

**ENVIRONMENTAL ASSESSMENT FOR
REPLACEMENT OF MEDICAL CLINIC
TINKER AIR FORCE BASE, OKLAHOMA**



**United States Air Force
Air Force Materiel Command
Tinker Air Force Base, Oklahoma**

September 2005

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Environmental Assessment Replacement of Medical Clinic FINDING OF NO SIGNIFICANT IMPACT

AGENCY

Department of the Air Force, Air Force Materiel Command, Tinker Air Force Base (AFB), Oklahoma County, Oklahoma.

BACKGROUND

Tinker AFB (the Base) is located in Oklahoma County in the southeastern city limits of Oklahoma City, Oklahoma. The Base covers more than 5,000 acres and is adjacent to Midwest City to the north and Del City to the west. Oklahoma City is served by Interstate Highways 35, 40, and 44.

The current medical clinic (Buildings 5800, 5801, 5802, 5803, 5808, and 5810) was constructed in 1957 with a life expectancy of approximately 50 years. A construction project in 1978 more than doubled the size of the original first floor with additions wrapping the original structure on the west, south, and east. A project for three more additions was completed in the early 1990s with additions to the southwest corner, just east of the south wing of the original structure, and south of the warehouse. A Pharmacy Annex with a drive-up window was subsequently added to the north side of the facility in the early 2000s, and another small pharmacy expansion is currently under design. There have been no major additions or changes to the second or third floors from the original 1957 construction. The main building contains approximately 184,156 square feet (ft²), including the additions. This inpatient facility changed to an outpatient clinic in 1998.

The TRICARE health facility (Building 5803), is a 3,100 ft² one-story structure that was built in 1995. The TRICARE facility is used for other clinic administrative functions such as insurance processing and work space for nurses. These functions will be moved to the existing clinic in February 2005 so Building 5803 can be used as swing space during on-going structural repair to Building 5801.

From an aesthetic standpoint, both the interior and exterior of the existing facilities are generally in good condition. However, through normal age and use, the original infrastructure has deteriorated and is in relative disrepair. There have been upgrades to the cosmetic aspects of the facilities, and the configuration of the first floor has been modified substantially in some areas, but the second and third floor configurations have not been modified despite numerous functional changes. There have been some upgrades to the building systems over the years, but there are still infrastructure code and criteria deficiencies, including life safety, accessibility, mechanical, and electrical. The roof is generally in good condition, but has recently undergone repairs due to tornado damage.

The existing medical facility is generally adequate in size and conveniently located close to a Base gate, military family housing, and unaccompanied military personnel barracks. Parking is well distributed around the entire clinic. Access to the many separate clinical entrances created as a result of the numerous additions over the years is convenient; however, some parking is in violation of Anti-Terrorism/Force Protection (AT/FP) criteria.

Pursuant to National Environmental Policy Act (NEPA) guidance, 32 Code of Federal Regulations 989 (Air Force Environmental Impact Analysis Process), and other applicable

regulations, the Air Force completed an EA of the potential environmental consequences of the No Action Alternative, Proposed Action, and Alternative Action.

NO ACTION ALTERNATIVE

Replacement of the medical clinic (Building 5801) will not be accomplished. Severe cracks in the columns, tiles, and brick façade will continue to affect the structural integrity of the building. These major structural issues will render the existing medical clinic unsuitable for use and will result in the closure of the facility if a new medical clinic is not constructed.

PROPOSED ACTION

Under the Proposed Action, a new medical clinic would be constructed to the east of the existing medical facility as early as 2008 or 2009. Some existing parking would need to be demolished to allow construction of the new medical clinic. The new facility would replace the existing facility and would result in the demolition of the Central Plant (Building 5802). Existing parking area would be utilized for the new medical clinic. The Central Plant contains both chillers and boilers and serves the existing medical clinic as well as other surrounding buildings near Buildings 5801 and 5802. Energy used to operate the boilers originates from diesel fuel stored in an underground storage tank. The Central Plant is a 2,580 ft² one-story structure and would be decentralized from the central heating and cooling system upon completion of the new medical clinic. The Proposed Action also includes a new 7,564 ft² 507th Medical Squadron Building and retains the existing War Readiness Materials (WRM) warehouse.

The new medical clinic would be approximately 167,000 ft² in size and would house doctor offices, exam and treatment rooms, laboratories, radiology, pharmacy, dental clinic, conference and training rooms, computer rooms and storage areas. Energy to operate the new boilers would include a combination of diesel fuel, stored in an above ground storage tank, and natural gas. Demolition of the existing medical clinic would include demolishing approximately 184,000 ft² of structures and associated parking areas. Upon completion of the new facilities, the existing medical clinic and TRICARE facility (Building 5803) would be demolished.

ALTERNATIVE ACTION

Under the Alternative Action, a new medical facility, approximately 172,000 ft² in size would be constructed as early as 2008 or 2009 in the open land area northeast of the Gott Gate. The facility would be similar in function and layout to the facility described under the Proposed Action. Earthwork would be planned and conducted in such a manner to minimize the duration of exposure of unprotected soil. Grass and other landscaping would be reestablished in the disturbed areas immediately after completion of construction, thereby reducing the potential for erosion. The 507th Medical Reserve Unit would also be located in the vicinity of the Alternative Action in a separate facility. The Central Plant (Building 5802) would remain to serve the non-medical facilities it currently serves. The WRM warehouse and TRICARE facility (Building 5803) would be turned over to the Base for other non-medical uses (Tinker AFB, 2005). Upon construction of the new medical clinic, the existing medical clinic facility would be demolished.

SUMMARY OF FINDINGS

The following paragraphs summarize the findings of the attached EA for the No Action Alternative, Proposed Action, and Alternative Action. Based on review of the EA, the government has determined that the Alternative Action is the Preferred Alternative.

EVALUATION OF THE NO ACTION ALTERNATIVE

Under the No Action Alternative, the existing medical clinic will operate past the anticipated life for the structure. Severe cracks in the columns, tiles, and brick façade will continue to affect the structural integrity of the building. These major structural issues will render the existing medical unsuitable for use and will result in the closure of the clinic if a new medical clinic is not constructed.

EVALUATION OF THE PROPOSED ACTION

Noise. Demolition and construction equipment noise will be intermittent, short-term in duration, and restricted to daytime. Outdoor noise from equipment operation at a nearby residence could be as high as 71 to 85 decibels (dB) at 100 feet from the equipment. Speech disruption and annoyance will be temporary, lasting only as long as the noise-producing event.

Land Use. The land on which the Proposed Action will occur will continue to be categorized as medical and industrial.

Air Quality. The greatest annual emissions for any of the criteria air pollutants will be 18.55 tons per year (tpy) for PM₁₀, which equates to less than 0.0133 percent of the baseline emissions within the air quality control region (AQCR). The emissions from construction activities are temporary and non-recurring in nature and are therefore not considered to be a major source of emissions. A conformity determination is not required. The AQCR is in attainment for all criteria pollutants.

Infrastructure and Utilities. No substantial increases in the demands on utility systems would result from the Proposed Action. No additional capacity or new facilities will be required under the Proposed Action. The change in impervious cover from the Proposed Action will be offset by the demolition of the existing medical clinic. No significant degradation of runoff is anticipated.

Biological Resources. Changes to wetland areas, loss of habitat for a plant or animal species or interference with wildlife movement or reproductive behavior will not result from the Proposed Action. An increase of impervious cover will not occur within a floodplain.

Water and Groundwater Resources. The Proposed Action will not impact any surface water bodies or groundwater resources.

Earth Resources. No change in topography or alteration of soil will occur under the Proposed Action. A substantial increase in erosion is not anticipated.

Solid Waste Management. Disposal of solid waste from the demolition activity in the Proposed Action equates to about 0.2 percent of the remaining capacity of the landfill.

Hazardous Materials and Hazardous Wastes Management. There are no Environmental Restoration Program (ERP) sites located in the area of the Proposed Action. Contractors will be required to use and store hazardous materials in accordance with the Base procedures. Any hazardous waste generated will be handled in accordance with all federal, state, and local laws and regulations. Demolition of the existing medical clinic will require adherence to Tinker AFB's Asbestos Management Plan. Lead based paint in the existing facility will be disposed of as demolition debris.

EVALUATION OF THE ALTERNATIVE ACTION

Noise. Demolition and construction equipment noise will be intermittent, short-term in duration, and restricted to daytime. No sensitive receptors are in the area.

Land Use. The land on which the Alternative Action will occur will be recategorized from open space to medical and industrial.

Air Quality. The greatest annual emissions for any of the criteria air pollutants will be 50.24 tons per year (tpy) for PM₁₀, which equates to less than 0.035 percent of the baseline emissions within the AQCR. The emissions from construction activities are temporary and non-recurring in nature and are therefore not considered to be a major source of emissions. A conformity determination is not required. The AQCR is in attainment for all criteria pollutants.

Infrastructure and Utilities. An increase in the demand on the electrical system will result from the Alternative Action. Additional capacity from a new substation will be required under the Alternative Action. A change from grassland conditions to impervious cover will result from the Alternative Action. No significant degradation of runoff is anticipated as storm water best management practices will be followed.

Biological Resources. The land on which the Alternative Action will be located is currently categorized as habitat for the Texas horned lizard, a sensitive species. Construction of the new medical facility in the South Forty area will likely reduce the current distribution range of the Texas horned lizard on Tinker AFB. The Alternative Action site would require a mitigation plan for the Texas Horned Lizard. The following issues would meet mitigation requirements concerning the Texas Horned Lizard; a) Habitat replacement would be required at a cost of approximately \$2,000 per acre. b) A pre-survey would be performed. The funding must be supplied 2 years in advance of project for survey requirements. The estimated cost to complete the Pre-survey would be approximately \$20,000. c) Procedures for pre-construction site searches and lizard encounters along with movement/relocation of lizards would be followed. This plan must specify what these cost are and how they will be supplied and timing prior to construction of the project.

Water and Groundwater Resources. A substantial increase in runoff to Redbud Pond and Beaver Pond will occur from the increase in impervious cover associated with the construction of the Alternative Action. Mitigation to water bodies would include erosion control measures and best management practices detailed in the construction contractor's Storm Water Pollution Prevention Plan.

Earth Resources. The Alternative Action will result in a substantial change in topography. Additional fill material will be required as the topography varies in elevation by up to 20 feet and the site will require considerable filling, grading, and hauling activities to change the surface to allow for proper construction. The change in topography will result in a change in runoff patterns at the site.

Solid Waste Management. Disposal of solid waste from the demolition activity in the Alternative Action equates to about 0.2 percent of the remaining capacity of the landfill.

Hazardous Materials and Hazardous Wastes Management. It is estimated that subsurface disturbance for construction of the new medical clinic would occur at depths no greater than 10 feet below the ground surface. Based on widespread soil sampling done at Tinker it is highly unlikely that any solvent type contaminants would remain in the shallow surface (including up to 10 foot depth for the excavation) due to volatilization of the organics and there is no known history of disposal at the site. Vapor intrusion, although always a possibility above a groundwater plume is also highly unlikely due to the depth to contaminated groundwater (USZ around 60 feet deep), the clayey nature of overlying Hennessey Group sediments, and the relatively low volatile organic concentrations in the groundwater under the site. Desiccation cracks (fractures) generally extend downward for only 30 feet or so, and therefore there is a very limited pathway to get vapors to the surface. Finally, an extraction and treatment system (Pump

and Treat) is operating in the area with extraction wells both up gradient and down gradient of the Alternative Action location, and there are additional plans to further remediate the source of the groundwater contamination. Groundwater contaminant levels are expected to decrease over time. Contractors will be required to use and store hazardous materials in accordance with the Base procedures. Any hazardous waste generated will be handled in accordance with all federal, state, and local laws and regulations. Demolition of the existing medical clinic will require adherence to Tinker AFB's Asbestos Management Plan. Lead based paint in the existing facility will be disposed of as demolition debris.

ENVIRONMENTAL JUSTICE

Activities associated with the No Action Alternative, Proposed Action, and Alternative Action, will not impose adverse environmental effects on adjacent populations. Therefore, no disproportionately high and adverse effects will occur to minority and low-income populations.

DECISION

Based on my review of the facts and analyses contained in the attached EA which is incorporated by reference, I conclude that implementation of the Alternative Action (Preferred Alternative) will not have a significant impact either by itself or when considering cumulative impacts. Accordingly, requirements of NEPA, regulations promulgated by the Council on Environmental Quality, and 32 CFR 989 are fulfilled and an environmental impact statement is not required.



Joan M. Cunningham, Colonel, USAF
Chairperson, Environmental, Safety, and
Occupational Health Council


Date

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ENVIRONMENTAL ASSESSMENT FOR REPLACEMENT OF MEDICAL CLINIC

Tinker Air Force Base, Oklahoma

Prepared for:

**Air Force Center for Environmental Excellence
Brooks City-Base, Texas
Contract F41624-03-D-8613, Task Order 0068**

and

**Department of the Air Force
Air Force Materiel Command
Oklahoma City Air Logistics Center**

Tinker Air Force Base, Oklahoma

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September 2005



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COVER SHEET

Environmental Assessment Replacement of Medical Clinic

Responsible Agency: Department of the Air Force, Air Force Materiel Command, Tinker Air Force Base, Oklahoma County, Oklahoma.

Alternative Action (Preferred Action): Under the Alternative Action, a new medical facility, approximately 172,000 ft² in size would be constructed as early as 2008 or 2009 in the open land area north east of the Gott Gate (See Figure 1-2). The facility would be similar in function and layout to the facility described under the Proposed Action. Earthwork would be planned and conducted in such a manner to minimize the duration of exposure of unprotected soil. Grass and other landscaping would be reestablished in the disturbed areas immediately after completion of construction, thereby reducing the potential for erosion. The 507th Medical Reserve Unit would also be located in the vicinity of the Alternative Action in a separate facility. The Central Plant (Building 5802) would remain to serve the non-medical facilities it currently serves. The WRM warehouse and TRICARE facility (Building 5803) would be turned over to the Base for other non-medical uses. (Tinker AFB, 2005). Upon construction of the new medical clinic, the existing medical clinic facility would be demolished. The 5.5 acre site would be revegetated and restored for future use. Table 2-2 represents facilities associated with the Alternative Action, facility size in square footage, and the total amount of impervious cover change affected by each facility. For impact analysis purposes, acreage disturbed is used for air quality analysis and impervious cover is used storm water management analysis.

Written Comments and inquiries regarding this document should be directed to: Mr. Tim Taylor, OC-ALC/EMOE, 7701 Arnold Street, Ste 109, Tinker AFB, Oklahoma 73145-9100, (405) 739-7062, email: Tim.Taylor@Tinker.af.mil.

Report Designation: Environmental Assessment (EA).

Abstract: The purpose of the Preferred Action is to construct a medical facility on Tinker AFB to correct deficiencies that exist by operating the current facility which has exceeded its original design and construction life expectancy of 50 years. Through normal age and use of the current facility, the infrastructure has deteriorated and is in relative disrepair. Waiting rooms and other service conditions are overcrowded and substandard because the facility does not meet the need of a modern outpatient facility required for the military and retirement community. The new facility would correct deficiencies because it would include doctor offices, exam and treatment rooms, laboratories, radiology, pharmacy, dental clinic, conference and training rooms, computer rooms and storage areas. It would also include space for the 507th Medical Reserve Unit.

The structure of the existing Medical Clinic is in disrepair and is functionally not meeting the requirements of a modern outpatient care facility. According to a structural analysis and independent study of the Medical Clinic, the building's structural problems are due to design flaws. The existing clinic has many structural, plumbing, electrical,

mechanical, and life safety issues. Numerous code violations also exist in the existing Medical Clinic and are cost prohibitive to update or repair. Due to these facility shortfalls, patients must endure lengthy waits in overcrowded waiting rooms to receive care in substandard examination rooms. The new facility must be conveniently located to serve the military populace, provide adequate parking, meet Anti-Terrorism/Force Protection (ATF) criteria, be compatible with current land use plans and policies, and not subject to potential hazards from other facilities and operations on the installation.

