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DRAFT

**Environmental Assessment
Access Improvement Initiative
6th Ranger Training Battalion
Camp James E. Rudder
Eglin Air Force Base, Florida
RCS 09-304 and 09-305**



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September 2014

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1 **COVER SHEET**

2 **ENVIRONMENTAL ASSESSMENT**
3 **ACCESS IMPROVEMENT INITIATIVE**
4 **6TH RANGER TRAINING BATTALION**
5 **CAMP JAMES E. RUDDER**
6 **EGLIN AIR FORCE BASE, FLORIDA**
7

8 **Responsible Agencies:** U.S. Army 6th Ranger Training Battalion (RTBn), Fort Benning; U.S.
9 Air Force, 96th Air Base Wing, Eglin Air Force Base (AFB); Air Force Materiel Command.

10 **Affected Location:** Eglin AFB, Okaloosa County, Florida.

11 **Report Designation:** Draft Environmental Assessment (EA).

12 **Abstract:** The U.S. Army proposes to improve primary road access to Camp James E. Rudder
13 (Camp Rudder), home of the 6th RTBn and tenant of Eglin AFB since 1951. Presently, primary
14 access to Camp Rudder is limited to a single, two-lane paved route (Range Roads 236/213/257)
15 that traverses 16.5 miles of Eglin reservation, negotiating several active Eglin Test and Training
16 Ranges (ETTs) along the way. This route of access is subject to provisional closure because of
17 missions associated with the test ranges. Other routes presently available are un-surfaced sand
18 range roads unsuitable for general vehicle travel. Another route of primary access is needed to
19 provide Camp Rudder with ingress/egress relatively unencumbered by missions-related closures.
20 The need for the Proposed Action is expected to be amplified by growth planned for Camp
21 Rudder to help meet the Army's need for more Rangers (the Army is planning an investment of
22 approximately \$60 million in infrastructure and facility upgrades through 2027). The improved
23 access would mitigate impact to the 6th RTBn mission that is caused by interruptions in traffic
24 flow due to 46th Test Group road closures. Additional benefits of the Proposed Action include
25 safer travel to and from the camp and elsewhere on Auxiliary Field 6; better access to medical
26 facilities; shorter response time for fire and medical emergencies; enhanced hurricane
27 evacuation; improved security with respect to force protection and nuisance activities; and better
28 stormwater management and erosion control.

29 This Draft EA evaluates the potential environmental consequences of the Proposed Action
30 Alternative and the No-Action Alternative on ten general resource areas: air quality, water
31 resources, biological resources, cultural resources, geological resources, coastal zone
32 management, noise, safety, solid waste, and transportation.

33 Written comments and inquiries regarding this document should be sent to:

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36 3761.

37 Comments must be received by November 7th, 2014.
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Privacy Advisory

Your comments on this Draft EA are requested. Letters or other written or oral comments provided may be published in the Final EA. As required by law, comments will be addressed in the Final EA and made available to the public. Any personal information provided will be used only to identify your desire to make a statement during the public comment portion of any public meetings or hearings or to fulfill requests for copies of the Final EA or associated documents. Private addresses will be compiled to develop a mailing list for those requesting copies of the Final EA. However, only the names of the individuals making comments and specific comments will be disclosed. Personal home addresses and phone numbers will not be published in the Final EA.

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ABBREVIATIONS AND ACRONYMS

46 OG/RANMS	46 th Operations Group Range Management Squadron
796CES	796 th Civil Engineering Squadron
96CEG/CEVSH	96th Stewardship Branch, Cultural Resources Section
96 CEG/CEVSP	Environmental Management Division, Stewardship Branch, Environmental Analysis Section
AAC	Air Armament Center
AADT	Average Annual Daily Traffic
AAFES	Army & Air Force Exchange Service
ABW	Air Base Wing
ADA	American with Disabilities Act
AFB	Air Force Base
AFI	Air Force Instruction
AFPD	Air Force Policy Directive
AFPAM	Air Force Pamphlet
AHPA	Archaeological and Historic Preservation Act
AOC	Area of Concern
APE	area of potential effect
AQCR	air quality control region
ARPA	Archaeological Resources Protection Act
AT/FP	Antiterrorism/Force Protection
BA	Biological Assessment
BASH	Bird Aircraft Strike Hazard
bls	below land surface
BGEPA	Bald and Golden Eagle Protection Act
BMP	best management practices
C	Candidate Species
C&D	Construction and Demolition
CAA	Clean Air Act
CCCL	Coastal Construction Control Line
CEQ	Council on Environmental Quality
CFC	chlorofluorocarbon
CFR	Code of Federal Regulations
CH ₄	methane

CO	Carbon monoxide
CO ₂	Carbon dioxide
CO ₂ -e	Carbon dioxide equivalents
CWA	Clean Water Act
CY	calendar year
CZMA	Coastal Zone Management Act
dB	decibels
dBA	A-weighted decibels
DMM	Discarded Military Munitions
DoD	Department of Defense
DNL	Day-night average A-weighted sound level
E	endangered
EA	Environmental Assessment
EBS	Environmental Baseline Survey
EGTR	Eglin Gulf Test and Training Range
EIAP	Environmental Impact Analysis Process
EIS	Environmental Impact Statement
EO	Executive Order
EOD	Explosive Ordnance Disposal
ERP	Environmental Restoration Program
ESA	Endangered Species Act
ETTAs	Eglin Test and Training Areas
FAC	Florida Administrative Code
FCMP	Florida Coastal Management Program
FDEP	Florida Department of Environmental Protection
FDOT	Florida Department of Transportation
FEMA	Federal Emergency Management Agency
FFWC	Florida Fish and Wildlife Commission
FGS	Florida Geological Survey
FHA	Federal Highway Administration
FICUN	Federal Interagency Committee on Urban Noise
FIHS	Florida Intrastate Highway System
FNAI	Florida Natural Areas Inventory
FONPA	Finding of No Practicable Alternative
FONSI	Finding of No Significant Impact

ft	feet
FTS	Flight Termination System
FY	fiscal year
GHG	Greenhouse Gas
gsf	gross square feet
GWP	Global Warming Potential
HCFCs	hydrochlorofluorocarbons
HLZs	Helicopter Landing Zones
HFCs	hydrofluorocarbons
HFES	hydrofluoroethers
HPP	Historic Preservation Plan
I-10	Interstate 10
IAW	in accordance with
ITE	Institute of Transportation Engineers
JDAM	Joint Direct Attack Munition
LCD	land clearing debris
LOS	Level of Service
LUC	Land-Use Control
m	meters
MBTA	Migratory Bird Treaty Act
MC	Munitions Constituents
MEDEVAC	Medical Evacuation
mg/m ³	milligram per cubic meter
MMRP	Military Munitions Response Program
MTCO ₂ e	metric tons of CO ₂ equivalent
MOT	Maintenance of Traffic
mph	miles per hour
MRS	Munitions Response Site
MRTFB	Major Range Test Facility Base
msl	mean sea level
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection and Repatriation Act
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
No.	number

N ₂ O	nitrous oxide
NOI	Notice of Intent
NO _x	nitrogen oxides
NRHP	National Register of Historic Places
NVD	Night Vision Device
NWFWMD	Northwest Florida Water Management District
NWR	New World Research, Inc.
O ₃	ozone
ODS	Ozone Depleting Substances
ORM	Operational Risk Management
OSHA	Occupational Safety and Health Act
Pb	lead
PCB	polychlorinated biphenyls
PFC	perfluorocarbons
PM _{2.5}	Particulate matter with an aerodynamic diameter less than or equal to 2.5 micrometers
PM ₁₀	Particulate matter with an aerodynamic diameter less than or equal to 10 micrometers
ppm	parts per million
PSD	Prevention of Significant Deterioration
PTA	Prentice Thomas and Associates, Inc.
RAICUZ	Range Air Installation Compatible Use Zone
RC3	Range Configuration Control Committee
RCRA	Resource Conservation and Recovery Act
RCS	Report Control System
RCW	red-cockaded woodpecker
RDESC	Range Develop Executive Steering Committee
ROI	region of influence
ROW	right of way
RR	Range Road
RTB	Ranger Training Brigade
RTBn	Ranger Training Battalion
SA	threatened due to similarity of appearance
SC	species of special concern
SDZ	Surface Danger Zone

SFG	Special Forces Group
SF6	Sulfur hexafluoride
SHPO	State Historic Preservation Officer
SIP	State Implementation Plan
SIS	Strategic Intermodal System
SMAQMD	Sacramento Metropolitan Air Quality Management District
SO ₂	sulfur dioxide
SO _x	sulfur oxides
SR	State Road
SWPPP	Stormwater Pollution Prevention Plan
T	threatened
TA	Test Area
tpy	tons per year
TRIP	Transportation Regional Incentive Program
TSCA	Toxic Substances Control Act
µg/m ³	microgram per cubic meter
UMAM	Uniform Mitigation Assessment Method
U.S.	United States
USACE	United States Army Corps of Engineers
USC	United States Code
USDOT	United States Department of Transportation
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
UXO	unexploded ordnance
VOC	Volatile Organic Compound

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1 **1.0 Purpose of and Need for Action**

2 **1.1 Proposed Action**

3 The United States (U.S.) Army 6th Ranger Training Battalion (RTBn) proposes to improve
4 primary road access to Camp James E. Rudder (Camp Rudder), home of the 6th RTBn and long-
5 time Eglin Air Force Base (AFB) tenant. Camp Rudder is remotely located along the northern
6 edge of Eglin AFB's 724-square mile range, approximately 23 miles northwest of Eglin's Main
7 Base. Primary access to the camp is limited to one two-lane paved route (Range Road [RR]
8 236/RR 213/RR 257) that traverses 16.5 miles of Eglin reservation, negotiating several active
9 Eglin Test and Training Areas (ETTAs) along the way. This route of access is subject to
10 provisional closure due to active military missions. Another route of primary access is needed to
11 provide Camp Rudder with ingress/egress relatively unencumbered by mission-related closures.

12 In mid-2009, the Army consulted the Eglin Range Configuration Control Committee (RC3) to
13 initiate improved primary road access. The RC3 subsequently presented the Need for the
14 Proposed Action to the Eglin Range Road Working Group (the primary management tool for
15 range road related issues on the Eglin Range). The RC3 and the Eglin Range Road Working
16 Group worked together with the Army to develop reasonable alternatives. All Alternatives
17 would occur primarily on Eglin property, with connection to a public roadway. The 46TW/XP
18 subsequently performed a Mission Impact analysis on the chosen alternatives and the 46TW
19 Commander at the Range Develop Executive Steering Committee (RDESC) concluded that the
20 alternatives proposed did not indicate incompatible changes to the configuration of the Eglin
21 Range. The committee cleared the Army to proceed with the environmental analysis, as
22 required. Funding and coordination for the assessment is overseen by the Army.

23 **1.2 Background**

24 The 6th RTBn is one of three Ranger training battalions organized under the Army Ranger
25 Training Brigade (RTB), headquartered at Fort Benning, Georgia. The RTB's primary
26 responsibility is to conduct the Army Ranger School, a demanding 61-day course that trains
27 combat leaders to further develop the combat arms skills of volunteers eligible for assignment to
28 units whose primary mission is to engage in close combat and direct fire battle. Ranger Training

1 is designed to instill a willingness to
2 march a little further, carry a heavier
3 load, and step into the dark and
4 unknown with a confident ability to
5 achieve a mission (Parsons, 2006).



6 Ranger School includes three phases
7 with each phase being conducted at
8 differing locations. The multiple
9 settings are necessary to expose
10 students to differing environments and

11 challenges. The first phase is conducted by the 4th RTBn at Fort Benning, Georgia, where
12 students are introduced to Ranger concepts, techniques, and tactics. Upon demonstration of
13 basic Ranger squad competencies, students are sent to the second phase at Camp Merrill,
14 Georgia to learn mountaineering skills from the 5th RTBn. Upon demonstration of successful
15 Ranger Platoon leadership, students move to Camp Rudder at Eglin AFB, Florida, for the third
16 and final phase of training by the 6th RTBn.

17 Camp Rudder has been the home of the 6th RTBn and an Eglin tenant since November 1951.
18 The camp was originally established as The Ranger School at Eglin AFB's Auxiliary Field
19 Number (No.) 7, Epler Field. The camp established the ranger training area in its current
20 location at Auxiliary Field No. 6, Biancur Field in January 1971. In June 1974, the Florida
21 Ranger Camp was renamed Camp James E. Rudder in honor of Major General James E. Rudder,



22 who commanded the 2nd Ranger Battalion when it scaled the
23 cliffs at Pointe Du Hoc, France, during the 1944 D-Day
24 Normandy invasion (Parsons, 2006).

25 The third phase, also referred to as the “swamp phase” or
26 “Florida phase,” provides students the opportunity to hone their
27 small unit combat leadership skills and demonstrate the ability
28 to conduct operations in swamp and tropical climate conditions.
29 To complete this phase and graduate from Ranger School,
30 students must be capable of operating effectively under

1 conditions of extreme mental and physical stress, which are created through practical exercises in
2 extended platoon level patrol operations in the jungle/swamp environment. The training further
3 develops the students' ability to plan for and lead small units on independent and coordinated
4 airborne, air assault, small boat, ship to shore, and dismounted combat patrol operations in a low
5 intensity combat environment against a well-trained, sophisticated enemy (Parsons, 2006).

6 The 6th RTBn conducts 11 "swamp phase" training sessions each year, with each session lasting
7 three weeks. Class size averages approximately 300 students per session. The demanding nature
8 of Ranger School is evidenced by its 50% graduation rate. Skills and tactics training is
9 conducted on Camp Rudder for the first five days of the phase, followed by 10 days of field
10 exercises utilizing thousands of acres in the training range around Camp Rudder and elsewhere
11 on the ETTA. Training is conducted 24 hours a day, much of it under dangerous, high-risk
12 conditions.

13 Camp Rudder is remotely located within Test Area (TA) B-6 along the northern edge of Eglin's
14 724-square mile range, approximately 23 miles northwest of Eglin's main base
15 (**Figure 1-1**). Functionally, Camp Rudder is a small self-contained installation independent of
16 the larger Eglin AFB installation with scheduling access to the Eglin 46th Test Wing assets (such
17 as TA B-6, Auxiliary Field No. 6, etc.). The camp receives support from the Eglin AFB 96th Air
18 Base Wing (ABW) Civil Engineer Group, the 96th Medical Group, and the Army & Air Force
19 Exchange Service (AAFES). Unique mission support comes from the Army at Fort Benning
20 (Parsons, 2006). Camp Rudder has a resident population of 130 (cadre and families), that
21 increases to approximately 430 when Ranger School is in session due to the addition of
22 approximately 300 students (Doverspike, 2009). In addition, there are approximately 306
23 transient cadre and support personnel that live off-post in the surrounding communities. Camp
24 facilities include approximately 295,000 square feet of structures under roof, as described below:

- 25 • Administrative buildings (battalion and company headquarters)
- 26 • Maintenance and storage (motor pool, civil engineering, boat house and storage, supply,
27 ammo holding area, arms room)
- 28 • Barracks (cadre, student, and recycle barracks; temporary living quarters)
- 29 • Housing (25 single-family homes for cadre and families)
- 30 • Community facilities (dining, fire station, gym, troop medical clinic)

1 These facilities at Camp Rudder are supported by the following infrastructure components:

- 2 • Water supply: two potable water wells and water distribution system
- 3 • Domestic wastewater system: a sanitary sewer distribution system directs wastewater to
4 a 99,000 gallon per day package plant for treatment, followed by discharge to a 9.5-acre
5 spray field
- 6 • Electrical distribution: primary electrical power is obtained from a regional provider
7 through overhead lines connected to off-site substations; backup power is supplied by
8 three emergency generators (Parsons, 2006a)
- 9 • Propane gas system: heating and hot water are provided by on-site propane tanks
10 (Parsons, 2006a)
- 11 • Telecommunications: the public communications system is available for cell phone and
12 land lines, however public cellular communications system coverage is poor and sporadic
13 at Camp Rudder and at times unavailable on the road leading to the Camp. No cable TV
14 or high speed internet is available for personal use.
- 15 • Transportation: the camp has approximately 0.5 miles of asphalt paved roads
16 supplemented with gravel roads. Auxiliary Field No. 6 contains an 8,000-foot airstrip
17 that accommodates landing and take-offs of C-130 aircraft, and is considered “Class B”
18 capable with renovations. The airstrip has been re-paved recently and is being used
19 regularly in support of 6 RTB and 1st Special Operations Wing operations.

20 Camp Rudder’s facilities are constructed and maintained by the 96th Test Wing at Eglin and its
21 contracted support. Facility and infrastructure capital improvements and resourcing is provided
22 by Fort Benning, which is responsible for planning, programming, and budget development at
23 Camp Rudder. Assessment of existing facility conditions, described in the March 2006
24 *Recapitalization Master Plan for U.S. Army Ranger School* (Parsons, 2006b) and the February
25 *2010 Future Development Plan – Update for Camp Rudder* (Clark-Nexsen, 2010), indicates that
26 the majority of Camp Rudder’s facilities are below accepted standards for soldier support.
27 Emergency construction has been conducted to address the most pressing needs.

28 Meanwhile, a substantial investment in capital improvements at Camp Rudder is planned by the
29 Army as it implements transformative initiatives designed to successfully engage the enemy on
30 today’s dynamic, evolving battlefield. The RTB leadership goal is to provide the Army with

1 2,000 Ranger School graduates per year, with current projections including approximately 320-
2 350 students, including hold-overs, per session.

3 In its 2006 *Future Development Plan* and 2010 *Future Development Plan-Update* for Camp
4 Rudder, the Army outlines a strategy and schedule for addressing existing facility needs and
5 modernizing the camp's facilities to accommodate the growth and change needed by the 6th
6 RTBn to fulfill its mission. Over the next 20 years, the Army plans to replace all of Camp
7 Rudder's facilities on a "worst-first" schedule at an estimated cost of \$50-60M.

8 The Army's vision includes:

- 9 • Construction of modern and sustainable facilities in accordance with the U.S. Army
10 Corps of Engineers (USACE) Centers of Standardization facility requirements
- 11 • Organization of facilities that will enhance student movement and cadre work functions
- 12 • Provision for expanded classroom space to accommodate a student load of up to 400 per
13 class
- 14 • Design and development of permanent facilities that will honor the heritage of Ranger
15 history instead of replicating the austere operating environments of many of the Ranger
16 missions
- 17 • Integration of current Anti-terrorism and Force Protection (AT/FP) stand-off
18 requirements into all designs
- 19 • Design and construction of facilities that, where appropriate, comply with the Americans
20 with Disabilities Act (ADA)

21 Future development plans for the Camp are outlined by Facility Type in **Table 1-1** below.

1

Table 1-1 Future Development Plans for Camp Rudder

Facility Name	Building Number	Planned Action
Training/Ranges		
Reptile House	6031	Renovate existing (8,000 gsf)
Planning Bays		Renovate six existing, Construct two new
100-Meter Outdoor Firing Range		Construct new
Multi-Purpose Training Facility	6009	Renovate and reuse 3,800 gsf of existing Battalion HQ (Bldg 6009)
Administration		
Battalion Headquarters		Construct new (14,000 gsf) (current building to be repurposed)
HQ and HQ Company	6010, 6063, 6021	Retain 6010 and 6063 (5,235 gsf), Demolish 6021 (1,472 gsf)
Company Ops/Platoon Tactical Training	6058, 6059, 6060, 6063	Retain existing, Construct new (4,189 gsf)
Modular Guard Station		Construct new
Housing & Quarters		
Cadre Barracks	6012, 6038, 6039	Renovate and retain (39,317gsf)
Student & Holdover Barracks	6017	Renovate and retain existing (26,409 gsf), Construct new (57,024 gsf)
Community Service		
Dining Hall	6027	Renovate and expand (8,320)
Chaplain's Office		Renovate a portion of Bldg 6009 to accommodate this function (120 gsf)
Community Facility	6016	Demolish (1,500 gsf)
Supply & Storage		
Parachute Storage Facility	6020	Demolish existing (2,480 gsf), Construct new storage, shakeout, and drying areas (4,000 gsf)
Armory	6015	Demolish existing (1,440 gsf) and include function in new Company Ops Facility
Storage	6001, 6021, 6023	Demolish (4,982 gsf)
Maintenance & Industrial		
Boat Storage	6061	Retain existing (7,825 gsf), Construct one open and one enclosed addition (3,195 gsf)
Water Tower		Retain existing, Construct Additional 75,000-gal Tower
Diesel Fuel Storage Tank		Demolish existing (800-gal) and replace with new (2,000- gal)
Civil Engineering Building	6003	Eglin to demolish existing (4,323 gsf), Construct new
Laundry Misc. Use	6011	Demolish (1,750 gsf)

Facility Name	Building Number	Planned Action
Fire & Medical Service		
Fire Station	6071	Upgrade planned by Eglin
Medical Platoon Facility	6018	Demolish existing (1,500 gsf), incorporate function into existing Bldg 6009
Troop Medical Clinic	6004	Demolish existing (2,688 gsf), Construct new (4,340 gsf)
Helicopter Emergency Response Station		Construct new (4,000 gsf)

1 gsf = gross square feet

2 **1.3 Need for Proposed Action**

3 The Proposed Action, a route of primary access to Camp Rudder with ingress/egress relatively
 4 unencumbered by 46 OG/RANMS related closures, was identified as an existing need by the
 5 Army in its *Recapitalization Master Plan for U.S. Army Ranger School*, March 2006. Planned
 6 facility upgrades and projected increases in students and associated support personnel are
 7 expected to amplify the need for the
 8 Proposed Action.

9 Presently, access to Camp Rudder by
 10 paved or improved roadway (primary
 11 access) is limited to a single, two-lane
 12 16.5-mile route (RR 236/213/257) that
 13 approaches the camp from the southern
 14 boundary of the Eglin range at Lewis
 15 Tuner Boulevard, just north of the city
 16 of Fort Walton Beach (**Figure 1-2**).



17 Secondary access by unimproved roadway is possible by four other routes (**Figure 1-3**) that
 18 approach the camp from State Road (SR) 85 to the east and SR 87 to the west, as described
 19 below:

- 20 • Approach from the northeast at SR 85: 12-mile route utilizing RR 211 (also known as
- 21 Rattlesnake Bluff Road for the first 3.8 miles) and RR 257
- 22 • Approach from the east at SR 85: 13.9-mile route utilizing RR 215, RR 241, RR 211, and
- 23 RR 257

- 1 • Approach from the southwest at SR 87: 15.3-mile route utilizing RR 213 and RR 257
- 2 • Approach from the west at SR 87: 14.5 mile route utilizing RR 211 and 257

3 Eglin performed a survey of the organizations which use the roads within Eglin Range. The
4 survey indicates that the 6th RTBn at Camp Rudder logs 48.6% of the monthly mileage on
5 Eglin's Range Roads, with an associated 334,265 miles per month (EAFB, June 2009).

6 The primary access route (RR 236/213/257) runs close to a number of active test ranges (B-4, B-
7 5, B-10, B-70, B-71, and B-82) and is commonly within footprints or setbacks established for
8 safety during a variety of Eglin AFB missions testing (**Figure 1-4**). For testing of munitions that
9 have flight characteristics (wings, guidance systems, etc.), the AAC Range Safety Group
10 establishes a Flight Termination Systems (FTS) Impact Line specific to the test item. The FTS
11 line establishes the outer limits of potential impact of the item or debris from the destruction of
12 the item, should termination be required. In general, the FTS line runs just south of Camp
13 Rudder in an east-west trending direction (**Figure 1-4**). In addition, depending on the test item
14 and range, there are provisions for an Alternate FTS Line due east of Camp Rudder. During
15 weapons testing activities, this primary route of travel is subject to closure for safety, which is a
16 necessary part of the Eglin Test and Training missions. The road closures, which are generally
17 noticed at least a day in advance, occur two to three days per week and typically last from four to
18 ten hours (Doverspike, 2009 and Hicks, 2014). Though provisional and temporary in nature, the
19 closures impede ingress and egress from the camp, which distracts from the 6th RTBn mission.

20 The access impediment disrupts logistical support of the camp. With a population of
21 approximately 736 during training sessions, Camp Rudder is a small, isolated community that
22 needs a steady and reliable flow of resources to and from the camp. Mission-related road
23 closures hinder movement of supporting personnel and hamper a routine supply schedule of
24 goods and services to the camp. Additionally, the wide scope of supporting organizations and
25 contractors which support the daily needs of the camp does not allow for precise or timely
26 coordination or notification of road closures; hence supplies are sometimes delayed for days or
27 weeks when road closures interfere with delivery and service. Furthermore, many of the supplies
28 and administrative support for the camp comes from north of the camp which increases the travel
29 time and distance for these resources when utilizing the current primary route. An alternative

1 route of primary access relatively unencumbered by road closures is needed to provide logistical
2 continuity.

3 These road closures substantially hinder the movement of cadre and students (soldiers) to and
4 from Camp Rudder. Presently, the access problem is minimally offset by adjusting 6th RTBn
5 schedules to help manage conflict with Eglin AFB test missions. This has a moderating effect,
6 but the conflict is still debilitating, in part due to the Ranger School's 24 hour-a-day operation.
7 Scheduling in this manner does not maximize use of the 6th RTBn's resources and hence, its
8 productivity.

9 Camp residents (soldiers' families) must manage the closures in carrying out their day-to-day
10 family duties and responsibilities. As an example, school-aged dependents living at the camp
11 require transport to and from elementary and middle/high schools in the local community. Bus
12 schedules are established by the school timetables. When mission-related road closures coincide
13 with the bus schedule, students are required to wait in the buses at the roadside for clearance,
14 sometimes for 45 minutes to two hours. In the past, bus drivers sometimes by-passed the closed
15 RR 236/213/257 route by circling around the range to the east, making a 29.5-mile detour from
16 Lewis Turner Boulevard to SR 85, SR 123, SR 85 again, RR 211, and then RR 257 into the
17 camp. This practice was terminated when four narrow bridges (some as narrow as ten-feet with
18 no side-rails) on RR 211 were determined to be unable to support the load-weight of a school
19 bus (Seifert, 2009). Without this detour, students are relegated to roadside delays in the school
20 buses.

21 The need for an alternative route of primary access is also realized in the realm of emergency
22 medical response. Camp Rudder has a troop medical clinic in its administrative and maintenance
23 facilities that provides Class II services (treatment requiring immediate life sustaining measures)
24 for soldiers in the training course. The extreme nature of the "swamp phase" Ranger School
25 training makes crisis situations inevitable, and the troop medical clinic provides on-site acute
26 medical care in those circumstances. In situations where emergency care has to be followed up
27 immediately with definitive care, timely transport to a local hospital or medical facility is critical.
28 Camp Rudder's remote location magnifies the time problem associated with receiving urgent
29 care. The current evacuation options are the primary route (RR 236/213/257), which could be
30 closed at the time of emergency, or one of the secondary routes, which may slow transport

1 because of unimproved surfacing. All trauma patients are airlifted to Sacred Heart or Eglin
2 Medical facilities, depending on type or severity of injury (Hicks, 2014). Students having life
3 threatening injuries would be air evacuated by Army helicopters kept on standby during training
4 cycles. Civilians or family members requiring helicopter transport would generally utilize
5 commercial service to Sacred Heart Hospital in Pensacola at approximately \$18,000 per flight.
6 Commercial service would be utilized for military members between training cycles or in the
7 event of mass-casualty.

8 The troop medical clinic generally provides emergency care only to soldiers in the training
9 course. Camp residents, their families, and support personnel generally use the services at the
10 hospital on Eglin's Main Base or another facility in the local community. The access limitation
11 is similarly problematic for these emergencies as response time for First Responders and medical
12 evacuation (MEDEVAC) is slowed by the extra coordination inevitable to any "passage of lines"
13 during active mission profiles.

14 Emergency response to fire represents another need for an alternate route of primary access to
15 Camp Rudder. The 96th ABW maintains Fire Station 5 on the west end of the camp, adjacent to
16 the airfield. Its fire department is staffed by eight firefighters with two trucks. Water is supplied
17 by two elevated tanks. The historic 75,000-gallon tank and an additional 250,000-gallon which
18 was constructed at the camp in 2011. Timely access is needed for First Responders from off-
19 camp areas to assist the Eglin Fire Protection Flight firefighters.

20 Furthermore, the existing hurricane evacuation route directs Camp Rudder residents south into
21 the heaviest traffic at the choke point of SR 85 near Fort Walton Beach rather than directing
22 them north towards Crestview and Interstate-10 (I-10). Secondary unimproved sand/clay roads
23 become impassable during storm events. Furthermore, having only one route of primary egress
24 is a potential hindrance to effective evacuation of personnel and resources prior to any hurricane
25 and for "ride-out team" access and support as well as recovery efforts after a hurricane. The
26 route could be become blocked with a fallen tree, debris, a vehicle accident, or heavy traffic
27 where it connects to Lewis Turner Boulevard. The unimproved secondary roads may offer
28 additional exit possibilities, but based on composition these roads are vulnerable to degradation
29 and potentially flooded bridge crossings. Inclement weather may render these routes impassable

1 during and after storm events. An alternative route of primary egress is needed to provide
2 reasonable assurance of safe and reliable hurricane evacuation.

3 **1.4 Objectives of the Proposed Action**

4 The objectives of the Proposed Action are as follows:

- 5 • Reduced Impact to the 6th RTBn Mission: Mitigate impact to the 6th RTBn mission by
6 providing a route of primary ingress/egress that is minimally encumbered by provisional
7 road closures associated with missions testing at Eglin AFB ranges.
- 8 • Improved Safety: Provide for safer travel to and from Camp Rudder by upgrading
9 roadway safety characteristics.
- 10 • Improved Emergency Response: Facilitate timely transport to medical facilities for those
11 in need of urgent medical care; improve response time and options for First Responders
12 and MEDEVAC crews responding to fire and medical emergencies.
- 13 • Enhanced Hurricane Evacuation: Facilitate quicker and more reliable hurricane
14 evacuation for 6th RTBn personnel and other southwest Okaloosa County residents by
15 augmenting the current evacuation route with an alternate, safe route.
- 16 • Minimized Impact to Eglin AFB's Mission and Operations: Provide for minimal
17 disturbance and conflict with Eglin AFB's mission, operations, land holdings, and land
18 use.

19 The purpose of this Environmental Assessment (EA) is to document the environmental
20 consequences of the Proposed Action and determine if a Finding of No Significant Impact
21 (FONSI) and Finding of No Practicable Alternative (FONPA) are appropriate.

22 **1.5 Related Documents**

23 Documents related to the Proposed Action include the following:

- 24 • *Recapitalization Master Plan for U.S. Army Ranger School*, Contract No. W912HN-04-
25 D-0033, DO 007. March, 2006.
- 26 • *Army Ranger Training, Safety Improvements Need to Be Institutionalized*, U.S. General
27 Accounting Office Report to Congressional Committees. 1997.

- 1 • *Camp Rudder Future Development Plan*, Prepared as an Element of Ranger Training
2 Brigade Real Property Recapitalization Plan, Contract No. W912HN-04-D-0033, DO
3 007. March, 2006.
- 4 • *Future Development Plan Update Briefing for Camp Rudder*, Eglin AFB, Florida.
5 September 2009.
- 6 • *Future Development Plan - Update for Camp Rudder, Eglin AFB, Florida*. February
7 2010.
- 8 • *6th Ranger Training Battalion Pre-Environmental Assessment Review*. April, 2005.
- 9 • *Environmental Impact Statement for Proposed Implementation of the Base Realignment*
10 *and Closure (BRAC) 2005 Decisions and Related Actions at Eglin AFB, FL*. October
11 2008.
- 12 • *Programmatic Environmental Assessment for Culvert Repairs on Range Roads at Eglin*
13 *AFB*. April 1994.
- 14 • *Programmatic Environmental Assessment for Range Roads*. December 2002.
- 15 • *Range Road Maintenance, Environmental Baseline Document, Rev 1*. June 2009.
- 16 • *Eglin Air Force Base Stream Crossings Manual*. September 2007.
- 17 • *DoD Antiterrorism Standard*, Department of Defense (DoD) Instruction. December,
18 2006.
- 19 • *Antiterrorism*. Air Force Instruction (AFI) 10-245. March, 2009.
- 20 • *Antiterrorism*. Army Regulation 525-13. January, 2002.

21 **1.6 Scope of the Environmental Assessment**

22 An environmental analysis of the Proposed Action was initiated by the 6th RTBn with
23 submission of Air Force Form 813, *Request for Environmental Impact Analysis*, to the
24 Environmental Management Division, Stewardship Branch, Environmental Analysis Section.
25 Through review of the Air Force Form 813, the Environmental Analysis Section determined that
26 an EA is required. The Air Force Form 813 Report Control System (RCS) numbers for this
27 project are 09-304 and 09-305.

1 This EA identifies, describes, and evaluates the potential environmental impacts associated with
2 the Proposed Action. Cumulative impact, or the impact of the Proposed Action in concert with
3 other relevant, on-going or planned actions, is evaluated in Section 4.0.

4 This EA has been prepared in accordance with the following regulations:

- 5 • National Environmental Policy Act (NEPA) of 1969 (Public Law 91-190, Title 42,
6 Chapter 55, U.S. Code (USC), Sections 4321-4347 [42 USC 4321-4347])
- 7 • President's Council on Environmental Quality (CEQ) Regulation, 40 Code of Federal
8 Regulations (CFR) 1500-1508, *Regulations for Implementing the Procedural Provisions*
9 *of the National Environmental Policy Act*, dated November 28, 1978
- 10 • 32 CFR Part 989, *Environmental Impact Analysis Process (EIAP)*, dated July 15, 1999, is
11 the U.S. Air Force's implementing regulation for NEPA
- 12 • 32 CFR Part 651, *Environmental Analysis of Army Actions, Final Rule*, dated March 29,
13 2002, is the U.S. Army's implementing regulation for NEPA
- 14 • 23 CFR Part 771, *Environmental Impact and Related Procedures*

15 **1.6.1 Issues Eliminated from Detailed Analysis**

16 Based on preliminary analysis of the scope of the Proposed Action and the No-Action
17 Alternative, the Air Force eliminated the following issues from further analysis.

18 **Air Space**

19 Air space is not reasonably expected to be affected by the Proposed Action and has therefore
20 been eliminated from further analysis. Compliance with Bird Aircraft Strike Hazard (BASH)
21 protocol in regards to placement of stormwater infrastructure associated with the Proposed
22 Action would be addressed during design.

23 **Asbestos**

24 Asbestos is not reasonably expected to be encountered or affected by the Proposed Action and
25 has therefore been eliminated from further analysis.

26 **Environmental Justice**

27 AFI 32-7061 and Executive Order (EO) 12898, *Federal Actions to Address Environmental*
28 *Justice in Minority Populations and Low-Income Populations*, instruct federal agencies to

1 consider the potential for a Proposed Action to cause disproportionately high and adverse health
2 effects on minority populations and low-income populations. Neither minority populations nor
3 low-income populations exist in the vicinity of the Proposed Action and adverse impact from the
4 Proposed Action is not reasonably expected. Environmental Justice has therefore been
5 eliminated from further analysis.

6 **Hazardous Materials and Hazardous Waste**

7 The Proposed Action may utilize hot asphalt as paving material. Hot asphalt is considered a
8 hazardous material (a Class 3 Flammable Liquid) by 49 CFR 172.101. The Army would ensure
9 that any hot asphalt generated or used in the Proposed Action would be managed in accordance
10 with all local, state, and federal requirements. The Proposed Action is not reasonably expected
11 to generate or require the use of any other hazardous materials or wastes.

12 Preliminary analysis of the Proposed Action was made with respect to two relevant, though not
13 necessarily hazardous, environmental issues: contamination sites and military munitions sites.
14 Through the Environmental Restoration Program (ERP), the Air Force has identified suspected
15 contamination sites (areas of concern, or AOCs) and known contamination sites (ERP sites) on
16 Eglin AFB. No AOCs or ERP sites occur within the footprint of any potential route for the
17 Proposed Action. Four ERP sites, ST-254 (Auxiliary Field No. 6 - Water Tower), ST-56 (a
18 former 2,500-gallon underground storage tank at Camp Rudder Building 6005), and OT-269, and
19 OT-270 (former cattle dipping vats), occur at respective distances of 20 feet, 800 feet, 4,118 and
20 4,490 feet from potential routes for the Proposed Action. All four sites are closed; ST-254 and
21 ST-56 with No Further Action status; and OT-269 and OT-270 with land-use control (LUC)
22 restrictions. These sites are not reasonably expected to be affected by the Proposed Action and
23 have therefore been eliminated from further analysis.

24 The Army recognizes the potential for discovery of contaminated media within the footprint of
25 the Proposed Action. If any evidence of contamination, such as suspect odors, stained soil,
26 buried foreign material, or abnormal groundwater odors were encountered, construction would
27 cease and notification would be made to the Eglin Environmental Management Restoration
28 branch.

29 Munitions-related activities required for military readiness create the potential for the presence of
30 unexploded ordnance (UXO), discarded military munitions (DMM), and munitions constituents

1 (MC). Through the Military Munitions Response Program (MMRP), the Air Force inventories
2 and addresses the potential safety, health, and environmental issues caused by past munitions
3 related activities located on “other than operable ranges.”

4 Phase I Comprehensive Site Evaluations were conducted for several sites in 2007 and those
5 requiring Phase II investigation were performed in 2011. In total, five Munitions Response Sites
6 (MRS) are in the vicinity of routes potentially accessed to reach Camp Rudder, as follows:

- 7 • XU656C is adjacent to RR 211
- 8 • XU656B is located approximately 255 feet south of RR 211
- 9 • XU656A is located approximately 210 feet west of RR 211
- 10 • XU657E is located approximately 0.85 miles north of RR 213.
- 11 • XU656E is located approximately 2.3 miles southeast of RR 213.

12 Each of these sites has been closed with No Further Action and are not reasonably expected to be
13 affected by the Proposed Action. As such, these have been eliminated from further analysis.

14 However, Eglin and the Army recognize the potential for discovery of unanticipated UXO or
15 DMM when performing construction within a test range, therefore any construction within the
16 footprint of the Proposed Action must be coordinated through Eglin Range Safety and Eglin
17 AFB Explosive Ordnance Disposal (EOD) Unit, who would determine whether UXO Survey or
18 Construction support would be required in conjunction with the Proposed Action.

19 **Lead-based paint**

20 Lead-based paint would not be utilized in the Proposed Action and is not reasonably expected to
21 be encountered. Lead-based paint has therefore been eliminated from further analysis.

22 **Polychlorinated bi-phenyls**

23 Polychlorinated bi-phenyls (PCBs) would not be utilized in the Proposed Action and are not
24 reasonably expected to be encountered. PCBs have therefore been eliminated from further
25 analysis.

1 **Radon**

2 The Proposed Action does not occur in an area where radon has been identified at elevated
3 levels, nor in an area identified as has having a high potential for elevated levels. Radon has
4 therefore been eliminated from further analysis.

5 **Socioeconomics**

6 Socioeconomics addresses the potential for positive and negative impacts on the economy in and
7 around the area of the Proposed Action. During the construction phase, it is likely that the
8 project would create construction jobs, thus, the local economy may experience a small-scale
9 temporary positive impact. The Proposed Action is not expected to have any negative impacts
10 on employment, housing, Eglin AFB, or Okaloosa County services. Therefore, socioeconomic
11 issues were eliminated from further consideration.

12 **Utilities**

13 Construction activities associated with the Proposed Action may require the repositioning of any
14 existing utilities coinciding with the route. The Army and the construction contractor would
15 coordinate with on-base and local utility service providers during construction to ensure
16 continued service, therefore decreases in the level of service to surrounding areas are not
17 anticipated.

18 Conversely, the implementation of the Proposed Action may provide opportunity to achieve
19 necessary installation or upgrades of utilities during the time of road construction. Utility
20 easements in conjunction with the Proposed Action would require completion of an
21 Environmental Baseline Survey (EBS) prior to Eglin granting an easement request. It is
22 recognized that fiber optic communication lines (high-speed internet/communications) are very
23 likely to utilize whatever new route is put in service as there is an identified need for such service
24 at Camp Rudder (Hicks, 2014).

25 Further analysis for potential utilities impact was not conducted.

26 **1.6.2 Issues Studied in Detail**

27 Preliminary analysis based on the scope of the Proposed Action and the No-Action Alternative
28 identified the following potential environmental issues warranting detailed analysis:

- 1 • Air Quality
- 2 • Biological Resources
- 3 • Coastal Zone Management
- 4 • Cultural Resources
- 5 • Geological Resources
- 6 • Land Use
- 7 • Noise
- 8 • Safety
- 9 • Solid Waste
- 10 • Transportation
- 11 • Water Resources, including groundwater, surface water, stormwater, wetlands, and
- 12 floodplains

13 **1.7 Summary of Key Environmental Compliance Requirements**

14 **1.7.1 National Environmental Policy Act**

15 NEPA (42 USC Section 4321–4347) is the federal statute that requires identification and analysis
16 of potential environmental impacts associated with proposed federal actions before those actions
17 are taken. NEPA established the CEQ, which is charged with the development of regulations
18 that ensure federal agency compliance with NEPA as codified in 40 CFR 1500-1508. For
19 actions initiated by the Air Force and the Army, NEPA is implemented through 32 CFR 989 and
20 32 CFR 651, respectively. CEQ regulations specify that an EA be prepared to briefly provide
21 evidence and analysis for determining whether to prepare a FONSI/FONPA or whether the
22 preparation of an Environmental Impact Statement (EIS) is necessary. The EA can aid in an
23 agency’s compliance with NEPA when an EIS is unnecessary and can facilitate preparation of an
24 EIS when one is required.

25 **1.7.2 Integration of Other Environmental Statutes and Regulations**

26 NEPA compliance requires that the planning and decision-making process integrate relevant
27 environmental statutes and regulations. The NEPA process, however, does not replace
28 procedural or substantive requirements of other environmental statutes and regulations. Rather,

1 it addresses them collectively in the form of an EA or EIS, which provides the decision-maker
2 with a comprehensive view of major environmental issues and requirements associated with the
3 Proposed Action.

4 As the proponent undertaking a Proposed Action on an Air Force installation, the Army must
5 consider Army policy, Air Force policy, applicable DoD policies, and federal law. This EA
6 evaluates the Proposed Action Alternatives and the No-Action Alternative with consideration
7 given to the regulatory requirements of the following legislation:

- 8 • Noise Control Act of 1972 (42 USC Sections 4901-4918)
- 9 • Clean Air Act (CAA) (42 USC 7401 et seq)
- 10 • Clean Water Act of 1972 (CWA) (33 USC Sections 1251-1376)
- 11 • National Historic Preservation Act of 1966 (NHPA) (16 USC 470 et seq)
- 12 • Endangered Species Act of 1973 (ESA) (16 USC Sections 1531-1544)
- 13 • Migratory Bird Treaty Act (MBTA) (16 USC Sections 703-712)
- 14 • Coastal Zone Management Act (CZMA) (16 USC Sections 1451-1464)
- 15 • Resource Conservation and Recovery Act of 1976 (RCRA) (42 USC Sections 6901-
16 6992)
- 17 • Toxic Substances Control Act of 1970 (TSCA) (15 USC Sections 2601-2671)
- 18 • Occupational Safety and Health Act (OSHA) (29 USC Sections 651)
- 19 • Environmental Impact and Related Procedures, 23 CFR Part 771

20 Additionally, this EA takes into consideration the following instructions and orders:

- 21 • AFI 32-7040, Air Quality Compliance
- 22 • AFI 32-7065, Cultural Resources Management
- 23 • AFI 32-7064, Integrated Natural Resource Management
- 24 • AFI 32-9003, Granting Use of Real Property
- 25 • AFI 91-202, The U.S. Air Force Mishap Prevention Program
- 26 • Air Force Pamphlet (AFPAM) 91-212, Bird/Wildlife Aircraft Strike Hazard Management
27 Techniques
- 28 • Air Force Policy Directive (AFPD) 32-70, Environmental Quality
- 29 • AFPD 91-2, Air Force Safety Program

- 1 • AR 385-10, Army Safety Program
- 2 • EO 11988, Floodplain Management
- 3 • EO 11990, Protection of Wetlands
- 4 • EO 12088, Federal Compliance with Pollution Control Standards
- 5 • EO 12898, Federal Actions to Address Environmental Justice in Minority Populations
- 6 and Low-Income Populations
- 7 • EO 13112, Invasive Species
- 8 • Federal Aviation Administration (FAA) Advisory Circular 150/5200-33, Hazardous
- 9 Wildlife Attractants On or Near Airports

10 **1.7.3 Regulations Applicable to Actions within Wetlands or Floodplains**

11 EO 11990, *Protection of Wetlands*, states that wherever there is a practicable alternative,
12 agencies shall avoid, to the extent possible, the destruction or modification of wetlands.
13 Agencies must evaluate possible alternatives that would preserve and enhance the natural and
14 beneficial values of wetlands. If it is decided that development would take place within
15 wetlands, the agency must include all practicable measures to minimize impact to the wetlands.
16 Notification for actions affecting wetlands must be made available for public review and
17 comment before any action can take place.

18 EO 11988, *Floodplain Management*, states that wherever there is a practicable alternative,
19 agencies shall avoid, to the extent possible, the occupancy and modification of floodplains.
20 Agencies must evaluate possible alternatives that would preserve the natural and beneficial
21 values served by floodplains. If it is decided that development would take place within the
22 floodplain, the agency must include all practicable measures to minimize impact to the
23 floodplain. Building design and construction plans must meet applicable state and local
24 floodplain protection standards to minimize the impact of floods on human safety, health, and
25 welfare. Notification for actions affecting floodplains must be made available for public review
26 and comment before any action can take place.

27 44 CFR 9.6, *Floodplain Management and Protection of Wetlands - Decision Making Process*,
28 provides a specific step-by-step process which agencies must follow to comply with EO 11988.
29 Steps include the following:

- 1 • Documenting whether or not the site is in a floodplain or wetland
- 2 • Documenting foreseeable direct or indirect impacts
- 3 • Evaluating measures to minimize impacts and to restore or preserve the beneficial values
- 4 of the floodplain or wetlands
- 5 • Identifying possible alternatives
- 6 • Preparing public notice with a clearly defined explanation that development within the
- 7 floodplain or wetland is the only practicable alternative

8 AFI 32-7064, *Integrated Natural Resource Management*, addresses the management of natural
9 resources on Air Force properties to comply with federal, state and local standards. It gives Air
10 Force Major Commands and installations a framework for documenting and maintaining Air
11 Force natural resources management programs. The document is a comprehensive, 17-chapter
12 guide addressing resource areas including threatened and endangered species, fish and wildlife,
13 forest and agricultural land, wildfires, invasive species, bird aircraft strike hazards, coastal
14 resources, floodplains, and wetlands. In regards to floodplains and wetlands it mandates the
15 following be completed:

- 16 • Baseline wetlands inventories
- 17 • Jurisdictional wetland surveys
- 18 • Floodplain boundary determinations

19 For actions that may potentially affect wetlands or floodplain on Air Force installations, the
20 proponent must perform an environmental impact analysis in accordance with NEPA and the Air
21 Force EIAP in 32 CFR Part 989.

22 For actions that would take place in wetlands or the floodplain on Air Force installations, the
23 proponent must undertake the following:

- 24 • Obtain a Florida Environmental Resource Permit [Florida Administrative Code (FAC),
25 Title 62, Chapter 312 (FAC 62-312)]
- 26 • Comply with the CWA, which includes a Section 404 permit; additionally, Section 401
27 actions requiring a State Environmental Resource Permit also require a Water Quality
28 Certificate from the state water pollution control agency
- 29 • Identify mitigation measures to result in a “no net loss” of wetlands, where applicable.

- 1 • Prepare a FONSI, where applicable
- 2 • Prepare a FONPA, where applicable

3 **1.7.4 Environmental Permit Requirements**

4 The Proposed Action requires coordination with the outside agencies discussed in the
5 subsections below. As the proponent of the Proposed Action, the Army would be responsible for
6 obtaining or overseeing the acquisition of all required permits and ensuring compliance with all
7 conditions contained within those permits. A list of agencies consulted is provided in
8 **Appendix A.**

9 **1.7.4.1 Section 404 CWA Permit**

10 A Section 404 CWA Permit from the USACE Jacksonville District would be required for
11 roadway improvement activities requiring the dredge and fill of any wetlands.

12 **1.7.4.2 Environmental Resource Permit**

13 FAC 62-346, *Environmental Resource Permitting in Northwest Florida*, authorizes the
14 Northwest Florida Water Management District (NFWFMD) to regulate the construction,
15 alteration, maintenance, removal, modification, and operation of all activities in uplands,
16 wetlands, and other surface waters that would alter, divert, impede, or otherwise change the flow
17 of surface waters. The program is designed to ensure that such activities do not degrade water
18 quality or cause flooding. The increase in impervious surface associated with the Proposed
19 Action would require an Environmental Resource Permit for stormwater from the NFWFMD.

20 In accordance with the Environmental Resource Permit program, this project would be required
21 to comply with stormwater quantity/flood control criteria as well as stormwater quality criteria.
22 With Phase II of the Environmental Resource Permit program becoming effective
23 November 1, 2010 in the panhandle of Florida, regulation of stormwater management systems
24 and dredge and fill permitting were merged for a streamlined review process. As such, dredge
25 and fill activities for works impacting the wetlands, such as any bridges included in the Proposed
26 Action, would be considered concurrent with the remainder of the construction work during
27 review of the Environmental Resource Permit application and supporting documentation.

1 An Operating Agreement between the Florida Department of Environmental Protection (FDEP)
2 and NFWFMD divides review of projects within the district. FDEP has implementation
3 authority for projects that include both stormwater and dredge and fill components.

4 **1.7.4.3 Stormwater Discharge Permit for Construction Activities**

5 The Proposed Action would be expected to disturb a total of approximately 103 acres of land,
6 which would include approximately 88 acres for the roadway and an additional 15 acres for
7 stormwater ponds. A project of this size is defined as a large construction activity for permitting
8 under the state of Florida Generic Permit for Stormwater Discharge from Large and Small
9 Construction Activities under FAC 62-621.300. To obtain coverage under the Generic
10 Stormwater Permit, a notice of intent (NOI) would be filed prior to commencing construction
11 activities. As part of the permit requirements, a Stormwater Pollution Prevention Plan (SWPPP)
12 would be developed and implemented for construction as part of the Proposed Action.

13 **1.7.4.4 CZMA Consistency Determination**

14 A CZMA consistency determination has been prepared for this Proposed Action (**Appendix B**).
15 The CZMA consistency determination is reviewed for concurrence by Florida agencies through
16 the Florida State Clearinghouse process (pending).

17 **1.7.4.5 ESA Consultations**

18 The Proposed Action has the potential for impacts on sensitive species that are protected under
19 the Endangered Species Act (16 USC 1531 to 1544). Section 7 of the ESA, requires federal
20 agencies to consult with the Secretary of the U.S. Department of the Interior or U.S. Department
21 of Commerce to ensure that any action authorized, funded, or carried out by such agency is not
22 likely to jeopardize the continued existence of any threatened or endangered species, or result in
23 the destruction or adverse modification of their habitat. The U.S. Fish and Wildlife Service
24 (USFWS) was consulted on the Proposed Action Corridor regarding the potential impacts on
25 species protected under the ESA. A Biological Assessment (BA) was submitted for informal
26 consultation under Section 7 of the ESA and USFWS concurrence was received in August 2010.

1 The Florida Fish and Wildlife Commission (FFWC) will also be consulted regarding potential
2 impacts to species protected under FAC 68A-27, *Rules Relating to Endangered or Threatened*
3 *Species* as part of the Florida State Clearinghouse review process (pending).

4 **1.7.4.6 Cultural Resources Consultations**

5 The Proposed Action has the potential for impacts on cultural resources that are protected under
6 the NHPA of 1966 (16 USC 470 et seq). A NHPA Section 106 Consultation between the Eglin
7 Cultural Resource Section, the Fort Benning Cultural Resource Section, Florida State Historic
8 Preservation Officer (SHPO), and Tribal officials is currently in-process.

9 **1.8 Public and Agency Notification**

10 Draft copies of the EA have been sent to the Florida Clearinghouse for distribution to applicable
11 federal, state, and local agencies listed in **Appendix A**. The public has been notified of the
12 Proposed Action by advertisement in the local Northwest Florida Daily News, and is being given
13 an opportunity to comment. Copies of the public notices are provided in **Appendix C**.

14 The CZMA (16 USC 1451-1464), as amended, requires federal agencies carrying out activities
15 subject to the act to provide a “consistency determination” to the relevant state agency. A
16 consistency determination examines the potential environmental consequences of the Proposed
17 Action and ascertains the extent to which the consequences of the Proposed Action are consistent
18 with the objectives of Florida Coastal Management Program. This enables the state to make
19 integrated, balanced decisions that ensure the wise use and protection of the state's water,
20 property, cultural, historic, and biological resources; protect public health; minimize the state's
21 vulnerability to coastal hazards; ensure orderly, managed growth; protect the state's
22 transportation system; and sustain a vital economy. A CZMA consistency determination was
23 prepared for this Proposed Action (**Appendix B**), and has been submitted to the Florida State
24 Clearinghouse. The Clearinghouse facilitates a multi-agency review of the EA and determines if
25 the Proposed Action is consistent with the Florida Coastal Management Plan.

26 **1.9 Organization of this Document**

27 This EA follows the organization established by the CEQ regulations (40 CFR 1500-1508). This
28 document consists of the following chapters and appendices.

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3 document consists of the following chapters and appendices.

4 **Section 1** - Purpose of and Need for Action

5 **Section 2** - Description of Proposed Action and Alternatives

6 **Section 3** - Affected Environment

7 **Section 4** - Environmental Consequences

8 **Section 5** – Plans, Permits, and Management Requirements

9 **Section 6** – Irreversible and Irretrievable Commitment of Resources

10 **Section 7** - List of Preparers

11 **Section 8** - List of Agencies and Persons Contacted

12 **Section 9** - References

13 **Appendix A** - Agency Recipient List

14 **Appendix B** - Coastal Zone Management Act Consistency Determination

15 **Appendix C** - Public Notice

16 **Appendix D** - Cultural Resources Documentation

17 **Appendix E** - Biological Assessment

18 **Appendix F** - Air Data Calculations

19

1 **2.0 Description of Proposed Action and Alternatives**

2 In accordance with NEPA and AFD 32-70, *Environmental Quality*, the Air Force must analyze
3 the Proposed Action with respect to its potential environmental impact, the relationship between
4 local short-term uses of man's environment and the maintenance and enhancement of long-term
5 productivity, and any irreversible and irretrievable commitments of resources which would be
6 involved if the Proposed Action were implemented.

7 NEPA and AFD 32-70 also require the Air Force to analyze reasonable alternatives to the
8 Proposed Action. Reasonable alternatives are those that meet the underlying purpose and need
9 for the Proposed Action and cause a reasonable person to inquire further before choosing a
10 particular course of action. Alternatives may be eliminated from detailed analysis based on
11 operational concerns, technical standards, environmental standards, or other factors applicable to
12 a particular project.

13 **2.1 Proposed Action**

14 The Proposed Action is to provide a route of primary access to Camp Rudder with ingress/egress
15 relatively unencumbered by missions-related closures. The Proposed Action considers seven
16 prospective alternative routes as identified below and depicted in **Figure 2-1**:

- 17 • Alternative Route A: RR 257/236/Holt Bridge - Northern Route
- 18 • Alternative Route B: RR 257/211 - Eastern Route, Asphalt
- 19 • Alternative Route C: RR 257/211 - Eastern Route, Clay-Based
- 20 • Alternative Route D: RR 257/211/241/215 - Eastern Route
- 21 • Alternative Route E: RR 211/257 - Western Route
- 22 • Alternative Route F: RR 600/215 - Eastern Route
- 23 • Alternative Route G: RR 257/213 - Southwestern Route

24 **2.1.1 Alternative Route A: RR257/236/Holt Bridge-Northern Route**

25 ***Route***

26 Alternative Route A would offer a primary two-lane asphalt access route north out of Camp
27 Rudder utilizing RR 257 and RR 236 and would require building a bridge over the Yellow River
28 and connecting to private property on Log Lake Road toward Holt, Florida (**Figure 2-2**).

1 ***Construction Details***

2 Prior to 1940, the Log Lake Bridge
3 crossed the Yellow River at this
4 proposed alternative crossing and
5 was utilized to get to the southern
6 part of the county. In June 1940, the
7 U.S. Forestry Service ceded the
8 Choctawhatchee National Forest,
9 consisting of some 384,000 acres
10 including this area, to the War
11 Department. Due to security



12 measures precluding it as an access point into the base and resulting lack of use, the bridge was
13 not maintained and fell into disrepair over the years. The last remnants of the bridge were
14 removed from the river for safety reasons following Hurricane Ivan in 2004, and are currently
15 displayed at the River's Edge Campground on the northern shore of the Yellow River.

16 This alternative would require re-establishing the former route through the swamp/floodplains of
17 the Yellow River northwest of RR 236. Meeting floodplain requirements would entail a
18 combination of lengthy approaches and a bridge of approximately 5,000 to 6,000 feet in length.

19 This route would involve upgrading RR 257 and RR 236 from secondary dirt roads to primary
20 asphalt roads, and construction of the bridge to connect Eglin property on the south side of the
21 river to a parcel of private land on the north side, requiring purchase or lease agreement from the
22 current owner. The route would follow the existing Log Lake Road to I-10 in Holt, Florida for a
23 total distance of approximately 5.1 miles. During the design phase, roadway engineers would
24 incorporate roadway safety characteristics, security measures, and stormwater infrastructure, as
25 needed.

26 ***Applicability to Objectives***

- 27
- ***Reduced Impact to the 6th RTBn Mission:*** This route would generally avoid road closures
28 associated with mission safety footprints and would minimize mission impact to the
29 6th RTBn by providing a minimally encumbered route of primary ingress/egress. In

1 addition, this route would enhance the 6th RTBn mission by facilitating improved and
2 dependable delivery of all facility provisions such as fuel, food, paper goods, etc.

- 3 • Improved Safety: This route would direct traffic north 3.2 miles out of the Eglin
4 reservation and away from the active test ranges thereby increasing the level of safety for
5 all traffic to and from Camp Rudder.
- 6 • Improved Emergency Response: Using this alternative the nearest hospital would be 16.5
7 miles from Camp Rudder and considering the 65 mile per hour (mph) speed limit on I-10,
8 this route would provide the quickest access to a hospital of all the Route Alternatives
9 and would expedite the access for First Responders, MEDEVAC crews, and fire response
10 from the neighboring communities of Holt and Crestview.
- 11 • Enhanced Hurricane Evacuation: The short distance (~5.1 miles) between Camp Rudder
12 and I-10 (a four-lane interstate) would provide a convenient and efficient hurricane
13 evacuation route by allowing almost immediate access to a major east/west route (I-10).
14 It is likely that Okaloosa County would make arrangements with Eglin and Camp Rudder
15 personnel to allow other residents to access this route for the purpose of hurricane
16 evacuation.
- 17 • Minimized Impact to Eglin AFB's Mission and Operations: Since this route would exit
18 the Eglin reservation 3.2 miles due north, there would be minimal to no direct impact on
19 Eglin's Mission. However, this Alternative would create a substantial indirect impact by
20 opening an additional primary route directly into the ETTA. This access would create a



possible security issue by encouraging direct access from I-10. An overall increase of traffic would enter a remote part of the ETTA and an associated increase in the “attractive nuisance” aspect into the area such as un-permitted recreation, poaching, and dumping would be expected.

Furthermore, since Eglin does not own the property north of the southern

1 shore of the Yellow River, this Alternative would require the purchase of private property
2 and would fall under the Uniform Relocation Assistance and Real Property Acquisition
3 Policies Act of 1970, P.L. 91-646, (Uniform Act), amended in 1987. Approvals for this
4 measure are outside the scope of this assessment and land acquisition is not in line with
5 the current Eglin Mission and Operations.

6 **2.1.2 Alternative Route B: RR257/211- Eastern Route, Asphalt**

7 *Route*

8 Alternative Route B would offer a primary two-lane asphalt access route north out of Camp
9 Rudder utilizing RR 257 to RR 211, then east along RR 211/Rattlesnake Bluff Road to SR 85,
10 for a total distance of approximately 12 miles (**Figure 2-3**).

11 *Construction Details*

12 This Alternative would involve upgrading RR 257 and 211 from gravel/dirt roads (secondary) to
13 a primary paved two-lane roadway and would include up to eight or nine small bridges where
14 RR 211 crosses tributaries of the Yellow and Shoal Rivers.

15 The area considered for this Alternative includes a 400-foot swath generally bordering existing
16 RR 211 from the intersection with RR 257 to the interchange at SR 85, a total area of
17 approximately 581 acres. Of the 400-foot swath under study, it is expected that a width of 40-60
18 feet would be all that is required to support construction of the upgraded roadway, and the
19 associated acreage would depend on the extent the existing roadway is retained. It is expected
20 that approximately 88 acres would be necessary for the roadway and an additional 15 acres
21 would be required for stormwater ponds.

