanization and are not usually found in close proximity to human developments (e.g., Benson 1990, Engels and Sexton, 1994, Sexton 1987). Arnold et al. (1996) suggest that GCWs prefer habitat adjacent to agricultural development rather than commercial and urban areas. Although GCWs prefer nesting in the interior forest (Coldren 1998), they are often observed at forest edges (Sexton 1991). Avian predators (e.g., crow, blue jay, grackle) are more abundant in GCW habitat within 100 meters (328 feet) from edges (Arnold et al. 1996) which may affect GCW use and/or reproductive success (Coldren 1998, Fink 1996). Urban development adjacent to GCW habitat also tends to attract blue jays, which have been shown to be incompatible with GCWs (Engels 1995, Engels and Sexton 1994). Coldren (1998) determined territory selection from habitat edges by GCWs as related to reproductive success and suggested 150 meters (492 feet) as the point at which GCW territories are affected by edge habitat. Additional effects include the potential import and spread of noxious vegetation within the action area. Noxious plants have the ability to displace native vegetation, thereby reducing habitat quality.

The remaining habitat on the property would be subject to the edge effects resulting from the university. The design of the university would incorporate 'No-build Zones' to preserve the remaining BCV habitat and the GCW habitat on the property (Figure 5). However, this habitat,

4.01 hectares (9.91 acres) of BCV habitat and 53.61 hectares (132.48 acres) of GCW habitat, will likely be rendered unsuitable, constituting harassment of the birds.

Effects related to harassment are expected to extend outside the boundaries of the parcel to the point at which they deter BCVs and/or GCWs from utilizing adjacent habitat or affect the reproductive success of birds using the adjacent habitat. Because the property is bound by roadways on the north and east, and there is no suitable habitat for the BCV or GCW beyond the road boundaries due to development, the disturbance effects would only be expected to extend to the adjacent Fort Hood property.

The BCV habitat in TA 27 occurs within the property boundary; there is no adjacent BCV habitat on Fort Hood that would be affected by the proposed action. For these reasons, the extent of the direct and indirect effects of the action on Fort Hood property will be evaluated using the best available information for the GCW. Currently, there are no specific guidelines on the distance from commercial/urban land use that would not be expected to affect GCWs; however, it is believed that large habitat patch size and/or connectivity to larger blocks of habitat reduce the effects (Arnold et al. 1996, Coldren 1998, Sexton 1991). Based on Coldren's (1998) work, it is anticipated that the effects regarding the construction, operation, and maintenance of the university would extend from the boundary of the property proposed for transfer to a maximum distance of 150 meters (492 feet) onto Fort Hood. Therefore, the action area includes the approximately 272 hectare (672 acre) parcel and up to 150 meters (492 feet) immediately adjacent to the property bounded by Fort Hood. It is expected that harassment of GCWs related to the effects of the development of the property would potentially reduce suitability of the adjacent habitat (approximately 20.16 hectares [49.82 acres]) on Fort Hood.

IV. Cumulative Effects

Cumulative effects include the effects of future State, tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

At this time, no future state, tribal, local or private actions are known to be planned within the action area. Because the action area encompasses the project site and Fort Hood property, any future actions concerning the area would occur at Fort Hood and thus require a separate consultation.

V. Conclusion

After reviewing the current status of the BCV and GCW, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is the Service's biological opinion that the transfer of approximately 272 hectares (672 acres) within Training Area (TA) 27 in South Fort Hood to TAMUS, as proposed, is not likely to jeopardize the

continued existence of the BCV or GCW. No critical habitat has been designated for these species, therefore, none will be affected.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulations pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this incidental take statement.

The measures described below are non-discretionary, and must be undertaken by the Army so that they become binding conditions of any grant or permit issued to TAMUS, as appropriate, for the exemption in section 7(o)(2) to apply. The Army has a continuing duty to regulate the activity covered by this incidental take statement. If the Army (1) fails to assume and implement the terms and conditions or (2) fails to require TAMUS to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the Army must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement. [50 CFR §402.14(i)(3)].

Amount or Extent of Take Anticipated

The Service anticipates that the proposed action could result in the incidental take of GCWs and BCVs. Take would be in the form of harm and harassment. Harm to the GCW would occur from the direct conversion of approximately 16.82 hectares (41.57 acres) of GCW habitat on the property proposed for transfer. Take in the form of harassment would occur on approximately 4.01 hectares (9.91 acres) of BCV habitat and approximately 73.77 hectares (182.30 acres) of GCW habitat. Assuming a maximum density of 0.11 GCW pairs per hectare and 0.42 BCV singing males per hectare (Hayden et al. 2001), it is anticipated that 10 GCW pairs (20 individuals) and 2 BCV pairs (4 individuals) could be taken.

Effect of the take

In the accompanying biological opinion, the Service determined that the level of anticipated habitat take is not likely to result in jeopardy to the BCV or GCW.

Reasonable and Prudent Measures

The Service believes the following reasonable and prudent measures are necessary and appropriate to minimize impacts of incidental take of the GCW and BCV:

- 1) Clearing of GCW habitat on the property outside of the No-build Zones will be scheduled outside of the major portion of the GCW breeding and nesting season (July through February). All vegetation clearing will be consistent with the current practices recommended by the Texas Forest Service to prevent the spread of oak wilt.
- 2) The buffer area within the No-build Zones will be planted and/or maintained as native vegetation to create a transitional area between the proposed university and remaining habitat. These areas will have restricted access limited to education activities and scientific research. The No-build Zone will be clearly marked prior to construction, vegetation removal, or other earth-disturbing activities to prevent accidental clearing by work crews.
- 3) The right-of-way for perimeter fence construction will be a maximum of 6.5 meters (21 feet) where it crosses GCW habitat.
- 4) Impacts related to lighting generated by the university will be minimized by the use of directional lighting and buffers around GCW and BCV habitat. Available lighting designs and methods will be investigated and used as appropriate to reduce impacts to birds.
- 5) Trails developed within the No-build Zone will be designed as ‘nature trails’ with no hard surface and minimal vegetation removal. The No-Build Zones will be managed as GCW and BCV habitat as appropriate.

Terms and conditions

In order to be exempt from the prohibitions of section 9 of the Act, the Army must comply with the following terms and conditions, which implement the reasonable and prudent measures described above and outline required reporting/monitoring requirements. These terms and conditions are non-discretionary.

- 1) The Army will develop and implement an appropriate monitoring plan for reporting progress in development of the property and implementation of the reasonable and prudent measures. The content, schedule, and format of the monitoring plan will be at the discretion of the Army.

The Service anticipates that no more than 20 GCWs and 4 BCVs would be taken as a result of the proposed action. The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize the impact of incidental take that might otherwise result from the proposed action. If, during the course of the action, this level of incidental take is exceeded, such incidental take represents new information requiring reinitiation of consultation and review of the reasonable and prudent measures provided. The Army must immediately

provide an explanation of the causes of the taking and review with the Service the need for possible modification of the reasonable and prudent measures.

The Service will not refer the incidental take of any migratory bird for prosecution under the Migratory Bird Treaty Act of 1918, as amended (16 U.S.C. §§ 703-712), if such take is in compliance with the terms and conditions (including amount and/or number) specified herein.

Conservation Recommendations

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information. The following recommendation is provided for consideration by the Army:

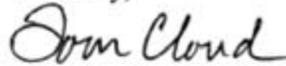
The Army is encouraged to partner with TAMUS in the development and implementation of an education program regarding threatened and endangered species in Texas, especially the GCW and BCV. The program should contain curricula for all education levels, from elementary school level to college level.

Reinitiation Notice

This concludes formal consultation on the actions outlined in the request. As provided in 50 CFR § 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (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 not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

The Service appreciates the cooperation extended by the Army staff and participating parties during this consultation. If further assistance or information is required, please contact Mr. Omar Bocanegra or myself at the above address or telephone (817) 277-1100.

Sincerely,



Thomas J. Cloud, Jr.
Field Supervisor

cc: State Administrator, Ecological Services, Austin, TX
Regional Director, FWS, Albuquerque, NM (Attn: ARD-ES)

LITERATURE CITED

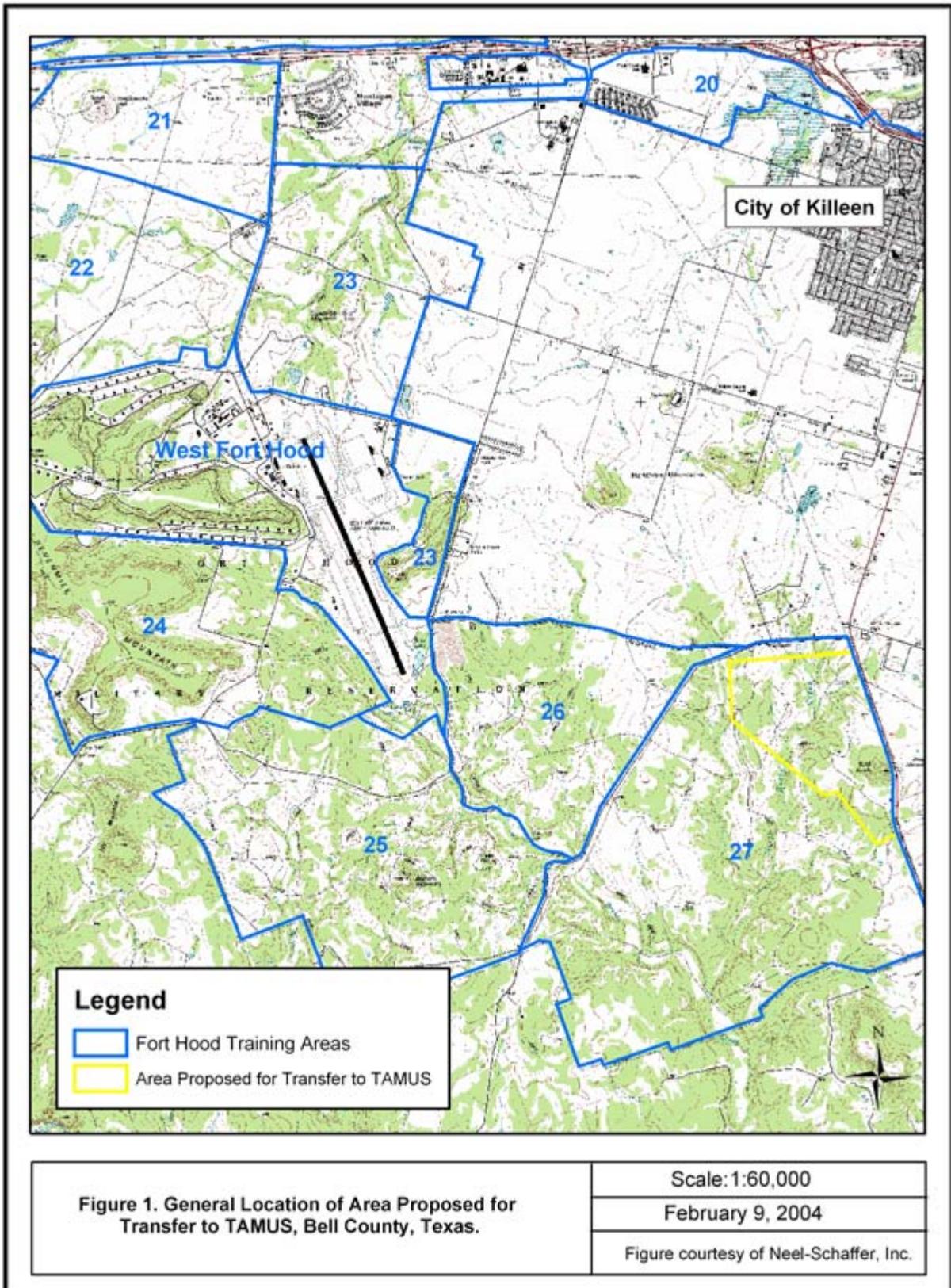
- Arnold, K.A., C.L. Coldren, and M.L. Fink. 1996. The interactions between avian predators and golden-cheeked warblers in Travis County, Texas. Report No. TX-96/1983-2, Texas Transportation Institute of Texas A&M University, College Station, TX, 110 pp.
- Benson, R.H. 1990. Habitat area requirements of the golden-cheeked warbler on the Edwards Plateau. Texas Parks and Wildlife Department, Austin, Texas.
- Blair, R. B. 1996. Land use and avian species diversity along an urban gradient. *Ecological Applications* 6(2): 506-519.
- Campbell, L. 1995. Endangered and Threatened Animals of Texas - Their Life History and Management. Texas Parks and Wildlife Department, Resource Protection Division, Endangered Species Branch. Austin, TX.
- Cimprich, D.A. 2003. The distribution of the black-capped vireo and its habitat on Fort Hood, Texas: the results of an installation-wide search. In: Endangered species monitoring and management at Fort Hood, Texas: 2003 annual report. The Nature Conservancy, Fort Hood Project, Fort Hood, Texas, USA.
- Coldren, C.L. 1998. The effects of habitat fragmentation on the golden-cheeked warbler. PhD Dissertation, Texas A&M University, College Station, TX.
- Diggs, G.M., Jr., B.L. Lipscomb, and R.J. O'Kennon. 1999. Shinnery & Mahler's Illustrated Flora of North Central Texas. Botanical Research Institute of Texas, Fort Worth, Texas.
- Engels, T.M. 1995. The conservation biology of the golden-cheeked warbler (*Dendroica chrysoparia*). PhD Dissertation, University of Texas at Austin, Austin, Texas.
- Engels, T.M. and C.W. Sexton. 1994. Negative correlation of blue jays and golden-cheeked warblers near an urbanizing area. *Conservation Biology* 8(1): 286-290.
- Fink, M. L. 1996. Factors contributing to nest predation within habitat of the golden-cheeked warbler, Travis County, Texas. M.S. Thesis, Texas A&M University, College Station, Texas.
- Friesen, L.E., P.F.J. Eagles, and R.J. Mackay. 1995. Effects of residential development on forest-dwelling neotropical migrant songbirds. *Conservation Biology* 9(6): 1408-1414.
- Gutzwiller, K.J., H.A. Marcum, H.B. Harvey, J.D. Roth, and S.H. Anderson. 1998. Bird tolerance to human intrusion in Wyoming montane forests. *The Condor* 100: 519-527.
- Hayden, T.J., J.D. Cornelius, H.J. Weinberg, L.L. Jette, and R.H. Melton. 2001. Endangered species management plan for Fort Hood, Texas; FY01-05. Technical Report