This EA evaluates the No Action Alternative, Proposed Action, and Alternative Action (Preferred Action). Under the No Action Alternative, the existing medical facility would not be replaced. Under the Proposed Action, the new medical clinic would be constructed east of the current Medical Clinic. The old Medical Clinic as well as the central heat plant and the TRICARE facility (Building 5803) would be demolished after construction. A new parking lot meeting AT/FP criteria would be built on land where the old Medical Clinic stood. Under the Alternative Action, the new medical facility would be constructed near the Gott Gate. The Central Plant and the TRICARE facility (Building 5803) will remain after the existing Clinic is demolished. A new parking lot meeting AT/FP criteria would be built on land where the old Medical Clinic stood, and roads leading to the new facility would be widened to four lanes.

Resources considered in the impact analysis were noise, land use, air quality, biological resources, socioeconomic resources, infrastructure and utilities (including storm water management and transportation), earth resources, installation restoration sites, water and groundwater resources, and hazardous materials and hazardous waste management. Under the No Action Alternative, temporary construction activity would not correct the major structural issues forcing the Base to shut down the clinic. No significant impacts would result from the Proposed Action or Alternative Action, nor would there be any cumulative impacts from Other Actions.

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ACRONYMS AND ABBREVIATIONS

$\mu\text{g}/\text{m}^3$	Micrograms per cubic meter
ACM	Asbestos-containing material
AFB	Air Force Base
AFMC	Air Force Materiel Command
AFR	Air Force regulation
AICUZ	Air Installations Compatible Use Zones
AMP	Asbestos management program
AQCR	Air quality control region
AT/FP	Anti-terrorism/force protection
BX	Base exchange
CAA	Clean Air Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CO	Carbon monoxide
CY	Calendar year
dB	Decibel
dBA	A-weighted sound level measured in decibels
DNL	Day-night average sound level
DoD	Department of Defense
EA	Environmental Assessment
EIS	Environmental Impact Statement
EMGIS	Environmental Management Geographic Information System
EMCO	Environmental Compliance Operations Branch
EO	Executive Order
ERP	Environmental Restoration Program
ESOH	Environmental Safety and Occupational Health
FICON	Federal Interagency Committee on Urban Noise
FONSI	Finding of No Significant Impact
ft^2	Square feet
HPP	Hazmat Pharmacy Program
HWBZ	Hennessey water-bearing zone
LBP	Lead-based paint
LLSZ	Lower lower saturated zone
LSZ	Lower saturated zone
MCL	Maximum contaminant level

msl	Mean sea level
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NO ₂	Nitrogen dioxide
O ₃	Ozone
OC-ALC	Oklahoma City - Air Logistics Command
PCB	Polychlorinated biphenyl
PM ₁₀	Particulate matter with an aerodynamic diameter less than or equal to 10 micrometers
PM _{2.5}	Particulate matter with an aerodynamic diameter less than or equal to 2.5 micrometers
ppm	Parts per million
PZ	Production zone
ROI	Region of influence
SEL	Sound exposure level
SO ₂	Sulfur dioxide
SO _x	Sulfur oxides measured as sulfur dioxide
TCE	Trichloroethene
the Base	Tinker AFB
TPWD	Texas Parks and Wildlife Department
tpy	Tons per year
USDA NRCS	U.S. Department of Agriculture - National Resource Conservation Service
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USZ	Upper saturated zone
VOQ	Visiting officers quarters
WMA	Wildlife management area
WRM	War readiness materials

CHAPTER 1 PURPOSE OF AND NEED FOR ACTION

This chapter discusses: background; a statement of the purpose and need for the action; the location of the action; a statement of the decision to be made; objective of the action, and a summary of the scope of the environmental review.

1.1 BACKGROUND

Tinker Air Force Base (AFB) is located in Oklahoma County in the southeastern city limits of Oklahoma City, Oklahoma. Tinker AFB (the Base) covers more than 5,000 acres adjacent to Midwest City to the north and Del City to the west. Oklahoma City is served by Interstate Highways 35, 40, and 44. Figure 1-1 shows the location of Tinker AFB and the surrounding area.

The current medical clinic (Building 5801) was constructed in 1957 with a life expectancy of approximately 50 years. A construction project in 1978 more than doubled the size of the original first floor with significant additions that wrap around the original structure on the west, south, and east sides. A project for three more additions was completed in the early 1990s with additions to the southwest corner, just east of the south wing of the original structure, and south of the warehouse. A Pharmacy Annex with a drive-up window was subsequently added to the north side of the facility in the early 2000s, and another small pharmacy expansion is currently under design. No additions or significant changes from the original 1957 construction have occurred to the second or third floors. The main building contains 184,156 square feet (ft²) including the additions. This facility, originally built for in-patient care, was changed to an out-patient clinic in 1998.

The TRICARE facility (Building 5803), is a 3,100 ft² one-story structure that was built in 1995. The TRICARE facility is used for other clinic administrative functions such as insurance processing and work space for nurses. These functions were moved to the existing clinic in February 2005 so Building 5803 can be used as swing space during structural repair periods to the current Medical Clinic.

From an aesthetic standpoint, the interior and exterior of the current Medical Clinic are generally in good condition; however, through normal age and use, the original infrastructure has deteriorated and is in relative disrepair. There have been upgrades to the cosmetic aspects of the facilities, and the configuration of the first floor has been modified significantly in some areas, but the second and third floor configurations have not been modified despite numerous functional changes. There have been some upgrades to the building systems over the years, but there are still infrastructure code and criteria deficiencies, including life safety, accessibility, mechanical, and electrical. The roof is generally in good condition, but has recently undergone repairs due to tornado damage.

The existing Medical Clinic is generally adequate in size and is conveniently located close to a Base gate, military family housing, and dormitories for unaccompanied military personnel. Access is convenient to the many separate clinical entrances created as a result of the numerous additions over the years. Parking is well distributed around the

entire Medical Clinic; however, some of the parking is in violation of Anti-Terrorism/Force Protection (AT/FP) criteria.

1.2 PURPOSE AND NEED FOR ACTION

The purpose of this action is to construct a medical facility to correct deficiencies that exist in the current Medical Clinic which has exceeded its original design and construction life expectancy of 50 years. The infrastructure of the Medical Clinic has deteriorated and is in relative disrepair due to normal aging and use. The Medical Clinic was originally built as an in-patient facility, so waiting rooms and other service areas are overcrowded and inadequate for use as a modern out-patient facility. The new facility would correct deficiencies because it would include doctor offices, examination and treatment rooms, laboratories, radiology, pharmacy, dental clinic, conference and training rooms, computer rooms and storage areas. It would also include space for the 507th Medical Reserve Unit.

The structure of the existing Medical Clinic is in disrepair and is functionally not meeting the requirements of a modern outpatient care facility. A recent structural evaluation of the clinic concluded the facility has a flawed structural design resulting in severe cracking through structural columns, structural tiles, and the brick facade. This condition can be stabilized but not corrected. From a risk management perspective it is unwise to continue to occupy the building longer than absolutely necessary, and certainly no more than five years, due to the risk of catastrophic building collapse in an earthquake or tornado. The existing clinic has many structural, plumbing, electrical, mechanical, and life safety issues. Numerous code violations exist in the existing Medical Clinic that are cost prohibitive to update or repair. Due to these shortfalls, patients in the current Medical Clinic endure lengthy waits in over crowded waiting rooms to receive care in substandard examination rooms. The new facility must be conveniently located to serve the military populace, provide adequate parking, meet ATF criteria, be compatible with current land use plans and policies, and not subject to potential hazards from other facilities and operations on the installation.

1.3 OBJECTIVE OF THE ACTION

The objective of the action is to construct a new medical clinic and demolish the existing Medical Clinic, central plant (Building 5802) that provides heat to the Medical Clinic and other nearby facilities, and the TRICARE facility (Building 5803).

1.4 LOCATION OF THE PROPOSED ACTION

The new medical clinic would be located immediately to the east of the existing clinic. This location is bound to the north by Arnold Street, to the east by McNarney Avenue and to the west by Doolittle Avenue. The Twining Fields portion of the 5000 area of the military family housing complex is situated to the south. Parking areas would be constructed at the location of the existing clinic and in open land situated on the southwest corner of Arnold Street and McNarney Avenue. The location of the Proposed Action site is shown in figure 1-2.

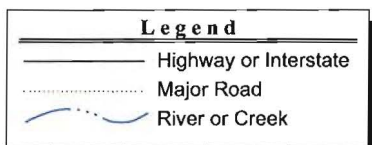
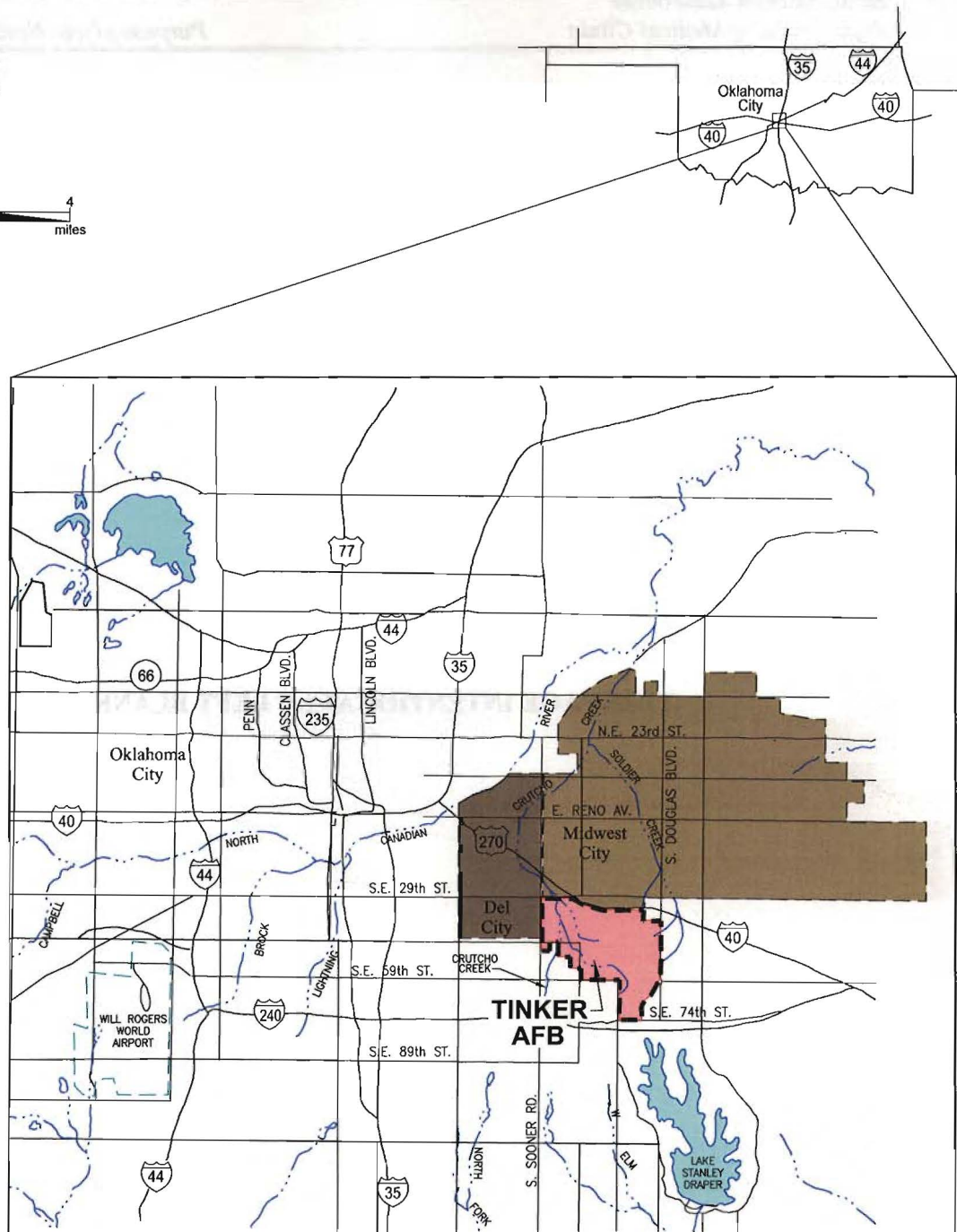
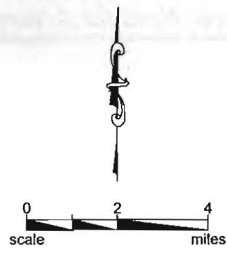


Figure 1-1

Site Vicinity Map

Tinker AFB, Oklahoma

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Figure 1-2

Location of Proposed Action and
Alternative Action Sites

Tinker AFB, Oklahoma

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1.5 DECISION TO BE MADE

The decision to be made by the Chairman of the Environmental, Safety, and Occupational Health (ESOH) Council at Tinker AFB is whether to:

- Take no action (No Action Alternative);
- Construct a new medical facility east of the existing Medical Clinic and a new 507th Medical Squadron facility; upon completion of construction, demolish the existing Medical Clinic, central heat plant (Building 5802), and the TRICARE facility (Building 5803) as well as upgrade the existing parking lot and construct additional parking areas (Proposed Action); or
- Construct a new medical facility and new 507th Medical Squadron facility near the Gott Gate. Upon construction of the new medical clinic, the existing medical clinic facility would be demolished. The 5.5 acre site would be revegetated and restored for future use. The Central Plant and the TRICARE facility (Building 5803) will remain after the existing Clinic is demolished.

1.6 SCOPE OF THE ENVIRONMENTAL REVIEW

The *National Environmental Policy Act* (NEPA) of 1969, as amended, requires federal agencies to consider environmental consequences in the decision-making process. The President's Council on Environmental Quality (CEQ) issued regulations to implement NEPA. The Air Force Environmental Impact Analysis Process is accomplished through adherence to the procedures set forth in CEQ regulations (40 Code of Federal Regulations [CFR] Sections 1500-1508) and 32 CFR 989 (*Air Force Environmental Impact Analysis Process*), 15 Jul 99, and amended 28 Mar 01. These federal regulations establish both the administrative process and substantive scope of the environmental impact evaluation designed to ensure that deciding authorities have a proper understanding of the potential environmental consequences of a contemplated course of action. The CEQ regulations require that an environmental assessment (EA):

- Briefly provide sufficient evidence and analysis to determine whether an environmental impact statement (EIS) or Finding of No Significant Impact (FONSI) should be prepared;
- Aid in agency's compliance with NEPA when an EIS is unnecessary; or
- Facilitate preparation of an EIS, when required.

This EA will assess the potential environmental impacts related to the replacement of the Medical Clinic. The EA will identify, describe, and evaluate the potential environmental impacts that may result from implementation of the No Action Alternative, Proposed Action, and Alternative Action, as well as possible cumulative impacts from other actions planned for the Base. The EA will also identify required environmental permits relevant to the Proposed Action. As appropriate, the affected environment and environmental consequences of the No Action Alternative, Proposed Action, and Alternative Action may be described in terms of site-specific descriptions or

regional overview. Finally, the EA will identify mitigation measures to prevent or minimize environmental impacts, if required.

The following environmental resources were identified to assess the potential environmental impacts at Tinker AFB: noise; land use; air quality; infrastructure and utilities (including energy, storm water management, and transportation); biological resources (including vegetation and wildlife, threatened and endangered species, and wetlands); water and groundwater resources, earth resources (including geology, topography, and soil); hazardous materials and hazardous waste management, (including asbestos containing materials [ACM], lead-based paint [LBP], and pesticides); environmental restoration program (ERP) sites; solid waste management and cultural resources (including historic and archaeological).