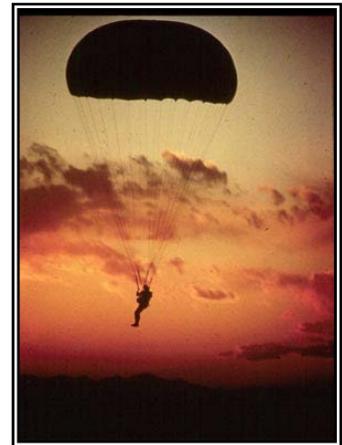
22 Okaloosa County holds an easement for Rattlesnake Bluff Road which extends from SR 85 to
23 the center of Section 16, Township 2-North, and Range 24-West. The county currently
24 maintains the road from SR 85 west to Jenkins Road, for a distance of approximately 3.8 miles
25 (Henderson, 2010). County maintenance enables private citizens to reliably access their land
26 that is bounded by the Shoal River and Eglin AFB. Although these 3.8 miles are currently
27 maintained as clay-based, under Alternative Route B this portion would be asphalted as part of
28 the Proposed Action. Bridges requiring update would be upgraded or replaced to accommodate
29 two-way traffic and increased load weights.

1 Due to the expected increase in traffic with this Alternative, it is likely that the intersection at SR
2 85 would require upgrade such as turning lanes, a signalized interchange, an overpass, or other
3 safety improvements as discussed below in Section 4.10. Additionally, this alternative would
4 cross the Florida National Scenic Trail in two places: east of both Carr Spring Branch and Crain
5 Pond (**Figure 3-4**). Construction would include appropriate access points and proper signage to
6 provide safe crossings for recreational trail users during all phases of construction.

7 The 400-foot swath under study for this Alternative includes ample acreage to accommodate re-
8 engineering of dangerous curves to improve roadway safety and line of sight for drivers; route
9 shifts to accommodate sensitive resources; and acreage required to accommodate stormwater
10 infrastructure necessary to alleviate road to creek runoff currently observed. Initial engineering
11 evaluations of this alternative indicate that a two-lane asphalt roadway with a speed limit of 45
12 mph could be constructed in an expanded area generally consistent with the current alignment,
13 thus minimizing the overall amount of clearing and grubbing required.

14 *Applicability to Objectives*

- 15 • Reduced Impact to the 6th RTBn Mission: The Army's 7th
16 Special Forces Group (Airborne) or 7th Special Forces Group
17 (SFG) has constructed a cantonment area within the Eglin
18 reservation due east of Camp Rudder. This complex includes
19 operations and maintenance facilities; housing; dining
20 facilities; and munitions storage and loading facilities. In
21 addition, the 7th SFG utilizes portions of the Eglin Range to
22 accommodate their "Backyard Ranges" and maintains the
23 associated safety footprints necessary for training and
24 exercises (**Figure 2-3**).



25 This alternative route runs north/northeast generally paralleling the northern boundary of
26 the Eglin reservation, just north of the both the FTS and the Alternate FTS lines and just
27 north of the proposed 7th SFG "Backyard Range" area. This route would generally avoid
28 road closures associated with mission safety footprints and would minimize the 6th RTBn
29 mission impact; and would likely enhance the mission by providing a minimally

1 encumbered route of primary ingress/egress. In addition, it would provide the 6th RTBn a
2 dependable and improved delivery route for all facility provisions.

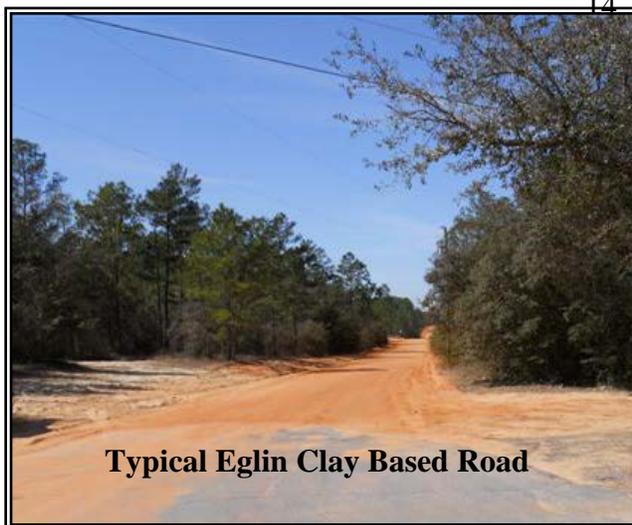
- 3 • Improved Safety: Safety would be enhanced by directing traffic north/northeast generally
4 paralleling the northern boundary of the Eglin reservation and out of ETTA safety
5 footprints. Furthermore, the current route utilizes roads with unimproved surfaces that
6 are frequently in poor condition due to weathering. The resulting pot holes, washboard
7 ruts, and washouts can affect vehicle traction. Numerous instances of vehicles leaving
8 the roadway and getting stuck have been documented. The paved route considered in
9 Alternative Route B would allow for consistently dependable, safe travel to and from the
10 camp.
- 11 • Improved Emergency Response: Using this alternative, the nearest hospital would be in
12 Crestview and would be accessed using the improved range roads and SR 85 for a total
13 travel distance of approximately 16 miles. A more direct connection to SR 85 would
14 enable First Responders and MEDEVAC crews to access the facility readily from the
15 north (Crestview) and from the south (Eglin Main, Niceville, and Fort Walton Beach). It
16 is reasonable to expect emergency response times of less than 20-25 minutes considering
17 the direct route, paved surface, and minimal mission-related road closures.
- 18 • Enhanced Hurricane Evacuation: This route would provide a more direct and efficient
19 evacuation route from Camp Rudder to SR 85 (~12 miles east) versus the current primary
20 access route which directs traffic south (toward the coast) before being directed east, west
21 or north. Furthermore, this route would tie in to SR 85 approximately 3.1 miles south of
22 I-10 as compared to the current route which ties in to SR 85 approximately 16.5 miles
23 south of I-10. When travel times of up to 8-hours from Eglin AFB to I-10 in Crestview
24 during previous hurricane evacuations are considered, this route would offer substantial
25 savings in travel time for those at the camp.
- 26 • Minimized Impact to Eglin AFB's Mission and Operations: This route runs
27 north/northeast generally paralleling the northern boundary of the Eglin reservation, just
28 north of both the FTS and the Alternate FTS lines, and just north of the 7th SFG
29 “Backyard Range” area. Increased traffic along this route would have a minor impact on
30 range planning for exercises with Helicopter Landing Zones (HLZs), Night Vision

1 Device (NVD) and ground maneuvers. Although this route already exists, asphaltting it
2 would increase the Level of Service (LOS) for the roadway into the ETTA and thus may
3 create a possible security issue by increasing the “attractive nuisance” aspect into the area
4 such as dumping, poaching, unpermitted recreation, etc. However, installation of an
5 access control gate (manned or self-service) is not precluded by any foreseeable obstacle.
6 A gate would be for use by authorized personnel only and would help control the flow of
7 essential traffic and alleviate nuisance traffic along this route, thereby minimizing impact
8 or encroachment issues to Eglin’s Mission.

9 **2.1.3 Alternative Route C: RR257/211- Eastern Route, Clay-Based**

10 ***Route***

11 Alternative Route C would follow the same route as Alternative Route B and would offer a
12 primary improved clay-based two-lane roadway from the intersection of RR 257 and RR 211 and
13 extending east on RR 211 to SR 85 (**Figure 2-3**).



Construction Details

This alternative would involve upgrading the existing road which is primarily sand/dirt with intervals of existing clay-base. The road would be re-graded and surfaced with packed clay to improve the stability and reduce erosion. The construction would incorporate vertical and horizontal alignment corrections where appropriate so that travel speeds can be increased above the current conditions. As

24 with Alternative B, route shifts to accommodate sensitive resources and stormwater
25 infrastructure would be implemented along the route; and bridges would be upgraded to
26 accommodate safer passage and increased load weights, as needed.

27 ***Applicability to Objectives***

- 28 • ***Reduced Impact to the 6th RTBn Mission:*** This alternative, as with Alternative B, would
29 generally avoid road closures associated with mission safety footprints and would

1 minimize the 6th RTBn mission impact. However, the clay-based roadway would remain
2 vulnerable to degradation from heavy storm events and may not remain reliable for safe
3 or timely passage during inclement weather. This alternative would enhance the 6th
4 RTBn mission and would provide the 6th RTBn a provisionally dependable and improved
5 delivery route for facility supplies and equipment.

- 6 • Improved Safety: This route would direct traffic north/northeast generally paralleling the
7 northern boundary of the Eglin reservation and ET TA and thus would increase the level
8 of safety for all traffic to and from Camp Rudder. However, unlike the paved roadway,
9 the clay-based roadway may not support speed limits above 35 mph and would remain
10 vulnerable to degradation from inclement weather.
- 11 • Improved Emergency Response: Using this alternative, the improved hospital distance
12 and First Responder and MEDEVAC access would provide the same benefit as
13 Alternative B. However, unlike the paved roadway, the clay-based roadway would
14 remain vulnerable to degradation from inclement weather.
- 15 • Enhanced Hurricane Evacuation: The distance to the nearest public highway (SR 85)
16 would be improved by providing an upgraded, more direct route off of Eglin (~12 miles
17 east). However unlike the paved roadway, the clay-based roadway would remain
18 vulnerable to degradation from extended periods of inclement weather and could rapidly
19 decline during pre-hurricane storms. As such, this alternative may not provide maximum
20 benefit for hurricane evacuation efforts.
- 21 • Minimized Impact to Eglin AFB's Mission and Operations: The impact expected on the
22 Eglin mission is the same for Alternative C as it would be for Alternative B.

23 **2.1.4 Alternative Route D: RR 257/211/241/215- Eastern Route**

24 ***Route***

25 Alternative Route D would offer a primary two-lane asphalt access route east out of Camp
26 Rudder utilizing RR 257 to RR 211 to RR 241, where it would turn southeast to RR 215 and then
27 due east to SR 85, for a total distance of approximately 13.9 miles (**Figure 2-4**). RR 215 is
28 currently being upgraded as part of the 7th SFG Complex construction effort and connection to

1 this range road would reduce the amount of road requiring upgrading for this alternative from
2 13.9 miles to approximately 8.5 miles.

3 ***Construction Details***

4 This Alternative would involve upgrading portions of RRs 257, 211, and 241 from secondary dirt
5 roads to primary asphalt two-lane roadways and would include up to four bridges where the
6 route crosses tributaries of the Yellow River. Existing bridges would be upgraded or replaced to
7 accommodate two-way traffic and increased load weights, as needed. Where feasible, safety and
8 LOS would be enhanced through vertical, horizontal, and surface improvements and security
9 measures and stormwater infrastructure would be implemented along the route, as needed.

10 ***Applicability to Objectives***

- 11 • ***Reduced Impact to the 6th RTBn Mission:*** The 7th SFG Complex has recently been
12 constructed due east of Camp Rudder. This alternative route would traverse the 7th SFG
13 “Backyard Ranges,” the Alternate FTS line area and enter active test areas and would be
14 subject to mission-related road closures. It is likely that this route could be subject to
15 substantially more and possibly longer closures than the current primary route and thus
16 would not reduce the impact to the 6th RTBn mission or provide an improvement over
17 current conditions.
- 18 • ***Improved Safety:*** Since this route would traverse the Alternate FTS line area and the
19 7th SFG Backyard Ranges Surface Danger Zone (SDZ) and enter into active ETTA areas,
20 safety would not be improved and could possibly be diminished.
- 21 • ***Improved Emergency Response:*** Using this alternative the nearest hospital would be in
22 Crestview and would be accessed using the improved range roads and SR 85 for a total
23 travel distance of approximately 21 miles. The connection to SR 85 would enable First
24 Responders and MEDEVAC crews to access the facility from the north (Crestview) and
25 from the south (Eglin Main, Niceville, and Fort Walton Beach). However, due to
26 traversing the active test and training areas, the emergency response time or ability to
27 respond could be hampered due to active missions.
- 28 • ***Enhanced Hurricane Evacuation:*** The distance to the nearest public highway (SR 85) off
29 of Eglin is approximately 14 miles east; however it is not a direct route. Additionally,

1 this route would introduce traffic approximately 6.3 miles south of I-10 as compared to
2 the current route which ties in to SR 85 approximately 16.5 miles south of I-10. When
3 travel times of up to 8-hours from Eglin AFB to I-10 in Crestview during previous
4 hurricane evacuations are considered, this route would offer moderate savings in travel
5 time for those at the camp.

- 6 • Minimized Impact to Eglin AFB's Mission and Operations: This route would direct
7 “non-participatory traffic” into the Alternate FTS line area and through the 7th SFG
8 Backyard Ranges SDZ which would impact troop movement and training activities.
9 Increased traffic along this route would have a moderate impact on range planning for
10 exercises with HLZs, NVD, and ground maneuvers. Although this route already exists,
11 improving to a primary asphalt roadway would increase the LOS into the ETTA and the
12 7th SFG Backyard Range and thus create a significant security issue by increasing the
13 “attractive nuisance” aspect into the area.

14 To avoid effect to the Backyard Ranges, this route would require a mission gate to
15 intercept and divert traffic to RR 211 in the event of a mission. Continued or increased
16 use of RR 211 in its current condition would cause further road degradation, erosion, and
17 bridge depreciation which may lead to increased incidents or accidents. RR 211 would
18 continue to be impassable during wet weather and would not support large, heavy
19 vehicles nor reliably support emergency actions.

20 **2.1.5 Alternative Route E: RR 257/211- Western Route**

21 ***Route***

22 Alternative Route E would offer a primary asphalt two-lane access route north and west out of
23 Camp Rudder utilizing RR 257 to RR 211 and westward to SR 87, for a total distance of
24 approximately 14.5 miles (**Figure 2-5**). This would direct traffic onto SR 87 approximately
25 6 miles south of I-10 and 11.5 miles southeast of Milton.

26 ***Construction Details***

27 This Alternative would involve upgrading RR 257 and 211 from secondary dirt roads to primary
28 asphalt two-lane roadways and would include up to six bridges where the route crosses
29 tributaries of the Yellow River. Existing bridges would be expanded to accommodate two-way

1 traffic and increased load weights, as needed. The current condition of RR 211 west of Camp
2 Rudder degrades significantly when compared to the eastern portion of RR 211. Initial
3 engineering evaluations of this alternative indicate that constructing a two-lane asphalt roadway
4 with a speed limit of 35 mph or higher would require substantial improvements to vertical and
5 horizontal curves throughout the route and would likely necessitate the final route to exceed the
6 current roadway footprint.

7 *Applicability to Objectives*

- 8 • Reduced Impact to the 6th RTBn Mission: This route would direct traffic southwest
9 toward TAs B-7 and B-75. Just west of Camp Rudder this route would enter into a very
10 active portion of the ETTA. Specifically, the road would cross into the Joint Direct
11 Attack Munition (JDAM) and would be within FTS line and the “large weapons area
12 safety footprint.” It is likely that this route could be subject to substantially more and
13 possibly longer closures than the current primary route and thus would not reduce the
14 impact to the 6th RTBn mission or provide an improvement over current conditions.
15 Additionally, routing support, supplies, and contractors from SR 87 would further
16 interfere with the logistical support of the camp by increasing travel time and distance for
17 suppliers.
- 18 • Improved Safety: Since this route would traverse the FTS line and enter the “large
19 weapons area safety footprint,” safety would not be improved and could possibly be
20 diminished. Therefore, the safety of this route would not be an improvement over the
21 current primary access due to Eglin missions.
- 22 • Improved Emergency Response: Using this alternative the nearest hospital would be in
23 Milton and would be accessed using the improved range roads and SR 87 for a total
24 travel distance of approximately 26 miles. The connection to SR 87 would enable First
25 Responders and MEDEVAC crews to access the facility readily from the northwest
26 (Milton) and from the southwest (Navarre). However, due to traversing the active test
27 and training areas, the emergency response time or ability to respond could be hampered
28 due to active missions and thus would not be an improvement.
- 29 • Enhanced Hurricane Evacuation: The distance to the nearest public highway (SR 87) off
30 of Eglin would be approximately 14.5 miles west. SR 87 is a rural highway and has a

1 history of being a “bottleneck” during recent hurricane evacuations from the coastal areas
2 of Navarre and southern Santa Rosa County. The majority of the cadre that live off-post,
3 reside in Crestview, Niceville, and Fort Walton Beach, therefore this route would
4 potentially direct personnel west 14.5 miles away from their homes. This alternative
5 would not appreciably enhance the hurricane evacuation efforts for Camp Rudder.

- 6 • Minimized Impact to Eglin AFB’s Mission and Operations: This route would direct
7 “non-participatory traffic” into the FTS line area and the “large weapons area safety
8 footprint” which would significantly impact Eglin’s ability to plan and execute missions.
9 In addition, during construction of this alternative it is likely the Eglin mission would be
10 impacted while trying to accommodate the construction schedule.

11 **2.1.6 Alternative Route F: RR 600/215- Eastern Route**

12 Alternative Route F would offer a primary asphalt two-lane access route east out of Camp
13 Rudder utilizing RR 600 to RR 215 to SR 85, for a total distance of approximately 12 miles
14 (**Figure 2-6**). RR 215 is currently being upgraded as part of the 7th SFG Complex construction
15 effort and connection to this range road would reduce the amount of road requiring upgrading for
16 this alternative from 12 miles to approximately 7.5 miles.

17 ***Construction Details***

18 This alternative would involve upgrading RR 600W/600E (secondary dirt roads) east out of
19 Camp Rudder and connecting to RR 215. The upgrade would require constructing the roadway
20 around or across the causeway/dam at Prisoners Pond (Metts Creek) and the installation of
21 possibly up to four bridges to cross tributaries to the Yellow River. In addition, RR 600 does not
22 currently connect with RR 215. The first opportunity to route to the north and connect to RR
23 215 is just after crossing the head of Turkey Gobbler Creek around the intersection of RRs
24 660E/238/616 and may require one additional bridge. Existing bridges would be expanded to
25 accommodate two-way traffic and increased load weights, as needed. Where feasible, safety
26 would be enhanced through vertical, horizontal, and surface improvements and security
27 measures and stormwater infrastructure would be implemented along the route as needed.

1 ***Applicability to Objectives***

- 2 • *Reduced Impact to the 6th RTBn Mission:* This alternative route would direct traffic along
3 the southern boundary and possibly into the 7th SFG Backyard Ranges SDZ and into both
4 the Alternate FTS and FTS Impact lines. It is likely that this route could be subject to
5 substantially more and possibly longer closures than the current primary route. This
6 alternative would not reduce the impact to the 6th RTBn mission or provide improvement
7 over current conditions.
- 8 • *Improved Safety:* Road alignment could be improved by utilizing long ramps or bridges
9 where RR 600 crosses deep ravines. However, this route would direct traffic into or
10 adjacent to the 7th SFG Backyard Ranges SDZ and through the FTS. Thus, the overall
11 effect on safety would not be an improvement due to the anticipated increased activity
12 from the 7th SFG.
- 13 • *Improved Emergency Response:* Using this alternative, the nearest hospital would be in
14 Crestview and would be accessed using the improved range roads and SR 85 for a total
15 travel distance of approximately 21 miles. The connection to SR 85 would enable First
16 Responders and MEDEVAC crews to access the facility readily from the north
17 (Crestview) and from the south (Eglin Main, Niceville, and Fort Walton Beach).
18 However, due to traversing the active test and training areas, the emergency response
19 time or ability to respond could be greatly hampered due to active missions.
- 20 • *Enhanced Hurricane Evacuation:* The distance to the nearest public highway (SR 85) off
21 of Eglin is approximately 11 miles east; however it is not a direct route. Additionally,
22 this route would introduce traffic approximately 6.3 miles south of I-10 as compared to
23 the current route which ties in to SR 85 approximately 16.5 miles south of I-10. When
24 travel times of up to 8-hours from Eglin AFB to I-10 in Crestview during previous
25 hurricane evacuations are considered, this route would offer moderate savings in travel
26 time for those at the camp.
- 27 • *Minimized Impact to Eglin AFB's Mission and Operations:* This route would direct
28 “non-participatory traffic” into both the Alternate FTS and FTS Impact line area and
29 through the southern portion of the 7th SFG Backyard Ranges SDZ which would impact
30 troop movement and training activities. Increased traffic along this route would have a

1 maneuvers. Although this route already exists, improving to a primary asphalt roadway
2 would increase the LOS into the ETTA and the 7th SFG Backyard Range and thus create
3 a significant security issue by increasing the “attractive nuisance” aspect into the area.
4 Furthermore, the mission could be greatly impacted while trying to accommodate the
5 construction schedule during construction of this alternative.

6 To avoid effect to the Backyard Ranges, this route would require a mission gate to
7 intercept and divert traffic to RR 211 in the event of a mission. Continued or increased
8 use of RR 211 in its current condition would cause further road degradation, erosion, and
9 bridge depreciation which may lead to increased incidents or accidents. RR 211 would
10 continue to be impassable during wet weather and would not support large, heavy
11 vehicles nor reliably support emergency actions.

12 **2.1.7 Alternative Route G: RR257/213- Southwestern Route**

13 ***Route***

14 Alternative Route G would offer a primary asphalt two-lane access route south and west out of
15 Camp Rudder utilizing RR 257 to RR 213 to SR 87, for a total distance of approximately 15.3
16 miles (**Figure 2-7**).

17 ***Construction Details***

18 This Alternative would involve upgrading RRs 257 and 213 from a combination of secondary
19 dirt/clay-base/asphalt roads to primary asphalt two-lane roadways and would include up to six
20 bridges where the route crosses tributaries of the Yellow River. Existing bridges would be
21 expanded to accommodate two-way traffic and increased load weights and security measures and
22 stormwater infrastructure would be implemented along the route as needed. Initial analysis
23 indicates this route would require substantial improvement to vertical and horizontal curves
24 throughout the route and may necessitate the final route to exceed the current roadway footprint.

25 ***Applicability to Objectives***

- 26 • ***Reduced Impact to the 6th RTBn Mission:*** Of all of the proposed alternatives, this route
27 would direct traffic directly into an extremely active test area of Eglin: TAs B-12, B-75,
28 and B-70. In fact it would direct traffic deep into the FTS Impact area and the “large
29 weapons area safety footprint” and could be subject to substantially more and possibly

1 longer closures than the current primary route and thus would not reduce the impact to
2 the 6th RTBn mission or provide an improvement over current conditions. Additionally,
3 routing support, supplies, and contractors from SR 87 would further interfere with the
4 logistical support of the camp by increasing travel time and distance for suppliers.

- 5 • Improved Safety: This route runs between TAs B-12, B-75, and B-70, into the FTS
6 Impact line area and the “large weapons area safety footprint.” Therefore, the safety of
7 this route would be greatly reduced compared to the current primary access.
- 8 • Improved Emergency Response: Using this alternative the nearest hospital would be in
9 Milton and would be accessed using the improved range roads and SR 87 for a total
10 travel distance of approximately 28 miles. The connection to SR 87 would enable First
11 Responders and MEDEVAC crews to access the facility readily from the northwest
12 (Milton) and from the southwest (Navarre). However, due to traversing the active ETTA
13 areas, the emergency response time or ability to respond could be hampered due to active
14 missions and thus would not be an improvement.
- 15 • Enhanced Hurricane Evacuation: The distance to the nearest public highway (SR 87) off
16 of Eglin would be approximately 15 miles west. SR 87 is a rural highway and has a
17 history of being a “bottleneck” during recent hurricane evacuations from the coastal areas
18 of Navarre and southern Santa Rosa County. The majority of the cadre that live off-post,
19 reside in Crestview, Niceville, and Fort Walton Beach, therefore this route would likely
20 direct personnel west 15 miles away from their homes. This alternative would not
21 enhance the hurricane evacuation efforts for Camp Rudder.
- 22 • Minimized Impact to Eglin AFB’s Mission and Operations: This route would direct
23 “non-participatory traffic” into a very active test area of Eglin, into the FTS Impact area
24 and the “large weapons area safety footprint.” This would significantly impact Eglin’s
25 ability to plan and execute missions in this area. In addition, during construction of this
26 alternative, the Eglin mission would be greatly impacted while trying to accommodate
27 the construction schedule.

28 **2.2 Relocation Alternative**

29 An alternative to providing relatively unencumbered access to the existing Camp Rudder would
30 be to relocate 6th RTBn to another location that meets or exceeds the Army’s access

1 requirements. This alternative would require expending valuable time and financial resources
2 identifying a suitable location that meets all of the environment and training objectives of the
3 “swamp phase” for Ranger training (if possible). Additionally, the Army has already invested
4 resources into outlining in its 2006 *Future Development Plan* and 2010 *Future Development*
5 *Plan-Update* for Camp Rudder, a strategy and schedule for addressing existing facility needs and
6 modernizing the camp’s facilities to accommodate the growth and change needed by the 6th
7 RTBn to fulfill its mission. Over the next 20 years, the Army plans to replace all of Camp
8 Rudder’s facilities on a “worst-first” schedule at an estimated cost of \$50-60M. Finally, if this
9 alternative was selected it would require U.S. Congressional and Presidential approval prior to
10 being implemented.

11 **2.3 No-Action Alternative**

12 In accordance with NEPA and AFPD 32-70, *Environmental Quality*, the Air Force must analyze
13 the No-Action Alternative. Whereas, reasonable alternatives are those that meet the underlying
14 purpose and need for the Proposed Action, the No-Action Alternative considers the effects of 6th
15 RTBn’s continued use of the current primary access (RR 236/RR 213/RR 257) to Camp Rudder.

16 This primary access traverses 16.5 miles of Eglin AFB reservation and directs traffic into the
17 FTS Impact line while negotiating several active Air Force test areas along the route. Continued
18 use of this access would cause personnel to be subjected to ongoing mission-related closures.
19 Furthermore, considering the anticipated increase in Ranger class sizes, the addition of the 7th
20 SFG Backyard Ranges and the anticipated increase in future ETTA activities it is reasonable to
21 expect that the 6th RTBn mission would be negatively impacted.

22 In addition to road closures due to mission impacts, continuing use of the primary access would
23 provide a continuing source of ecosystem degradation due to erosion of the road surface
24 materials into tributaries of the Yellow and Shoal Rivers and associated wetland areas.
25 Furthermore, portions of the current route are dangerous due to very poor road conditions.

26 Therefore, the No-Action Alternative does not meet the Purpose and Need for the Proposed
27 Action. However, unlike other Alternatives the No-Action Alternative cannot be eliminated
28 from detailed analysis.

1 **2.4 Alternatives Eliminated From Further Study**

2 **2.4.1 Alternative Route A: RR257/236/Holt Bridge-Northern Route**

3 Alternative Route A, a northerly route that would offer a primary two-lane asphalt access route
4 out of Camp Rudder utilizing RRs 257 and 236, and a new bridge across the Yellow River,
5 designated Critical Habitat for the federally protected Gulf sturgeon,(**Figure 2-2**). Although this
6 route would generally avoid road closures associated with mission safety footprints and would
7 provide timely access to I-10, this alternative would require re-establishing the former route
8 through the swamp/floodplains of the Yellow River northwest of RR 236 and would open an
9 additional primary access route directly into the ETTA. Furthermore, the purchase of private
10 property north of the Yellow River would be required to accommodate the bridge. The potential
11 negative effect to protected species and the impact to the Eglin Mission does not meet the
12 objectives of the Proposed Action as discussed in Section 2.1.3 above.

13 **2.4.2 Alternative Route D: RR 257/211/241/215- Eastern Route**

14 Alternative Route D, an eastern route following RR 211 to RR 241 to RR 215 to SR 85, traverses
15 an area of the ETTA that is encumbered by the 7 SFG Backyard Ranges (**Figure 2-4**). As such,
16 this route would not meet the majority of the objectives of the Proposed Action as discussed in
17 Section 2.1.4 above.

18 **2.4.3 Alternative Route E: RR 257/211- Western Route**

19 Alternative Route E, a western route following RR 257 and RR 211 to SR 87 in Santa Rosa
20 County, traverses the FTS Impact line area and the “large weapons area safety footprint” (**Figure**
21 **2-5**). This route is currently subject to frequent road closures for missions and is likely to
22 increase in the future with the anticipated increase of testing activities on the ETTA. As such,
23 this route would not meet the majority of the objectives of the Proposed Action as discussed in
24 Section 2.1.5 above.

25 **2.4.4 Alternative Route F: RR 600/215- Eastern Route**

26 Alternative Route F, an eastern route following RR 600 to RR 215 to SR 85, traverses both the
27 Alternate FTS and FTS Impact line area and through the southern portion of the 7th SFG
28 Backyard Ranges SDZ (**Figure 2-6**). This route is currently subject to frequent road closures for

1 missions on the ETTA. Road closures may intensify in the future with the anticipated increase
2 of 7th SFG training exercises and Eglin testing activities. As such, this route would not meet the
3 majority of the objectives of the Proposed Action as discussed in Section 2.1.6 above.

4 **2.4.5 Alternative Route G: RR 257/213- Southwestern Route**

5 Alternative Route G, a southwestern route following RR 257 to RR 213 to SR 87, directs traffic
6 into an extremely active test area of Eglin, including Test Areas B-12, B-75, and B-70 (**Figure**
7 **2-7**). This route is currently subject to frequent road closures for missions and is likely to
8 increase in the future with the anticipated increase of testing activities. As such, this route would
9 not meet the majority of the objectives of the Proposed Action as discussed in Section 2.1.7
10 above.

11 **2.4.6 Relocation Alternative**

12 While technically feasible, relocation of the Army Rangers 6th RTBn training from Camp Rudder
13 to an undetermined location is not a “reasonable alternative” for a number of reasons and
14 relocation of any DoD training facility would require U.S. Congressional approval which is
15 beyond the scope of this assessment or authority.

16 The size of the training area required and necessary environmental, ecological, and climatic
17 conditions mandate a southern swamp. Unoccupied DoD lands required for this training are not
18 available outside of Eglin AFB.

19 Moving the support buildings would be possible and could be accomplished on or near the Eglin
20 range. However, such a move would be minor in distance if the current training area is to be
21 employed and would be of little value. Relocation will therefore not be studied in detail.

22 **2.5 Selection of Alternatives to Carry Forward for Analysis**

23 A number of alternatives were considered, however as discussed above in Section 2.4, six of
24 these alternatives were eliminated for the stated reasons. As shown in **Table 2-1** below, and
25 Alternative Route B – RR 257/211 Asphalt, Eastern Route and Alternative Route C –
26 RR 257/211 Clay Based, Eastern Route are the only alternatives that fully meet all the selection
27 criteria for providing improved, relatively unencumbered primary access to Camp Rudder.

- 1 As required by NEPA, the No-Action Alternative will also be carried forward for analysis. A
- 2 summary of the resources to be evaluated for the selected alternatives are also provided in
- 3 **Table 2-1.**

1 **Table 2-1 Selection of Alternatives to Carry Forward and Resource Issues**

<i>Resource</i>	<i>Alternative & Discussion</i>
Air Quality	Alternative B: RR 257/211 - Eastern Route, Asphalt
	<p>Air emissions during implementation would be short-term and would diminish once construction activities are completed. The proponent and contractors would take reasonable precautions to minimize fugitive particulate emissions (dust) during construction IAW Chapter 62-296 FAC (Rule 62 - 296). Calculations suggest emission limits would not be exceeded as a result of this Alternative and that there would be a long-term beneficial impact by eliminating a dirt road as source of dust generation. Therefore, no adverse impacts are anticipated.</p>
	Alternative C: RR 257/211 - Eastern Route, Clay-Based
	<p>Air emissions associated with Alternative C would be similar to Alternative B during initial grading activities. However, due to the lack of pavement under Alternative C, no emissions would materialize due to paving equipment or pavement components.</p> <p>However, unlike Alternative B, the Clay-Based Alternative C would continue to be a limited source of fugitive dust and may remain a minor contributor to long term adverse effect on air quality.</p>
	No-Action Alternative
	<p>The existing primary route (RR 236/RR 213/RR 257) would continue to be maintained as a two-lane asphalt road, therefore no short-term or long-term impact would be expected due to construction efforts.</p> <p>However, because RR 211 would remain a combination of gravel and clay/sand it would continue to be a potential source of fugitive dust generation. Due to the projected increases in activity at Camp Rudder and in the general area, it is logical to assume that use of RR 211 would increase also, thereby increasing the long-term adverse effect on air quality due to dust generation.</p>
Biological Resources	<p>Alternative B: RR 257/211 - Eastern Route, Asphalt</p> <p>There are numerous federal- and state-listed species within close proximity to the proposed construction corridor. These include the red cockaded woodpecker (RCW), eastern indigo snake, gopher tortoise, and Florida black bear. In addition, there are several species of special concern such as the bog frog, gopher frog, and the Pine Barrens tree frog in the area. This Alternative traverses several tributaries to the Yellow and Shoal Rivers. A Biological Assessment for the Proposed Action Corridor has been prepared by Eglin</p>

<i>Resource</i>	<i>Alternative & Discussion</i>
	<p>Natural Resources and is included in Appendix D of this EA. The BA facilitated an informal Section 7 consultation with the goal of avoiding and, if necessary, mitigating adverse impacts.</p> <p>Since this road largely exists and is currently maintained as a clay/sand road ~24-60 feet wide, construction of a two-lane paved road would require only minimal removal of trees, vegetation, etc. to accommodate the road and associated stormwater controls, etc.</p> <p>A primary source of ecosystem degradation has been the erosion of road surface materials and roadside areas. Therefore, engineered stormwater management and erosion control associated with the Proposed Action would have a long-term beneficial impact on potentially affected tributaries, wetlands, and hence the Biological Resources.</p> <p>Alternative C: RR 257/211 - Eastern Route, Clay-Based</p> <p>The direct effect on Biological Resources would be the same for Alternative B, with the exception that a clay based road would continue to contribute limited amounts of run-off and erosion. However, implementation of storm water ponds and additional erosion control associated with this Action would have a long-term beneficial impact on potentially affected tributaries, wetlands, and hence the Biological Resources.</p> <p>No-Action Alternative</p> <p>The existing primary route (RR 236/RR 213/RR 257) would continue to be maintained as a two-lane asphalt road therefore; no short-term or long-term impact would be expected with continuing use of this route.</p> <p>However, RR 211 would remain a combination of gravel and clay/sand, and would therefore continue to be a potential source of ecosystem degradation due to erosion of road surface materials and roadside areas. Due to the projected increases in activity at Camp Rudder and in the general area, it is logical to assume that use of the RR 211 would increase also, thereby increasing the long-term adverse effect of soil erosion into streams and wetlands, leading to continuing negative effects on Biological Resources.</p>
Coastal Zone Management	<p>Alternatives B, C, and the No Action Alternative</p> <p>A consistency determination for the Preferred Alternative is included in Appendix B and has been submitted along with the EA to the Florida State Clearinghouse to ensure consistency with coastal zone management regulations and guidelines.</p>

<i>Resource</i>	<i>Alternative & Discussion</i>
<p>Cultural Resources</p>	<p>Alternative B: RR 257/211 - Eastern Route, Asphalt</p>
	<p>Cultural resources eligible for the National Register of Historic Places are located within the general project area. The State Historic Preservation Officer has been consulted under Section 106. A Programmatic Agreement has been put in place outlining measures to avoid, mitigate, and to support data recovery, where necessary. Results of the Section 106 Consultation have been incorporated into project documentation.</p>
	<p>Alternative C: RR 257/211 - Eastern Route, Clay-Based</p>
	<p>Same as Alternative B.</p>
	<p>No-Action Alternative</p> <p>No changes or impacts would occur.</p>
<p>Geological Resources</p>	<p>Alternative B: RR 257/211 - Eastern Route, Asphalt</p>
	<p>During grading and construction, implementation of erosion control measures associated with permit requirements would minimize the potential for soil erosion. Such grading, excavating, and re-contouring of soils and shallow geologic sediments would result in minor disturbance to geological resources. The Proposed Action would have short-term, minor adverse impact on geological resources.</p>
	<p>Alternative C: RR 257/211 - Eastern Route, Clay-Based</p>
	<p>Similar to Alternative B, however maintaining this route with Clay cover would require ongoing grading and contouring and occasional replenishment with acceptable soils. Ongoing potential for erosion would remain, contributing a minor adverse long term impact on geological resources.</p>
	<p>No-Action Alternative</p> <p>The existing primary route (RR 236/RR 213/RR 257) would continue to be maintained as a two-lane asphalt road, therefore no short-term or long-term impact would be expected from continued use of this route.</p> <p>However, RR 211 would remain gravel clay/sand road and would continue to a primary source of ecosystem degradation due to erosion of road surface materials and roadside areas. Due to the projected increases in activity at Camp Rudder and in the general area, it is logical to assume that use of RR 211 would increase also, thereby continuing adverse erosion of the surficial geologic sediments.</p>

<i>Resource</i>	<i>Alternative & Discussion</i>
<p>Noise</p>	<p>Alternative B: RR 257/211 - Eastern Route, Asphalt</p>
	<p>Operational construction/demolition noise associated with the Proposed Action would occur. Potential noise impacts from the construction phase would be minimized by the employment of construction BMPs. Furthermore, construction noise would be temporary and localized to the area immediately surrounding the active construction site. Due to the location of the Alternative B, annoyance due to noise to off-base residents is not expected. Major noise impacts to biological resources are not anticipated but have been considered as part of the Section 7 consultation process. Therefore, Alternative B would have a negligible or minor short-term impact on noise levels. No long term adverse noise impacts would be expected from implementation of this Alternative.</p>
	<p>Alternative C: RR 257/211 - Eastern Route, Clay-Based</p>
	<p>Same as Alternative B.</p>
	<p>No-Action Alternative</p>
<p>Safety</p>	<p>No changes or impacts would occur.</p>
	<p>Alternative B: RR 257/211 - Eastern Route, Asphalt</p>
	<p>Safety impacts from construction activity and associated traffic pattern changes and disruptions would be temporary.</p> <p>Potential UXO hazards would be mitigated through coordination with Eglin Range Safety and the EOD Unit prior to commencing construction activities. This may require UXO surveys and/or UXO Construction Support during certain activities.</p> <p>Once completed, the Proposed Action would improve roadway safety characteristics and expected travel times, resulting in long-term beneficial impacts.</p>
	<p>Alternative C: RR 257/211 - Eastern Route, Clay-Based</p>
<p>Safety Impacts and UXO hazards would be the same as for Alternative B.</p> <p>However, once completed, the Clay-Based Alternative would provide a limited improvement over existing conditions. Due to the natural sediment used for Clay-Based roadways, washouts, washboarding, and roadway degradation during extended periods of inclement weather would continue.</p>	

<i>Resource</i>	<i>Alternative & Discussion</i>
	<p>No-Action Alternative</p> <p>The existing primary route (RR 236/RR 213/RR 257) would continue to be maintained as a two-lane asphalt road, however, due to the anticipated increase in testing at the ETTA and 7th SFG training, it would be expected that the impact on the 6th RTBn mission would continue to degrade. Travel times and delays due to road closures in support of test missions would continue to disrupt orderly traffic flow and could potentially result in medical assistance or emergency response delays, thus negatively affecting safety.</p> <p>RR 211 would remain gravel and clay/sand and be subject to washouts, washboarding, etc. during storm events and thus requiring substantial maintenance to provide continuing usability and to maintain safe passage.</p>
Solid Waste	<p>Alternative B: RR 257/211 - Eastern Route, Asphalt</p> <p>The Proposed Action is not expected to adversely impact the capacity of local landfills to handle solid waste, as the waste increase due to project activities would be minor. Where clearing is required, vegetative waste would be minimized through chipping trees and stumps and selling for fuel, mulch, etc., reducing waste by approximately 90%. However, the improved roadway may lead to more roadway users which in turn may increase the likelihood for increased illegal dumping. As such, the Proposed Action would have a minor impact on solid waste.</p> <p>Alternative C: RR 257/211 - Eastern Route, Clay-Based</p> <p>Same as Alternative B.</p> <p>No-Action Alternative</p> <p>No changes or impacts would occur.</p>
Transportation	<p>Alternative B: RR 257/211 - Eastern Route, Asphalt</p> <p>During construction, the Proposed Action would result in short-term adverse impacts to transportation. Once completed, enhanced travel times, availability of a route that avoids road closures due to test missions, increased coastal evacuation operations, and improved roadway safety characteristics would have a long-term beneficial impact.</p> <p>Alternative C: RR 257/211 - Eastern Route, Clay-Based</p> <p>During construction, the Proposed Action would result in short-term adverse impacts to transportation. Once completed, enhanced travel times,</p>

<i>Resource</i>	<i>Alternative & Discussion</i>
	<p>availability of a route that avoids road closures due to test missions, increased coastal evacuation operations, and improved roadway safety characteristics would have a long-term beneficial impact. However, due to the natural sediment used for Clay-Based roadways, washouts, washboarding, and roadway degradation during extended periods of inclement weather would likely continue.</p> <p>No-Action Alternative</p> <p>The existing primary route (RR 236/RR 213/RR 257) would continue to be maintained as a two-lane asphalt road, however, due to the anticipated increase in testing at the ETTA and 7th SFG training, it would be expected that the impact on the 6th RTBn mission would continue to degrade. Travel times and delays due to road closures in support of test missions would continue to disrupt orderly traffic flow and could potentially result in medical assistance or emergency response delays.</p> <p>RR 211 would remain gravel and clay/sand and be subject to washouts, washboarding, etc. during storm events, thus requiring substantial maintenance to provide continuing usability.</p>
<p>Water Resources</p>	<p>Alternative B: RR 257/211 - Eastern Route, Asphalt</p> <p>Current RR 211 is loose sand, clay, and a combination of both in certain areas. These natural materials create an erosion control issue along the entire route. There are locations where there is 18-24 inches of loose sandy clay adjacent to and on top of a bridge span, allowing for direct runoff into surface water bodies. Implementation of Alternative B would greatly reduce or eliminate soil/sediment migration from the roadway and swales into the surface water and swamps, thus providing a substantial long-term benefit to water resources. During construction, BMPs and required stormwater and erosion control measures would be implemented to avoid adverse impacts to drainage basins, floodplains, surface waters, or ground water resources.</p> <p>An NPDES stormwater construction permit would be obtained prior to construction activities and permit requirements would be implemented accordingly.</p> <p>Wetland mitigation needs would be assessed during the Florida Environmental Resource Permit, USACE Section 404 Permit, and the Application for Works in the Waters of Florida processes.</p> <p>Roadway improvement activities would meet federal and state regulations for increased stormwater management, creating long-term beneficial impacts to water resources.</p>

<i>Resource</i>	<i>Alternative & Discussion</i>
	<p>Alternative C: RR 257/211 - Eastern Route, Clay-Based</p> <p>Similar to Alternative B, stormwater infrastructure implemented as component of Alternative C would provide appreciable benefit, however the Clay-Based Alternative would present continuing erosion control issues along the entire route of RR 211. Implementation of this alternative would help reduce soil/sediment migration from the roadway and swales into the adjacent surface waters and swamps to a limited extent and would provide a minor long-term benefit to water resources.</p> <p>No-Action Alternative</p> <p>The existing primary route (RR 236/RR 213/RR 257) would continue to be maintained as a two-lane asphalt road therefore; no short-term or long-term impact would be expected.</p> <p>RR 211 would remain gravel and clay/sand and be subject to washouts, washboarding, etc. during storm events, and thus provide a continuing source ecosystem degradation due to erosion of road surface materials and roadside areas into streams and wetland areas. Due to the projected increases in activity at Camp Rudder, 7th SFG and ETTA, it is logical to assume that the use of RR 211 would increase, thereby increasing the adverse effect of soil erosion into the water resources.</p>

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2 **2.6 Designation of Preferred Alternative**

3 The Army has designated *Alternative B: RR 257/211 - Eastern Route, Asphalt* as the Preferred
 4 Alternative in coordination with Eglin AFB.

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1 **3.0 Affected Environment**

2 This section presents information on environmental conditions for resources potentially affected
3 by implementation of the *Preferred Alternative (RR 257/211 - Eastern Route, Asphalt)*,
4 *Alternative Route C (RR 257/211 - Eastern Route, Clay-Based)*, and the *No-Action Alternative*
5 described in Section 2.0. Under the NEPA, analysis of environmental conditions should address
6 only those areas and environmental resources with the potential to be affected by the Preferred or
7 other Alternatives. Locations and resources with no potential to be affected need not be
8 analyzed. The topics evaluated in this section and subsequently analyzed in Section 4.0 were
9 selected based on their relevance, as described in Section 1.6. For the analyses in this EA,
10 baseline conditions represent the status of Eglin AFB and Okaloosa County in 2013, unless
11 otherwise stated.

12 **3.1 Air Quality**

13 **3.1.1 Definition**

14 **Air Pollutants and Regulations**

15 Air quality is determined by the type and concentration of pollutants in the atmosphere, the size
16 and topography of the air basin, and local and regional meteorological influences. The severity
17 of a pollutant’s concentration in a region or geographical area is determined by comparing it to
18 federal, state, or regional ambient air quality standards. The CAA of 1970 directed the U.S.
19 Environmental Protection Agency (USEPA) to develop, implement, and enforce strong
20 environmental regulations that would ensure cleaner air for all Americans. The CAA
21 Amendments of 1990 are currently the comprehensive federal legislation regulating the
22 prevention and control of air pollution. EO 12088, *Federal Compliance with Pollution Control*
23 *Standards*; AFPD 32-70, *Environmental Quality*; and AFI 32-7040 *Air Quality Compliance* are
24 the implementing standards for DoD compliance with the CAA.

25 Under the provisions of the CAA, the USEPA established both primary and secondary
26 concentration-based standards called National Ambient Air Quality Standards (NAAQS).
27 Primary standards define levels of air quality necessary to protect public health with an adequate
28 margin of safety. Secondary standards define air quality levels necessary to protect public
29 welfare (i.e., soils, vegetation, property, and wildlife) from any known or anticipated adverse

1 effect. NAAQS are currently established for six air pollutants, known as criteria air pollutants.
2 These include carbon monoxide (CO), nitrogen oxides (NO_x), ozone (O₃), sulfur oxides (SO_x)
3 (measured as sulfur dioxide [SO₂]), lead (Pb), and particulate matter. Particulate matter
4 standards incorporate two particulate classes: (1) particulate matter with an aerodynamic
5 diameter less than or equal to 10 micrometers [PM₁₀] and (2) particulate matter with an
6 aerodynamic diameter less than or equal to 2.5 micrometers [PM_{2.5}].

7 The CAA does not make the NAAQS directly enforceable; however, the CAA does require each
8 state to promulgate a State Implementation Plan (SIP) that provides for implementation,
9 maintenance, and enforcement of the NAAQS in each air quality control region (AQCR) in the
10 state. Title I of the CAA requires federal actions to conform to the provisions of the approved
11 SIP, which is developed and maintained in Florida by the FDEP under Chapter 62 of the FAC.

12 The USEPA classifies the air quality within an AQCR according to whether or not the
13 concentration of criteria air pollutants in the atmosphere exceeds primary or secondary NAAQS.
14 All areas within each AQCR are assigned a designation of attainment, nonattainment,
15 maintenance, unclassifiable attainment, or not designated attainment for each criteria air
16 pollutant. An attainment designation indicates that the air quality within an area is as good as or
17 better than the NAAQS. Nonattainment indicates that air quality within a specific geographical
18 area exceeds applicable NAAQS. Maintenance indicates that an area was previously designated
19 nonattainment but is now attainment. Unclassifiable and not designated indicate that the air
20 quality cannot be or has not been classified on the basis of available information as meeting or
21 not meeting the NAAQS. Areas designated as unclassifiable or not designated are treated as
22 attainment (CAA, 1990).

23 First promulgated in FAC 62-204.240, the state of Florida adopted each of the NAAQS as the
24 Florida standards except for SO₂. However, this statute was later repealed in 2012 to remove
25 obsolete provisions related to ambient air quality standards. By doing so, Florida standards align
26 with Federal Standards as listed in **Table 3-1**. These standards are reported in parts per million
27 (ppm), milligram per cubic meter (mg/m³), or microgram per cubic meter (µg/m³).

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Table 3-1 National and State Ambient Air Quality Standards

Criteria Pollutant	Averaging Time	Primary NAAQS ^{a,b}	Secondary NAAQS ^{a,d}
Carbon Monoxide	8-hour	9 ppm (10 mg/m ³)	No standard
	1-hour	35 ppm (40 mg/m ³)	No standard
Nitrogen Dioxide	1-hour	100 ppb ^d	No standard
	Annual	0.053 ppm	0.053 ppm
Ozone	8-hour ^c	0.075 ppm (0.2 µg/m ³)	0.075 ppm (0.2 µg/m ³)
Sulfur Dioxide	1-hour ^e	0.075 ppm	No standard
	3-hour	No standard	0.50 ppm (1,300 µg/m ³)
Lead	Quarterly	1.5 µg/m ³	1.5 µg/m ³
PM _{2.5}	Annual	12.0 µg/m ³	15.0 µg/m ³
	24-hour	35 µg/m ³	35 µg/m ³
PM ₁₀	24-hour	150 µg/m ³	150 µg/m ³

Notes:

ppm parts per million

PM_{2.5} Particles with aerodynamic diameter of 2.5 micrometers or less

PM₁₀ Particles with aerodynamic diameters less than or equal to a nominal 10 micrometers

mg/m³ milligram per cubic meter

µg/m³ microgram per cubic meter

^a The NAAQS based on standard temperature of 0 degrees Celsius and standard pressure of 760 millimeters of mercury.

^b National Primary Standards: The levels of air quality necessary to protect the public health with an adequate margin of safety.

^c The 8-hour primary and secondary ambient air quality standards for ozone are met at a monitoring site when the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentration is less than or equal to 0.075 ppm.

^d The primary 1-hour standard for Nitrogen Dioxide must be in the 98th percentile, averaged over three years

^e The 1-hour standard for SO₂ must be in the 99th percentile of the 1-hour daily maximum concentration, averaged over a period of 3 years.

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19 Section 176 (c)(4) of the CAA, the General Conformity Rule, requires that any federal action
 20 must meet the requirements of a state or Federal Implementation Plan. More specifically, CAA
 21 conformity is ensured when a federal action does not result in the following: a new violation of
 22 the NAAQS, an increase in the frequency or severity of violations of NAAQS, or delay in the
 23 timely attainment of any NAAQS, interim progress milestones, or other milestones toward
 24 achieving compliance with the NAAQS.

1 The General Conformity Rule applies only to actions in nonattainment or maintenance areas and
2 considers both direct and indirect emissions. The rule applies only to federal actions that are
3 considered “regionally significant” or where the total emissions from the action meet or exceed
4 the *de minimis* thresholds presented in 40 CFR 93.153. An action is regionally significant when
5 the total nonattainment pollutant emissions exceed 10 percent of the AQCR’s total emissions
6 inventory for that nonattainment pollutant. If a federal action does not meet or exceed the *de*
7 *minimis* thresholds and is not considered regionally significant, then a full Conformity
8 Determination is not required. Each of the four counties in which Eglin AFB is located is in
9 attainment for all criteria pollutants; therefore, the Conformity Rule does not apply to Eglin AFB
10 or the surrounding areas.

11 Title V of the CAA requires identification and characterization of emissions from all Minor
12 Sources and requires state and local agencies to permit Major Stationary Sources. Minor
13 Sources include aircraft maintenance facilities, fuel storage tanks, and emissions from aircraft
14 and motor vehicles. Generally, Major Stationary Sources are facilities such as industrial
15 manufacturing plants, military bases, refineries, or other activities that can emit more than 100
16 tons per year (tpy) of any one criteria air pollutant, 10 tpy of a hazardous air pollutant, or 25 tpy
17 of any combination of hazardous air pollutants. However, lower pollutant-specific Major Source
18 permitting thresholds apply in nonattainment areas. For example, the Title V permitting
19 threshold for an “extreme” O₃ nonattainment area is 10 tpy of potential volatile organic
20 compound (VOC) or NO_x emissions. The purpose of the permitting rule is to establish
21 regulatory control over large, industrial-type activities and monitor their impact on air quality.

22 New Major Sources (including major modifications at existing facilities) regulated under the
23 CAA are subject to Federal Prevention of Significant Deterioration (PSD) regulations which
24 define air pollutant emissions to be “significant” if (1) a proposed project is within 10 kilometers
25 of any Class I area and (2) regulated pollutant emissions would cause an increase in the 24-hour
26 average concentration of any regulated pollutant in the Class I area of 1.0 µg/m³ or more (40
27 CFR 52.21(b)(23)(iii)). The goal of the PSD program is to protect public health from adverse
28 effect which may occur at levels meeting NAAQS criteria; to preserve and protect air quality in
29 areas of recreational, scenic or historic value; and to ensure economic growth while preserving
30 existing air quality. PSD regulations also define ambient air increments, limiting the allowable

1 increases to any area's baseline air contaminant concentrations, based on the area's designation
2 as Class I, II, or III (40 CFR 52.21(c)). Eglin AFB is designated as Class II, and it is not within
3 10 kilometers of a Class I area; therefore, the PSD regulations do not apply.

4 **Greenhouse Gases**

5 Greenhouse gases (GHGs) allow sunlight to enter the atmosphere freely, and when sunlight hits
6 the Earth's surface, some of the sunlight is reflected back towards space as infrared radiation
7 (heat). GHGs trap the heat in the atmosphere and the accumulation of GHGs in the atmosphere
8 regulates the earth's temperature. Rising concentrations of GHGs produce an increase in the
9 average surface temperature of the Earth over time.

10 GHGs include: carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), several
11 hydrofluorocarbons (HFCs), perfluorocarbons (PFC), sulfur hexafluoride, and
12 chlorofluorocarbons (CFCs). Each GHG has an estimated global warming potential (GWP),
13 which is a function of its atmospheric lifetime and its ability to absorb and radiate infrared
14 energy emitted from the Earth's surface. CO₂ has a GWP of 1, and is, therefore, the standard by
15 which all other GHGs are measured. The GWP of a particular gas provides a relative basis for
16 calculating its carbon dioxide equivalent (CO₂-e), i.e. the amount of CO₂ emissions that gas
17 would be equal to.

18 GHG emissions are generated by both natural processes and human activities. Sources of CO₂
19 on Eglin AFB include burning of fossil fuels (coal, oil, and natural gas), aircraft engine testing
20 and operation, munitions testing, open burning/open detonation, fire training, prescribed burning,
21 government and privately owned vehicles, aerospace ground support equipment, marina
22 operations, and solid waste landfills.

23 On February 18, 2010, the CEQ released its *Draft NEPA Guidance on Consideration of the*
24 *Effects of Climate Change and Greenhouse Gas Emissions*, which suggests that proposed actions
25 that would be reasonably anticipated to emit 25,000 metric tons or more of CO₂-e GHG
26 emissions every year should be evaluated by quantitative and qualitative assessments. This is
27 not a threshold of significance but a minimum level that would require consideration in NEPA
28 documentation. The purpose of quantitative analysis of CO₂-e GHG emissions in this EA is for
29 its potential usefulness in making reasoned choices among alternatives.

1 **3.1.2 Existing Conditions**

2 **Air Pollutants**

3 Eglin AFB is located in Santa Rosa, Okaloosa, Gulf, and Walton Counties and is within the
4 jurisdiction of the FDEP Northwest District. The Proposed Action is located in Okaloosa
5 County. Therefore, for the purposes of the Air Pollutants analysis, the region of influence (ROI)
6 is Okaloosa County. As defined in 40 CFR Part 81.68, Okaloosa County is located in the Mobile
7 (Alabama), Pensacola-Panama City (Florida), Southern Mississippi Interstate AQCR, which is
8 also known as AQCR 5. In 2006, the USEPA designated Florida in attainment for all criteria
9 pollutants, based on data collected in the previous three years (FDEP, 2006).

10 An air emissions inventory is an estimate of total mass emissions of pollutants generated from a
11 source or sources over a period of time, typically a year. The quantity of air pollutants is
12 generally measured in tons or pounds per year. Emission sources are categorized as point, area,
13 or mobile emission sources. Point sources are stationary sources which can be identified by
14 name and operated at a fixed location. Area sources are stationary sources of emissions too
15 small to track individually, such as gas stations, small office buildings, or open burning
16 associated with agriculture, forest management, and land clearing activities. Mobile sources are
17 vehicles or equipment with gasoline or diesel engines and are divided into two types, on-road
18 and non-road. On-road mobile sources are vehicles such as cars, light trucks, heavy trucks,
19 buses, engines, and motorcycles. Non-road sources are aircraft, locomotives, diesel and gasoline
20 boats and ships, personal watercraft, lawn and garden equipment, agricultural and construction
21 equipment, and recreational vehicles. At Eglin AFB, air pollutant contributors include
22 government and personal vehicles, munitions testing, fuel storage, jet engine operation and
23 testing, general maintenance activities, open burning/open detonation, prescribed burns, and
24 wildfires. The USEPA 2011 National Emissions Inventory data for Okaloosa County are
25 provided in **Table 3-2** and include point, area, and mobile source data (USEPA, 2008).

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1 **Table 3-2 2011 National Emissions Inventory, Okaloosa County**

Description	CO (tpy)	NO_x (tpy)	PM₁₀ (tpy)	PM_{2.5} (tpy)	SO₂ (tpy)	VOC (tpy)
Point Sources	1226.3	157.0	32.2	29.6	12.8	201.3
Area Sources	4542.5	840.9	4244.6	911.2	237.5	37408.6
On-road Mobile	18010.2	3621.2	183.3	118.5	22.2	1699.3
Non-road Mobile	9213.8	1007.4	97.0	92.3	2.7	1758.7
Total	32992.8	5626.6	4557.1	1151.6	275.2	41067.8

2 Source: Data summarized from USEPA’s Air Emission Sources 2011 (<http://www.epa.gov/airdata/>)

3
 4 **Greenhouse Gases**

5 In response to air quality requirements promulgated under the CAA, Eglin AFB has prepared a
 6 comprehensive GHG emissions inventory for scope 1, 2, and 3 GHG emission sources at Eglin
 7 AFB for calendar year (CY) 2003, CY 2008, and fiscal year (FY) 2012. For the purposes of the
 8 GHG analysis, the ROI is the entirety of Eglin AFB.

9 “Scope 1” emissions are direct emissions from stationary, mobile, and fugitive emissions sources
 10 that are owned and/or controlled by the base. “Scope 2” emissions account for GHG emissions
 11 from the generation of purchased electricity consumed by the base, where the emissions actually
 12 occur at sources owned or controlled by another entity, typically a utility company. “Scope 3”
 13 emissions include indirect emissions that are not electricity-related and that are a consequence of
 14 the activities at the base but are generated from entities that are not owned or controlled by the
 15 base, such as the transportation of purchased fuels, offsite waste disposal, employee commuting,
 16 business travel, and production of purchased materials. Of these, Scope 3 emissions in the form
 17 of increased traffic would be associated with the Proposed Action.

18 The six primary internationally recognized and regulated GHGs are:

- 19 • Carbon dioxide (CO₂)
- 20 • Methane (CH₄)
- 21 • Nitrous Oxide (N₂O)
- 22 • Hydrofluorocarbons (HFCs)
- 23 • Perfluorocarbons (PFCs)
- 24 • Sulfur hexafluoride (SF₆)

1 Other GHGs included in the Eglin AFB GHG inventory are:

- 2 • Class II Ozone Depleting Substances (ODS) (Hydrochlorofluorocarbons [HCFCs])
- 3 • Hydrofluoroethers (HFEs)

4 The reported FY 2012 GHG emissions inventory for Eglin AFB is presented in **Table 3-3**. The
 5 values are expressed in metric tons of CO₂ equivalent (MTCO₂-e).

6 **Table 3-3 2012 Summary of Eglin AFB Greenhouse Gas Emissions**

Description	Scope 1 (MTCO ₂ -e)	Scope 2 (MTCO ₂ -e)	Scope 3 (MTCO ₂ -e)	Total (MTCO ₂ -e)
Eglin AFB	529,712.62	197,084.00	62,532.94	789,329.56

7 Source: EAFB, 2013

8 **3.2 Biological Resources**

9 **3.2.1 Definition**

10 Biological resources include native or naturalized plants and animals and the habitats, such as
 11 wetlands, forests, grasslands, and estuaries, in which these resources exist. Sensitive and
 12 protected biological resources include plant and animal species listed as threatened or
 13 endangered by the USFWS, the state of Florida, or species covered by the MBTA, (16 USC 703-
 14 712). Determining which species occur in an area affected by a Proposed Action can be
 15 accomplished through literature reviews and coordination with appropriate federal and state
 16 regulatory agency representatives, resource managers, and other knowledgeable experts.

17 Under the ESA (16 USC 1536), an endangered species is defined as any species in danger of
 18 extinction throughout all or a significant portion of its range. A threatened species is defined as
 19 any species likely to become an endangered species in the foreseeable future. The USFWS also
 20 maintains a list of species considered to be candidates for possible listing under the ESA.
 21 Although candidate species receive no statutory protection under the ESA, the USFWS has
 22 attempted to advise government agencies, industry, and the public that these species are at risk
 23 and could warrant protection under the ESA. Under the MBTA, migratory birds are protected
 24 throughout their range and protection includes migratory birds, parts, nests, or eggs of any such
 25 bird, or any product thereof.

1 The FFWC oversees the protection and management of state-protected fauna under the Florida
 2 Endangered and Threatened Species Act (Florida Statute 372.072). Within the FAC, protection
 3 is provided to endangered species (FAC 68A-27.003), threatened species (FAC 68A-27.004),
 4 and species of special concern (FAC 68A-27.005). The Florida Department of Agriculture and
 5 Consumer Services maintains the state list of plants designated as endangered, threatened, and
 6 commercially exploited (FAC 5B-40) as defined under Florida Statute 581.185(2).