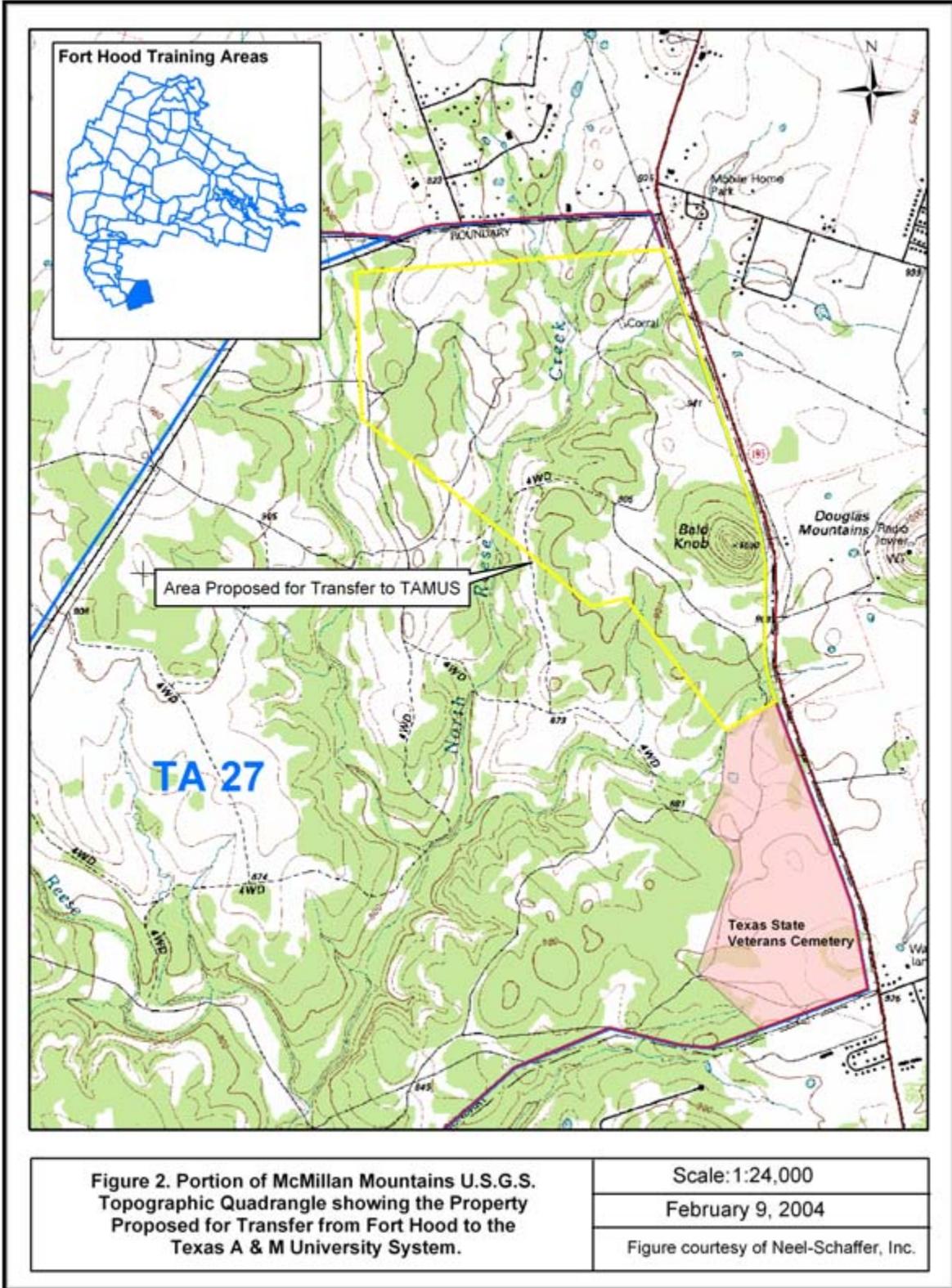
- ERDC/CERL TR-01-26. Department of the Army, Engineer Research and Development Center, Construction Engineering Research Laboratory, Champaign, Ill.
- Hayward, O.T., P.N. Dolliver, D.L. Amsbury, and J.C. Yelderman. 1992. A field guide to the Grand Prairie of Texas, land, history, culture. Program for Regional Studies, Baylor Univ., Waco, TX.
- Hill, R.T. 1901. The topography and geology of the Cross Timbers and surrounding regions in northern Texas. *Amer. J. Sci.* (3rd Series) 133:291-303.
- Horne, J. S. 2000. Effects of open-canopy corridor width on definitions of forest fragmentation and habitat loss for golden-cheeked warblers. Endangered species monitoring and management at Fort Hood, Texas: 1999 annual report. Revised edition. Fort Hood Project, The Nature Conservancy of Texas, Fort Hood, Texas.
- Koloszar, J. A., L. L. Sanchez, and M. E. Batchelor. 2000. Black-capped vireo habitat manipulation: comparing hydro-axing, bulldozing, and prescribed burning for creating suitable breeding habitat. 1999 annual report. Fort Hood Project, The Nature Conservancy of Texas, Fort Hood, Texas.
- Peak, R.G. 2003. Population trends of the golden-cheeked warbler on Fort Hood, Texas 1992-2003. In: Endangered species monitoring and management at Fort Hood, Texas: 2003 annual report. The Nature Conservancy, Fort Hood Project, Fort Hood, Texas, USA.
- Riffell, S.K., K.J. Gutzwiller, and S.H. Anderson. 1996. Does repeated human intrusion cause cumulative declines in avian richness and abundance? *Ecological Applications* 6(2): 492-505.
- Sexton, C.W. 1987. A comparative analysis of urban and native bird populations in central Texas. PhD. Dissertation, University of Texas, Austin, Texas.
- Sexton, C.W. 1991. Golden-cheeked warblers adjacent to an urban environment: special studies for the Balcones Canyonlands Conservation Plan. Draft Report prepared for The Nature Conservancy and The Biological Advisory Team, Balcones Canyonlands Conservation Plan.
- Tazik, D.J. 1991. Proactive management of an endangered species on army lands: the black-capped vireo on the lands of Fort Hood, Texas. PhD. Dissertation, University of Illinois, Urbana.
- Tazik, D.J., J.D. Cornelius, D.M. Herbert, T.J. Hayden, and B.R. Jones. 1992. Biological assessment of the effects of military associated activities on endangered species at Fort Hood, Texas. USACERL Special Report EN-93/01/ADA263489.

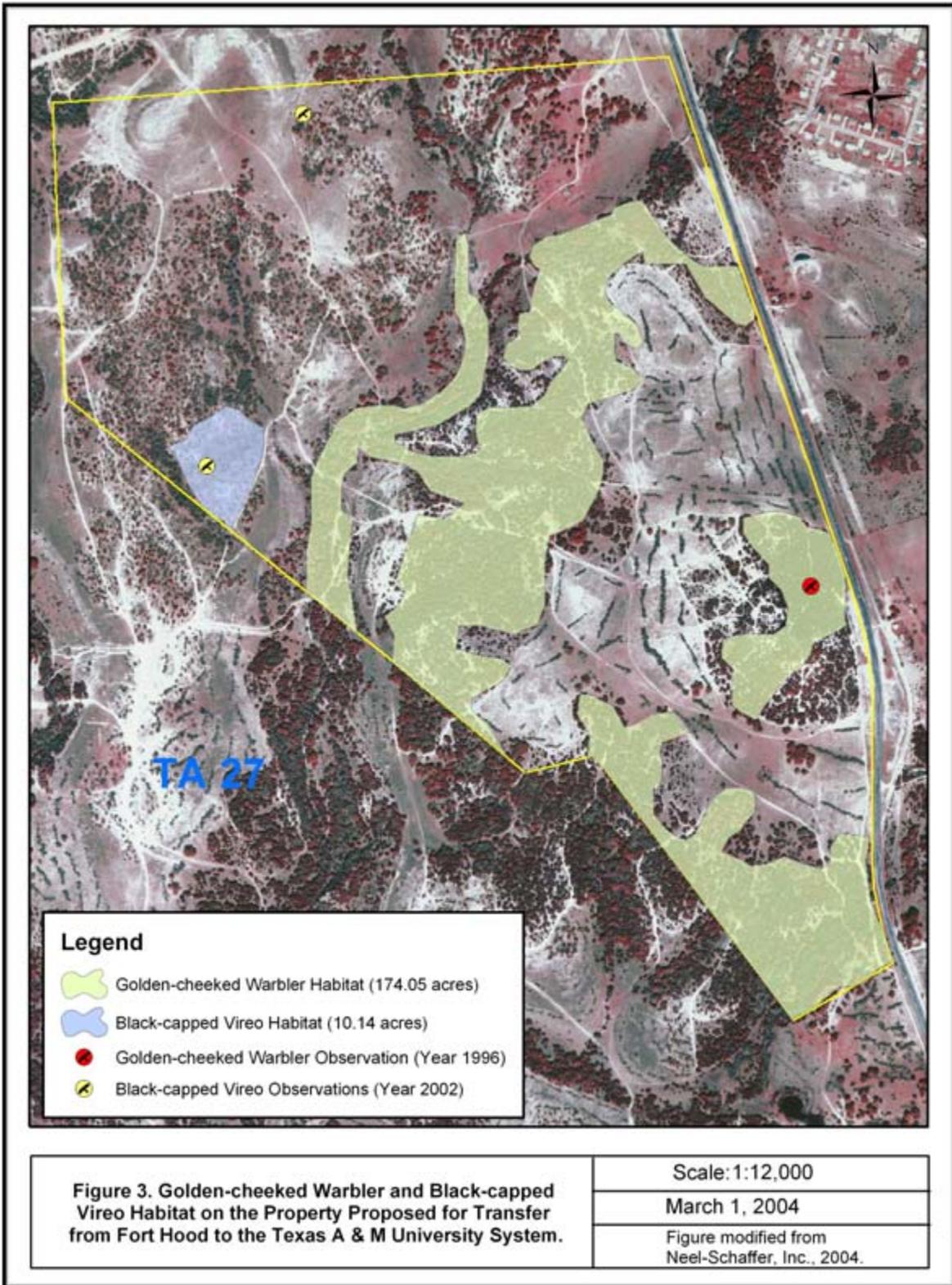
- Tazik, D.J., Grzybowski, J.A., and J.D. Cornelius. 1993. Status of the black-capped vireo at Fort Hood, Texas, volume II: habitat. Technical Report EN-94/01, U.S. Army Engineer Research and Development Center, Champaign, IL.
- The Nature Conservancy (TNC). 1998. Summary of 1997 research activities. Compiled by L.L. Sanchez. Texas Conservation Data Center, The Nature Conservancy, Fort Hood, Texas. 314 pp.
- U.S. Fish and Wildlife Service (USFWS). 1991. Black-capped Vireo (*Vireo atricapillus*) Recovery Plan. Austin, Texas, pp. vi + 74.
- U.S. Fish and Wildlife Service (USFWS). 1992. Golden-cheeked Warbler (*Dendroica chrysoparia*) Recovery Plan. Albuquerque, New Mexico. 88 pp.
- U.S. Fish and Wildlife Service (USFWS). 1996. Black-capped vireo population and habitat viability assessment report. Compiled and edited by C. Beardmore, J. Hatfield, and J. Lewis in conjunction with workshop participants. Report of a Sept. 18-21, 1995 workshop arranged by the USFWS in partial fulfillment of U.S. National Biological Service Grant No. 80333-1423. Austin, Texas.
- Wilcove, D.S. 1988. Changes in the avifauna of the Great Smoky Mountains: 1947-1983. *Wilson Bulletin* 100: 256-271.

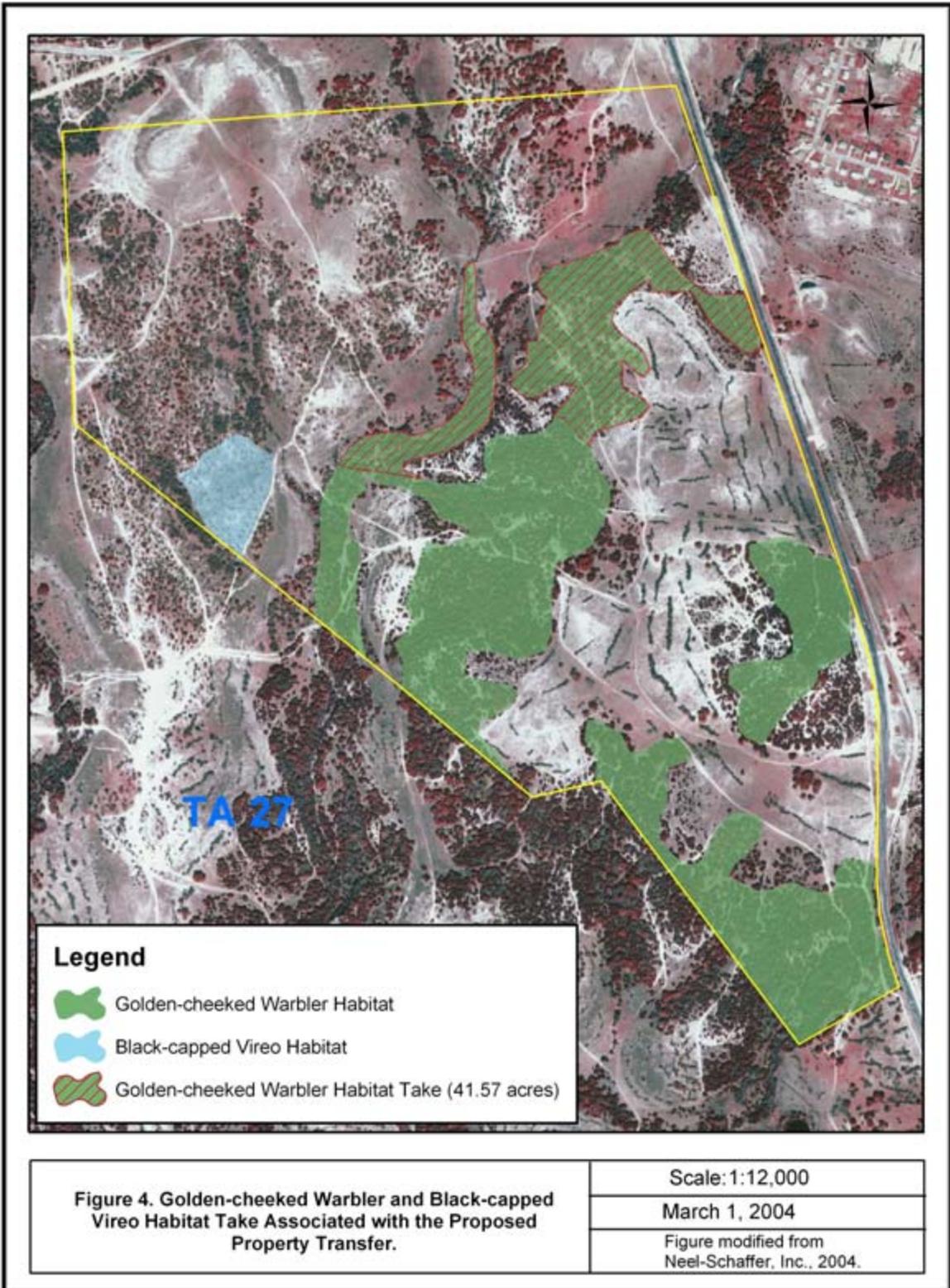
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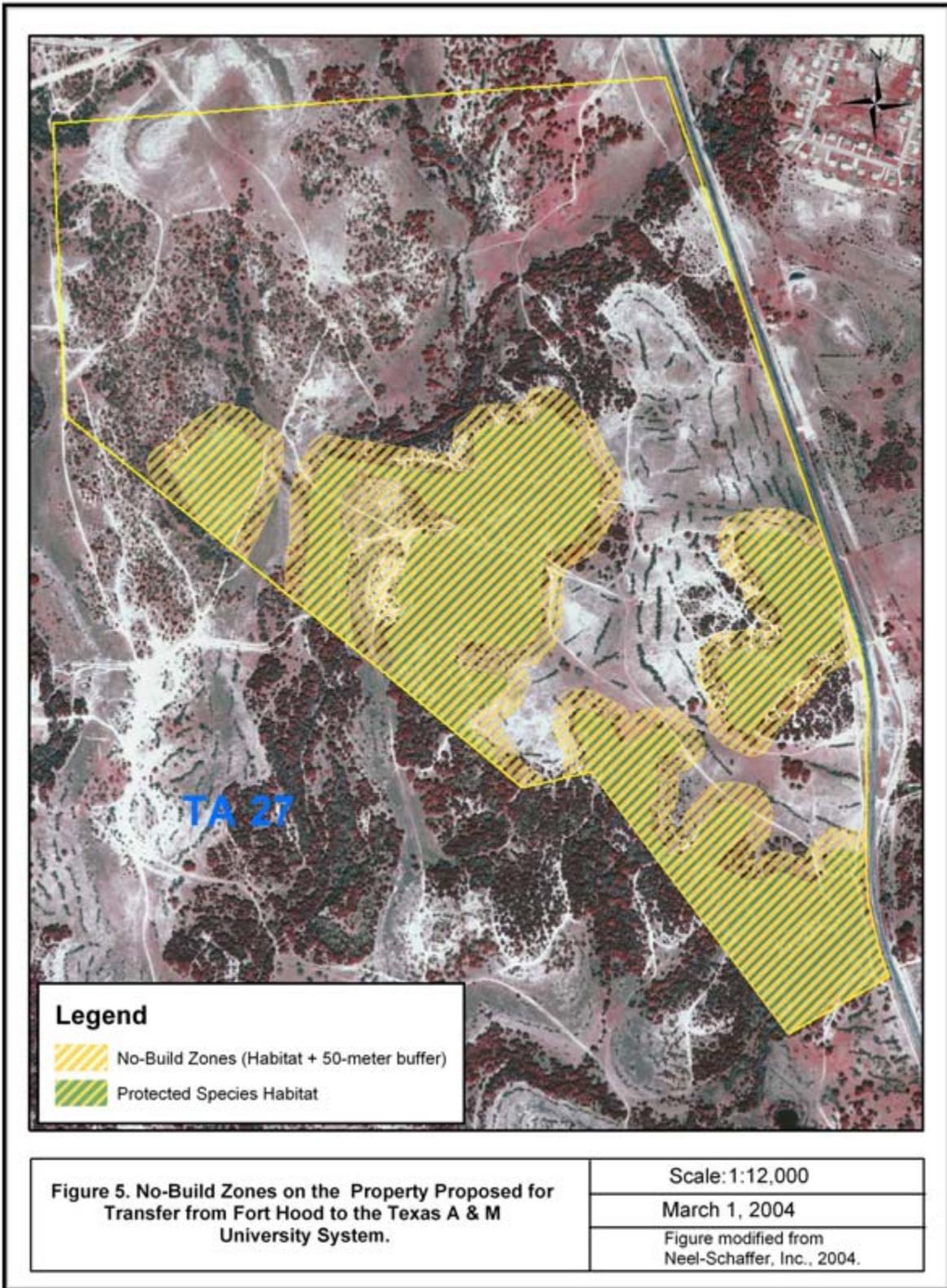
- Cornelius, John. 2004. Fort Hood Military Reservation, Fort Hood, Texas.