The baseline conditions used for the environmental evaluation in this EA are assumed to be calendar year (CY) 2004. However, if CY04 data are not available, the most recent information will be used. Baseline conditions correspond to the designation of the affected environment for the No Action Alternative. A region of influence (ROI) will be established for each resource area affected by the No Action Alternative, Proposed Action, and the Alternative Action. The ROI determines the geographical area to be addressed as the affected environment. Although the Base boundary may constitute the ROI limit for some resources, potential impacts associated with some resources extend beyond the Base boundary.

1.7 RESOURCES NOT CONSIDERED IN THIS ENVIRONMENTAL ASSESSMENT

The areas where the Proposed Action or Alternative Action would take place at Tinker AFB have had extensive surface disturbance that most likely would have exposed and disturbed any sites that may have been of historical significance or there is a low potential for archaeological remains based on previous archeological surveys. The construction activities associated with the Proposed Action or Alternative Action would occur in an area of the Base that has been disturbed by previous activities such as construction of roads, buildings, and fences. However, if any suspected archaeological sites are encountered during a project, the contractor must protect the site in place and report the discovery to the government. According to Tinker AFB personnel, no adverse effects to archaeological or historical resources would be anticipated from the Proposed Action or Alternative Action activities at Tinker AFB (Taylor 2005). Therefore, cultural resources will not be analyzed further in this EA.

The Proposed Action and Alternative Action would require no changes in, water consumption (only for dust suppression during construction), natural gas usage, and wastewater generation during construction of the new medical facility or after the action is complete. For these reasons, water consumption, natural gas usage, and wastewater generation, which are typically included in infrastructure and utilities, will not be analyzed further in this EA. The Proposed Action and the Alternative Action would not occur in the 100 year floodplain. For this reason, floodplains will not be analyzed further in this EA.

Safety and health impacts arising from construction and maintenance of the facilities will not be evaluated, as contractors would be responsible for compliance with applicable Occupational Safety and Health Act regulations specifying appropriate protective measures for all employees. Polychlorinated biphenyls (PCB) will not be evaluated, as Tinker AFB is a PCB-free facility (Mowad 2003). Radon will also not be evaluated, as radon emissions testing indicated radon concentrations at the Base were well below the United States Environmental Protection Agency (USEPA) action level of 4.0 picoCuries per liter (Tinker AFB 2003).

No long-term changes would be anticipated to area population, housing requirements, school enrollment, or economic factors (*i.e.*, sales volume, income, or employment) because no changes in Air Force personnel assignments would be attributable to the Proposed Action or Alternative Action. It is assumed that the local labor pool is more than sufficient to supply the necessary labor for the project construction. Thus, there would be no short-term impacts to area population, housing requirements, or school enrollment. For these reasons, no socioeconomic impacts would be anticipated, and socioeconomic resources will not be analyzed further in this EA.

1.8 ENVIRONMENTAL JUSTICE

Executive Order (EO) 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, was issued by the President on February 11, 1994. In the EO, the President instructed each federal agency to make “achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations.” Adverse is defined by the Federal Interagency Working Group on environmental justice as “having a deleterious effect on human health or the environment that is significant, unacceptable, or above generally accepted norms.” Based on analysis of impacts, a determination on significance of impacts will be made. If impacts would be significant, the Air Force would either prepare an EIS or not implement the proposal. Accordingly, environmental justice will be addressed either in a FONSI (after determination on significance of impacts) or in a Record of Decision based on an EIS.

1.9 APPLICABLE REGULATORY REQUIREMENTS

Additional permits and amendments to existing permits may be required by the Proposed Action and Alternative Action. It would be the construction contractor’s responsibility to ensure permits are identified and obtained from Base, local, state, and federal agencies. Tinker AFB would coordinate permit requirements identified by the construction contractor during the project. The contractor would ensure that a storm water pollution prevention plan and other applicable construction permits are completed and approved before initiating construction activities.

1.10 ORGANIZATION OF THE DOCUMENT

This EA is organized into seven chapters.

- Chapter 1* Contains an introduction, a statement of the purpose and need for the action and objective, location of the action, a statement of the decision that must be made, scope of the environmental review, presentation of the applicable regulatory requirements, and organization of the EA.
- Chapter 2* Contains the formulation of the alternatives, describes the alternatives considered but eliminated from further consideration, details the No Action Alternative, Proposed Action, and Alternative Action, presents other actions announced for the Base, and summarizes the environmental impacts for all alternatives.
- Chapter 3* Contains a general description of the biophysical resources and baseline conditions that potentially could be affected by the No Action Alternative, Proposed Action, and Alternative Action.
- Chapter 4* Discusses the environmental consequences, mitigation requirements, and cumulative impacts of the No Action Alternative, Proposed Action, and Alternative Action.
- Chapter 5* Lists preparers of this document.
- Chapter 6* Lists the persons and agencies consulted in preparation of this EA.
- Chapter 7* Lists the sources of the information used in preparation of this EA.
- Appendix A* Interagency and Intergovernmental Correspondence for Environmental Planning

CHAPTER 2 DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

This chapter discusses the following: alternatives development; identification of alternatives eliminated from further consideration; a detailed description of the No Action Alternative, Proposed Action, and Alternative Action; a description of the other actions; and a summary of impacts anticipated for Tinker AFB during the time period associated with replacement of the medical clinic.

2.1 FORMULATION OF ALTERNATIVES

Tinker AFB manages an ongoing planning process that evaluates how well existing facilities, infrastructure, and land use meet mission requirements. This evaluation process also considers long-term land use to meet expected future requirements. When a facility no longer meets the mission, or it becomes apparent there will be a future insufficiency, multiple options are explored to resolve the deficiency.

Once a facility is identified as not satisfying the functional needs of its mission, the Base planning process is used to determine how best to resolve the deficiency. This process includes development of a Proposed Action and other Alternative Actions that consider issues such as the need for the facility, where the facility should be located to best accomplish the mission, what is the need date to ensure there is no degradation of the mission, and what is the most cost effective and efficient manner to complete and operate the facility.

2.2 ALTERNATIVES ELIMINATED FROM FURTHER CONSIDERATION

Tinker AFB planning personnel considered other alternatives for replacement of the medical facility, but eliminated them from further consideration. A new facility construction was considered for the area northwest of the Gott Gate, but was eliminated due to this area already being designated for the upcoming military housing privatization project.

2.3 DESCRIPTION OF THE PROPOSED ALTERNATIVES

2.3.1 No Action Alternative

Under the No Action Alternative, the existing medical clinic would not be replaced. The building would continue to have infrastructure code and criteria deficiencies to include life safety, accessibility, structural, plumbing, electrical, and mechanical. The existing facility is functionally inadequate for employees and patients. Numerous structural failures have been recently identified at the clinic and subsequent investigations and analyses recommend replacement as soon as possible (Zahl-Ford, Inc. 2004). Code violations would continue to persist and the facility would be operating outside the life expectancy for the structure and the Base would be forced to shut down the clinic.

2.3.2 Description of the Proposed Action

Under the Proposed Action, a new medical clinic would be constructed to the east of the existing medical facility (Buildings 5800, 5801, 5802, 5803, 5808, and 5810) as early as 2008 or 2009 (see Figure 1-2). Some existing parking would need to be demolished to allow construction of the new medical clinic. The new facility would replace the existing facility and would result in the demolition of the Central Plant (Building 5802). Existing parking area would be utilized for the new medical clinic. The Central Plant contains both chillers and boilers and serves the existing medical clinic as well as other surrounding buildings near Buildings 5801 and 5802. Energy used to operate the boilers originates from diesel fuel stored in an underground storage tank. The Central Plant is a 2,580 ft² one-story structure and would be decentralized from the central heating and cooling system upon completion of the new medical clinic. The Proposed Action also includes a new 7,564 ft² 507th Medical Squadron Building and retains the existing WRM warehouse (Building 5800).

The new medical clinic would be approximately 167,000 ft² in size and would house doctor offices, exam and treatment rooms, laboratories, radiology, pharmacy, dental clinic, conference and training rooms, computer rooms and storage areas. Energy to operate the new boilers would include a combination of diesel fuel, stored in an above ground storage tank, and natural gas. Demolition of the existing medical clinic would include demolishing approximately 184,000 ft² of structures and associated parking areas. Upon completion of the new facilities, the existing medical clinic and TRICARE facility (Building 5803) would be demolished. Table 2-1 represents facilities associated with the Proposed Action, each facilities size in square footage, and the total amount of impervious cover change affected by each facility. For impact analysis purposes, acreage disturbed is used for air quality analysis and impervious cover is used storm water management analysis.

Table 2-1 Facilities Associated with the Proposed Action

Facility	Size (ft ²)	Acres	Impervious Cover Change (acres)
Construct Medical Clinic	167,000	4.9	+ 4.9
Construct 507th Medical Squadron	7,564	0.2	+ 0.2
Demolish Central Plant	2,580	0.1	- 0.1
Demolish TRICARE Facility	3,100	0.1	-0.1
Demolish Existing Medical Clinic	184,156	5.5	-5.5
	Total 364,400	Total 10.8	Net Change -0.6

2.3.3 Description of the Alternative Action

Under the Alternative Action, a new medical facility, approximately 172,000 ft² in size would be constructed as early as 2008 or 2009 in the open land area north east of the Gott Gate (See Figure 1-2). The facility would be similar in function and layout to the facility described under the Proposed Action. Earthwork would be planned and

conducted in such a manner to minimize the duration of exposure of unprotected soil. Grass and other landscaping would be reestablished in the disturbed areas immediately after completion of construction, thereby reducing the potential for erosion. The 507th Medical Reserve Unit would also be located in the vicinity of the Alternative Action in a separate facility. The Central Plant (Building 5802) would remain to serve the non-medical facilities it currently serves. The WRM warehouse and TRICARE facility (Building 5803) would be turned over to the Base for other non-medical uses. (Tinker AFB, 2005). Upon construction of the new medical clinic, the existing medical clinic facility would be demolished. The 5.5 acre site would be revegetated and restored for future use. Table 2-2 represents facilities associated with the Alternative Action, facility size in square footage, and the total amount of impervious cover change affected by each facility. For impact analysis purposes, acreage disturbed is used for air quality analysis and impervious cover is used storm water management analysis.

Table 2-2 Facilities Associated with the Alternative Action

Facility	Size (ft ²)	Acres	Impervious Cover Change (acres)
Construct Medical Clinic	172,000	5.1	+ 5.1
Construct 507th Medical Squadron	7,564	0.2	+ 0.2
Construct Parking Area	90,000*	2.7	+ 2.7
Demolish Existing Medical Clinic	184,156	5.5	-5.5
	Total 453,720	Total 13.5	Change +2.5

* Estimated Figure

2.4 OTHER ACTIONS ANNOUNCED FOR TINKER AFB

Complete environmental impact analysis of the No Action Alternative, Proposed Action, and Alternative Action must consider cumulative impacts from other actions. A cumulative impact, as defined by the CEQ (40 CFR 1508.7), is the "impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of which agency (federal or non-federal) or person undertakes such actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time."

Several other projects that would occur during the construction period associated with the Proposed Action and Alternative Action are identified in Table 2-3. Additionally, some of the projects are detailed in the Commander's Summary of the General Plan for Tinker AFB (USAF 2004). These actions are not related to the Proposed Action and Alternative Action evaluated in this EA, but are additional actions announced for the Base or the surrounding community. The environmental impacts of these additional actions have or will be analyzed in separate NEPA documents and are addressed in this EA only in the context of potential cumulative impacts, if any.

Table 2.3 Other Actions Considered for Cumulative Impact

Construction Project Title	Estimated Project Start Date	Facility Size Construction (ft ²)	Facility Size Demolition (ft ²)
Actions Planned Near the Proposed Action Location			
New Dormitories	2008	86,400	-
Transient Alert Facilities	2011	50,000	-
Physical Fitness Center	2011	71,544	-
Chapel Care Center Addition	2011	25,000	-
Demolish Visitor Officers Quarters (VOQ)	2011	-	59,394
Construct New VOQs / New Collocated Officers' Club	2011	83,000/72,000	-
Military Family Housing Privatization	2011	TBD*	-
Actions Planned Near the Alternative Location			
Child Development Center	2007	32,936	-
72 Comm/Information Technology Facility	2009	112,000	-
Consolidate Security Forces Squadron	2010	58,000	-
Expand and Upgrade Air Depot Road to a Four-lane Boulevard	2010	TBD	TBD
Substation Six	2008	TBD	TBD
Gott Gate Upgrade	2013	144	-
Military Family Housing Privatization	2011	TBD	-

TBD – To be determined

2.5 COMPARISON OF ENVIRONMENTAL IMPACTS OF ALL ALTERNATIVES

Table 2-4 summarizes the impacts of the Proposed Action and Alternative Action. The No Action Alternative is not included as there is no change from baseline conditions.

Table 2-4 Summary of Environmental Impacts for the Proposed Action and Alternative Action

Resource	Proposed Action	Alternative Action
Noise	<ul style="list-style-type: none"> Noise from demolition and construction activity would be temporary and intermittent. Minor annoyance and speech interpretation may result for people near the construction site. Hearing loss would not occur for any people exposed to construction noise. The primary source of noise throughout and after the project is completed would continue to be aircraft operations. 	<ul style="list-style-type: none"> Noise from demolition and construction activity would be temporary and intermittent. No sensitive receptors are in the area. The primary source of noise throughout and after the project is completed would continue to be aircraft operations.
Biological Resources	<ul style="list-style-type: none"> The construction of the Proposed Action would not substantially change habitat for plant or animal species, nor would they diminish an important plant or animal species. No threatened or endangered species would be adversely affected. No wetlands would be affected. 	<ul style="list-style-type: none"> The construction of the Alternative Action would reduce likely Texas Horned Lizard habitat in the South Forty. No threatened or endangered species would be adversely affected. No wetlands would be affected.

Table 2-4 Summary of Environmental Impacts for the Proposed Action and Alternative Action (continued)

Resource	Proposed Action	Alternative Action
Earth Resources	<ul style="list-style-type: none"> The Proposed Action would not affect topography during construction of the new medical clinic. Soil disturbances would be minimal and occur during the construction phase. A decrease in impervious cover of 0.6 acres. Construction activity would occur within areas in which the soil has been disturbed and modified by prior construction activities. Use of best management practices such as silt fences would minimize erosion during construction. 	<ul style="list-style-type: none"> The Alternative Action would require changes in topography during the construction phase and operational phase of the new medical clinic. Soil disturbances would occur during the construction phase and there would be a increase in impervious cover of approximately 2.5 acres. Construction activity would occur within areas in which the soil has been disturbed and modified by prior construction activities. Use of best management practices such as silt fences would minimize erosion during construction.
Land Use	<ul style="list-style-type: none"> The Proposed Action is in direct correlation with the future land use plan of Tinker AFB. No changes in Land Use would occur due to the Proposed Action. 	<ul style="list-style-type: none"> The Alternative Action is in direct correlation with the future land use plan of Tinker AFB. No changes in Land Use would occur due to the Alternative Action.
Air Quality	<ul style="list-style-type: none"> The greatest annual emissions from Proposed Action activities would be NOx (10.70 tpy), which equates to less than 0.014 percent of the NOx emissions within air quality control region (AQCR) 184. Emissions would be temporary and fall off rapidly with distance from the proposed construction site. A conformity determination would not be required because the AQCR is in attainment for criteria pollutants. 	<ul style="list-style-type: none"> The greatest annual emissions from Proposed Action activities would be PM10 (50.24 tpy), which equates to less than 0.035 percent of the PM10 emissions within air quality control region (AQCR) 184. Emissions would be temporary and fall off rapidly with distance from the proposed construction site. A conformity determination would not be required because the AQCR is in attainment for criteria pollutants.
Infrastructure and Utilities	<ul style="list-style-type: none"> The contractor would ensure a storm water pollution prevention plan is completed and approved prior to initiating construction activities. There would be no change in impervious cover in the vicinity of the action over the baseline conditions after demolition of the existing medical clinic. Electrical costs are expected to be similar to those of the existing medical clinic. Sufficient electrical power is currently obtainable at this site. Transportation to and from the medical clinic would be accomplished through both foot and vehicle traffic. Close proximity to the dormitories would allow military personnel living in these facilities to walk to the medical clinic. The location is convenient to other community facilities located in the area such as the BX, Commissary, Movie Theater, and Chapel. 	<ul style="list-style-type: none"> The contractor would ensure that a storm water pollution prevention plan is completed and approved prior to initiating construction activities. Impervious cover would increase the storm water flow over baseline conditions. Electricity rates are expected to be three times higher than the existing clinic location. The construction of a new substation would reduce these rates. Location of the new medical clinic at this site would require military personnel living in the dormitories to obtain transportation to and from the medical clinic. Transportation to other areas of the Base for off-Base personnel would be less convenient as other community facilities such as the BX and Commissary are located on the opposite side of the Base.
Water and Groundwater Resources	<ul style="list-style-type: none"> No changes from baseline conditions, the new medical clinic would be located in the same general area as the existing medical clinic. 	<ul style="list-style-type: none"> Runoff to two water bodies located in the area would be affected by changes in topography.
Solid Waste	<ul style="list-style-type: none"> Solid waste disposal of demolition material would result in a 2 percent reduction in life expectancy of the landfill. 	<ul style="list-style-type: none"> Same as the Proposed Action.