7 **3.2.2 Existing Conditions**

8 The ETТА surrounding Camp Rudder includes an abundance of habitat types, plants, and
 9 animals. Among them are several federal- and state-listed species. In order to determine
 10 occurrence and potential occurrence of state and federally-protected plant and animal species
 11 within the study area, preliminary data was collected from several sources. The approximate
 12 boundaries and locations of existing natural features were identified and mapped using the
 13 following information:

- 14 • U.S. Geological Survey (USGS) Digital Topographic Quadrangle Maps, 7.5 minute
- 15 series
- 16 • 2007 Florida Department of Transportation (FDOT) Aerial photographs
- 17 • Florida Natural Areas Inventory (FNAI) database
- 18 • USFWS and FFWC databases for listed species and critical habitat
- 19 • Eglin AFB GIS database of federally-listed threatened and endangered species

20 A number of protected plant species are possible within and surrounding the construction
 21 corridors associated with the Proposed Action, as shown in **Table 3-4**, below.

22 **Table 3-4 Protected Plant Species: Proposed Action Corridor**

COMMON NAME	SCIENTIFIC NAME	STATE STATUS	LIKELIHOOD OF OCCURRENCE
Arkansas oak	<i>Quercus arkansana</i>	T	Potential
Ashe's magnolia	<i>Magnolia ashei</i>	E	Potential
Baltzell's sedge	<i>Carex baltzellii</i>	T	Potential
bog button	<i>Lachnocaulon digynum</i>	T	Potential
bog spicebush	<i>Lindera subcoriacea</i>	E	Documented Historic
Boykin's lobelia	<i>Lobelia boykinii</i>	E	Potential

COMMON NAME	SCIENTIFIC NAME	STATE STATUS	LIKELIHOOD OF OCCURRENCE
Curtiss' sandgrass	<i>Calamovilfa curtissii</i>	T	Potential
Florida flame azalea	<i>Rhododendron austrinum</i>	E	Potential
Gulf Coast lupine	<i>Lupinus westianus</i>	T	Potential
hairy wild indigo	<i>Baptisia calycosa</i> <i>var. villosa</i>	T	Likely
hairy-peduncled beaksedge	<i>Rhynchospora crinipes</i>	E	Likely
Harper's yellow-eyed grass	<i>Xyris scabrifolia</i>	T	Potential
incised groove-bur	<i>Agrimonia incisa</i>	E	Potential
karst pond xyris	<i>Xyris longisepala</i>	E	Potential
large-leaved jointweed	<i>Polygonella macrophylla</i>	T	Potential
naked-stemmed panicgrass	<i>Panicum nudicaule</i>	T	Potential
Panhandle lily	<i>Lilium iridollae</i>	E	Likely
Panhandle meadowbeauty	<i>Rhexia salicifolia</i>	T	Documented Historic, Potential
pineland hoary-pea/ goat's rue	<i>Tephrosia mohrii</i> / <i>Tephrosia virginiana</i>	T	Potential
pine-woods bluestem	<i>Andropogon arctatus</i>	T	Potential
pondspice	<i>Litsea aestivalis</i>	E	Potential
primrose-flowered butterwort	<i>Pinguicula primuliflora</i>	E	Potential
serviceberry holly	<i>Ilex amelanchier</i>	T	Likely
small-flowered meadowbeauty	<i>Rhexia parviflora</i>	E	Documented Historic, Potential
spoon-leaved sundew	<i>Drosera intermedia</i>	T	Documented Historic
sweet pitcherplant	<i>Sarracenia rubra</i>	T	Documented Historic, Potential
toothed savory	<i>Calamintha dentata</i>	T	Potential
white-top pitcherplant	<i>Sarracenia leucophylla</i>	E	Documented Historic, Potential
yellow fringeless orchid	<i>Platanthera integra</i>	E	Potential

Note: E = Endangered
 T = Threatened

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4 Additionally, a number of federal- and state-listed animal species are potentially located within
 5 and surrounding the construction corridors associated with the Proposed Action as listed below
 6 in **Table 3-5**, below. The locations of protected species and critical habitat are depicted in
 7 **Figure 3-1**.

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Table 3-5 Protected Animal Species: Proposed Action Corridor

COMMON NAME	SCIENTIFIC NAME	FEDERAL	STATE	LIKELIHOOD OF OCCURRENCE
AMPHIBIANS				
Florida bog frog	<i>Rana okaloosae</i>	-	SC	Documented Historic
frosted flatwoods salamander	<i>Ambystoma cinquatum</i>	T	T	Potential
gopher frog	<i>Rana capito</i>	-	SC	Likely
one-toed amphiuma	<i>Amphiuma pholeter</i>	-	T	Potential
pine barrens treefrog	<i>Hyla andersonii</i>	-	SC	Likely
reticulated flatwoods salamander	<i>Ambystoma bishopi</i>	E	E	Very unlikely
BIRDS				
bald eagle	<i>Haliaeetus leucocephalus</i>	BGEPA/MBTA	-	Likely
Florida burrowing owl	<i>Athene cunicularia floridana</i>	-	SC	Potential
red-cockaded woodpecker	<i>Picoides borealis</i>	E	E	Likely to forage within 1 km
FISH				
blackmouth shiner	<i>Notropis melanostomus</i>	-	T	Likely
bluenose shiner	<i>Pteronotropis welaka</i>	-	SC	Potential
Gulf sturgeon	<i>Acipenser oxyrinchus desotoi</i>	T	T	Documented in the main channel of the Yellow River
MAMMALS				
Florida black bear	<i>Ursus americanus floridanus</i>	-	T	Likely
REPTILES				
alligator snapping turtle	<i>Macrochelys temminckii</i>	-	SC	Likely
American alligator	<i>Alligator mississippiensis</i>	SA	SC	Known from the Yellow River
Eastern indigo snake	<i>Drymarchon couperi</i>	T	T	Likely
Florida pine snake	<i>Pituophis melanoleucus mugitus</i>	-	SC	Potential
gopher tortoise	<i>Gopherus polyphemus</i>	C	T	Potential

1 Notes: E – Endangered
2 T – Threatened
3 SC – Species of Special Concern
4 C – Candidate Species
5 SA - Threatened due to Similarity of Appearance
6 BGEPA – Bald and Golden Eagle Protection Act
7 MBTA – Migratory Bird Treaty Act
8

9 Due to the presence of federally-listed species within the construction corridor and surrounding
10 area of the Proposed Action, an informal Section 7 ESA consultation is required with the
11 USFWS to emphasize the identification and informal resolution of potential species conflicts in
12 the early stages of project planning. A separate Biological Assessment has been prepared by the
13 Eglin Natural Resource Division to support the consultation. The Assessment and the USFWS
14 response are provided in **Appendix E**.

15 **3.3 Coastal Zone Management**

16 **3.3.1 Definition**

17 The CZMA of 1972 was instituted to preserve, protect, develop, and, where possible, to restore
18 or enhance the resources of the nation’s coastal zone. The coastal zone in the Florida Panhandle
19 is rich in a variety of natural, commercial, recreational, ecological, industrial, and aesthetic
20 resources of immediate and potential value to the present and future well-being of the nation
21 (CZMA, 1972).

22 The habitat areas of the coastal zone and the fish, shellfish, other living marine resources, and
23 wildlife therein are ecologically fragile and consequently extremely vulnerable to damage by
24 coastal alterations. Additionally, the special natural and scenic characteristics of coastal zones in
25 the U.S. are being damaged by ill-planned development that threatens these values. Land uses in
26 the coastal zone and the uses of adjacent lands which drain into the coastal zone may
27 significantly affect the quality of coastal waters and habitats. Efforts to control coastal water
28 pollution from land use activities must be improved (CZMA, 1972).

29 **3.3.2 Existing Conditions**

30 In response to the federal CZMA, Florida enacted the Florida Coastal Management Program
31 (FCMP) (Florida Statutes, Chapter 380, Part II) to support management, protection, and

1 maintenance of the coastal zone and its resources. The geography of Florida is such that the
2 entire state is considered to be within the coastal zone and therefore subject to oversight by the
3 FCMP. As a result, the state has the authority to review federal actions for consistency with the
4 program.

5 The FCMP consists of a network of agencies implementing 24 Florida Statutes that protect and
6 enhance the state's natural, cultural, and economic coastal resources. A list of the 24 applicable
7 Florida Statutes is provided in **Appendix B**. The goal of the program is to coordinate local,
8 state, and federal agency activities using existing laws to ensure that Florida's coast is as
9 valuable to future generations as it is today. The FCMP operates the Florida State
10 Clearinghouse, which circulates applications for federal activities, including federal permits and
11 funding, to government agencies that have statutory authority over some part of the activity
12 (State of Florida, 2008). The office of Intergovernmental Programs serves as the Florida's single
13 point-of-contact for the Florida State Clearinghouse program and coordinates FDEP's position
14 on the consistency of federal projects and federally-funded activities with departmental policies
15 and regulations. FDEP provides comments to the Florida State Clearinghouse in accordance
16 with EO 12372, *Intergovernmental Review of Federal Programs*, NEPA, CZMA, and other
17 federal laws and policies (FDEP, 2005).

18 Under Florida's program, permits are required for any erosion control devices, excavations, or
19 erection of structures waterward of the Coastal Construction Control Line (CCCL). This line
20 demarks the landward extent (from the shores along the Gulf of Mexico, excluding
21 Choctawhatchee Bay) of the potential inland impacts of erosion due to a 100-year storm event.
22 The construction corridor for the Proposed Action is landward of Choctawhatchee Bay, therefore
23 outside of the CCCL.

24 Federal applicants seeking a FCMP consistency determination submit their own preliminary
25 consistency determination along with the EA to the Florida State Clearinghouse, which
26 coordinates the review process. Consistency reviews of projects which require permits from the
27 USACE, U.S. Coast Guard, or require a Florida Environmental Resource Permit are conducted
28 during the state permit review and must include an evaluation on the project based upon
29 Florida's 24 statutes (**Appendix B**).

1 **3.4 Cultural Resources**

2 **3.4.1 Definition and Mandating Legislation**

3 Cultural resources can be divided into three major categories: archaeological resources
4 (prehistoric and historic); architectural resources; and traditional cultural resources. Mandating
5 legislation for the treatment of cultural resources includes, but is not limited to: the Antiquities
6 Act of 1906, which established government responsibility for the protection of sites on federally
7 owned or administered lands; the Historic Sites Act of 1935, the Archaeological and Historic
8 Preservation Act of 1974, which provides mechanisms for the recovery of archaeological data;
9 the Archaeological Resources Protection Act of 1979, implemented to protect archaeological
10 resources on public lands and American Indian reservations from unauthorized activity and to
11 enhance communication and exchange of information; the Native American Graves Protection
12 and Repatriation Act (NAGPRA) of 1990, which requires inventory of American Indian, Native
13 Alaskan, or Native Hawaiian human remains and associated funerary objects, makes it illegal to
14 sell or purchase said items, and establishes standard operating procedures for consultation; the
15 American Indian Religious Freedom Act of 1978, which protect the right for American Indians
16 to believe, express, and exercise traditional religions; and the National Historic Preservation Act
17 (NHPA) of 1966 as amended (16 U.S.C. 470 et seq.), which established a national program to
18 implement policy to preserve the nation’s cultural resources.

19 All of the above are relevant to cultural resources concerns, but the NHPA dictates steps for
20 comprehensive compliance in the case of mission-driven activity, which applies to this Proposed
21 Action. Section 106 of the NHPA requires federal agencies to consider the effects of their
22 undertakings on historic properties eligible for nomination to the National Register of Historic
23 Places (NRHP), a congressionally mandated listing of historic properties regarded as significant
24 on local, state, and/or national levels.

25 Section 106 of the NHPA (16 U.S.C. 470 et seq.) defines a historic property as any prehistoric or
26 historic district (including cultural landscapes), sites, building, or object included in or eligible
27 for inclusion in the NRHP. To be eligible for listing on the NRHP, a cultural resource must
28 possess integrity and meet one or more of the significance evaluation criteria as established in
29 36 CFR 60.4, as follows:

- 1 • Criterion A- The property is associated with events that have made a significant
2 contribution to the broad patterns of our history
- 3 • Criterion B- The property is associated with the lives of persons significant in our past
- 4 • Criterion C- The property embodies the distinctive characteristics of a type, period, or
5 method of construction; represents the work of a master; possesses high artistic values; or
6 represents a significant and distinguishable entity whose components may lack individual
7 distinction
- 8 • Criterion D- The property has yielded, or may be likely to yield, information important to
9 prehistory or history.

10 Once an undertaking has been established, the Section 106 process, under the NHPA
11 (36 CFR 800), is implemented through a series of steps as follows:

- 12 1. Identify consulting/interested parties
- 13 2. Identify the area of potential effect (APE)
- 14 3. Identify and evaluate historic properties
- 15 4. Assess effects of the undertaking on historic properties
- 16 5. Consult with appropriate agencies on measures to resolve adverse effect through
17 avoidance or mitigation of said effects.

18 Historic properties considered as part of this assessment are either listed in the NRHP,
19 determined to be eligible for NRHP listing by concurrence from the SHPO, or have been
20 identified as potentially eligible for listing.

21 **3.4.2 Local Prehistory and History**

22 According to the Eglin AFB Historic Preservation Plan (HPP) (Thomas and Campbell, 1993),
23 the area has been occupied since at least 10,000 B.C. The earliest inhabitants, Paleoindians
24 (10,000 to 8,000 B.C.), produced lanceolate projectile points at a time when sea level was 60 to
25 100 meters (m) lower. Since they roamed a landmass much larger than present-day Florida,
26 substantial evidence of Paleoindian occupation lies in offshore deposits. The Archaic Stage
27 (8,000 to 700 B.C.) is divided into Early, Middle, and Late periods, during which sea level rose,
28 reaching the current level sometime near the end of the stage. Stylistic changes in stemmed
29 projectile points and stone technology underscore the basic differences between the periods.
30 Settlement and subsistence patterns reflect a dependence on fishing, hunting, and collection of

1 plant resources. There may have been a population increase at the end of the Archaic stage,
2 corresponding to a time of dramatic cultural and economic dynamics in the Southeast. The Late
3 Archaic people hunted with large, broad-bladed, stemmed points, formed baked clay objects for
4 cooking, produced containers from soft stone, and manufactured the first ceramic vessels. They
5 also engaged in long-distance trade and established centers of redistribution, the latter
6 characterized by celebratory feasting and an exchange of goods.

7 A sedentary lifestyle based on hunting, fishing, and gathering, and the widespread manufacture
8 of plain and decorated pottery characterized the subsequent Woodland Stage (700 B.C. to
9 A.D. 1000). Early and Middle Woodland settlement was coastally-oriented, with villages along
10 Santa Rosa Sound and the bayous and creeks around East and Choctawhatchee bays. They were
11 culturally conservative until the spread of influence from regions to the east and west led to
12 greater innovation during the Late Early Woodland Period. Limited evidence of ceremonialism
13 in the form of mound construction occurred in the Middle Woodland, and patterns of village
14 organization in circular and semi-circular horseshoe-shaped ring middens merged. Population
15 increased in the Late Woodland, with settlements broadcast across the landscape from the coast
16 into the interior to the Yellow and Shoal rivers. The same patterned arrangement of villages
17 continued in the Late Woodland, although there was a decided increase in mound construction.

18 Sometime around A.D. 1000, the area witnessed the rise of Mississippian culture (A.D. 1000 to
19 A.D. 1500), marked by construction of mounds that often served as homes to chiefs. Large
20 villages were established along coastal stretches, occurring in clusters that appear tethered to
21 ritual places, such as mounds and cemeteries. Evidence of cultivation has been found in pre-
22 contact Mississippian contexts in northwest Florida, but evidence of maize agriculture has been
23 limited to only one site on Eglin to date. The Mississippian way of life continued in the Eglin
24 region through the Contact and Colonial periods, with little demonstrable change.

25 Historic Indians had commercial dealings with Colonial merchants and there were conflicts
26 between the groups, but the greatest interaction occurred closer to the capitol of West Florida at
27 Pensacola. There is evidence of Spanish settlement near Eglin and representative artifacts of the
28 Spanish periods have been found, but no substantive settlement by that colonial power has been
29 documented archaeologically. In contrast, British settlement occurred in the East Bay area of

1 Eglin and substantial remains of at least one plantation have been found in the archaeological
2 record.

3 People were slow to settle much of the Eglin area in the early American Period, largely due to
4 poor transportation and, in some cases, continued hostility with indigenous people. Eventually,
5 settlements increased in the 1800s, with communities in the east around the Yellow River, near
6 Eucheeanna, and at East Pass (present-day Destin). No major Civil War battles took place,
7 although there were skirmishes between the Confederate and Union soldiers. After the Civil
8 War, the population increased steadily and small towns grew up in response to the coming of the
9 railroad and the burgeoning timber and naval stores industries.

10 The modern military arrived in the 1930s with construction of the Valparaiso Bombing and
11 Gunnery Base, which was renamed Eglin Field and subsequently Eglin AFB. Eglin has played a
12 crucial role in the country's defense and weapons development from World War II to the present.
13 Today, the military is a neighbor to a patchwork of towns, supporting a varied industry,
14 including a healthy tourism business.

15 **3.4.3 Existing Conditions**

16 As part of the Section 106 process (36 CFR 800), a literature and document review was
17 conducted to determine the following regarding the area of Proposed Action: 1) how much of
18 the area has been inventoried for cultural resources; 2) where and how many sites have been
19 identified; and 3) what is the NRHP evaluation of identified sites. For purposes of addressing
20 these questions, the APE was 200 feet on either side of Range Roads 257 and 211 to the
21 intersection of RR 211 and SR 85, the entirety of the Proposed Action Corridor. The Preferred
22 Alternative and Alternative C, follow the same path, but differ in surface treatment.

23 The review of data indicate that the APE has been inventoried by Phase I survey and all sites
24 previously listed as potentially eligible have been unequivocally evaluated by Phase II testing as
25 either "eligible" or "ineligible" for NRHP nomination. The record of work relevant to the
26 Proposed Action was conducted by one of two contractors, New World Research, Inc. (NWR), a
27 firm contracted for the multi-year, multi-phase HPP-related studies in the 1980s, and Prentice
28 Thomas & Associates, Inc. (PTA), the company responsible for investigations, beginning in the
29 1990s. **Table 3-6** lists all projects that investigated the Eglin AFB property and overlapping the

1 400-foot Proposed Action Corridor. For reference, sites investigated by more than one project
 2 are denoted by an asterisk. The table is ordered by project name and for each, the level of effort,
 3 year of performance, contractor, cultural resources investigated, NRHP status, and location with
 4 regard to the areas of Proposed Action.

5 **Table 3-6 Cultural Resources Investigations/Findings Pertinent to Proposed Action**

Project	Effort	Date	Contractor	Cultural Resource	NRHP Status	Location
HPP ¹	Recording/Testing	1982	NWR	8OK108*	Eligible	Both
HPP	Recording/Testing	1982	NWR	8OK143*	Ineligible	Both
HPP SU31 ²	Survey/Recording	1982	NWR	8OK209	Ineligible	Both
HPP X-5 ³	Survey/Recording	1982	NWR	8OK155*	Ineligible	Both
HPP X-43	Survey/Recording	1984	NWR	8OK392	Ineligible	Both
HPP X-43	Survey/Recording/Testing	1984	NWR	8OK402*	Eligible	Both
HPP X-81	Survey/Recording	1984	NWR	8OK431*	Ineligible	Both
HPP X-82	Survey/Recording	1984	NWR	8OK363	Ineligible	Both
HPP X-134	Survey/Recording	1983	NWR	8OK273*	Ineligible	Both
HPP X-135	Survey/Recording	1983	NWR	8OK274*	Potentially Eligible	Both
HPP X-137	Survey	1983	NWR	None	n/a	n/a
HPP X-139	Survey/Recording	1984	NWR	8OK407*	Ineligible	Both
HPP X-170	Survey/Recording	1982	NWR	8OK445	Ineligible	Both
HPP X-175	Survey/Recording	1982	NWR	8OK451	Ineligible	Both
HPP X-186	Survey/Recording	1983	NWR	8OK354*	Potentially Eligible	Both
X-237	Survey	1994	PTA	None	n/a	n/a
X-281	Survey	1995	PTA	None	n/a	n/a
X-281	Survey	1995	PTA	None	n/a	n/a
X-302	Survey	1995	PTA	8OK1026	Ineligible	Both
X-357	Survey	1997	PTA	8OK1124*	Ineligible	Both

¹ 8OK108 and 8OK143 were originally reported by an informant and recorded during the HPP as part of a selective program to investigate previously known cultural occurrences.

² SU 31 was investigated as part of the HPP probabilistic survey to develop a predictive model.

³ HPP X-5 and other projects listed with the prefix HPP X- were surveyed as part of the HPP judgmental investigations. All contracted survey tracts investigated subsequent to the HPP continued to be prefixed by an X.

Project	Effort	Date	Contractor	Cultural Resource	NRHP Status	Location
X-401	Survey	1997	PTA	8OK1220	Ineligible	Both
X-404	Revisit/Re-evaluation	1998	PTA	8OK143*	Ineligible	Both
	Revisit/Re-evaluation			8OK402*	Eligible	Both
	Survey/Recording			8OK1238	Ineligible	Both
	Survey/Recording			8OK1241	Potentially Eligible	Both
X-448	Revisit	1999	PTA	8OK108*	Eligible	Both
X-451	Survey/Recording	2000	PTA	8OK1277	Ineligible	Both
n/a	Phase II Testing	2000	PTA	8OK1241*	Eligible	Both
X-575	Survey	2001	PTA	None	n/a	n/a
	Revisit/Re-evaluation			8OK155*	Ineligible	Both
	Survey/Recording			8OK1702	Ineligible	Both
X-576	Survey	2001	PTA	None	n/a	n/a
X-594	Survey	2002	PTA	None	n/a	n/a
X-601	Survey	2001	PTA	None	n/a	n/a
X-750	Survey	2005	PTA	None	n/a	n/a
	Survey			None	n/a	n/a
X-752	Survey	2005	PTA	None	n/a	n/a
X-754	Survey	2005	PTA	None	n/a	n/a
	Survey			None	n/a	n/a
X-796	Survey	2005	PTA	None	n/a	n/a
X-797	Revisit/Re-evaluation	2007	PTA	8OK392*	Ineligible	Both
	Survey/Recording			8OK2410	Ineligible	Both
	Survey/Recording			8OK2411	Ineligible	Both
X-897	Survey/Recording	2007	PTA	8OK2599	Ineligible	Both
X-999	Revisit/Re-evaluation	2009	PTA	8OK273*	Ineligible	Both
	Revisit/Re-evaluation			8OK274*	Ineligible	Both
X-1123	Revisit/Re-evaluation	2011	PTA	8OK1124*	Ineligible	Both
X-1124	Revisit/Incorporate 8OK407 into 8OK108	2011	PTA	8OK108/8OK407*	Eligible	Both
	Survey/Recording			8OK2810	Ineligible	Both
	Survey/Recording			8OK2812	Eligible	Both
X-1125	Survey/Recording	2011	PTA	8OK2815	Eligible	Both
X-1183	Revisit/Re-evaluation	2012	PTA	8OK354*	Eligible	Both

1
 2 The table needs points of clarification pertaining to properties listed under the *Cultural Resource*
 3 column. The column includes only those cultural resources within the 400-foot APE (200 feet
 4 on either side of the existing road). For example, SU 31 resulted in the discovery of three sites,

1 but only one is in the APE; the other two are situated over 300 m to the west and, thus, excluded
2 from the table. Second, some sites are listed more than once on **Table 3-6** because of multiple
3 investigations. A good example is 8OK108, which was recorded by NWR and subsequently
4 tested and found eligible for NRHP nomination during the HPP investigations in the 1980s. In
5 1999, a portion of 8OK108 was investigated by PTA when survey in X-448 overlapped the site
6 boundaries. In PTA's 2011 survey of X-1124, the boundaries of 8OK108 were expanded further
7 and determined to encompass all of 8OK407, a small site that was also first identified as part of
8 the HPP work conducted by NWR.

9 Six archaeological sites on **Table 3-6** sites have been evaluated as eligible for nomination to the
10 NRHP and, therefore, raise cultural concerns. The Cox Cemetery also presents a cultural
11 concern. Ordinarily cemeteries or graves are not considered eligible for the NRHP, but Florida
12 state law (Chapter 872.02) makes it illegal to willfully and knowingly disturb human remains or
13 even memorials (e.g., fences, tombstones, markers, vegetation) associated with a burial. Other
14 than the six sites and historic cemetery, the cultural resources on **Table 3-6** are ineligible for
15 NRHP nomination and pose no cultural concern for the Proposed Action.

16 **3.5 Geological Resources**

17 **3.5.1 Definition**

18 Geological resources consist of the topography and natural materials removed, excavated, or
19 mined from the earth's surface and subsurface. Such resources may have economic, aesthetic, or
20 are valuable as a supportive environment for living organisms. The topography, soils,
21 stratigraphy, and mineral resources are considered relevant geologic resources for the purpose of
22 this EA.

23 **Topography**

24 Topography is the term used to describe the three-dimensional shape or texture of land surface
25 that allows for identification of specific landforms. Topographic maps include contour lines that
26 show land surface elevations and illustrate physiographic features. The topography and
27 physiographic nature of northwest Florida are primarily the products of stream and sea wave
28 activity (Pratt et al., 1996).

1 **Soils**

2 Soil is the naturally occurring, unconsolidated or loose mixture of mineral and organic matter
3 that covers land surface and is capable of supporting life. It is formed by the combined effect of
4 physical, chemical, and biological processes on parent material. Soils are a key component of an
5 ecosystem, often controlling the form of the ecosystem and habitat.

6 **Geologic Stratigraphy**

7 Stratigraphy is a branch of geology dealing with the succession and layering of rock formations
8 and geologic units. The stratigraphy of Florida deals with surficial unconsolidated deposits
9 (sand, gravel, silt, and clay) and consolidated sedimentary rock layers (primarily dolomite and
10 limestone) lying deeper below the surface of the ground. The study of stratigraphy enables
11 geologists to define the environment in which the sediments were deposited and to determine the
12 deformational history of those sediments caused by the structural forces of plate tectonics.

13 **Mineral Resources**

14 Mineral resources are supplies of rocks, minerals (metallic and non-metallic), fluids, and gases
15 extracted or mined from the earth for man's benefit. In the Florida Panhandle, important
16 resources include phosphate, limestone (crushed rock), sand, gravel, clay, peat, heavy minerals,
17 oil, and natural gas.

18 **Geologic Hazards**

19 Specific geologic conditions may exist in some areas of Florida that present potential threats to
20 safety, welfare, and the environment. Unstable slopes, steephead slopes, sinkholes, and, to a
21 lesser extent, seismic activity may occur in Florida.

22 **3.5.2 Existing Conditions**

23 **Topography**

24 The Proposed Action is within the Western Highlands Physiographic Region in the Coastal Plain
25 Province (Randazzo and Jones, 1997). This area is characterized by highly dissected, eroded,
26 and reworked uplands and ridges.

1 In Okaloosa County, the natural topography of the project area has been slightly altered by past
2 cut and fill activities associated with the construction of range roads, in particular RR 211,
3 various crossroads, stream crossings and drainage ditches. The natural topography of the project
4 area varies significantly, ranging from approximately
5 20 feet above mean sea level (msl) in the vicinity of
6 the Yellow River, to approximately 135 feet above
7 msl at Camp Rudder (**Figure 3-2**).



8 The topography of the Preferred Alternative varies
9 greatly throughout the project area with lower areas
10 being along the creeks and swamps. In general, the
11 creeks flow northward towards the Shoal and Yellow
12 Rivers. RR 211 crosses several creeks including Metts, Middle, Turkey Gobbler, Gopher, and
13 Turkey Hen Creeks, Carr Spring Branch, and the unnamed tributary to the Shoal River that flows
14 from Crain Pond. The creeks intersect RR 211 at elevations ranging from 25 to 75 feet above
15 msl.

16 Range Road 257 increases in elevation from north to south beginning at an elevation of
17 approximately 65 feet above msl at the intersection of RR 211 and RR 257, climbing to an
18 elevation of over 135 feet above msl at the projects southern terminus at Camp Rudder.

19 **Soils**

20 Twelve different soil units (not including water-covered areas) are mapped along the Proposed
21 Action Corridor (USDA, 2009; Overing et al., 1995). The soil units are identified and generally
22 characterized in **Table 3-7** below. A map showing the locations of the various soil units is
23 included as **Figure 3-3**. Soils are considered hydric if formed under conditions of saturation,
24 flooding, or ponding long enough during the growing season to develop anaerobic conditions in
25 the upper layers (Federal Register, 1994).

1

Table 3-7 Distribution and Description of Soils

Soil Unit	General Occurrence	Preferred Alternative - Pave RR 211/257 and Alternative C - Clay Base RR 211/257			
		60-foot work corridor centered on existing roadway		Entire 400-foot study corridor	
		Acreage (approximate)	Percentage (approximate)	Acreage (approximate)	Percentage (approximate)
Chipley and Hurricane Soils, 0-5% slopes	Somewhat poorly drained, nearly level, sandy marine deposits located on flats on marine terraces on coastal plains.	7.70	8.8	51.3	8.8
Dorovan Muck, frequently flooded	Very poorly drained, nearly level, organic material, located on flood plains on marine terraces on coastal plains.	6.68	7.7	44.5	7.7
Foxworth Sand, 0-5% slopes	Moderately well drained, nearly level soils located on the ridges of marine terraces.	4.80	5.5	32.0	5.5
Kinston, Johnston, and Bibb Soils, frequently flooded.	Poorly to very poorly drained, nearly level soils located on flood plains on marine terraces on coastal plains.	---	---	---	---
Lakeland Sand, 0-5% slopes	Excessively drained, nearly level to gently sloping soils primarily on broad ridges in the uplands.	57.00	65.4	380	65.4
Lakeland Sand, 5-12% slopes	Excessively drained, sloping soils primarily on broad ridges in the upland hillsides leading to drainageways and around depressions.	6.71	7.7	44.7	7.7
Lakeland Sand, 12-30% slopes	Excessively drained, strongly sloping soils primarily on broad ridges in the upland hillsides leading to drainageways and around depressions.	0.54	0.6	3.6	0.6
Troup Sand, 0-5% slopes	of sandy and loamy marine deposits located on ridges on mariner terraces on coastal plains.	---	---	---	---
Troup Sand, 5-8% slopes	sandy and loamy marine deposits located on ridges on mariner terraces on coastal plains.	1.68	1.9	11.2	1.9
Troup Sand, 8-12% slopes	Well drained, strongly sloping soils consisting of sandy and loamy marine deposits located on ridges on mariner terraces on coastal plains.	0.80	0.9	5.3	0.9
Udorthents, nearly level	Poorly drained, nearly level areas where the original soils have been cut away or covered with a loamy fill material	1.17	1.3	7.8	1.3
Water Bodies (fresh)	Water	0.09	0.1	0.6	0.1
Yemassee, Garcon, and Bigbee Soils, occasionally flooded	Ranging from somewhat poorly drained to excessively drained, nearly level soils located on flood plain and streams terraces on marine terraces on coastal	---	---	---	---
Total		87.15	100	581	100

2

3 Source: USDA, 2009; Overing, 1995

4 Lakeland Sand dominates the area associated with both the Preferred Alternative and Alternative
 5 C. These sands are extremely well drained and highly permeable deposits that occupy upland
 6 areas. The depth to the unconfined groundwater table is variable, but normally exceeds 10 feet
 7 below land surface (bls) and may be in excess of 50 feet bls on ridges and knolls. Minor
 8 occurrences of Chipley and Hurricane Soils, Foxworth Sand, and Troup Sand occur in upland
 9 areas and along the banks of the Yellow River and its tributaries, along both routes. None of
 10 these soil units have hydric soil characteristics.

1 The Dorovan Muck soil unit characterizes the lowest topographic regions of the floodplain area.
 2 Water and pits (Udorthents) occupy less than two percent of the project area. The Dorovan unit
 3 may exhibit hydric characteristics.

4 **Geologic Stratigraphy**

5 The project area is underlain by sedimentary deposits many thousands of feet thick. The near-
 6 surface deposits, those down to approximately 500 feet, are most relevant to the activities
 7 associated with the project. The stratigraphic sections of interest and their hydrogeologic
 8 equivalents are summarized in **Table 3-8**, below.

9 **Table 3-8 Shallow Stratigraphy**

Geologic Unit	Hydrogeologic Equivalent	Structural Top in Yellow River Floodplain		Structural Top at Camp Rudder		Thickness		Lithologic Descriptions	
		feet bls	feet NGVD	feet bls	feet NGVD	feet			
Pliocene-Recent Sands	Sand & Gravel Aquifer	outcrop	15	outcrop	185	95	to	265	unconsolidated body of fine to medium grained, white to gray quartz sand; occasional clay lenses and layers of organic debris; fossils include primarily mollusks
Citronelle Formation									non-indurated, multi-colored quartz sand with discontinuous layers of gravel, clay, and limonite; typically unfossiliferous with occasional iron cement
Alum Bluff Undifferentiated	Intermediate System Confining Unit	95	-80	265	-80	145		poorly consolidated clayey sand, sandy clay and shell beds, interfingering with the Intracoastal locally	
Pensacola Clay		240	-225	410	-225	155		pale yellow-brown to olive-gray, dense, silty clay, sometimes containing high concentrations of quartz sand; generally unfossiliferous	
Bruce Creek Limestone	Floridan Aquifer System	Upper Floridan Aquifer	395	-380	565	-380	140		white to light gray moderately indurated, granular, fossiliferous, occasionally calcarenite limestone
Chattahoochee-Chickasawhay Limestone			535	-520	705	-520	130		tan, sucrosic dolomite or cream to buff fossiliferous limestone
Bucatanna Clay		Bucatanna Clay Confining Unit	665	-650	835	-650	50		brown to yellow brown clay with modest quartz sand content; limestone is common accessory; sparsely fossiliferous
Ocala Group Limestones		Lower Floridan Aquifer	715	-700	885	-700	250		white to light gray chalky fossiliferous limestone and tan sucrosic dolomite
Lisbon Formation	Sub-Floridan System	965	-950	1135	-950	?		cream sandy, pyritic, glauconitic limestone and light gray clay and sand	

10

11 Note: bls = below land surface;
 12 msl = mean sea level
 13 all tops are approximate
 14 Sources: Pratt et al., 1996; Schmidt and Clark, 1982.

15 The stratigraphy of Okaloosa County is influenced by the Chattahoochee Anticline, a regional
 16 flexure or folding of Florida's Panhandle sediments that crests some 80 miles to the east-
 17 northeast in Jackson County, Florida. The area of interest lies on the western flank of this
 18 structure; hence, the geologic units beneath Okaloosa County dip to the southwest toward the
 19 Gulf of Mexico at an incline of about 15 to 25 feet per mile (Pratt et al., 1996; Schmidt and
 20 Wiggs-Clark, 1982). The ROI of this resource is the immediate vicinity of RRs 211 and 257.

1 Outcropping unconsolidated sediments along the RRs 211 and 257 corridors are ascribed to the
2 Pliocene-Recent Sands unit, a deposit of unconsolidated quartz sand. These Recent Sands
3 overlap and interfinger into the multicolored sands, gravels, and clays of the underlying
4 Citronelle Formation. The contact conformability between the Recent Sands and the Citronelle
5 Formation is questionable in the ROI due to insufficient data. However, the Citronelle
6 Formation can be distinguished from the Pliocene-Recent Sands by its lack of fossils. The
7 surficial sediments are underlain by the sandy clay, clayey sand, and shell beds of the Alum
8 Bluff Group and the dense, silty clay of the Pensacola Clay. The Pensacola Clay is a wedge-
9 shaped deposit which thickens to the south and west and pinches out to the east in western
10 Okaloosa County (Schmidt and Wiggs-Clark, 1982).

11 These low permeability sediments are underlain by a 270 foot thick sequence of carbonate
12 formations comprised of the Bruce Creek Limestone and the Chickasawhay/Chattahoochee
13 Limestone. This series is interrupted by an estimated 50 foot section of the Bucatunna Clay at a
14 depth of 665 to 835 feet bls. This locale represents an area of transition for the Bucatunna Clay
15 as it gradually pinches out to the east/northeast. The Ocala Group Limestone extends nearly 250
16 feet below the Bucatunna where it is underlain by the clayey limestone of the Lisbon Formation.
17 Collectively, the Bruce Creek Limestone, the Chickasawhay/Chattahoochee Limestone, and the
18 Ocala Group Limestone comprise the Floridan Aquifer, with the Bucatunna Clay dividing the
19 System into the Upper Floridan and Lower Floridan. The Floridan Aquifer System for this
20 portion of Okaloosa County is recharged in southern Alabama (Schmidt & Clarke, 1982) and is
21 the primary source for public water supply in the area.

22 Together, the Pliocene-Recent Sands and the Citronelle Formation make up the Sand & Gravel
23 Aquifer. The Sand & Gravel Aquifer ranges from approximately 95 feet thick in the floodplain
24 of the Yellow River to approximately 265 feet thick in the vicinity of I-10. Depth to the shallow
25 groundwater table in the project corridor varies from land surface in topographically low areas of
26 the Yellow River Floodplain to greater than 50 feet on the ridges and knolls (Pratt et al., 1996).
27 The Sand & Gravel Aquifer is recharged by local rainfall.

28 The surficial sediments are underlain by the sandy clay, clayey sand, and shell beds of the Alum
29 Bluff Group and the dense, silty clay of the Pensacola Clay. Locally, these two low permeability
30 strata are approximately 300 feet thick and serve as an upper confining unit for the Floridan

1 Aquifer. This low-permeability clay to sandy clay sediment effectively restricts the exchange of
2 groundwater between the overlying Sand & Gravel Aquifer and the underlying Floridan Aquifer
3 System, thus its hydrogeologic assignment as the Intermediate System Confining Unit.

4 **Mineral Resources**

5 Although not typically thought of as a mining state, Florida ranks fifth nationally in industrial
6 mineral production (Florida Geological Survey [FGS], 2008, 2009). Resource potential in the
7 Florida Panhandle includes phosphate, limestone, sand and gravel, clay, fuller's earth, peat, oil,
8 and natural gas as well as heavy minerals such as ilmenite, rutile, zircon, leucosene, staurolite,
9 monazite, and tourmaline.

10 Commercial deposits of phosphate have not been identified in the Western Florida Panhandle.
11 Limestone (used in the crushed stone industry) occurs at great depth in the ROI and is not
12 recoverable. Heavy minerals associated with marine sand deposits are often concentrated by
13 wave action along coastal beaches and are not likely to exist in commercial quantities in the
14 project corridor. Oil and natural gas production exists in extreme northern Santa Rosa County,
15 which is adjacent to Okaloosa County, but no reserves have been exploited or identified in the
16 project area.

17 Sand, gravel, and clay are mined throughout the Florida Panhandle. Substantial commercial
18 deposits are mined from the Pliocene-Recent Sands unit and the Citronelle Formation. Quartz
19 sand and, in some instances, gravel is available in large quantities from the Pliocene-Recent
20 Sands unit and could be present in commercial quantities beneath the project area.

21 **Geologic Hazards**

22 With respect to geologic hazards, no faults or fault zones have been interpreted in the vicinity of
23 the ROI. This portion of northwest Florida is not prone to sinkhole development due to the
24 substantial depth at which carbonate sediments occur and the thick layer of cohesive sediments
25 that overlie them (Sinclair and Stewart, 1985). The area of interest is not located in or near a
26 seismic impact zone (Frankel et al., 2002). No unstable areas (such as areas with fissures, areas
27 where the ground is prone to mass movement, or areas with highly expansive soils) have been
28 identified in the ROI.

1 **3.6 Land Use**

2 **3.6.1 Definition**

3 Land use refers to the classification of land on the basis of natural conditions and the types of
4 human activity occurring on that land. Land use planning combines both natural environments
5 and associated human activity. Proper land use planning considers functional interrelationships
6 between natural conditions and human activities, the type of human activities occurring, and land
7 use of adjacent and proximal areas.

8 **3.6.2 Existing Conditions**

9 Five types of land use (including water) support the current mission of Eglin AFB and the Army
10 in the testing and evaluation of non-nuclear munitions, electronic combat systems,
11 navigation/guidance systems, military operations, and training (USAF, 2009). The uses
12 necessary to conduct and support the objectives of Eglin AFB are as follows:

- 13 • Test and evaluation
- 14 • Space Operations Support
- 15 • Training
- 16 • Eglin Gulf Test and Training Ranges (EGTTR)
- 17 • Administrative Area Land Use

18 As a result of BRAC 2005, Eglin AFB has identified land use as a growth related challenge that
19 could possibly affect Eglin’s current and future military mission. Therefore, Eglin has become
20 involved in a cooperative land use planning effort (Joint Land Use Study) between military
21 installations and the surrounding communities to promote compatible community growth that
22 supports military training and operational missions (EDC, 2010).

23 The program goals of the *Eglin Air Force Base Joint Land Use Study* (Tetra Tech, Inc., 2009) are
24 to:

- 25 • Foster city and county involvement
- 26 • Protect the health, safety, and welfare of the civilian and military communities
- 27 • Identify appropriate regulatory and non-regulatory measures to ensure compatibility
28 between existing and future land uses

- 1 • Increase communication and cooperation between Eglin AFB and neighboring local
- 2 governments
- 3 • Protect and promote the present and future operational capabilities of Eglin’s land
- 4 holdings

5 Eglin AFB is one of 20 component installations that make up the DoD Major Range Test Facility
6 Base (MRTFB). Eglin’s primary function is to support research, development, test, and
7 evaluation of conventional weapons and electronic systems. It also provides support for joint
8 training of operational units. Eglin AFB is composed of 724 square miles of land situated among
9 four counties—Santa Rosa, Okaloosa, Gulf, and Walton. There are 36 specific test areas, and
10 124,642 sq. mi. within the EGTTR. The current land use within and surrounding the areas of the
11 Proposed Action is depicted in **Figure 3-4** and discussed below.

12 The Preferred Alternative as described in Section 2.1.2 would involve upgrading RR 257 and
13 211 from gravel/dirt roads (secondary) to primary paved two-lane roadways for a distance of
14 approximately 12 miles. Alternative C would follow the same route, but the surface would be an
15 improved clay based roadway. Each Alternative may include refurbishment or replacement of
16 up to eight or nine small bridges where RR 211 crosses tributaries of the Yellow and Shoal
17 Rivers. The implementation of either alternative would be within unimproved military property
18 owned by the U.S. Air Force/Eglin AFB.

19 There is a small community comprised of single family residences, mobile homes, and vacant
20 residential lots just off of RR 211 (Rattlesnake Bluff Road) and bounded by the Shoal River and
21 Eglin AFB (**Figures 2-3** and **3-4**). Okaloosa County, Public Works Road Division, has been
22 granted an easement from Eglin (who maintains ownership) for the 3.8 miles of RR 211 from
23 Jenkins Road to SR 85. Under the easement the County maintains this portion of the road,
24 enabling private citizens to reliably access their land.

25 The area around the section of RR 257 (1.66 miles) going north out of Camp Rudder is within
26 Eglin TA-B6 and generally parallels the Auxiliary Field No. 6 runway located 2,000 feet to the
27 west. Other than this portion of RR 257, the entire Proposed Action Corridor is outside of
28 designated Eglin Test Areas. Land surrounding RR 211, from SR 85 to RR 257 at the boundary
29 of TA-B6, consists of forest, wetlands, and tributaries of the Yellow and Shoal Rivers. The
30 proposed corridor is transected by the Florida National Scenic Trail, and much of the

1 surrounding area is currently open to public access for recreational purposes with a proper Eglin
2 Natural Resource Branch permit.

3 **3.7 Noise**

4 **3.7.1 Definition**

5 Noise and sound share the same physical aspects, but noise is considered a disturbance while
6 sound is defined as an auditory effect. The physical characteristics of noise or sound include its
7 intensity, frequency, and duration. Sources of noise may be stationary or transient and may emit
8 sound constantly or intermittently. The meaning of noise for this analysis is undesirable sound
9 that interferes with verbal communication and hearing or otherwise diminishes the quality of the
10 environment. Human response to increased noise levels varies according to the source type,
11 characteristics of the noise source, distance between source and receptor, receptor sensitivity,
12 and time of day.

13 Sound is measured with instruments that record instantaneous sound levels in decibels (dB).
14 Sound level measurements used to characterize sound levels that can be sensed by the human ear
15 are designated “A-weighted” (dBA). A-weighted denotes the adjustment of the frequency
16 content of a noise event to represent the way in which the average human ear responds to the
17 noise event.

18 Noise levels used to characterize community noise effects from such activities as aircraft or
19 building construction are measured in the day-night average denoted as “A-weighted sound
20 level” (DNL). The DNL metric accounts for the greater annoyance of noise during nighttime
21 hours and is calculated by averaging hourly sound levels for a 24-hour period and applying a 10-
22 dB penalty for operations conducted between 10:00 PM and 7:00 AM.

23 Most people are exposed to sound levels of DNL 50 to 55 dBA or higher on a daily basis. Noise
24 levels in residential areas vary depending on the housing density and location. As shown in
25 **Table 3-9**, a normal suburban area is about 55 dBA, which increases to 60 dBA for an urban
26 residential area and 80 dBA in the downtown section of a city.

1

Table 3-9 Typical Outdoor Noise Levels

Day-Night Noise Level	Location
50 dBA	Residential area in a small town or quiet suburban area
55 dBA	Suburban residential area
60 dBA	Urban residential area
65 dBA	Noisy urban residential area
70 dBA	Very noisy urban residential area
80 dBA	City noise (downtown of major metropolitan area)
88 dBA	3rd floor apartment in a major city next to a freeway

2

Source: Federal Highway Administration, 1980

3

4

In June 1980, the Federal Interagency Committee on Urban Noise (FICUN) published *Noise Fundamentals Training Document Highway Noise Measurement and Guidelines for Considering Noise in Land Use Planning and Control* (FICUN, 1980) relating DNL values to compatible land uses. Most federal agencies have identified 65 dB DNL as a criterion that protects those most affected by noise and that can often be achieved on a practical basis.

9

3.7.2 Existing Conditions

10

The primary sources of noise on Eglin AFB are airfield operations, industrial activities, and vehicular traffic. A noise study was conducted at Eglin in 2006 to construct noise contours for airfield operations at the installation (Eglin, 2008). According to the 2006 noise contour GIS Layers, the Proposed Action Corridor lies outside the 65 dBA contour (the lowest level for which contours were established).

15

The noise guidelines established for land use planning at Eglin are essentially the same as those published in the June 1980 FICUN publications. Based on these guidelines, the maximum acceptable noise level for most residential land uses is considered to be 65 dBA DNL and acceptable levels for recreational areas range from 65-75 dBA.

19

The ROI for noise concerns for the Proposed Action is the area immediately surrounding the proposed corridor. Noise contours above 65dBA associated with Eglin do not affect the ROI for the Proposed Action.

22

Some areas on Eglin and beyond the Eglin Reservation boundary are subject to increased levels of impulse, or explosive, noise according to the Eglin Range Air Installation Compatible Use

23

1 Zone (RAICUZ). There are three impulse noise intensity levels represented as *Low Intensity-*
2 *Infrequent Impulse Noise, Moderate Intensity-Less Frequent Impulse Noise, and Higher*
3 *Intensity-Greater Frequency Impulse Noise*. Each noise intensity level indicates the potential for
4 humans to notice and/or be annoyed by the noise. The Proposed Action Corridor traverses
5 northernmost edge of the *Higher Intensity-Greater Frequency Impulse Noise* coverage area.

6 The land use on this portion of Eglin AFB is unimproved military property. However,
7 residential communities are located near the eastern terminus of the Proposed Action Corridor.

8 **3.8 Safety**

9 **3.8.1 Definition**

10 A safe environment is one with an absence of or an optimally reduced potential for death, serious
11 bodily injury or illness, or property damage.

12 **3.8.2 Existing Conditions**

13 The existing safety environment encompasses:

- 14 • Range Road Usage
- 15 • Construction Safety
- 16 • Unexploded Ordnance (UXO)

17 **Range Roads and Training Exercises**

18 For actions occurring on military property with inherent safety risks, procedures are in place to
19 minimize or eliminate risks to the public. Such measures include the temporary or permanent
20 designation of areas as “restricted” or “closed” to the public. Such constraints are driven by the
21 dimensions of the “safety footprint” of a particular action that may have potentially harmful
22 noise, blast, or other effects; or by the presence of residual unexploded ordnance, chemicals, or
23 other elements from historical missions.

24 Additionally, there are Air Force regulations, policies, and management protocols in place for
25 range safety to keep travelers safe while using range roads. Due to their placement near testing
26 and training activities, range roads have inherent safety risks. Management protocols include a
27 requirement for recreational users of Eglin property to obtain permits from Eglin Natural

1 Resources; restricting access to specific areas by placement of locking gates or positioned
2 Security Police; and requiring personnel to schedule range access via the Eglin Range Operations
3 Control Center.

4 The primary regulations that establish relevant safety policy and define requirements and
5 procedures for conducting tests on Eglin AFB and areas under its jurisdiction are (Eglin, 2009A):

- 6 • AAC Instruction 91-201, Test Safety Review Process.
- 7 • AFI 90-901, Operational Risk Management (ORM)
- 8 • AFPAM 90-902, ORM Guidelines and Tools.

9 Standard safety procedures exist to ensure limited public access to affected training areas during
10 test implementation. These procedures require every practical effort to keep the designated
11 training areas clear of all nonparticipating persons and vehicles; necessitating that large portions
12 of Eglin are closed to general public use (Eglin, 2009A).

13 Additional safety risks for range roads are due to their construction of sand or clay with minimal
14 engineering. The 796th Civil Engineering Squadron (796 CES) has the responsibility to
15 maintain all roads on Eglin. Annually, the 796 CES maintains approximately 1,545 miles of
16 roads, of which approximately 1,409 miles are unpaved (Eglin, 2009A). Maintenance activities
17 performed by the 796 CES include periodic road maintenance such as road grading, resurfacing,
18 or reconstruction and structure maintenance of culverts, and bridges, etc. Most maintenance
19 activities consist of “quick-fix” type repairs and include grading, resurfacing, filling holes, and
20 repairing washouts. However, even with regular maintenance, the very nature of unpaved roads
21 can lead to safety issues resulting from poor road surface integrity, limited sight distances due to
22 curves and inclines, and tendencies for wash-out during inclement weather.

23 **Contractor and Construction Activities**

24 All contractors performing construction activities are responsible for following ground safety
25 and OSHA Act for Construction Work (29 CFR 1910.12 and 29 CFR 1926) regulations.
26 Contractors are required to conduct construction activities in a manner that does not pose a risk
27 to site workers or installation personnel. Industrial hygiene programs address exposure to
28 hazardous materials, use of personal protective equipment, and use and availability of Safety
29 Data Sheets.

1 Contractor responsibilities include exposure monitoring (e.g., asbestos, lead, hazardous
2 chemicals and materials) and review of potentially hazardous workplaces; physical effects (e.g.,
3 noise propagation), and biological agents (e.g., wildlife). It is up to the contractor to recommend
4 and evaluate controls (e.g., ventilation, respirators) to ensure personnel are properly protected or
5 remain unexposed; and to ensure a medical surveillance program is in place to perform
6 occupational health physicals for those workers subject to any accidental chemical exposures or
7 engaged in hazardous waste work.

8 **Unexploded Ordnance (UXO)**

9 UXO is defined as “any munitions device containing explosive material that did not detonate
10 upon impact, but still has the potential to detonate.” UXO is a safety concern across much of the
11 Eglin Range Complex as a result of 60-years of munitions testing. During its long history, a vast
12 number of different munitions items have been expended throughout the Eglin Range complex as
13 part of training and testing activities. While UXO is an unintended but unavoidable consequence
14 of any operation involving energetic material, only recently has the Air Force published
15 standards for munitions residue maintenance, remediation, and documentation (EAFB, 2009).

16 Some areas of Eglin have been classified as clean and do not have access restrictions. These
17 areas either have never been used for munitions and/or the near surface has been checked for the
18 presence of UXO. However, much of the complex is considered potentially contaminated with
19 UXO that may have resulted from historical activities (EAFB, 2009). Areas are categorized as
20 having “possible” and “probable” UXO contamination. The Proposed Action Corridor is not in
21 an area with a high probability of UXO.

22 **3.9 Solid Waste**

23 **3.9.1 Definition**

24 The Solid Waste Disposal Act (42 USC 3251 et seq.) established guidelines for solid waste
25 collection, transport, separation, recovery, and disposal systems. RCRA (42 USC 6901 et seq.)
26 amended this act by shifting the emphasis from disposal to recycling and reuse of recoverable
27 materials. Florida also has solid waste management regulations pertaining to solid waste
28 facilities; resource recovery and management programs; certification of resource recovery

1 equipment; as well as used oil and domestic sludge classification, utilization, and disposal
2 criteria.

3 Florida solid waste management rules and regulations include the following:

- 4 • Florida Solid and Hazardous Waste Management Act of 1988 (Chapter 403 FS):
 - 5 – Comprehensive language essentially amended Chapter 403 FS, the Environmental
 - 6 Control Statute, specifically Part IV, Resource Recovery and Management.
 - 7 – Requires counties and municipalities to adequately plan and provide for efficient,
 - 8 environmentally acceptable solid waste management including hazardous waste, as
 - 9 well as promote the reduction, recycling, reuse, or treatment of solid waste.
 - 10 – Establishes FDEP responsibilities
 - 11 – Defines terms that are fundamental to the topic of waste management (403.703 FS).
- 12 • Florida Solid Waste Management Facility Regulations (62-701 FAC):
 - 13 – Establishes standards for the construction, operation, and closure of solid waste
 - 14 facilities as well as procedures for the handling of certain recovered or recycled
 - 15 materials.
- 16 • The Energy, Climate Change, and Economic Security Act of 2008 (403.7032 FS):
 - 17 – Establishes a statewide recycling goal of 75% by the year 2020, directing the FDEP
 - 18 to develop programs aimed at achieving this goal.

19 Air Force regulatory requirements and management of solid waste include:

- 20 • AFD 32-70, Environmental Quality
 - 21 – Requires compliance with applicable federal, state, and local environmental laws and
 - 22 standards.
- 23 • AFI 32-7042, Waste Management
 - 24 – Implements AFD 32-70, Environmental Quality
 - 25 – Requires that each installation have a solid waste management program that includes
 - 26 a solid waste management plan addressing the handling, storage, collection, disposal,
 - 27 and reporting of solid waste.

- 1 • AFI 32-7080, Hazardous Material Management
- 2 – Contains the solid waste requirement for preventing pollution through source
- 3 reduction, resource recovery, and recycling.

4 Additionally, Eglin Environmental Management directs the solid waste management program,
5 and has implemented a supplement to AFI 32-7042 referred to as the Eglin Basewide Solid
6 Waste Management plan.

7 Due to the Proposed Action occurring primarily on Air Force Property, the action would be
8 subject to federal, state, local, Army, Air Force, and Eglin AFB mandates and regulations.

9 **3.9.2 Existing Conditions**

10 Existing landfill capacity available to support the Proposed Action is central to the evaluation of
11 solid waste. For regulatory purposes the FDEP issues permits and classifies landfills in
12 accordance with the material types and volumes handled. Landfill types potentially affected by
13 the Proposed Action could include Class I, Construction and Debris (C&D), and Land Clearing
14 Debris (LCD) facilities. Class I facilities are open to receive “Class I” solid waste, which
15 includes putrescible and household waste (municipal waste), providing it is not hazardous or
16 prohibited from disposal in a lined landfill under Rule 62-701.300 FAC. C&D facilities are
17 permitted to receive materials generated by large scale construction, demolition, development,
18 and land clearing projects (403.703 FS). LCD facilities generally handle only land clearing
19 debris as would be generated by the clearing and grubbing associated with the Proposed Action.

20 For the purposes of this evaluation, Okaloosa County is considered to be the ROI. There are no
21 active Class I facilities in the ROI; however there are two active transfer stations which transport
22 Class I solid waste to a permitted facility outside the ROI. There are currently five active C&D
23 facilities and one LCD facility operating within Okaloosa County. The active C&D and LCD
24 sites in the ROI have from several to tens of years of capacity remaining.

25 **3.10 Transportation**

26 **3.10.1 Definition**

27 Transportation is defined as the movement of passengers or goods from place to place. In
28 general, transportation refers to air, water, and ground vehicles and those services that make use

1 of these infrastructures. Roadways are an example of a transportation infrastructure for
2 automobiles, trucks, and buses to carry both people and goods.

3 Important terms to describe the function of a transportation facility are Average Annual Daily
4 Traffic (AADT), capacity, and LOS. AADT is the annual average number of vehicles passing a
5 given point on a roadway during a 24-hour period. Ideally AADT is computed using data from
6 monitoring locations on given roadways. If roadway data is not available, traffic planners often
7 rely on numerous studies performed by the Institute of Transportation Engineers (ITE) to
8 estimate AADT. Vehicle capacity is defined as “the maximum number of vehicles that can pass
9 a given point during a specified period under prevailing roadway conditions” (TRB, 2000). LOS
10 is a measure of a roadway’s operational characteristics. In general, it reflects the amount of
11 congestion and ease of use of a roadway segment by individual drivers, but does not measure
12 safety parameters of a roadway. LOS and vehicle capacity are often evaluated using peak hour
13 analysis because it demonstrates conditions during the most critical operating period of a road
14 system. This represents “rush hour” characteristics and is based on the peak hour of the roads
15 and not necessarily the peak hour of a particular land use being studied, such as the Ranger
16 School in this case.

17 The LOS for Class 1 two-lane highways is based on:

18 *“percent of time following and average travel speed. Percent of time following*
19 *represents the freedom to maneuver and the comfort and convenience of travel. It*
20 *is the average percentage of the time that vehicles must travel in platoons behind*
21 *slower vehicles due to the inability to pass.”*

22 LOS stratification is alphabetic A through F, as follows:

- 23 • LOS A describes highest quality transportation facility. Motorists experience free-
24 flowing traffic at average travel speeds of 55 mph or greater unless lower speed limits are
25 strictly enforced. On roads with LOS A, motorists are slowed by following slower
26 vehicles without an opportunity to pass no more than 35 percent of their travel time.
- 27 • LOS B is described as reasonably unimpeded operation at average travel speeds, typically
28 between 50 and 55 mph and a percent of time following of between 35 and 50 percent.

- 1 • LOS C is described as stable operations; however, the ability to maneuver and change
2 lanes is more restricted than in LOS B, with lower average travel speeds of typically
3 between 45 and 50 mph and a percent of time following of between 50 and 65 percent.
- 4 • LOS D described a transportation facility where traffic flow is considered unstable. On
5 these roads small increases in flow may cause substantial increases in delay and
6 decreases in travel speed. LOS D may be due to high opposing volumes of traffic which
7 limit the passing capacity of motorists. Average travel speeds are 40 to 45 mph and a
8 percent of time following of between 65 and 80 percent.
- 9 • LOS E is characterized by significant delays and average travel speeds of 30 to 40 mph
10 and a percent of time following of greater than 80 percent.
- 11 • LOS F is characterized by congested traffic flow at variable speeds, often less than 30
12 mph. These roads are considered congested and motorists experience delays and
13 extensive queuing.

14 The state of Florida has established a minimum LOS C for rural two-lane facilities in the State's
15 Strategic Intermodal System (SIS), the Florida Intrastate Highway System (FIHS), or the
16 Transportation Regional Incentive Program (TRIP). Local governments and/or federal lands
17 may set the LOS for roads within their jurisdiction, as needed. AAC policy has been to maintain
18 roads to the minimum LOS required to support the mission.

19 **3.10.2 Existing Conditions**

20 Eglin performed a survey of the organizations which use the roads within the Eglin Range.
21 Results of the survey are published in the *Range Roads Maintenance Final Environmental*
22 *Baseline Document-Revision* (EAFB, June 2009). This survey indicates that the 6th RTBn at
23 Camp Rudder logs the most mileage on Eglin's Range Roads, with an associated 334,265 miles
24 per month. This is likely due to the number of persons associated with the Camp and its remote
25 location relative to other base facilities and the surrounding communities.

26 Ranger Camp is a small self-contained installation, independent of the larger Eglin installation,
27 and is located within Test Area B-6. Camp Rudder has a resident population of 130 (cadre and
28 families), that increases to approximately 430 when Ranger School is in session due to the
29 addition of approximately 300 students (Doverspike, 2009). In addition, there are approximately
30 306 transient cadre and support personnel that live off-post in the surrounding communities.