APPENDIX C
Air Conformity Analysis



Appendix C - Clean Air Act General Conformity Analysis Emission Calculations

Emissions Estimates for Development TAMUS at Kileen, TX

This workbook contains

Summary	(this worksheet) Summarizes total emissions by calendar year.
Combustion	(one sheet for each calendar year) Estimates emissions from non-road equipment exhaust as well as painting.
Grading	(one sheet for each calendar year) Estimates the number of days of site preparation, to be used for estimating heavy equipment exhaust and earthmoving dust emissions)
Fugitive	(one sheet for each calendar year) Estimates fine particulate emissions from earthmoving, vehicle traffic, and windblown dust.
POVs	Estimates emissions from privately-owned vehicles for each calendar year.
Austin-Waco AQCR Tier Report	Estimates net air pollution sources (area and point) in tons per year (1999) for the Austin-Waco Intrastate AQCR

Air Quality Emission Calculations

Summary of Proposed Action's Emissions

	NOx (ton)	VOC (ton)	CO (ton)	SO2 (ton)	PM10 (ton)
CY2008					
Construction Eqpt.	29.20	8.84	25.14	1.46	2.44
Fugitive Dust					19.62
POVs	0.00	0.00	0.00	0.00	0.00
TOTAL CY2008	29.20	8.84	25.14	1.46	22.06

	NOx (ton)	VOC (ton)	CO (ton)	SO2 (ton)	PM10 (ton)
CY2009					
Construction Eqpt.	18.26	5.98	14.93	0.93	1.64
Fugitive Dust					19.62
POVs	0.00	0.00	0.00	0.00	0.00
TOTAL CY2009	18.26	5.98	14.93	0.93	21.26

	NOx (ton)	VOC (ton)	CO (ton)	SO2 (ton)	PM10 (ton)
CY2010					
Construction Eqpt.	18.26	5.98	14.93	0.93	1.64
Fugitive Dust					19.62
POVs	0.00	0.00	0.00	0.00	0.00
TOTAL CY2010	18.26	5.98	14.93	0.93	21.26

	NOx (ton)	VOC (ton)	CO (ton)	SO2 (ton)	PM10 (ton)
CY2011					
Construction Eqpt.	18.26	5.98	14.93	0.93	1.64
Fugitive Dust					19.62
POVs	0.00	0.00	0.00	0.00	0.00
TOTAL CY2011	18.26	5.98	14.93	0.93	21.26

	NOx (ton)	VOC (ton)	CO (ton)	SO2 (ton)	PM10 (ton)
CY2012					
Construction Eqpt.	18.26	5.98	14.93	0.93	1.64
Fugitive Dust					19.62
POVs	0.00	0.00	0.00	0.00	0.00
TOTAL CY2012	18.26	5.98	14.93	0.93	21.26

	NOx (ton)	VOC (ton)	CO (ton)	SO2 (ton)	PM10 (ton)
CY2013					
Construction Eqpt.	10.59	3.95	8.57	0.54	0.96
Fugitive Dust					12.26
POVs	9.18	5.98	77.15	2.50	34.49
TOTAL CY2013	19.78	9.93	85.72	3.05	47.72

Air Quality Emission Calculations

	NOx (ton)	VOC (ton)	CO (ton)	SO2 (ton)	PM10 (ton)
CY2014					
Construction Eqpt.	10.59	3.95	8.57	0.54	0.96
Fugitive Dust					12.26
POVs	11.15	7.26	93.69	3.04	41.88
TOTAL CY2014	21.74	11.21	102.25	3.58	55.11

	NOx (ton)	VOC (ton)	CO (ton)	SO2 (ton)	PM10 (ton)
CY2015					
Construction Eqpt.	10.59	3.95	8.57	0.54	0.96
Fugitive Dust					12.26
POVs	13.12	8.54	110.22	3.58	49.28
TOTAL CY2015	23.71	12.49	118.79	4.12	62.50

	NOx (ton)	VOC (ton)	CO (ton)	SO2 (ton)	PM10 (ton)
CY2016					
Construction Eqpt.	10.59	3.95	8.57	0.54	0.96
Fugitive Dust					12.26
POVs	15.09	9.83	126.75	4.12	56.67
TOTAL CY2016	25.68	13.77	135.32	4.66	69.89

	NOx (ton)	VOC (ton)	CO (ton)	SO2 (ton)	PM10 (ton)
CY2017					
Construction Eqpt.	10.59	3.95	8.57	0.54	0.96
Fugitive Dust					12.26
POVs	17.06	11.11	143.29	4.65	64.06
TOTAL CY2017	27.65	15.05	151.85	5.19	77.28

	NOx (ton)	VOC (ton)	CO (ton)	SO2 (ton)	PM10 (ton)
CY2018					
Construction Eqpt.	10.59	3.95	8.57	0.54	0.96
Fugitive Dust					12.26
POVs	19.02	12.39	159.82	5.19	71.45
TOTAL CY2018	29.61	16.34	168.39	5.73	84.67

	NOx (ton)	VOC (ton)	CO (ton)	SO2 (ton)	PM10 (ton)
CY2019					
Construction Eqpt.	10.59	3.95	8.57	0.54	0.96
Fugitive Dust					12.26
POVs	20.99	13.67	176.35	5.73	78.84
TOTAL CY2019	31.58	17.62	184.92	6.27	92.07

Air Quality Emission Calculations

	NOx (ton)	VOC (ton)	CO (ton)	SO2 (ton)	PM10 (ton)
CY2020					
Construction Eqpt.	10.59	3.95	8.57	0.54	0.96
Fugitive Dust					12.26
POVs	22.96	14.95	192.89	6.26	86.23
TOTAL CY2020	33.55	18.90	201.45	6.80	99.46

	NOx (ton)	VOC (ton)	CO (ton)	SO2 (ton)	PM10 (ton)
CY2021					
Construction Eqpt.	10.59	3.95	8.57	0.54	0.96
Fugitive Dust					12.26
POVs	24.93	16.23	209.42	6.80	93.62
TOTAL CY2021	35.52	20.18	217.99	7.34	106.85

	NOx (ton)	VOC (ton)	CO (ton)	SO2 (ton)	PM10 (ton)
CY2022					
Construction Eqpt.	10.59	3.95	8.57	0.54	0.96
Fugitive Dust					12.26
POVs	26.90	17.51	225.95	7.34	101.01
TOTAL CY2022	37.49	21.46	234.52	7.88	114.24

	NOx (ton)	VOC (ton)	CO (ton)	SO2 (ton)	PM10 (ton)
CY2023					
Construction Eqpt.	10.59	3.95	8.57	0.54	0.96
Fugitive Dust					12.26
POVs	28.86	18.80	242.48	7.87	108.41
TOTAL CY2023	39.45	22.74	251.05	8.41	121.63

	NOx (ton)	VOC (ton)	CO (ton)	SO2 (ton)	PM10 (ton)
CY2024					
Construction Eqpt.	10.59	3.95	8.57	0.54	0.96
Fugitive Dust					12.26
POVs	30.83	20.08	259.02	8.41	115.80
TOTAL CY2024	41.42	24.03	267.58	8.95	129.02

	NOx (ton)	VOC (ton)	CO (ton)	SO2 (ton)	PM10 (ton)
CY2025					
Construction Eqpt.	10.59	3.95	8.57	0.54	0.96
Fugitive Dust					12.26
POVs	32.80	21.36	275.55	8.95	123.19
TOTAL CY2025	43.39	25.31	284.12	9.49	136.41

Air Quality Emission Calculations

	NOx (ton)	VOC (ton)	CO (ton)	SO2 (ton)	PM10 (ton)
CY2026					
Construction Eqpt.	10.59	3.95	8.57	0.54	0.96
Fugitive Dust					12.26
POVs	34.77	22.64	292.08	9.48	130.58
TOTAL CY2026	45.36	26.59	300.65	10.03	143.80

	NOx (ton)	VOC (ton)	CO (ton)	SO2 (ton)	PM10 (ton)
CY2027					
Construction Eqpt.	9.67	3.80	8.37	0.48	0.80
Fugitive Dust					6.13
POVs	36.73	23.92	308.62	10.02	137.97
TOTAL CY2027	46.41	27.73	316.98	10.50	144.90

Emissions By Calendar Year for Proposed Action

Year	NOx (tpy)	VOC (tpy)	CO (tpy)	SO2 (tpy)	PM10 (tpy)
2008	29.20	8.84	25.14	1.46	22.06
2009	18.26	5.98	14.93	0.93	21.26
2010	18.26	5.98	14.93	0.93	21.26
2011	18.26	5.98	14.93	0.93	21.26
2012	18.26	5.98	14.93	0.93	21.26
2013	19.78	9.93	85.72	3.05	47.72
2014	21.74	11.21	102.25	3.58	55.11
2015	23.71	12.49	118.79	4.12	62.50
2016	25.68	13.77	135.32	4.66	69.89
2017	27.65	15.05	151.85	5.19	77.28
2018	29.61	16.34	168.39	5.73	84.67
2019	31.58	17.62	184.92	6.27	92.07
2020	33.55	18.90	201.45	6.80	99.46
2021	35.52	20.18	217.99	7.34	106.85
2022	37.49	21.46	234.52	7.88	114.24
2023	39.45	22.74	251.05	8.41	121.63
2024	41.42	24.03	267.58	8.95	129.02
2025	43.39	25.31	284.12	9.49	136.41
2026	45.36	26.59	300.65	10.03	143.80
2027	46.41	27.73	316.98	10.50	144.90

Air Quality Emission Calculations

Regional Significance (Using General Conformity Rule Significance Threshold - 10% of regional budget)

Although the General Conformity Rule is not applicable to the Proposed Action, the Conformity Significance Threshold is used as a frame of reference for this analysis. Because future year budgets were not readily available, actual 1999 air emissions inventories for the counties were used as an approximation of the regional inventory. Because the Proposed Action is two orders of magnitude below significance, the conclusion would be the same, regardless of whether future year budget data were used.

Metropolitan San Antonio Intrastate AQCR

Year	Point and Area Sources Combined				
	NOx (tpy)	VOC (tpy)	CO (tpy)	SO2 (tpy)	PM10 (tpy)
1999	231,564	139,443	865,780	270,283	103,908

Source: USEPA-AirData NET Tier Report (<http://www.epa.gov/air/data/nettier.html>). Site visited on 3/8/04

Determination Significance (Significance Threshold = 10%)

AQCR Inventory -1999

2008 Proposed Action Emissions

Proposed Action %

NOx (tpy)	VOC (tpy)	CO (tpy)	SO2 (tpy)	PM10 (tpy)
231,564	139,443	865,780	270,283	103,908
29.20	8.84	25.14	1.46	22.06
0.0126%	0.0063%	0.0029%	0.0005%	0.0212%

AQCR Inventory -1999

2009 Proposed Action Emissions

Proposed Action %

NOx (tpy)	VOC (tpy)	CO (tpy)	SO2 (tpy)	PM10 (tpy)
231,564	139,443	865,780	270,283	103,908
18.26	5.98	14.93	0.93	21.26
0.0079%	0.0043%	0.0017%	0.0003%	0.0205%

AQCR Inventory -1999

2010 Proposed Action Emissions

Proposed Action %

NOx (tpy)	VOC (tpy)	CO (tpy)	SO2 (tpy)	PM10 (tpy)
231,564	139,443	865,780	270,283	103,908
18.26	5.98	14.93	0.93	21.26
0.0079%	0.0043%	0.0017%	0.0003%	0.0205%

AQCR Inventory -1999

2011 Proposed Action Emissions

Proposed Action %

NOx (tpy)	VOC (tpy)	CO (tpy)	SO2 (tpy)	PM10 (tpy)
231,564	139,443	865,780	270,283	103,908
18.26	5.98	14.93	0.93	21.26
0.0079%	0.0043%	0.0017%	0.0003%	0.0205%

NOx	VOC	CO	SO2	PM10

Air Quality Emission Calculations

	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)
AQCR Inventory -1999	231,564	139,443	865,780	270,283	103,908
2012 Proposed Action Emissions	18.26	5.98	14.93	0.93	21.26
Proposed Action %	0.0079%	0.0043%	0.0017%	0.0003%	0.0205%

	NOx (tpy)	VOC (tpy)	CO (tpy)	SO2 (tpy)	PM10 (tpy)
AQCR Inventory -1999	231,564	139,443	865,780	270,283	103,908
2013 Proposed Action Emissions	19.78	9.93	85.72	3.05	47.72
Proposed Action %	0.0085%	0.0071%	0.0099%	0.0011%	0.0459%

	NOx (tpy)	VOC (tpy)	CO (tpy)	SO2 (tpy)	PM10 (tpy)
AQCR Inventory -1999	231,564	139,443	865,780	270,283	103,908
2014 Proposed Action Emissions	21.74	11.21	102.25	3.58	55.11
Proposed Action %	0.0094%	0.0080%	0.0118%	0.0013%	0.0530%

	NOx (tpy)	VOC (tpy)	CO (tpy)	SO2 (tpy)	PM10 (tpy)
AQCR Inventory -1999	231,564	139,443	865,780	270,283	103,908
2015 Proposed Action Emissions	23.71	12.49	118.79	4.12	62.50
Proposed Action %	0.0102%	0.0090%	0.0137%	0.0015%	0.0601%

	NOx (tpy)	VOC (tpy)	CO (tpy)	SO2 (tpy)	PM10 (tpy)
AQCR Inventory -1999	231,564	139,443	865,780	270,283	103,908
2016 Proposed Action Emissions	25.68	13.77	135.32	4.66	69.89
Proposed Action %	0.0111%	0.0099%	0.0156%	0.0017%	0.0673%

	NOx (tpy)	VOC (tpy)	CO (tpy)	SO2 (tpy)	PM10 (tpy)
AQCR Inventory -1999	231,564	139,443	865,780	270,283	103,908
2017 Proposed Action Emissions	27.65	15.05	151.85	5.19	77.28
Proposed Action %	0.0119%	0.0108%	0.0175%	0.0019%	0.0744%

Air Quality Emission Calculations

AQCR Inventory -1999
2018 Proposed Action Emissions
Proposed Action %

NOx (tpy)	VOC (tpy)	CO (tpy)	SO2 (tpy)	PM10 (tpy)
231,564	139,443	865,780	270,283	103,908
29.61	16.34	168.39	5.73	84.67
0.0128%	0.0117%	0.0194%	0.0021%	0.0815%

AQCR Inventory -1999
2019 Proposed Action Emissions
Proposed Action %

NOx (tpy)	VOC (tpy)	CO (tpy)	SO2 (tpy)	PM10 (tpy)
231,564	139,443	865,780	270,283	103,908
31.58	17.62	184.92	6.27	92.07
0.0136%	0.0126%	0.0214%	0.0023%	0.0886%

AQCR Inventory -1999
2020 Proposed Action Emissions
Proposed Action %

NOx (tpy)	VOC (tpy)	CO (tpy)	SO2 (tpy)	PM10 (tpy)
231,564	139,443	865,780	270,283	103,908
33.55	18.90	201.45	6.80	99.46
0.0145%	0.0136%	0.0233%	0.0025%	0.0957%

AQCR Inventory -1999
2021 Proposed Action Emissions
Proposed Action %

NOx (tpy)	VOC (tpy)	CO (tpy)	SO2 (tpy)	PM10 (tpy)
231,564	139,443	865,780	270,283	103,908
35.52	20.18	217.99	7.34	106.85
0.0153%	0.0145%	0.0252%	0.0027%	0.1028%

AQCR Inventory -1999
2022 Proposed Action Emissions
Proposed Action %

NOx (tpy)	VOC (tpy)	CO (tpy)	SO2 (tpy)	PM10 (tpy)
231,564	139,443	865,780	270,283	103,908
37.49	21.46	234.52	7.88	114.24
0.0162%	0.0154%	0.0271%	0.0029%	0.1099%

AQCR Inventory -1999
2023 Proposed Action Emissions
Proposed Action %

NOx (tpy)	VOC (tpy)	CO (tpy)	SO2 (tpy)	PM10 (tpy)
231,564	139,443	865,780	270,283	103,908
39.45	22.74	251.05	8.41	121.63
0.0170%	0.0163%	0.0290%	0.0031%	0.1171%