Table 2-4 Summary of Environmental Impacts for the Proposed Action and Alternative Action (continued)

Resource	Proposed Action	Alternative Action
Hazardous Materials and Hazardous Wastes Management	<ul style="list-style-type: none"> • The contractor would be required to use and store hazardous materials in accordance with Base procedures. • Any hazardous waste generated would be handled in accordance with all federal, Air Force, state, and local laws and regulations. • In the event of a spill of any amount or type of hazardous material or waste, the contractor would take immediate action to contain and clean up the spill. • The existing medical clinic contains both asbestos and lead based paint. Lead based paint can be disposed as construction debris upon demolition of the facility. The asbestos would fall under regulations and guidelines set by the Tinker AFB Asbestos Management Plan. 	<ul style="list-style-type: none"> • The contractor would be required to use and store hazardous materials in accordance with Base procedures. • Any hazardous waste generated would be handled in accordance with all federal, Air Force, state, and local laws and regulations. • In the event of a spill of any amount or type of hazardous material or waste, the contractor would take immediate action to contain and clean up the spill. • The existing medical clinic contains both asbestos and lead based paint. Lead based paint can be disposed of as construction debris upon demolition of the facility. The asbestos would fall under regulations and guidelines set for by the Tinker AFB Asbestos Management Plan. • ERP site CG038 (Groundwater Management Unit 2, Subunit 2E) is located at the Alternative Action site. The subunit is contaminated with trichloroethene (TCE) in the Upper Saturated Zone.

CHAPTER 3 AFFECTED ENVIRONMENT

This chapter describes the existing environmental resources that could be affected by or could affect the No Action Alternative, Proposed Action, and Alternative Action. Only those specific resources relevant to the potential impacts are described in detail.

3.1 MISSION

The mission of Tinker AFB is to provide for the management, storage, and depot maintenance of all components and the end commodity items of all major weapons systems assigned to the Oklahoma City-Air Logistics Command (OC-ALC).

The largest organization at Tinker AFB is the OC-ALC, one of three depot repair centers in the Air Force Materiel Command (AFMC). The OC-ALC reports to AFMC located at Wright-Patterson AFB, Ohio. Tinker AFB is home to several major Department of Defense (DoD), Air Force, and Navy activities with critical national defense missions. The 72nd Air Base Wing is the host organization for the Base and provides operational support for the Base as well as associated off-Base activities. The 72nd Air Base Wing supports the entire installation, providing several critical Base functions, including security, fire protection, medical services, civil engineering, communications, supply, and airfield operations.

3.2 NOISE

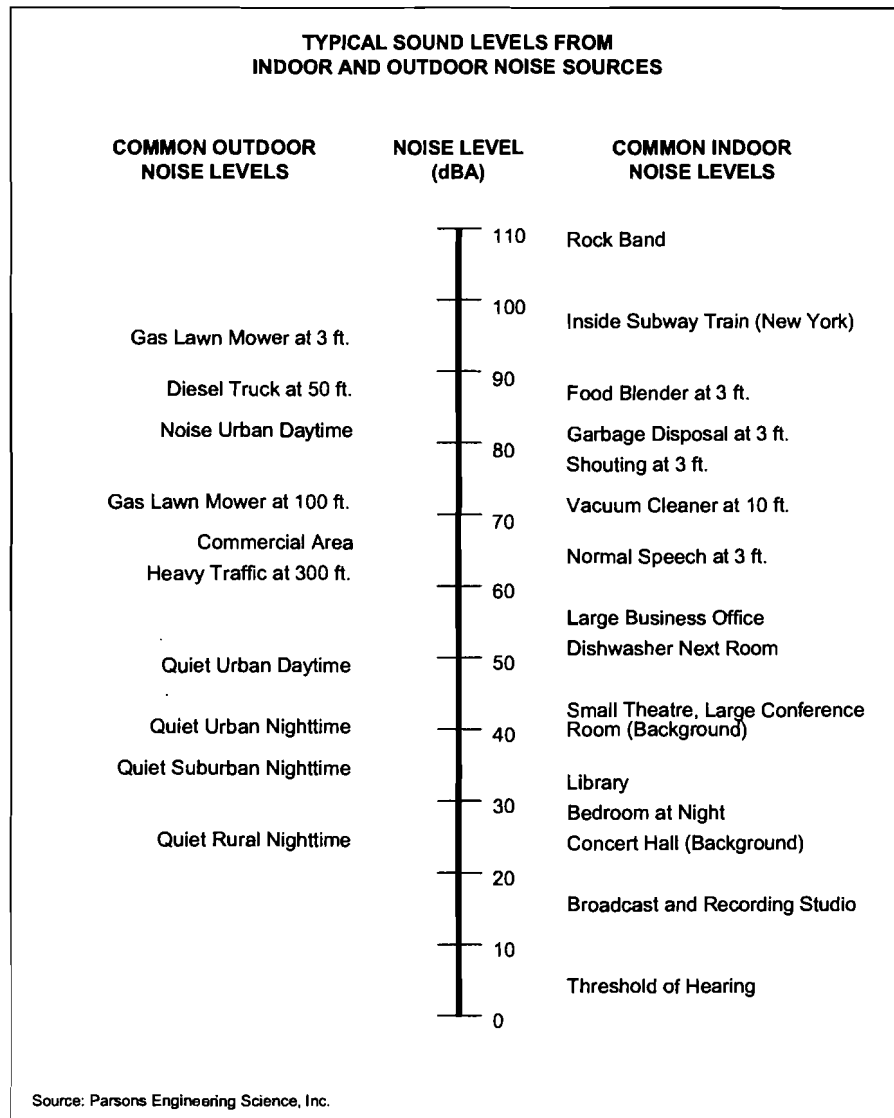
3.2.1 Background Information

The characteristics of sound include parameters such as amplitude (loudness), frequency (pitch), and duration. Sound varies over an extremely large range of amplitudes. The decibel, a logarithmic unit that accounts for the large variations in amplitude, is the accepted standard unit for describing levels of sound.

Different sounds have different frequency contents. Because the human ear is not equally sensitive to sound at all frequencies, a frequency-dependent adjustment, called A-weighting and expressed as dBA, has been devised to measure sound similar to the way the human hearing system responds. The adjustments in amplitude, established by the American National Standards Institute (ANSI 1983), are applied to the frequency content of the sound. Figure 3-1 depicts typical A-weighted sound pressure levels for various sources. For example, 65 dBA is equivalent to normal speech at a distance of 3 feet.

Noise is defined as sound that is undesirable because it interferes with speech and hearing, is intense enough to damage hearing, or is otherwise annoying. Noise levels often change with time. To compare sound levels over different time periods, several descriptors have been developed that take into account this time-varying nature. These descriptors are used to assess and correlate the various impacts of noise on humans.

Figure 3-1 Typical A-Weighted Noise Levels



The DNL metric is a measure of the total community noise environment. DNL is the average A-weighted sound level over a 24-hour period, with a 10 dBA adjustment added to the nighttime levels (between 10:00 p.m. and 7:00 a.m.). This adjustment is an effort to account for increased human sensitivity to nighttime noise events. DNL was endorsed by the United States Environmental Protection Agency (USEPA) for use by federal agencies and has been adopted by the Department of Housing and Urban Development, FAA, and DoD. DNL is an accepted unit for quantifying annoyance to humans by general environmental noise, including aircraft noise. The Federal Interagency Committee on Urban Noise (FICON) developed land use compatibility guidelines for

noise (USDOT 1980). Compatible or incompatible land use is determined by comparing the predicted DNL level at a site with the recommended land uses.

Methods used to quantify the impacts of noise, such as annoyance, speech interference, and health and hearing loss, have undergone extensive scientific development during the past several decades. The most reliable measures are noise-induced annoyance and hearing loss. The impacts of noise exposure are summarized in the following paragraphs.

Annoyance. Noise annoyance is defined by the USEPA as any negative subjective reaction to noise by an individual or group. Table 3-1 presents the results of over a dozen studies of the relationship between noise and annoyance levels. This relationship has been suggested by the National Academy of Sciences (NAS 1977) and was reevaluated (Fidell *et al.* 1988) for use in describing people's reaction to semi-continuous (transportation) noise. These data are shown to provide a perspective on the level of annoyance that might be anticipated.

For example, 15 to 25 percent of persons exposed on a long-term basis to DNL of 65 to 70 dBA would be expected to be highly annoyed by noise events.

Table 3-1 Percentage of Persons Highly Annoyed by Noise Exposure

Noise Exposure Zone (DNL dBA)	Percentage of Persons Highly Annoyed
<65	<15
65-70	15-25
70-75	25-37
75-80	37-52
>80	61

Note: Noise impacts on individuals vary. The "low" numbers above indicate individuals with higher tolerance of noise while the "high" numbers indicate individuals with higher sensitivity to noise.

Source: Adapted from NAS 1977.

Speech Interference. One of the ways noise affects daily life is by prevention or impairment of speech communication. In a noisy environment, understanding speech is diminished when speech signals are masked by intruding noises. Reduced speech intelligibility also may have other impacts. For example, if speech understanding is interrupted, performance may be reduced, annoyance may increase, and learning may be impaired. Elevated noise levels can interfere with speech, causing annoyance or communication difficulties. Based on a variety of studies, DNL 75 dBA indicates a good probability for frequent speech disruption. This level produces ratings of "barely acceptable" for intelligibility of spoken material. Increasing the level of noise to 80 dB reduces the intelligibility to zero, even if people speak in loud voices.

Hearing Loss. Hearing loss is measured in decibels and refers to a permanent auditory threshold shift of an individual's hearing. The USEPA (USEPA 1974) recommended a limiting daily equivalent energy value or equivalent sound level of 70 dBA to protect against hearing impairment over a period of 40 years. This daily energy average would translate into a DNL value of approximately 75 dBA or greater. Based on a USEPA study, hearing loss is not expected in people exposed to a DNL of 75 dBA or

less (USEPA 1974). The potential for hearing loss involves direct exposure to DNL levels above 75 dBA on a regular, continuing, long-term basis. FICON states that hearing loss due to noise: 1) may begin to occur in people exposed to long-term noise at or above a DNL of 75 dBA; 2) will not likely occur in people exposed to noise between a DNL of 70 and 75 dBA; and 3) will not occur in people exposed to noise less than a DNL of 70 dBA (USDOT 1980).

An outdoor DNL of 75 dBA is considered the threshold above which the risk of hearing loss is evaluated. Following guidelines recommended by the Committee on Hearing, Bioacoustics, and Biomechanics, the average change in the threshold of hearing for people exposed to DNL equal to or greater than 75 dBA was evaluated. Results indicated that an average of 1 dBA hearing loss could be expected for people exposed to DNL equal to or greater than 75 dBA. For the most sensitive 10 percent of the exposed population, the maximum anticipated hearing loss would be 4 dBA. These hearing loss projections must be considered conservative as calculations are based on an average daily outdoor exposure of 16 hours (7:00 a.m. to 10:00 p.m.) over a 40-year period. It is doubtful any individual would spend this amount of time outdoors within the DNL equal to or greater than 75 dBA noise exposure area (USAF 1997d).

3.2.2 Existing Noise Levels

Aircraft operations are the primary source of noise at Tinker AFB. Aircraft activities include aircraft and aircraft maintenance operations. During periods of no flying activity, noise results primarily from aircraft maintenance and shop operations, ground traffic movement, occasional construction, and similar sources. This noise is almost entirely restricted to the Base itself and is comparable to sounds that occur in typical communities. It is during periods of aircraft ground or flight activity that the noise environment changes.

Noise from aircraft operations at Tinker AFB was defined using the Air Force-developed NOISEMAP (Version 6.5) modeling program. This model predicted areas exposed to DNL of 65, 70, 75, 80, and 85 dBA (noise contours) for Tinker AFB. Figure 4.8 in the Tinker AFB General Plan presents the aircraft noise contours from Tinker AFB aircraft flight and maintenance engine runup operations. Because only areas with a DNL above 65 dBA are considered in land use compatibility planning and impact assessment, only contours of a DNL 65 dBA and greater are shown. According to the General Plan, the project areas are not located within a DNL above 65 dBA (Tinker AFB 2000). Based on the examples in Figure 3-1, ambient noise in the project areas would range from an approximately 50 dBA (quiet urban daytime) to about 80 dBA (noisy urban daytime).

FICON developed land use compatibility guidelines for noise in terms of DNL (USDOT 1980). DNL is the metric used by the Air Force in determining noise impacts of military airfield operations for land use planning. Air Force land use compatibility guidelines (relative to DNL values) are documented in the Air Installation Compatible Use Zone (AICUZ) *Program Manager's Handbook* (USAF 1999b). Four noise zones are used in AICUZ studies to identify noise impacts from aircraft operations. These noise zones range from DNL of 65 dBA to DNL of 80 dBA. For example, it is recommended

that no residential uses, such as homes, multifamily dwellings, dormitories, hotels, and mobile home parks be located where the noise is expected to exceed a DNL of 65 dBA. If noise sensitive structures are located in areas within a DNL range of 65 to 75 dBA, the structures should be designed to achieve a 25 to 30 dBA interior noise reduction. For outdoor activities, the USEPA recommends DNL of 55 dBA as the sound level below which there is no reason to suspect that the general population will be at risk from any noise impacts (USEPA 1974).

Air Force policy for many years has been to implement, where feasible, NLR measures in on-Base residential and public use buildings. NLR measures are intended to reduce indoor noise levels to DNL 45 dBA or less. Buildings constructed prior to implementation of the Noise Reduction Policy were not necessarily built to NLR standards. Since implementation of the NLR standards, all new buildings are designed and constructed to comply with the appropriate NLR standards (USAF 1978).

3.3 BIOLOGICAL RESOURCES

3.3.1 Vegetation and Wildlife

Several natural and disturbed community types occur on Tinker AFB. The majority of these community types include: developed and semi-developed urban landscaping, grassland, park and savanna (Parsons 2002). Most of the grounds in the area of the Proposed Action are semi-improved to improved and are intensively landscaped and maintained. Most of the Alternative Action area is undeveloped grassland.