1 Presently, access to Camp Rudder by paved or improved roadway (primary access) is limited to a
2 single, two-lane 16.5 mile route (RR 236/213/257) that approaches the camp from the southern
3 boundary of Eglin AFB range at Lewis Turner Boulevard, just north of the city of Fort Walton
4 Beach. Secondary access by unpaved or unimproved roadway is possible by four other routes
5 (**Figure 1-3**) that approach the camp from SR 85 to the east and SR 87 to the west as described
6 below:

- 7 • Approach from the northeast at SR 85: 12-mile route utilizing RR 211 (also known as
8 Rattlesnake Bluff Road for the first 3.8 miles) and RR 257
- 9 • Approach from the east at SR 85: 13.9-mile route utilizing RR 213/215, RR 241, RR 211,
10 and RR 257
- 11 • Approach from the southwest at SR 87: 15.3 mile route utilizing RR 213 and RR 257
- 12 • Approach from the west at SR 87: 14.5 mile route utilizing RR 211 and RR 257

13 Those surveyed from the 6th RTB regarding mileage on Range Roads indicated that
14 approximately 57.9% of their monthly travel was on paved roads, and the remaining 42.1% of
15 travel was on unimproved roads of varying surface material, including clay, sand/clay, or sand
16 roads. Considering the breakdown of the monthly mileage compared to the ratio of miles on
17 paved roads versus miles on unpaved roads and the lengths of the various routes to and from
18 Camp Rudder, one can estimate the corresponding AADT generated by Camp Rudder on the
19 various types of roads. Approximately 366 of those trips would be expected to traverse the
20 primary paved route, while approximately 333 of the trips would circulate on the various
21 unpaved roads of the range. The total trips generated by Camp Rudder over paved and unpaved
22 routes combined would be approximately 699 AADT. Additional information provided by
23 respondents included vehicle type utilized for travel. Approximately 95% of the mileage driven
24 by Army Rangers was by way of Class 1 vehicles, defined in the study as cars or small pickup
25 trucks. The remaining 5% of mileage was in Class 2 or Class 3 vehicles (light truck or suburban-
26 type vehicles and heavy duty trucks, respectively).

27 While the AADT is relatively low on the existing primary access, this route would likely score a
28 LOS C based on typical speed and travel time when the route is open. However, the LOS
29 perceived by the motorist would decrease substantially when the route is closed due to range
30 operations. During extended road closures, the effective LOS of the route would fall to F.

1 Currently the RR 257/211 eastern route provides access from Camp Rudder to SR 85 just south
2 of the Yellow and Shoal Rivers near Crestview, Florida. Of the approximate 331 daily trips on
3 unpaved roads within the range, an estimated 15%, or roughly 50 AADT, could be expected to
4 traverse this route to SR 85.

5 Okaloosa County maintains the easternmost 3.8 miles of this route, commonly known as
6 Rattlesnake Bluff Road, to provide access to private property owners of land north of the road
7 from SR 85. There are approximately 140 lots of record north of Rattlesnake Bluff Road;
8 however, only about 55 of them are developed with a single family residence or mobile home
9 according to the Okaloosa County Property Appraiser's records. The remaining lots are
10 currently vacant. While the AADT has not been measured or computed for this road by
11 Okaloosa County or the FDOT, the trips generated by the populated lots of record can be
12 estimated as 9.57 trips per single family dwelling unit per day (ITE, 2008). Therefore, the
13 developed lots along Rattlesnake Bluff Road could generate up to 526 AADT. The residential
14 trips added to trips attributed to Camp Rudder personnel results in cumulative 576 AADT for
15 this roadway.

16 While the AADT is relatively low on this route, this route would score a LOS E, as a higher LOS
17 is not achievable on this road due to a low posted speed which is based on poor road surface
18 integrity. The intersection of Rattlesnake Bluff Road and SR 85 is un-signalized. A left turn
19 lane exists on SR 85 for traffic approaching Rattlesnake Road from the south allowing for safe
20 stacking of vehicles out of the through travel lane while waiting for an opportunity to turn. No
21 right turn, or deceleration lane, exists on SR 85 for traffic approaching Rattlesnake Road from
22 the north.

23 **3.11 Water Resources**

24 **3.11.1 Definition**

25 Water resources are those waters both above and below the surface of the earth that are
26 potentially useful to humans and the environment. The CWA of 1977 is the primary federal law
27 that protects the nation's water resources, including lakes, rivers, aquifers, and coastal areas.
28 Water resources relevant to the project corridor are drainage basins, floodplains, stormwater,
29 surface water, wetlands, and groundwater.

1 **Drainage basin**

2 A drainage basin is a specific tract of land that gathers water originating as precipitation and
3 directs it to a particular stream channel or system of channels or to a lake, reservoir, or other
4 body of water. The topography of the land is the key feature that defines and divides these
5 catchment areas, whose acreage increases in hierarchal form as smaller sub-basins join and
6 contribute water to terrain at decreasing elevations.

7 **Floodplain**

8 Floodplains are lands bordering rivers and streams that normally are dry but become covered
9 with water during floods. They occur in both inland and coastal areas. Risk of flooding
10 typically hinges on local topography, the frequency of precipitation events, size of the watershed
11 above the floodplain, and, in the case of coastal areas, storm surge intensity. The direct function
12 of a floodplain is to absorb water and energy from storms. Indirect benefits are groundwater
13 recharge from stormwater absorption, nutrient cycling, waste disposal, carbon sequestration,
14 wildlife habitat, vegetative diversity, and aesthetic qualities.

15 **Stormwater**

16 Stormwater is surface water generated by precipitation events that may percolate into permeable
17 surficial sediments or flow across the top of impervious or saturated surficial areas, a condition
18 known as runoff. Excessive runoff may degrade surface water resources by increasing sediment
19 loads or introducing foreign contaminants in natural systems at undesirable levels. Construction
20 projects often increase the percentage of impervious area in a drainage system, thereby
21 increasing runoff. Therefore, controlling surface water runoff is normally an integral part of any
22 large construction project. Stormwater may directly and indirectly affect surface water,
23 wetlands, and groundwater and is therefore incorporated into the discussion of each.

24 **Surface water**

25 Surface water is water collected on the ground. It is any body of water at land's surface and
26 includes natural features such as wetlands, swamps, streams, rivers, ponds, lakes, marshes,
27 bayous, and oceans. Man-made surface waters include impoundments, canals, drainage ditches,
28 and stormwater retention basins.

1 **Wetlands**

2 Wetlands are transitional areas of land between well-drained uplands and permanently flooded or
3 aquatic systems. They include swamps, marshes, and bogs and are found in both coastal and
4 inland settings. Their soils are typically hydric, and the water table is commonly at or near land
5 surface for much of the year. Wetlands filter water to remove nutrients, contaminants, and
6 sediment, thereby improving water quality. They recharge water supplies, reduce risk of flood
7 because of storage capacity, and provide important habitat for fish and wildlife. Any
8 development in wetlands would require justification through development of a FONPA.

9 **Groundwater**

10 Groundwater is classically defined as subsurface water that occurs beneath the water table in
11 soils and in fully saturated geologic formations (i.e., pore spaces in the subsurface materials are
12 completely filled with water). Groundwater is part of the hydrologic cycle, originating as
13 precipitation that infiltrates or seeps into the subsurface and then moves toward surface water
14 bodies, where it discharges to complete the cycle.

15 **3.11.2 Existing Conditions**

16 **Drainage Basins**

17 The Proposed Action is located in the Yellow River USGS hydrologic cataloguing unit, which
18 encompasses 860 square miles of land. A corridor for the Proposed Action centered on the
19 existing roadway would encompass a total of 87.3 acres or less than 0.02% of the total surface
20 area within the Yellow River unit, whereas the entire 400-foot study area would encompass
21 1.6%. The Yellow River unit is composed of numerous sub-basins, of which eight are in
22 immediate hydrologic contact with the corridor for the Proposed Action. The sub-basins in
23 immediate hydrologic contact with the Proposed Action Corridor include Gopher, Malone,
24 Metts, Middle, Turkey Gobbler, and Turkey Hen Creeks; and the Pearl, Shoal, and Yellow River
25 sub-basins. Potential impacts would occur in these sub-basins, the ROI for drainage basins. The
26 drainage basins are illustrated on **Figure 3-5**. The relationship of these drainage units to the
27 Proposed Action is summarized in **Table 3-10** below.

1

Table 3-10 Drainage Basins

Region	Subregion	Accounting Unit	Cataloguing Unit	Sub-basin	Relationship to Sub-basins Proposed Action Corridor - RR 211/257	
					60-foot work corridor centered on existing roadway (87.3 acres)	Entire 400-foot study corridor (581 acres)
03 South Atlantic - Gulf	14 Choctawhatchee - Escambia 15,000 sq. mi.	01 Florida Panhandle Coastal 6,060 sq. mi.	03 Yellow River 54.2 sq. mi.	Gopher Creek 1.60 sq. mi.	7.0% (6.1 acres) of the total acreage of the corridor (87.3 acres) coincides with this sub-basin; the corridor comprises 0.006% of the total land mass of this sub-basin.	4.6% (26.9 acres) of the total acreage of the corridor (581 acres) coincides with this sub-basin; the corridor comprises 0.026% of the total land mass of this sub-basin
				Malone Creek 7.83 sq. mi.	3.5% (3.1 acres) of the total acreage of the corridor (87.3 acres) coincides with this sub-basin; the corridor comprises 0.001% of the total land mass of this sub-basin.	3.9% (23.1 acres) of the total acreage of the corridor (581 acres) coincides with this sub-basin; the corridor comprises 0.005% of the total land mass of this sub-basin
				Metts Creek 7.04 sq. mi.	16.7% (14.5 acres) of the total acreage of the corridor (87.3 acres) coincides with this sub-basin; the corridor comprises 0.0001% of the total land mass of this sub-basin.	16.8% (97.9 acres) of the total acreage of the corridor (581 acres) coincides with this sub-basin; the corridor comprises 0.022% of the total land mass of this sub-basin
				Middle Creek 6.89 sq. mi.	3.4% (3.0 acres) of the total acreage of the corridor (87.3 acres) coincides with this sub-basin; the corridor comprises 0.001% of the total land mass of this sub-basin.	3.7% (21.4 acres) of the total acreage of the corridor (581 acres) coincides with this sub-basin; the corridor comprises 0.005% of the total land mass of this sub-basin
				Pearl River 3.66 sq. mi.	---	0.1% (0.7 acres) of the total acreage of the corridor (581 acres) coincides with this sub-basin; the corridor comprises 0.0003% of the total land mass of this sub-basin
				Shoal River 42.72 sq. mi.	21.2% (18.5 acres) of the total acreage of the corridor (87.3 acres) coincides with this sub-basin; the corridor comprises 0.001% of the total land mass of this sub-basin.	21.3% (123.8 acres) of the total acreage of the corridor (581 acres) coincides with this sub-basin; the corridor comprises 0.005% of the total land mass of this sub-basin
				Turkey Gobbler Creek 11.8 sq. mi.	3.0% (2.6 acres) of the total acreage of the corridor (87.3 acres) coincides with this sub-basin; the corridor comprises 0.0003% of the total land mass of this sub-basin.	3.3% (19.0 acres) of the total acreage of the corridor (581 acres) coincides with this sub-basin; the corridor comprises 0.003% of the total land mass of this sub-basin
				Turkey Hen Creek 9.28 sq. mi.	9.0% (7.9 acres) of the total acreage of the corridor (87.3 acres) coincides with this sub-basin; the corridor comprises 0.001% of the total land mass of this sub-basin.	9.0% (52.5 acres) of the total acreage of the corridor (581 acres) coincides with this sub-basin; the corridor comprises 0.009% of the total land mass of this sub-basin
				Yellow River 92.00 sq. mi.	36.3% (31.6 acres) of the total acreage of the corridor (87.3 acres) coincides with this sub-basin; the corridor comprises 0.001% of the total land mass of this sub-basin.	37.1% (215.5 acres) of the total acreage of the corridor (581 acres) coincides with this sub-basin; the corridor comprises 0.004% of the total land mass of this sub-basin

2

3 Sources: Seaber, 1987; FDEP, 1998

4

5 Modest changes were made to natural drainage patterns in the project area by the construction of
 6 Range Roads. These changes are of a localized nature, involving site-specific cut and fill and
 7 compaction activities for construction of the existing unpaved roadway. There are currently no
 8 man-made stormwater retention basins or swales present along the majority of the project
 9 corridor, thus stormwater runoff is not being actively managed along the Range Roads in the
 10 project area. However, stormwater infrastructure would be included as a component of the
 11 Proposed Action under an Environmental Resource Permit in accordance with Chapter 62-346
 12 FAC. It is expected that additional acreage required for stormwater infrastructure is accounted

1 for in the 400-foot area under evaluation for the Preferred Alternative, however the exact
2 number, location, size, and distribution of the stormwater features has not yet been determined.

3 Road-stream crossings have been identified as
4 major contributors to surface water degradation
5 (primarily to local streams and rivers) as a
6 result of stormwater runoff. The existing RR
7 211/257 roadway corridor currently crosses
8 eight tributaries to the Yellow and Shoal Rivers
9 and travels adjacent to one pond.



10 A ranking system has been established for the
11 319 road-stream crossings on Eglin where a
12 culvert, bridge, or ford is used to continue transportation across a stream water body (USAF,
13 2009). Streams affected by unpaved roads are ranked from low to high priority for needed
14 crossing repairs based on crossing features, hydrologic disturbance, water quality, aquatic
15 habitat, crossing stability, paved crossing, and hybrid crossing criteria. Currently Middle Creek
16 is ranked high while Turkey Gobbler, Middle, and Metts Creeks, and the Yellow River are
17 ranked medium. These surface waters are all impacted by sedimentation from crossings
18 currently associated with RR 211/257.

19 **Floodplains**

20 The Federal Emergency Management Agency (FEMA) has divided flood zone designations into
21 four categories: moderate to low risk, high risk, high risk – coastal areas, and undetermined risk
22 areas (FEMA, 2013). Each designation is further subdivided as summarized in **Table 3-11**
23 below.

1

Table 3-11 FEMA Floodplain Designations

Risk Area	Zone	Description
Moderate to Low Risk	B and X (shaded)	Area of moderate flood hazard, usually the area between the limits of the 100-year and 500-year floods. Are also used to designate base floodplains of lesser hazards, such as areas protected by levees from 100-year flood, or shallow flooding areas with average depths of less than one foot or drainage areas less than 1 square mile.
	C and X (unshaded)	Area of minimal flood hazard, usually depicted on flood insurance rate maps (FIRM s) as above the 500-year flood level.
High Risk	A	Areas with a 1% annual chance of flooding and a 26% chance of flooding over the life of a 30-year mortgage. Because detailed analyses are not performed for such areas; no depths or base flood elevations are shown within these zones.
	AE	The base floodplain where base flood elevations are provided. AE Zones are now used on new format FIRMs instead of A1-A30 Zones.
	A1-A30	These are known as numbered A Zones (e.g., A7 or A14). This is the base floodplain where the FIRM shows a BFE (old format).
	AH	Areas with a 1% annual chance of shallow flooding, usually in the form of a pond, with an average depth ranging from 1 to 3 feet. These areas have a 26% chance of flooding over the life of a 30-year mortgage. Base flood elevations derived from detailed analyses are shown at selected intervals within these zones
	AO	River or stream flood hazard areas, and areas with a 1% or greater chance of shallow flooding each year, usually in the form of sheet flow, with an average depth ranging from 1 to 3 feet. These areas have a 26% chance of flooding over the life of a 30-year mortgage. Average flood depths derived from detailed analyses are shown within these zones.
	AR	Areas with a temporarily increased flood risk due to the building or restoration of a flood control system (such as a levee or a dam). Mandatory flood insurance purchase requirements will apply, but rates will not exceed the rates for unnumbered A zones if the structure is built or restored in compliance with Zone AR floodplain management regulations.
	A99	Areas with a 1% annual chance of flooding that will be protected by a Federal flood control system where construction has reached specified legal requirements. No depths or base flood elevations are shown within these zones.
High Risk - Coastal Areas	V	Coastal areas with a 1% or greater chance of flooding and an additional hazard associated with storm waves. These areas have a 26% chance of flooding over the life of a 30-year mortgage. No base flood elevations are shown within these zones.
	VE, V1 - 30	Coastal areas with a 1% or greater chance of flooding and an additional hazard associated with storm waves. These areas have a 26% chance of flooding over the life of a 30-year mortgage. Base flood elevations derived from detailed analyses are shown at selected intervals within these zones.
Undetermined Risk Areas	D	Areas with possible but undetermined flood hazards. No flood hazard analysis has been conducted. Flood insurance rates are commensurate with the uncertainty of the flood risk.

2
 3 FEMA (Fema.gov, 2013)

4
 5 Approximately 5.75% of the Proposed Action Corridor is designated as High Risk (Zone AE) for
 6 flooding indicating areas within the 100-year floodplain mapped by FEMA, meaning the
 7 potential for flooding in those areas is 1% chance or greater in any given year. As might be
 8 expected, there is a strong correlation between those areas mapped as wetlands and the 100-year
 9 floodplain. The remainder of the area of Proposed Action Corridor is designated as Low Risk.

10 The mapped floodplain area along the Proposed Action Corridor is associated with the Metts,
 11 Middle, Turkey Gobbler, and Turkey Hen Creeks, Carr Spring Branch, and the unnamed
 12 tributary to the Shoal River that flows from Crain Pond (**Figure 3-5**).

13 The increased risk of hazard in floodplains is an important consideration in project siting. In
 14 cases where construction in a floodplain is unavoidable, the action should conform to applicable
 15 floodplain protection standards, and accepted flood-proofing and protection measures should be

1 applied to the construction. EO 11988, *Floodplain Management*, requires that any proposed
2 construction project in a floodplain must be justified through the development of a FONPA.

3 **Surface Water**

4 In Okaloosa County, the Shoal and Yellow Rivers, and their associated tributaries (Metts,
5 Middle, Turkey Gobbler, Gopher, and Turkey Hen Creeks, Carr Spring Branch, and the unnamed
6 tributary to the Shoal River that flows from Crain Pond) and Crain Pond are the only perpetually
7 present bodies of water located in the ROI (**Figures 3-2 and 3-5**). The ROI for this resource
8 includes the nine drainage sub-basins discussed earlier. Periodic and seasonal bodies of water
9 may be present in the floodplain of the Shoal and Yellow Rivers.

10 The state of Florida classifies surface waters as Class I (potable), Class II (shellfish propagation
11 and harvesting areas), Class III (areas of recreational use and propagation and for maintenance of
12 healthy and well-balanced fish and wildlife populations), Class IV (agricultural water supply),
13 and Class V (bodies of water used for navigation, utility, and industrial use). The water
14 classifications are arranged in order of protection, Class I having the most stringent and Class V
15 the least. All surface waters in the state are considered Class III unless otherwise identified in
16 FAC 62-302.600. Class I waters have not been designated in Okaloosa County per FDEP
17 Chapter 62-302, and the Yellow River is designated as a Class III body of water.

18 A portion of the Yellow River approximately 20-river miles downstream, is designated as the
19 Yellow River Marsh Aquatic Preserve, and has been designated as an “*Outstanding Florida*
20 *Water.*” Outstanding Florida Waters are rivers, lakes, and other bodies of water designated by
21 FDEP (Section 403.061(27), FS) as worthy of special protection because of their natural
22 attributes. Aquatic preserves and Outstanding Florida Waters have special restrictions on any
23 new construction activities (Chapter 18-20 FAC, 62-302.700 FAC).

24 **Wetlands**

25 Approximately 10% of the Proposed Action Corridor is wetlands. Many of the wetland areas in
26 the corridor have been previously impacted with the harvest of the original pine savannah and
27 subsequent replanting with the more commercially viable slash pine as was the common forestry
28 practice of the 1950’s era. A certain amount of unintended impact can also be attributed to the
29 construction and maintenance of the existing range roads. These construction impacts can

1 mainly be attributed to excess fill materials being placed outside of the limits of the road way as
2 well as runoff from the road construction causing excess siltation into sensitive wetland areas.
3 The effect from historic activities on the subject wetlands within the project area would be
4 accounted for in the Uniform Mitigation Assessment Method (UMAM) portion of the
5 forthcoming wetlands permitting process.

6 **Groundwater**

7 Groundwater resources in southern Okaloosa County come from the Sand & Gravel Aquifer and
8 the Upper Floridan Aquifer. The Sand & Gravel Aquifer extends from land surface to 95 feet bls
9 in the Yellow River Floodplain up to 265 feet bls in the vicinity of I-10 due to changes in ground
10 surface elevation. In the vicinity of the Proposed Action, the Upper Floridan Aquifer is a 270-
11 foot thick sequence of limestone and dolomite that begins at a depth of approximately 395 to 565
12 feet bls. Refer to the discussion of geologic stratigraphy in Section 3.5.2 for a more in-depth
13 discussion of the relationship between groundwater resources and the regional
14 geology/stratigraphy.

15 Typically, the water from the Sand & Gravel Aquifer is good for drinking and generally meets
16 State and federal drinking water quality standards and is classified by the state of Florida as G-II,
17 meaning it is designated for potable use and comes from an aquifer which has total dissolved
18 solids content of less than 10,000 milligrams per liter. Chloride concentrations are normally less
19 than 50 milligrams per liter everywhere in Okaloosa County, with the exception of areas
20 bordering the coast with elevated chloride concentrations greater than 1,000 milligrams per liter
21 reported for some wells. Water from the Sand & Gravel Aquifer can have concentrations of
22 hydrogen sulfide high enough to be corrosive and cause objectionable odor; iron content is
23 occasionally high; and the water is characteristically acidic, with pH frequently as low as 4 to 5
24 standard units (Hayes and Barr, 1983). Water from the Upper Floridan also generally meets state
25 and federal drinking water quality standards and is classified by the state of Florida as G-II.

26 Significant quantities of groundwater are available from the Sand & Gravel Aquifer in Okaloosa
27 County. The water table in the project corridor varies from land surface in topographically low
28 areas of creeks and rivers, to greater than 50 feet on ridges and knolls (Pratt et al., 1996), which
29 gives it a saturated thickness of approximately 95 to 215 feet. The aquifer commonly occurs as a

1 single unconfined hydraulic unit, but is sometimes divided into an upper zone and a lower zone
2 by intervening sediment of relatively lower permeability.

3 Rainfall in southern Alabama recharges the Upper Floridan Aquifer, while local rainfall
4 replenishes the Sand & Gravel Aquifer. The Upper Floridan Aquifer discharges to the Gulf of
5 Mexico or is depleted through pumping. The Sand & Gravel Aquifer is drained or depleted upon
6 discharge to surface water bodies that it contacts (Shoal and Yellow Rivers, and associated
7 tributaries) or from sub-surface pumping. Due to the shallow nature of the Sand & Gravel
8 Aquifer and its direct contact with surface water features such as the Yellow River, the Sand &
9 Gravel Aquifer is more vulnerable to contamination than the deeper Floridan Aquifer.

10

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1 **4.0 Environmental Consequences**

2 This section presents the analysis of the potential environmental consequences of
3 implementation of the *Preferred Alternative (RR 257/211 - Eastern Route, Asphalt)*, *Alternative*
4 *Route C: (RR 257/211- Eastern Route, Clay-Based)*, and the *No-Action Alternative* on the
5 resource areas presented in Section 3.0. For many resources, potential effects are the same for
6 the Preferred Alternative and Alternative C, and where applicable both Alternatives will be
7 covered in the same discussion below.

8 The general approach followed in this section is to describe the criteria for determining the
9 significance of the impacts under each topic and then provide a discussion of the potential
10 impacts from each Alternative. The criteria for determining significance for most impacts were
11 obtained from federal, state, or local agency guidelines and/or requirements or legislative
12 criteria. The significance of an impact is measured in terms of its intensity and context.
13 Intensity refers to the severity of the impact, which might be beneficial or adverse. The
14 significance of impacts might also depend on the degree of their being controversial or posing
15 highly uncertain, unique, or unknown risks. Significance can also be found where an action sets
16 a precedent for future actions having significant impacts as well as in cases involving cumulative
17 impacts.

18 **4.1 Air Quality**

19 Impacts from proposed federal actions on local and regional air quality conditions are
20 determined by the increases in regulated pollutant emissions relative to existing conditions and
21 ambient air quality. Specifically, the impact in NAAQS attainment areas would be considered
22 major if the net increase in pollutant emissions from the federal action would result in any one of
23 the following scenarios:

- 24 • Cause or contribute to a violation of any national or state ambient air quality standard
- 25 • Expose sensitive receptors to substantially increased pollutant concentrations
- 26 • Represent an increase of 10 percent or more in an affected ROI emissions inventory
- 27 • Exceed any evaluation criteria established by a SIP

28

1 As discussed in Section 3.1.2, Okaloosa County and Eglin AFB are in attainment for all criteria
2 pollutants. Therefore, the General Conformity Rule requirements are not applicable.
3 Additionally, neither Okaloosa County nor Eglin AFB is within 10 kilometers of a Class I area;
4 therefore, the PSD regulations do not apply.

5 **4.1.1 Proposed Action**

6 **Air Pollutants**

7 The Proposed Action would generate temporary air pollutant emissions as a result of grading,
8 filling, compacting, trenching, clearing and grubbing, and other preparations required during
9 construction of the new road, stormwater infrastructure, and bridges. Fugitive dust from ground-
10 disturbing activities, combustive emissions from construction equipment, and emissions from
11 asphalt paving operations, where applicable, would be generated during the roadway
12 improvements. Fugitive dust contains total suspended particulates, PM_{2.5} and PM₁₀. Fugitive
13 dust would be generated from activities associated with clearing, grading, cut and fill operations,
14 and from vehicular traffic moving over the disturbed site. These emissions would be greatest
15 during the initial site preparation activities and would vary from day to day, depending on the
16 construction phase, level of activity, and prevailing weather conditions. The quantity of
17 uncontrolled fugitive dust emissions from a construction site is proportional to the area of land
18 being worked and the level of construction activity.

19 Fugitive dust emissions for various construction activities were calculated using emissions
20 factors and assumptions published in USEPA's AP-42 Section 11.9 dated October 1998 and
21 Section 13.2 dated December 2003. These estimates assume that 230 working days are available
22 per year for construction (accounting for weekends, weather, and holidays). Soil types across the
23 Proposed Action area range from excessively to very poorly drained and applicable dust control
24 measures would need to be adapted accordingly. The USEPA estimates that the effects of
25 fugitive dust from construction activities would be reduced significantly with an effective
26 watering program. Watering the disturbed area of the construction site twice per day with
27 approximately 3,500 gallons per acre per day would reduce total suspended particulate emissions
28 as much as 50% (USEPA, 1995).

29 In addition to fugitive dust emissions, temporary emissions of criteria pollutants as combustion
30 products and evaporative emissions from asphalt paving operations would be generated from

1 roadway improvements. The emissions factors and estimates used in this assessment were based
 2 on the Sacramento Metropolitan Air Quality Management District (SMAQMD) *Guide to Air*
 3 *Quality Assessment* (SMAQMD, 2009).

4 The estimated project durations and affected project areas that would be disturbed as part of the
 5 Proposed Action, as presented in Section 2.1.2, were used to estimate fugitive dust and all other
 6 criteria pollutant emissions. Detailed calculations and the assumptions used to estimate the air
 7 quality emissions from construction activities are presented in **Appendix F**.

8 **4.1.1.1 Preferred Alternative – RR257/211- Eastern Route, Asphalt**

9 **4.1.1.1.1 Direct and Indirect Impacts**

10 The estimated construction emissions associated with the Preferred Alternative as compared to
 11 the ROI and the NAAQS are presented in **Tables 4-1** and **4-2**, respectively.

12 **Table 4-1 Estimated Emissions: Preferred Alternative as Compared to Okaloosa County**

Description	CO (tpy)	NOx (tpy)	PM10 (tpy)	SO2 (tpy)	VOC (tpy)
Preferred Alternative – RR 257/211 Asphalt Eastern Route	55	41	127	.82	6.7
Okaloosa County Emissions	9,214	5,627	4,557	275	1,759
Percentage of ROI Emissions	.29	.73	2.8	.29	.38

13

14 **Table 4-2 Estimated Emissions: Preferred Alternative as Compared to the NAAQS**

Criteria Pollutant	Averaging Time	NAAQS (ppm)	Calculated Concentration (ppm)
CO	1-Hour	35	1.391E-11
	8-Hour	9	1.113E-10
NOX	Annual	0.053	8.657E-08
	3-Hour	0.5	2.777E-13
SO2	24-Hour	0.14	2.222E-12
	Annual	0.03	8.110E-10
PM10	24- Hour	150 µg/m3	1.035E-10
	Annual	50 µg/m3	3.779E-08

1 **4.1.1.2 Alternative Route C: RR257/211- Eastern Route, Clay-Based**

2 **4.1.1.2.1 Direct and Indirect Impacts**

3 The estimated construction emissions for Alternative Route C: RR257/211- Eastern Route, Clay-
 4 Based are presented in **Table 4-3** and **4-4**.

5 **Table 4-3 Estimated Emissions: Alternative C as Compared to Okaloosa County**

Description	CO (tpy)	NOx (tpy)	PM10 (tpy)	SO2 (tpy)	VOC (tpy)
Alternative C – RR257/211- Eastern Route, Clay-Based	20	17	126	.34	2.6
Okaloosa County Emissions	9,214	5,627	4,557	275	1,759
Percentage of ROI Emissions	.22	.31	2.76	.13	.15

6

7 **Table 4-4 Estimated Emissions: Alternative C as Compared to the NAAQS**

Criteria Pollutant	Averaging Time	NAAQS (ppm)	Calculated Concentration (ppm)
CO	1-Hour	35	2.901E-12
	8-Hour	9	2.321E-11
NOX	Annual	0.053	1.870E-05
	3-Hour	0.5	6.007E-14
SO2	24-Hour	0.14	4.805E-13
	Annual	0.03	1.754E-10
PM10	24- Hour	150 µg/m3	3.875E-11
	Annual	50 µg/m3	1.414E-08

8 As shown in **Tables 4-1** through **4-4**, the Preferred Alternative and Alternative C would generate
 9 emissions below 10% of the emissions inventory for the ROI and would not exceed federal
 10 Standards. Additionally, emissions generated would be short-term and the resulting improved
 11 range roads would result in reduced fugitive dust related to vehicle travel. Therefore, the
 12 implementation of the Preferred Alternative or Alternative C would not result in an adverse
 13 impact on regional or local air quality.

14

1 **4.1.2 No-Action Alternative**

2 **4.1.2.1 Direct and Indirect Impacts**

3 The No-Action Alternative would result in no new construction. Therefore, the existing primary
4 route (RR 236/RR 213/RR 257) would continue to be maintained as a two-lane asphalt road and
5 no changes would be expected to the short-term or long-term impact of this alternative.

6 Using this alternative, Range Roads 257/236/211(the subject roads) would remain gravel and/or
7 clay/sand roads thus providing a continuing source of dust from the road surface and
8 maintenance activities. Due to the projected increases in activity at Camp Rudder, 7th SFG, and
9 the ETTA, it is logical to assume that use of the Range Roads would increase also. This would
10 result in an increase in fugitive dust from these roadways, and thus a minor long-term adverse
11 impact to air quality.

12 **4.1.2.2 Cumulative Impacts**

13 The No-Action Alternative would result in no new construction and thus no construction related
14 emissions would occur. Continued use of the currently available routes including dirt roads
15 would have minor adverse effects on regional air quality. The No-Action Alternative would
16 result in a minor adverse cumulative impact on air quality.

17 **4.2 Greenhouse Gases**

18 The potential effects of GHG emissions from the Proposed Action are by nature global. Given
19 the global nature of climate change and the current state of the science, it is not useful at this
20 time to attempt to link the emissions quantified for local actions to any specific climatological
21 change or resulting environmental impact.

22 However, while regional and state impacts are more difficult to predict than large regional or
23 global impacts, a report by the Florida Governor’s Action Team on Energy and Climate Change
24 (2010) says that regional models indicate the following possible impacts in the state of Florida:

- 25 • Sea level rise could lead to flooding of low-lying areas, erosion of beaches, loss of
26 coastal wetlands, intrusion of salt water into water supplies, and increased vulnerability
27 of coastal areas to storms and hurricanes.

- 1 • As climate changes, this could cause some plants and animals to go extinct, some to
2 decline or increase in population, and animal species may migrate to areas with more
3 favorable conditions. For example, along the coast, fish that need colder temperatures to
4 survive could migrate north, while more tropical varieties could move up the coast into
5 Florida.
- 6 • Diseases and pests with current tropical ranges could invade Florida, as have West Nile
7 virus and Africanized honey bees in Florida's panhandle. Crops and trees that need
8 cooler climates may not grow as well in Florida, while more tropical varieties might do
9 better.
- 10 • More severe storms and droughts could affect crop production, pests, and growth rates.

11 Under the Proposed Action, GHG emissions would result from asphalt paving operations for the
12 roadway improvements. The GHG emissions from the Proposed Action Alternatives and the No
13 Action Alternative have been quantified to the extent feasible in this EA for information and
14 comparison purposes. The emission factor for asphalt paving used in this assessment is based on
15 pavement emissions factors established by the King County, Washington, Department of
16 Environmental Services (King County, 2007). The emission factor is an embodied factor, which
17 means it includes emissions from the manufacture of the paving materials, paving equipment,
18 and maintenance of the pavement over its expected life cycle of 40-years.

19 **4.2.1 Preferred Alternative – RR257/211- Eastern Route, Asphalt**

20 **4.2.1.1 Direct and Indirect Impacts**

21 The proposed pavement area associated with the Preferred Alternative – RR 257/211 Asphalt
22 Eastern Route as presented in Section 2.1.2, is approximately 88 acres and was used to estimate
23 the GHG emissions. The estimated emissions associated with the construction of the Preferred
24 Alternative are presented in **Table 4-5**.

1 **Table 4-5 Estimated Greenhouse Emissions: Preferred Alternative**

Description	Area to be Paved (acres)	Pavement area (sq ft)	MTCO ₂ -e per thousand (sq ft)	MTCO ₂ -e	40-year expected pavement life cycle	MTCO ₂ -e avg. per year
Preferred Alternative	88	5,662,800	50	192,192	40	4,804.8
FY 2012 Eglin AFB Emissions						789,329.56
Percentage of ROI Emissions						0.61

2 As shown in **Table 4-5** the Preferred Alternative would generate emissions amounting to less
 3 than one-percent of the Eglin AFB FY 2012 GHG emissions.

4 **4.2.2 Alternative C – RR 257/211- Eastern Route, Clay Based**

5 **4.2.2.1 Direct and Indirect Impacts**

6 No paved area is associated with Alternative C as presented in Section 2.1.3. Therefore, no
 7 greenhouse emissions due to paving would be expected.

8 Implementation of the Preferred Alternative or Alternative C would not result in an adverse
 9 impact on Eglin AFB GHG emissions.

10 **4.2.3 Cumulative Impacts**

11 Impacts on air quality due to construction would not be long-term and only minor adverse
 12 cumulative impacts would be expected from construction of the Preferred Alternative or
 13 Alternative C in combination with other actions potentially occurring elsewhere at Camp
 14 Rudder, at the 7th SFG complex, at Duke Field, or at Eglin main base, as any effects would be
 15 short-term and localized. The long-term use of either route would have a minor beneficial effect
 16 on regional air quality due to a decrease in dusty road conditions and implementation of either
 17 route would contribute negligibly to Eglin’s GHG inventory. Only minor cumulative impacts on
 18 air quality would be expected.

1 **4.3 Biological Resources**

2 Evaluation criteria for the significance of impacts on biological resources are based on the
3 following:

- 4 • The importance (legal, commercial, recreational, ecological, or scientific) of the resource
- 5 • The proportion of the resource that would be affected relative to its occurrence in the
6 region
- 7 • The sensitivity of the resource that would be affected relative to its occurrence in the
8 region
- 9 • The duration of the ecological ramifications
- 10 • Potential for reduction in population size or distribution in a species of high concern

11 **4.3.1 Proposed Action Corridor**

12 **Preferred Alternative – RR 257/211- Eastern Route, Asphalt and**

13 **Alternative C – RR 257/211- Eastern Route, Clay Based**

14 The Proposed Action would involve varying amounts of clearing of vegetation to accommodate
15 the proposed construction of a two-lane paved roadway, stormwater infrastructure, and bridges.
16 The Proposed Action may affect species whose habitat is near the roadway corridor as well as
17 species who reside in waters and tributaries of the Yellow and Shoal Rivers. Due to the presence
18 of federally-protected species, an informal Section 7 ESA consultation was required. A
19 Biological Assessment has been prepared by Eglin Natural Resources to support the Section 7
20 consultation and USFWS concurrence on the project is included as **Appendix E**.

21 **4.3.1.1 Direct and Indirect Impacts**

22 A summary of the potentially affected protected species, their classification, and the potential
23 effects for the Preferred Alternative is provided in **Table 4-6**.

24

25

1 **Table 4-6 Potentially Affected Species for the Proposed Action Corridor**

COMMON NAME	SCIENTIFIC NAME	FEDERAL STATUS	STATE STATUS	POTENTIAL EFFECTS FROM PROPOSED ACTION
<i>PLANT SPECIES</i>				
Arkansas oak	<i>Quercus arkansana</i>	--	T	If present, individual plants may be destroyed. Not likely to adversely affect overall population
Ashe's magnolia	<i>Magnolia ashei</i>	--	E	If present, individual plants may be destroyed. Not likely to adversely affect overall population
Baltzell's sedge	<i>Carex baltzellii</i>	--	T	If present, individual plants may be destroyed. Not likely to adversely affect overall population
bog button	<i>Lachnocaulon digynum</i>	--	T	If present, individual plants may be destroyed. Not likely to adversely affect overall population
bog spicebush	<i>Lindera subcoriacea</i>	--	E	If present, individual plants may be destroyed. Not likely to adversely affect overall population
Boykin's lobelia	<i>Lobelia boykinii</i>	--	E	If present, individual plants may be destroyed. Not likely to adversely affect overall population
Curtiss' sandgrass	<i>Calamovilfa curtissii</i>	--	T	If present, individual plants may be destroyed. Not likely to adversely affect overall population
Florida flame azalea	<i>Rhododendron austrinum</i>	--	E	If present, individual plants may be destroyed. Not likely to adversely affect overall population
Gulf Coast lupine	<i>Lupinus westianus</i>	--	T	If present, individual plants may be destroyed. Not likely to adversely affect overall population
hairy wild indigo	<i>Baptisia calycosa</i> <i>var. villosa</i>	--	T	If present, individual plants may be destroyed. Not likely to adversely affect overall population
hairy-peduncled beaksedge	<i>Rhynchospora crinipes</i>	--	E	If present, individual plants may be destroyed. Not likely to adversely affect overall population
Harper's yellow-eyed grass	<i>Xyris scabrifolia</i>	--	T	If present, individual plants may be destroyed. Not likely to adversely affect overall population
incised groove-bur	<i>Agrimonia incisa</i>	--	E	If present, individual plants may be destroyed. Not likely to adversely affect overall population
karst pond xyris	<i>Xyris longisepala</i>	--	E	If present, individual plants may be destroyed. Not likely to adversely affect overall population
large-leaved jointweed	<i>Polygonella macrophylla</i>	--	T	If present, individual plants may be destroyed. Not likely to adversely affect overall population
naked-stemmed panicgrass	<i>Panicum nudicaule</i>	--	T	If present, individual plants may be destroyed. Not likely to adversely affect overall population

COMMON NAME	SCIENTIFIC NAME	FEDERAL STATUS	STATE STATUS	POTENTIAL EFFECTS FROM PROPOSED ACTION
Panhandle lily	<i>Lilium iridollae</i>	--	E	If present, individual plants may be destroyed. Not likely to adversely affect overall population
Panhandle meadowbeauty	<i>Rhexia salicifolia</i>	--	T	If present, individual plants may be destroyed. Not likely to adversely affect overall population
pineland hoary-pea/ goat's rue	<i>Tephrosia mohrii/ Tephrosia virginiana</i>	--	T	If present, individual plants may be destroyed. Not likely to adversely affect overall population
pine-woods bluestem	<i>Andropogon arctatus</i>	--	T	If present, individual plants may be destroyed. Not likely to adversely affect overall population
pondspice	<i>Litsea aestivalis</i>	--	E	If present, individual plants may be destroyed. Not likely to adversely affect overall population
primrose-flowered butterwort	<i>Pinguicula primuliflora</i>	--	E	If present, individual plants may be destroyed. Not likely to adversely affect overall population
serviceberry holly	<i>Ilex amelanchier</i>	--	T	If present, individual plants may be destroyed. Not likely to adversely affect overall population
small-flowered meadowbeauty	<i>Rhexia parviflora</i>	--	E	If present, individual plants may be destroyed. Not likely to adversely affect overall population
spoon-leaved sundew	<i>Drosera intermedia</i>	--	T	If present, individual plants may be destroyed. Not likely to adversely affect overall population
sweet pitcherplant	<i>Sarracenia rubra</i>	--	T	If present, individual plants may be destroyed. Not likely to adversely affect overall population
toothed savory	<i>Calamintha dentata</i>	--	T	If present, individual plants may be destroyed. Not likely to adversely affect overall population
white-top pitcherplant	<i>Sarracenia leucophylla</i>	--	E	If present, individual plants may be destroyed. Not likely to adversely affect overall population
yellow fringeless orchid	<i>Platanthera integra</i>	--	E	If present, individual plants may be destroyed. Not likely to adversely affect overall population
AMPHIBIANS				
Florida bog frog	<i>Rana okaloosae</i>	-	SC	Construction runoff would be controlled to avoid siltation. Not likely to adversely affect
frosted flatwoods salamander	<i>Ambystoma cinquatum</i>	T	T	Construction runoff would be controlled to avoid siltation. Not likely to adversely affect
gopher frog	<i>Rana capito</i>	-	SC	Construction runoff would be controlled to avoid siltation. Not likely to adversely affect

COMMON NAME	SCIENTIFIC NAME	FEDERAL STATUS	STATE STATUS	POTENTIAL EFFECTS FROM PROPOSED ACTION
one-toed amphiuma	<i>Amphiuma pholeter</i>	-	T	Construction runoff would be controlled to avoid siltation. Not likely to adversely affect
pine barrens treefrog	<i>Hyla andersonii</i>	-	SC	Construction runoff would be controlled to avoid siltation. Not likely to adversely affect
reticulated flatwoods salamander	<i>Ambystoma bishopi</i>	E	E	Construction runoff would be controlled to avoid siltation. Not likely to adversely affect
BIRDS				
bald eagle	<i>Haliaeetus leucocephalus</i>	BGEPA/MB TA	-	If present, foraging individuals likely to flee during construction. Not likely to adversely affect.
Florida burrowing owl	<i>Athene cunicularia floridana</i>	-	SC	Potential habitat/foraging area may be affected. If present, individual species are likely to flee during construction. Not likely to adversely affect
red-cockaded woodpecker	<i>Picoides borealis</i>	E	E	Potential foraging area may be affected. Not likely to adversely affect.
FISH				
blackmouth shiner	<i>Notropis melanostomus</i>	-	T	Construction runoff would be controlled to avoid siltation. Not likely to adversely affect
bluenose shiner	<i>Pteronotropis welaka</i>	-	SC	Construction runoff would be controlled to avoid siltation. Not likely to adversely affect
Gulf sturgeon	<i>Acipenser oxyrinchus desotoi</i>	T	T	Species not expected to be present in tributaries associated with the Preferred Alternative, as Gulf sturgeon typically do not utilize small tributaries as part of their habitat. Construction runoff would be controlled to avoid potentially harmful downstream sedimentation or habitat disruption. Not likely to adversely affect.
FRESHWATER MUSSELS				
narrow pigtoe	<i>Fusconaia Escambia</i>	C	-	Species not likely present in tributaries. Runoff from construction would be controlled to avoid potential downstream sedimentation. Not likely to adversely affect.
fuzzy pigtoe	<i>Pleurobema strodeanum</i>	C	-	
Choctaw bean	<i>Villosa choctawensis</i>	C	-	
southern sandshell	<i>Hamiota australis</i>	C	-	
MAMMALS				

COMMON NAME	SCIENTIFIC NAME	FEDERAL STATUS	STATE STATUS	POTENTIAL EFFECTS FROM PROPOSED ACTION
Florida black bear	<i>Ursus americanus floridanus</i>	-	T	Potential habitat/foraging area may be affected. Surveys, signage, and avoidance measures would be implemented during construction activities. Permanent signage would be installed along the roadway to warn motorists of potential presence and bear crossing. Not likely to adversely affect.
REPTILES				
alligator snapping turtle	<i>Macrochelys temminckii</i>	-	SC	Construction runoff would be controlled to avoid potentially harmful sedimentation or habitat disruption. If present at time of construction, turtles would temporarily relocate to area of lesser disturbance. Not likely to adversely affect.
American alligator	<i>Alligator mississippiensis</i>	SA	SC	Construction runoff would be controlled to avoid potentially harmful sedimentation or habitat disruption. If present at time of construction, alligator would temporarily relocate to area of lesser disturbance. Not likely to adversely affect.
Eastern indigo snake	<i>Drymarchon couperi</i>	T	T	Potential for effect on habitat/foraging area and potential for slight long term increase in road mortality. Surveys, signage, and avoidance measures would be implemented. Not likely to adversely affect.
Florida pine snake	<i>Pituophis melanoleucus mugitus</i>	-	SC	Individuals likely to flee during construction; potential for slight long-term increase in road mortality. Not likely to adversely affect population.
gopher tortoise	<i>Gopherus polyphemus</i>	C	T	Potential habitat/foraging area may be affected. Surveys, signage, and avoidance measures would be implemented. Not likely to adversely affect.

1 Notes: E – Endangered
2 T – Threatened
3 SC – Species of Special Concern
4 C – Candidate Species
5 SA - Threatened due to Similarity of Appearance
6 BGEPA – Bald and Golden Eagle Protection Act
7 MBTA – Migratory Bird Treaty Act

8 Prior to implementing either Alternative, the Army, through the Eglin Base Civil Engineer,
9 would obtain construction and stormwater permits as required. These permits would include an
10 Erosion, Sedimentation, and Pollution Control Plan which would require the implementation of
11 site-specific management actions and best management practices (BMPs), such as planting
12 vegetation, and employing silt fencing, sand bags, rock bags, sediment traps, sediment basins,
13 synthetic bales, and floating and staked turbidity barriers. These measures would help ensure
14 that road and bridge construction activities do not create erosion, sedimentation, or siltation,
15 which could negatively impact individual species and their habitat.

16 No long term adverse impacts to surface waters or wetland quality are expected from the
17 implementation of the Proposed Action.

18 Construction staging and storage areas would be sited to lessen impacts to sensitive habitat along
19 the roadway corridor to avoid adverse effect to the extent possible. All clearing and staging
20 areas must be approved through the Eglin Natural Resources Section. Additionally, the Army
21 would coordinate any required field surveys with Eglin Natural Resources. Required surveys
22 may include documentation of nesting activities such as active bird nests or gopher tortoise
23 burrows. Any nesting activities identified during survey may require further consultation with
24 the USFWS, FFWC, and the Eglin Natural Resources Section. Instances would be handled on a
25 case-by-case basis, should they occur. For example, if a gopher tortoise burrow were to be
26 discovered, it would be given a mandatory 25-foot buffer or the tortoise would be relocated
27 under permit, depending on its location in respect to the project area, per Eglin Natural
28 Resources direction. Other instances, such as certain nesting species, may result in an altered
29 construction plan or schedule as the situation warrants.

30 In accordance with EO 13112 *Invasive Species*; FAC Chapter 5B-57 *Introduction or Release of*
31 *Plant Pests, Noxious Weeds, Arthropods, and Biological Control Agents*; active measures would
32 be implemented to help prevent and control dissemination of invasive plant species during

1 ground disturbing activities. Measures would include the prohibition of natural hay or straw
2 bales.

3 The overall acreage to be impacted by either Alternative is negligible when compared to the
4 acreage of available habitat in the area. Furthermore, it is expected that once construction
5 activities cease, any potentially affected species would resume use and forage of the affected
6 area with no adverse long-term effect. Additionally, habitat loss would not affect federally-
7 protected plant species as none are found in the project area.

8 In accordance with Eglin Natural Resource guidelines, signs would be posted in active work
9 sites. Work crews would be instructed to stop work if any protected animal species were
10 encountered and to only resume work once the species leave the area. It is expected that most
11 potential species in the project are noise sensitive and would be expected to leave the area on
12 their own accord, thereby limiting the chance for strike or contact.

13 Animal species may be affected by noise disturbance during times of active construction.
14 However, species such as RCWs and eagles continue to thrive near noisy test areas, indicating
15 that habitat quality seems to be more influential in determining productivity, survival and
16 population stability than noise. Furthermore, construction noise is intermittent and relatively
17 short-term. It is expected that when construction activities cease, species sensitive to noise
18 would resume normal activities.

19 No long-term adverse effect would result to biological resources due to noise.

20 The physical and physiological barriers to movements and migration created by roads can
21 modify animal behavior, resulting in potential changes to animal populations. Additionally,
22 traffic pattern changes and the potential for increased traffic and speed on the improved roadway
23 could potentially lead to an increase in road mortality as species in the project area may approach
24 or cross the roadway during their normal routine.

- 25
- Based on the RCW's feeding habits and behaviors, no direct impacts from increased road
26 use are anticipated.
 - The Florida black bear may be found in a variety of habitats on Eglin and several
27 sightings and incidents have occurred along the current roadways leading to Camp
28 Rudder. The potential increase in the amount of traffic on RR 211 and RR 257 could
29

1 cause a higher mortality rate for bears in the proximity of the roadway. To reduce a
2 possible increase in bear mortality on the roads, the posted speed limit would be 35 to 45
3 mph on the newly resurfaced roads. Additionally, pending approval from the FFWC,
4 bear crossing signs would be posted along RR 211 and RR 257 to warn motorists to be
5 cautious.

- 6 • Gopher tortoises may be present in the surrounding project area. The gopher tortoise
7 survey prior to road improvement activities would ensure that tortoises would not be
8 impacted in the immediate area, however, there is a potential for tortoises to be in the
9 proximity of the roadway corridor. The potential increase in the amount of traffic on RR
10 211 and RR 257 could impact a tortoise attempting to cross the road. However, there
11 have been no known reports to Eglin Natural Resources regarding tortoise kills on these
12 roads (Varble, 2010).
- 13 • Snakes are particularly vulnerable to direct physical impacts on roads as some reptiles
14 seek roads for thermal cooling and heating which could cause mortality by vehicles. The
15 potential increase in the amount of traffic on RR 211 and RR 257 could cause a higher
16 mortality rate for the eastern indigo snake. However, the eastern indigo snake is
17 generally rare in the Florida panhandle. There have been few sightings on Eglin as the
18 last recorded sighting was a road killed snake in 1999.
- 19 • Decreasing sedimentation in nearby water bodies due to improving the roadway surface
20 would benefit the Gulf sturgeon, bog frog, freshwater mussels, and other localized fish
21 species. However, stormwater runoff during rain events would remain a potential
22 concern. Eglin Natural Resources and the USFWS Fisheries Biologist would be
23 represented at road design meetings to ensure stormwater mitigation would not impact
24 the tributaries of the Shoal and Yellow Rivers.

25 Eglin Natural Resources has determined that the project would have minimal impacts on
26 Biological Resources. Implementation of site-specific management actions, BMPs, and the
27 findings of the Section 7 consultation would help ensure no adverse effect is associated with the
28 Proposed Action.

1 **4.3.1.2 Cumulative Impacts**

2 Due to the extensive mitigation, avoidance, and minimization efforts to be implemented in order
3 to protect existing biological resources within the project area, only minor adverse cumulative
4 impacts on biological resources would be expected.

5 **4.3.2 No-Action Alternative**

6 **4.3.2.1 Direct and Indirect Impacts**

7 The No-Action Alternative would result in no new construction. Therefore, the existing primary
8 route (RR 236/RR 213/RR 257) would continue to be maintained in its current state. Increased
9 use of the existing route, as expected with projected growth associated with Camp Rudder,
10 would eventually lead to roadway mortality for bears or other species.

11 Using this alternative, Range Roads 257/236/211(the subject roads) would remain gravel and/or
12 clay/sand roads thus providing a continuing source of ecosystem degradation due to erosion of
13 the road surface materials and roadside areas into tributaries to the Yellow and Shoal Rivers and
14 associated wetland areas. Due to the projected increases in activity at Camp Rudder, 7th SFG
15 and the ETTA, it is logical to assume that use of the Range Roads would increase also, thereby
16 increasing erosion of the road surface materials and may result in a moderate long-term adverse
17 impact to ecological habitat and thus the biological resources.

18 **4.3.2.2 Cumulative Impacts**

19 The No-Action Alternative would result in no new construction and therefore the proposed
20 stormwater infrastructure would not be constructed, potentially resulting in increased erosion and
21 sedimentation in adjacent water bodies, thereby potentially affecting ecological habitats and thus
22 biological resources. The No-Action Alternative may result in a moderate long-term adverse
23 impact to ecological habitat and thus the biological resources.

24 **4.4 Coastal Zone Management**

25 **4.4.1 Proposed Action**

26 Federal applicants seeking a FCMP consistency determination are required to submit their own
27 preliminary consistency determination along with an EA to the Florida State Clearinghouse. The

1 preliminary consistency determination for the Proposed Action is presented in **Appendix B**. The
2 Draft EA has been submitted to the Florida State Clearinghouse for a FCMP consistency
3 determination from FDEP. The Clearinghouse solicits comments from appropriate state,
4 regional, and local reviewers to determine consistency with the FCMP. Based on an evaluation
5 of comments and recommendations, FDEP makes the state’s final consistency determination.

6 **4.4.2 No-Action Alternative**

7 The No-Action Alternative would result in no new construction. Using this alternative the
8 coastal zone management conditions would remain the same, as described in Section 3.3.2.

9 **4.5 Cultural Resources**

10 In making an assessment of effects, criteria of adverse effect (36 CFR 800.5) are applied to
11 historic properties within the area of Proposed Action. As stated in the regulation (36 CFR
12 800.5(1)) an adverse effect is found when “an undertaking may alter, directly or indirectly, any
13 of the characteristics of a historic property” that qualify it for inclusion in the NRHP in a way
14 that diminishes the “integrity of the property’s location, design, setting, materials, workmanship,
15 feeling, or association.” Examples of adverse effect that may result from Proposed Action are as
16 follows.

- | | | |
|----|-----------|---|
| 17 | Effect 1. | Physical destruction of or damage to all or part of the property |
| 18 | Effect 2. | Alteration of a property that is inconsistent with the Secretary of the |
| 19 | | Interior’s standards for the treatment of historic properties (36 CFR 68) |
| 20 | | and applicable guidelines |
| 21 | Effect 3. | Removal from its historic location |
| 22 | Effect 4. | Change in character of use or physical features within the setting that |
| 23 | | contribute to historic significance |
| 24 | Effect 5. | Introduction of elements that diminish the integrity of the property’s |
| 25 | | significant historic features |
| 26 | Effect 6. | Neglect that causes deterioration to a property ⁴ |

⁴ *Except where such neglect and deterioration are recognized qualities of a property of religious and cultural significance to an Indian tribe or Native Hawaiian organization.*

1 **4.5.1 Proposed Action Corridor**
 2 **Preferred Alternative – RR 257/211- Eastern Route, Asphalt and**
 3 **Alternative C – RR 257/211- Eastern Route, Clay Based**

4 The Proposed Action may affect six historic properties in and near the project corridor.

5 **4.5.1.1 Direct and Indirect Impacts**

6 Six historic properties located within the area of the Proposed Action are threatened with adverse
 7 effect. **Table 4-7** summarizes these potentially affected historic properties with reference to the
 8 effects 1 through 6.

9 **Table 4-7 Potentially Affected Historic Properties**

Historic Property	Description	NRHP Eligibility Status	Potential Effects from Proposed Action
8OK108/8OK407	Late Paleoindian/Early Archaic, Weeden Island possible village	Eligible	Threatened with adverse effect: Effects 1 and 4
8OK354	Component of the Crestview Farms and Orchard Resource Group (8OK2943)	Eligible	Threatened with adverse effect: Effects 1 and 4
8OK402	Late Paleoindian/ Early Archaic, Santa Rosa/Swift Creek components	Eligible	Threatened with adverse effect: Effects 1 and 4
8OK1241	Late Paleoindian/ Early Archaic, Elliotts Point Complex, Weeden Island components	Eligible	Threatened with adverse effect: Effects 1 and 4
8OK2812	Weeden Island component; early twentieth century homestead remnants of J. B. Carr	Eligible	Threatened with adverse effect: Effects 1 and 4
8OK2815	Component of the Crestview Farms and Orchard Resource Group (8OK2943)	Eligible	Threatened with adverse effect: Effects 1 and 4

10
 11 8OK108/407 is a multi-component prehistoric site, with the earliest temporal marker reflecting
 12 Late Paleoindian/Early Archaic use of the site, followed by later Weeden Island occupation. It is
 13 situated north of and overlapping the current roadbed of RR 211. The southern portion of the

1 site is threatened with direct impact from the Proposed Action and the remaining site area may
2 be threatened with inadvertent impact (e.g., staging, turnarounds).

3 8OK354 contains structural remains associated with a large farm complex known as Crestview
4 Farms and Orchards, which has been designated Resource Group 8OK2943. 8OK354 is situated
5 north of the current roadbed of RR 211. The southern part of the site in the area of Proposed
6 Action is threatened with direct impact and the remainder may be threatened with inadvertent
7 impact.

8 8OK402 is a multi-component prehistoric site, with the earliest temporal marker reflecting Late
9 Paleoindian/Early Archaic use of the site, followed by a Santa Rosa/Swift Creek presence. The
10 site is situated north and south of the current roadbed of RR 211. Those portions within the area
11 of Proposed Action are threatened with direct impact from the undertaking and other parts may
12 be threatened with inadvertent impact.

13 8OK1241 is a multi-component prehistoric site, with evidence of Late Paleoindian/Early
14 Archaic, Elliotts Point, and Weeden Island use of the site. The site is situated north of the
15 current roadbed of RR 211 and, therefore, not threatened with direct impact, but portions may be
16 threatened by inadvertent impact.

17 8OK2812 consists of a prehistoric Weeden Island component and a historic early twentieth
18 century homestead remains of J. B. Carr. Carr is documented as obtaining the land containing
19 the site in 1907, and resided there until the early 1940s when his homestead was acquired by the
20 government for military purposes. 8OK2812 is situated less than 100 feet north of the current
21 roadbed of RR 211. That portion within the area of Proposed Action is threatened with direct
22 impact and other parts of the site may be threatened with inadvertent impact.

23 8OK2815 contains structural remains also associated with the early to mid-twentieth century
24 Crestview Farms and Orchards (Resource Group 8OK2943). The site is situated south of and
25 abuts the current roadbed of RR 211. The northern part is threatened with direct impact within
26 the area of Proposed Action and other portions of the site may be threatened with inadvertent
27 impact.

1 **4.5.1.2 Cumulative Impacts**

2 The direct impact posed by adverse effect to five historic properties (8OK108/407, 8OK354,
3 8OK402, 8OK2812, and 8OK2815) would be mitigated by avoidance and professional
4 monitoring within the proposed right-of-way (ROW). Indirect impacts to all six historic
5 properties (the five above plus 8OK1241) would be mitigated through avoidance and
6 professional monitoring within the area of cultural concern. Due to the implementation of these
7 measures, no cumulative adverse effect on historic properties is expected. If direct impact
8 cannot be avoided, data recovery would be the alternative treatment; plans outlining the nature of
9 work have been prepared and are included in the Programmatic Agreement (**Appendix D**).

10 **4.5.2 No-Action Alternative**

11 **4.5.2.1 Direct and Indirect Impacts**

12 The No-Action Alternative would result in no new construction. Using this alternative, there
13 would be no adverse effect to cultural resources. Using this alternative the condition of
14 geological resources would remain the same, as described in Section 3.4.2.

15 **4.5.2.2 Cumulative Impacts**

16 The No-Action Alternative would result in no new construction and would, therefore, result in no
17 adverse cumulative impacts on cultural resources.

18 **4.6 Geological Resources**

19 Protection of unique geological and topographical features, minimization of soil erosion, and
20 siting of facilities in relation to potential geologic hazards (such as sinkholes) should be
21 considered when evaluating potential impacts of a proposed action on the area's geological
22 resources. Generally, impacts can be avoided or minimized if proper siting, construction
23 techniques, erosion control measures, and engineering design are incorporated into project
24 development.

1 **4.6.1 Proposed Action Corridor**

2 **Preferred Alternative – RR 257/211- Eastern Route, Asphalt and**
3 **Alternative C – RR 257/211- Eastern Route, Clay Based**

4 **4.6.1.1 Direct and Indirect Impacts**

5 Under the Proposed Action, construction activities, such as grading, excavating, and re-
6 contouring of the soils and shallow geologic sediments would result in some minor disturbance
7 to geological resources.

8 During construction, erosion and sediment disturbances resulting from normal construction
9 activities would be managed through the implementation of BMPs (e.g., silt fencing, sediment
10 traps, application of water sprays, and re-vegetation of disturbed areas) in compliance with FAC
11 62-621 and 62-346 permit requirements.

12 Therefore, the Proposed Action for the construction project would have a short-term minor
13 adverse impact on geological resources in the RR 211/257 corridor.

14 **4.6.1.2 Cumulative Impacts**

15 The entire construction corridor for RR 211/257 is located within the boundaries of Eglin AFB.
16 The likelihood of past, present, or reasonably foreseeable future actions causing moderate
17 adverse cumulative impacts to the geologic environment is low. Only minor adverse cumulative
18 impacts on geological resources would be expected.

19 **4.6.2 No-Action Alternative**

20 **4.6.2.1 Direct and Indirect Impacts**

21 The No-Action Alternative would result in no new construction. Using this alternative the
22 condition of geological resources would remain the same, as described in Section 3.5.2.

23 **4.6.2.2 Cumulative Impacts**

24 The No-Action Alternative would result in no new construction and would therefore result in no
25 adverse cumulative impacts on geological resources.