Air Quality Emission Calculations

AQCR Inventory -1999
 2024 Proposed Action Emissions
 Proposed Action %

NOx (tpy)	VOC (tpy)	CO (tpy)	SO2 (tpy)	PM10 (tpy)
231,564	139,443	865,780	270,283	103,908
41.42	24.03	267.58	8.95	129.02
0.0179%	0.0172%	0.0309%	0.0033%	0.1242%

AQCR Inventory -1999
 2025 Proposed Action Emissions
 Proposed Action %

NOx (tpy)	VOC (tpy)	CO (tpy)	SO2 (tpy)	PM10 (tpy)
231,564	139,443	865,780	270,283	103,908
43.39	25.31	284.12	9.49	136.41
0.0187%	0.0181%	0.0328%	0.0035%	0.1313%

AQCR Inventory -1999
 2026 Proposed Action Emissions
 Proposed Action %

NOx (tpy)	VOC (tpy)	CO (tpy)	SO2 (tpy)	PM10 (tpy)
231,564	139,443	865,780	270,283	103,908
45.36	26.59	300.65	10.03	143.80
0.0196%	0.0191%	0.0347%	0.0037%	0.1384%

AQCR Inventory -1999
 2027 Proposed Action Emissions
 Proposed Action %

NOx (tpy)	VOC (tpy)	CO (tpy)	SO2 (tpy)	PM10 (tpy)
231,564	139,443	865,780	270,283	103,908
46.41	27.73	316.98	10.50	144.90
0.0200%	0.0199%	0.0366%	0.0039%	0.1395%

Air Quality Emission Calculations

Construct TAMUS at Killeen, TX (2008)

Construction Combustion Emissions

Includes:

100% of Construct TAMUS Facilities	130,680 ft ²	3 ac
100% of Construct TAMUS Pavements	87,120 ft ²	2 ac
100% of Other Grading Disturbance (Utilities, Ball Fields, etc.)	479,160 ft ²	11 ac

Construction Site Air Emissions

Combustion Emissions of ROG, NOx, SO₂, CO and PM₁₀ Due to Construction

User Inputs:

Total Building Area:	130,680	ft ²	(1)
Total Paved Area:	87,120	ft ²	(2)
Total Disturbed Area:	16.00	acres	(1-3)
Construction Duration:	1.0	years	(assumed)
Annual Construction Activity:	230	days/yr	(assumed)

Results:[Average per Year Over the Construction Period]

	ROG	NOx	SO ₂	CO	PM ₁₀
Emissions, lbs/day	76.85	253.90	12.67	218.63	21.21
Emissions, tons/yr	8.84	29.20	1.46	25.14	2.44

Air Quality Emission Calculations

Calculation of Unmitigated Emissions

Summary of Input Parameters

	ROG	NOx	SO2	CO	PM10
Total new acres disturbed:	16.00	16.00	16.00	16.00	16.00
Total new acres paved:	2.00	2.00	2.00	2.00	2.00
Total new building space, ft ² :	130,680	130,680	130,680	130,680	130,680
Total years:	1.00	1.00	1.00	1.00	1.00
Area graded, acres in 1 yr:	16.00	16.00	16.00	16.00	16.00
Area paved, acres in 1 yr:	2.00	2.00	2.00	2.00	2.00
Building space, ft ² in 1 yr:	130,680	130,680	130,680	130,680	130,680

Annual Emissions by Source (lbs/day)

	ROG	NOx	SO2	CO	PM10
Grading Equipment	4.0	25.6	1.7	5.5	4.5
Asphalt Paving	0.5	0.0	0.0	0.0	0.0
Stationary Equipment	22.0	17.9	1.2	3.9	1.0
Mobile Equipment	20.9	210.4	9.8	209.2	15.7
Architectural Coatings (Non-Res)	29.5	0.0	0.0	0.0	0.0
Total Emissions (lbs/day):	76.8	253.9	12.7	218.6	21.2

Emission Factors

Reference: Air Quality Thresholds of Significance, SMAQMD, 1994.

Source	SMAQMD Emission Factor				
	ROG	NOx	SO2 *	CO *	PM10
Grading Equipment	2.50E-01 lbs/acre/day	1.60E+00 lbs/acre/day	0.11 lbs/acre/day	0.35 lbs/acre/day	2.80E-01 lbs/acre/day
Asphalt Paving	2.62E-01 lbs/acre/day	NA	NA	NA	NA
Stationary Equipment	1.68E-04 lbs/day/ft ²	1.37E-04 lbs/day/ft ²	9.11E-06 lbs/day/ft ²	2.97E-05 lbs/day/ft ²	8.00E-06 lbs/day/ft ²
Mobile Equipment	1.60E-04 lbs/day/ft ²	1.61E-03 lbs/day/ft ²	7.48E-05 lbs/day/ft ²	0.0016 lbs/day/ft ²	1.20E-04 lbs/day/ft ²
Architectural Coatings (Non-Res)	8.15E-02 lbs/day/ft	NA	NA	NA	NA

* Factors for grading equipment and stationary equipment are calculated from AP-42 for diesel engines using ratios with the NOx factors. Factors for mobile equipment are calculated from ratios with Mobile5a 2001 NOx emission factors for heavy duty trucks for each site.

Air Quality Emission Calculations

Construct TAMUS at Kileen, TX (2008)

Construction Fugitive Dust Emissions

Calculation of PM10 Emissions Due to Site Preparation (Uncontrolled).

User Input Parameters / Assumptions

Acres graded per year:	16.00	acres/yr	(From "Combustion" worksheet)
Grading days/yr:	52.48	days/yr	(From "Grading" worksheet)
Exposed days/yr:	90	assumed days/yr	graded area is exposed
Grading Hours/day:	8	hr/day	
Soil piles area fraction:	0.10	(assumed fraction of site area covered by soil piles)	
Soil percent silt, s:	8.5	%	(mean silt content; expected range: 0.5 to 23, AP-42 Table 13.2.2-1)
Soil percent moisture, M:	85	%	(NOAA 2003 http://www.cpc.noaa.gov/products/soilmst/drought_compc)
Annual rainfall days, p:	80	days/yr	rainfall exceeds 0.01 inch/day (AP-42 Fig 13.2.2-1)
Wind speed > 12 mph %, I:	15	%	Ave. of wind speed at Austin, TX (ftp://ftp.wcc.nrcs.usda.gov/downloads)
Fraction of TSP, J:	0.5	(SCAQMD recommendation)	
Mean vehicle speed, S:	5	mi/hr	(On-site)
Dozer path width:	8	ft	
Qty construction vehicles:	1.92	vehicles	(From "Grading" worksheet)
On-site VMT/vehicle/day:	5	mi/veh/day	(Excluding bulldozer VMT during grading)
PM10 Adjustment Factor k	2.6	lb/VMT	(AP-42 Table 13.2.2-2 9/98 for PM10)
PM10 Adjustment Factor a	0.8	(dimensionless)	(AP-42 Table 13.2.2-2 9/98 for PM10)
PM10 Adjustment Factor b	0.4	(dimensionless)	(AP-42 Table 13.2.2-2 9/98 for PM10)
PM10 Adjustment Factor c	0.3	(dimensionless)	(AP-42 Table 13.2.2-2 9/98 for PM10)
Mean Vehicle Weight W	40	tons	assumed for aggregate trucks

Air Quality Emission Calculations

Emissions Due to Soil Disturbance Activities

Operation Parameters (Calculated from User Inputs)

Grading duration per acre	26.2 hr/acre	
Bulldozer mileage per acre	1 VMT/acre	(Miles traveled by bulldozer during grading)
Construction VMT per day	10 VMT/day	
Construction VMT per acre	31.5 VMT/acre	(Travel on unpaved surfaces within site)

Equations Used (Corrected for PM10)

Operation	Empirical Equation	Units	AP-42 Section (5th Edition)
Bulldozing	$0.75(s^{1.5})/(M^{1.4})$	lbs/hr	Table 11.9-18.24, Overburden
Grading	$(0.60)(0.051)s^{2.0}$	lbs/VMT	Table 11.9-18.24
Vehicle Traffic	$[k(s/12)^a (W/3)^b / (M/0.2)^c] [(365-P)/365]$	lbs/VMT	Section 13.2.2

Source: Compilation of Air Pollutant Emission Factors, Vol. I, USEPA AP-42, Section 11.9 dated 7/98 and Section 13.2 dated 9/98

Calculation of PM10 Emission Factors for Each Operation

Operation	Emission Factor (mass/ unit)	Operation Parameter	Emission Factor (lbs/ acre)
Bulldozing	0.04 lbs/hr	26.2 hr/acre	1 lbs/acre
Grading	0.77 lbs/VMT	1 VMT/acre	0.8 lbs/acre
Vehicle Traffic	0.71 lbs/VMT	31.5 VMT/acre	22.3 lbs/acre

Air Quality Emission Calculations

Emissions Due to Wind Erosion of Soil Piles and Exposed Graded Surface

Reference: Air Quality Thresholds of Significance, SCAQMD, 1994.

Soil Piles EF = $1.7(s/1.5)[(365 - H)/235](I/15)(J) = (s)(365 - H)(I)(J)/(3110.2941)$, p. A9-99.

Soil Piles EF = 5.8 lbs/day/acre covered by soil piles

Consider soil piles area fraction so that EF applies to graded area

Soil piles area fraction: 0.10 (Fraction of site area covered by soil piles)
 Soil Piles EF = 0.58 lbs/day/acres graded

Graded Surface EF = 26.4 lbs/day/acre (recommended in CEQA Manual, p. A9-93).

Calculation of Annual PM10 Emissions

Source	Emission Factor	Graded Acres/yr	Exposed days/yr	Emissions lbs/yr	Emissions tons/yr
Bulldozing	1 lbs/acre	16.00	NA	16	0.01
Grading	0.8 lbs/acre	16.00	NA	13	0.01
Vehicle Traffic	22.3 lbs/acre	16.00	NA	357	0.18
Erosion of Soil Piles	0.6 lbs/acre/day	16.00	90	835	0.42
Erosion of Graded Surface	26.4 lbs/acre/day	16.00	90	38,016	19.01
TOTAL				39,237	19.62

Soil Disturbance EF: 24.1 lbs/acre
 Wind Erosion EF: 26.98 lbs/acre/day

Back calculate to get EF: 46.7 lbs/acre/grading day

Air Quality Emission Calculations

Construct TAMUS at Kileen, TX (2008)

Construction (Grading) Schedule

Estimate of time required to grade a specified area.

Input Parameters

Construction area: 16.00 acres/yr (from "Combustion" Worksheet)
 Qty Equipment: 1.92 (calculated based on acres disturbed)

Assumptions.

Terrain is mostly flat.
 An average of 6" soil is excavated from one half of the site and backfilled to the other half of the site; no soil is hauled off-site or borrowed.
 200 hp bulldozers are used for site clearing.
 300 hp bulldozers are used for stripping, excavation, and backfill.
 Vibratory drum rollers are used for compacting.
 Stripping, Excavation, Backfill and Compaction require an average of two passes each.
 Excavation and Backfill are assumed to involve only half of the site.

Calculation of days required for one piece of equipment to grade the specified area.

Reference: Means Heavy Construction Cost Data, 6th Ed., R. S. Means, 1992.

Means Line No.	Operation	Description	Output	Units	Acres per equip-day)	equip-days per acre	Acres/yr	Equip-days per year
021 108 0550	Site Clearing	Dozer & rake, medium brush	0.6	acre/day	0.6	1.67	16.00	26.67
021 144 0300	Stripping	Topsoil & stockpiling, adverse soil	1,650	cu. yd/day	2.05	0.49	16.00	7.82
022 242 5220	Excavation	Bulk, open site, common earth, 150' haul	800	cu. yd/day	0.99	1.01	8.00	8.07
022 208 5220	Backfill	Structural, common earth, 150' haul	1,950	cu. yd/day	2.42	0.41	8.00	3.31
022 226 5020	Compaction	Vibrating roller, 6 " lifts, 3 passes	1,950	cu. yd/day	2.42	0.41	16.00	6.62
TOTAL								52.48

Calculation of days required for the indicated pieces of equipment to grade the designated acreage.

(Equip)(day)/yr: 52.48
 Qty Equipment: 1.92
 Grading days/yr: 52.48

Round to	52 grading days/yr
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Air Quality Emission Calculations

Construct TAMUS at Kileen, TX (2009 to 2012)

Construction Combustion Emissions

Includes:

100% of Construct TAMUS Facilities	76,230 ft ²	1.75 ac
100% of Construct TAMUS Pavements	87,120 ft ²	2 ac
100% of Other Grading Disturbance (Utilities, Ball Fields, etc.)	533,610 ft ²	12.25 ac

Construction Site Air Emissions

Combustion Emissions of ROG, NOx, SO₂, CO and PM₁₀ Due to Construction

User Inputs:

Total Building Area:	76,230	ft ²	(1)
Total Paved Area:	87,120	ft ²	(2)
Total Disturbed Area:	16.00	acres	(1-3)
Construction Duration:	1.0	years	(assumed)
Annual Construction Activity:	230	days/yr	(assumed)

Results:[Average per Year Over the Construction Period]

	ROG	NOx	SO ₂	CO	PM ₁₀
Emissions, lbs/day	52.03	158.77	8.10	129.84	14.24
Emissions, tons/yr	5.98	18.26	0.93	14.93	1.64

Air Quality Emission Calculations

Calculation of Unmitigated Emissions

Summary of Input Parameters

	ROG	NOx	SO2	CO	PM10
Total new acres disturbed:	16.00	16.00	16.00	16.00	16.00
Total new acres paved:	2.00	2.00	2.00	2.00	2.00
Total new building space, ft ² :	76,230	76,230	76,230	76,230	76,230
Total years:	1.00	1.00	1.00	1.00	1.00
Area graded, acres in 1 yr:	16.00	16.00	16.00	16.00	16.00
Area paved, acres in 1 yr:	2.00	2.00	2.00	2.00	2.00
Building space, ft ² in 1 yr:	76,230	76,230	76,230	76,230	76,230

Annual Emissions by Source (lbs/day)

	ROG	NOx	SO2	CO	PM10
Grading Equipment	4.0	25.6	1.7	5.5	4.5
Asphalt Paving	0.5	0.0	0.0	0.0	0.0
Stationary Equipment	12.8	10.4	0.7	2.3	0.6
Mobile Equipment	12.2	122.7	5.7	122.0	9.1
Architectural Coatings (Non-Res)	22.5	0.0	0.0	0.0	0.0
Total Emissions (lbs/day):	52.0	158.8	8.1	129.8	14.2

Emission Factors

Reference: Air Quality Thresholds of Significance, SMAQMD, 1994.

Source	SMAQMD Emission Factor				
	ROG	NOx	SO2 *	CO *	PM10
Grading Equipment	2.50E-01 lbs/acre/day	1.60E+00 lbs/acre/day	0.11 lbs/acre/day	0.35 lbs/acre/day	2.80E-01 lbs/acre/day
Asphalt Paving	2.62E-01 lbs/acre/day	NA	NA	NA	NA
Stationary Equipment	1.68E-04 lbs/day/ft ²	1.37E-04 lbs/day/ft ²	9.11E-06 lbs/day/ft ²	2.97E-05 lbs/day/ft ²	8.00E-06 lbs/day/ft ²
Mobile Equipment	1.60E-04 lbs/day/ft ²	1.61E-03 lbs/day/ft ²	7.48E-05 lbs/day/ft ²	0.0016 lbs/day/ft ²	1.20E-04 lbs/day/ft ²
Architectural Coatings (Non-Res)	8.15E-02 lbs/day/ft	NA	NA	NA	NA

* Factors for grading equipment and stationary equipment are calculated from AP-42 for diesel engines using ratios with the NOx factors. Factors for mobile equipment are calculated from ratios with Mobile5a 2001 NOx emission factors for heavy duty trucks for each site.

Construct TAMUS at Kileen, TX (2009 to 2012)**Construction Fugitive Dust Emissions**

Calculation of PM10 Emissions Due to Site Preparation (Uncontrolled).