Tinker AFB is classified into three wildlife management areas (WMA): WMA 1, 2, and 3 (see Figure 3-2). The use of this classification system is helpful in achieving the goals for the Natural Resources Program. There are several Federal Species of Concern and/or Oklahoma State Species of Concern found at Tinker AFB. The Texas horned lizard (*Phrynosoma cornutum*), the barn owl (*Tyto alba*), the burrowing owl (*Athene cunicularia*), the Swainson's Hawk (*Buteo swainsoni*), and the migrant Loggerhead shrike (*Lanius ludovicianus migrans*) are listed as Federal or State Species of Concern. The Alternative Action is located within WMA 2, which includes a large area of Texas horned lizard habitat. The U.S. Fish and Wildlife Service (USFWS) defines Species of Concern as an informal term indicating that the USFWS has some degree of concern for the future well-being of the species, but the species does not receive any Endangered Species Act protection. Air Force Instruction (AFI) 32 7064 states that species having such a status should be considered in future planning and facility siting as well as provided protection wherever possible.

The Texas horned lizard occurs in the area of the Alternative Action. Figure 3-3 shows distribution of the Texas horned lizard, and sightings of species of concern in relation to the Alternative Action site. Of special note, shrikes of the species *Lanius ludovicianus* do occur on Base (Tinker AFB 2001). The barn owl (*Tyto alba*), the burrowing owl (*Athene cunicularia*), and the Swainson's Hawk (*Buteo swainsoni*) occur on the Base as well. The previously listed migrant race of shrikes (*migrans*), the barn owl, the burrowing owl, and the Swainson's Hawk have the potential to occur on Base near the Alternative Action.

Base-wide surveys for the Texas horned lizard were conducted in 1993 and 1994. During the 1993-1994 surveys, Texas horned lizards or their scat were found in these delineated areas. Several Texas horned lizards were sighted in designated Texas horned lizard habitat in the area of the Alternative Action. (Tinker AFB 2004b).

Watchable wildlife at Tinker AFB includes songbirds and small mammals. Larger animals, including deer and geese, increase the danger for aircraft strikes and are therefore discouraged from occupying the Base (Tinker AFB 2004a). Several flocks of Canada geese (*Branta canadensis*), however, frequently feed at the Base golf course, but are discouraged.

A number of fur-bearing species inhabit Tinker AFB. Terrestrial furbearers include the coyote, skunk, raccoon, opossum, and beaver. Human-wildlife conflicts are not uncommon at Tinker AFB. Beaver dam building has damaged ornamental trees, caused flooding problems, and disabled spill gates. Skunks provide a nuisance to personnel and residents, and coyotes pose an aircraft hazard (Tinker AFB 2004a).

Vegetation in the Proposed Action area is typical of that found in an urban setting. The vicinity of the Proposed Action is predominately administrative, commercial, and industrial buildings having grass lawns with ornamental shrubbery and trees scattered throughout. The plant community is composed of turf grasses (predominantly bermudagrass [*Cynodon dactylon*]), shrubbery (boxwoods) and ornamental trees (bradford pear) (Tinker AFB 2004a).

Grasslands in the Alternative Action Site area vary wildly in species composition. The majority of the site is dominated by introduced species such as KR bluestem (*Bothriochloa ischaemum*), bermudagrass, and fescue (*Festuca arundinacea*). The predominance of non-native grasses indicates that these areas were planted with these species, and may have been used for grazing or hay production. The site is not dominated by a particular introduced species tend to be very mixed. Common native grass species include silver bluestem (*Bothriochloa saccharoides*), switchgrass (*Panicum virgatum*), little bluestem (*Schyzachyrium scoparium*), and sideoats grama (*Bouteloua curtipendula*) (Parsons 2002). Parks (savanna) are defined as having 11 to 70 percent woody cover, with woody plants scattered within continuous grass or forbs (Texas Parks and Wildlife Department [TPWD] 1995).

The riparian vegetation community in the area around Tinker AFB contains such species as American elm (*Ulmus Americana*), slippery elm (*Ulmus rubra*), hackberry (*Celtis* spp.), and cottonwood (*Populus deltoids*) (Parsons 2002). Riparian areas occur adjacent to streams or drainage channels or in low-lying areas where water availability is relatively greater than the surrounding landscape. In the upland forest, the dominant plant species are deciduous or evergreen trees. The crowns are closed, or nearly so (greater than 60 percent canopy cover) (Hoagland 2000, TPWD 1995), and the trees are generally over 30 feet tall (Tinker AFB 1999).







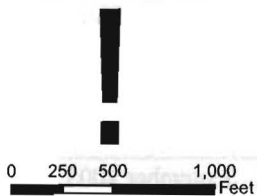
Figure 3-2

Location of
Wildlife Management Areas

Tinker AFB, Oklahoma

Legend

-  Proposed Action Site
-  Alternative Action Site
-  Management Area 1
-  Management Area 2



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




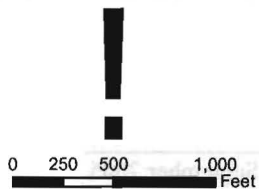
Figure 3-3

Location of Species of Concern Areas

Tinker AFB, Oklahoma

Legend

-  Proposed Action Site
-  Alternative Action Site
-  Texas Horned Lizard Habitat
-  Shrike



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3.3.2 Threatened and Endangered Species

No flora on Tinker AFB are classified as a state species of concern or federally listed as threatened or endangered. However, the Oklahoma penstemon (*Penstemon oklahomensis*), which is classified as rare under the Oklahoma Natural Heritage Inventory Program, is found at numerous locations on the Base. Previous studies indicate that the Oklahoma penstemon does not grow in the areas of the Proposed Action or the Alternative Action (Tinker AFB 2004b).

Two federally listed species are known to be seasonal residents of the local area, the Bald eagle (*Haliaeetus leucocephalus*) and the Whooping crane (*Grus americana*). The closest known sightings of the Bald eagle are around Lake Arcadia and Thunderbird. It is unlikely that these species would forage along creeks and open areas adjacent to the Proposed Action or the Alternative Action areas, as these habitats are generally urban and of poor quality for the subject species (Tinker AFB 1999).

Base-wide surveys for the Black-capped vireo (*Vireo atricapilla*) were conducted in 1993 and 1994. No Black-capped vireos were sighted during these surveys.

3.3.3 Wetlands and Waterbodies

The USFWS, utilizing National Wetlands Inventory criteria, identified approximately 65 acres of wetlands on Tinker AFB. This includes creeks, ponds, drainage swales, and other wet areas. Figure 3-4 shows basewide locations of surface water and wetlands areas in relation to the project areas.

Discharging dredge or fill material into wetlands and waters of the United States on Tinker AFB is regulated by the U.S. Army Corps of Engineers under Section 404 of the Clean Water Act. Disturbance of wetlands by federal activities is further regulated by Executive Order 11990 for the preservation of wetlands. Current data shows that there are no wetlands located in the area of the Proposed Action or the Alternative Action.

3.4 EARTH RESOURCES

3.4.1 Topography

Tinker AFB is located in the Central Redbed Plains section of the Central Lowland Physiographic Province that is characterized by gently rolling hills, broad flat plains and bottomlands bisected by small- to medium-sized water courses. Oklahoma County elevations range from about 850 feet above mean sea level (msl) in the southeastern part to 1300 feet msl in the northwestern part. Base elevations range from approximately 1200 msl at Crutch Creek in the northwestern portion of the Base to 1310 feet msl in the southeast portion of the Base. The airfield elevation is approximately 1291 feet msl (Tinker AFB 2000).

3.4.2 Geology

A 1988 U.S. Army Corps of Engineers report stated the Garber-Wellington Formation underlies the entire Base, but is overlapped by the Hennessey Group at the

southern half of the Base. Recent drilling of wells and construction of geological cross-sections (a visual representation of the underlying strata along a designated section line) confirm that the erosion edge of the Hennessey Group extends from the northwest corner of the Base southeastward to the 38th EIG District. Over three quarters of the Base surface geology is Hennessey. Most of the remaining surface geology is Garber Sandstone with some alluvium along streams. Recent work shows that the Hennessey at the surface is underlain by Garber Sandstone which in-turn is underlain by the Wellington Formation. The surface geology at the Base is comprised primarily of sandstone and shale. The sandstone is orange-red to reddish-brown in color and fine-grained with a poor cement bond. The grains are sub-angular to sub-rounded and composed of quartz. The shale is reddish-brown and silt like (Tinker AFB 2000).

3.4.3 Soil

A soil survey of the Base was completed in 1983 and updated in 1991 by the United States Department of Agriculture Natural Resource Conservation Service (USDA NRCS). Forty-two soil types have been identified within Base boundaries. Eighty-nine acres were classified as prime farmland, which is defined as land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber and oilseed crops, and is also available for these uses. At the time Tinker AFB was surveyed, most land (approximately 300 acres) which would have been designated prime farmland had long since been urbanized and therefore no longer meet prime farmland criteria.

According to the USDA NRCS, Tinker AFB soils are comprised of three major associations. First, the Darnell-Stephenville association is characterized by shallow to deep, light-colored sandy upland soil with reddish subsoil under oak-hickory forest with prairie openings. Areas are gently to moderately sloped with some areas strongly sloped. The Renthin-Vernon-Bethany association consists of shallow to deep, dark, loamy upland soil with clayey subsoil under tall grass. Sloping varies from nearly level to moderately steep. The Dale-Canadian-Port association consists of deep, loamy alluvial soils located in bottomlands along watercourses.

Over the years, soil properties have been changed greatly by urban activities. Topsoil has been removed at some locations and not replaced. Soil compaction is commonplace as the result of off-road training exercises, military construction projects, past aircraft parking on the airfield, and related activities.

3.4.4 Hydrogeology

The direction of groundwater flow for Tinker AFB varies depending on location. General groundwater flow for the Proposed Action area is to the east. There is an apparent groundwater divide associated with Crutch Creek that affects groundwater flow direction. Regional topographic lows draw portions of groundwater in the area southwestward, while other areas flow northward toward discharge points along Crutch Creek (Tinker AFB 2001). Groundwater flow in the Alternative Action area is generally in a southwesterly direction (Tinker AFB 2002).



Legend

- Proposed Action Site
- Alternative Action Site
- Wetlands
- Ponds
- Streams**
- Intermittent
- Perennial

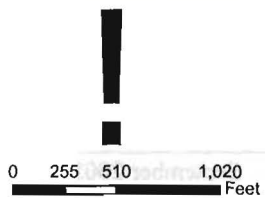


Figure 3-4

Location of Wetlands and Waterbodies

Tinker AFB, Oklahoma

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The area encompassed by Tinker AFB consists of ephemeral and perennial aquifers. The Base is situated over the Garber-Wellington aquifer, a perennial aquifer that is the primary potable water supply source for the Base and several surrounding communities. This aquifer is recharged primarily by infiltration of rainfall or surface water through fractures in the Fairmont Shale and directly into the Garber Sandstone. Because much of Tinker AFB is composed of Garber Sandstone, the Base is considered to be a recharge zone for this aquifer. Throughout much of the northern half of the Base, the Garber-Wellington aquifer is not overlain and thus, not protected by any confining shale. In the southern half of the Base, including the Alternative Action area, the Hennessey Group overlies the aquifer and acts as a confining layer, because it is typical clay-rich, low permeability shale. The confining nature of the Hennessey Group causes rainfall to remain near ground surface and flow laterally until it discharges to streams.

The groundwater system at Tinker AFB has been divided into five hydrogeologic zones: the Hennessey Water Bearing Zone, the Upper Saturated Zone (USZ), the Lower Saturated Zone (LSZ), the Lower-Lower Saturated Zone (LLSZ), and the Production Zone (PZ). The Hennessey is perched above the USZ over the southwest portion of the Base. The USZ and LSZ are regionally considered to be in the upper third of the Garber-Wellington aquifer, and generally are present at depths of less than 200 feet bgs. The LLSZ is considered the lower half of the LSZ. The PZ generally is considered to be greater than 200 feet bgs, and is used for water supply at Tinker AFB and off-Base locations (Tinker AFB 2002).

3.5 LAND USE

The Tinker AFB General Plan contains guidance for land use and development at the Base. Twelve land use categories (based on function of the activity within the category) have been established for land management at the Base: (1) administration; (2) airfield operations and maintenance; (3) airfield clear surfaces; (4) airfield pavements; (5) community (commercial); (6) community (service); (7) housing (family); (8) housing (unaccompanied); (9) industrial; (10) medical; (11) open space; and (12) outdoor recreation (Tinker AFB 2000).

The central core area of the Base consists of the airfield which with associated clear surfaces, occupies the largest portion of the Base. The airfield includes two runways and associated taxiways, aprons and aircraft parking area in addition to clear areas. Runway 12/30 is 10,000 feet long and Runway 17/35 is 11,000 feet long.

On-Base community related land uses consist of commercial and service type uses, and comprise approximately 100 acres. The majority of the commercial uses are located near Tinker Gate, and include the Base Exchange (BX) and Commissary. Other commercial land uses include the Base theater and credit union, which are located in the northern and western portions of the Base. Community service type uses include education centers, Base library, chapel facilities, and child development centers. These uses are scattered throughout the northern and western portions of the Base, and are generally associated with commercial and administrative facilities. Other community service type uses include medical and dental clinics, and an occupational health clinic.

Most of the community service related land uses are located in close proximity to family and unaccompanied housing.

The predominant land use patterns surrounding the Base are a mixture of residential and low-density commercial uses. Heavy industrial uses exist mostly to the south and east of the Base. Residential areas adjoin the Base to the west. The Base extends to the north and east of the military housing area, and residential and undeveloped land extends to the south.

Accompanied and unaccompanied housing, which occupy 238 acres, is concentrated in the western section of the installation. Accompanied housing consists of family housing and temporary lodging facilities. Four individual neighborhoods, comprising 694 housing units, located in the western section of the installation comprise all of the accompanied housing on the Base. Unaccompanied housing, which consists of dormitories and visiting personnel quarters, occupy a dormitory campus in the northwest section of the Base and provide living quarters for 787 unaccompanied personnel (Tinker AFB 2000).

Outdoor recreation and open space occupies approximately 1,300 acres on the installation. These uses include a golf course, athletic fields and courts, swimming pools, park and picnic areas, conservation and preservation areas, safety/security zones, and buffer areas. The majority of the outdoor recreational uses are located in the northwest corner of the installation, with an 18-hole golf course being the predominant use. Several small outdoor recreation uses are scattered throughout the family housing area.

Tinker AFB has 15,625,507 ft² of space in 750 buildings. Organizations in direct support of the OC-ALC comprise nearly 6 million ft² of space in 82 buildings. The 72nd Air Base Wing (ABW) and associated tenants occupy over 3 million ft² and are located in 249 buildings. Additional tenants occupy nearly 6 million ft² of the remaining space on Tinker AFB (Tinker AFB 2000).

3.6 AIR QUALITY

3.6.1 Air Pollutants and Regulations

Air quality in any given region is measured by the concentration of various pollutants in the atmosphere, typically expressed in units of parts per million (ppm) or in units of micrograms per cubic meter ($\mu\text{g}/\text{m}^3$). Air quality is not only determined by the types and quantities of atmospheric pollutants, but also by surface topography, size of the air basin, and by prevailing meteorological conditions.

The Clean Air Act (CAA), as amended in 1977 and 1990, provides the basis for regulating air pollution to the atmosphere. Different provisions of the CAA apply depending on where the source is located, which pollutants are being emitted, and in what amounts. The CAA required the USEPA to establish ambient ceilings for certain criteria pollutants. These criteria pollutants are usually referred to as the pollutants for which the USEPA has established National Ambient Air Quality Standards (NAAQS). The ceilings were based on the latest scientific information regarding the impacts a pollutant may have on public health or welfare. Subsequently, the USEPA promulgated regulations that set

NAAQS. Two classes of standards were established: primary and secondary. Primary standards define levels of air quality necessary, with an adequate margin of safety, to protect public health, including the health of “sensitive” populations such as asthmatics, children, and the elderly. Secondary standards define levels of air quality necessary to protect public welfare (*e.g.*, decreased visibility, damage to animals, crops, vegetation, wildlife, and buildings) from any known or anticipated adverse impacts of a pollutant.