1 **4.7 Land Use**

2 The significance of potential land use impacts is based on the level of land use sensitivity in
3 areas affected by a Proposed Action and compatibility of a Proposed Action in relation to
4 existing conditions. In general, a land use impact would be major if it were to:

- 5 • Be inconsistent or in noncompliance with existing land use plans or policies
- 6 • Preclude the viability of existing land use, continued use or occupation of an area
- 7 • Be incompatible with adjacent land use to the extent that public health or safety is
8 threatened
- 9 • Conflict with planning criteria established to ensure the safety and protection of human
10 life and property

11 **4.7.1 Proposed Action Corridor**

12 **Preferred Alternative – RR 257/211- Eastern Route, Asphalt and** 13 **Alternative C – RR 257/211- Eastern Route, Clay Based**

14 **4.7.1.1 Direct and Indirect Impacts**

15 The Preferred Alternative would involve upgrading RR 257 and 211 from gravel/dirt roads
16 (secondary) to primary paved two-lane roadways, and Alternative C would involve upgrades to
17 RR 257 and 211 to improved clay based two-lane roadways. Each Alternative would include up
18 to eight or nine small bridges where RR 211 crosses tributaries of the Yellow and Shoal Rivers.
19 Okaloosa County currently maintains the road from SR 85 west to Jenkins Road, a distance of
20 approximately 3.8 miles (Henderson, 2010). County maintenance enables private citizens to
21 reliably access their land bounded by the Shoal River and Eglin AFB. Although these 3.8 miles
22 are maintained as clay-based, this portion would be asphalted under the Preferred Alternative and
23 re-graded and updated under Alternative C. Each Alternative would entail appropriate
24 stormwater infrastructure, and existing bridges would be upgraded or replaced to accommodate
25 two-way traffic and increased load weights, as needed. Improvements of these roadways would
26 have no direct or indirect impact to “off-base land use.” Improvements to the road may increase
27 traffic through this area and thus potentially impact missions within the vicinity of RR 211 such
28 as HLZs, NVDs, ground maneuvers, operational security for the 7th SFG. However, this
29 alternative should have no direct impact on the military mission. Indirect impact to the military

1 mission is possible due to opening another two-lane asphalt route into the ETTA and thus
2 creating a possible security and safety issue by increasing the “attractive nuisance” aspect into
3 the area such as dumping, poaching, un-permitted recreation, etc.

4 The Preferred Alternative and Alternative C would have short-term negligible adverse impacts
5 on land use due to construction activities and interruptions within the RR 211/257 corridor. It is
6 possible that the implementation of either alternative would have a long-term minor impact to
7 the military mission by increasing traffic, vehicle lights, and the “attractive nuisance” aspect;
8 however potential options to mitigate this adverse effect include additional coordination of
9 mission schedules and/or installation of a security gate. Installation of a gate is not precluded by
10 any foreseeable obstacles, and could be established as manned or self-service operation. The
11 gate would be maintained for use by authorized personnel only and would help control flow of
12 essential traffic and alleviate nuisance traffic along this route; thereby minimizing impact or
13 encroachment issues to Eglin’s Mission.

14 **4.7.1.2 Cumulative Impacts**

15 There is the potential that recreation and hunting practices would require changes to
16 accommodate higher traffic volumes associated with implementation of the Proposed Action.
17 Some recreation sites may experience increased usage and others may require closure.
18 Additionally, hunting may require further restriction in certain areas to protect through-traffic.

19 The likelihood of past, present, or reasonably foreseeable future actions in conjunction with the
20 Proposed Action are expected to cause only minor adverse cumulative impacts to land use.

21 **4.7.2 No-Action Alternative**

22 **4.7.2.1 Direct and Indirect Impacts**

23 The No-Action Alternative would result in no change to Camp Rudder access and no change in
24 land use on or off base.

25 **4.7.2.2 Cumulative Impacts**

26 The No-Action Alternative would result in no new construction. Using this alternative land use
27 in the vicinity of the Proposed Action would remain the same, as described in Section 3.6.2.

1 **4.8 Noise**

2 Human response to noise depends on a variety of circumstances including the time of day, the
3 individual’s sensitivity, distance from the source, and environment. The maximum acceptable
4 noise level for most residential land uses is generally considered to be 65 dBA DNL (FICUN,
5 1980). Noise impact analysis evaluates potential changes to the existing noise environment that
6 would result from implementation of the Proposed Action. Beneficial changes in the noise
7 environment would be achieved by reducing the number of sensitive receptors exposed to
8 unacceptable noise levels. Negligible changes in the noise environment would be observed when
9 the number of sensitive receptors exposed to unacceptable noise levels is essentially unchanged.
10 Adverse changes in the noise environment would be observed when the number of sensitive
11 receptors exposed to unacceptable noise levels is increased. For the Proposed Action, noise
12 levels of 65 dBA or greater would be considered an adverse effect.

13 **4.8.1 Proposed Action Corridor**

14 **Preferred Alternative – RR 257/211- Eastern Route, Asphalt and**
15 **Alternative C – RR 257/211- Eastern Route, Clay Based**

16 **4.8.1.1 Direct and Indirect Impacts**

17 Based on the USEPA publication, *Noise from Construction Equipment and Operations, Building*
18 *Equipment, and Home Appliances, PB 206717* (USEPA, 1971), noise levels from a construction
19 source decrease by approximately 3 dBA every 50 feet over a hard, unobstructed surface such as
20 asphalt. Noise levels from a construction source decrease by approximately 4.5 dBA every 50
21 feet over a soft surface such as vegetation.

22 A reasonable rule of thumb average cumulative noise parameter (at a distance of 50 feet) for
23 typical construction equipment as required for roadway construction is approximately 90 dBA.
24 For the purposes of this analysis, it is not likely that general construction activities would grossly
25 exceed this threshold; therefore, a noise level of 90 dBA is used to calculate potential noise
26 levels for residential receptors along RR 211, as shown in **Table 4-8**, below.

27

28

1 **Table 4-8 Noise Level Calculations**

Location	Approximate distance from residence (feet)	Change in dBA	Resulting dBA
Westernmost extent of neighborhood on Rattlesnake Bluff	1,544 ft	-138.96	<65
Mid neighborhood	1,064	-95.76	<65
Easternmost extent	320	-28.8	<65

2 Operational and temporary construction noise associated with the Proposed Action would occur.
 3 Where necessary, noise impacts from the construction and road work would be minimized by the
 4 employment of construction BMPs as specified in 23 CFR Part 772, *Procedures for Abatement*
 5 *of Highway Traffic Noise and Construction Noise*. Construction noise would be temporary and
 6 localized to the area immediately surrounding the construction site.

7 Short-term minor adverse effects are anticipated as a result of the construction activities and
 8 long-term minor adverse effects are anticipated as a result of vehicular traffic. Implementation
 9 of the Proposed Action would have short-term minor adverse effects on the noise environment
 10 from the use of heavy equipment during construction activities. Long term minor adverse effects
 11 are anticipated as a result of vehicular traffic, as the additional traffic would likely cause minor
 12 increases in noise levels for noise-sensitive residential receptors along RR 211.

13 **4.8.1.2 Cumulative Impacts**

14 The likelihood of past, present, or reasonably foreseeable future actions are expected to cause
 15 only minor adverse cumulative impacts to noise effecting residential receptors. No major
 16 adverse cumulative impacts on noise levels would be expected due to the Preferred Alternative
 17 or Alternative C.

18 **4.8.2 No-Action Alternative**

19 **4.8.2.1 Direct and Indirect Impacts**

20 The No-Action Alternative would result in no new construction. Using this alternative noise
 21 levels in the vicinity of the Proposed Action would remain the same, as described in Section
 22 3.7.2.

1 **4.8.2.2 Cumulative Impacts**

2 The No-Action Alternative would result in no new construction and would therefore result in no
3 increase in noise levels. Therefore, the No-Action Alternative would have no long-term adverse
4 cumulative impact on noise levels in the ROI.

5 **4.9 Safety**

6 Impacts were assessed based on direct and indirect effects from range road usage, construction
7 activities, and UXO. Impacts on safety would be considered major if human health would be
8 placed in jeopardy or undue risk by the implementation of the Proposed Action.

9 **4.9.1 Proposed Action Corridor**

10 **Preferred Alternative – RR 257/211- Eastern Route, Asphalt and**
11 **Alternative C – RR 257/211- Eastern Route, Clay Based**

12 **4.9.1.1 Direct and Indirect Impacts**

13 **Construction Safety**

14 Construction and land clearing activities associated with implementation of the Proposed Action
15 could pose short-term safety hazards to construction workers and Eglin or Camp Rudder
16 personnel in or near areas of active construction. Hazards generated during construction projects
17 are generally industrial in nature. The greatest risk would be to construction personnel actively
18 working in a construction zone, with a lesser likelihood of risk for Eglin and Camp Rudder
19 personnel who remain within or traverse the immediate vicinity of a construction zone. Safety
20 hazards associated with construction activities typically include exposure to slips and falls,
21 excavations and trenches, noise, dusts, heavy equipment operations, congested working spaces,
22 parking areas, and constantly changing work environments. Any non-Air Force personnel (e.g.,
23 contractors) performing work on Eglin are subject to the OSHA regulations to ensure the
24 protection of construction workers, other personnel, and the general public during construction;
25 thereby alleviating this potential safety hazard.

1 **Range Road Usage**

2 The Preferred Alternative and Alternative C would generally avoid range safety footprints and
3 other restrictions. However, the larger range road system would likely be utilized by
4 construction personnel, heavy equipment operators, and other ancillary suppliers, personnel and
5 laborers during times of construction. Range access protocol, including obtaining clearance and
6 compliance with mission gate closures, would need to be followed at all times. Range road
7 conditions would need to be continually monitored to ensure safe and reliable access for heavy
8 equipment and traffic volume associated with construction activities.

9 Once construction has been completed, general traveler safety would be enhanced with either of
10 these alternatives by directing traffic north/northeast generally paralleling the northern boundary
11 of the Eglin reservation and out of the ETTA safety footprints for Eglin testing. Furthermore,
12 portions of the current route are dangerous due to very poor road conditions. Frequent pot holes,
13 washboard ruts, and washouts can affect vehicle traction and numerous instances of vehicles
14 leaving the roadway and getting stuck have been documented. Proposed improvements would
15 help alleviate these safety issues.

16 Approximately 687,000 miles a month are logged on roads by all organizations at Eglin. Army
17 Rangers typically log the highest overall vehicle mileage and alone account for nearly 50 percent
18 (334,264 miles a month) of all logged vehicle miles (EAFB, 2009). An average of 57.9% of
19 their monthly travel is on paved roads, and the remaining 42.1% of travel is on unimproved roads
20 of varying surface material, including clay, sand/clay, or sand roads. Approximately 95% of the
21 mileage driven by Army Rangers was by way of Class 1 vehicles, defined in the study as cars or
22 small pickup trucks. Travelers along either of the new routes would be traveling on improved
23 roadways updated with current safety standards, thus significantly reducing the 42.1% travel on
24 unimproved roads thereby increasing traveler safety. In addition, the new routes would provide
25 new two-lane bridges which would further increase the safety over the current condition.
26 Although the new route is through portions of the ETTA, the area the Proposed Action Corridor
27 traverses is not as active as the current existing primary route (RR 236/RR 213/RR 257). As
28 such, the potential closures for the proposed route would be infrequent. Therefore, there would
29 be a long-term beneficial impact on safety by providing the travelers to and from Camp Rudder a
30 more direct route to a major arterial roadway.

1 **Improved Emergency Response**

2 With the implementation of the Proposed Action, the nearest hospital would be in Crestview and
3 could be accessed using the improved range roads and SR 85 for a total travel distance of
4 approximately 16 miles versus the current circuitous 19.5 miles. The connection to SR 85 would
5 enable First Responders and MEDEVAC crews to access the facility readily from the north
6 (Crestview) and from the south (Eglin Main, Niceville, and Fort Walton Beach). It is reasonable
7 to expect emergency response times of approximately 20-25 minutes considering the direct
8 route, improved surface and minimal mission-related road closures.

9 **Enhanced Hurricane Evacuation**

10 Implementation of the Proposed Action would offer a route with a direct and efficient evacuation
11 route from Camp Rudder to SR 85 (~12 miles east). The current primary access route directs
12 traffic south toward the coast before funneling traffic east or west and then to the north.
13 Furthermore, this route would tie in to SR 85 approximately 3.1 miles south of I-10 as compared
14 to the current route which ties in to SR 85 approximately 16.5 miles south of I-10. During
15 previous hurricanes, travel times of up to 8-hours have been documented from Eglin Main Base
16 to I-10 in Crestview. Therefore, this route would offer substantial savings in travel safety and
17 travel time for those at Camp Rudder.

18 Safety impacts while traveling to and from Camp Rudder, associated with the implementation of
19 the Preferred Alternative or Alternative C would have numerous long-term beneficial impacts on
20 traveler safety.

21 **Unexploded Ordnance (UXO)**

22 Neither the Preferred Alternative nor Alternative C is located in areas with a high probability of
23 the presence of UXO. However, prior to implementation of the Proposed Action, Range Safety,
24 Eglin EOD, and Civil Engineering would determine whether or not UXO clearance and UXO
25 Construction Support would be necessary.

26 Construction safety impacts associated with the implementation of the Preferred Alternative or
27 Alternative C would be of a temporary, short-term nature and thus do not pose a long-term
28 adverse impact on safety.

1 **4.9.1.2 Cumulative Impacts**

2 Construction and land clearing activities associated with the Proposed Action in combination
3 with other construction or demolition activities occurring elsewhere on Eglin, would negligibly
4 cumulatively increase safety risks. Day-to-day operations and maintenance activities conducted
5 at Eglin would be performed in accordance with applicable Air Force safety regulations and
6 OSHA requirements. Construction activities would be accomplished in accordance with
7 applicable Air Force, OSHA, federal, state, and local regulations to minimize general
8 construction hazards as well as those associated with hazardous materials, wastes, and
9 substances.

10 Use of range roads for construction support related to the Proposed Action would be short term.
11 Once constructed, the Proposed Action would give personnel options to drive outside restricted
12 areas which would provide a long-term beneficial effect on safety.

13 If EOD support for UXO clearance is deemed necessary during the permitting and consultation
14 portion of the project, commercial UXO subcontractors have the capability to clear the proposed
15 action area ahead of ground disturbing activities.

16 No adverse cumulative impacts on safety would be expected.

17 **4.9.2 No-Action Alternative**

18 **4.9.2.1 Direct and Indirect Impacts**

19 Under the No-Action Alternative, alternate access would not be provided to Camp Rudder.
20 Considering that the Rangers already log more miles on Eglin roads than any other single/group
21 user, this would be expected to increase in the future. It is reasonable to surmise that travel on
22 unimproved roads of varying surface material; including clay, sand/clay, or sand roads will also
23 increase. Range Roads 257/236/211 (the subject roads) would remain gravel and/or clay/sand
24 roads and continue to be subject to washouts, washboarding, etc. and thus would continue to
25 require an increased level of maintenance to maintain a minimum LOS for travelers using these
26 roads. Emergency access and hurricane evacuations would be hampered by congestion and
27 insufficient roadway capacity. As a result, reliable and safe access to Camp Rudder would

1 remain an issue and likely degrade, thus having a long-term adverse impact to the safety of
2 personnel traveling to and from Camp Rudder.

3 **4.9.2.2 Cumulative Impacts**

4 The No-Action Alternative would result in no new road construction. Due to the projected
5 increases in activity at Camp Rudder, 7th SFG, and the ETTA, it is logical to assume that use of
6 the Range Roads would increase accordingly. Day to day traffic, emergency access, and
7 hurricane evacuation conditions would continue to degrade and the roadway conditions would
8 not be improved. The No-Action Alternative would result in a moderate adverse cumulative
9 impact on safety for travelers to and from Camp Rudder.

10 **4.10 Solid Waste**

11 Impacts on solid waste and waste management would be considered major if the Proposed
12 Action resulted in noncompliance with applicable federal, FDEP, or Eglin regulations or
13 generated or procured amounts beyond current capacities of the regions waste management
14 system.

15 **4.10.1 Proposed Action Corridor**

16 **Preferred Alternative – RR 257/211- Eastern Route, Asphalt and**
17 **Alternative C – RR 257/211- Eastern Route, Clay Based**

18 **4.10.1.1 Direct and Indirect Impacts**

19 The Proposed Action is subject to federal, state, local, and Air Force regulations, since the
20 project would occur on Air Force property. Compliance with applicable regulation is expected.

21 The evaluation for the Proposed Action considers a 400-foot corridor to afford the necessary area
22 to accommodate curves, sensitive resources, etc. However, the actual ROW would require an
23 approximate 60-foot wide construction corridor. To the extent practicable, the existing roadway
24 would be utilized, and thus would minimize the amount of land clearing and grubbing necessary
25 to accommodate the proposed action. Considering the current roadway varies from
26 approximately 24-60 feet wide, an average of 25 feet of clearing will be used for calculation.

1 **4.10.1.2 Cumulative Impacts**

2 The likelihood of past, present, or reasonably foreseeable future actions causing an adverse
3 cumulative impact to solid waste resources is low. Therefore, the cumulative effect on solid
4 waste is expected to be negligible.

5 **4.10.2 No-Action Alternative**

6 **4.10.2.1 Direct and Indirect Impacts**

7 The No-Action Alternative would have no impact on solid waste systems within the ROI. Using
8 this alternative the conditions would remain the same, as described in Section 3.9.2

9 **4.10.2.2 Cumulative Impacts**

10 The No-Action Alternative would have no cumulative impact on solid waste systems within the
11 ROI.

12 **4.11 Transportation**

13 Impacts on transportation are evaluated based on their potential to deteriorate or improve
14 existing levels of service. Impacts may arise from physical changes to traffic patterns,
15 construction activities, introduction of construction-related traffic on local roads, or changes in
16 daily or peak-hour traffic volumes. Effects are categorized as follows:

- 17 • Beneficial – improved LOS
18 • Minor – LOS remains the same or increases or decreases only slightly
19 • Major – LOS declines to unacceptable levels

20 **4.11.1 Proposed Action Corridor**

21 **Preferred Alternative – RR 257/211- Eastern Route, Asphalt and**
22 **Alternative C – RR 257/211- Eastern Route, Clay Based**

23 **4.11.1.1 Direct and Indirect Impacts**

24 During construction of a paved roadway along the eastern route, additional vehicle trips would
25 be generated in and around the route by vehicles transporting workers, material, and equipment

1 to the work site. This additional traffic would cause a slight, temporary increase in AADT on the
2 affected range roads (RR 257 and RR 211) as well as Rattlesnake Bluff Road and SR 85. The
3 increase on SR 85 would be negligible and would be replaced with redirected trips of Ranger
4 Camp traffic upon completion of the project.

5 The route would presumably remain open to through-traffic during the course of construction.
6 Safety of construction workers and motorists is a concern whenever both are present on
7 roadways. Appropriate Maintenance of Traffic (MOT) measures, including signage and
8 flagmen, would be implemented to manage traffic and alert motorists to work zone hazards.
9 These are essential to ensuring a safe environment for both the workers and motorists in these
10 areas.

11 Upon completion of the construction project, motorists would realize positive impacts of the new
12 paved route primarily due to an increase in the travel speed on the road as a function of the
13 road's improved surface and alignment. Analyzing the LOS on the improved road conditions
14 using the existing trip rate of 576 AADT would result in an LOS of C. It is expected that
15 following construction, many motorists utilizing the current primary access to Camp Rudder (RR
16 236/213/257) would likely begin utilizing the new road upon completion, even in the absence of
17 road closing missions and operations which affect the current primary route. The alternative
18 route would also likely be preferable to motorists whose destination or point of origin is Eglin
19 Main Base, Fort Walton Beach, or Niceville. While the number of redirected trips is difficult to
20 quantify in terms of AADT, the completed Preferred Alternative is expected to function at LOS
21 C for trips up to approximately 1,700 AADT, which is well above current predicted roadway
22 usage.

23 **4.11.1.2 Cumulative Impacts**

24 Improving Range Roads 257 and 211 would improve emergency response and safety of traffic
25 for the Camp Rudder community by routing motorists east out of the Eglin reservation and away
26 from the active test areas. This action would improve transportation opportunities for the Camp
27 Rudder community by routing motorists around Range Roads subject to closure during ETTA
28 operations. The LOS along this route would be improved from LOS E to LOS C by the
29 proposed construction activities.

1 SR 85 is maintained by FDOT and therefore, connections made to it must meet FDOT standards.
2 Using FDOT standard guidelines, the length of the deceleration lane may need to be increased
3 for traffic approaching Rattlesnake Bluff Road from the north. Using the AM Peak Hour Traffic
4 estimates for these roads, the limiting right-turn volume would be “7 *right-turning vehicles*
5 *during a 60 minute period between the hours of 7 AM and 9 AM.*” Any turning vehicles over
6 that threshold amount would trigger the need for a right-turn lane.

7 A preliminary traffic signal warrant analysis in general accordance with the *Manual on Uniform*
8 *Traffic Control Devices for Streets and Highways* (U.S. DOT Federal Highway Administration,
9 2009) indicates that the proposed changes to this intersection would not warrant a traffic
10 signal. However, SR 85 has high volumes of traffic in both north- and southbound directions
11 during the AM and PM peak hour periods. This could create difficulty for vehicles approaching
12 the intersection via Rattlesnake Bluff Road to find an adequate gap to enter SR 85. As such, two
13 approach lanes should be considered for the road improvements to Rattlesnake Bluff Road. One
14 approach lane would be for right turning vehicles and one approach lane would be for straight or
15 left turning vehicles.

16 Once active construction has been completed, long-term effects on transportation would be
17 beneficial and no adverse cumulative impacts would result.

18 **4.11.2 No-Action Alternative**

19 **4.11.2.1 Direct and Indirect Impacts**

20 The No-Action Alternative would result in no improvements to the roadways, thus the LOS for
21 RR 211 would remain at LOS E. The continuing LOS failure would have a long term adverse
22 effect on Transportation.

23 **4.11.2.2 Cumulative Impacts**

24 The No-Action Alternative would result in no new construction and thus no roadway
25 improvements would occur. Continued use of the currently available routes including dirt roads
26 would have adverse effects on transportation. The No-Action Alternative would result in an
27 adverse cumulative impact on transportation

1 **4.12 Water Resources**

2 Evaluation criteria for impacts on water resources are based on water availability, quality, and
3 use; existence of wetlands or floodplains; and associated regulations. The Proposed Action
4 would have adverse impacts if it were to do one or more of the following:

- 5 • Significantly reduce water availability or supply to existing users
- 6 • Cause aquifer overdraft
- 7 • Adversely affect water quality
- 8 • Diminish aesthetic or recreational value of surface waters
- 9 • Endanger public health by creating or worsening health hazard conditions
- 10 • Threaten or damage unique hydrologic characteristics
- 11 • Violate established laws or regulations adopted to protect water resources
- 12 • Cause flooding or be subject to flooding
- 13 • Diminish the major function of a wetland or floodplain or significantly alter it without
14 mitigation

15 **4.12.1 Proposed Action Corridor**

16 **Preferred Alternative – RR 257/211- Eastern Route, Asphalt and**
17 **Alternative C – RR 257/211- Eastern Route, Clay Based**

18 **4.12.1.1 Direct and Indirect Impacts**

19 **Drainage Basin**

20 The Proposed Action Corridor includes acreage located in nine drainage sub-basins including:
21 Gopher, Malone, Metts, Middle, Turkey Gobbler, and Turkey Hen Creeks; and the Pearl, Shoal,
22 and Yellow River sub-basins. All of these sub-basins are within the larger Yellow River
23 cataloguing unit (**Figure 3-5**). During construction, erosion and sediment control BMPs would
24 be implemented to minimize the impact to drainage basins.

25 The Yellow River unit consists of 860 square miles and is composed of numerous sub-basins.
26 The approximate 88 acres of proposed development and the entire 581 acre Study Corridor
27 under the Proposed Action represent a very small fraction of each sub-basin as summarized in
28 **Table 4-9** below.

1

Table 4-9 Drainage Basins: Proposed Action

Sub-basin	Percent of Yellow River Basin	
	60-foot work corridor centered on existing roadway (87.3 acres)	Entire 400-foot study corridor (581 acres)
Gopher Creek	0.006	0.026
Malone Creek	0.001	0.005
Metts Creek	0.003	0.022
Middle Creek	0.001	0.005
Pearl River	--	0.0003
Turkey Gobbler Creek	0.0003	0.0025
Turkey Hen Creek	0.001	0.009
Shoal River	0.001	0.005
Yellow River	0.001	0.004

2

3 Currently, stormwater runoff is not managed along the RR 211/257 corridor. Completed
 4 construction would add impervious surface (roads) to the drainage basin thereby increasing
 5 stormwater runoff. In accordance with regulation under Chapter 62-346, FAC, stormwater
 6 infrastructure would be required to attenuate runoff from post-development condition so that it
 7 does not exceed that of the pre-development condition. Stormwater infrastructure acts to manage
 8 stormwater runoff, prevent flooding and erosion, and improve the overall water quality in the
 9 drainage basins by directing stormwater flow into appropriate basins, ponds, swales, etc.
 10 Stormwater infrastructure would be designated during the project design phase and appropriate
 11 locations would be chosen with regard to cultural resources, natural resources, wetlands, and
 12 proximity to airfields in the vicinity of the project area. However, based on proximity to local
 13 airfields, the addition of stormwater retention areas as part of the Proposed Action may increase
 14 the potential to attract regional and seasonal migratory birds. Birds present in the area may pose
 15 a risk to flight operations at nearby Duke Field and Auxiliary Field No. 6. A BASH program has
 16 been developed to assist pilots in preventing bird strikes on aircraft for all Eglin Airfields. The
 17 program provides established guidance and advisory procedures for bird avoidance, both around
 18 installations and on low-altitude flying routes to minimize adverse impacts. In accordance with
 19 standard BASH protocol, stormwater pond design should incorporate measures to allow for
 20 maximum drainage (less than 48-hours, where practicable) thereby eliminating standing water to
 21 the extent possible. Additionally, bird monitoring protocols and a routine mowing schedule to
 22 control grass height would be established, as needed.

1 The NFWFMD regulates the construction, alteration, maintenance, removal, modification, and
2 operation of all activities in uplands, wetlands, and other surface waters that would alter, divert,
3 impede, or otherwise change the flow of surface waters. All stormwater control would be in
4 accordance with FAC 62-346, *Environmental Resource Permitting in Northwest Florida*.
5 Therefore, the Proposed Action would have long-term beneficial impacts on drainage basins in
6 the ROI and would mitigate the impact of sediment erosion from the unpaved RR 257 and
7 RR 211 (USAF, 2009).

8 **Floodplains**

9 EO 11988, *Floodplain Management*, requires federal agencies to determine whether a proposed
10 action would occur within a floodplain. This determination typically involves consultation of
11 appropriate FEMA Flood Insurance Rate Maps, which contain enough general information to
12 determine the relationship of the project area to nearby floodplains. EO 11988 directs federal
13 agencies to avoid construction in floodplains unless the agency determines that there is no
14 practicable alternative. Where the only practicable alternative is to site in a floodplain, the
15 agency must comply with procedures and practices outlined in EO 11988, 44 CFR 9.6, AFI 32-
16 7064, and 32 CFR 989 as detailed in Section 1.7.3.

17 Approximately 6% of the Proposed Action is planned in the floodplain (**Figure 3-5**). During
18 construction, erosion and sediment control BMPs would be implemented to minimize the impact
19 to the floodplain. In accordance with FAC 62-346, once construction is complete, stormwater
20 runoff from the roadway and bridges would be directed to stormwater infrastructure and not
21 directly discharged directly to the floodplain as is the current practice. Therefore, the Proposed
22 Action would have a moderate long-term beneficial impact on the floodplain. Furthermore, the
23 addition of stormwater retention basins and/or swales would prevent flooding and erosion from
24 RR 211/257 and improve water quality in the floodplain resulting in long-term beneficial impact
25 to the floodplain.

26 **Surface Water**

27 Surface water resources associated with the Proposed Action include tributaries of the Shoal and
28 Yellow Rivers (Metts, Middle, Turkey Gobbler, Gopher, and Turkey Hen Creeks, Carr Spring
29 Branch, and the unnamed tributary to the Shoal River that flows from Crain Pond) and Crain
30 Pond are the only perpetually present bodies of water located in the ROI.

1 Standard road and bridge construction BMPs and all required construction permits would be
2 implemented to ensure that construction activities do not lead to direct discharge to surface
3 water and/or erosion of sediments into surface waters.

4 Implementation of the Preferred Alternative would have a negligible minor short-term adverse
5 impact on surface waters. However, asphaltting the roadway; installation of stormwater swales
6 and/or retention basins along the entire length of the road, as appropriate; and construction of
7 new bridges would greatly reduce or eliminate the erosion of road surface material that is
8 currently impacting the majority of the stream crossings. Reduction of sediment and siltation
9 downstream from RR 211/257 would greatly improve overall surface water quality in the area,
10 resulting in long-term moderate beneficial impact.

11 **Wetlands**

12 EO 11990, *Protection of Wetlands*, directs agencies to consider alternatives to avoid adverse
13 impacts and incompatible development in wetlands. Federal agencies are to avoid new
14 construction in wetlands, unless the agency finds there is no practicable alternative and the
15 proposed construction incorporates all possible measures to limit harm to the wetland. Agencies
16 should use economic and environmental data, agency mission statements, and any other
17 pertinent information when deciding whether or not to build in wetlands. If Proposed Actions
18 are in wetlands, the agency must comply with procedures and practices outlined in EO 11990,
19 44 CFR 9.6, AFI 32-7064, and 32 CFR 989, as described in Section 1.7.3.

20 Under the Proposed Action, it is estimated that upwards of 8 acres of wetlands could potentially
21 be impacted, and impact on wetlands acreage would be a consideration as the route is finalized.
22 Additionally, wetlands surveys would identify differing wetland types, function loss, and overall
23 affected acreages.

24 Much of the localized wetlands are currently being negatively impacted by the unimproved clay
25 and sand based road currently in place and several of the wetland areas coincide with creek
26 crossings. Thus, required mitigation in conjunction with properly designed and constructed
27 bridges would minimize impact and may even provide a beneficial effect to the wetlands.

28 The construction of the stormwater infrastructure may alter the localized hydrology to various
29 degrees. However, the implementation of this infrastructure would be beneficial to the overall

1 wetlands system in the area. Not only would it provide treatment of stormwater runoff, it would
2 help eliminate the “*ditch to stream*” effect that is currently taking place. This dramatic
3 reduction in direct runoff to area wetlands and tributaries of the Yellow and Shoal Rivers would
4 greatly minimize the introduction of pollutants via stormwater runoff.

5 The standards set forth in the requisite plans and permits would be implemented to protect water
6 and wetland quality by minimizing erosion, sedimentation, and siltation. In order to protect the
7 remaining surrounding wetlands, proper selection of means and methods, including choice of
8 construction equipment is necessary to minimize ground disturbance and to prevent excessive
9 hydrologic alterations. In addition to protecting existing primary and secondarily affected
10 wetlands during construction, construction within wetlands generally requires mitigation
11 measures to be implemented.

12 All mitigation measures would likely be in the same drainage basin as the wetland impacts
13 associated with the Proposed Action. The mitigation process begins with functional
14 assessments of the wetlands impacted. Completed assessments, an Application for Works in the
15 Waters of Florida, and supporting documentation would be submitted to the USACE and FDEP
16 during the forthcoming permitting process. The agencies must then determine whether the
17 proposed habitat restoration would provide sufficient functional gain to offset the functional loss
18 for primary and secondary affected wetlands at the impact site. Once the mitigation
19 requirements are identified, a Joint Environmental Resource Permit application and CWA
20 Section 404 Permit application would be submitted to the FDEP and USACE.

21 Any adverse impact on wetlands in the Preferred Alternative project corridor would be fully
22 mitigated as a condition of the Joint Environmental Resource Permit and CWA Section 404
23 Permit. Therefore, the Preferred Alternative would have a negligible adverse impact to the
24 overall wetland resource.

25 **Groundwater**

26 Sand & Gravel Aquifer. During construction, erosion and sediment control BMPs would be
27 implemented to minimize impact to the Sand & Gravel Aquifer. Currently, stormwater runoff is
28 not managed along the RR 211/257 corridor. Engineered stormwater swales and/or retention
29 basins would be included in implementation of the Proposed Action. Stormwater retention
30 basins (catchment basins) and swales are types of long-term BMPs utilized to manage

1 stormwater runoff, prevent flooding and erosion, and improve the overall water quality in the
2 drainage basins.

3 Therefore, the Proposed Action would have long-term minor beneficial impact on water quality
4 in the Sand & Gravel Aquifer in the ROI.

5 Floridan Aquifer. Due to the surficial nature of the Proposed Action, the Proposed Action
6 would not affect the Floridan Aquifer.

7 **4.12.1.2 Cumulative Impacts**

8 The likelihood of past, present, or reasonably foreseeable future actions causing adverse
9 cumulative impacts to the drainage basin, floodplain, surface water, wetlands, or groundwater
10 conditions is low. No adverse cumulative impacts on water resources would be expected.

11 **4.12.2 No-Action Alternative**

12 **4.12.2.1 Direct and Indirect Impacts**

13 The No-Action Alternative would result in no new construction. Using this alternative the
14 drainage basin, floodplain, surface water, wetlands, and groundwater conditions in the vicinity
15 of the Proposed Action would result in continued degradation due to sediment and road material
16 runoff into surface water and wetlands, as described in Section 3.11.2. The No-Action
17 Alternative would result in no engineered stormwater controls and thus continued stormwater
18 runoff, resulting in flooding, erosion, and degraded water quality in the drainage basins.
19 Therefore, the No-Action Alternative would have a minor long-term adverse impact on water
20 resources in the ROI.

21 **4.12.2.2 Cumulative Impacts**

22 The No-Action Alternative would result in no new construction. Due to the projected increases
23 in activity at Camp Rudder, 7th SFG, and ETTA, it is logical to assume that use of the Range
24 Roads would increase accordingly. Continued lack of engineered stormwater controls and thus
25 continuing stormwater runoff would result in ongoing flooding, erosion, and degraded water
26 quality in the drainage basins. Therefore, the No-Action Alternative would result in a moderate
27 adverse cumulative impact on water resources in the ROI.

1 **5.0 Plans, Permits, and Management Requirements**

2 **5.1 Plans**

- 3 • Roadway Design and Construction Plans
- 4 • Stormwater Pollution Prevention Plan (FAC 62-621.300)
- 5 • Stormwater, Erosion, and Sedimentation Control Plan

6 **5.2 Permits**

- 7 • Stormwater facility design and construction permit (62-346, FAC).
- 8 • Section 404 CWA Permit for dredge and fill of wetlands (33 USC Sections 1251-1376)
- 9 • Environmental Resource Permit for dredge and fill of wetlands (FAC 62-312 and 346)
- 10 • State of Florida Generic Permit for Stormwater Discharge from construction activities
- 11 that disturb one or more acres of land (FAC 62-621.300)
- 12 • Base civil engineering work clearance request, Air Force Form 103
- 13 • CZMA Consistency Determination (Florida Statutes, Chapter 380, Part II)
- 14 • USFWS Informal Section 7 ESA Consultation for potential effects to the RCW, eastern
- 15 indigo snake, gopher tortoise, and Florida black bear (16 USC 1536)\
- 16 • Gopher tortoise relocation permit, as needed
- 17 • Cultural Resource survey and NHPA Section 106 consultation with the Florida State
- 18 Historic Preservation Officer (16 USC 470 et seq)
- 19 • Other permits and authorization through Eglin AFB and Okaloosa County, as needed

20 **5.3 Management Requirements**

21 The proponent is responsible for the implementation of the following management requirements.

22 **5.3.1 Air Quality**

23 Reasonable precautions would be taken to minimize fugitive particulate emissions during
24 ground-disturbing/construction activities in accordance with Rule 62-296, FAC. These may
25 include the application of water sprays, re-vegetation of disturbed areas, and use of geotextiles,
26 as needed.

1 **5.3.2 Biological Resources**

2 Site design plans and permits would include site-specific management requirements for erosion
3 and sediment control BMPs. BMPs include: silt fencing, sand bags, rock bags, sediment traps,
4 sediment basins, synthetic bales, floating and staked turbidity barriers, application of water
5 sprays, re-vegetation of disturbed areas, and use of geotextiles, as needed (FAC 62-621 and 62-
6 346).

7 Design plan measures to help prevent and control dissemination of invasive species including the
8 prohibition of hay or stray bales (EO 13112).

9 In accordance with Eglin Natural Resources, all construction staging and storage areas would be
10 sited to lessen impacts to sensitive habitat along the roadway corridor to avoid adverse effect to
11 the extent possible. All clearing and staging areas must be approved through the Eglin Natural
12 Resources Section. Additionally, the Army would coordinate any required field surveys with
13 Eglin Natural Resources. Required surveys may include documentation of nesting activities
14 such as active bird nests or gopher tortoise burrows. Any nesting activities identified during
15 survey may require further consultation with the USFWS, FFWC, and the Eglin Natural
16 Resources Section. Instances would be handled on a case-by-case basis, should they occur. For
17 example, if a gopher tortoise burrow were to be discovered, it would be given a mandatory 25-
18 foot buffer or the tortoise would be relocated under permit, depending on its location in respect
19 to the project area, per Eglin Natural Resources direction. Other instances, such as certain
20 nesting species, may result in an altered construction plan or schedule as the situation warrants.

21 The presence of gopher tortoise burrows would increase the likelihood of the presence of the
22 eastern indigo snake. Per Eglin regulations, information signs would be posted in active
23 construction areas alerting crews to the potential presence of the snake and other protected
24 species. Contractors would familiarize work crews with the appearance of potential protected
25 species and instruct work crews not to kill any snakes, especially black snakes. Other safeguards
26 such as predator-proof waste containers would be utilized during construction so as to avoid
27 attracting bears or other species. Work crews would be instructed to stop work if protected
28 animal species are encountered and to only resume work once the species leave the area. Certain
29 species or activities such as nesting within or near the project area may require further
30 consultation with the Eglin Natural Resources, the FWC, or the USFWS.

1 **5.3.3 Cultural Resources**

2 Following consultation procedures established in Section 106 (36 CFR 800), before any ground
3 disturbance activities associated with the Proposed Action begin, data recovery to mitigate
4 adverse effects where direct impact threatens portions of historic properties would be completed
5 with concurrence of consulting parties. Historic properties threatened with indirect impact will
6 be protected from adverse effect through avoidance. These properties will be identified on
7 construction plans as “No Staging/No Disturbance” zones and cordoned off with barrier fencing
8 to be installed using pre-set (GPS) geo-reference points shown on the plans.

9 A Programmatic Agreement developed for cultural resources concerns of the Proposed Action
10 includes stipulations on procedures to mitigate adverse effect where direct impact is threatened
11 and to avoid adverse effect where indirect impact threatens historic properties. Without
12 identifying specific details on cultural resources, the PA stipulations would be included in all
13 requests for proposals (RFPs) for all tasks resulting in ground disturbance for the Proposed
14 Action. The RFP would include concise wording that no work may begin in areas of direct
15 impact between specified station markers until notice is given that mitigation is complete. The
16 RFPs would include concise wording on the avoidance and fencing of “No Staging/No
17 Disturbance” zones. Contractors responding to RFPs would be required to acknowledge their
18 understanding of the stipulations of the PA as part of their quality assurance/quality control
19 (QA/QC) program, include procedures to ensure against violations by any member of their
20 teams, and specify measures to be followed in the event of violation of any part of the PA by a
21 member of their team. The type(s) of barrier fencing for cordoning off the “No Staging/No
22 Disturbance” areas, pre-approved by Eglin AFB, would be included in the RFPs. Contractors
23 responding to the RFPs would identify the type of barrier fencing to be used and any
24 specifications on installation.

25 Additionally, the Eglin AFB Procedures for Unexpected Discoveries are included as Appendix C
26 of the PA. These measures are to be implemented in the event of unexpected discoveries relating
27 to historic properties.

28 Furthermore, the PA stipulations would be part of the Work Clearance Request (AF 103) permit
29 and contractors would be required to acknowledge their understanding before 96th Civil
30 Engineering, Cultural Resources Section would affix an authorizing signature.

1 As a final measure of resolving the threat of adverse effect, a professional archaeologist would
2 monitor all stages of construction that result in ground disturbance, including fence installation,
3 within the area of cultural sensitivity denoted by station markers on construction plans.

4 **5.3.4 Geological Resources (Soil and Erosion)**

5 Site design plans and permits would include site-specific management requirements for erosion
6 and sediment control BMPs. BMPs include: silt fencing, sand bags, rock bags, sediment traps,
7 sediment basins, synthetic bales, floating and staked turbidity barriers, application of water
8 sprays, re-vegetation of disturbed areas, and use of geotextiles, as needed. (FAC 62-621 and 62-
9 346)

10 Stormwater management controls, inspections, and required remedial actions, as necessary in
11 accordance with the Project Stormwater Pollution Prevention Plan. (FAC 62-621.300)

12 Construction activities would be sequenced to limit length of soil exposure.

13 Areas of existing vegetation that would not be disturbed by construction activities would be
14 marked and identified.

15 **5.3.5 Safety**

16 OSHA (29 USC Sections 651) - specifies the amount and types of training required for workers,
17 standard work protocols and procedures, the use of protective equipment, the implementation of
18 engineering controls, and maximum exposure limits for workplace stressors.

19 Range access protocol, including obtaining clearance and compliance with mission gate closures,
20 would need to be followed at all times.

21 **5.3.6 Water Resources**

22 Site design plans and permits would include site-specific management requirements for erosion
23 and sediment control BMPs. BMPs include: silt fencing, sand bags, rock bags, sediment traps,
24 sediment basins, synthetic bales, floating and staked turbidity barriers, application of water
25 sprays, re-vegetation of disturbed areas, and use of geotextiles, as needed. (FAC 62-621 and 62-
26 346)

1 Stormwater management controls, inspections, and required remedial actions, as necessary in
2 accordance with the Project Stormwater Pollution Prevention Plan. (FAC 62-621.300)

3 **5.3.7 Wetlands**

4 Site design plans would avoid and minimize direct and indirect disturbance of wetlands to the
5 maximum extent practicable. Effect to wetlands would be permitted and mitigated in accordance
6 with USACE and NFWMD/FDEP requirements, as needed.

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1 **6.0 Irreversible and Irretrievable Commitments of Resources**

2 The National Environmental Policy Act requires environmental analysis to identify any
3 irreversible and irretrievable commitments of resources involved in the implementation of the
4 Proposed Action or alternatives. Irreversible and irretrievable resource commitments are related
5 to the use of nonrenewable resources and the effects that the uses of these resources have on
6 future generations. Irreversible effects primarily result from the use or destruction of a specific
7 resource (e.g., energy and minerals) that cannot be replaced within a reasonable timeframe.
8 Irretrievable resource commitments involve the loss in value of an affected resource that cannot
9 be restored as a result of the action (e.g., extinction of a threatened or endangered species or the
10 disturbance of a cultural site). Implementing the Proposed Action through any of the alternatives
11 would require a commitment of natural, physical, human, and fiscal resources. In all of these
12 categories, irreversible and irretrievable commitments of resources would occur. Land required
13 for roadway construction or expansion would be irreversibly committed during the functional life
14 of the roadway; in some cases, land uses would change from undeveloped to developed.
15 Although it is possible for land to revert to its former state if the roadway were abandoned and
16 destroyed, the likelihood of such an occurrence for established facilities would be low.

17 Considerable amounts of fossil fuels and construction materials, such as steel, concrete,
18 aggregate, and asphalt materials, would be expended under the action alternatives. These
19 physical resources should generally be in sufficient supply during the proposed project initiation,
20 and their commitment to the project would not have an adverse effect on the resource's
21 continued or future availability. Some biological resources would be irreversibly and
22 irretrievably lost with construction of the proposed project, and some areas of wildlife habitat
23 would be lost. However, based on the size of the Eglin Complex compared with the amount of
24 acreage that would be used for roadway, the loss would be minimal; sensitive habitat areas
25 would be avoided to the extent practicable and impacts on sensitive species would be mitigated
26 as discussed.

27 In terms of human resources, labor would be used in preparation, fabrication, and construction of
28 the project. Labor is generally not considered to be a resource in short supply, and commitment
29 to the project would not have an adverse effect on the continued availability of these resources.
30 Project construction would require a substantial expenditure of funds. It is anticipated that

1 businesses, employees, and residents of the local area would benefit from improved economics
2 resulting from implementation of the Proposed Action.

3 Not constructing primary access has irretrievable impacts associated from the increased
4 consumption of fuels and increase in air pollutants and erosion related due to stopping traffic
5 during mission activities and the continued use of dirt roads.

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1 **7.0 List of Preparers**

Personnel	Project Contribution	Experience
Jeff Brown, PG Professional Geologist, FL No. 1104 B.S. Geology	Author	30 years environmental and geologic sciences
Richard L. Burdine, PG Professional Geologist, FL No. 1863 B.S. Geology	Author	28 years environmental and geologic sciences
Melissa A. Hoover MS, PMP B.S. Biological Sciences M.S. Environmental Sciences	Project Manager / Author	16 years environmental science/ 10 years project management
Jonathan M. Kramer, M.A. B.S. Geology M.A. Geology	Author	10 years environmental science
Robyn E. Peterson, PE Professional Engineer, FL No. 53925 B.S. Biological Engineering	Author	19 years engineering design and development
Clifford Knauer, PE Professional Engineer, FL No. 53930 B.S. Civil Engineering	Transportation Engineering	21 years engineering design and development
L. Janice Campbell, M.A. M.A. Anthropology	Author	36 years cultural resources management
Tony R. Schmucker, PG B.S. Geosciences	Author / GIS-Mapping	7 years environmental science and GIS
Andrea Ward, E.I. Engineer Intern, FL No. 1100011073 B.S. Civil Engineering M.E. Environmental Engineering	Data Support / Author	5 years environmental science and engineering

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1 **8.0 List of Agencies and Persons Contacted**

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Mr. Bill Miller 46 RANMS/DOJ 505 N. Barrancas Ave Ste 201 Eglin AFB, Florida 32542	Mr. Glenn Todd IMSE-BEN-PW Fort Benning, GA (770) 331-2028
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- 3 U.S. Department of Transportation (USDOT) Federal Highway Administration (FHA). 2009.
4 *Manual on Uniform Traffic Control Devices for Streets and Highways*.
- 5 USEPA, 1995. *Compilation of Air Pollutant Factors, Volume 1: Stationary Point and Area*
6 *Sources (AP-42), 5th edition*. United States Environmental Protection Agency, Ann Arbor,
7 January 1995.
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- 9 USEPA. 2009. *Proposed Endangerment and Cause or Contribute Findings for Greenhouse*
10 *Gases under the Clean Air Act* EPA-HQ-OAR-2009-0171. U.S. Environmental Protection
11 Agency April 24, 2009.
- 12 U.S. General Accounting Office. 1997. *Army Ranger Training, Safety Improvements Need to Be*
13 *Institutionalized*, U.S. General Accounting Office Report to Congressional Committees.
14 January, 1997.
- 15 Varble, D. 2010. Personal communication between Dustin Varble, Eglin Natural Resources
16 Sections, Wildlife and Kelly Knight, SAIC. June 2010.
- 17

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FIGURES

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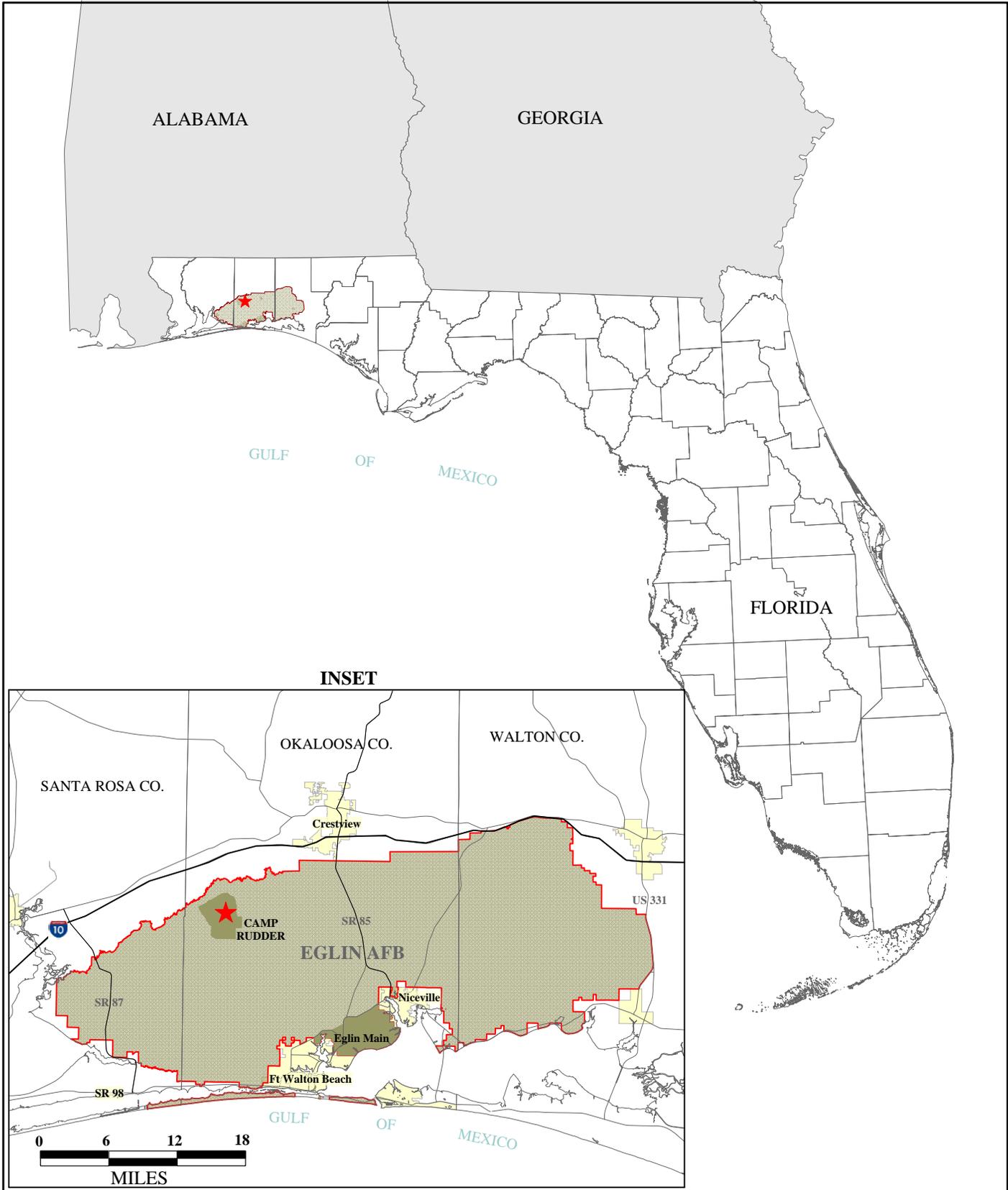
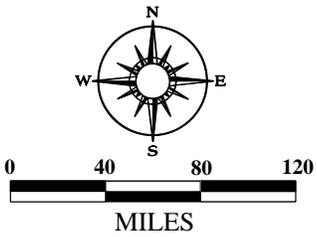
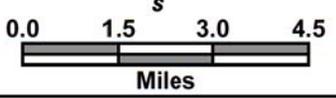
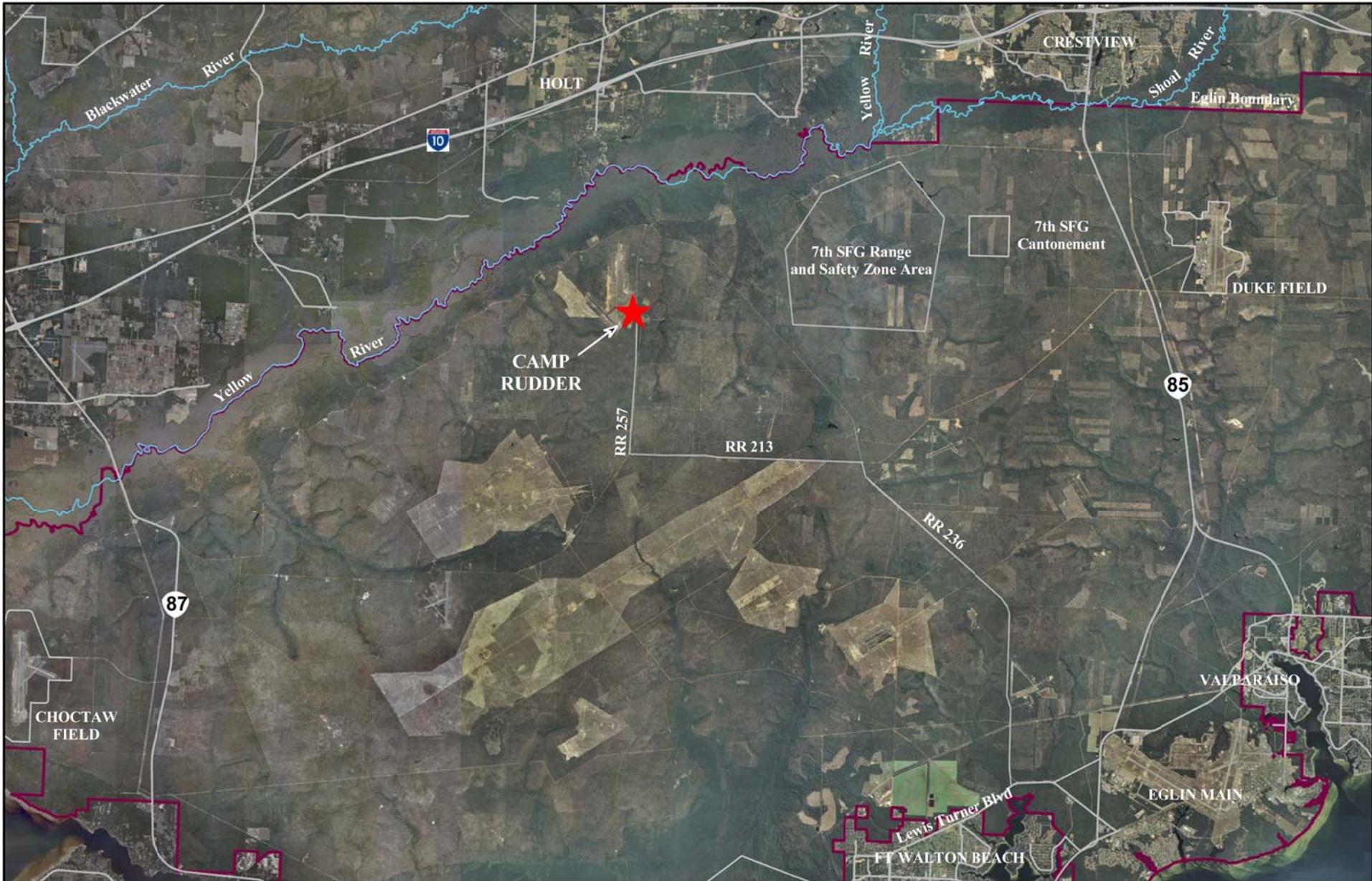


FIGURE 1-1
SITE LOCATION MAP
ACCESS IMPROVEMENT INITIATIVE
Environmental Assessment
6th RTBn - Camp Rudder
Eglin Air Force Base, Florida



Sources:
 U.S. Census Bureau
 Eglin Enterprise Spatial Database



Sources: Florida Department of Transportation, 2007
Eglin Enterprise Spatial Database

FIGURE 1-2
AERIAL OVERVIEW
ACCESS IMPROVEMENT INITIATIVE
Environmental Assessment
6th RTBn - Camp Rudder
Eglin Air Force Base, Florida

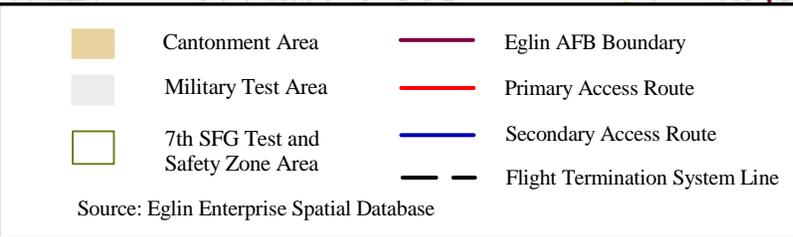
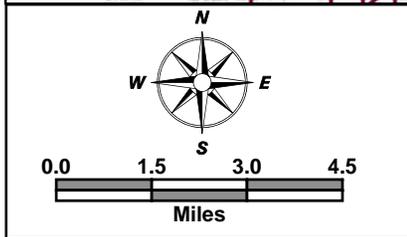
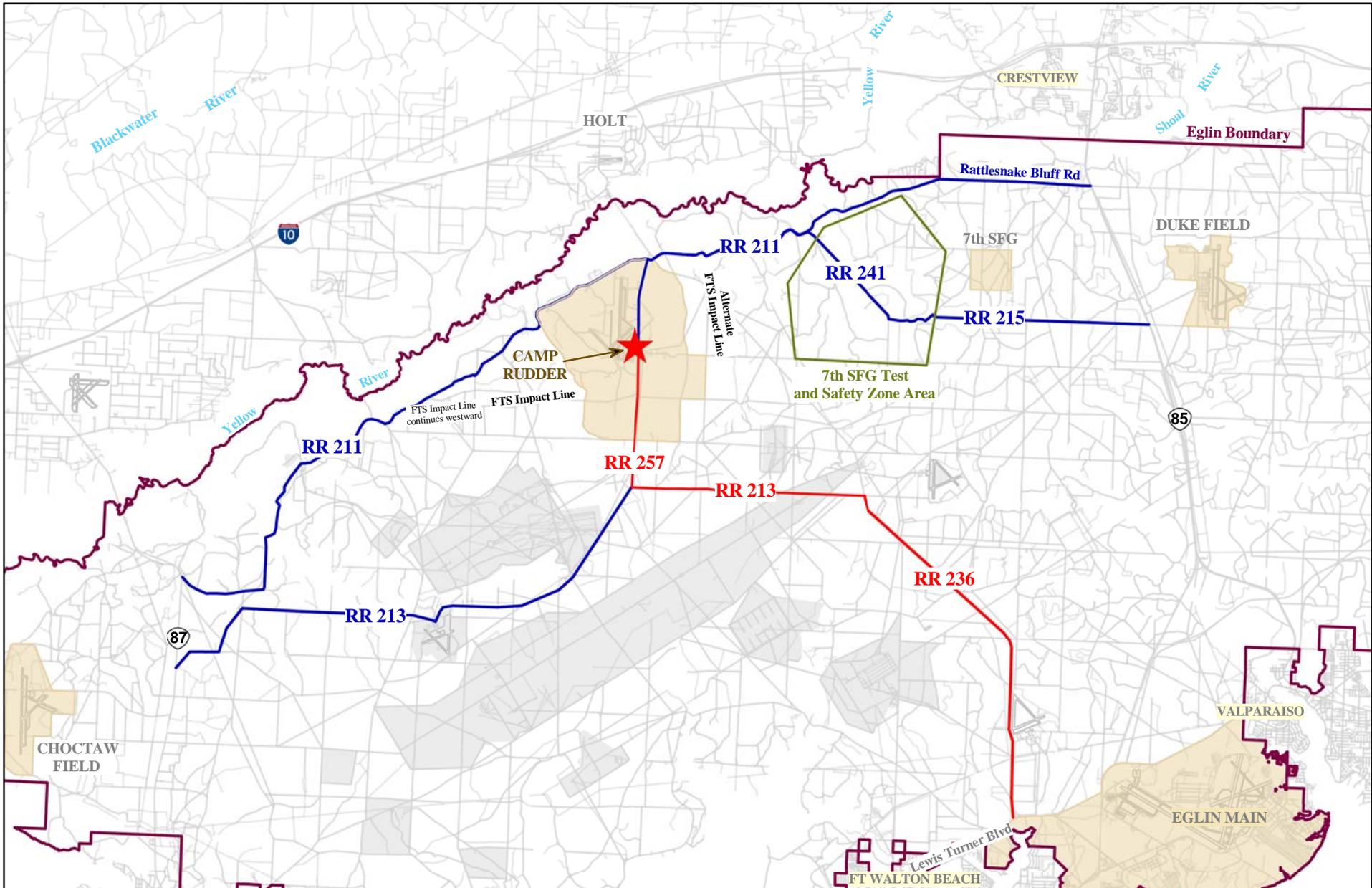
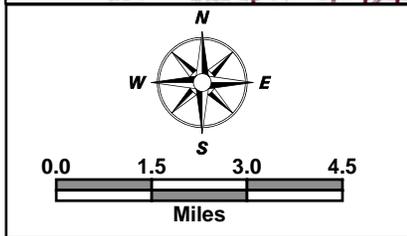
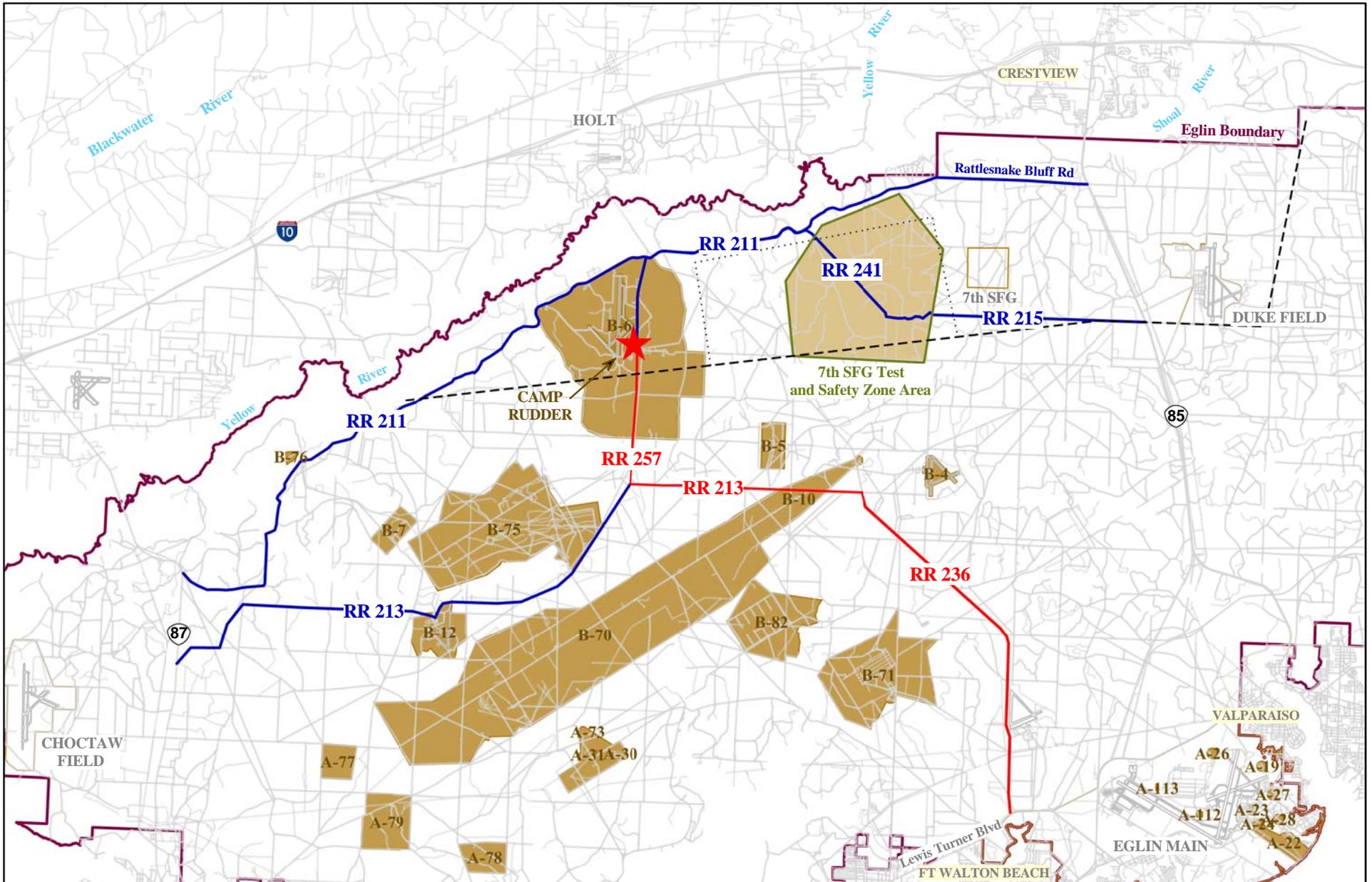