User Input Parameters / Assumptions

Acres graded per year:	16.00	acres/yr	(From "Combustion" worksheet)
Grading days/yr:	52.48	days/yr	(From "Grading" worksheet)
Exposed days/yr:	90	assumed days/yr	graded area is exposed
Grading Hours/day:	8	hr/day	
Soil piles area fraction:	0.10	(assumed fraction of site area covered by soil piles)	
Soil percent silt, s:	8.5	%	(mean silt content; expected range: 0.5 to 23, AP-42 Table 13.2.2-1)
Soil percent moisture, M:	85	%	(NOAA 2003 http://www.cpc.noaa.gov/products/soilmst/drought_comp)
Annual rainfall days, p:	80	days/yr	rainfall exceeds 0.01 inch/day (AP-42 Fig 13.2.2-1)
Wind speed > 12 mph %, I:	15	%	Ave. of wind speed at Austin, TX (ftp://ftp.wcc.nrcs.usda.gov/download
Fraction of TSP, J:	0.5	(SCAQMD recommendation)	
Mean vehicle speed, S:	5	mi/hr	(On-site)
Dozer path width:	8	ft	
Qty construction vehicles:	1.92	vehicles	(From "Grading" worksheet)
On-site VMT/vehicle/day:	5	mi/veh/day	(Excluding bulldozer VMT during grading)
PM10 Adjustment Factor k	2.6	lb/VMT	(AP-42 Table 13.2.2-2 9/98 for PM10)
PM10 Adjustment Factor a	0.8	(dimensionless)	(AP-42 Table 13.2.2-2 9/98 for PM10)
PM10 Adjustment Factor b	0.4	(dimensionless)	(AP-42 Table 13.2.2-2 9/98 for PM10)
PM10 Adjustment Factor c	0.3	(dimensionless)	(AP-42 Table 13.2.2-2 9/98 for PM10)
Mean Vehicle Weight W	40	tons	assumed for aggregate trucks

Air Quality Emission Calculations

Emissions Due to Soil Disturbance Activities

Operation Parameters (Calculated from User Inputs)

Grading duration per acre	26.2 hr/acre	
Bulldozer mileage per acre	1 VMT/acre	(Miles traveled by bulldozer during grading)
Construction VMT per day	10 VMT/day	
Construction VMT per acre	31.5 VMT/acre	(Travel on unpaved surfaces within site)

Equations Used (Corrected for PM10)

Operation	Empirical Equation	Units	AP-42 Section (5th Edition)
Bulldozing	$0.75(s^{1.5})/(M^{1.4})$	lbs/hr	Table 11.9-18.24, Overburden
Grading	$(0.60)(0.051)s^{2.0}$	lbs/VMT	Table 11.9-18.24
Vehicle Traffic	$[k(s/12)^a (W/3)^b / (M/0.2)^c] [(365-P)/365]$	lbs/VMT	Section 13.2.2

Source: Compilation of Air Pollutant Emission Factors, Vol. I, USEPA AP-42, Section 11.9 dated 7/98 and Section 13.2 dated 9/98

Calculation of PM10 Emission Factors for Each Operation

Operation	Emission Factor (mass/ unit)	Operation Parameter	Emission Factor (lbs/ acre)
Bulldozing	0.04 lbs/hr	26.2 hr/acre	1 lbs/acre
Grading	0.77 lbs/VMT	1 VMT/acre	0.8 lbs/acre
Vehicle Traffic	0.71 lbs/VMT	31.5 VMT/acre	22.3 lbs/acre

Air Quality Emission Calculations

Emissions Due to Wind Erosion of Soil Piles and Exposed Graded Surface

Reference: Air Quality Thresholds of Significance, SCAQMD, 1994.

Soil Piles EF = $1.7(s/1.5)[(365 - H)/235](I/15)(J) = (s)(365 - H)(I)(J)/(3110.2941)$, p. A9-99.

Soil Piles EF = 5.8 lbs/day/acre covered by soil piles

Consider soil piles area fraction so that EF applies to graded area

Soil piles area fraction: 0.10 (Fraction of site area covered by soil piles)
 Soil Piles EF = 0.58 lbs/day/acres graded

Graded Surface EF = 26.4 lbs/day/acre (recommended in CEQA Manual, p. A9-93).

Calculation of Annual PM10 Emissions

Source	Emission Factor	Graded Acres/yr	Exposed days/yr	Emissions lbs/yr	Emissions tons/yr
Bulldozing	1 lbs/acre	16.00	NA	16	0.01
Grading	0.8 lbs/acre	16.00	NA	13	0.01
Vehicle Traffic	22.3 lbs/acre	16.00	NA	357	0.18
Erosion of Soil Piles	0.6 lbs/acre/day	16.00	90	835	0.42
Erosion of Graded Surface	26.4 lbs/acre/day	16.00	90	38,016	19.01
TOTAL				39,237	19.62

Soil Disturbance EF: 24.1 lbs/acre
 Wind Erosion EF: 26.98 lbs/acre/day

Back calculate to get EF: 46.7 lbs/acre/grading day

Air Quality Emission Calculations

Construct TAMUS at Kileen, TX (2009 to 2012)

Construction (Grading) Schedule

Estimate of time required to grade a specified area.

Input Parameters

Construction area 16.00 acres/yr (from "Combustion" Worksheet)
 Qty Equipment: 1.92 (calculated based on acres disturbed)

Assumptions.

Terrain is mostly flat.
 An average of 6" soil is excavated from one half of the site and backfilled to the other half of the site; no soil is hauled off-site or borrowed.
 200 hp bulldozers are used for site clearing.
 300 hp bulldozers are used for stripping, excavation, and backfill.
 Vibratory drum rollers are used for compacting.
 Stripping, Excavation, Backfill and Compaction require an average of two passes each.
 Excavation and Backfill are assumed to involve only half of the site.

Calculation of days required for one piece of equipment to grade the specified area.

Reference: Means Heavy Construction Cost Data, 6th Ed., R. S. Means, 1992.

Means Line No.	Operation	Description	Output	Units	Acres per equip-day)	equip-days per acre	Acres/yr	Equip-days per year
021 108 0550	Site Clearing	Dozer & rake, medium brush	0.6	acre/day	0.6	1.67	16.00	26.67
021 144 0300	Stripping	Topsoil & stockpiling, adverse soil	1,650	cu. yd/day	2.05	0.49	16.00	7.82
022 242 5220	Excavation	Bulk, open site, common earth, 150' haul	800	cu. yd/day	0.99	1.01	8.00	8.07
022 208 5220	Backfill	Structural, common earth, 150' haul	1,950	cu. yd/day	2.42	0.41	8.00	3.31
022 226 5020	Compaction	Vibrating roller, 6 " lifts, 3 passes	1,950	cu. yd/day	2.42	0.41	16.00	6.62
TOTAL								52.48

Calculation of days required for the indicated pieces of equipment to grade the designated acreage.

(Equip)(day)/yr: 52.48
 Qty Equipment: 1.92
 Grading days/yr: 52.48

Round to 52 grading days/yr
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Air Quality Emission Calculations

Construct TAMUS at Killeen, TX (2013 to 2026)

Construction Combustion Emissions

Includes:

100% of Construct TAMUS Facilities	43,560 ft2	1 ac
100% of Construct TAMUS Pavements	87,120 ft2	2 ac
100% of Other Grading Disturbance (Utilities, Ball Fields, etc.)	304,920 ft2	7 ac

Construction Site Air Emissions

Combustion Emissions of ROG, NOx, SO2, CO and PM10 Due to Construction

User Inputs:

Total Building Area:	43,560	ft ²	(1)
Total Paved Area:	87,120	ft ²	(2)
Total Disturbed Area:	10.00	acres	(1-3)
Construction Duration:	1.0	years	(assumed)
Annual Construction Activity:	230	days/yr	(assumed)

Results:[Average per Year Over the Construction Period]

	ROG	NOx	SO2	CO	PM10
Emissions, lbs/day	34.32	92.10	4.72	74.49	8.38
Emissions, tons/yr	3.95	10.59	0.54	8.57	0.96

Air Quality Emission Calculations

Calculation of Unmitigated Emissions

Summary of Input Parameters

	ROG	NOx	SO2	CO	PM10
Total new acres disturbed:	10.00	10.00	10.00	10.00	10.00
Total new acres paved:	2.00	2.00	2.00	2.00	2.00
Total new building space, ft ² :	43,560	43,560	43,560	43,560	43,560
Total years:	1.00	1.00	1.00	1.00	1.00
Area graded, acres in 1 yr:	10.00	10.00	10.00	10.00	10.00
Area paved, acres in 1 yr:	2.00	2.00	2.00	2.00	2.00
Building space, ft ² in 1 yr:	43,560	43,560	43,560	43,560	43,560

Annual Emissions by Source (lbs/day)

	ROG	NOx	SO2	CO	PM10
Grading Equipment	2.5	16.0	1.1	3.5	2.8
Asphalt Paving	0.5	0.0	0.0	0.0	0.0
Stationary Equipment	7.3	6.0	0.4	1.3	0.3
Mobile Equipment	7.0	70.1	3.3	69.7	5.2
Architectural Coatings (Non-Res)	17.0	0.0	0.0	0.0	0.0
Total Emissions (lbs/day):	34.3	92.1	4.7	74.5	8.4

Emission Factors

Reference: Air Quality Thresholds of Significance, SMAQMD, 1994.

Source	SMAQMD Emission Factor				
	ROG	NOx	SO2 *	CO *	PM10
Grading Equipment	2.50E-01 lbs/acre/day	1.60E+00 lbs/acre/day	0.11 lbs/acre/day	0.35 lbs/acre/day	2.80E-01 lbs/acre/day
Asphalt Paving	2.62E-01 lbs/acre/day	NA	NA	NA	NA
Stationary Equipment	1.68E-04 lbs/day/ft ²	1.37E-04 lbs/day/ft ²	9.11E-06 lbs/day/ft ²	2.97E-05 lbs/day/ft ²	8.00E-06 lbs/day/ft ²
Mobile Equipment	1.60E-04 lbs/day/ft ²	1.61E-03 lbs/day/ft ²	7.48E-05 lbs/day/ft ²	0.0016 lbs/day/ft ²	1.20E-04 lbs/day/ft ²
Architectural Coatings (Non-Res)	8.15E-02 lbs/day/ft	NA	NA	NA	NA

* Factors for grading equipment and stationary equipment are calculated from AP-42 for diesel engines using ratios with the NOx factors. Factors for mobile equipment are calculated from ratios with Mobile5a 2001 NOx emission factors for heavy duty trucks for each site.

Construct TAMUS at Kileen, TX (2013 to 2026)**Construction Fugitive Dust Emissions**

Calculation of PM10 Emissions Due to Site Preparation (Uncontrolled).

User Input Parameters / Assumptions

Acres graded per year:	10.00	acres/yr	(From "Combustion" worksheet)
Grading days/yr:	32.80	days/yr	(From "Grading" worksheet)
Exposed days/yr:	90	assumed days/yr	graded area is exposed
Grading Hours/day:	8	hr/day	
Soil piles area fraction:	0.10	(assumed fraction of site area covered by soil piles)	
Soil percent silt, s:	8.5	%	(mean silt content; expected range: 0.5 to 23, AP-42 Table 13.2.2-1)
Soil percent moisture, M:	85	%	(NOAA 2003 http://www.cpc.noaa.gov/products/soilmst/drought_comp)
Annual rainfall days, p:	80	days/yr	rainfall exceeds 0.01 inch/day (AP-42 Fig 13.2.2-1)
Wind speed > 12 mph %, I:	15	%	Ave. of wind speed at Austin, TX (ftp://ftp.wcc.nrcs.usda.gov/download
Fraction of TSP, J:	0.5	(SCAQMD recommendation)	
Mean vehicle speed, S:	5	mi/hr	(On-site)
Dozer path width:	8	ft	
Qty construction vehicles:	1.92	vehicles	(From "Grading" worksheet)
On-site VMT/vehicle/day:	5	mi/veh/day	(Excluding bulldozer VMT during grading)
PM10 Adjustment Factor k	2.6	lb/VMT	(AP-42 Table 13.2.2-2 9/98 for PM10)
PM10 Adjustment Factor a	0.8	(dimensionless)	(AP-42 Table 13.2.2-2 9/98 for PM10)
PM10 Adjustment Factor b	0.4	(dimensionless)	(AP-42 Table 13.2.2-2 9/98 for PM10)
PM10 Adjustment Factor c	0.3	(dimensionless)	(AP-42 Table 13.2.2-2 9/98 for PM10)
Mean Vehicle Weight W	40	tons	assumed for aggregate trucks

Air Quality Emission Calculations

Emissions Due to Soil Disturbance Activities

Operation Parameters (Calculated from User Inputs)

Grading duration per acre	26.2 hr/acre	
Bulldozer mileage per acre	1 VMT/acre	(Miles traveled by bulldozer during grading)
Construction VMT per day	10 VMT/day	
Construction VMT per acre	31.5 VMT/acre	(Travel on unpaved surfaces within site)

Equations Used (Corrected for PM10)

Operation	Empirical Equation	Units	AP-42 Section (5th Edition)
Bulldozing	$0.75(s^{1.5})/(M^{1.4})$	lbs/hr	Table 11.9-18.24, Overburden
Grading	$(0.60)(0.051)s^{2.0}$	lbs/VMT	Table 11.9-18.24
Vehicle Traffic	$[k(s/12)^a (W/3)^b / (M/0.2)^c] [(365-P)/365]$	lbs/VMT	Section 13.2.2

Source: Compilation of Air Pollutant Emission Factors, Vol. I, USEPA AP-42, Section 11.9 dated 7/98 and Section 13.2 dated 9/98

Calculation of PM10 Emission Factors for Each Operation

Operation	Emission Factor (mass/ unit)	Operation Parameter	Emission Factor (lbs/ acre)
Bulldozing	0.04 lbs/hr	26.2 hr/acre	1 lbs/acre
Grading	0.77 lbs/VMT	1 VMT/acre	0.8 lbs/acre
Vehicle Traffic	0.71 lbs/VMT	31.5 VMT/acre	22.3 lbs/acre

Air Quality Emission Calculations

Emissions Due to Wind Erosion of Soil Piles and Exposed Graded Surface

Reference: Air Quality Thresholds of Significance, SCAQMD, 1994.

Soil Piles EF = $1.7(s/1.5)[(365 - H)/235](I/15)(J) = (s)(365 - H)(I)(J)/(3110.2941)$, p. A9-99.

Soil Piles EF = 5.8 lbs/day/acre covered by soil piles

Consider soil piles area fraction so that EF applies to graded area

Soil piles area fraction: 0.10 (Fraction of site area covered by soil piles)
 Soil Piles EF = 0.58 lbs/day/acres graded

Graded Surface EF = 26.4 lbs/day/acre (recommended in CEQA Manual, p. A9-93).

Calculation of Annual PM10 Emissions

Source	Emission Factor	Graded Acres/yr	Exposed days/yr	Emissions lbs/yr	Emissions tons/yr
Bulldozing	1 lbs/acre	10.00	NA	10	0.01
Grading	0.8 lbs/acre	10.00	NA	8	0.00
Vehicle Traffic	22.3 lbs/acre	10.00	NA	223	0.11
Erosion of Soil Piles	0.6 lbs/acre/day	10.00	90	522	0.26
Erosion of Graded Surface	26.4 lbs/acre/day	10.00	90	23,760	11.88
TOTAL				24,523	12.26

Soil Disturbance EF: 24.1 lbs/acre
 Wind Erosion EF: 26.98 lbs/acre/day

Back calculate to get EF: 74.8 lbs/acre/grading day

Air Quality Emission Calculations

Construct TAMUS at Kileen, TX (2013 to 2026)

Construction (Grading) Schedule

Estimate of time required to grade a specified area.

Input Parameters

Construction area 10.00 acres/yr (from "Combustion" Worksheet)
 Qty Equipment: 1.20 (calculated based on acres disturbed)

Assumptions.

Terrain is mostly flat.
 An average of 6" soil is excavated from one half of the site and backfilled to the other half of the site; no soil is hauled off-site or borrowed.
 200 hp bulldozers are used for site clearing.
 300 hp bulldozers are used for stripping, excavation, and backfill.
 Vibratory drum rollers are used for compacting.
 Stripping, Excavation, Backfill and Compaction require an average of two passes each.
 Excavation and Backfill are assumed to involve only half of the site.

Calculation of days required for one piece of equipment to grade the specified area.

Reference: Means Heavy Construction Cost Data, 6th Ed., R. S. Means, 1992.

Means Line No.	Operation	Description	Output	Units	Acres per equip-day)	equip-days per acre	Acres/yr	Equip-days per year
021 108 0550	Site Clearing	Dozer & rake, medium brush	0.6	acre/day	0.6	1.67	10.00	16.67
021 144 0300	Stripping	Topsoil & stockpiling, adverse soil	1,650	cu. yd/day	2.05	0.49	10.00	4.89
022 242 5220	Excavation	Bulk, open site, common earth, 150' haul	800	cu. yd/day	0.99	1.01	5.00	5.04
022 208 5220	Backfill	Structural, common earth, 150' haul	1,950	cu. yd/day	2.42	0.41	5.00	2.07
022 226 5020	Compaction	Vibrating roller, 6 " lifts, 3 passes	1,950	cu. yd/day	2.42	0.41	10.00	4.14
TOTAL								32.80

Calculation of days required for the indicated pieces of equipment to grade the designated acreage.