Air quality standards are currently in place for six pollutants or “criteria” pollutants: carbon monoxide (CO), nitrogen dioxide (NO₂), ozone (O₃), sulfur oxides (SO_x, measured as sulfur dioxide [SO₂]), lead (Pb), and particulate matter with an aerodynamic diameter less than or equal to 10 micrometers (PM₁₀). There are two categories of PM, particulate matter less than 10 micrometers (PM₁₀) and particulate matter less than 2.5 micrometers (PM_{2.5}). There are many suspended particles in the atmosphere with aerodynamic diameters larger than 10 micrometers. Particles less than 2.5 micrometers in diameter (PM_{2.5}) are referred to as “fine” particles and are believed to pose the largest health risks. Because of their small size (less than one-seventh the average width of a human hair), fine particles can lodge deeply into the lungs. The collective of all particle sizes is commonly referred to as total suspended particulates (TSP). TSP is defined as particulate matter as measured by the methods outlined in 40 CFR Part 50, Appendix B. The NAAQS are the cornerstone of the CAA. Although not directly enforceable, they are the benchmark for the establishment of emission limitations by the states for the pollutants USEPA determines may endanger public health or welfare.

Ozone (ground level O₃), which is a major component of “smog,” is a secondary pollutant formed in the atmosphere by photochemical reactions involving previously emitted pollutants or precursors. Ozone precursors are mainly nitrogen oxides (NO_x) and volatile organic compounds (VOC). NO_x is the designation given to the group of all oxygenated nitrogen species, including nitric oxide (NO), NO₂, nitrous oxide (N₂O), and others. However, only NO, NO₂, and N₂O are found in appreciable quantities in the atmosphere. VOCs are organic compounds (containing at least carbon and hydrogen) that participate in photochemical reactions and include carbonaceous compounds except metallic carbonates, metallic carbides, ammonium carbonate, carbon dioxide (CO₂), and carbonic acid. Some volatile organic compounds (VOC) are considered non-reactive under atmospheric conditions and include methane, ethane, and several other organic compounds.

As noted above, O₃ is a secondary pollutant and is not directly emitted from common emissions sources. Therefore, to control O₃ in the atmosphere, the effort is made to control NO_x and VOC emissions. For this reason, NO_x and VOCs emissions are calculated and reported in emission inventories.

The CAA does not make the NAAQS directly enforceable. However, the CAA does require each state to promulgate a State Implementation Plan (SIP) that provides for “implementation, maintenance, and enforcement” of the NAAQS in each air quality control region (AQCR) in the state. The CAA also allows states to adopt air quality standards more stringent than the federal standards. In Oklahoma, state standards are established by the Oklahoma Department of Environmental Quality (ODEQ) and are at

least as restrictive as the NAAQS. The national and state ambient air quality standards are presented in Table 3-2.

Table 3-2 National and Oklahoma Ambient Air Quality Standards

Criteria Pollutant	Averaging Time	National Standards ^a		Oklahoma Standards ^{a,b}	
		Primary NAAQS ^c	Secondary NAAQS ^d	Primary NAAQS ^c	Secondary NAAQS ^d
Carbon Monoxide	8-hour	9 ppm (10,000 µg/m ³)	No standard	9 ppm (10,000 µg/m ³)	9 ppm (10,000 µg/m ³)
	1-hour	35 ppm (40,000 µg/m ³)	No standard	35 ppm (40,000 µg/m ³)	35 ppm (40,000 µg/m ³)
Lead	Quarterly	1.5 µg/m ³	1.5 µg/m ³	1.5 µg/m ³	1.5 µg/m ³
Nitrogen Oxide	Annual	0.0543 ppm (100 µg/m ³)	0.0543 ppm (100 µg/m ³)	0.0543 ppm (100 µg/m ³)	0.0543 ppm (100 µg/m ³)
Ozone ^e	8-hour	0.08 ppm (157 µg/m ³)	0.08 ppm (157 µg/m ³)	No standard	No standard
	1-hour	0.12 ppm (235 µg/m ³)	0.12 ppm (235 µg/m ³)	0.12 ppm (235 µg/m ³)	0.12 ppm (235 µg/m ³)
Particulate Matter (measured as PM ₁₀)	Annual	50 µg/m ³	50 µg/m ³	50 µg/m ³	50 µg/m ³
	24-hour	150 µg/m ³	150 µg/m ³	150 µg/m ³	150 µg/m ³
Particulate Matter (measured as PM _{2.5})	Annual	15 µg/m ³	15 µg/m ³	No standard	No standard
	24-hour	65 µg/m ³	65 µg/m ³	No standard	No standard
Sulfur Oxides (measured as SO ₂)	Annual	0.03 ppm (80 µg/m ³)	No standard	0.03 ppm (80 µg/m ³)	No standard
	24-hour	0.14 ppm (365 µg/m ³)	No standard	0.14 ppm (365 µg/m ³)	No standard
	3-hour	No standard	0.50 ppm (1,300 µg/m ³)	No standard	0.50 ppm (1,300 µg/m ³)

- a National standards (other than ozone, particulate matter, and those based on an annual averages or annual arithmetic mean) are not to be exceeded more than once per year. For PM₁₀, the 24-hour standard is attained, when 99 percent of the daily concentrations, averaged over 3 years, are equal to or less than the standard.*
- b Concentrations are expressed first in units in which they were promulgated. Equivalent units are given in parenthesis.*
- c National Primary Standards: The levels of air quality necessary to protect the public health with an adequate margin of safety. Each state must attain the primary standards no later than 3 years after the state implementation plan is approved by the USEPA.*
- d National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse impacts of a pollutant. Each state must attain the secondary standards within a "reasonable time" after the state implementation plan is approved by the USEPA.*
- e The ozone standard is attained when the fourth highest daily maximum 8-hour average in a year, averaged over 3 years, is equal to or less than the standard. The 1-hour will no longer apply to an area one year after the effective date of the designation of that area for the 8-hour ozone. The effective designation date for most areas is June 15, 2004 (40 CFR 50.9).*

Based on requirements outlined in USEPA's general conformity rule published in 58 Federal Register 63214 (November 30, 1993) and codified at 40 CFR part 93, subpart B (for federal agencies), a conformity analysis is required to analyze whether the applicable criteria air pollutant emissions associated with the project equal or exceed the

threshold emission limits that trigger the need to conduct a formal conformity determination. The intent of the conformity rule is to encourage long range planning by evaluating the air quality impacts from federal actions before the projects are undertaken. This rule establishes an elaborate process for analyzing and determining whether a proposed project in a nonattainment area conforms to the SIP and federal standards.

3.6.2 Regional Air Quality

The fundamental method by which the USEPA tracks compliance with the NAAQS is the designation of a particular region as “attainment” or “nonattainment.” Based on the NAAQS, each state is divided into three types of areas for each of the criteria pollutants. The areas are:

- Those that are in compliance with the NAAQS (attainment);
- Those that don’t meet the ambient air quality standards (nonattainment); and
- Those where a determination of attainment/nonattainment cannot be made due to a lack of monitoring data (unclassifiable – treated as attainment until proven otherwise).

Generally, areas in violation of one or more of the NAAQS are designated nonattainment and must comply with stringent restrictions until all the standards are met. In the case of O₃, CO, and PM₁₀, USEPA divides nonattainment areas into different categories, depending on the severity of the problem in each area. Each nonattainment category has a separate deadline for attainment and a different set of control requirements under the SIP.

The ODEQ has several monitoring stations located throughout the state to monitor ambient air quality. Regional ambient air monitoring data show that the Oklahoma City area is currently in attainment of the NAAQS for all pollutants. These monitoring stations measure representative air quality conditions in the metropolitan area.

Tinker AFB is located in Oklahoma County within the Central Oklahoma Intrastate AQCR 184. The ODEQ has regulatory authority for air pollution control in the State of Oklahoma. Canadian, Cleveland, Grady, Kingfisher, Lincoln, Logan, McClain, Oklahoma, and Pottawatomie Counties compose the Central Oklahoma Intrastate AQCR. According to federal regulations (40 CFR 81.337), all nine counties in the AQCR are better than national standards for the criteria air pollutants, except for the criteria pollutants O₃ and CO, which are classified as Unclassifiable/Attainment.

3.6.3 Baseline Air Emissions

An air emissions inventory is an estimate of total mass emissions of pollutants generated from a source or sources over a period of time, typically a year. Accurate air emissions inventories are needed for estimating the relationship between emissions sources and air quality. Quantities of air pollutants are generally measured in pounds per year or tons per year (tpy). All emission sources may be categorized as either mobile or stationary emission sources. Stationary emission sources may include boilers, generators,

fueling operations, industrial processes, and burning activities, among others. Mobile emission sources typically include vehicle operations.

The CY 2002 air emissions inventory summary for the Central Oklahoma Intrastate AQCR 184, which includes reported permitted stationary, mobile, and grandfathered air emission sources, is presented in Table 3-3. Emissions from Tinker AFB are included in this inventory.

Table 3-3 Baseline Air Emissions

Criteria Air Pollutant	CO (tpy)	VOC (tpy)	NO _x (tpy)	SO _x (tpy)	PM ₁₀ (tpy)	PM _{2.5} (tpy)
AQCR CY 02 Totals:	481,118	15,925	80,696	9,496	142,797	29,903

Note: VOC is not a criteria air pollutant. However, VOC is reported because, as an ozone precursor, it is a controlled pollutant. PM_{2.5} included for information only.

Source: AIRData 2002.

3.7 INFRASTRUCTURE AND UTILITIES

3.7.1 Energy

Electrical power is supplied to the Base by a public utility company through two feeder lines. Oklahoma Gas and Electric provides electricity to the main Base area and the MFH area. The system capacity is approximately 300,805,600 kWh or 824,123 kWh per day (2,810 MBtu per day) (Branson 2003). Electrical supply lines are in place near the existing medical facility and in the area of the Gott Gate. A substation is located near the existing medical clinic. Electrical supply is currently inadequate in the area of the Alternative Action and would require the construction of a new substation to meet future electrical supply needs.

3.7.2 Storm Water Management

Tinker AFB has a large area of impervious cover. Buildings account for 470.1 acres of impervious cover. Roadways and parking areas account for approximately 900 acres of impervious cover. The airfield pavement has 545.5 acres of impervious cover. Total impervious cover for the Base is approximately 1,915 acres. Generally, rainfall events can cause significant problems with surface water flow on Tinker AFB due to the poor percolation qualities of the soil (Tinker AFB 2004a). The northern area of the project area has a storm water drainage system that is a combination of natural and man-made features. Man-made features include curbs gutters, culverts, and pipes. These structures in the northwest and southwest portions of the Base convey storm water to Crutcho Creek. Structures in the north central portion of the Base convey storm water to Kuhlman Creek. The majority of storm water on the eastern side of the Base is conveyed to Soldier Creek with the exception of the southeast corner where storm water is conveyed to a tributary of Elm Creek.

3.7.3 Transportation

Several high capacity transportation routes provide direct access to the Base. The Oklahoma City region is served by the crossroads of Interstate 40 and Interstate 35.

Interstate 40 runs parallel to 29th Street along the northern boundary of the Base, and provides direct Base access via Tinker and Eaker Gates. Interstate 240 runs east to west just south of the Base boundary. Douglas Boulevard, a four lane arterial street, forms the eastern boundary of the main Base. Sooner Road, another four lane arterial, defines the western boundary of the Base. Sooner Road runs north to south between Interstate 40 and Interstate 240.

- Traffic enters Tinker AFB through six main gates:
- Tinker Gate (Gate 1), SE 29th Street and Air Depot Boulevard;
- Eaker Gate (Gate 2), SE 29th Street and “F” Avenue;
- Lancer Gate (Gate 20), Bradley Drive and Douglas Boulevard;
- Gott Gate (Gate 34), SE 59th Street and Air Depot Boulevard;
- Vance Gate (Gate 40), Sooner Road and Doolittle Avenue; and
- Hope Gate (38th EIW), SE 59th Street and Hilltop Road.

Several additional gates are open on a part time basis to facilitate traffic flow during peak times. Stacking at Tinker, Eaker, and Lancer Gates create significant traffic congestion during peak morning and afternoon traffic times. Tinker, Gott, and Lancer Gates are the most active gates and operate 24-hours per day. The Eaker gate is open daily from 6:00 a.m. to 6:00 p.m. The Vance Gate operates only during peak traffic periods in the morning and afternoon.

The installation has a network of roads and streets, which, for the most part, are laid-out on a north-south grid. There are primary roads as main distributing arteries for all traffic originating from outside and within the Base. The primary roads are Air Depot Boulevard, Arnold Street, and Perimeter Road/Industrial Boulevard.

There are numerous secondary roads and streets that have two and three travel lanes supplementing the primary system by providing access to, through, and within the installations functional areas. The tertiary streets with at least two travel lanes provide access from other roads and streets to individual units and organizations within their functional areas. In addition, there are a limited number of security patrol roads inside the installation.

The area of the Proposed Action is accessed via the Vance Gate located off Sooner Road at Doolittle Drive. The area of the Alternative Action is accessed via the Gott Gate located at the intersection of Air Depot Boulevard and SE 59th Street.

3.7.4 Solid Waste Management

Municipal solid waste (MSW) management at Tinker AFB is managed in accordance to the guidelines specified in AFI 32-7042, Solid and Hazardous Waste Compliance. The instruction incorporates by reference the requirements of Subtitle D, 40 CFR Parts, 240 through 244, 257, and 258, and other applicable federal regulations, AFIs and Department of Defense Directives. In general, AFI 32-7042 establishes the requirement for installations to have a solid waste management program to incorporate the following: a solid waste management plan; procedures for handling, storage, collection, and disposal

of solid waste; record-keeping and reporting; and pollution prevention. An Integrated Solid Waste Management Plan (ISWMP) was prepared for the Base to provide a single reference for the management of solid waste at the installation. The Environmental Management Directorate provides program management for the Tinker AFB ISWMP (USAF 2002).

Tinker AFB generated 7,993 tons of MSW during FY 2003, an average of 21.9 tons per day. Solid waste generated by the Base is collected by a contractor and hauled to the Southeast Landfill for disposal. Construction and demolition debris from the Base is also disposed in the Southeast Landfill.

The State of Oklahoma has permitted the Southeast Landfill for disposal of MSW under permit number 3555028, which is good for the life of the site. Currently, there are no plans to expand the landfill; however, adjacent undeveloped property is available for future expansion. As of December 2002, the landfill had a projected life expectancy of 11 years or until 2013 (ODEQ 2003). Annual disposal for the 3 fiscal years, ending September 30, 2003, were 446,960, 413,944, and 404,434 tons, respectively. The average daily disposal for a 260-day year and 421,779 tons (the annual average for the 3 years) is 1,622 tons per day (Branson 2003).

3.8 HAZARDOUS MATERIALS AND HAZARDOUS WASTE MANAGEMENT

3.8.1 Environmental Restoration Program

The Air Force established the Environmental Restoration Program (ERP) to identify, characterize, and evaluate past disposal sites and remediate contamination on its installations as needed to control migration of contaminants and potential hazards to human health and the environment in accordance with Comprehensive Environmental Response, Compensation, and Liabilities Act (CERCLA) requirements. Tinker AFB currently has recognized a total of 40 ERP sites, four of these are listed as operable units (OU) on the National Priorities List (NPL) (*i.e.*, Superfund sites).