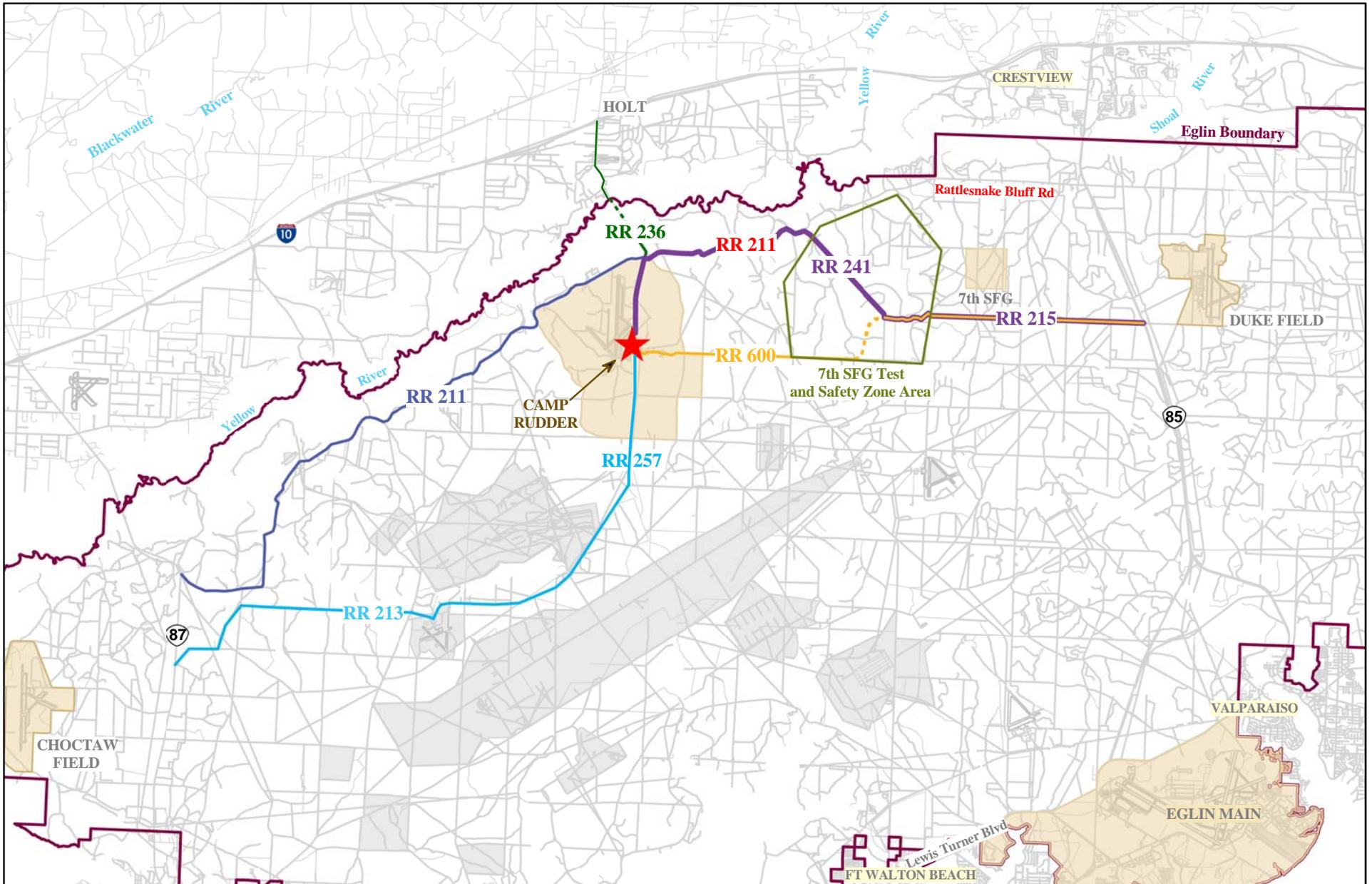
FIGURE 1-3
CURRENT ACCESS
ACCESS IMPROVEMENT INITIATIVE
Environmental Assessment
6th RTBn - Camp Rudder
Eglin Air Force Base, Florida



	Cantonment Area		Eglin AFB Boundary
	Military Test Area		Primary Access Route
	7th SFG Test and Safety Zone Area		Secondary Access Route
			Flight Termination System Line
			Flight Termination System Line Alt

Source: Eglin Enterprise Spatial Database

FIGURE 1-4
TEST AREA FOOTPRINT OVERVIEW
ACCESS IMPROVEMENT INITIATIVE
Environmental Assessment
6th RTBn - Camp Rudder
Eglin Air Force Base, Florida

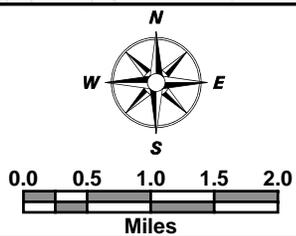
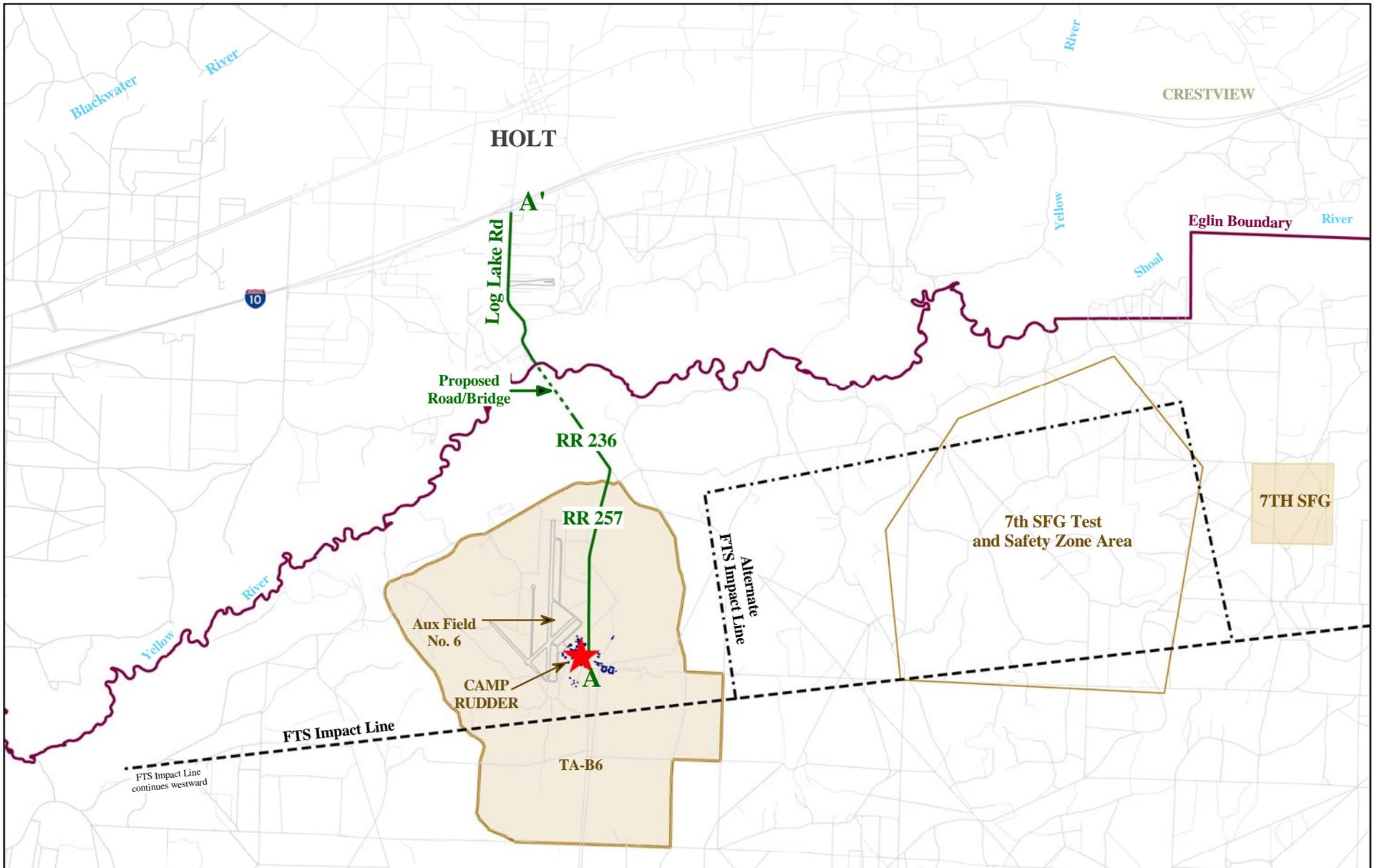


- Cantonment Area
- 7th SFG Test and Safety Zone Area

- Eglin AFB Boundary
- Military Test Area

Source: Eglin Enterprise Spatial Database

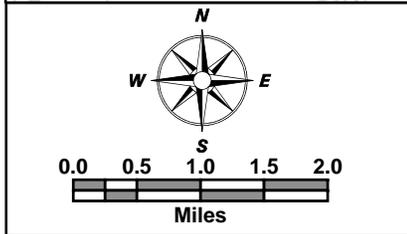
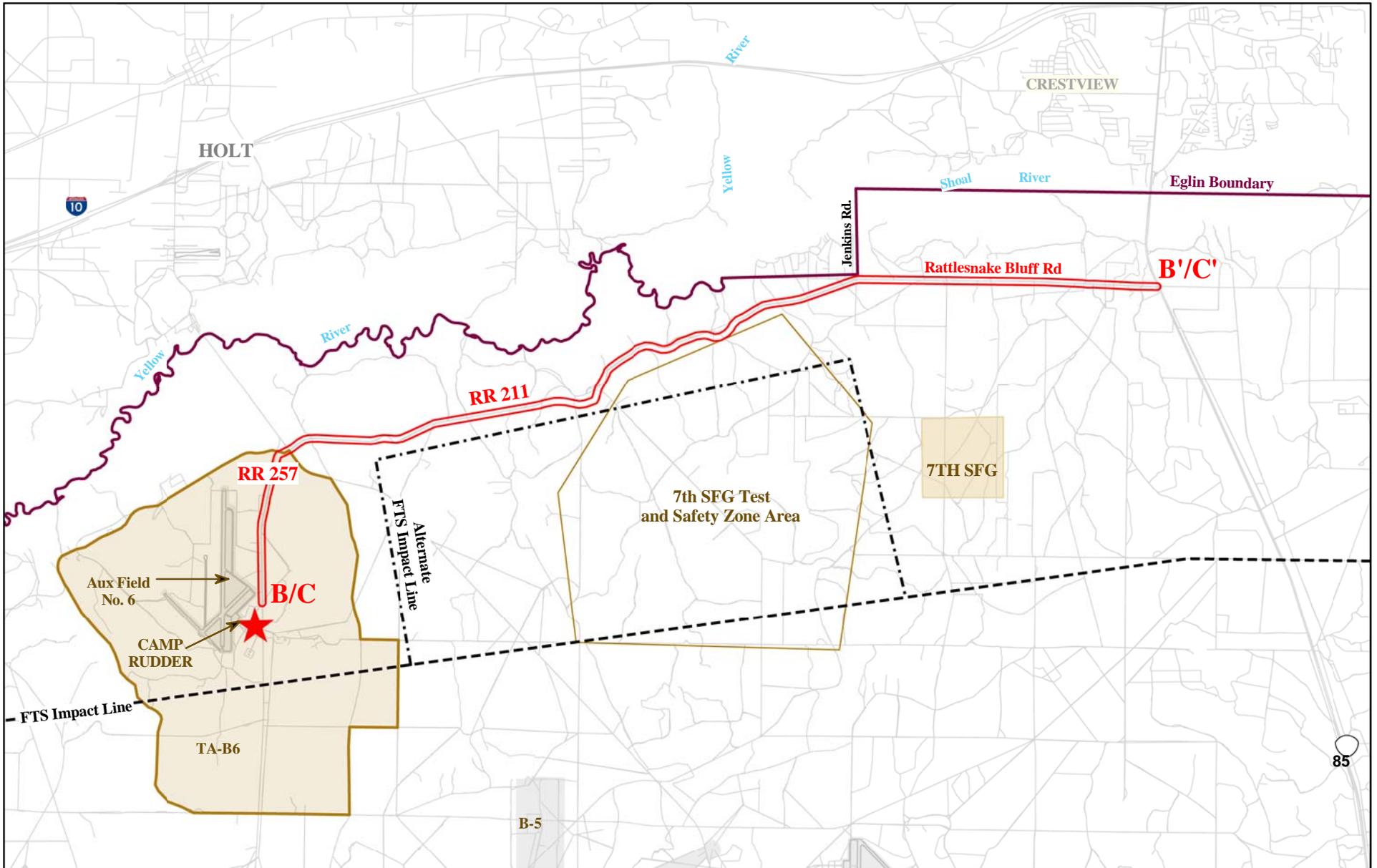
FIGURE 2-1
ALTERNATIVE ROUTES
ACCESS IMPROVEMENT INITIATIVE
Environmental Assessment
6th RTBn - Camp Rudder
Eglin Air Force Base, Florida



**ALTERNATIVE ROUTE A
RR 257/236/Holt Bridge - Northern Route**

Source: Eglin Enterprise Spatial Database

**FIGURE 2-2
ALTERNATIVE ROUTE A
ACCESS IMPROVEMENT INITIATIVE
Environmental Assessment
6th RTBn - Camp Rudder
Eglin Air Force Base, Florida**

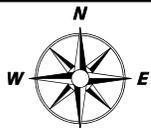
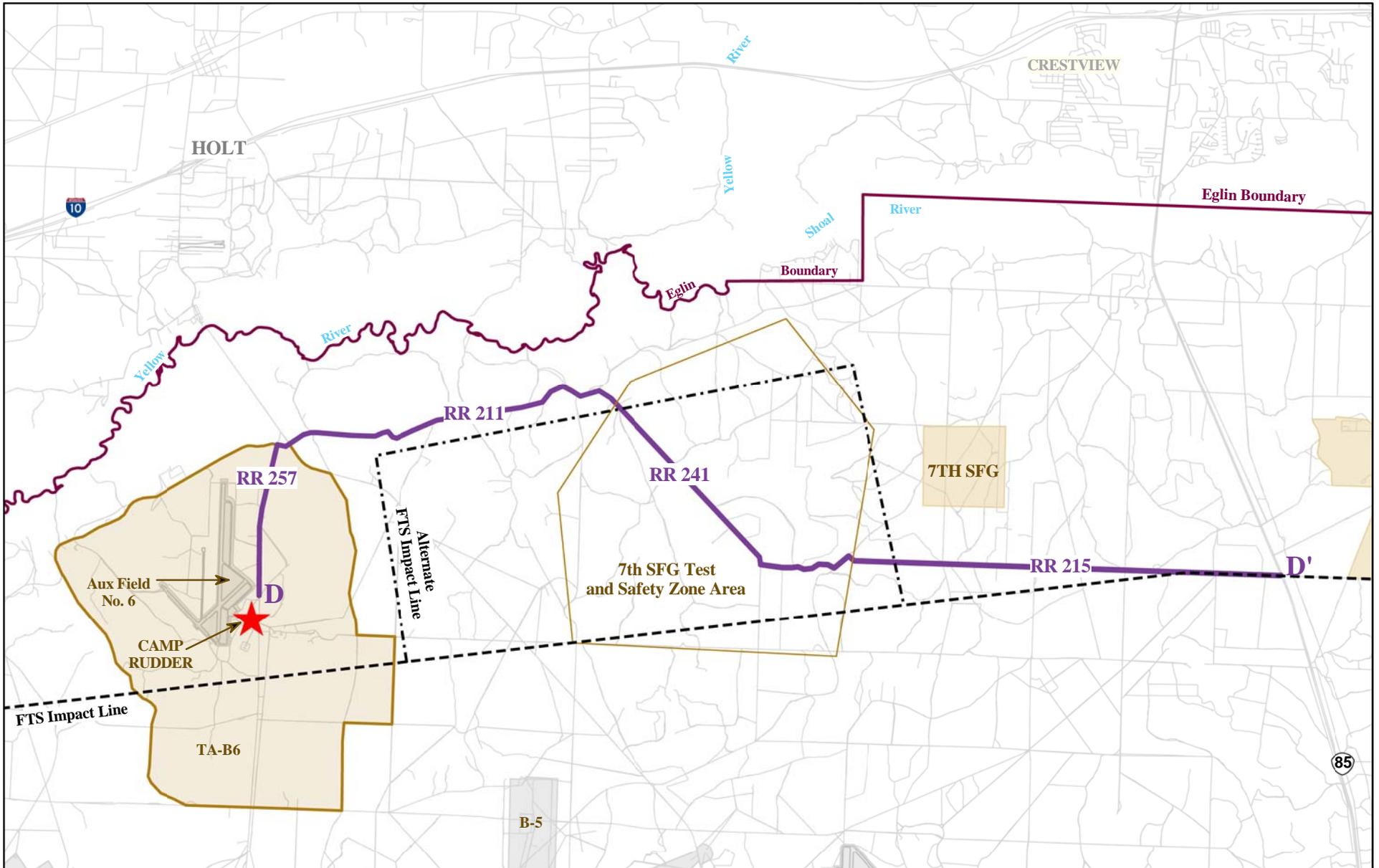


ALTERNATIVE ROUTE B
 RR 257/211 - Eastern Route (Asphalt pavement)

ALTERNATIVE ROUTE C
 RR 257/211 - Eastern Route (Clay-Based)

Source: Eglin Enterprise Spatial Database

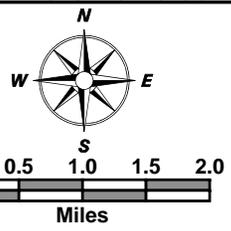
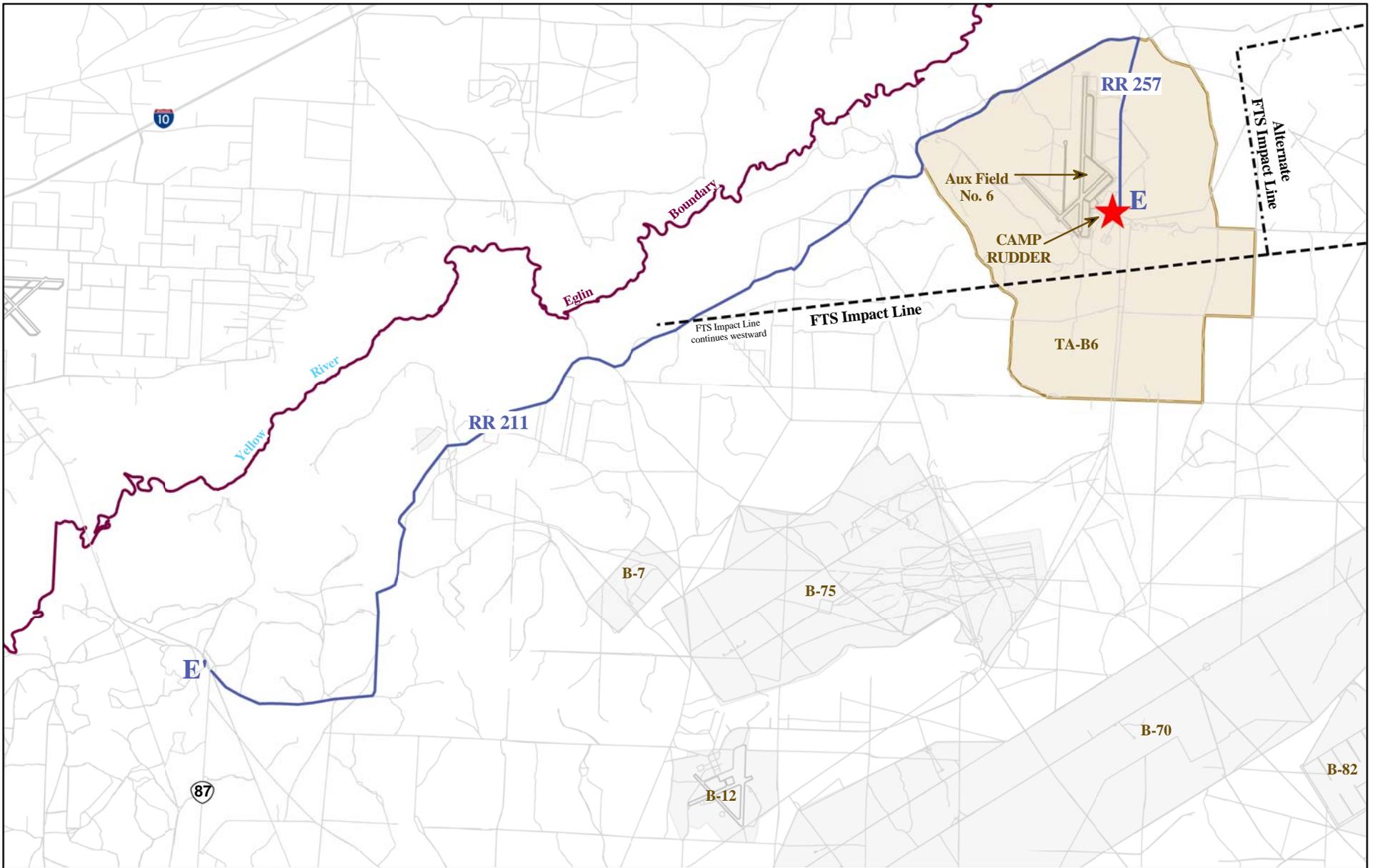
FIGURE 2-3
ALTERNATIVE ROUTE B AND C
ACCESS IMPROVEMENT INITIATIVE
 Environmental Assessment
 6th RTBn - Camp Rudder
 Eglin Air Force Base, Florida



ALTERNATIVE ROUTE D
RR 257/211/241/215 - Eastern Route

Source: Eglin Enterprise Spatial Database

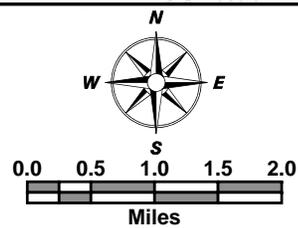
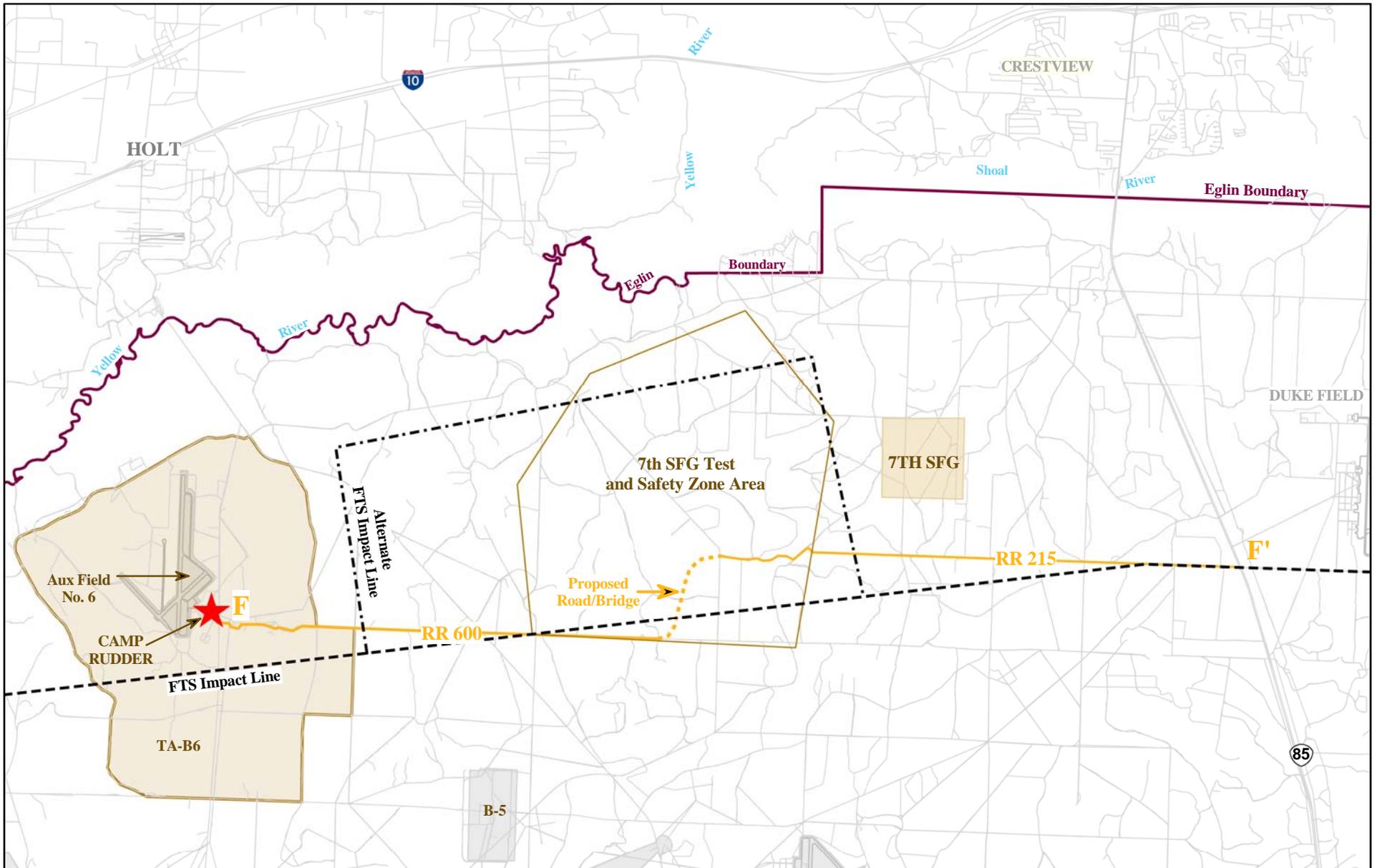
FIGURE 2-4
ALTERNATIVE ROUTE D
ACCESS IMPROVEMENT INITIATIVE
Environmental Assessment
6th RTBn - Camp Rudder
Eglin Air Force Base, Florida



**ALTERNATIVE ROUTE E
RR 257/211 - Western Route**

Source: Eglin Enterprise Spatial Database

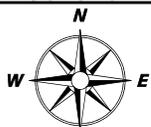
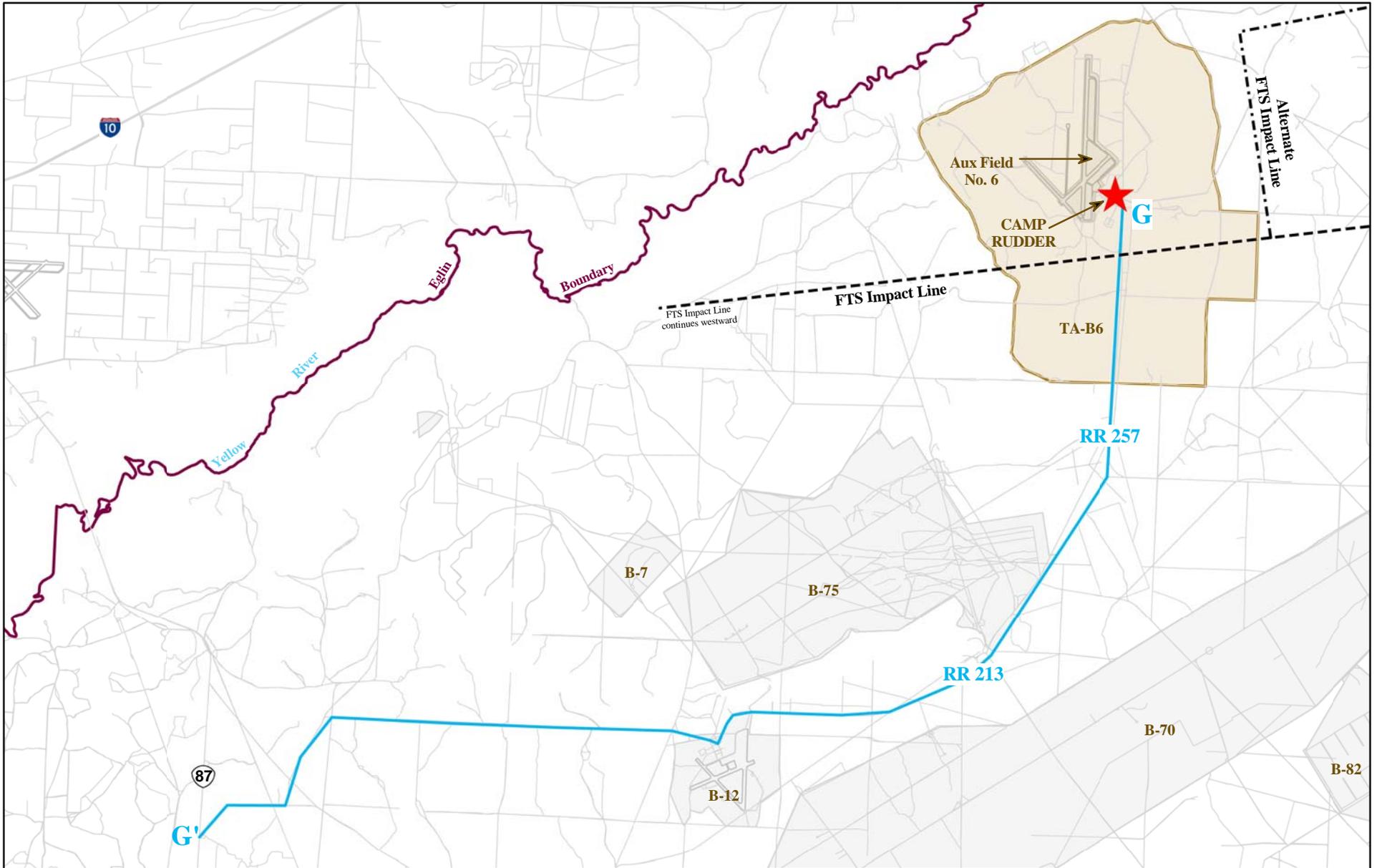
**FIGURE 2-5
ALTERNATIVE ROUTE E
ACCESS IMPROVEMENT INITIATIVE
Environmental Assessment
6th RTBn - Camp Rudder
Eglin Air Force Base, Florida**



**ALTERNATIVE ROUTE F
RR 600/215 - Eastern Route**

Source: Eglin Enterprise Spatial Database

**FIGURE 2-6
ALTERNATIVE ROUTE F
ACCESS IMPROVEMENT INITIATIVE
Environmental Assessment
6th RTBn - Camp Rudder
Eglin Air Force Base, Florida**

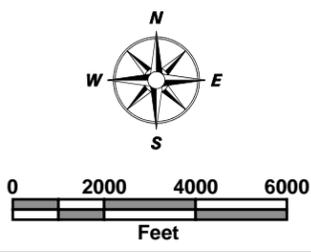
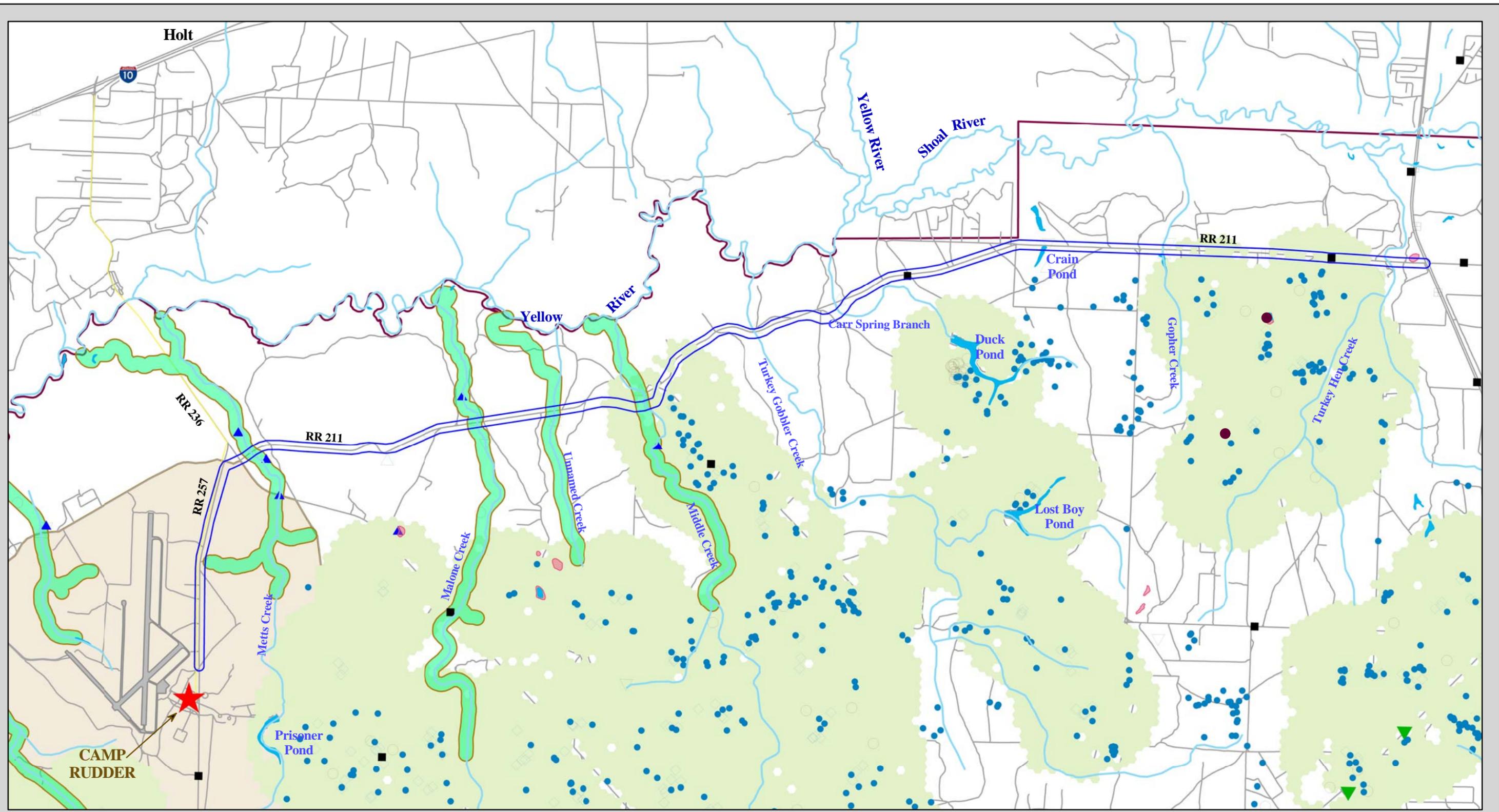


**Alternative Route G
RR 257/213 Southwestern Route**

Source: Eglin Enterprise Spatial Database

**FIGURE 2-7
ALTERNATIVE ROUTE G
ACCESS IMPROVEMENT INITIATIVE
Environmental Assessment
6th RTBn - Camp Rudder
Eglin Air Force Base, Florida**

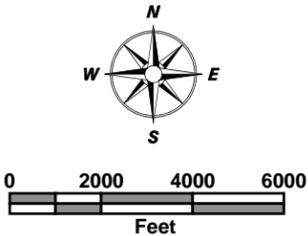
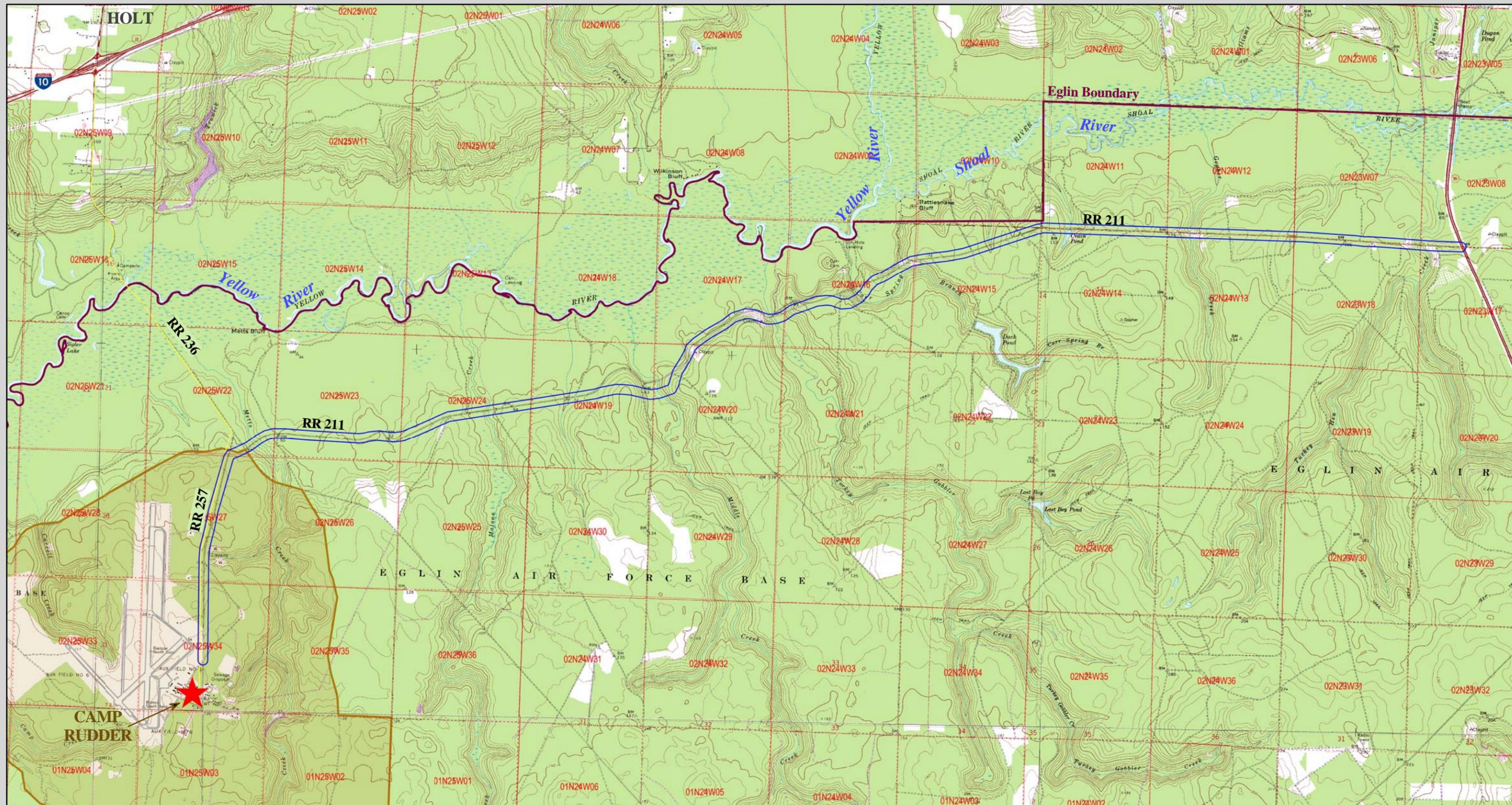
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- | | | | |
|-----------------------------------|------------------------|------------------------------|--------------------------|
| RCW Forage Area Model | Pitcher Plant | Black Bear Sighting Point | Proposed Action Corridor |
| RCW Inactive Tree | Pine Snake | Black Bear Incident Point | Roadway/Range Road |
| Salamander Confirmed Ponds Buffer | Pine Barrens Tree Frog | Black Bear Range - Primary | River/Stream |
| Salamander Potential Ponds Buffer | Gopher Tortoise Burrow | Black Bear Range - Secondary | Eglin Reservation |
| | Gopher Frog Pond | Bog Frog Potential Habitat | Surface Water |
| | RCW Active Tree | Bog Frog | |

Source: Eglin Enterprise Spatial Database

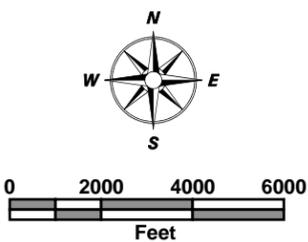
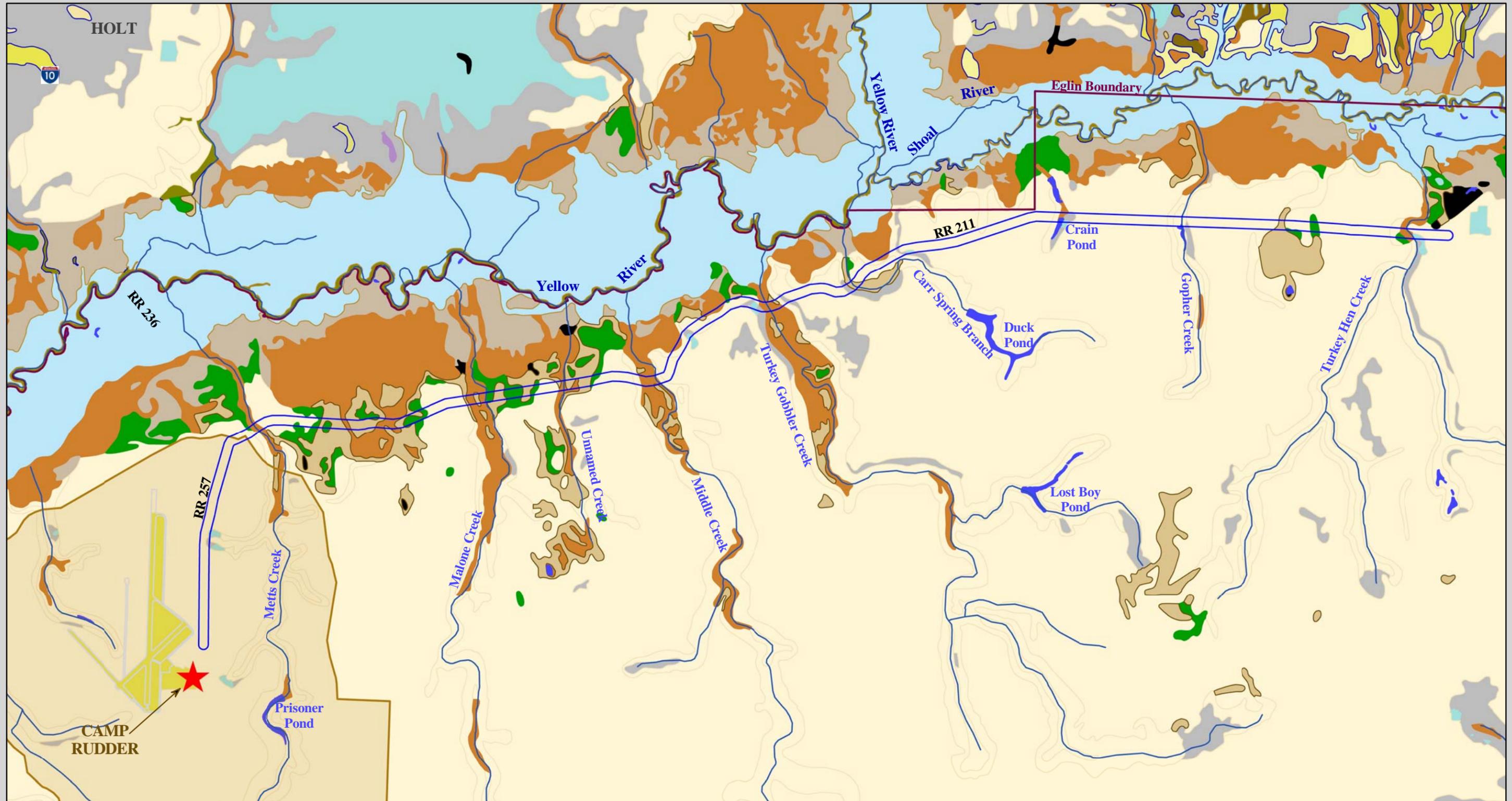
FIGURE 3-1
Protected Species Locations
ACCESS IMPROVEMENT INITIATIVE
Environmental Assessment
6th RTBn - Camp Rudder
Eglin Air Force Base, Florida



Sources:
 -USGS 1:24,000 topographic maps;
 Crestview South, Floridale, Harold SE,
 Holt, Holt SW, Valparaiso
 -Eglin Enterprise Spatial Database

- ▬ Proposed Action Corridor
- ▬ Eglin Reservation
- 02N24W33 Township-Range-Section

FIGURE 3-2
USGS Topographic Map
ACCESS IMPROVEMENT INITIATIVE
Environmental Assessment
6th RTBn - Camp Rudder
Eglin Air Force Base, Florida



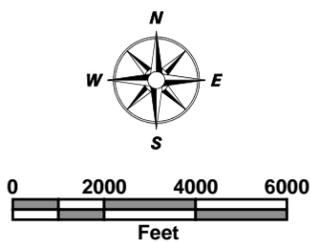
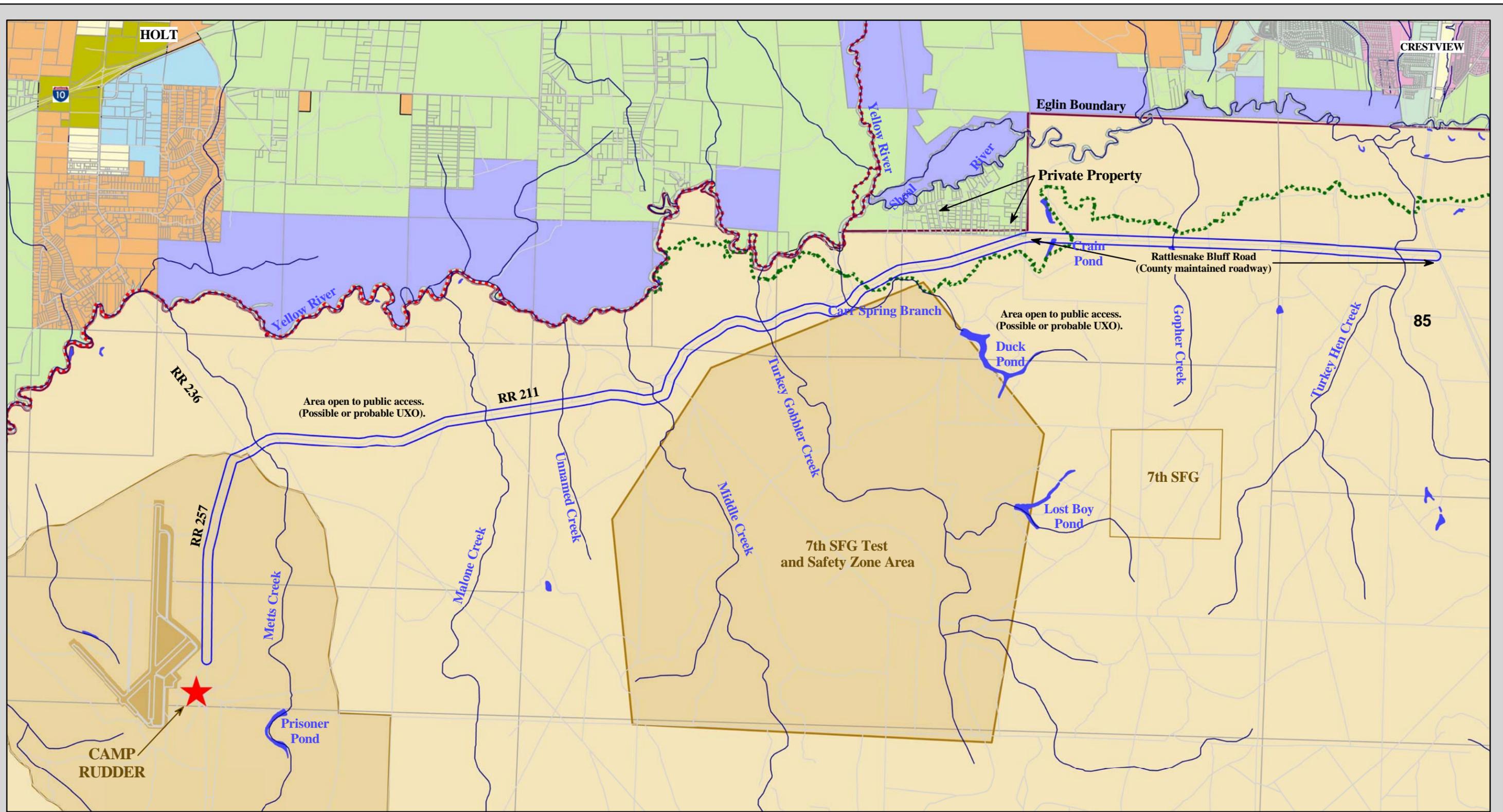
Sources:
 -U.S. General Soil Map (STATSGO),
 -National Resources Conservation Service (NRCS)
 -Eglin Enterprise Spatial Database

SOIL UNITS

	CHIPLEY		LAKELAND		UDORTHENTS
	DOROVAN		LUCY		YEMASSEE
	FOXWORTH		RUTLEGE		
	KINSTON		TROUP		

	Proposed Action Corridor
	River/Stream
	Eglin Reservation

FIGURE 3-3
Site Soil Units
 ACCESS IMPROVEMENT INITIATIVE
 Environmental Assessment
 6th RTBn - Camp Rudder
 Eglin Air Force Base, Florida



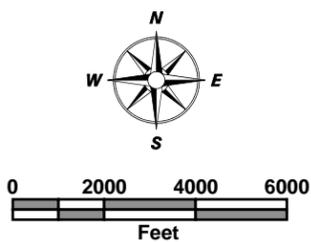
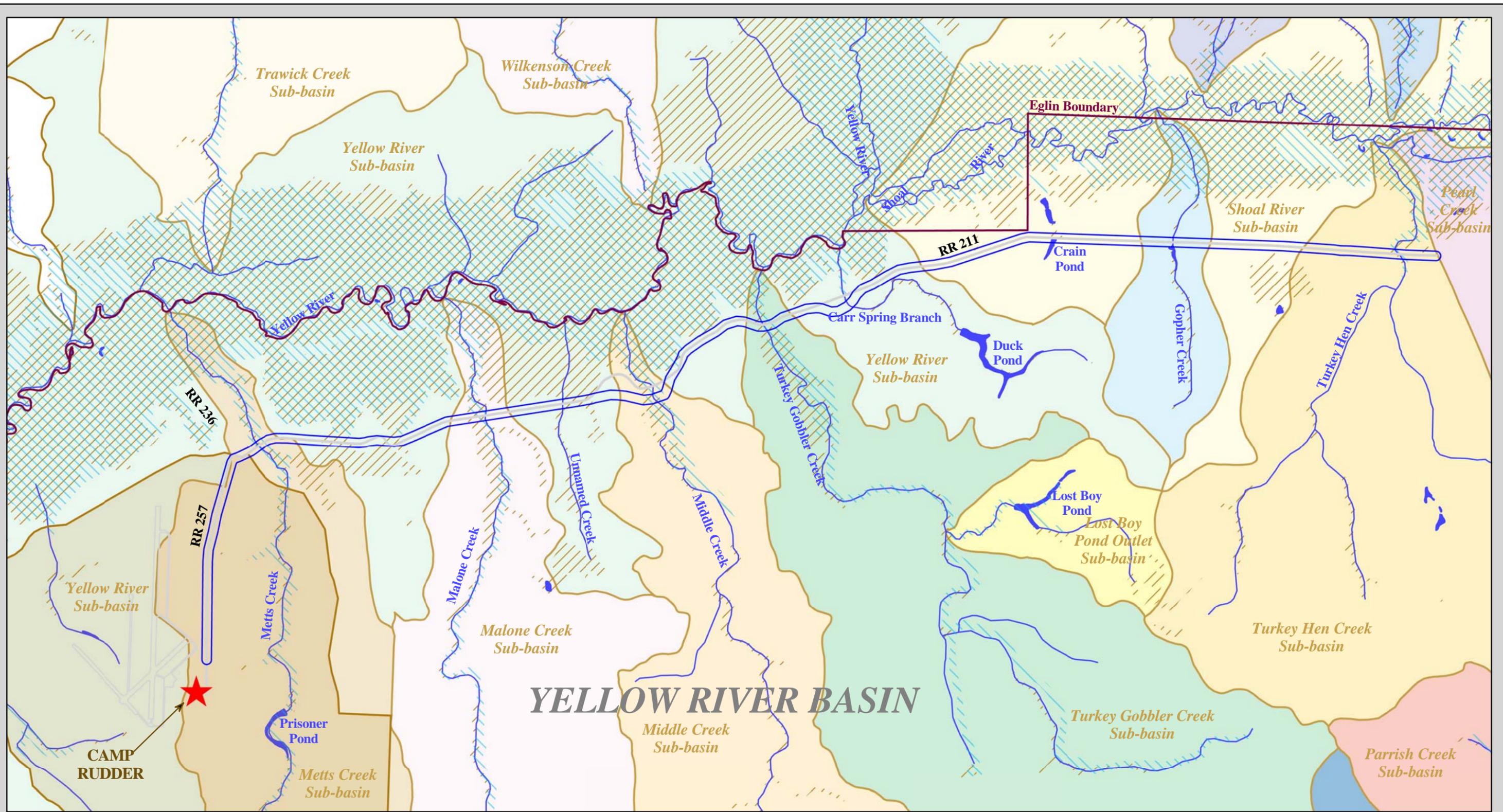
Sources: Eglin Enterprise Spatial Database
Okaloosa County GIS ; May 2010

LAND USE MAP CATAGORIES

Agriculture	Industrial
Commercial	Low Density Residential
City	Mixed Use
Conservation	Rural Residential
Eglin	

Cantonment Area	Proposed Action Corridor
Military Test Area	River/Stream
Surface Water	Eglin Reservation
Florida National Scenic Trail	
Yellow River State Canoe Trail	

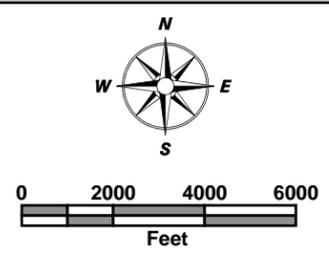
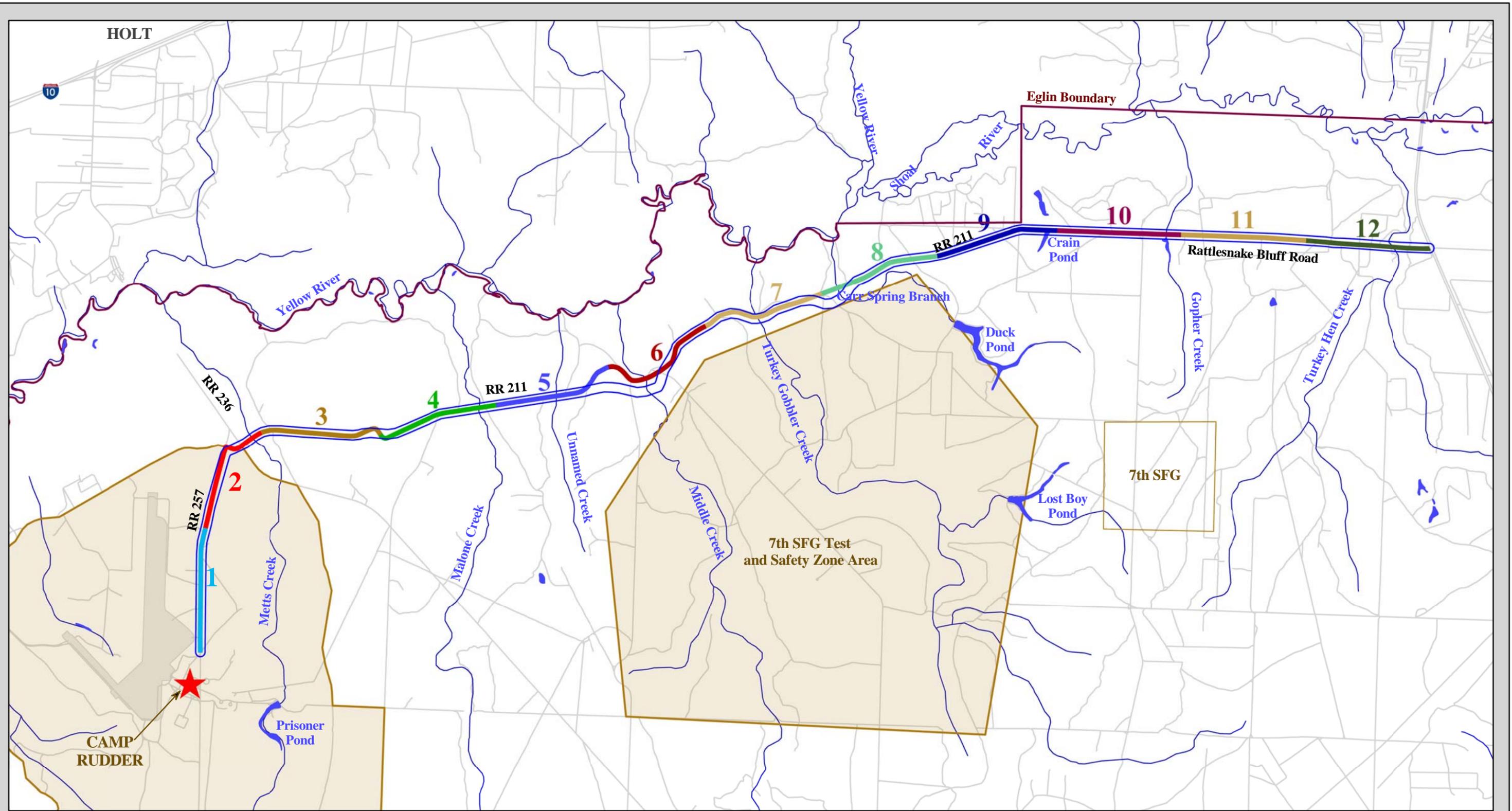
FIGURE 3-4
LAND USE
ACCESS IMPROVEMENT INITIATIVE
Environmental Assessment
6th RTBn - Camp Rudder
Eglin Air Force Base, Florida



Source: Eglin Enterprise Spatial Database

-  Proposed Action Corridor
-  River/Stream
-  Eglin Reservation
-  100 Year Flood Plain
-  Wetland
-  Surface Water
-  Sub-basin

FIGURE 3-5
Water Resources
ACCESS IMPROVEMENT INITIATIVE
Environmental Assessment
6th RTBn - Camp Rudder
Eglin Air Force Base, Florida



Source: Eglin Enterprise Spatial Database

- Proposed Action Corridor
- Eglin Reservation
- Roadway/Range Road
- River/Stream
- Surface Water

FIGURE 4-1
Segment Overview Map
ACCESS IMPROVEMENT INITIATIVE
Environmental Assessment
6th RTBn - Camp Rudder
Eglin Air Force Base, Florida

Appendix A

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Appendix B

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FEDERAL AGENCY COASTAL ZONE MANAGEMENT ACT (CZMA) CONSISTENCY DETERMINATION

Introduction

This document provides the State of Florida with the U.S. Air Force's Consistency Determination under CZMA Section 307 and 15 C.F.R. Part 930 sub-part C. The information in this Consistency Determination is provided pursuant to 15 C.F.R. Section 930.39 and Section 307 of the Coastal Zone Management Act, 16 U.S.C. § 1456, as amended, and its implementing regulations at 15 C.F.R. Part 930.