(Equip)(day)/yr: 32.80
 Qty Equipment: 1.20
 Grading days/yr: 32.80

Round to 33 grading days/yr
--

Air Quality Emission Calculations

Construct TAMUS at Killeen, TX (2027)

Construction Combustion Emissions

Includes:

100% of Construct TAMUS Facilities	43,560 ft ²	1 ac
100% of Construct TAMUS Pavements	87,120 ft ²	2 ac
100% of Other Grading Disturbance (Utilities, Ball Fields, etc.)	87,120 ft ²	2 ac

Construction Site Air Emissions

Combustion Emissions of ROG, NOx, SO₂, CO and PM₁₀ Due to Construction

User Inputs:

Total Building Area:	43,560	ft ²	(1)
Total Paved Area:	87,120	ft ²	(2)
Total Disturbed Area:	5.00	acres	(1-3)
Construction Duration:	1.0	years	(assumed)
Annual Construction Activity:	230	days/yr	(assumed)

Results:[Average per Year Over the Construction Period]

	ROG	NOx	SO ₂	CO	PM ₁₀
Emissions, lbs/day	33.07	84.10	4.19	72.76	6.98
Emissions, tons/yr	3.80	9.67	0.48	8.37	0.80

Air Quality Emission Calculations

Calculation of Unmitigated Emissions

Summary of Input Parameters

	ROG	NOx	SO2	CO	PM10
Total new acres disturbed:	5.00	5.00	5.00	5.00	5.00
Total new acres paved:	2.00	2.00	2.00	2.00	2.00
Total new building space, ft ² :	43,560	43,560	43,560	43,560	43,560
Total years:	1.00	1.00	1.00	1.00	1.00
Area graded, acres in 1 yr:	5.00	5.00	5.00	5.00	5.00
Area paved, acres in 1 yr:	2.00	2.00	2.00	2.00	2.00
Building space, ft ² in 1 yr:	43,560	43,560	43,560	43,560	43,560

Annual Emissions by Source (lbs/day)

	ROG	NOx	SO2	CO	PM10
Grading Equipment	1.3	8.0	0.5	1.7	1.4
Asphalt Paving	0.5	0.0	0.0	0.0	0.0
Stationary Equipment	7.3	6.0	0.4	1.3	0.3
Mobile Equipment	7.0	70.1	3.3	69.7	5.2
Architectural Coatings (Non-Res)	17.0	0.0	0.0	0.0	0.0
Total Emissions (lbs/day):	33.1	84.1	4.2	72.8	7.0

Emission Factors

Reference: Air Quality Thresholds of Significance, SMAQMD, 1994.

Source	SMAQMD Emission Factor				
	ROG	NOx	SO2 *	CO *	PM10
Grading Equipment	2.50E-01 lbs/acre/day	1.60E+00 lbs/acre/day	0.11 lbs/acre/day	0.35 lbs/acre/day	2.80E-01 lbs/acre/day
Asphalt Paving	2.62E-01 lbs/acre/day	NA	NA	NA	NA
Stationary Equipment	1.68E-04 lbs/day/ft ²	1.37E-04 lbs/day/ft ²	9.11E-06 lbs/day/ft ²	2.97E-05 lbs/day/ft ²	8.00E-06 lbs/day/ft ²
Mobile Equipment	1.60E-04 lbs/day/ft ²	1.61E-03 lbs/day/ft ²	7.48E-05 lbs/day/ft ²	0.0016 lbs/day/ft ²	1.20E-04 lbs/day/ft ²
Architectural Coatings (Non-Res)	8.15E-02 lbs/day/ft	NA	NA	NA	NA

* Factors for grading equipment and stationary equipment are calculated from AP-42 for diesel engines using ratios with the NOx factors. Factors for mobile equipment are calculated from ratios with Mobile5a 2001 NOx emission factors for heavy duty trucks for each site.

Air Quality Emission Calculations

Construct TAMUS at Kileen, TX (2027)

Construction Fugitive Dust Emissions

Calculation of PM10 Emissions Due to Site Preparation (Uncontrolled).

User Input Parameters / Assumptions

Acres graded per year:	5.00	acres/yr	(From "Combustion" worksheet)
Grading days/yr:	16.40	days/yr	(From "Grading" worksheet)
Exposed days/yr:	90	assumed days/yr	graded area is exposed
Grading Hours/day:	8	hr/day	
Soil piles area fraction:	0.10	(assumed fraction of site area covered by soil piles)	
Soil percent silt, s:	8.5	%	(mean silt content; expected range: 0.5 to 23, AP-42 Table 13.2.2-1)
Soil percent moisture, M:	85	%	(NOAA 2003 http://www.cpc.noaa.gov/products/soilmst/drought_comp)
Annual rainfall days, p:	80	days/yr	rainfall exceeds 0.01 inch/day (AP-42 Fig 13.2.2-1)
Wind speed > 12 mph %, I:	15	%	Ave. of wind speed at Austin, TX (ftp://ftp.wcc.nrcs.usda.gov/download
Fraction of TSP, J:	0.5	(SCAQMD recommendation)	
Mean vehicle speed, S:	5	mi/hr	(On-site)
Dozer path width:	8	ft	
Qty construction vehicles:	1.92	vehicles	(From "Grading" worksheet)
On-site VMT/vehicle/day:	5	mi/veh/day	(Excluding bulldozer VMT during grading)
PM10 Adjustment Factor k	2.6	lb/VMT	(AP-42 Table 13.2.2-2 9/98 for PM10)
PM10 Adjustment Factor a	0.8	(dimensionless)	(AP-42 Table 13.2.2-2 9/98 for PM10)
PM10 Adjustment Factor b	0.4	(dimensionless)	(AP-42 Table 13.2.2-2 9/98 for PM10)
PM10 Adjustment Factor c	0.3	(dimensionless)	(AP-42 Table 13.2.2-2 9/98 for PM10)
Mean Vehicle Weight W	40	tons	assumed for aggregate trucks

Air Quality Emission Calculations

Emissions Due to Soil Disturbance Activities

Operation Parameters (Calculated from User Inputs)

Grading duration per acre	26.2 hr/acre	
Bulldozer mileage per acre	1 VMT/acre	(Miles traveled by bulldozer during grading)
Construction VMT per day	10 VMT/day	
Construction VMT per acre	31.5 VMT/acre	(Travel on unpaved surfaces within site)

Equations Used (Corrected for PM10)

Operation	Empirical Equation	Units	AP-42 Section (5th Edition)
Bulldozing	$0.75(s^{1.5})/(M^{1.4})$	lbs/hr	Table 11.9-18.24, Overburden
Grading	$(0.60)(0.051)s^{2.0}$	lbs/VMT	Table 11.9-18.24
Vehicle Traffic	$[k(s/12)^a (W/3)^b / (M/0.2)^c] [(365-P)/365]$	lbs/VMT	Section 13.2.2

Source: Compilation of Air Pollutant Emission Factors, Vol. I, USEPA AP-42, Section 11.9 dated 7/98 and Section 13.2 dated 9/98

Calculation of PM10 Emission Factors for Each Operation

Operation	Emission Factor (mass/ unit)	Operation Parameter	Emission Factor (lbs/ acre)
Bulldozing	0.04 lbs/hr	26.2 hr/acre	1 lbs/acre
Grading	0.77 lbs/VMT	1 VMT/acre	0.8 lbs/acre
Vehicle Traffic	0.71 lbs/VMT	31.5 VMT/acre	22.3 lbs/acre

Air Quality Emission Calculations

Emissions Due to Wind Erosion of Soil Piles and Exposed Graded Surface

Reference: Air Quality Thresholds of Significance, SCAQMD, 1994.

Soil Piles EF = $1.7(s/1.5)[(365 - H)/235](I/15)(J) = (s)(365 - H)(I)(J)/(3110.2941)$, p. A9-99.

Soil Piles EF = 5.8 lbs/day/acre covered by soil piles

Consider soil piles area fraction so that EF applies to graded area

Soil piles area fraction: 0.10 (Fraction of site area covered by soil piles)
 Soil Piles EF = 0.58 lbs/day/acres graded

Graded Surface EF = 26.4 lbs/day/acre (recommended in CEQA Manual, p. A9-93).

Calculation of Annual PM10 Emissions

Source	Emission Factor	Graded Acres/yr	Exposed days/yr	Emissions lbs/yr	Emissions tons/yr
Bulldozing	1 lbs/acre	5.00	NA	5	0.00
Grading	0.8 lbs/acre	5.00	NA	4	0.00
Vehicle Traffic	22.3 lbs/acre	5.00	NA	112	0.06
Erosion of Soil Piles	0.6 lbs/acre/day	5.00	90	261	0.13
Erosion of Graded Surface	26.4 lbs/acre/day	5.00	90	11,880	5.94
TOTAL				12,262	6.13

Soil Disturbance EF: 24.1 lbs/acre
 Wind Erosion EF: 26.98 lbs/acre/day

Back calculate to get EF: 149.5 lbs/acre/grading day

Air Quality Emission Calculations

Construct TAMUS at Kileen, TX (2027)

Construction (Grading) Schedule

Estimate of time required to grade a specified area.

Input Parameters

Construction area 5.00 acres/yr (from "Combustion" Worksheet)
 Qty Equipment: 0.60 (calculated based on acres disturbed)

Assumptions.

Terrain is mostly flat.
 An average of 6" soil is excavated from one half of the site and backfilled to the other half of the site; no soil is hauled off-site or borrowed.
 200 hp bulldozers are used for site clearing.
 300 hp bulldozers are used for stripping, excavation, and backfill.
 Vibratory drum rollers are used for compacting.
 Stripping, Excavation, Backfill and Compaction require an average of two passes each.
 Excavation and Backfill are assumed to involve only half of the site.

Calculation of days required for one piece of equipment to grade the specified area.

Reference: Means Heavy Construction Cost Data, 6th Ed., R. S. Means, 1992.

Means Line No.	Operation	Description	Output	Units	Acres per equip-day)	equip-days per acre	Acres/yr	Equip-days per year
021 108 0550	Site Clearing	Dozer & rake, medium brush	0.6	acre/day	0.6	1.67	5.00	8.33
021 144 0300	Stripping	Topsoil & stockpiling, adverse soil	1,650	cu. yd/day	2.05	0.49	5.00	2.44
022 242 5220	Excavation	Bulk, open site, common earth, 150' haul	800	cu. yd/day	0.99	1.01	2.50	2.52
022 208 5220	Backfill	Structural, common earth, 150' haul	1,950	cu. yd/day	2.42	0.41	2.50	1.03
022 226 5020	Compaction	Vibrating roller, 6 " lifts, 3 passes	1,950	cu. yd/day	2.42	0.41	5.00	2.07
TOTAL								16.40

Calculation of days required for the indicated pieces of equipment to grade the designated acreage.

(Equip)(day)/yr: 16.40
 Qty Equipment: 0.60
 Grading days/yr: 16.40

Round to 16 grading days/yr
--

Air Quality Emission Calculations

**Privately-Owned Vehicle Emissions
Construct TAMUS at Killeen, TX**

Year	People On Campus Per Day	Vehicles On Campus Per Day
2008	0	0
2009	0	0
2010	0	0
2011	0	0
2012	0	0
2013	5,000	3,571
2014	6,071	4,337
2015	7,143	5,102
2016	8,214	5,867
2017	9,286	6,633
2018	10,357	7,398
2019	11,429	8,163
2020	12,500	8,929
2021	13,571	9,694
2022	14,643	10,459
2023	15,714	11,224
2024	16,786	11,990
2025	17,857	12,755
2026	18,929	13,520
2027	20,000	14,286

1.4 riders per vehicle
40 miles ave commute round trip
180 school days per year

POV Vehicle Mix

Light-duty gasoline vehicles (passenger cars)
Light-duty gasoline trucks (SUVs, pickups GVW <6000 lb)
Light-duty gasoline trucks (GVW 6000-8500 lbs)
Heavy-duty gasoline trucks (GVW > 8500 lbs)
Light-duty diesel vehicles (passenger cars)
Light-duty diesel trucks (SUVs, pickups GVW <8500 lb)
Heavy-duty diesel trucks (GVW > 8500 lbs)
Motorcycles

Assumed

POV
VMT %

POV
Avg Age

LDGV	46%	5
LDGT1	25%	6
LDGT2	20%	5
HDGV	0%	
LDDV	3%	6
LDDT	5%	5
HDDV	0%	
MC	1%	5

100%

Air Quality Emission Calculations

Data:

Emission factors are taken from the U.S. EPA MOBIL5 emissions model, as compiled and published in "Air Emissions Inventory Guidance Document for Mobile Sources and Air Force Installations" Air Force Institute for Environmental Safety and Occupational Health Risk Analysis (AFIERA), July 2001.

All vehicle emissions are calculated from 2010 emission factors.

Note that PM emission factors include both exhaust and "fugitive" emissions (paved road, brake & tire dust, etc.).

Emission Factors

Emission Factors in g/mi from MOBILE5 Tables based on vehicle age in the year of interest.

	POV Low Altitude g/mi - 2010				
	NOx	VOC	CO	SO2	PM10
LDGV	0.2	0.2	2.6	0.072	0.71
LDGT1	0.3	0.2	2.9	0.096	1.08
LDGT2	0.4	0.2	3.5	0.098	2.58
HDGV	0.0	0.0	0.0	0.154	5.51
LDDV	0.9	0.3	1.2	0.116	0.80
LDDT	1.0	0.4	1.3	0.157	1.59
HDDV	0.0	0.0	0.0	0.512	7.73
MC	0.0	0.0	0.0	0.032	0.08

Reference: Tables 4-2 through 4-53, (AF IERA, July 2001)

Air Quality Emission Calculations

Average Factor Weighting Worksheet - adjusting for VMT weighting by vehicle class

	POV Low Altitude g/mi - 2010				
	NOx	VOC	CO	SO2	PM10
LDGV	0.092	0.092	1.196	0.033	0.327
LDGT1	0.075	0.050	0.725	0.024	0.270
LDGT2	0.080	0.040	0.700	0.020	0.516
HDGV	0.000	0.000	0.000	0.000	0.000
LDDV	0.027	0.009	0.036	0.003	0.024
LDDT	0.050	0.020	0.065	0.008	0.080
HDDV	0.000	0.000	0.000	0.000	0.000
MC	0.000	0.000	0.000	0.000	0.001
Factors:	0.32	0.21	2.72	0.09	1.22

POV Emissions By Calendar Year for Proposed Action

Year	NOx (tpy)	VOC (tpy)	CO (tpy)	SO2 (tpy)	PM10 (tpy)
2008	0.00	0.00	0.00	0.00	0.00
2009	0.00	0.00	0.00	0.00	0.00
2010	0.00	0.00	0.00	0.00	0.00
2011	0.00	0.00	0.00	0.00	0.00
2012	0.00	0.00	0.00	0.00	0.00
2013	9.18	5.98	77.15	2.50	34.49
2014	11.15	7.26	93.69	3.04	41.88
2015	13.12	8.54	110.22	3.58	49.28
2016	15.09	9.83	126.75	4.12	56.67
2017	17.06	11.11	143.29	4.65	64.06
2018	19.02	12.39	159.82	5.19	71.45
2019	20.99	13.67	176.35	5.73	78.84
2020	22.96	14.95	192.89	6.26	86.23
2021	24.93	16.23	209.42	6.80	93.62
2022	26.90	17.51	225.95	7.34	101.01
2023	28.86	18.80	242.48	7.87	108.41
2024	30.83	20.08	259.02	8.41	115.80
2025	32.80	21.36	275.55	8.95	123.19
2026	34.77	22.64	292.08	9.48	130.58
2027	36.73	23.92	308.62	10.02	137.97

Example Calculation: CY2013 NOx Estimate

$$(5000 \text{ commuters}/1.4 \text{ riders per vehicle}) * (180 \text{ school days}) * (40 \text{ miles/day}) * (1.132 \text{ g/mi}) / (453.6 \text{ g/lb}) = 35.91 \text{ tons NOx}$$

Air Quality Emission Calculations

AUSTIN-WACO INTRASTATE AQCR
Construct TAMUS at Killeen, TX (2027)