ERP sites LF012 (Landfill 2), LF013 (Landfill 3), LF014 (Landfill 4), RW024 (Radioactive Waste Disposal Site 1022 East), RW027 (Radioactive Waste Disposal Site 62598), RW029 (Radioactive Waste Disposal Site 1022 East), CG038 (Southwest Groundwater Management Unit) are located within the vicinity of the Alternative Action.

CG038 groundwater contamination is divided into five subunits (2A, 2B, 2C, 2D, and 2E). Only Subunit 2E is located at the site of the Alternative Action. The primary organic contaminant in Subunit 2E is TCE; secondary organic contaminants include cis-1,2-dichloroethene (cis-1,2-DCE), 1,2-dichloroethane (1,2-DCA), and vinyl chloride. The contaminant plumes are primarily within the USZ and, to a lesser extent, the overlying HWBZ and underlying LSZ. The HWBZ is more prevalent in CG038, with groundwater flow generally semi-radially from topographic highs toward creek drainages. Groundwater flow in the USZ within CG038 and in the area of the Alternative Action is generally to the southwest at a depth of 60 feet bgs (Tinker AFB 2002). CG038 is currently undergoing groundwater pumping and treatment. Figure 3-5 shows the groundwater management subunit associated with Alternative Action site (Tinker AFB 2003a).

Environmental Assessment Replacement of Medical Clinic FINDING OF NO SIGNIFICANT IMPACT

AGENCY

Department of the Air Force, Air Force Materiel Command, Tinker Air Force Base (AFB), Oklahoma County, Oklahoma.

BACKGROUND

Tinker AFB (the Base) is located in Oklahoma County in the southeastern city limits of Oklahoma City, Oklahoma. The Base covers more than 5,000 acres and is adjacent to Midwest City to the north and Del City to the west. Oklahoma City is served by Interstate Highways 35, 40, and 44.

The current medical clinic (Buildings 5800, 5801, 5802, 5803, 5808, and 5810) was constructed in 1957 with a life expectancy of approximately 50 years. A construction project in 1978 more than doubled the size of the original first floor with additions wrapping the original structure on the west, south, and east. A project for three more additions was completed in the early 1990s with additions to the southwest corner, just east of the south wing of the original structure, and south of the warehouse. A Pharmacy Annex with a drive-up window was subsequently added to the north side of the facility in the early 2000s, and another small pharmacy expansion is currently under design. There have been no major additions or changes to the second or third floors from the original 1957 construction. The main building contains approximately 184,156 square feet (ft²), including the additions. This inpatient facility changed to an outpatient clinic in 1998.

The TRICARE health facility (Building 5803), is a 3,100 ft² one-story structure that was built in 1995. The TRICARE facility is used for other clinic administrative functions such as insurance processing and work space for nurses. These functions will be moved to the existing clinic in February 2005 so Building 5803 can be used as swing space during on-going structural repair to Building 5801.

From an aesthetic standpoint, both the interior and exterior of the existing facilities are generally in good condition. However, through normal age and use, the original infrastructure has deteriorated and is in relative disrepair. There have been upgrades to the cosmetic aspects of the facilities, and the configuration of the first floor has been modified substantially in some areas, but the second and third floor configurations have not been modified despite numerous functional changes. There have been some upgrades to the building systems over the years, but there are still infrastructure code and criteria deficiencies, including life safety, accessibility, mechanical, and electrical. The roof is generally in good condition, but has recently undergone repairs due to tornado damage.

The existing medical facility is generally adequate in size and conveniently located close to a Base gate, military family housing, and unaccompanied military personnel barracks. Parking is well distributed around the entire clinic. Access to the many separate clinical entrances created as a result of the numerous additions over the years is convenient; however, some parking is in violation of Anti-Terrorism/Force Protection (AT/FP) criteria.

Pursuant to National Environmental Policy Act (NEPA) guidance, 32 Code of Federal Regulations 989 (Air Force Environmental Impact Analysis Process), and other applicable

regulations, the Air Force completed an EA of the potential environmental consequences of the No Action Alternative, Proposed Action, and Alternative Action.

NO ACTION ALTERNATIVE

Replacement of the medical clinic (Building 5801) will not be accomplished. Severe cracks in the columns, tiles, and brick façade will continue to affect the structural integrity of the building. These major structural issues will render the existing medical clinic unsuitable for use and will result in the closure of the facility if a new medical clinic is not constructed.

PROPOSED ACTION

Under the Proposed Action, a new medical clinic would be constructed to the east of the existing medical facility as early as 2008 or 2009. Some existing parking would need to be demolished to allow construction of the new medical clinic. The new facility would replace the existing facility and would result in the demolition of the Central Plant (Building 5802). Existing parking area would be utilized for the new medical clinic. The Central Plant contains both chillers and boilers and serves the existing medical clinic as well as other surrounding buildings near Buildings 5801 and 5802. Energy used to operate the boilers originates from diesel fuel stored in an underground storage tank. The Central Plant is a 2,580 ft² one-story structure and would be decentralized from the central heating and cooling system upon completion of the new medical clinic. The Proposed Action also includes a new 7,564 ft² 507th Medical Squadron Building and retains the existing War Readiness Materials (WRM) warehouse.

The new medical clinic would be approximately 167,000 ft² in size and would house doctor offices, exam and treatment rooms, laboratories, radiology, pharmacy, dental clinic, conference and training rooms, computer rooms and storage areas. Energy to operate the new boilers would include a combination of diesel fuel, stored in an above ground storage tank, and natural gas. Demolition of the existing medical clinic would include demolishing approximately 184,000 ft² of structures and associated parking areas. Upon completion of the new facilities, the existing medical clinic and TRICARE facility (Building 5803) would be demolished.

ALTERNATIVE ACTION

Under the Alternative Action, a new medical facility, approximately 172,000 ft² in size would be constructed as early as 2008 or 2009 in the open land area northeast of the Gott Gate. The facility would be similar in function and layout to the facility described under the Proposed Action. Earthwork would be planned and conducted in such a manner to minimize the duration of exposure of unprotected soil. Grass and other landscaping would be reestablished in the disturbed areas immediately after completion of construction, thereby reducing the potential for erosion. The 507th Medical Reserve Unit would also be located in the vicinity of the Alternative Action in a separate facility. The Central Plant (Building 5802) would remain to serve the non-medical facilities it currently serves. The WRM warehouse and TRICARE facility (Building 5803) would be turned over to the Base for other non-medical uses (Tinker AFB, 2005). Upon construction of the new medical clinic, the existing medical clinic facility would be demolished.

SUMMARY OF FINDINGS

The following paragraphs summarize the findings of the attached EA for the No Action Alternative, Proposed Action, and Alternative Action. Based on review of the EA, the government has determined that the Alternative Action is the Preferred Alternative.

EVALUATION OF THE NO ACTION ALTERNATIVE

Under the No Action Alternative, the existing medical clinic will operate past the anticipated life for the structure. Severe cracks in the columns, tiles, and brick façade will continue to affect the structural integrity of the building. These major structural issues will render the existing medical unsuitable for use and will result in the closure of the clinic if a new medical clinic is not constructed.

EVALUATION OF THE PROPOSED ACTION

Noise. Demolition and construction equipment noise will be intermittent, short-term in duration, and restricted to daytime. Outdoor noise from equipment operation at a nearby residence could be as high as 71 to 85 decibels (dB) at 100 feet from the equipment. Speech disruption and annoyance will be temporary, lasting only as long as the noise-producing event.

Land Use. The land on which the Proposed Action will occur will continue to be categorized as medical and industrial.

Air Quality. The greatest annual emissions for any of the criteria air pollutants will be 18.55 tons per year (tpy) for PM₁₀, which equates to less than 0.0133 percent of the baseline emissions within the air quality control region (AQCR). The emissions from construction activities are temporary and non-recurring in nature and are therefore not considered to be a major source of emissions. A conformity determination is not required. The AQCR is in attainment for all criteria pollutants.

Infrastructure and Utilities. No substantial increases in the demands on utility systems would result from the Proposed Action. No additional capacity or new facilities will be required under the Proposed Action. The change in impervious cover from the Proposed Action will be offset by the demolition of the existing medical clinic. No significant degradation of runoff is anticipated.

Biological Resources. Changes to wetland areas, loss of habitat for a plant or animal species or interference with wildlife movement or reproductive behavior will not result from the Proposed Action. An increase of impervious cover will not occur within a floodplain.

Water and Groundwater Resources. The Proposed Action will not impact any surface water bodies or groundwater resources.

Earth Resources. No change in topography or alteration of soil will occur under the Proposed Action. A substantial increase in erosion is not anticipated.

Solid Waste Management. Disposal of solid waste from the demolition activity in the Proposed Action equates to about 0.2 percent of the remaining capacity of the landfill.

Hazardous Materials and Hazardous Wastes Management. There are no Environmental Restoration Program (ERP) sites located in the area of the Proposed Action. Contractors will be required to use and store hazardous materials in accordance with the Base procedures. Any hazardous waste generated will be handled in accordance with all federal, state, and local laws and regulations. Demolition of the existing medical clinic will require adherence to Tinker AFB's Asbestos Management Plan. Lead based paint in the existing facility will be disposed of as demolition debris.

EVALUATION OF THE ALTERNATIVE ACTION

Noise. Demolition and construction equipment noise will be intermittent, short-term in duration, and restricted to daytime. No sensitive receptors are in the area.

Land Use. The land on which the Alternative Action will occur will be recategorized from open space to medical and industrial.

Air Quality. The greatest annual emissions for any of the criteria air pollutants will be 50.24 tons per year (tpy) for PM₁₀, which equates to less than 0.035 percent of the baseline emissions within the AQCR. The emissions from construction activities are temporary and non-recurring in nature and are therefore not considered to be a major source of emissions. A conformity determination is not required. The AQCR is in attainment for all criteria pollutants.

Infrastructure and Utilities. An increase in the demand on the electrical system will result from the Alternative Action. Additional capacity from a new substation will be required under the Alternative Action. A change from grassland conditions to impervious cover will result from the Alternative Action. No significant degradation of runoff is anticipated as storm water best management practices will be followed.

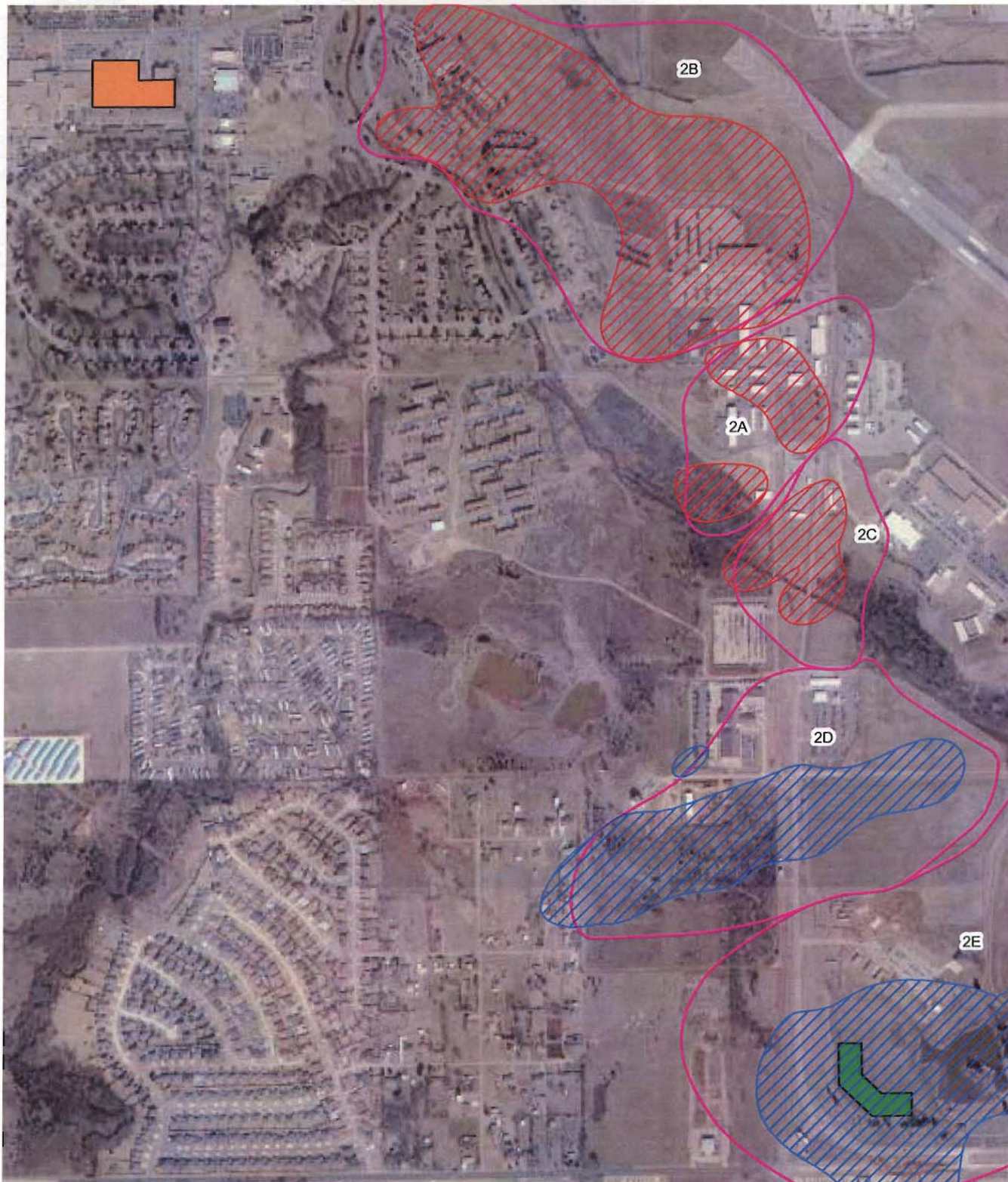
Biological Resources. The land on which the Alternative Action will be located is currently categorized as habitat for the Texas horned lizard, a sensitive species. Construction of the new medical facility in the South Forty area will likely reduce the current distribution range of the Texas horned lizard on Tinker AFB. The Alternative Action site would require a mitigation plan for the Texas Horned Lizard. The following issues would meet mitigation requirements concerning the Texas Horned Lizard; a) Habitat replacement would be required at a cost of approximately \$2,000 per acre. b) A pre-survey would be performed. The funding must be supplied 2 years in advance of project for survey requirements. The estimated cost to complete the Pre-survey would be approximately \$20,000. c) Procedures for pre-construction site searches and lizard encounters along with movement/relocation of lizards would be followed. This plan must specify what these cost are and how they will be supplied and timing prior to construction of the project.

Water and Groundwater Resources. A substantial increase in runoff to Redbud Pond and Beaver Pond will occur from the increase in impervious cover associated with the construction of the Alternative Action. Mitigation to water bodies would include erosion control measures and best management practices detailed in the construction contractor's Storm Water Pollution Prevention Plan.

Earth Resources. The Alternative Action will result in a substantial change in topography. Additional fill material will be required as the topography varies in elevation by up to 20 feet and the site will require considerable filling, grading, and hauling activities to change the surface to allow for proper construction. The change in topography will result in a change in runoff patterns at the site.

Solid Waste Management. Disposal of solid waste from the demolition activity in the Alternative Action equates to about 0.2 percent of the remaining capacity of the landfill.