This federal consistency determination addresses the Proposed Action for the Access Improvement Initiative for Camp Rudder on Eglin Air Force Base (AFB), Florida (Figure 1).

Proposed Federal agency action:

The United States (US) Army 6th Ranger Training Battalion (RTBn) proposes to improve primary road access to Camp James E. Rudder (Camp Rudder), home of the 6th RTBn and long time Eglin AFB tenant. Camp Rudder is remotely located along the northern edge of Eglin AFB's 724-square mile range. Primary access to the camp is limited to one two-lane paved route (Range Road [RR] 236 / RR 213 / RR 257) that traverses 16.5 miles of Eglin AFB reservation, negotiating several active Eglin Test and Training Ranges (ETTRs) along the way. This route of access is subject to provisional closure because of military missions associated with the ETTRs. Another route of primary access is needed to provide Camp Rudder with ingress/egress relatively unencumbered by missions-related closures. The Proposed Action would occur primarily on Eglin AFB property, with connection to a public roadway. The Army would coordinate the Proposed Action with stake holding entities, fund the access improvement, and provide on-going maintenance as required to keep the route in service. The Proposed Action would offer a primary two-lane asphalt access route north out of Camp Rudder utilizing RR 257 to RR 211, then east along RR 211/Rattlesnake Bluff Road to SR 85, for a total distance of approximately 12 miles (Figure 2).

Construction Details

The Proposed Action would involve upgrading RR 257 and 211 from gravel/dirt roads (secondary) to a primary paved two-lane roadway and would include up to eight or nine small bridges where RR 211 crosses tributaries of the Yellow and Shoal Rivers. The Okaloosa County easement for Rattlesnake Bluff road extends from SR 85 to the center of Section 16, Township 2-North, and Range 24-West. The county currently maintains the road from SR 85 west to Jenkins Road, for a distance of approximately 3.8 miles. County maintenance enables private citizens to reliably access their land that is bounded by the Shoal River and Eglin AFB. Although these 3.8 miles are maintained as clay-based, it would be asphalted with this project. Existing bridges would be upgraded or replaced to accommodate two-way traffic and increased load weights. Where feasible,

dangerous curves along the route of RR 211 would be re-routed or engineered to improve roadway safety and increase the line of sight for drivers. Initial engineering evaluations of this alternative indicate that a two-lane asphalt roadway with a speed limit of 35 mph could be constructed along the current alignment while generally staying within the area that is presently maintained for the roadway, thus minimizing the amount of clearing/grubbing required. Stormwater infrastructure would be implemented along the route as required. This route would cross the Florida National Scenic Trail in two places: just east of Crain Pond and Carr Spring Branch. Construction would include appropriate access points and proper signage to provide safe crossings for recreational trail users (Figure 3).

Federal Consistency Review

Statutes addressed as part of the Florida Coastal Zone Management Program consistency review and considered in the analysis of the Proposed Action are discussed in the following table.

Pursuant to 15 C.F.R. § 930.41, the Florida State Clearinghouse has 60 days from receipt of this document in which to concur with or object to this Consistency Determination, or to request an extension, in writing, under 15 C.F.R. § 930.41(b). Florida's concurrence will be presumed if Eglin AFB does not receive its response on the 60th day from receipt of this determination.



Figure 1. Regional Location of Eglin Air Force Base, FL



Figure 2. Location of Project on Eglin AFB

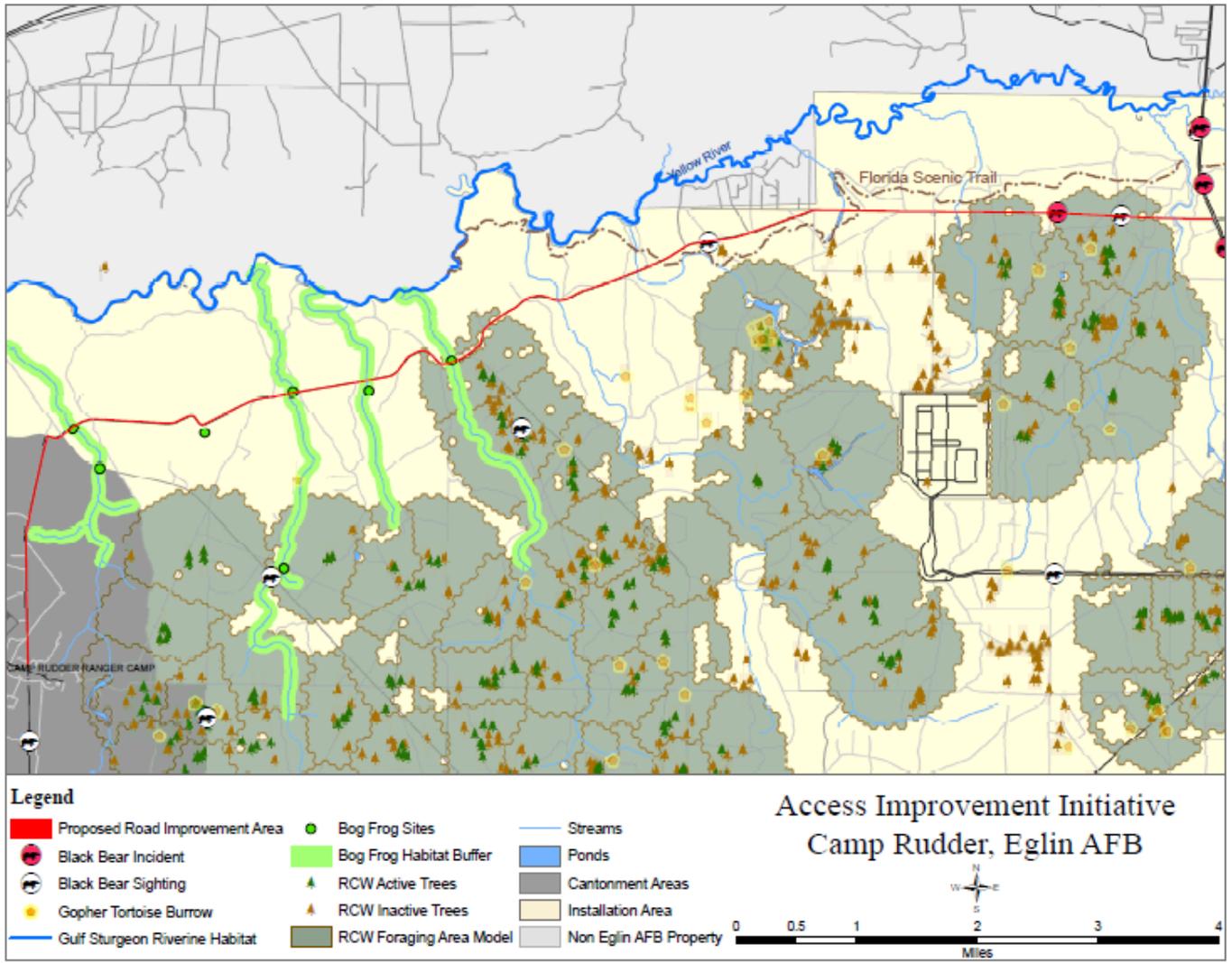


Figure 3. Sensitive Habitat and Species near Proposed Action

Florida Coastal Management Program Consistency Review

Statute	Consistency	Scope
Chapter 161 <i>Beach and Shore Preservation</i>	<p>The Proposed Action would not affect beach and shore management, specifically as it pertains to:</p> <ul style="list-style-type: none"> • The Coastal Construction Permit Program. • The Coastal Construction Control Line (CCCL) Permit Program. • The Coastal Zone Protection Program. <p>All land activities would occur on federal property.</p>	Authorizes the Bureau of Beaches and Coastal Systems within DEP to regulate construction on or seaward of the states' beaches.
Chapter 163, Part II <i>Growth Policy; County and Municipal Planning; Land Development Regulation</i>	The Proposed Action would not affect local government comprehensive plans.	Requires local governments to prepare, adopt, and implement comprehensive plans that encourage the most appropriate use of land and natural resources in a manner consistent with the public interest.
Chapter 186 <i>State and Regional Planning</i>	State and regional agencies will be provided the opportunity to review the Environmental Assessment. Therefore, the Proposed Action would be consistent with Florida's statutes and regulations regarding state plans for water use, land development or transportation.	Details state-level planning requirements. Requires the development of special statewide plans governing water use, land development, and transportation.
Chapter 252 <i>Emergency Management</i>	<p>The Proposed Action would not affect the state's vulnerability to natural disasters.</p> <p>The Proposed Action would not affect emergency response and evacuation procedures.</p>	Provides for planning and implementation of the state's response to, efforts to recover from, and the mitigation of natural and manmade disasters.
Chapter 253 <i>State Lands</i>	All activities would occur on federal property; therefore the Proposed Action would not affect state public lands.	Addresses the state's administration of public lands and property of this state and provides direction regarding the acquisition, disposal, and management of all state lands.
Chapter 258 <i>State Parks and Preserves</i>	The Proposed Action would not affect state parks, recreational areas and aquatic preserves.	Addresses administration and management of state parks and preserves (Chapter 258).
Chapter 259 <i>Land Acquisition for Conservation or Recreation</i>	The Proposed Action would not affect tourism and/or outdoor recreation.	Authorizes acquisition of environmentally endangered lands and outdoor recreation lands (Chapter 259).

<p>Chapter 260 <i>Recreational Trails System</i></p>	<p>This route would cross the Florida National Scenic Trail in two places: just east of Crain Pond and Carr Spring Branch. Construction would include appropriate access points and proper signage to provide safe crossings for recreational trail users.</p> <p>Therefore, the Proposed Action would not affect the Greenways and Trails Program.</p>	<p>Authorizes acquisition of land to create a recreational trails system and to facilitate management of the system (Chapter 260).</p>
<p>Chapter 375 <i>Multipurpose Outdoor Recreation; Land Acquisition, Management, and Conservation</i></p>	<p>The Proposed Action would not affect opportunities for recreation on state lands.</p>	<p>Develops comprehensive multipurpose outdoor recreation plan to document recreational supply and demand, describe current recreational opportunities, estimate need for additional recreational opportunities, and propose means to meet the identified needs (Chapter 375).</p>
<p>Chapter 267 <i>Historical Resources</i></p>	<p>Cultural resources eligible for the National Register of Historic Places may be located within the general project area. If these resources cannot be avoided, the State Historic Preservation Officer will be consulted, and survey, testing, and data recovery would be conducted, as needed, to mitigate any potential adverse impacts. Identified resources would be managed in compliance with Federal Law and Air Force regulations.</p>	<p>Addresses management and preservation of the state's archaeological and historical resources.</p>
<p>Chapter 288 <i>Commercial Development and Capital Improvements</i></p>	<p>The Proposed Action would not affect future business opportunities on state lands, or the promotion of tourism in the region.</p>	<p>Provides the framework for promoting and developing the general business, trade, and tourism components of the state economy.</p>
<p>Chapter 334 <i>Transportation Administration</i></p>	<p>During construction, the Proposed Action would result in short-term adverse impacts to transportation. Once completed, enhanced travel times, cessation of road closures due to test missions, increased coastal evacuation operations, and improved roadway safety characteristics would have a long-term beneficial impact.</p>	<p>Addresses the state's policy concerning transportation administration (Chapter 334).</p>
<p>Chapter 339 <i>Transportation Finance and Planning</i></p>	<p>The Proposed Action would not affect the finance and planning needs of the state's transportation system.</p>	<p>Addresses the finance and planning needs of the state's transportation system (Chapter 339).</p>
<p>Chapter 370 <i>Saltwater Fisheries</i></p>	<p>The Proposed Action would not affect saltwater fisheries.</p>	<p>Addresses management and protection of the state's saltwater fisheries.</p>
<p>Chapter 372</p>	<p>Road improvement activities may have an indirect localized effect on native</p>	<p>Addresses the management of the</p>

<p><i>Wildlife</i></p>	<p>terrestrial wildlife species. However, it is anticipated that these species would either move to another location or remain within the area and utilize adjacent habitat.</p> <p>Eglin AFB Natural Resources Section will be coordinating an informal consultation with the USFWS under Section 7 of the ESA in regards to the red-cockaded woodpecker, eastern indigo snake, Gulf sturgeon critical habitat and freshwater mussels (Figure 3). The proponent and contractors involved with the project will be responsible for implementing all management actions resulting from this consultation.</p> <p>Eglin Natural Resources and the USFWS will be represented at design meetings for the road to ensure stormwater mitigations do not negatively impact the tributaries of the Yellow and Shoal Rivers.</p> <p>Prior to project initiation a gopher tortoise survey is required. If a gopher tortoise burrow cannot be avoided, then the tortoise would be relocated in accordance with the Florida Fish and Wildlife Conservation Commission (FWC) protocols.</p> <p>Therefore, the Proposed Action would be consistent with the State's policies concerning the protection of wildlife and other natural resources.</p>	<p>wildlife resources of the state.</p>
<p>Chapter 373 <i>Water Resources</i></p>	<p>The current roadway is loose sand, clay and a combination of both which creates an erosion control issue along the entire route of RR 211. There are locations where there is 18-24 inches of loose sandy clay adjacent to and on top of a bridge span provide direct runoff into surface water bodies. Implementation of this alternative would greatly reduce or eliminate soil/sediment migration from the roadway and swales into the surface water and swamps and thus provide a substantial long-term benefit to the water resources. During construction best management practices (BMPs) and required stormwater and erosion control measures would be implemented, so there would be no adverse impacts to drainage basin, floodplain, surface water, or ground water resources.</p> <p>Eglin's Water Resources Section, 96</p>	<p>Addresses the state's policy concerning water resources.</p>

	<p>CEG/CEVCE, would coordinate all applicable permits in accordance with the Florida Administrative Code (FAC).</p> <p>Wetland mitigation needs would be assessed during the Florida Environmental Resource Permit (ERP), USACE Sect 404 Permit, and the Application for Works in the Waters of Florida processes.</p> <p>The Proposed Action would increase the potential for impact from the increased rate and volume of stormwater runoff, due to an increase in impervious surface area. In order to limit the effects the Proposed Action would have on water resources, BMPs such as preserving vegetation for as long as possible and stabilizing disturbed areas would be applied to control erosion and stormwater runoff.</p> <p>Applicable permitting requirements would be satisfied in accordance with 62-25 of the FAC and National Pollutant Discharge Elimination System (NPDES). Eglin AFB would submit a notice of intent to use the generic permit for stormwater discharge under the NPDES program prior to project initiation according to Section 403.0885, Florida Statutes (FS). The Proposed Action would also require coverage under the generic permit for stormwater discharge from construction activities that disturb one or more acres of land (FAC 62-621).</p> <p>The Proposed Action would include the construction of stormwater retention pond(s) in accordance with FAC 62-25.</p> <p>Therefore, the Proposed Action would be consistent with Florida’s statutes and regulations regarding the water resources of the state.</p>	
<p>Chapter 376 <i>Pollutant Discharge Prevention and Removal</i></p>	<p>Any construction area larger than one acre would require a NPDES General Permit under 40 CFR 122.26(b)(14)(x). A stormwater pollution prevention plan would also be required under the NPDES permit before beginning construction activities.</p> <p>Therefore, the Proposed Action would be consistent with Florida’s statutes and regulations regarding the transfer, storage, or transportation of pollutants.</p>	<p>Regulates transfer, storage, and transportation of pollutants, and cleanup of pollutant discharges.</p>

<p>Chapter 377 <i>Energy Resources</i></p>	<p>The Proposed Action would not affect energy resource production, including oil and gas, and/or the transportation of oil and gas.</p>	<p>Addresses regulation, planning, and development of oil and gas resources of the state.</p>
<p>Chapter 380 <i>Land and Water Management</i></p>	<p>The Proposed Action would occur on federally owned lands.</p> <p>The Proposed Action would not affect development of state lands with regional (i.e. more than one county) impacts. The Proposed Action would not include changes to coastal infrastructure such as capacity increases of existing coastal infrastructure, or use of state funds for infrastructure planning, designing or construction.</p>	<p>Establishes land and water management policies to guide and coordinate local decisions relating to growth and development.</p>
<p>Chapter 381 <i>Public Health, General Provisions</i></p>	<p>The Proposed Action would not affect the state's policy concerning the public health system.</p>	<p>Establishes public policy concerning the state's public health system.</p>
<p>Chapter 388 <i>Mosquito Control</i></p>	<p>The Proposed Action would not affect mosquito control efforts.</p>	<p>Addresses mosquito control effort in the state.</p>
<p>Chapter 403 <i>Environmental Control</i></p>	<p>Eglin's Water Resources Section, 96 CEG/CEVCE, would coordinate all applicable permits in accordance with the FAC.</p> <p>Wetland mitigation needs would be assessed during the Florida ERP, USACE Sect 404 Permit, and the Application for Works in the Waters of Florida processes.</p> <p>Air emissions from implementation would be short-term and would diminish once construction activities are completed. The proponent and contractors would take reasonable precautions to minimize fugitive particulate (dust) emissions during construction IAW Chapter 62-296 FAC (Rule 62-296). Modeling suggests emission limits will not be exceeded as a result of this Proposed Action and that there would be a long-term beneficial impact by eliminating a dirt road as source of dust generation. Therefore, no adverse impacts are anticipated.</p> <p>The Proposed Action is not expected to adversely impact the capacity of local landfills to handle solid waste, as the waste increase due to project activities would be minor. Where clearing is required, vegetative waste would be minimized through chipping trees and</p>	<p>Establishes public policy concerning environmental control in the state.</p>

	<p>stumps and selling for fuel, mulch, etc., reducing waste by approximately 90%. However, improved roadway may lead to more roadway users which in turn may increase the likelihood for increased illegal dumping. As such, the Proposed Action would have a minor impact on solid waste.</p> <p>Therefore, the Proposed Action would be consistent with Florida's statutes and regulations regarding water quality, air quality, pollution control, solid waste management, or other environmental control efforts.</p>	
<p>Chapter 582 <i>Soil and Water Conservation</i></p>	<p>Implementation of erosion control measures associated with permit requirements would minimize the potential for soil erosion. Grading, excavating, and re-contouring of soils and shallow geologic sediments would result in minor disturbance. All applicable Best Management Practices, such as preserving vegetation for as long as possible and stabilizing disturbed areas would be applied to minimize erosion and storm water run-off, and to regulate sediment control.</p> <p>Therefore, the Proposed Action is not expected to impact soil and water conservation efforts.</p>	<p>Provides for the control and prevention of soil erosion.</p>

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Appendix C

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DRAFT PUBLIC NOTIFICATION

In compliance with the National Environmental Policy Act, Eglin Air Force Base announces the availability of a Draft Environmental Assessment and Finding of No Significant Impact for RCS 09-304, "Access Improvement Initiative 6th Ranger Training Battalion, Camp James E. Rudder, Eglin Air Force Base, Florida" for public review and comment.

The Proposed Action would provide improved primary road access to Camp James E. Rudder. The Preferred Alternative would involve Range Road (RR) 257 to RR 211, then east along RR 211/Rattlesnake Bluff Road to State Road 85. Improvements would include paving the roadway; upgrading or replacing existing bridges to accommodate two-way traffic and increased load weights; and re-engineering dangerous curves along the route of RR 211 to improve roadway safety and increase the line of sight for drivers, where necessary. In order to accommodate a speed limit of 45 mph, initial engineering evaluations indicate that minimal amounts of clearing/grubbing and wetlands/floodplain impact would be required outside the existing 60-foot roadway alignment.

Your comments on this Draft EA are requested. Letters and other written or oral comments provided may be published in the Final EA. As required by law, comments will be addressed in the Final EA and made available to the public. Any personal information provided, including private addresses, will be used only to identify your desire to make a statement during the public comment period or to compile a mailing list to fulfill requests for copies of the Final EA or associated documents. However, only the names and respective comments of respondent individuals will be disclosed, personal home addresses and phone numbers will not be published in the Final EA.

The Draft Environmental Assessment and Draft Finding of No Significant Impact are available on the web at www.eglin.af.mil/environmentalassessments.asp from October 3, 2014 to November 3, 2014. Each of the libraries in Niceville and Fort Walton Beach has computers available to the general public and librarians who can provide assistance linking to the document. Hard copies of the document may be available for a limited time by contacting: Mike Spaits, 96th Test Wing Environmental Public Affairs, 101 W. D Ave., Suite 238, Eglin AFB, Florida 32542 or email:michael.spaits@us.af.mil. Tel: (850) 882-2836; Fax: (850) 882-3761.

For more information or to comment on the Proposed Action, contact Mike Spaits using the contact information given above. Comments must be received by November 7th 2014.

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Appendix D

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**PROGRAMMATIC AGREEMENT AMONG
EGLIN AIR FORCE BASE
THE FLORIDA STATE HISTORIC PRESERVATION OFFICER
US ARMY 6TH RANGER TRAINING BATTALION, FORT BENNING
THE ADVISORY COUNCIL ON HISTORIC PRESERVATION AND
PURSUANT TO 36 CFR PART 800 REGARDING
ACCESS IMPROVEMENT INITIATIVE 6TH RANGER TRAINING BATTALION
CAMP JAMES E. RUDDER
EGLIN AIR FORCE BASE, OKALOOSA COUNTY, FLORIDA**

WHEREAS, the US Army 6th Ranger Training Battalion (RTBn), Fort Benning, Georgia, proposes to improve primary road access to Camp James E. Rudder (hereafter referred to as the Project). Design specifics have not been actualized, however it is established that this effort will include widening, grading, and paving portions of Range Road (RR) 211 and RR 257 in Okaloosa County, Florida (see vicinity map, Appendix A).

WHEREAS, the Project is located on lands owned and administered by Eglin Air Force Base (AFB), thereby, making it an undertaking subject to review under Section 106 of the National Historic Preservation Act (NHPA) (16 U.S.C. 470 et seq.); and

WHEREAS, Eglin AFB has determined that implementation of the Project may have an effect upon properties included in or eligible for inclusion in the National Register of Historic Places (NRHP) under 36 CFR 60.4(d) (hereafter referred to as Historic Properties), and consulted with the Florida State Historic Preservation Officer (SHPO) and the Advisory Council on Historic Preservation (ACHP) pursuant to 36 CFR 800.6 and 36 CFR 800.14(b), regulations implementing Section 106 of the NHPA (16 U.S.C. Section 470 et seq.); and

WHEREAS, pursuant to the consultation conducted under 36 CFR 800.14(b), the signatories have developed this Programmatic Agreement (hereafter referred to as Agreement) in order to establish an efficient and effective program for taking into account the effects of the Project on

Historic Properties and for affording the ACHP a reasonable opportunity to comment on the undertaking covered by this Agreement; and

WHEREAS, the Area of Potential Effect (APE), as defined in 36 CFR Part 800.16(d), extends for 16.5 miles along RR 211 and RR 257, with a variable width encompassing the road right-of-way (ROW) and original and adjusted routes being considered in the design phase (see APE map, Appendix B); and

WHEREAS, the RTBn and Eglin AFB, in consultation with the Florida SHPO, conducted cultural resources studies to identify and evaluate Historic Properties that may be adversely effected through direct or indirect impact from implementation of the Project; and

WHEREAS, Eglin AFB has identified a number of Historic Properties in proximity to the APE and determined that six (8OK108/407, 8OK354, 8OK402, 8OK1241, 8OK2812, and 8OK2815) are within the APE and threatened with adverse effect from Project-related activities; (see APE map, Appendix B); and

WHEREAS, RTBn and Eglin AFB have notified the public, interested parties, and federally recognized Indian tribes with ancestral relationships to northwest Florida about this Agreement, has requested their comments, and has taken any comments received into consideration; and

WHEREAS, the RTBn and Eglin AFB will resolve the adverse effects of the Project through avoidance of all Historic Properties; and

WHEREAS, the RTBn will resolve the potential for unexpected discoveries by designating a 75-meter buffered area around Historic Properties in the APE as Avoidance Zones within which all ground disturbance will be monitored by a professional archaeologist as defined in 36 CFR Part 61; and

WHEREAS, pursuant to 36 CFR Section 800.13, the RTBn, Eglin AFB, the Florida SHPO, and the ACHP have developed procedures in this Agreement to ensure that assessment of effects and

development of treatment and mitigation plans for unforeseen effects to identified Historic Properties and/or Historic Properties discovered during the implementation of the Project are properly coordinated;

NOW THEREFORE, the signatories agree to implement the undertaking in accordance with the following stipulations in order to take into account the foreseen and unforeseen adverse effects on Historic Properties.

Stipulations

The RTBn, in coordination with Eglin AFB and the Florida SHPO, will ensure that the following measures are carried out.

I. Definitions

For purposes of this Agreement, the definitions provided in 36 CFR 800.16(a) through (y) inclusive shall apply.

II. Consultation with Federally Recognized Indian Tribes

- A. In recognition of the unique government-to-government relationship between the Federal government and federally recognized Indian tribes (hereafter referred to as the Tribes), Eglin AFB will take the lead in identifying and establishing consultation with the Tribes consistent with the requirements of 36 CFR 800.2(c)(2) and 36 CFR 800.3(c) through (f).
- B. Eglin AFB will ensure that consultation with the Tribes (see list in Appendix C) is initiated early enough in the design stage in order to identify properties of cultural and religious significance to the Tribes that may be affected by the Project as well as other concerns.
- C. Eglin AFB shall consult with the Tribes regarding measures developed to protect any such properties from adverse effects.
- D. Eglin AFB shall invite the Tribes to concur in this agreement.

III. Participation of Consulting and Interested Parties, and the Public

- A. Consulting and interested parties will be identified pursuant to, and their participation in undertakings covered under this Agreement will be governed by 36 CFR 800.2(c)(5) and 800.3(f).

- B. The RTBn will seek and consider the views of the public, as appropriate, in a manner that reflects the nature and complexity of the Project and its effects on Historic Properties, and the likely interest of the public in the effects on Historic Properties consistent with procedures for compliance with the National Environmental Policy Act (NEPA) and governed by 36 CFR 800.2(d) and 800.3(e).
- C. Consistent with Section 304 of the NHPA, as amended, the signatories and participating concurring parties to this Agreement will not disclose to the public any information about the location or character of a historic property if it is determined that disclosure may risk harm to a historic property.

IV. Avoidance of Adverse Effects

- A. The RTBn and Eglin AFB shall ensure that the Project covered by this Agreement does not adversely affect Historic Properties through the implementation of avoidance measures.
- B. These measures may include rerouting the corridor of proposed road improvements outside boundaries of Historic Properties, establishing buffer zones, erecting barrier fencing for cordoning off “No Staging/No Disturbance” zones, or other effective, enforceable protection efforts designed to ensure that effects or adverse effects to Historic Properties do not occur.

V. Design and Construction Process

- A. The RTBn will provide Eglin AFB with proposed design updates and comment on the design with regard to avoidance of adverse effect to Historic Properties.
- B. The RTBn, in consultation with Eglin AFB, will depict Avoidance Zones on construction plans without disclosing information on the nature of these areas. The RTBn will provide a copy of these plans to Eglin AFB for review and approval. The plans and succinct wording related to activities in proximity to the Avoidance Zones as specified in Stipulations VII and VIII (see below) will be incorporated into the Request for Proposals (RFPs) and Air Force 103 (AF 103) permits. Contractors responding to RFPs will be required to acknowledge their understanding of procedures related to Avoidance Zones and include them in a Quality Assurance/Quality Control (QA/QC) plans required by the solicitation. The successful contractor will be responsible for agent, work crew,

subcontractors, and any other party associated with the Project being in strict compliance with the QA/QC plans for Avoidance Zones.

- C. The RTBn, in consultation with Eglin AFB, will develop a plan for cordoning off Avoidance Zones. The plan will specify the type(s) of material to be used and noninvasive installation procedures to protect deposits associated with Historic Properties in the APE.
- D. Construction will not begin until measures required to ensure avoidance as stated in Stipulation IV and as specified by Stipulation V(C) above are complete, and have been inspected and approved by Eglin AFB.
- E. The RTBn will schedule a pre-construction meeting between the contractor, project team, and Eglin AFB to ensure all parties understand policies of avoidance stipulated in this Agreement and implemented to protect known Historic Properties within the APE. The RTBn ensures that construction activities within Avoidance Zones will be monitored by a professional archaeologist who meets the standards set forth in 36 CFR Part 61 as stated in Stipulation X(A) (see below). If cultural remains are encountered, the archaeologist will have the authority to stop work until the process for unforeseen effects in Stipulation VII (see below) has been implemented.
- F. All design enhancements that may affect historic properties, including, but not limited to lighting, signage, landscaping, and stormwater infrastructure, in the APE, will be subject to review and concurrence by Eglin AFB and the Florida SHPO prior to installation.

VI. Adverse Effects

- A. The RTBn will employ all possible and prudent measures to implement avoidance as the preferred treatment for Historic Properties. If avoidance is not possible and an adverse effect will result, the RTBn will provide mitigation plans in consultation with Eglin AFB, and Eglin AFB will submit and consult with the Florida SHPO for review and concurrence. The RTBn will implement the mitigation plan once it is approved by Eglin AFB and the Florida SHPO.
- B. If, after consultation, the RTBn and the Florida SHPO cannot agree on appropriate terms for the mitigation plan, the matter will be referred to the ACHP pursuant to Stipulation XI(A).

VII. Unforeseen Effects and Unexpected Discoveries

- A. In spite of efforts to avoid Historic Properties, the RTBn may identify unforeseen adverse effects to Historic Properties or discover a previously unknown archaeological site. In either event, the RTBn will promptly stop construction activity in the vicinity of the Historic Property and implement all reasonable measures needed to avoid, minimize, or mitigate further harm to the property. The RTBn will notify Eglin AFB immediately and, in consultation with the Florida SHPO, the effects to the property will be evaluated according to 36 CFR Section 800.5 (see procedural steps in Appendix D).
- B. In the event that any form of activity occurs in the Avoidance Zones, the RTBn will order the activity to cease, secure the location, notify Eglin AFB, and not resume any Project-related activity until a damage assessment can be conducted and a report reviewed and accepted by Eglin AFB.

VIII. Human Remains and Funerary Items

- A. Since the objective of this Agreement is to avoid adverse effects to sites, it is unlikely human remains and/or associated funerary items as defined by the Native American Graves Protection and Repatriation Act (NAGPRA) of 1990 will be encountered during implementation of actions covered by this Agreement. Although unlikely, the possibility of finding such items could result if unexpected discoveries of Native American archaeological sites are encountered.

Prior to implementing any actions covered by this Agreement, the RTBn will inform all contractors, work crews, and other key personnel that in the event of discovery of human remains and/or associated NAGPRA items, a 50-meter buffered Avoidance Zone will be established around the find(s) and all Project activities in that location will cease, and the discovery will be reported to Eglin AFB immediately and the federal agency will notify the Florida SHPO within twenty-four (24) hours to begin procedures outlined in Chapter 872, Florida Statute.

- B. Eglin AFB will implement procedures to evaluate the discovery as detailed in Appendix E.

IX. Curation

- A. Eglin AFB Curation Standards will be incorporated by reference into all cultural resource-related contracts and subcontracts for the Project.

- B. Pursuant to this Agreement, deliverables to Eglin AFB will include, but not be limited to all artifacts, objects, samples, and specimens recovered, and documents, such as historic source materials, field notes, analysis sheets, electronic database, GIS shape files, drawings, and photographs gathered or generated as part of monitoring and any associated archaeological investigations within the APE.
- C. All deliverables will be prepared and submitted in strict adherence with Eglin AFB Curation Standards and turned over to Eglin AFB for permanent curation.

X. Professional Qualifications

- A. All actions prescribed by this Agreement that involve the identification, evaluation, analysis, recording, treatment, monitoring, or disposition of historic properties, or that involve the reporting or documentation of such actions in the form of reports, forms, or other records, shall be carried out by or under the direct supervision of a person or persons who meet the Secretary of the Interior's Standards and Guidelines for Professional Qualifications (hereafter referred to as PQ) in archaeology and history as described in the Federal Register: June 20, 1997 (Volume 62, Number 119, pages 33707-33723).
- B. Nothing in this stipulation, however, may be interpreted to preclude RTBn or any agent or contractor thereof from using the services of persons who do not meet the PQ as long as their activities are overseen by an individual or individuals whose credentials do meet the PQ as approved by Eglin AFB.

XI. Administrative Coordination

- A. Unless otherwise agreed, Eglin AFB, the RTBn, and the SHPO will have a review period of thirty (30) work days for commenting on all documents, plans, and specifications under the terms of this Agreement; the ACHP will be consulted only in the event of a dispute between the reviewing agencies who are signatories to this document.
- B. Any signatory to this agreement may request that the agreement be amended, whereupon the other parties will consult to consider such amendment. If consensus among the signatories is not reached within thirty (30) days, the agreement will remain unchanged and any signatory can terminate the agreement by following Stipulation XII (see below). If this agreement is amended, the amendment will take effect once signed by all signatories.

- C. The terms of this Agreement are valid through December 31, 2018 or completion of all phases of the Project, whichever comes first, unless otherwise agreed to by the signatories to the Agreement.

XII. Termination

- A. If any signatory to this agreement determines that its terms will not or cannot be carried out, the party will provide ninety (90) days written notification to the other signatories in order to develop an amendment per Stipulation XI above and avoid termination.
- B. In the event of termination, Eglin AFB will comply with 36 CFR Parts 800.3 through 800.6 with regard to individual aspects of the undertaking covered by this agreement.

Signatories:

EGLIN AIR FORCE BASE

By: _____ Date: _____

US ARMY 6TH RANGER TRAINING BATTALION, FORT BENNING

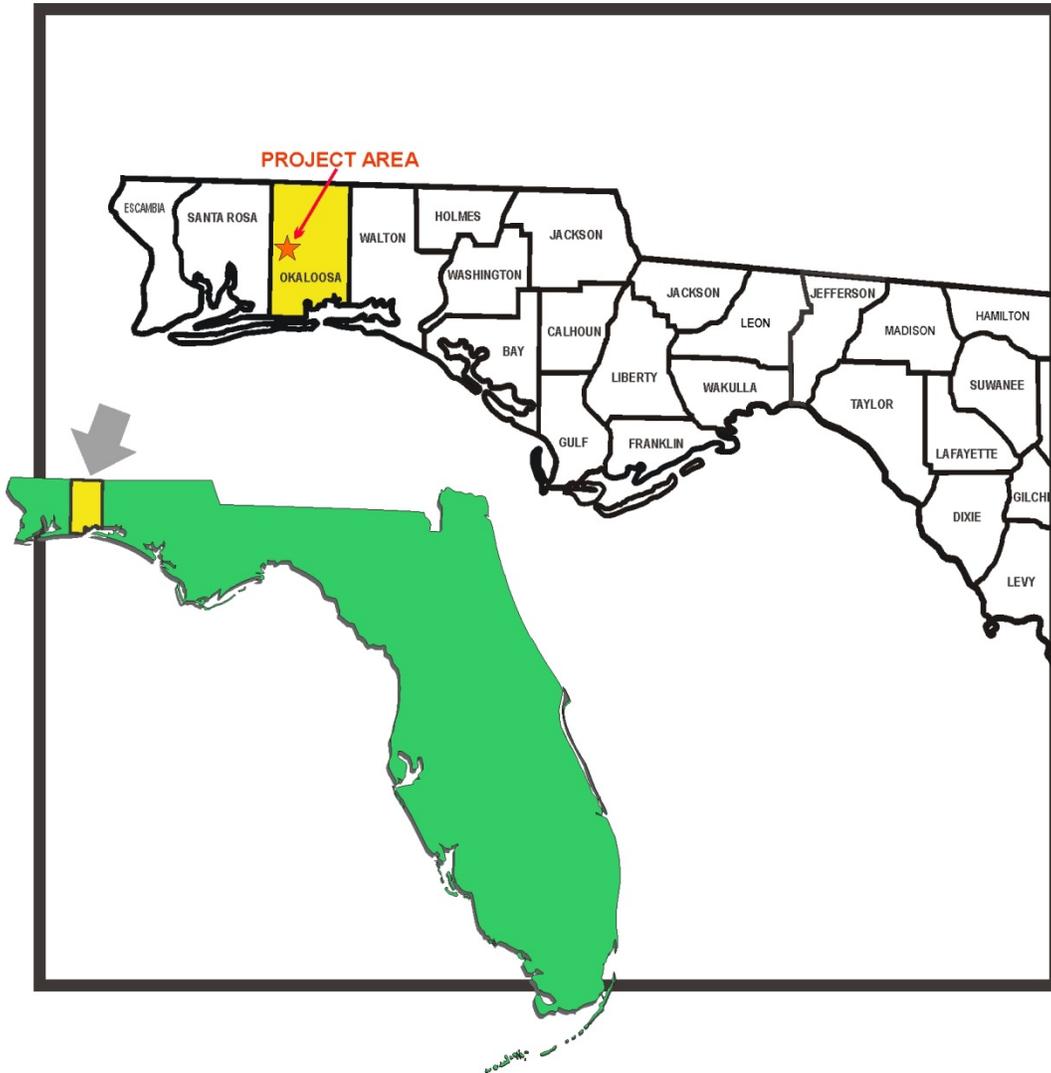
By: _____ Date: _____

FLORIDA STATE HISTORIC PRESERVATION OFFICER

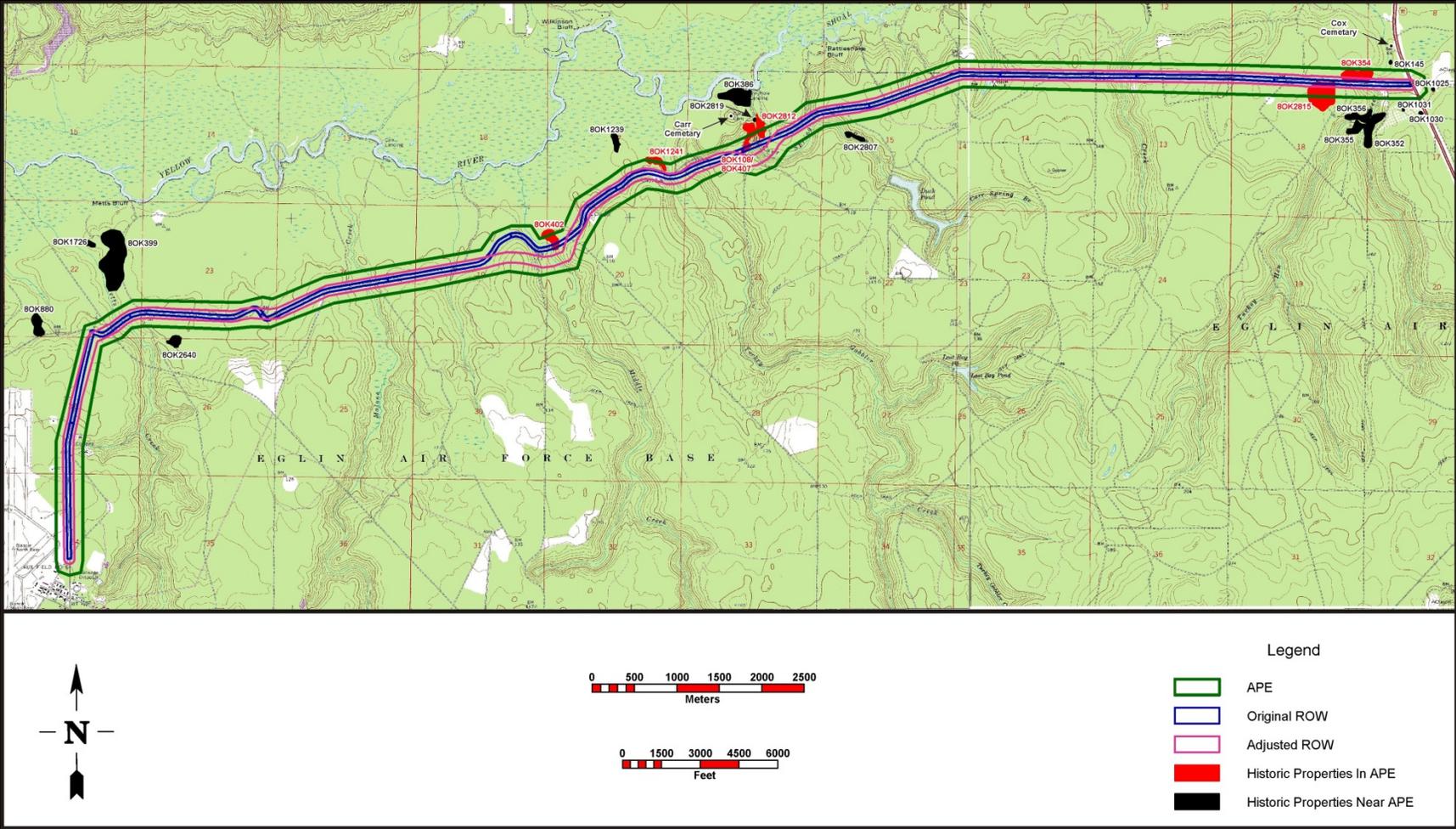
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Pending

Appendix A – Vicinity Map



Appendix B - APE Map with Alternate Routes and Historic Properties



Appendix C – Detail Steps for Unforeseen Effects and Unexpected Discoveries

Pursuant to Stipulation VII in this Agreement, the RTBn may identify unforeseen effects to Historic Properties or the Avoidance Zone, and/or discovery of a previously undocumented archaeological site. If any of these situations occurs, the RTBn, in consultation with Eglin AFB and the Florida SHPO, will evaluate the effects to the property according to 36 CFR Part 800.5 and following the procedural steps below.

General

1. The RTBn will cease all construction-related activity in the vicinity of the affected location immediately and secure the discovery location from further harm until Eglin AFB determines that potential adverse effect has been resolved.
2. The RTBn will immediately notify Eglin AFB of the discovery.

Unforeseen Effect to Known Historic Property or Avoidance Zone

1. In the event of an unforeseen effect to a known Historic Property or Avoidance Zone, or discovery of a new archaeological site, the RTBn will hire a professional archaeologist, who will coordinate response procedures with Eglin AFB.
2. In the case of an effect to a known Historic Property or unexpected discovery, the archaeologist will document the nature and extent of the effect, assess whether different mitigative treatment is necessary, and conduct whatever measures are needed to make a thorough assessment of the damage and offer guidance recommendations for Eglin AFB. The findings will be documented in a management summary and submitted to Eglin AFB within ten (10) work days of the discovery. Within five (5) work days of receipt of the report, Eglin AFB will initiate consultation with the Florida SHPO to resolve adverse effect, if applicable. Project-related activities may not resume in the affected location until Eglin AFB provides approval.

Appendix D – Detail Steps for Unforeseen Effects and Unexpected Discoveries

Pursuant to Stipulation VII in this Agreement, the RTBn may identify unforeseen effects to Historic Properties or the Avoidance Zone, and/or discovery of a previously undocumented archaeological site. If any of these situations occurs, the RTBn, in consultation with Eglin AFB and the Florida SHPO, will evaluate the effects to the property according to 36 CFR Part 800.5 and following the procedural steps below.

General

1. The RTBn will cease all construction-related activity in the vicinity of the affected location immediately and secure the discovery location from further harm until Eglin AFB determines that potential adverse effect has been resolved.
2. The RTBn will immediately notify Eglin AFB of the discovery.

Unforeseen Effect to Known Historic Property or Avoidance Zone

1. In the event of an unforeseen effect to a known Historic Property or Avoidance Zone, or discovery of a new archaeological site, the RTBn will hire a professional archaeologist, who will coordinate response procedures with Eglin AFB.
4. In the case of an effect to a known Historic Property or unexpected discovery, the archaeologist will document the nature and extent of the effect, assess whether different mitigative treatment is necessary, and conduct whatever measures are needed to make a thorough assessment of the damage and offer guidance recommendations for Eglin AFB. The findings will be documented in a management summary and submitted to Eglin AFB within ten (10) work days of the discovery. Within five (5) work days of receipt of the report, Eglin AFB will initiate consultation with the Florida SHPO to resolve adverse effect, if applicable. Project-related activities may not resume in the affected location until Eglin AFB provides approval.

Appendix E - Discovery of Human Remains and Funerary Items

Other unexpected discoveries may include Indian graves and/or NAGPRA items, or lost historic cemeteries. If these are encountered, guidelines set forth in FL Statute 872 must be followed.

1. The RTBn will cease all construction-related activity in the vicinity of the discovery, secure the location from any further disturbance, and notify Eglin AFB immediately.
2. RTBn will be advised of any other steps necessary to protect the discovery location by Eglin AFB, personnel from which will notify the Florida SHPO within twenty-four (24) hours to begin procedures outlined in Chapter 872, Florida Statute.

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Appendix E

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DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 96TH AIR BASE WING (AFMC)
EGLIN AIR FORCE BASE FLORIDA

JUL 6 2010

Mr. Stephen M. Seiber
Chief, Natural Resources Section
96 CEG/CEVSN
501 De Leon Street, Suite 101
Eglin AFB FL 32542-5133

Dr. Donald Imm
U.S. Fish and Wildlife Service
1601 Balboa Avenue
Panama City FL 32405

Dear Dr. Imm:

The following information is being submitted to fulfill requirements under Section 7 of the Endangered Species Act (ESA). This biological assessment addresses potential impacts to the red-cockaded woodpecker (RCW), eastern indigo snake, Gulf sturgeon critical habitat and freshwater mussels associated with the Access Improvement Initiative for Camp Rudder on Eglin Air Force Base (AFB), Florida (Figure 1). Additionally the Florida black bear, bog frog, and gopher tortoise are considered.

Description of the Proposed Action

The United States (US) Army 6th Ranger Training Battalion (RTBn) proposes to improve primary road access to Camp James E. Rudder (Camp Rudder), home of the 6th RTBn. Camp Rudder is remotely located along the northern edge of Eglin AFB's 724-square mile range. Primary access to the camp is limited to one two-lane paved route (Range Road [RR] 236 / RR 213 / RR 257) that traverses 16.5 miles of Eglin AFB reservation, negotiating several active Eglin Test and Training Ranges (ETTRs) along the way. This route of access is subject to provisional closure because of military missions associated with the ETTRs. Another route of primary access is needed to provide Camp Rudder with ingress/egress relatively unencumbered by missions-related closures. The Proposed Action would occur primarily on Eglin AFB property, with connection to a public roadway. The Army would coordinate the Proposed Action with stake holding entities, fund the access improvement, and provide on-going maintenance as required to keep the route in service. The Proposed Action would offer a primary two-lane asphalt access route north out of Camp Rudder utilizing RR 257 to RR 211, then east along RR 211/Rattlesnake Bluff Road to SR 85, for a total distance of approximately 12 miles (Figure 2).

Construction Details

The Proposed Action would involve upgrading RR 257 and 211 from gravel/dirt roads (secondary) to a primary paved two-lane roadway and would include up to eight or nine small bridges where RR 211 crosses tributaries of the Yellow and Shoal Rivers. The Okaloosa County

easement for Rattlesnake Bluff road extends from SR 85 to the center of Section 16, Township 2-North, and Range 24-West. The county currently maintains the road from SR 85 west to Jenkins Road, for a distance of approximately 3.8 miles. County maintenance enables private citizens to reliably access their land that is bounded by the Shoal River and Eglin AFB. Although these 3.8 miles are maintained as clay-based, it would be asphalted with this project. Existing bridges would be upgraded or replaced to accommodate two-way traffic and increased load weights. Where feasible, dangerous curves along the route of RR 211 would be re-routed or engineered to improve roadway safety and increase the line of sight for drivers. Initial engineering evaluations of this alternative indicate that a two-lane asphalt roadway with a speed limit of 35 mph could be constructed along the current alignment while generally staying within the area that is presently maintained for the roadway, thus minimizing the amount of clearing/grubbing required. Stormwater infrastructure would be implemented along the route as required.

Biological Information

Three federally-listed endangered or threatened species and three candidate species are known to occur within or near the project area. The following list indicates those species considered for this action:

<u>Common Name</u>	<u>Scientific Name</u>	<u>Federal Status</u>
Red-cockaded Woodpecker	<i>Picoides borealis</i>	E
Eastern Indigo Snake	<i>Drymarchon corais couperi</i>	T
Gulf Sturgeon	<i>Acipenser oxyrinchus desotoi</i>	T
Southern Sandshell	<i>Hamiota australis</i>	C
Fuzzy Pigtoe	<i>Pleurobema strodeanum</i>	C
Narrow Pigtoe	<i>Fusconia escambiae</i>	C

Red-cockaded Woodpecker

The RCW (*Picoides borealis*) is listed as a federally endangered bird species and a state species of special concern. The RCW excavates cavities in live longleaf pine trees that are at least 85 years old. The RCW historically had a habitat range as far north as New Jersey and as far west as Oklahoma. Today, the RCW has been restricted to the southeastern United States, from Florida to Virginia and to southeast Texas, due to a loss of habitat. In the southeast, 98 percent of the longleaf pine forests have been removed, making relatively undeveloped federal lands such as Eglin AFB primary habitat for the species. Due to the preservation of continuous longleaf pine forests on Eglin, the Eglin Range has one of the largest remaining populations of RCWs in the country. In 2003, the USFWS identified Eglin AFB as 1 of 13 primary core populations for the RCW (U.S. Air Force, 2006). Eglin's population goal is 350 Potential Breeding Groups (PBGs). The Eglin population has been increasing since 1994, and the current population has 420 active clusters and an estimated 371 PBGs. Eglin is executing a USFWS-approved management strategy to meet certain growth objectives of the RCW and to obtain increased mission flexibility with the federal requirements for RCW impacts.

Eastern Indigo Snake

The eastern indigo snake (*Drymarchon corais couperi*) is listed as a federal and state threatened species and is the largest nonvenomous snake in North America. The primary reason for its listing is population decline resulting from habitat loss and fragmentation. Movement along travel corridors between seasonal habitats exposes the snake to danger from increased contact with humans. Indigo snakes frequently utilize gopher tortoise burrows and the burrows of others species for overwintering. The snake frequents flatwoods, hammocks, stream bottoms, riparian thickets, and high ground with well-drained, sandy soils. The indigo snake could occur anywhere on Eglin AFB because it uses such a wide variety of habitats (U.S. Air Force, 2006).

The indigo snake is extremely uncommon on Eglin AFB with the sighting of only twenty-nine snakes throughout Eglin AFB from 1956 to 1999. No confirmed indigo snake sightings have been recorded since 1999 (Gault, 2009). Most of these snakes were seen crossing roads or after being killed by vehicles. It is difficult to determine a precise number or even estimate the numbers of these snakes due to the secretive nature of this species (U.S. Air Force, 2006).

Gulf Sturgeon

The Gulf sturgeon is an anadromous fish that spends part of its life cycle in the marine environment and part in riverine environments. The Gulf sturgeon migrates from salt water into large coastal rivers to spawn and spend the warm months (Wordsworth Dictionary of Science and Technology, 1995). It lives predominately in the northeastern Gulf of Mexico (GOM), where it ranges from the Mississippi Delta east to the Suwannee River in Florida. However, it can be found in the bays and estuaries throughout this range (U.S. Coast Guard, 1996). Spawning takes place during April through June in fresh water, such as the Yellow River, which borders Eglin AFB along the northwest (Parauka, 1996).

Eglin NRS is currently working with U.S. Fish and Wildlife Service personnel to conduct a multi-year Gulf sturgeon tagging and tracking project in the GOM, Santa Rosa Sound, and rivers near Eglin AFB. As of October 2009, sonic tags have been placed in 120 sturgeon in the Choctawhatchee, Yellow, Blackwater, and Escambia Rivers. Receivers have been placed at various locations to track the movement of these individuals, including locations in the nearshore GOM off Eglin's Santa Rosa Island property. The receivers record acoustic transmissions generated by the tags, and provide information on the location of individual fish in the area as well as the date and time the fish were recorded.

Preliminary data (unpublished at this time) indicate that Gulf sturgeon begin moving to the Gulf in late October/early November. The fish are detected off Eglin's SRI property until approximately mid-December, when they generally migrate east and west out of the area, possibly to aggregation sites that have been detected near Perdido Key, Alabama and near Panama City, Florida. Few fish are detected off Eglin's property between mid-December and mid-March, when the sturgeon begin returning to riverine environments. Initial data show that 82 percent of the detections occurred within approximately 500 meters of the shoreline, in water depth less than 40 feet. Further, 99 percent of detection occurred within approximately 1,000 meters of the shore, in water depths less than 60 feet (only 1 percent of detections occurred in

water depths of 60 feet or greater). This data supports the hypothesis that Gulf sturgeon offshore migrations typically occur in water depths of 40 feet or less.

Gulf Sturgeon Critical Habitat

Critical habitat for the Gulf sturgeon was designated in March 2003. *Critical habitat* is a term that refers to specific geographic areas that contain the essential habitat features necessary for the conservation of threatened and/or endangered species. Critical habitat areas may require special protection or management considerations for current populations as well as potential population increases necessary to achieve species recovery. Features include food, water, shelter, breeding areas, and space for growth, among other requirements. In the Final Rule for the designation of critical habitat for the Gulf sturgeon, seven primary constituent elements are identified.

- 1) Abundant food items within riverine habitats for larval and juvenile life stages, and within estuarine and marine habitats for adult and subadult life stages.
- 2) Riverine spawning sites with suitable substrate.
- 3) Riverine aggregation areas (resting, holding, or staging areas).
- 4) Proper stream flow regime for all life stages.
- 5) Adequate water quality for all life stages.
- 6) Adequate sediment quality for all life stages.
- 7) Safe and unobstructed migratory pathways for passage within and between riverine, estuarine, and marine habitats.

Critical habitat for the Gulf sturgeon is comprised of 14 geographic areas, or units. The units collectively encompass almost 2,800 river kilometers and over 6,000 square kilometers of estuarine and marine habitat. Critical habitat is delineated for the Yellow River, East Bay, Santa Rosa Sound, and Choctawhatchee Bay, and extends from the mean high-water line to 1 nautical mile offshore in the GOM (Figure 3).

Freshwater Mussels

The southern sandshell (*Hamiota australis*), fuzzy pigtoe (*Pleurobema strodeanum*), and Narrow Pigtoe (*Fusconia escambiae*) freshwater mussels are federal candidates for listing as threatened or endangered species. These freshwater mussels are found only in the Yellow, Escambia, and Choctawhatchee river drainages in Florida and Alabama. From the 1990s to 2004, surveys have documented declines in the numbers of these candidate mussel species (Blalock-Herod et al., 2002; Pilarczyk et al., 2006). Furthermore, these surveys have been unable to capture many of these mussel species at sites where they were previously known to occur. These local extirpations and reductions in numbers are attributed to habitat alteration from various sources.

The greatest threat to these freshwater mussels is runoff associated with poor land use practices, such as poorly conducted agricultural or silvicultural practices, construction, and mining activities. Because of their limited motility, mussels are extremely vulnerable to acute, localized impacts (i.e., impoundment, runoff from adjacent unvegetated land) (Box and Mossa,

1999). Mussels filter fine particulate organic matter from the water, so excess sedimentation may interfere with feeding. Sedimentation may also cause direct mortality by deposition and suffocation, and turbidity may reduce or eliminate juvenile recruitment. Pesticides and other water quality issues also threaten the health of these filter feeders. Preferred habitats are creeks and rivers with slow to moderate currents and sandy substrates (NRCS, 2007).

Other Species Considered:

Florida Black Bear

The Florida black bear (*Ursus americanus floridanus*) is currently listed as a state threatened species except in Baker and Columbia counties and Apalachicola National Forest. Florida black bear populations are currently found in Florida and Georgia, as well as a small population in Alabama. Reasons for population declines throughout Florida and Georgia include loss of habitat due to urban development and direct mortality due to collisions with vehicles. Eglin AFB is considered to be the smallest population, with an estimated sixty to one-hundred individuals; however, Eglin's black bear population has shown signs of increase since the early 1990s. Black bear in Florida breed in June/July, and young are born in January/February. Most black bears within Eglin AFB utilize the large swamps and floodplain forests in the southwest and northern portions of Eglin AFB, where they feed on fruits, acorns, beetles, and yellow jackets. Black bear sightings have occurred at numerous locations throughout Eglin AFB, the majority of which have been within the interstitial areas (U.S. Air Force, 2006).

Florida Bog Frog

The Florida bog frog (*Rana okaloosae*) a species of special concern by the state, can only be found within Walton, Okaloosa, and Santa Rosa Counties. Most of the habitat for the frog lies on Eglin AFB property with all known locations of the frog in small tributary streams of the Yellow, Shoal, and East Bay Rivers. There are 65 documented bog frog locations on the Eglin Range, but only 58 of those have been verified.

Gopher Tortoise

The gopher tortoise (*Gopherus polyphemus*), a state-threatened species, is found primarily within the Sandhills and Open Grassland ecological associations on Eglin, where it excavates a tunnel-like burrow for shelter from climatic extremes and refuge from predators. The primary features of good tortoise habitat are sandy soils, open canopy with plenty of sunlight, and abundant food plants (forbs and grasses). Prescribed fire is often employed to maintain these conditions. Nesting occurs during May and June and hatching occurs from August through September. Gopher tortoise burrows are important habitat for many species, including the federally-listed indigo snake (U.S. Air Force, 2006).

Determination of Impacts

Red-cockaded Woodpecker

Construction Impacts:

Construction activities associated with improving RR 211 and RR 257 may temporarily disturb individuals or populations of RCWs (Figure 3). Staging areas for construction equipment would be coordinated through Eglin NRS. No RCW foraging habitat would be removed during road improvements; however, foraging RCWs may avoid areas where construction is occurring. Suitable habitat appears to outweigh any negative influences associated with noise due to construction. Observations have indicated that many animals become adapted to human activities and noises (Busnel, 1978). Scientists who have researched the effects of noise on wildlife report that animals may initially react with a startle effect from noises, but adapt over time, so that even this behavior is eradicated (Busnel, 1978). Based on the fact that the RCW population continues to grow at Eglin, including locations which are in close proximity to test areas, it appears that they have adapted to noises associated with the military mission. Overall noise during road improvement activities would have fewer impacts on RCWs as compared with mission activities. Therefore, Eglin NRS has determined that the Proposed Action is **not likely to adversely affect** the red-cockaded woodpecker.

Increased Road Use Impacts:

Since the current roads are clay based and the new roads will be paved, it is highly likely that RR 211 and RR 257 will see an increase in the amount of traffic on these roads. Based on the RCW's feeding habits and behaviors, no direct impacts from increased road use are anticipated. Potential noise impacts from increased road use would be the same as discussed above and would have minimal to no impact on foraging behavior. Therefore, the increased road usage is **not likely to adversely affect** the red-cockaded woodpecker.

Eastern Indigo Snake

Construction Impacts:

The potential impact to the eastern indigo snake from the proposed road improvement activities would be from direct physical impacts associated with road construction equipment. Incidental contact with personnel and equipment could result in trampling of an individual snake. However, this occurrence is considered highly unlikely, as the snake would most likely move away from the area if it sensed a general disturbance in its vicinity. Should an indigo snake be sighted during construction activities, personnel would cease activities until the snake has moved away from the area before resuming work. Eglin NRS has determined that the Proposed Action is **not likely to adversely affect** the eastern indigo snake with implementation of the following avoidance and minimization measures:

- Construction personnel would be provided a description of the eastern indigo snake and its protection under Federal Law. Indigo snake signs would be provided by Eglin NRS

and posted at the construction site. Personnel would be given instructions not to harass injure, harm, or kill this species.

- Should an indigo snake be sighted, construction personnel would be directed to cease any activities and allow the eastern indigo snake sufficient time to move away from the site on its own before resuming such activities. Personnel would contact Eglin NRS immediately to report the sighting of the snake.

Increased Road Use Impacts:

Snakes are particularly vulnerable to direct physical impacts on roads; some reptiles seek roads for thermal cooling and heating which could cause mortality by vehicles. The potential increase in the amount of traffic on RR 211 and RR 257 could cause a higher mortality rate for the eastern indigo snake. However, the eastern indigo snake is generally rare in the Florida panhandle. There have been few sightings on Eglin; the last recorded sighting was a road killed snake in 1999. The probability of encountering an indigo snake is low; therefore Eglin NRS has determined that the increased road usage is **not likely to adversely affect** the indigo snake.

Gulf Sturgeon and Gulf Sturgeon Critical Habitat

Construction Impacts:

The proposed road improvement area crosses several tributaries of the Shoal and Yellow Rivers, which is designated critical habitat for the Gulf sturgeon. Construction runoff (i.e. siltation) could potentially impact Gulf sturgeon critical habitat. However, permits required for this project, which would include an Erosion, Sedimentation, and Pollution Control Plan, would require the implementation of site-specific management actions and best management practices (BMPs), such as planting vegetation, and employing silt fencing, sand bags, rock bags, sediment traps, sediment basins, synthetic bales, and floating and staked turbidity barriers. These measures would help ensure that road and bridge construction activities do not create erosion, sedimentation, or siltation, which could negatively impact the Gulf sturgeon and its habitat. Also, Eglin NRS and the USFWS Fisheries Biologist will be represented at road design meetings to ensure stormwater mitigations will not impact the tributaries of the Shoal and Yellow Rivers. Therefore, Eglin NRS has determined that the Proposed Action is **not likely to adversely affect** the Gulf sturgeon and **not likely to adversely modify** Gulf sturgeon critical habitat.