STATE	COUNTY	NOx (tpy)		VOC (tpy)		CO (tpy)		SO2 (tpy)		PM10 (tpy)	
		AREA SOURCES	POINT SOURCES								
TX	Bastrop Co	2,309	2,343	2,585	121	15,407	262	133	6	1,864	83
TX	Bell Co	9,559	280	11,812	1,121	69,343	7,391	596	543	6,042	99
TX	Blanco Co	509	0	766	0	5,804	0	25	0	882	0
TX	Bosque Co	1,441	749	1,372	5	8,015	309	88	507	1,673	357
TX	Brazos Co	4,760	1,113	7,435	46	44,703	565	328	10	4,142	79
TX	Burleson Co	1,509	358	1,653	73	7,446	362	95	0	2,312	< 1
TX	Burnet Co	1,420	0	2,390	0	15,544	0	78	0	1,985	0
TX	Caldwell Co	2,030	1,083	2,868	57	10,981	145	120	723	1,477	< 1
TX	Coryell Co	1,873	0	2,833	35	15,618	0	135	0	2,903	4
TX	Falls Co	1,690	0	1,345	0	7,197	0	110	0	3,698	0
TX	Fayette Co	2,870	21,170	2,911	440	14,184	2,840	155	33,232	2,486	1,173
TX	Freestone Co	2,083	13,081	2,550	277	12,712	876	159	84,179	1,625	798
TX	Grimes Co	1,684	5,678	1,606	143	9,861	593	104	12,120	1,775	305
TX	Hamilton Co	440	0	686	0	3,874	0	34	0	1,897	0
TX	Hays Co	4,801	2,459	5,189	120	35,375	3,403	276	1,704	2,394	467
TX	Hill Co	3,721	0	3,176	93	19,453	0	208	0	2,744	16
TX	Lampasas Co	1,207	0	970	0	5,924	0	78	0	1,209	0
TX	Lee Co	975	785	1,419	182	6,228	676	66	0	1,638	1
TX	Leon Co	2,277	2	2,517	3	13,859	11	109	1,080	2,523	< 1
TX	Limestone Co	853	25,223	1,895	290	6,473	2,003	65	32,869	1,560	667
TX	Llano Co	350	1,187	1,221	36	7,224	149	20	4	1,170	47
TX	Madison Co	1,212	138	1,244	21	9,523	106	58	0	1,307	5
TX	McLennan Co	10,069	18,533	13,267	278	83,553	2,821	574	1,073	5,992	520
TX	Milam Co	2,074	28,806	2,182	1,636	9,526	22,237	137	89,243	3,086	2,237
TX	Mills Co	571	0	578	0	4,253	0	34	0	1,287	0
TX	Robertson Co	1,744	2,545	1,290	166	6,472	626	108	6,335	2,817	320
TX	San Saba Co	310	0	744	0	6,121	0	21	0	1,956	0
TX	Travis Co	27,235	3,337	41,353	267	271,086	1,545	1,814	238	18,883	349
TX	Washington Co	1,640	0	2,293	< 1	12,064	0	104	0	1,647	0
TX	Williamson Co	9,478	0	11,848	35	81,037	0	585	0	11,407	0
		102,694	128,870	133,998	5,445	818,860	46,920	6,417	263,866	96,381	7,527

Austin-Waco Intrastate AQCR

NOx (tpy)	VOC (tpy)	CO (tpy)	SO2 (tpy)	PM10 (tpy)
231,564	139,443	865,780	270,283	103,908

SOURCE:

<http://www.epa.gov/air/data/nettier.html>

USEPA - AirData NET Tier Report

*Net Air pollution sources (area and point) in tons per year (1999)

Site visited on March 8, 2004

APPENDIX D
Correspondence





DEPARTMENT OF THE ARMY
HEADQUARTERS, U.S. ARMY GARRISON
BUILDING 1001 ROOM W321
FORT HOOD, TEXAS 76544-5000

REPLY TO
ATTENTION OF

MAR 10 2004

Directorate of Public Works

Mr. Tom Cloud
U.S. Fish and Wildlife Service
Arlington Ecological Services Office
711 Stadium Drive East, Suite 252
Arlington, Texas 76011

Dear Mr. Cloud:

I am writing to request that the Service consult with Fort Hood regarding the proposed transfer of approximately 673 acres to Texas A&M University for a Central Texas campus. A Biological Assessment of this action has been completed and is enclosed.

As you are aware, this land tract, located at the corner of State Highway 195 and Airport Road east of the new Robert Gray Regional Airport, has potential habitat for Golden-cheeked Warbler and Black-capped Vireo. However, we have worked closely with Texas A&M to develop a building plan that minimizes the impact of campus construction on habitat. For example, construction has been clustered on the north and eastern portions of the tract in order to avoid fragmentation of warbler habitat, and the majority of the habitat on the tract will be retained as green space with foot traffic only.

I respectfully request the formal consultation process begin with your review of this Biological Assessment followed ultimately by your Biological Opinion on this action. For further information, please contact Dennis Herbert, Fort Hood Natural Resources Branch, 254-287-2885. Thank you for your continued support.

Sincerely,

A handwritten signature in cursive script that reads "Randall J. Butler".

Randall J. Butler
Colonel, U.S. Army
Director of Public Works

Enclosure

Sent 15 July: 7001 0320 0000 0111 0844



DEPARTMENT OF THE ARMY
HEADQUARTERS, U.S. ARMY GARRISON
BUILDING 1001 ROOM W321
FORT HOOD, TEXAS 76544-5000

REPLY TO
ATTENTION OF

July 13, 2004

Environmental Programs

Mr. Lawrence Oaks
State Historic Preservation Officer
Texas Historical Commission
P. O. Box 12276
Austin, Texas 78711-2276

RE: Second Follow up for Requested information on 41BL349 within the Area of Potential Effect for the Proposed Transfer of Land from Fort Hood to the Texas A&M University System

Dear Mr. Oaks:

In your letter of May 18, 2004, your staff requested further additional information regarding the ineligibility determination of 41BL0349 located within West Fort Hood and supplemental information regarding the findings in report volume 44, the 1999 field season. That letter was a followon from your previous letter of April 14, 2004, when your staff identified site 41BL0349 within the proposed Texas A&M campus transfer Area of Potential Effect. Mr. Baker correctly identified that the site was assessed as potentially eligible for listing on the National Register of Historic Places based on work published in report volume 39. From that point he requested additional information on the eligibility of this site. Fort Hood responded to this request on April 23, 2004, stating Prewitt and Associates, Inc., had tested 41BL0349 during the 1999 field season. The results of that testing determined that the site did not meet National Register of Historic Places eligibility criteria. This response was met with the current request for additional information on site 41BL0349 and volume 44.

In response to your request for further information regarding site 41BL349, Fort Hood's Cultural Resource Management office reviewed our documentation for that site. As stated previously, this site was tested and determined ineligible during the 1999 field season. This result was coordinated with your office in correspondence, February 7, 2000, with respect to the Robert Gray Army Airfield Joint-Use project with the City of Killeen. In this letter, Fort Hood pursued a concurrence of non-eligibility on 41BL0349 since the site was within the Area of Potential Effect for the proposed airport project. A copy of the letter is enclosed. The response from your office accepted the information that had been provided within the February 7, 2000, letter and did not request any further information or clarification regarding the sites within the Area of Potential Effect. A copy of this letter is enclosed. Hence Fort Hood considered this site had concurrence for a non-eligibility determination and took it off our protection database during an update of our databases in 2000. This is why we did not include it in our original coordination request for the proposed Texas A&M campus land transfer.

As for further information regarding the coordination of the 1999 field season report, Fort Hood agreed with Prewitt and Associates, Inc., National Register eligibility determinations in volume 44. To recap, there were two types of excavations undertaken: shovel testing and eligibility testing. Table 1 lists the sites tested and the recommendations for shovel tested sites. The sub-areas within the forty-five (45) sites resulted in 66 sub-areas tested. Three (3) sub-

areas/sites were assessed as meeting national register eligibility criteria and thirteen (13) had the potential to meet criteria but required further testing to make a final determination. The remaining 50 sub-areas/sites were assessed as not meeting the National Register eligibility criteria.

Table 1: List of sites shovel tested and their eligibility determinations.

Site	Site Type	Determination
41BL0195	Open Campsite	NE
41BL239	Cave	NE
41BL337A	Lithic Scatter	NE
41BL337B	Lithic Scatter	NE
41BL405	Lithic Scatter	NE
41BL520	Lithic Scatter	NE
41BL522	Lithic Scatter	NE
41BL657	Lithic Scatter	NE
41BL658	Lithic Scatter	NE
41BL660	Lithic Scatter	NE
41BL662A	Unidentified	NE
41BL662B	Lithic Scatter	PE
41BL662C	Lithic Scatter	PE
41BL662D	Lithic Scatter	NE
41BL665	Open Campsite	NE
41BL795A	Lithic Scatter	PE
41BL795B	Open Campsite	NE
41BL795C	Lithic Scatter	NE
41BL797	Rockshelter	E
41BL802	Lithic Scatter	NE
41BL902	Rockshelter	NE
41BL904	Cave	NE
41BL905	Rockshelter	NE
41BL906	Lithic Scatter	NE
41BL907A	Cave	NE
41BL907B	Lithic Scatter	NE
41BL908A	Lithic Scatter	PE
41BL908B	Lithic Scatter	NE
41BL908C	Lithic Scatter	NE
41BL909A	Lithic Scatter	PE
41BL909B	Lithic Scatter	NE
41BL911	Rockshelter	NE
41BL912	Rockshelter	NE
41BL914	LRPA	NE
41BL915	LRPA	NE
41BL917A	Cave	NE
41BL917B	Lithic Scatter	NE
41BL918A	Open Campsite	PE
41BL918B	Lithic Scatter	NE
41BL918C	Lithic Scatter	NE
41BL919	Lithic Scatter	NE

41BL920	Lithic Scatter	NE
41BL925	Lithic Scatter	NE
41BL926	Lithic Scatter	NE
41BL927	Lithic Scatter	PE
41BL929A	Rockshelter	NE
41BL929B	Open Campsite	NE
41BL929C	Lithic Scatter/LRPA	NE
41BL929D	Rockshelter	E
41BL930	Lithic Scatter	NE
41BL931A	Lithic Scatter	NE
41BL931B	Open Campsite w/midden	PE
41BL931C	LRPA	NE
41BL931D	Open Campsite	PE
41BL932	Lithic Scatter	NE
41BL933A	Open Campsite	NE
41BL933B	LRPA	NE
41BL934	Rockshelter	E
41BL935	Burned Rock Midden	PE
41BL936	Lithic Scatter	NE
41CV092	LRPA	NE
41CV580A	Unknown	PE
41CV580B	Open Campsite	PE
41CV1415	Paluxy	PE
41CV1553	Lithic Scatter	NE
41CV1540	Open Campsite	NE

Additional work reported is the testing of 12 sites with both sub-areas of one site (41CV94) being tested. Assessment results identified five (5) sites met National Register eligibility criteria and the remainder did not. Table 2 lists the sites tested.

Table 2: List of the sites tested for eligibility.

Site	Site Type	Determination
41BL192	Rockshelter	NE
41BL349	Burned Rock Midden	NE
41CV041	Open Campsite	E
41CV094	Open Campsite	NE
41CV579	Open Campsite	E
41CV668	Open Campsite	NE
41CV956	Open Campsite	NE
41CV1441	Open Campsite	NE
41CV1443	Open Campsite	E
41CV1553	Paluxy	E
41CV1555	Open Campsite	E
41CV1556	Open Campsite	NE

As stated above, Fort Hood agreed with Prewitt and Associates, Inc., recommendations on the eligibility of the sites shovel tested and National Register tested. Fort Hood also took on their recommendation of implementing a monitoring and protection program that has practically eliminated looting and vandalism of archaeological sites. The only aspects of Prewitt's recommendations that Fort Hood did not agree with are the need for further work on sites before developing a research design for data recovery excavations and the use of mechanical stripping.

This letter addresses your staff's requests for further information on 41BL0349 and assessed archaeological sites reported in volume 44 of the Fort Hood Archaeological Research Series. Should you have any questions or desire additional information, please do not hesitate to contact Dr. Cheryl L. Huckerby, Cultural Resource Program Manager, (254) 287-1092.

Sincerely,

A handwritten signature in black ink, appearing to read "S. Burrow", with a long horizontal line extending to the right.

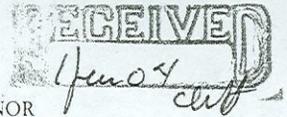
Steven G. Burrow
Chief, Environmental Programs

Enclosures



TEXAS
HISTORICAL
COMMISSION

The State Agency for Historic Preservation



RICK PERRY, GOVERNOR

JOHN L. NAU, III, CHAIRMAN

F. LAWRENCE OAKS, EXECUTIVE DIRECTOR

May 18, 2004

Steven Burrow
Chief, Environmental Programs
Headquarters, U.S. Army Garrison
Building 1001, Room W321
Fort Hood, Texas 76544-5000

Re: Project review under Section 106 of the National Historic Preservation Act of 1966;
Follow up for Requested Information on 41BL349 within the Area of Potential Effect for the
Proposed Transfer of Land from Fort Hood, to the Texas A&M University System
(Army-Fort Hood)

Dear Mr. Burrow:

Thank you for your correspondence providing additional information regarding archeological site 41BL349 and the above proposed land transfer undertaking. This letter serves as comment on the proposed undertaking from the State Historic Preservation Officer, the Executive Director of the Texas Historical Commission.

We cannot concur that "no further work be requested" in regards to the above undertaking. It appears that Fort Hood changed the National Register eligibility status of historic properties, including 41BL349, without SHPO review and concurrence. Please forward Fort Hood research report number 44 (covering the 1999 season) and clarify if each of the National Register changes proposed therein were actually made, and when.

As soon as we receive the research report, we will expedite review of 41BL349 and comment on the proposed land transfer. We will also review the other National Register eligibility changes proposed in the research report. In the future, please circulate research drafts and proposed management changes as soon as possible to avoid project delays.

Thank you for your cooperation in this federal review process, and for your efforts to preserve the irreplaceable heritage of Texas. **If you have any questions concerning our review or if we may be of further assistance, please contact Mr. Ed Baker at 512/463-5866.**

Sincerely,

A handwritten signature in black ink, appearing to read "F. Lawrence Oaks".

F. Lawrence Oaks, State Historic Preservation Officer
FLO/elb

cc: Dr. Cheryl Huckerby, Ft. Hood CRM; Dave Berwick, Advisory Council for Historic Preservation

attachment: Fort Hood DPW letter of April 23, 2004

Sent 28 Apr 07: 7001 0320 0000 0111 1032



DEPARTMENT OF THE ARMY
HEADQUARTERS, U.S. ARMY GARRISON
BUILDING 1001 ROOM W321
FORT HOOD, TEXAS 76544-5000

REPLY TO
ATTENTION OF

April 23, 2004

Environmental Programs

Mr. Lawrence Oaks
State Historic Preservation Officer
Texas Historical Commission
P. O. Box 12276
Austin, Texas 78711-2276

RE: Follow up for Requested information on 41BL349 within the Area of Potential Effect for the Proposed Transfer of Land from Fort Hood, to the Texas A&M University System

Dear Mr. Oaks:

Thank you for your letter of April 14, 2004, providing concurrence that archaeological site 41BL332 does not meet eligibility requirements for listing on the National Register of Historic Places. In that same letter, your staff reviewer, Mr. Ed Baker, requested additional information regarding the status of archaeological site 41BL349 that also lies within the project Area of Potential Effect for the Texas A & M proposed land transfer. As cited within the above referenced letter, the site was initially examined and reported in Fort Hood's Archaeological Resource Management Series Research Report, volume 39. This volume reports work performed during the 1997 field season that suggested the site had potential to meet eligibility criteria for listing on the National Register of Historic Places.

In response to your request for further information regarding site 41BL349, Fort Hood's Cultural Resource Management office has reviewed our documentation for that site. The site was evaluated during the 1999 field season. The results of this fieldwork indicated that 41BL349 does not meet eligibility criteria for listing on the National Register of Historic Places. This result is reported in Fort Hood's Archaeological Resource Management Series Research Report, volume 44, page 157.

At this time, Fort Hood has met your request for additional information regarding 41BL349 and requests concurrence that there no further work be requested regarding the proposed Texas A & M land transfer per the National Register of Historic Places, Section 106 guidance, 36 CFR Part 800. Should you have any questions or desire additional information, please do not hesitate to contact Dr. Cheryl L. Huckerby, Cultural Resource Program Manager, (254) 287-1092.

Sincerely,

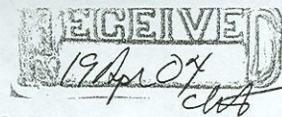
A handwritten signature in black ink, appearing to read "Steven G. Burrow".

Steven G. Burrow
Chief, Environmental Programs



TEXAS
HISTORICAL
COMMISSION

The State Agency for Historic Preservation



RICK PERRY, GOVERNOR

JOHN L. NAU, III, CHAIRMAN

F. LAWRENCE OAKS, EXECUTIVE DIRECTOR

April 14, 2004

Steven Burrow
Chief, Environmental Programs
Headquarters, U.S. Army Garrison
Building 1001, Room W321
Fort Hood, Texas 76544-5000

Re: Project review under Section 106 of the National Historic Preservation Act of 1966;
Request For Concurrence on Cultural Resources Assessment within the Area of Potential
Effect for the Proposed Transfer of Land from Fort Hood, to the Texas A&M University
System
(Army-Fort Hood)

Dear Mr. Burrow:

Thank you for your correspondence describing the above referenced assessment. This letter serves as comment on the proposed undertaking from the State Historic Preservation Officer, the Executive Director of the Texas Historical Commission.