Increased Road Use Impacts:

The potential increase in the amount of traffic on RR 211 and RR 257 should not pose any negative impacts to the Gulf sturgeon due to the fact that the road will be paved thus decreasing sedimentation into the tributaries. The concern would be with stormwater runoff during rain events. For this reason, Eglin NRS and the USFWS Fisheries Biologist will be represented at road design meetings to ensure stormwater mitigations will not impact the tributaries of the Shoal and Yellow Rivers. Therefore, Eglin NRS has determined that the project is **not likely to adversely affect** the Gulf sturgeon and **not likely to adversely modify** Gulf sturgeon critical habitat.

Freshwater Mussels

Construction Impacts:

The proposed road improvement area crosses several tributaries of the Shoal and Yellow Rivers, where freshwater mussels are found. Construction runoff (i.e. siltation) could potentially impact freshwater mussels. However, permits required for this project, which would include an Erosion, Sedimentation, and Pollution Control Plan, would require the implementation of site-specific management actions and BMPs, such as planting vegetation, and employing silt fencing, sand bags, rock bags, sediment traps, sediment basins, synthetic bales, and floating and staked turbidity barriers. These measures would help ensure that road and bridge construction activities do not create erosion, sedimentation, or siltation, which could negatively impact the freshwater mussels. Also, Eglin NRS and the USFWS Fisheries Biologist will be represented at road design meetings to ensure stormwater mitigations will not impact the tributaries of the Shoal and Yellow Rivers. Therefore, Eglin NRS has determined that the Proposed Action is **not likely to adversely affect** the freshwater mussels.

Increased Road Use Impacts:

The potential increase in the amount of traffic on RR 211 and RR 257 should not pose any negative impacts to the freshwater mussels due to the fact that the road will be paved thus decreasing sedimentation into the tributaries. The concern would be with stormwater runoff during rain events. For this reason, Eglin NRS and the USFWS Fisheries Biologist will be represented at road design meetings to ensure stormwater mitigations will not impact the tributaries of the Shoal and Yellow Rivers. Therefore, Eglin NRS has determined that the project is **not likely to adversely affect** the freshwater mussels.

Other Species Considered:

Florida Black Bear

Construction Impacts:

During road improvement activities, any potential impact to the Florida black bear would occur from incidental contact with the animal, or disruption of its behavioral habits. In the unlikely event that construction personnel come into contact with a black bear, all activities would cease until the bear has moved away from the area. Personnel should contact Eglin NRS if a black bear is located in the construction area. Therefore, Eglin NRS has determined that the Proposed Action would have minimal impacts on the Florida black bear.

Increased Road Use Impacts:

The Florida black bear may be found in a variety of habitats on Eglin. Several sightings and incidents have occurred along the project site (Figure 3). The potential increase in the amount of traffic on RR 211 and RR 257 could cause a higher mortality rate for these bears. To reduce a possible increase in bear mortality on the roads, the speed limit (as stated in the proposed action) would be 35 mph on the newly paved roads. Also, bear crossing signs would be posted along RR

211 and RR 257 to warn motorists to be cautious (pending approval from the Florida Fish and Wildlife Conservation Commission (FWC)). Therefore Eglin NRS has determined that the increased road usage would have minimal impacts on the Florida black bear.

Florida Bog Frog

Construction Impacts:

The proposed road improvement area crosses four known bog frog creeks (Figure 3). Construction runoff (i.e. siltation) could potentially impact bog frog habitat. However, permits required for this project, which would include an Erosion, Sedimentation, and Pollution Control Plan, would require the implementation of site-specific management actions and BMPs, such as planting vegetation, and employing silt fencing, sand bags, rock bags, sediment traps, sediment basins, synthetic bales, and floating and staked turbidity barriers. These measures would help ensure that road and bridge construction activities do not create erosion, sedimentation, or siltation, which could negatively impact the bog frog and its habitat. Also, Eglin NRS and the USFWS Fisheries Biologist will be represented at road design meetings to ensure stormwater mitigations will not impact the bog frog creeks along RR 211. Therefore Eglin NRS has determined that the Proposed Action would have minimal impacts on the Florida bog frog.

Increased Road Use Impacts:

The potential increase in the amount of traffic on RR 211 and RR 257 should not pose any negative impacts to the bog frog due to the fact that the road will be paved thus decreasing sedimentation into its habitat. The concern would be with stormwater runoff during rain events. For this reason, Eglin NRS and the USFWS Fisheries Biologist will be represented at road design meetings to ensure stormwater mitigations will not impact the creeks along RR 211. Therefore Eglin NRS has determined that the project would have minimal impacts on the Florida bog frog.

Gopher Tortoise

Construction Impacts:

The potential to impact the gopher tortoise is from direct physical impacts associated with road improvement activities. Incidental contact with personnel and equipment could result in trampling or crushing of individuals or their burrow. A gopher tortoise survey would need to be conducted within the right-of-way of the road and for any staging areas for equipment. If a gopher tortoise burrow is identified within the proposed project area, the burrow must be examined and any gopher tortoise or commensals occupying the burrow must be relocated. All gopher tortoise or commensal relocation would be performed in accordance with the FWC protocols. In the unlikely event that construction personnel come into contact with a gopher tortoise, all activities would cease until the tortoise has moved away from the area. Eglin NRS has determined that the Proposed Action would have minimal impact on the gopher tortoise with implementation of the following avoidance and minimization measures:

- Prior to project initiation a gopher tortoise survey is required at least one month prior to any ground disturbance. Proponent must obtain their own qualified contractor. Proponent must provide gopher tortoise survey results and any tortoise relocation must be coordinated through Eglin Natural Resources.
- If a gopher tortoise burrow cannot be avoided, then the tortoise would be relocated in accordance with the FWC protocols.
- Should a gopher tortoise burrow be identified within the proposed path of construction by construction personnel, work would cease until the burrow has been examined and any gopher tortoise or commensals are relocated to a suitable location.

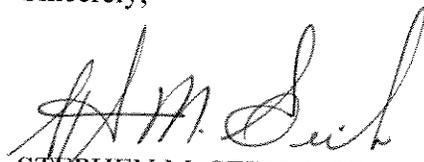
Increased Road Use Impacts:

Gopher tortoises may be present in the surrounding project area (Figure 3). The gopher tortoise survey prior to road improvement activities would ensure that tortoises would not be impacted in the immediate area, however, there is a potential for tortoises to be in the surrounding area. The potential increase in the amount of traffic on RR 211 and RR 257 could impact a tortoise attempting to cross the road. However, there have been no known reports to Eglin NRS regarding tortoise kills on these roads (Varble, 2010). Therefore Eglin NRS has determined that the increased road usage would have minimal impacts on the gopher tortoise.

Conclusion

Eglin NRS has determined that the Proposed Action is **not likely to adversely affect** the red-cockaded woodpecker, eastern indigo snake, Gulf sturgeon, Gulf sturgeon critical habitat and freshwater mussels with implementation of the avoidance and minimization measures addressed in this biological assessment. Eglin AFB would notify the USFWS immediately if it modifies any of the actions considered in the Proposed Action or if additional information on listed species becomes available, as the USFWS may require a reinitiation of consultation. If an impact to a listed species occurs beyond what Eglin has considered in this assessment, all operations would cease and Eglin would notify the USFWS. Prior to commencement of activities, Eglin would implement any modifications or conditions resulting from consultation with the USFWS. Eglin NRS believes this fulfills all requirements of the ESA, and no further action is necessary. If you have any questions regarding this letter or any of the proposed activities, please do not hesitate to contact either Mr. Bob Miller (850) 883-1153 or myself at (850) 882-8391.

Sincerely,



STEPHEN M. SEIBER, YF-02
Chief, Natural Resources Section

REFERENCES:

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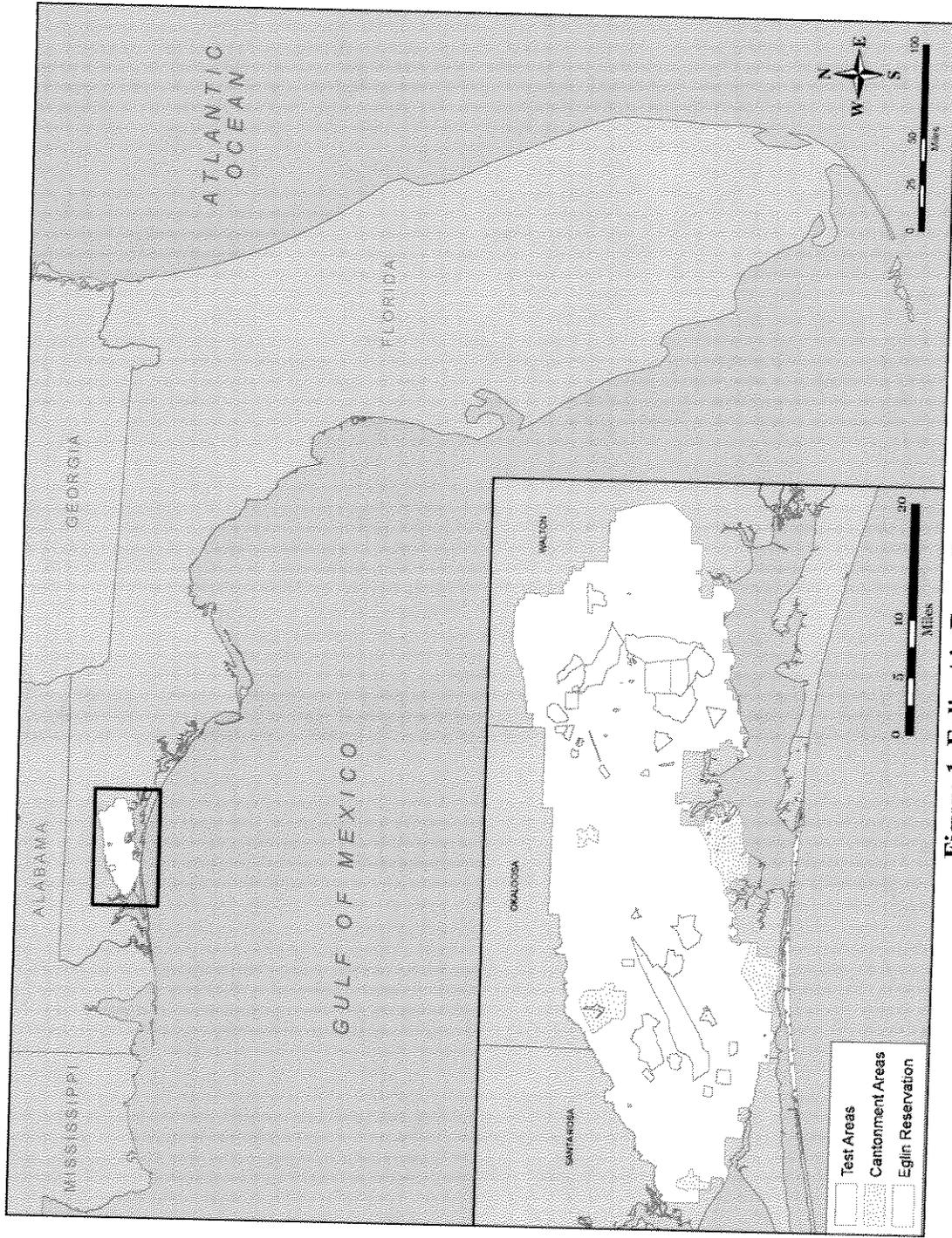


Figure 1. Eglin Air Force Base, Florida

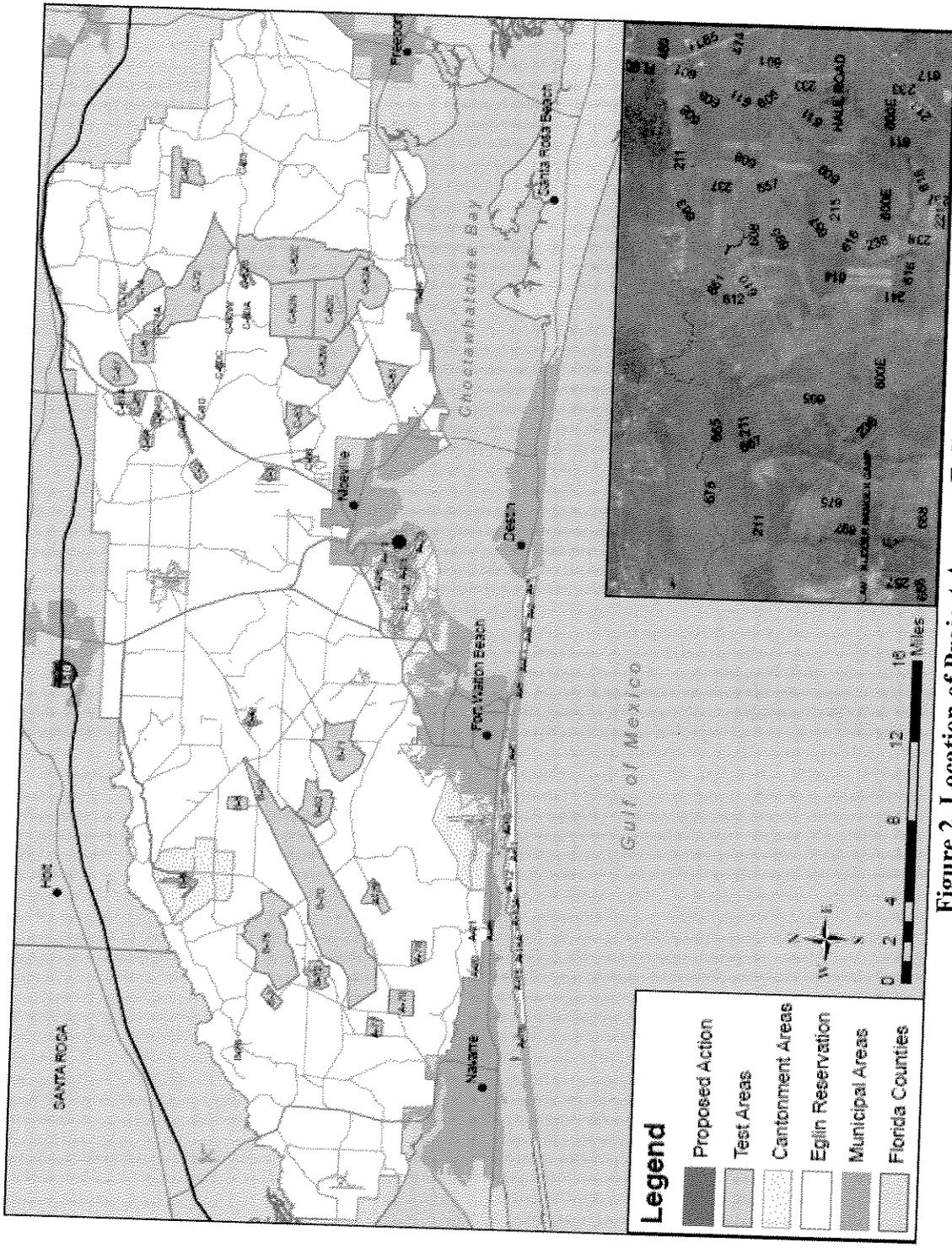


Figure 2. Location of Project Area on Eglin AFB

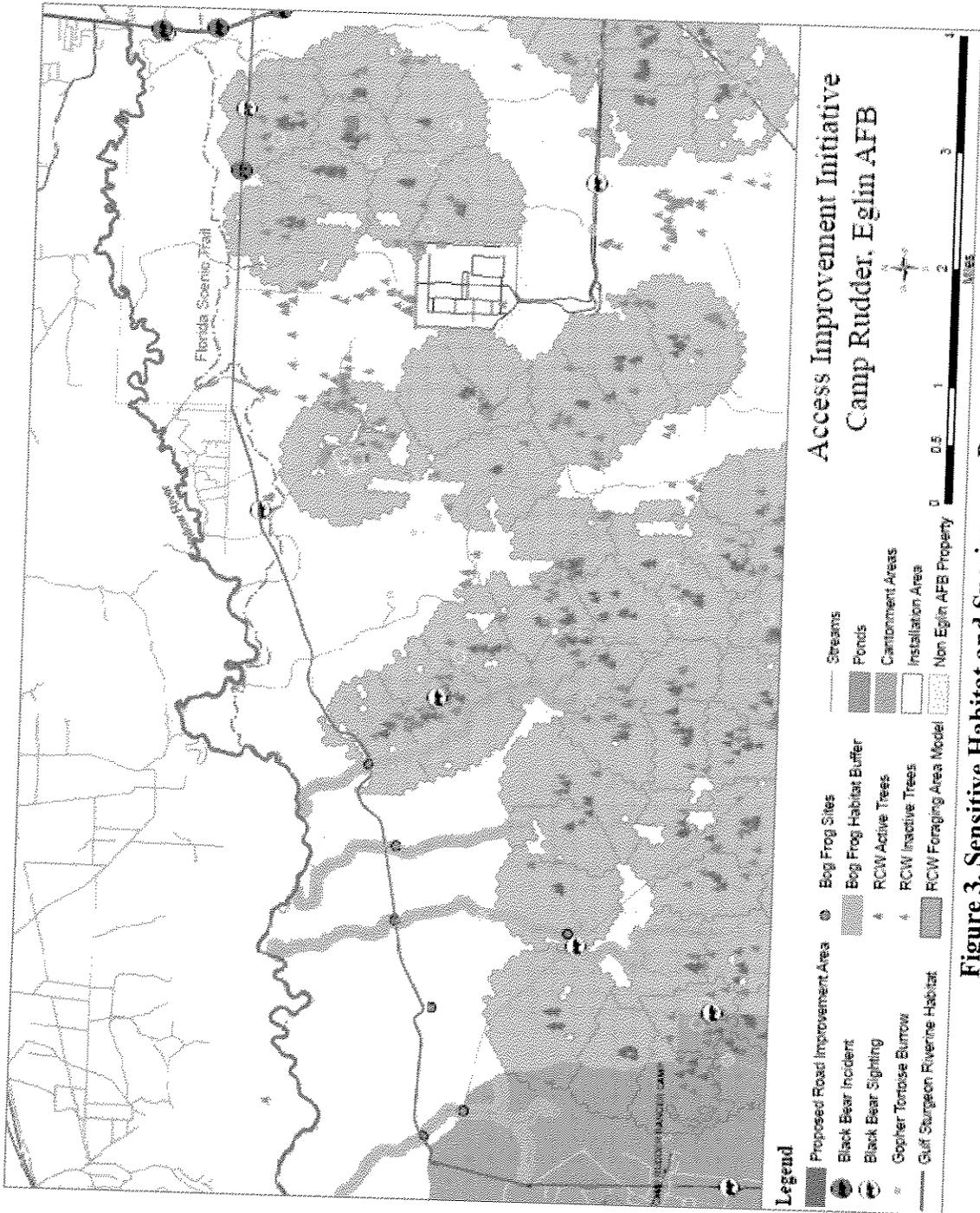
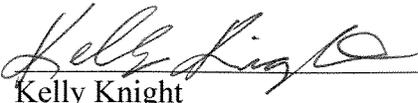


Figure 3. Sensitive Habitat and Species near Proposed Action

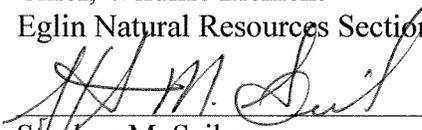
INFORMAL CONSULTATION REGARDING

**POTENTIAL IMPACTS TO FEDERALLY LISTED SPECIES RESULTING FROM
THE ACCESS IMPROVEMENT INITIATIVE FOR CAMP RUDDER
EGLIN AIR FORCE BASE, FLORIDA**

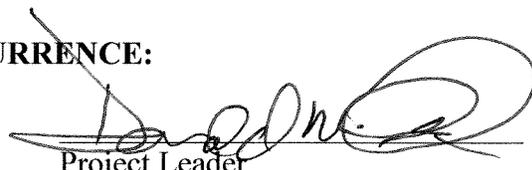
Prepared by:  6/25/10
Date
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Reviewed by:  6/28/10
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Bob Miller
Endangered Species Biologist
Eglin Natural Resources Section

Date
Bruce Hagedorn
Chief, Wildlife Element
Eglin Natural Resources Section

 7/3/2010
Date
Stephen M. Seiber
Chief, Eglin Natural Resources Section

USFWS CONCURRENCE:

 8/25/10
Date
Project Leader
U.S. Fish and Wildlife Service
Panama City, FL

FWS Log No. 41410-2010-I-0316

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Appendix F

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- Summary** Summarizes total emissions by calendar year.
- Combustion** Estimates emissions from non-road equipment exhaust as well as painting.
- Fugitive** Estimates fine particulate emissions from earthmoving, vehicle traffic, and windblown dust
- Grading** Estimates the number of days of site preparation, to be used for estimating heavy equipment exhaust and earthmoving dust emissions
- NEI Tier Report** Summarizes total emissions for the Okaloosa County, Florida Tier Reports for 2011, to be used to compare project to regional emissions.

Construction Emissions from Proposed Action

	NO_x (ton)	VOC (ton)	CO (ton)	SO₂ (ton)	PM₁₀ (ton)
CY2015					
Construction Combustion	41.053	6.676	55.061	0.821	1.240
Construction Fugitive Dust	0.000	0.000	0.000	0.000	125.397
TOTAL CY2015	41.053	6.676	55.061	0.821	126.638

Since future year budgets were not readily available, actual 2002 air emissions inventories for the counties were used as an approximation of the regional inventory. Because the Proposed Action is several orders of magnitude below significance, the conclusion would be the same, regardless of whether future year budget data set were used.

Okaloosa County, Florida

Year	Point, Area, On-Road Mobile, and Non-Road Mobile Sources Combined				
	NO_x (tpy)	VOC (tpy)	CO (tpy)	SO₂ (tpy)	PM₁₀ (tpy)
2011	5,627	1,759	9,214	275	4,557

Source: Data summarized from USEPA's Air Emission Sources 2011 (<http://www.epa.gov/airdata/>). Website visited February

Determination Significance (Significance Threshold = 10%) for Construction Activities

	Point and Area Sources Combined				
	NO_x (tpy)	VOC (tpy)	CO (tpy)	SO₂ (tpy)	PM₁₀ (tpy)
Minimum - 2011	5,627	1,759	9,214	275	4,557
2015 Emissions	41.053	6.676	55.061	0.821	126.638
Proposed Action %	0.730%	0.380%	0.598%	0.298%	2.779%

Construction Combustion Emissions

Combustion Emissions of VOC, NO_x, SO₂, CO and PM₁₀ Due to Construction

Includes:

Alt B - RR 257/236 Eastern Route, Asphalt	4,486,680 ft ²	103.00 acres
Total Building Construction Area:	0 ft ²	0.00 acres
Total Demolished Area:	0 ft ²	0.00 acres
Total Paved Area:	3,833,280 ft ²	88.00 acres
Total Disturbed Area:	4,486,680 ft ²	103.00 acres
Construction Duration:	1.5 year(s)	
Annual Construction Activity:	230 days/yr	

Emission Factors Used for Construction Equipment

Reference: Guide to Air Quality Assessment, SMAQMD, 2004

Emission factors are taken from Table 3-2. Assumptions regarding the type and number of equipment are from Table 3-1 unless otherwise noted.

Grading

Equipment	No. Req ^d . ^a per 10 acres	NO _x (lb/day)	VOC ^b (lb/day)	CO (lb/day)	SO ₂ ^c	PM ₁₀ (lb/day)
Bulldozer	1	29.40	3.66	25.09	0.59	1.17
Motor Grader	1	10.22	1.76	14.98	0.20	0.28
Water Truck	1	20.89	3.60	30.62	0.42	0.58
Total per 10 acres of activity	3	60.51	9.02	70.69	1.21	2.03

Paving

Equipment	No. Req ^d . ^a per 10 acres	NO _x (lb/day)	VOC ^b (lb/day)	CO (lb/day)	SO ₂ ^c	PM ₁₀ (lb/day)
Paver	1	7.93	1.37	11.62	0.16	0.22
Roller	1	5.01	0.86	7.34	0.10	0.14
Total per 10 acres of activity	2	12.94	2.23	18.96	0.26	0.36

Demolition

Equipment	No. Req ^d . ^a per 10 acres	NO _x (lb/day)	VOC ^b (lb/day)	CO (lb/day)	SO ₂ ^c	PM ₁₀ (lb/day)
Loader	1	7.86	1.35	11.52	0.16	0.22
Haul Truck	1	20.89	3.60	30.62	0.42	0.58
Total per 10 acres of activity	2	28.75	4.95	42.14	0.58	0.80

Building Construction

Equipment ^d	No. Req ^d . ^a per 10 acres	NO _x (lb/day)	VOC ^b (lb/day)	CO (lb/day)	SO ₂ ^c	PM ₁₀ (lb/day)
Stationary						
Generator Set	1	11.83	1.47	10.09	0.24	0.47
Industrial Saw	1	17.02	2.12	14.52	0.34	0.68
Welder	1	4.48	0.56	3.83	0.09	0.18
Mobile (non-road)						
Truck	1	20.89	3.60	30.62	0.84	0.58
Forklift	1	4.57	0.79	6.70	0.18	0.13
Crane	1	8.37	1.44	12.27	0.33	0.23
Total per 10 acres of activity	6	67.16	9.98	78.03	2.02	2.27

Note: Footnotes for tables are on following page

Architectural Coatings

Equipment	No. Reqd. ^a per 10 acres	NO _x (lb/day)	VOC ^b (lb/day)	CO (lb/day)	SO ₂ ^c	PM ₁₀ (lb/day)
Air Compressor	1	6.83	0.85	5.82	0.14	0.27
Total per 10 acres of activity	1	6.83	0.85	5.82	0.14	0.27

- a) The SMAQMD 2004 guidance suggests a default equipment fleet for each activity, assuming 10 acres of that activity, (e.g., 10 acres of grading, 10 acres of paving, etc.). The default equipment fleet is increased for each 10 acre increment in the size of the construction project. That is, a 26 acre project would round to 30 acres and the fleet size would be three times the default fleet for a 10 acre project.
- b) The SMAQMD 2004 reference lists emission factors for reactive organic gas (ROG). For the purposes of this worksheet ROG = VOC.
- c) The SMAQMD 2004 reference does not provide SO₂ emission factors. For this worksheet, SO₂ emissions have been estimated based on approximate fuel use rate for diesel equipment and the assumption of 500 ppm sulfur diesel fuel. For the average of the equipment fleet, the resulting SO₂ factor was found to be approximately 0.04 times the NO_x emission factor for the mobile equipment (based upon 2002 USAF IERA "Air Emissions Inventory Guidance") and 0.02 times the NO_x emission factor for all other equipment (based on AP-42, Table 3.4-1)
- d) Typical equipment fleet for building construction was not itemized in SMAQMD 2004 guidance. The equipment list above was assumed based on SMAQMD 1994 guidance.

PROJECT-SPECIFIC EMISSION FACTOR SUMMARY

Source	Equipment Multiplier*	SMAQMD Emission Factors (lb/day)				
		NO _x	VOC	CO	SO ₂ **	PM ₁₀
Grading Equipment	11	6855.783	1021.966	8009.177	137.116	229.999
Paving Equipment	9	1024.848	176.616	1501.632	20.497	28.512
Demolition Equipment	1	0.000	0.000	0.000	0.000	0.000
Building Construction	1	0.000	0.000	0.000	0.000	0.000
Air Compressor for Architectural Coating	1	0.000	0.000	0.000	0.000	0.000
Architectural Coating**			0.000			

*The equipment multiplier is an integer that represents units of 10 acres for purposes of estimating the number of equipment required for the project

**Emission factor is from the evaporation of solvents during painting, per "Air Quality Thresholds of Significance", SMAQMD, 1994

Example: SMAQMD Emission Factor for Grading Equipment NO_x = (Total Grading NO_x per 10 ac*((total disturbed area/43560)/10))*(Equipment Multiplier)

Summary of Input Parameters

	Total Area (ft ²)	Total Area (acres)	Total Days	
Grading:	4,486,680	103.00	5	(from "Grading" worksheet)
Paving:	3,833,280	88.00	47	
Demolition:	0	0.00	0	
Building Construction:	0	0.00	0	
Architectural Coating	0	0.00	0	(per the SMAQMD "Air Quality of Thresholds of Significance", 1994)

NOTE: The 'Total Days' estimate for paving is calculated by dividing the total number of acres by 0.21 acres/day, which is a factor derived from the 2005 MEANS Heavy Construction Cost Data, 19th Edition, for 'Asphaltic Concrete Pavement, Lots and Driveways - 6" stone base', which provides an estimate of square feet paved per day. There is also an estimate for 'Plain Cement Concrete Pavement', however the estimate for asphalt is used because it is more conservative. The 'Total Days' estimate for demolition is calculated by dividing the total number of acres by 0.02 acres/day, which is a factor also derived from the 2005 MEANS reference. This is calculated by averaging the demolition estimates from 'Building Demolition - Small Buildings, Concrete', assuming a height of 30 feet for a two-story building; from 'Building Footings and Foundations Demolition - 6" Thick, Plain Concrete'; and from 'Demolish, Remove Pavement and Curb - Concrete to 6" thick, rod reinforced'. Paving is double-weighted since projects typically involve more paving demolition. The 'Total Days' estimate for building construction is assumed to be 230 days, unless project-specific data is known.

Total Project Emissions by Activity (lbs)

	NO _x	VOC	CO	SO ₂	PM ₁₀
Grading Equipment	34,278.92	5,109.83	40,045.89	685.58	1,150.00
Paving	47,826.24	8,242.08	70,076.16	956.52	1,330.56
Demolition	-	-	-	-	-
Building Construction	-	-	-	-	-
Architectural Coatings	-	-	-	-	-
Total Emissions (lbs):	82,105.16	13,351.91	110,122.05	1,642.10	2,480.56

Results: Total Project Annual Emission Rates

	NO _x	VOC	CO	SO ₂	PM ₁₀
Total Project Emissions (lbs)	82,105.16	13,351.91	110,122.05	1,642.10	2,480.56
Total Project Emissions (tons)	41.05	6.68	55.06	0.82	1.24

Construction Fugitive Dust EmissionsCalculation of PM₁₀ Emissions Due to Site Preparation (Uncontrolled).User Input Parameters / Assumptions

Acres graded per year:	103.00	acres/yr	(From "Combustion" worksheet)
Grading days/yr:	4.01	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: 0.56 to 23, AP-42 Table 13.2.2-1)
Soil percent moisture, M:	65	%	(http://www.cpc.noaa.gov/products/soilmst/w.shtml)
Annual rainfall days, p:	110	days/yr	rainfall exceeds 0.01 inch/day (AP-42 Fig 13.2.2-1)
Wind speed > 12 mph %, l:	16.7	%	Ave. of wind speed at Eglin AFB, FL (Personal Correspondence, Richard Henning, Meteorologist, GS-12, 46th WS/WST, March 19, 2008)
Fraction of TSP, J:	0.5	per California Environmental Quality Act (CEQA) Air Quality Handbook, SCAQMD, 1993, p. A9-99	
Mean vehicle speed, S:	5	mi/hr	(On-site)
Dozer path width:	8	ft	
Qty construction vehicles:	12.36	vehicles	(From "Grading worksheet)
On-site VMT/vehicle/day:	5	mi/veh/day	(Excluding bulldozer VMT during grading)
PM ₁₀ Adjustment Factor k	1.5	lb/VMT	(AP-42 Table 13.2.2-2 12/03 for PM ₁₀ for unpaved roads)
PM ₁₀ Adjustment Factor a	0.9	(dimensionless)	(AP-42 Table 13.2.2-2 12/03 for PM ₁₀ for unpaved roads)
PM ₁₀ Adjustment Factor b	0.45	(dimensionless)	(AP-42 Table 13.2.2-2 12/03 for PM ₁₀ for unpaved roads)
Mean Vehicle Weight W	40	tons	assumed for aggregate trucks

TSP - Total Suspended Particulate

VMT - Vehicle Miles Traveled

Emissions Due to Soil Disturbance Activities

Operation Parameters (Calculated from User Inputs)

Grading duration per acre	0.3 hr/acre	
Bulldozer mileage per acre	1 VMT/acre	(Miles traveled by bulldozer during grading)
Construction VMT per day	62 VMT/day	
Construction VMT per acre	2.4 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 11.9-1, Overburden
Grading	$(0.60)(0.051)s^{2.0}$	lbs/VMT	Table 11.9-1,
Vehicle Traffic (unpaved roads)	$[(k(s/12)^a (W/3)^b)] [(365-P)/365]$	lbs/VMT	Section 13.2.2

Source: Compilation of Air Pollutant Emission Factors, Vol. I, USEPA AP-42, Section 11.9 dated 10/98 and Section 13.2 dated 12/03

Calculation of PM₁₀ Emission Factors for Each Operation

Operation	Emission Factor (mass/ unit)	Operation Parameter	Emission Factor (lbs/ acre)
Bulldozing	0.05 lbs/hr	0.3 hr/acre	0.00 lbs/acre
Grading	0.77 lbs/VMT	1 VMT/acre	0.80 lbs/acre
Vehicle Traffic (unpaved roads)	2.46 lbs/VMT	2.4 VMT/acre	5.90 lbs/acre

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

Reference: California Environmental Quality Act (CEQA) Air Quality Handbook, SCAQMD, 1993.

Soil Piles EF = $1.7(s/1.5)[(365 - p)/235](I/15)(J) = (s)(365 - p)(I)(J)/(3110.2941)$, 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	0.00 lbs/acre	103.00	NA	0	0.000
Grading	0.80 lbs/acre	103.00	NA	82	0.041
Vehicle Traffic	5.90 lbs/acre	103.00	NA	608	0.304
Erosion of Soil Piles	0.58 lbs/acre/day	103.00	90	5,377	2.688
Erosion of Graded Surface	26.40 lbs/acre/day	103.00	90	244,728	122.364
TOTAL				250,795	125.40

Soil Disturbance EF: 6.70 lbs/acre
 Wind Erosion EF: 26.98 lbs/acre/day

Back calculate to get EF: 606.65 lbs/acre/grading day

Construction (Grading) Schedule

Estimate of time required to grade a specified area.

Input Parameters

Construction area: 103.00 acres/yr (from "Combustion" Worksheet)
 Qty Equipment: 12.36 (calculated based on 3 pieces of equipment for every 25 acres)
 Rnd Qty Equipment: 43

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, 19th Ed., R. S. Means, 2005.

Means Line No.	Operation	Description	Output	Units	Acres per equip-day	equip-days per acre	Acres/yr (project-specific)	Equip-days per year
2230 200 0550	Site Clearing	Dozer & rake, medium brush	8	acre/day	8	0.13	103.00	12.88
2230 500 0300	Stripping	Topsoil & stockpiling, adverse soil	1,650	cu. yd/day	2.05	0.49	103.00	50.36
2315 432 5220	Excavation	Bulk, open site, common earth, 150' haul	800	cu. yd/day	0.99	1.01	51.50	51.93
2315 120 5220	Backfill	Structural, common earth, 150' haul	1,950	cu. yd/day	2.42	0.41	51.50	21.30
2315 310 5020	Compaction	Vibrating roller, 6 " lifts, 3 passes	2,300	cu. yd/day	2.85	0.35	103.00	36.12
TOTAL								172.59

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

(Equip)(day)/yr: 172.59
 Qty Equipment: 43.00
 Grading days/yr: 4.01

Description	Emissions (tons/yr)				
	CO	NO _x	PM	SO _x	VOC
Preferred Alternative - RR257/211 Asphalt Eastern Route	139.747	106.36	198.31	2.127	17.06
ROI Emissions	96613	7914	7854	96613	24349
Percentage of ROI Emissions (%)	0.145	1.344	2.525	0.149	0.07

Description	Emissions (lb/day)				
	CO	NO _x	PM	SO _x	VOC
Preferred Alternative - RR257/211 Asphalt Eastern Route	8.576E+02	6.527E+02	1.217E+03	1.305E+01	1.047E+02
ROI Emissions	5.929E+05	4.857E+04	4.820E+04	5.929E+05	1.494E+05
Percentage of ROI Emissions (%)	8.899E-01	8.248E+00	1.550E+01	9.144E-01	4.296E-01

CHECK

Description	Emissions (kg/day)				
	CO	NO _x	PM	SO _x	VOC
Preferred Alternative - RR257/211 Asphalt Eastern Route	3.891E+02	2.961E+02	5.522E+02	5.922E+00	4.750E+01
ROI Emissions	2.690E+05	2.204E+04	2.187E+04	2.690E+05	6.780E+04
Percentage of ROI Emissions (%)	4.037E-01	3.742E+00	7.030E+00	4.149E-01	1.949E-01

Description	Emissions (kg/yr)				
	CO	NO _x	PM	SO _x	VOC
Preferred Alternative - RR257/211 Asphalt Eastern Route	1.420E+05	1.081E+05	2.015E+05	2.161E+03	1.733E+04
ROI Emissions	9.816E+07	8.041E+06	7.980E+06	9.816E+07	2.474E+07
Percentage of ROI Emissions (%)	1.473E+02	1.366E+03	2.565E+03	1.514E+02	7.112E+01

Check

Description	Emissions (kg/day)				
	CO	NO _x	PM	SO _x	VOC
Preferred Alternative - RR257/211 Asphalt Eastern Route	3.834E+02	2.918E+02	5.440E+02	5.835E+00	4.680E+01
ROI Emissions	2.650E+05	2.171E+04	2.155E+04	2.650E+05	6.679E+04
Percentage of ROI Emissions (%)	3.978E-01	3.687E+00	6.927E+00	4.087E-01	1.920E-01

Estimated Construction Emissions: Preferred Alternative

Description	Emissions (ug/m ³)				
	CO	NO _x	PM	SO _x	VOC
Preferred Alternative - RR257/211 Asphalt Eastern Route	3.834E-07	2.918E-07	5.440E-07	5.835E-09	4.680E-08
ROI Emissions	2.650E-04	2.171E-05	2.155E-05	2.650E-04	6.679E-05
Percentage of ROI Emissions (%)	3.978E-10	3.687E-09	6.927E-09	4.087E-10	1.920E-10

	CO	NO _x	PM	SO _x	VOC
Molecular Weight (g/mol)	28.01	30.01	128.17	64.06	30.02

Estimated Construction Emissions: Preferred Alternative

Description	Emissions (ppm)				
	CO	NO _x	PM	SO _x	VOC
Preferred Alternative - RR257/211 Asphalt Eastern Route	3.339E-10	2.372E-10	1.035E-10	2.222E-12	3.803E-11
ROI Emissions	2.308E-07	1.765E-08	4.101E-09	1.009E-07	5.428E-08
Percentage of ROI Emissions (%)	3.464E-13	2.997E-12	1.318E-12	1.556E-13	1.560E-13

Table 4-X Estimated Construction Emissions: Preferred Alternative Compared to the NAAQS

Criteria Pollutant	Averaging Time	NAAQS (ppm)	Calculated Concentration (ppm)
CO	1-Hour	35	1.391E-11
	8-Hour	9	1.113E-10
NO _x	Annual	0.053	8.657E-08
SO ₂	3-Hour	0.5	2.777E-13
	24-Hour	0.14	2.222E-12
	Annual	0.03	8.110E-10
PM ₁₀	24- Hour	150 µg/m ³	1.035E-10
	Annual	50 µg/m ³	3.779E-08

Conversion Table:	
Tons to lbs	1 ton = 2240 lbs
lbs to kg	1 lb = 0.4537 kg
kg to µg	1 kg = 10 ⁹ µg
Tons to kg	1 ton = 1016 kg
Year to day	1 yr = 365 days
day to hr	1 day = 24 hrs
°F to K	[K] = ([°F] + 459.67) × 5/9

Conversion Formula to ppm	
$\text{ppm} = ((M_p/MW) * 22.414 \text{ l/mol} * (T_2/273 \text{ K}) * (101.325 \text{ kPa}/P_2)) / V_a * 1000 \text{ L/m}^3$	
<p>M_p = mass of pollutant MW = Molecular Weight T₂ = Absolute temperature at time of reading P₂ = Absolute pressure at time of reading V_a = Volume of air sampled (assumed to be 1 m³)</p>	

Assumptions			
	°F		K
Temp	85	[K] = ([°F] + 459.67) × 5/9	302.59
	Oxygen	Molecular Weight (g/mol)	
CO	1	28.01	
NO _x	1	30.01	
PM		128.17	(naphtalene C ₁₀ H ₈)
SO _x	2	64.06	
VOC		30.02	(formaldehyde CH ₂ O)

- Summary** Summarizes total emissions by calendar year.
- Combustion** Estimates emissions from non-road equipment exhaust as well as painting.
- Fugitive** Estimates fine particulate emissions from earthmoving, vehicle traffic, and windblown dust
- Grading** Estimates the number of days of site preparation, to be used for estimating heavy equipment exhaust and earthmoving dust emissions
- NEI Tier Report** Summarizes total emissions for the Okaloosa County, Florida Tier Reports for 2011, to be used to compare project to regional emissions.

Construction Emissions from Proposed Action

	NO_x (ton)	VOC (ton)	CO (ton)	SO₂ (ton)	PM₁₀ (ton)
CY2015					
Construction Combustion	17.139	2.555	20.023	0.343	0.575
Construction Fugitive Dust	0.000	0.000	0.000	0.000	125.397
TOTAL CY2015	17.139	2.555	20.023	0.343	125.972

Since future year budgets were not readily available, actual 2002 air emissions inventories for the counties were used as an approximation of the regional inventory. Because the Proposed Action is several orders of magnitude below significance, the conclusion would be the same, regardless of whether future year budget data set were used.

Okaloosa County, Florida

Year	Point, Area, On-Road Mobile, and Non-Road Mobile Sources Combined				
	NO_x (tpy)	VOC (tpy)	CO (tpy)	SO₂ (tpy)	PM₁₀ (tpy)
2011	5,627	1,759	9,214	275	4,557

Source: Data summarized from USEPA's Air Emission Sources 2011 (<http://www.epa.gov/airdata/>). Website visited February

Determination Significance (Significance Threshold = 10%) for Construction Activities

	Point and Area Sources Combined				
	NO_x (tpy)	VOC (tpy)	CO (tpy)	SO₂ (tpy)	PM₁₀ (tpy)
Minimum - 2011	5,627	1,759	9,214	275	4,557
2015 Emissions	17.139	2.555	20.023	0.343	125.972
Proposed Action %	0.305%	0.145%	0.217%	0.125%	2.764%

Assumptions

Total Alternative C - RR257/211 Eastern Route, Clay-Based

Item Description	Land Mass (Acres)
Roadway	88
Estimated Stormwater Management Area	15
Total	103
Total sq feet =	4,486,680

Total miles for RR 257/211	14.000	Total miles for RR 257/211	14.000
Assume 1.5 years for construction	547.5 days		
Assume 20% of construction for grading	110 days		
Paving:		Clearing:	
Assume pavement width =	52 feet	Assume cleared width =	52 feet
1 mile =	5,280 feet	1 mile =	5,280 feet
14 miles =	73,920 feet	14 miles =	73,920 feet
Total sq feet paved =	0 sq feet	Total sq feet cleared =	3,843,840 sq feet
1 acre =	43,560 sq feet	1 acre =	43,560 sq feet
Total acres paved =	0.00 acres	Total acres cleared =	88.24 acres
Rounded =	130.00	Stormwater acres cleared =	15.00
1 acre =	43,560 sq feet	Rounded Total =	103.00
Total sq feet paved =	0		

Construction Combustion Emissions

Combustion Emissions of VOC, NO_x, SO₂, CO and PM₁₀ Due to Construction

Includes:

Alt B - RR 257/236 Eastern Route, Asphalt	4,486,680 ft ²	103.00 acres
Total Building Construction Area:	0 ft ²	0.00 acres
Total Demolished Area:	0 ft ²	0.00 acres
Total Paved Area:	0 ft ²	0.00 acres
Total Disturbed Area:	4,486,680 ft ²	103.00 acres
Construction Duration:	1.5 year(s)	
Annual Construction Activity:	230 days/yr	

Emission Factors Used for Construction Equipment

Reference: Guide to Air Quality Assessment, SMAQMD, 2004

Emission factors are taken from Table 3-2. Assumptions regarding the type and number of equipment are from Table 3-1 unless otherwise noted.

Grading

Equipment	No. Req ^d . ^a per 10 acres	NO _x (lb/day)	VOC ^b (lb/day)	CO (lb/day)	SO ₂ ^c	PM ₁₀ (lb/day)
Bulldozer	1	29.40	3.66	25.09	0.59	1.17
Motor Grader	1	10.22	1.76	14.98	0.20	0.28
Water Truck	1	20.89	3.60	30.62	0.42	0.58
Total per 10 acres of activity	3	60.51	9.02	70.69	1.21	2.03

Paving

Equipment	No. Req ^d . ^a per 10 acres	NO _x (lb/day)	VOC ^b (lb/day)	CO (lb/day)	SO ₂ ^c	PM ₁₀ (lb/day)
Paver	0	7.93	1.37	11.62	0.16	0.22
Roller	0	5.01	0.86	7.34	0.10	0.14
Total per 10 acres of activity	0	12.94	2.23	18.96	0.26	0.36

Demolition

Equipment	No. Req ^d . ^a per 10 acres	NO _x (lb/day)	VOC ^b (lb/day)	CO (lb/day)	SO ₂ ^c	PM ₁₀ (lb/day)
Loader	1	7.86	1.35	11.52	0.16	0.22
Haul Truck	1	20.89	3.60	30.62	0.42	0.58
Total per 10 acres of activity	2	28.75	4.95	42.14	0.58	0.80

Building Construction

Equipment ^d	No. Req ^d . ^a per 10 acres	NO _x (lb/day)	VOC ^b (lb/day)	CO (lb/day)	SO ₂ ^c	PM ₁₀ (lb/day)
Stationary						
Generator Set	1	11.83	1.47	10.09	0.24	0.47
Industrial Saw	1	17.02	2.12	14.52	0.34	0.68
Welder	1	4.48	0.56	3.83	0.09	0.18
Mobile (non-road)						
Truck	1	20.89	3.60	30.62	0.84	0.58
Forklift	1	4.57	0.79	6.70	0.18	0.13
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Note: Footnotes for tables are on following page

Architectural Coatings

Equipment	No. Reqd. ^a per 10 acres	NO _x (lb/day)	VOC ^b (lb/day)	CO (lb/day)	SO ₂ ^c	PM ₁₀ (lb/day)
Air Compressor	1	6.83	0.85	5.82	0.14	0.27
Total per 10 acres of activity	1	6.83	0.85	5.82	0.14	0.27

- a) The SMAQMD 2004 guidance suggests a default equipment fleet for each activity, assuming 10 acres of that activity, (e.g., 10 acres of grading, 10 acres of paving, etc.). The default equipment fleet is increased for each 10 acre increment in the size of the construction project. That is, a 26 acre project would round to 30 acres and the fleet size would be three times the default fleet for a 10 acre project.
- b) The SMAQMD 2004 reference lists emission factors for reactive organic gas (ROG). For the purposes of this worksheet ROG = VOC.
- c) The SMAQMD 2004 reference does not provide SO₂ emission factors. For this worksheet, SO₂ emissions have been estimated based on approximate fuel use rate for diesel equipment and the assumption of 500 ppm sulfur diesel fuel. For the average of the equipment fleet, the resulting SO₂ factor was found to be approximately 0.04 times the NO_x emission factor for the mobile equipment (based upon 2002 USAF IERA "Air Emissions Inventory Guidance") and 0.02 times the NO_x emission factor for all other equipment (based on AP-42, Table 3.4-1)
- d) Typical equipment fleet for building construction was not itemized in SMAQMD 2004 guidance. The equipment list above was assumed based on SMAQMD 1994 guidance.

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		NO _x	VOC	CO	SO ₂ **	PM ₁₀
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Demolition Equipment	1	0.000	0.000	0.000	0.000	0.000
Building Construction	1	0.000	0.000	0.000	0.000	0.000
Air Compressor for Architectural Coating	1	0.000	0.000	0.000	0.000	0.000
Architectural Coating**			0.000			

*The equipment multiplier is an integer that represents units of 10 acres for purposes of estimating the number of equipment required for the project

**Emission factor is from the evaporation of solvents during painting, per "Air Quality Thresholds of Significance", SMAQMD, 1994

Example: SMAQMD Emission Factor for Grading Equipment NO_x = (Total Grading NO_x per 10 ac*((total disturbed area/43560)/10))*(Equipment Multiplier)

Summary of Input Parameters

	Total Area (ft ²)	Total Area (acres)	Total Days	
Grading:	4,486,680	103.00	5	(from "Grading" worksheet)
Paving:	0	0.00	0	
Demolition:	0	0.00	0	
Building Construction:	0	0.00	0	
Architectural Coating	0	0.00	0	(per the SMAQMD "Air Quality of Thresholds of Significance", 1994)

NOTE: The 'Total Days' estimate for paving is calculated by dividing the total number of acres by 0.21 acres/day, which is a factor derived from the 2005 MEANS Heavy Construction Cost Data, 19th Edition, for 'Asphaltic Concrete Pavement, Lots and Driveways - 6" stone base', which provides an estimate of square feet paved per day. There is also an estimate for 'Plain Cement Concrete Pavement', however the estimate for asphalt is used because it is more conservative. The 'Total 'Days' estimate for demolition is calculated by dividing the total number of acres by 0.02 acres/day, which is a factor also derived from the 2005 MEANS reference. This is calculated by averaging the demolition estimates from 'Building Demolition - Small Buildings, Concrete', assuming a height of 30 feet for a two-story building; from 'Building Footings and Foundations Demolition - 6" Thick, Plain Concrete'; and from 'Demolish, Remove Pavement and Curb - Concrete to 6" thick, rod reinforced'. Paving is double-weighted since projects typically involve more paving demolition. The 'Total Days' estimate for building construction is assumed to be 230 days, unless project-specific data is known.

Total Project Emissions by Activity (lbs)

	NO _x	VOC	CO	SO ₂	PM ₁₀
Grading Equipment	34,278.92	5,109.83	40,045.89	685.58	1,150.00
Paving	-	-	-	-	-
Demolition	-	-	-	-	-
Building Construction	-	-	-	-	-
Architectural Coatings	-	-	-	-	-
Total Emissions (lbs):	34,278.92	5,109.83	40,045.89	685.58	1,150.00

Results: Total Project Annual Emission Rates

	NO _x	VOC	CO	SO ₂	PM ₁₀
Total Project Emissions (lbs)	34,278.92	5,109.83	40,045.89	685.58	1,150.00
Total Project Emissions (tons)	17.14	2.55	20.02	0.34	0.57

Construction Fugitive Dust Emissions

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

User Input Parameters / Assumptions

Acres graded per year:	103.00	acres/yr	(From "Combustion" worksheet)
Grading days/yr:	4.01	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: 0.56 to 23, AP-42 Table 13.2.2-1)
Soil percent moisture, M:	65	%	(http://www.cpc.noaa.gov/products/soilmst/w.shtml)
Annual rainfall days, p:	110	days/yr	rainfall exceeds 0.01 inch/day (AP-42 Fig 13.2.2-1)
Wind speed > 12 mph %, l:	16.7	%	Ave. of wind speed at Eglin AFB, FL (Personal Correspondence, Richard Henning, Meteorologist, GS-12, 46th WS/WST, March 19, 2008)
Fraction of TSP, J:	0.5	per California Environmental Quality Act (CEQA) Air Quality Handbook, SCAQMD, 1993, p. A9-99	
Mean vehicle speed, S:	5	mi/hr	(On-site)
Dozer path width:	8	ft	
Qty construction vehicles:	12.36	vehicles	(From "Grading worksheet)
On-site VMT/vehicle/day:	5	mi/veh/day	(Excluding bulldozer VMT during grading)
PM ₁₀ Adjustment Factor k	1.5	lb/VMT	(AP-42 Table 13.2.2-2 12/03 for PM ₁₀ for unpaved roads)
PM ₁₀ Adjustment Factor a	0.9	(dimensionless)	(AP-42 Table 13.2.2-2 12/03 for PM ₁₀ for unpaved roads)
PM ₁₀ Adjustment Factor b	0.45	(dimensionless)	(AP-42 Table 13.2.2-2 12/03 for PM ₁₀ for unpaved roads)
Mean Vehicle Weight W	40	tons	assumed for aggregate trucks

TSP - Total Suspended Particulate

VMT - Vehicle Miles Traveled

Emissions Due to Soil Disturbance Activities

Operation Parameters (Calculated from User Inputs)

Grading duration per acre	0.3 hr/acre	
Bulldozer mileage per acre	1 VMT/acre	(Miles traveled by bulldozer during grading)
Construction VMT per day	62 VMT/day	
Construction VMT per acre	2.4 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 11.9-1, Overburden
Grading	$(0.60)(0.051)s^{2.0}$	lbs/VMT	Table 11.9-1,
Vehicle Traffic (unpaved roads)	$[(k(s/12)^a (W/3)^b)] [(365-P)/365]$	lbs/VMT	Section 13.2.2

Source: Compilation of Air Pollutant Emission Factors, Vol. I, USEPA AP-42, Section 11.9 dated 10/98 and Section 13.2 dated 12/03

Calculation of PM₁₀ Emission Factors for Each Operation

Operation	Emission Factor (mass/ unit)	Operation Parameter	Emission Factor (lbs/ acre)
Bulldozing	0.05 lbs/hr	0.3 hr/acre	0.00 lbs/acre
Grading	0.77 lbs/VMT	1 VMT/acre	0.80 lbs/acre
Vehicle Traffic (unpaved roads)	2.46 lbs/VMT	2.4 VMT/acre	5.90 lbs/acre

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

Reference: California Environmental Quality Act (CEQA) Air Quality Handbook, SCAQMD, 1993.

Soil Piles EF = $1.7(s/1.5)[(365 - p)/235](I/15)(J) = (s)(365 - p)(I)(J)/(3110.2941)$, 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	0.00 lbs/acre	103.00	NA	0	0.000
Grading	0.80 lbs/acre	103.00	NA	82	0.041
Vehicle Traffic	5.90 lbs/acre	103.00	NA	608	0.304
Erosion of Soil Piles	0.58 lbs/acre/day	103.00	90	5,377	2.688
Erosion of Graded Surface	26.40 lbs/acre/day	103.00	90	244,728	122.364
TOTAL				250,795	125.40

Soil Disturbance EF: 6.70 lbs/acre
 Wind Erosion EF: 26.98 lbs/acre/day

Back calculate to get EF: 606.65 lbs/acre/grading day

Construction (Grading) Schedule

Estimate of time required to grade a specified area.

Input Parameters

Construction area: 103.00 acres/yr (from "Combustion" Worksheet)
 Qty Equipment: 12.36 (calculated based on 3 pieces of equipment for every 25 acres)
 Rnd Qty Equipment: 43

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, 19th Ed., R. S. Means, 2005.

Means Line No.	Operation	Description	Output	Units	Acres per equip-day	equip-days per acre	Acres/yr (project-specific)	Equip-days per year
2230 200 0550	Site Clearing	Dozer & rake, medium brush	8	acre/day	8	0.13	103.00	12.88
2230 500 0300	Stripping	Topsoil & stockpiling, adverse soil	1,650	cu. yd/day	2.05	0.49	103.00	50.36
2315 432 5220	Excavation	Bulk, open site, common earth, 150' haul	800	cu. yd/day	0.99	1.01	51.50	51.93
2315 120 5220	Backfill	Structural, common earth, 150' haul	1,950	cu. yd/day	2.42	0.41	51.50	21.30
2315 310 5020	Compaction	Vibrating roller, 6 " lifts, 3 passes	2,300	cu. yd/day	2.85	0.35	103.00	36.12
TOTAL								172.59

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

(Equip)(day)/yr: 172.59
 Qty Equipment: 43.00
 Grading days/yr: 4.01

Description	Emissions (tons/yr)				
	CO	NO _x	PM	SO _x	VOC
Preferred Alternative - RR257/211 Asphalt Eastern Route	139.747	106.36	198.31	2.127	17.06
ROI Emissions	96613	7914	7854	96613	24349
Percentage of ROI Emissions (%)	0.145	1.344	2.525	0.149	0.07

Description	Emissions (lb/day)				
	CO	NO _x	PM	SO _x	VOC
Preferred Alternative - RR257/211 Asphalt Eastern Route	8.576E+02	6.527E+02	1.217E+03	1.305E+01	1.047E+02
ROI Emissions	5.929E+05	4.857E+04	4.820E+04	5.929E+05	1.494E+05
Percentage of ROI Emissions (%)	8.899E-01	8.248E+00	1.550E+01	9.144E-01	4.296E-01

CHECK

Description	Emissions (kg/day)				
	CO	NO _x	PM	SO _x	VOC
Preferred Alternative - RR257/211 Asphalt Eastern Route	3.891E+02	2.961E+02	5.522E+02	5.922E+00	4.750E+01
ROI Emissions	2.690E+05	2.204E+04	2.187E+04	2.690E+05	6.780E+04
Percentage of ROI Emissions (%)	4.037E-01	3.742E+00	7.030E+00	4.149E-01	1.949E-01

Description	Emissions (kg/yr)				
	CO	NO _x	PM	SO _x	VOC
Preferred Alternative - RR257/211 Asphalt Eastern Route	1.420E+05	1.081E+05	2.015E+05	2.161E+03	1.733E+04
ROI Emissions	9.816E+07	8.041E+06	7.980E+06	9.816E+07	2.474E+07
Percentage of ROI Emissions (%)	1.473E+02	1.366E+03	2.565E+03	1.514E+02	7.112E+01

Check

Description	Emissions (kg/day)				
	CO	NO _x	PM	SO _x	VOC
Preferred Alternative - RR257/211 Asphalt Eastern Route	3.834E+02	2.918E+02	5.440E+02	5.835E+00	4.680E+01
ROI Emissions	2.650E+05	2.171E+04	2.155E+04	2.650E+05	6.679E+04
Percentage of ROI Emissions (%)	3.978E-01	3.687E+00	6.927E+00	4.087E-01	1.920E-01

Estimated Construction Emissions: Preferred Alternative

Description	Emissions (ug/m ³)				
	CO	NO _x	PM	SO _x	VOC
Preferred Alternative - RR257/211 Asphalt Eastern Route	3.834E-07	2.918E-07	5.440E-07	5.835E-09	4.680E-08
ROI Emissions	2.650E-04	2.171E-05	2.155E-05	2.650E-04	6.679E-05
Percentage of ROI Emissions (%)	3.978E-10	3.687E-09	6.927E-09	4.087E-10	1.920E-10

	CO	NO _x	PM	SO _x	VOC
Molecular Weight (g/mol)	28.01	30.01	128.17	64.06	30.02

Estimated Construction Emissions: Preferred Alternative

Description	Emissions (ppm)				
	CO	NO _x	PM	SO _x	VOC
Preferred Alternative - RR257/211 Asphalt Eastern Route	3.339E-10	2.372E-10	1.035E-10	2.222E-12	3.803E-11
ROI Emissions	2.308E-07	1.765E-08	4.101E-09	1.009E-07	5.428E-08
Percentage of ROI Emissions (%)	3.464E-13	2.997E-12	1.318E-12	1.556E-13	1.560E-13

Table 4-X Estimated Construction Emissions: Preferred Alternative Compared to the NAAQS

Criteria Pollutant	Averaging Time	NAAQS (ppm)	Calculated Concentration (ppm)
CO	1-Hour	35	1.391E-11
	8-Hour	9	1.113E-10
NO _x	Annual	0.053	8.657E-08
	3-Hour	0.5	2.777E-13
SO ₂	24-Hour	0.14	2.222E-12
	Annual	0.03	8.110E-10
PM ₁₀	24- Hour	150 µg/m ³	1.035E-10
	Annual	50 µg/m ³	3.779E-08

Conversion Table:	
Tons to lbs	1 ton = 2240 lbs
lbs to kg	1 lb = 0.4537 kg
kg to μg	1 kg = $10^9 \mu\text{g}$
Tons to kg	1 ton = 1016 kg
Year to day	1 yr = 365 days
day to hr	1 day = 24 hrs
$^{\circ}\text{F}$ to K	$[\text{K}] = ([^{\circ}\text{F}] + 459.67) \times \frac{5}{9}$

Conversion Formula to ppm	
$\text{ppm} = ((M_p/MW) * 22.414 \text{ l/mol} * (T_2/273 \text{ K}) * (101.325 \text{ kPa}/P_2)) / V_a * 1000 \text{ L/m}^3$	
<p>M_p = mass of pollutant MW = Molecular Weight T_2 = Absolute temperature at time of reading P_2 = Absolute pressure at time of reading V_a = Volume of air sampled (assumed to be 1m^3)</p>	

Assumptions			
	$^{\circ}\text{F}$		K
Temp	85	$[\text{K}] = ([^{\circ}\text{F}] + 459.67) \times \frac{5}{9}$	302.59
	Oxygen	Molecular Weight (g/mol)	
CO	1	28.01	
NO_x	1	30.01	
PM		128.17	(naphtalene C_{10}H_8)
SO_x	2	64.06	
VOC		30.02	(formaldehyde CH_2O)