The review staff, led by Ed Baker, needs more information to complete its review. It appears that archeological site 41BL349 is within your 672 acre project area. Our agencies concurred in 1999 that this site may be eligible for the National Register of Historic Places (see also FTHARMS #39). Please let us know if the site is in the project area and if the site is still considered potentially eligible for the National Register of Historic Places.

We concur that 41BL332 does not meet eligibility criteria for the National Register of Historic Places. The potentially significant portions of the archeological site were bulldozed in 1999 during firebreak construction and no intact buried deposits are thought to remain.

Thank you for your cooperation in this federal review process, and for your efforts to preserve the irreplaceable heritage of Texas. **If you have any questions concerning our review or if we may be of further assistance, please contact Mr. Ed Baker at 512/463-5866.**

Sincerely,

for
F. Lawrence Oaks, State Historic Preservation Officer
FLO/elb

cc: Dr. Cheryl Huckerby, Ft. Hood CRM

Sent 17mar04: 7001 0320 0000 0111 1074

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Permit No. G-1



DEPARTMENT OF THE ARMY
HEADQUARTERS, U.S. ARMY GARRISON
BUILDING 1001 ROOM W321
FORT HOOD, TEXAS 76544-5000

REPLY TO
ATTENTION OF

March 13, 2004

Environmental Programs

Mr. Lawrence Oaks
State Historic Preservation Officer
Texas Historical Commission
P. O. Box 12276
Austin, Texas 78711-2276

RE: Request for Concurrence on Cultural Resource Assessment within the Area of Potential Effect for the Proposed Transfer of Land from Fort Hood, to the Texas A&M University System

Dear Mr. Oaks:

Fort Hood is considering a transfer of land to the Texas A&M University system for the implementation of a campus to serve Bell, Coryell and other local counties' future students. The facility would provide higher education opportunities for active soldiers, family members, retirees as well as civilians. The land under consideration is located on 672.36 acres in the North East section of Training Area 27 abutting Texas State Highway 195 in West Fort Hood (Figure 1). This property will be transferred via special legislation passed by congress.

Fort Hood's Cultural Resource Management office reviewed the proposed acreage as the Area of Potential (APE) to identify potential impacts under the National Historic Preservation Act Section 106 guidance. The review consisted of a records search as well as on site survey. One archaeological site, 41BL332, was identified within the APE that had the potential to be affected by the proposed transfer. 41BL332 is a prehistoric archaeological site consisting of a shallow burned rock mound with little other cultural material on an upland type surface. Thomas first recorded the site in 1980 identifying the mound and that looting activities impacted 10 percent of the mound. Since 1980, a variety of monitoring reports have relocated the degrading mound but no other archaeological materials. Review of local cut banks did not reveal any further cultural materials.

In 2000, Fort Hood's Cultural Resource Management staff reviewed the site in depth as part of the National Historic Preservation Act Section 106 review for the Robert Gray Army Airfield joint-use project with the City of Killeen. During that review, Fort Hood's Cultural Resource Management staff proposed that 41BL332 did not meet contextual integrity criteria under criteria D of 36 CFR Part 800. The review established that the burned rock mound had been affected by a variety of man-caused (looting and fire-control) and natural (erosion and fire) impacts that had disbursed the burned rocks of

-2-

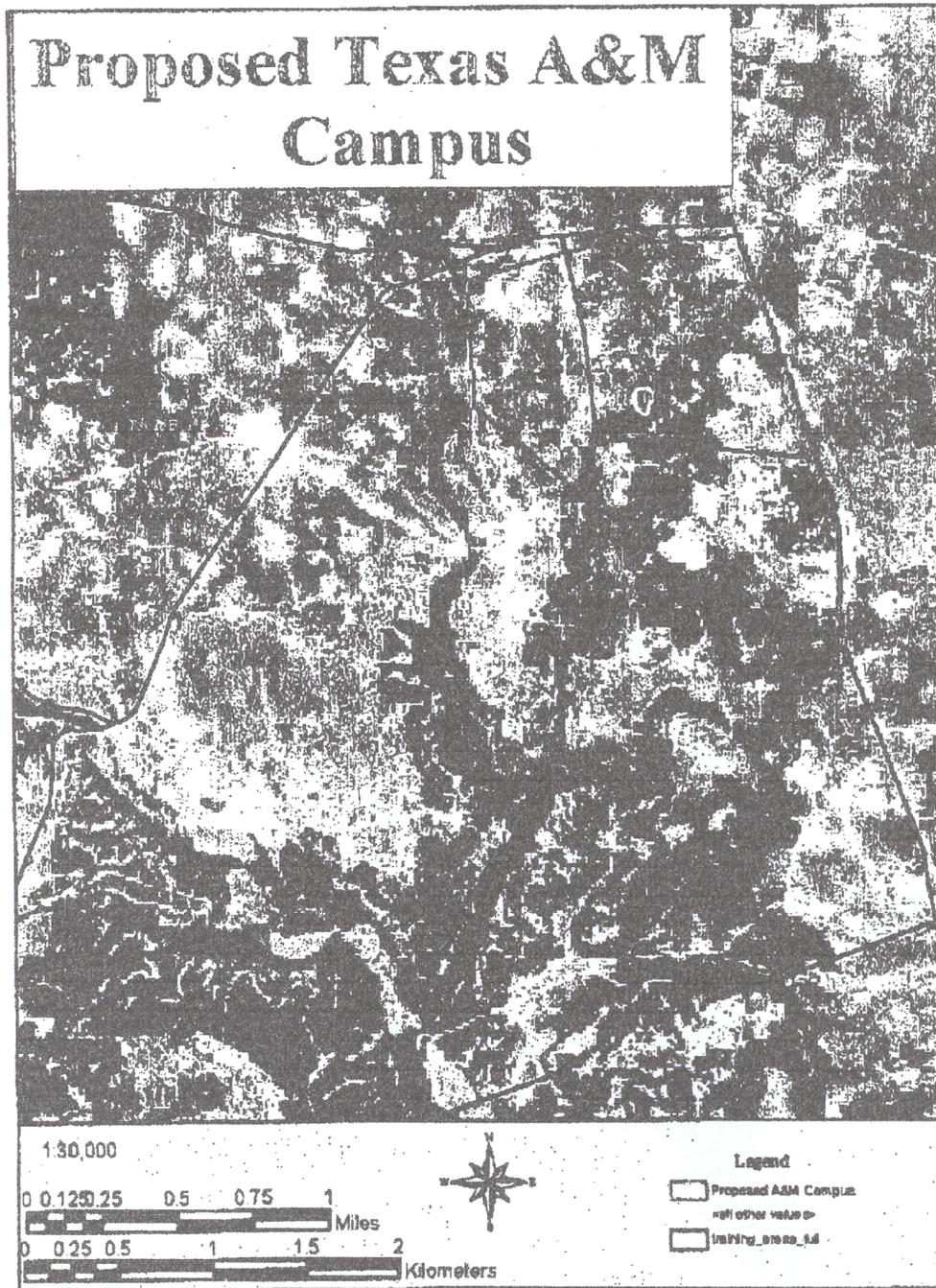
the small mound. It was also not definable how much of the observed burned rock was created by various natural fires versus cultural hearth creation activities. A request for concurrence that 41BL332 be considered ineligible was sent in February 7, 2000. As of this time, no concurrence or non-concurrence has been provided for 41BL332.

At this time, Fort Hood requests your concurrence with our previous assessment that 41BL332 does "not meet criteria for eligibility" as defined in the National Register of Historic Places Section 106 guidance, 36 CFR Part 800. Should you have any questions, or desire additional information; please do not hesitate to contact Dr. Cheryl L. Huckerby, Cultural Resource Program Manager, (254) 287-1092.

Sincerely,


for Steven G. Burrow
Chief, Environmental Programs

Figure 1: Location of APE and 41BL332.





TEXAS
HISTORICAL
COMMISSION

The State Agency for Historic Preservation

GEORGE W. BUSH, GOVERNOR

JOHN L. NAU, III, CHAIRMAN

F. LAWRENCE OAKS, EXECUTIVE DIRECTOR



February 22, 2000

David C. Wrbas
Deputy Director
Environmental Programs
Headquarters III Corps and Fort Hood
Fort Hood, Texas 76554-5028

Re: Project review under Section 106 of the National Historic Preservation Act of 1966
Environmental Assessment for Joint Use Facility at Fort Hood's Robert Gray Army Airfield
(Army-Fort Hood)

Dear Mr. Wrbas:

Thank you for your correspondence of February 7 concerning the above referenced project. This letter serves as comment on the proposed undertaking from the State Historic Preservation Officer, the Executive Director of the Texas Historical Commission.

The review staff, led by Ed Baker, has completed its review. After receiving clarification from your staff and TxDOT staff regarding the Area of Potential Effect (APE) for this project, we understand that the APE for Ft. Hood is the RGAAFJU facility, and that TxDOT will take responsibility for the APE along Clear Creek and Reese Creek Roads.

Since there is a Memorandum of Agreement in effect for the RGAAFJU facility signed by this office, by Colonel Hall of the U.S. Army, and by Killeen City Manager D. A. Blackburn, we believe that Fort Hood has addressed its Section 106 responsibilities. Please notify this office when the stipulations of the MOA have been executed.

We look forward to further consultation with your office concerning the remainder of the above-referenced project and hope to maintain a partnership that will foster effective historic preservation. Thank you for your cooperation in this federal review process, and for your efforts to preserve the irreplaceable heritage of Texas. **If you have any questions concerning our review or if we may be of further assistance, please contact Mr. Ed Baker at 512/463-5866.**

Sincerely,

F. Lawrence Oaks, State Historic Preservation Officer
FLO/elb

cc: Dr. Cheryl Huckerby, Ft. Hood archeologist; CPT Scott Flesch, Administrative Law Attorney; Lain Ellis, TxDOT archeologist



REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY
HEADQUARTERS III CORPS AND FORT HOOD
FORT HOOD, TEXAS 76544-5028

COPY

February 7, 2000

Environmental Programs

Mr. F. Lawrence Oaks
State Historic Preservation Officer
Texas Historical Commission
P. O. Box 12276
Austin, Texas 78711-2276

RE: Project Review Under Section 106 of the National Historic Preservation Act of 1966
Environmental Assessment for Joint Use Facility at Fort Hood's Robert Gray Army Airfield
(RGAAFJUP)

Dear Mr. Oaks:

This letter is to request concurrence that issues identified in your letter of December 9, 1999, regarding the above-referenced Environmental Assessment (EA) have been addressed. In that letter, Mr. Baker identified four concerns requiring additional information and consultation with your office. These concerns included: (1) standing historic structures on Fort Hood that may be near the proposed project area which were not identified or addressed in the EA; (2) that the area of potential effect (APE) was not well defined; (3) the need for testing buried alluvial terraces for the presence of sub-surface cultural resources; and (4) clarification of potential adverse effects impact to Brown's Cemetery. The following outlines the actions that have been taken to address these issues and the results of those actions.

In the letter, Mr. Baker indicated that conversations he had with the Texas Department of Transportation (TxDOT) identified the presence of several historic structures that were not addressed in the EA. These structures, the Okay Store and the Whitehead House, are located on the West Side of the airfield outside of the APE. As a result, Fort Hood made its determination under the National Historic Preservation Act (NHPA) that the project would not potentially affect these properties. Figure 1 identifies the location of these structures.

Mr. Baker also expressed the concern that the APE was not clearly defined in the EA. Figure 1 identifies the extent of the APE with regard to Fort Hood property. The APE was first presented to your office with Fort Hood's assessment of the project impacts on cultural resources along with the January 8, 2000, letter. The assessment report is titled "Determination of Effects on Known Cultural Resources within the Area of Potential Effect (APE) of the Proposed Robert Gray Army Air Field Joint-Use Project (RGAAF Joint-Use Project)" (Attachment 1). TxDOT identified their APE in letters to your office of December 3 and December 10, 1999. TxDOT's

APE is defined by the proposed road construction along Clear Creek Road between FM 3470 (Stan Schlueter Loop) and Reeses Creek Road and from Reeses Creek Road to Highway 195 (Attachment 2). These letters also provided TxDOT's determination of ineligibility for historic structures off of Fort Hood but within TxDOT's APE for the project.

Another concern was the necessity for testing sub-surface alluvial deposits within the project APE. Fort Hood has proposed TxDOT conduct sub-surface alluvial testing in accordance with Fort Hood's standards, consultation with your office, and in conjunction with the attainment of the rights of way lease for road construction. Fort Hood's letter of February 3, 2000, to TxDOT outlines the proposed agreement (Attachment 3). Fort Hood is currently awaiting written acknowledgement of this agreement from TxDOT.

Finally, Mr. Baker was concerned about potential effects to Brown's Cemetery from project construction and airport activities. This Cemetery was previously known as the Okay Community Cemetery and was originally located on Fort Hood. In 1953, the cemetery was moved to its current location when the Robert Gray Army Airfield runway was extended. TxDOT, in the above-referenced correspondence of December 3, 1999, determined that "impacts to the cemetery are not likely and that TxDOT will take steps to contractually exclude construction and other activities from the area".

In separate consultations with Mr. Baker, he requested additional information related to our previously submitted determination report (Attachment 1). Enclosed are copies of the testing report for site 41BL0373 (Attachment 4). The last sub-section of this site was tested in our 1997 field season recently published in Fort Hood's Archaeological Research Series as volume 38. Your office concurred with the ineligibility for the National Register of Historic Places (NRHP) determination. In addition, while reviewing information for this site and 41BL0332, Fort Hood's cultural resources office identified that the information stated in the determination report for site 41BL0332 was confused with another site 41BL0349 located within 200 meters. Attachment 5 is a copy of the testing report for 41BL0349. Testing of this site was completed in the 1999 field season at Fort Hood. Fort Hood agrees with the determination of ineligibility for the NRHP. Fort Hood requests concurrence on this determination.

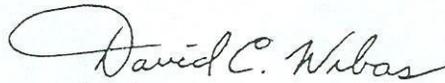
As for site 41BL0332, this site has not been tested as a result of insufficient funds. In assessing the potential impact of the RGAAFJU project on this site, Fort Hood's cultural resource office performed a record and on-site review. A copy of the review report is enclosed as Attachment 6. The review identified the site as a lithic scatter on an upland terrace. Due to long-term erosion and other natural actions, the integrity of the site has deteriorated through time. Based on this assessment, Fort Hood has determined site 41BL0332 as not eligible for the NRHP.

In conclusion, Fort Hood requests concurrence that all concerns and issues addressed in your letter of December 9, 1999, have been addressed appropriately and in accordance with

Federal Law. Fort Hood also requests concurrence that prehistoric archeological sites 41BL0349 and 41BL0332 are not eligible for the NRHP. Furthermore, Fort Hood requests acknowledgement from your office that NHPA Section 106 consultation is complete concerning the RGAAFJU EA, resulting in the continuance of the NEPA process.

Please provide your comments as soon as possible. This will allow the overall NEPA process to proceed in a timely manner. Should you have any questions about the undertaking or desire additional information, please contact Dr. Cheryl L. Huckerby, Fort Hood Cultural Resource Manager at 254-287-1092.

Sincerely,



David C. Wrbas
Deputy Director for
Environmental Programs

Enclosures

Figure 1: Location of Historic Structures and Area of Potential Effect (APE).

Attachment 1: *Determination of Effects on Known Cultural Resources within the Area of Potential Effect (APE) of the Proposed Robert Gray Army Air Field Joint-Use Project (RGAAF Joint Use Project)*

Attachment 2: Correspondence from TxDOT to Texas SHPO dated December 3 and 10, 1999

Attachment 3: Correspondence between Fort Hood and TxDOT outlining agreement for testing sub-surface alluvial deposits associated with creeks.

Attachment 4: Preliminary Testing Report of National Register Testing at Site 41BL373

Attachment 5: Preliminary Testing Report of National Register Testing at Site 41BL349

Attachment 6: Memorandum of Record regarding Archaeological assessment of Prehistoric site 41BL332

Cc:

Jeff T. Anderson, Carter & Burgess, Inc.

Nan Terry, Federal Aviation Administration

Janice S. Jackson, Waco District TxDOT

Dr. G. Lain Ellis, Staff Archaeologist, TxDOT

CPT Scott N. Flesch, Office of the Staff Judge Advocate, Fort Hood, TX