Hazardous Materials and Hazardous Wastes Management. It is estimated that subsurface disturbance for construction of the new medical clinic would occur at depths no greater than 10 feet below the ground surface. Based on widespread soil sampling done at Tinker it is highly unlikely that any solvent type contaminants would remain in the shallow surface (including up to 10 foot depth for the excavation) due to volatilization of the organics and there is no known history of disposal at the site. Vapor intrusion, although always a possibility above a groundwater plume is also highly unlikely due to the depth to contaminated groundwater (USZ around 60 feet deep), the clayey nature of overlying Hennessey Group sediments, and the relatively low volatile organic concentrations in the groundwater under the site. Desiccation cracks (fractures) generally extend downward for only 30 feet or so, and therefore there is a very limited pathway to get vapors to the surface. Finally, an extraction and treatment system (Pump



Legend

- Proposed Action Site
- Alternative Action Site
- GWMU Subunits
- USZ TCH (ERP Site CG037)
- USZ TCE (ERP Site CG038)

Figure 3-5

Location of ERP Sites

Tinker AFB, Oklahoma

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3.8.2 Hazardous Materials

Hazardous materials are those substances defined by the USDOT (49 CFR 105.5). The Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act (RCRA) (42 United States Code [USC] 6901, *et seq.*), that was further amended by the Hazardous and Solid Waste Amendments of 1984, defines hazardous waste. In general, both hazardous materials and waste include substances that, because of their quantity, concentration, physical, chemical, or infectious characteristics, may present substantial danger to public health or welfare or to the environment when released or otherwise improperly managed.

Management of Hazardous materials at Air Force installations is established primarily by AFI 32-7086, *HAZMAT Management*. The AFI incorporates requirements of all federal regulations, other AFIs, and DoD directives for hazardous material reduction, use, purchasing, managing, and tracking of hazardous materials on Tinker AFB.

The use of hazardous materials on Tinker AFB must be authorized by the Base's Hazmat Pharmacy Program (HPP). The hazardous materials management program applies to all Base activities, including contractors, and operating locations. The Environmental Compliance Operations Branch (EMCO) is responsible for managing hazardous materials and waste and for complying with all Air Force guidelines, USEPA, and Oklahoma State regulations. No hazardous material may be used until it is entered into the Hazardous Materials Management System, approved for use, and issued a serial tracking label. Under this system, EMCO personnel maintain positive records for the location of the containers, from issue to return, and ultimate disposal.

3.8.2.1 Asbestos-Containing Materials

Tinker AFB asbestos management program operates under procedures outlined in the Asbestos Management Program (AMP). The AMP contains procedures to comply with the policies established in the AFI 32-1052, *Facility Asbestos Management*. The plan also complies with existing federal and state regulations regarding the identification and communication of presumed asbestos containing materials and ACM. This plan addresses AF policy and guidance, including the January 2, 2001, Air Force Materiel Command (AFMC) memorandum, Implementation of Air Force Instruction 32-1052, *Facility Asbestos Management*, and the February 15, 2002, Tinker AFB *Memorandum of agreement between the Base Civil Engineer, Environmental Management, and Bioenvironmental Engineering*.

The primary objective of the AMP is to maintain a permanent record of the status and condition of all ACM in the installation's facility inventory. Knowledgeable personnel who are trained in the identification of ACM and/or presumed ACM conduct a series of checks on the work request and survey process in order to identify ACM and/or presumed ACM prior to any work that may disturb the material. This process is relied upon to avoid the accidental release of asbestos into the environment rather than perform a detailed survey of all ACM on the Base. Tinker AFB has not performed a

comprehensive asbestos survey and current policy dictates the provision for project specific sampling.

During 1984 and 1985 the existing medical clinic was surveyed for asbestos. Asbestos containing materials (ACM) were identified in the basement boiler room, second floor boiler room, and the third floor boiler room. ACM was primarily found in the boiler tanks and associated tanks and in the pipe lagging.

3.8.2.2 Lead-Based Paint

Lead-based paint (LBP) management at Air Force installations is established in the Air Force policy and guidance on LBP in facilities. The policy incorporates by reference the requirements of 29 CFR 1910.1025, 29 CFR 1926, 40 CFR 50.12, 40 CFR 240 through 280, the CAA, Public Law 102-550, and other applicable federal regulations. This policy requires each installation to develop and implement a facility management plan for identifying, evaluating, managing, and abating LBP hazards.

The use of LBP declined after 1978 when the Consumer Product Safety Commission lowered the allowable lead content in paint to 0.06 percent by weight (trace amount) from its 1973 level of 0.5 percent by weight in a dry film of newly applied paint. This change was made under the Consumer Safety Act of 1977, Public Law 101-608, as implemented by 16 CFR Part 1303. DoD implemented a ban of LBP use in 1978. The existing Medical Clinic was constructed prior to 1978 and the environmental management geographic information system (EMGIS) indicates that the existing medical clinic contains lead based paint (LBP).

3.8.2.3 Hazardous Waste

Tinker AFB has a RCRA Part B Permit to operate a Hazardous Waste Storage Facility (HWSF) and manage corrective action at Solid Waste management Units under the Hazardous and Solid Waste Amendments for 1984 issued for a 10-year period by ODEQ (Tinker 2002). Up to 158,796 gallons of hazardous waste can be stored on Tinker AFB in the permitted facility (Tinker 2002). The HWSF in Building 810 was recently constructed to temporarily house hazardous waste for a period up to 1 year (Tinker AFB 2004a). Because of the building size, both hazardous waste and hazardous materials destined for reutilization, transfer, donation or sale may also be stored in Building 810.

Other storage sites at Tinker AFB include the Hazardous Waste Management Facility, Building 809, east of the HWSF and other less-than-90-day temporary storage areas. This facility replaces a previously permitted two-building facility near Douglas Boulevard near the east edge of the Base (Tinker 2002). The hazardous waste storage facility is operated by Defense Reutilization and Marketing Service.

Over 4,000 tons of hazardous waste are produced on Tinker AFB annually. To properly handle this waste, there are over 1,200 Initial Accumulation Points and approximately 400 hazardous waste staging areas. This waste is removed from the installation and disposed by a licensed contractor.

RCRA Subtitle C (40 CFR Parts 260 through 270) regulations are administered by the ODEQ and are applicable to the management of hazardous waste. Hazardous waste

must be handled, stored, transported, disposed, or recycled in accordance with these regulations. The storage, handling, recycling, and disposal of this waste is subject to regulations under the RCRA of 1976 and its 1988 amendments. Tinker AFB has a Hazardous Waste Management Plan to assist in compliance with these regulations. The plan fulfills requirements in Title 40, CFR Parts 260-270.

The Base's hazardous materials planning and response plan is an integrated plan titled "OC-ALC Plan 19-2 (*Tinker AFB Spill Prevention and Emergency Response Plan for Hazardous and Extremely Hazardous Substances*)."

The plan covers the requirements for handling oil, hazardous substances, extremely hazardous materials/substances, hazardous materials emergency planning, training, response, and reporting and would be used to respond to spills on the Base.

The majority of waste streams generated at Tinker AFB are from aircraft maintenance, modification, and jet engine overhaul activities. The largest waste streams result from surface preparation of aircraft skin, structural members, and engine parts. These activities include paint removal and application; grease, dirt, and carbon removal; metal etching and priming; and abrasive blasting. These processes generate toxic solvents, corrosive acids, and bases, ignitable liquids, and solutions contaminated with toxic metals. Other large waste streams result from alteration of metal surfaces through removal by grinding and cutting operations, or through build-up by electroplating and plasma-spray operations. These processes generate toxic metals, cyanide solutions, contaminated cutting and coolant fluids, and corrosive liquids.

Other hazardous waste streams generated at Tinker AFB result from RCRA corrective actions on past-contaminated sites, and remediation of a Superfund site on the Base. These wastes consist of solvent, hydrocarbon, and metal-contaminated soil and debris removed during remediation projects.

The medical clinic on Base provides out-patient support for military personnel and their families. Hazardous wastes generated at the clinic include; biohazardous medical waste, disposable surgical instruments, and needles (sharps). These wastes are kept separate from other solid waste and are disposed off Base at a licensed facility through a government contract.

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CHAPTER 4 ENVIRONMENTAL CONSEQUENCES

This chapter provides the scientific and analytic basis for the environmental consequences of the No Action Alternative, Proposed Action, and Alternative Action.

4.1 MISSION

The construction and operational activities associated with the Proposed Action and Alternative Action would be consistent with those of the baseline mission condition. Overall, the quality of health care would be improved and would meet Air Force standards, benefiting the Base mission.

4.2 NOISE

In considering the basis for evaluating noise impacts, the following evaluation criteria were used:

The degree to which noise levels generated by construction activities are greater than the ambient noise levels and the potential for hearing loss; and

The proximity of noise-sensitive receptors such as schools to the noise source.

4.2.1 No Action Alternative

Under the No Action Alternative, construction of the Medical Clinic would not be performed and the Base would be forced to shut down the clinic. The project areas would continue to experience the same noise levels that currently exist under the baseline condition.

4.2.2 Proposed Action

Assuming that noise from the construction equipment radiates equally in all directions, the sound intensity would diminish inversely at the square of the distance from the source. Therefore, in a free field (no reflections of sound), the sound pressure level decreases 6 dB with each doubling of the distance from the source. Under most conditions, reflected sound would reduce the attenuation due to distance. Therefore, doubling the distance may only result in a decrease of 4 to 5 dB (AIHA 1996). Table 4-1 shows the anticipated sound pressure levels at a distance of 50 feet for miscellaneous heavy equipment.

Construction of a new Medical Clinic east of the existing Medical Clinic would be accomplished under the Proposed Action. The primary source of noise from these activities would be from equipment and vehicles involved in demolition, site preparation, construction, and finishing work. Typical noise levels generated by these activities range from 75 to 89 dB at 50 feet from the source as predicted from Table 4-1. The area of the Proposed Action is located adjacent to a highly developed housing area in the northwestern part of the Base. Sensitive receptors within 400 feet of the short-term Proposed Action construction activities include; the family housing area to the south, the existing medical clinic to the west, and the dormitories north.

Table 4-1 Heavy Equipment Noise Levels at 50 Feet

Equipment Type	Number Used ¹	Generated Noise Levels, L _p (dB) ²
Bulldozer	1	88
Backhoe (rubber tire)	1	80
Front Loader (rubber tire)	1	80
Concrete Truck	1	75
Concrete Finisher	1	80
Crane	1	75
Asphalt Spreader	1	80
Roller	1	80
Flat Bed Truck (18 wheel)	1	75
Scraper	1	89
Trenching Machine	1	85

¹ Estimated number in use at any time.

² L_p = sound pressure level

Source: CERL 1978.

For the purposes of this analysis, it is estimated the shortest distance between demolition or construction noise source and a sensitive receptor would be about 100 feet. Conservatively, outdoor noise at an occupied residence or school could range from as high as 71 to 85 dB at 100 feet from the source. However, the noise level could be lower if the sound is not reflected. Interior noise levels would be reduced from the 71 to 85 dB level by approximately 18 to 27 due to the NLR properties of the building's construction materials (USDOT 1992). It is anticipated that demolition and construction activities would occur between 7:30 a.m. and 4:30 p.m., 5 days per week for the duration of the project. The noise would be temporary and occur only during the hours that construction, and demolition activity would occur and would cease when the project is completed.

Based on data in Table 3-1, 61 percent of the persons exposed to DNL 85 dBA could be highly annoyed from the demolition and construction noise. No hearing loss would be anticipated for persons outdoors because they would not be exposed to DNL equal to or greater than 75 dBA for 40 years of exposure at 16 hours per day, the level at which hearing loss could occur. Sleep interference is unlikely because demolition and construction activities would occur during the daytime.

Elevated noise levels can interfere with speech, causing annoyance or communication difficulties. Based on a variety of studies, DNL 75 dBA indicates there is good probability for frequent speech disruption. This level produces ratings of "barely acceptable" for intelligibility of spoken material. Persons conducting conversations within the project area could have their speech disrupted by construction or demolition generated noise. Speech disruption would be temporary, lasting only as long as the noise-producing event.

The primary source of noise at Tinker AFB would continue to be from aircraft operations. It should be noted that noise from flying activities would tend to mask the noise generated by construction projects for the same exposure area. The perception would be that construction noise likely would not be discernible during periods of aircraft operations. However, there could be periods of time during which construction noise

could be discerned and provide minor annoyance. This condition would occur when construction activity is underway and flying activity is low.

In summary, noise from demolition, and construction activity would be temporary and intermittent, lasting only as long as the Proposed Action activities. The new medical clinic would be in the same general area as the No Action Alternative and would be designed and constructed to meet minimum Air Force NLR criteria.

4.2.3 Alternative Action

Noise levels relating to the Proposed Alternative Action would be similar to noise generated for the Proposed Action. Noise from construction activities would be temporary and intermittent and would last only for the construction phase of the Proposed Alternative Action. There are no sensitive receptors located within 400 feet of the Alternative Action. However, the greenway trail is located in the area and is utilized as a recreational jogging path.

As with the Proposed Action, noise from demolition and construction activity would be temporary and intermittent, lasting in duration only as long as Alternative Action activities. The new medical clinic would be designed and constructed to meet minimum Air Force NLR criteria.

Mitigation

Although noise levels would be temporarily increased from demolition and construction activities, no significant noise impacts would be anticipated and mitigation measures would not be required. Greenway trail users will experience short term noise resulting from the construction effort, but these will be temporary and last only as long as the construction effort. Trail users will experience vehicular noise similar to other portions of the base where the trail parallels the roadways. Noise impacts to trail users would not result in a significant impact during the operational phase of the Alternative Action.

Cumulative Impacts

The closest distance between the other action sites and the areas of the Proposed and Alternative Actions would be approximately 400 feet and greater. This distance would preclude combined noise at significant levels. No cumulative noise impacts would be anticipated from the Proposed Action and other actions.

4.3 BIOLOGICAL RESOURCES

Biological resources analyses used the following evaluation criteria to assess the impacts of the alternatives:

- Changes to wetlands areas;
- Diminished habitat for a plant or animal species;
- Diminished regionally important plant or animal species;
- Interference with wildlife movement or reproductive behavior; and
- Increase of impervious cover within a floodplain area.

4.3.1 Vegetation and Wildlife

No Action Alternative

Under the No Action Alternative, the construction of the new medical facility would not be performed and the Base would be forced to shut down the clinic. There would no change from the baseline condition for vegetation and wildlife.

Proposed Action

The Proposed Action would take place in previously developed areas near the existing medical clinic. There would be no impacts to wetlands nor would impervious cover increase within a floodplain area.

The Proposed Action would not substantially change habitat for plant or animal species, nor would it diminish an important plant or animal species. There would be no impacts to vegetation within the developed areas of the Base. Trees and shrubs would be retained to the greatest extent possible. Use of best management practices and reestablishment of ground cover during construction would minimize the potential for adverse impacts to vegetation and wildlife at and near the construction sites. Therefore, no adverse impacts would be anticipated to wildlife and vegetation.

Alternative Action

The Alternative Action occurs at a site in the South Forty area that is currently open space. The Texas horned lizard occurs in this area. Figure 3-2 shows locations of the WMAs and Figure 3-3 shows distribution of the Texas horned lizard and sightings of species of concern in relation to the project area. Of special note, shrikes of the species *Lanius ludovicianus* do occur on Base (Tinker AFB 2001). Only the previously listed migrant race of shrikes (*migrans*) has the potential to occur on Base near the Alternative Action.

Base-wide surveys for the Texas horned lizard were conducted in 1993 and 1994. During the 1993-1994 surveys, Texas horned lizards or their scat were found in these delineated areas. Several Texas horned lizards were sighted in the South Forty area in what is classified as a Texas horned lizard habitat area (Tinker AFB 2004b). Construction of the new medical facility in the South Forty area would likely reduce the current distribution range of the Texas Horned Lizard.

Although the Texas horned lizard is not protected under the Endangered Species Act, The Air Force, per AFI 32 7064, would consider the species prior to construction to protect the species wherever possible. Coordination with Tinker AFB Natural Resources personnel and ground survey and review prior to equipment staging and construction operations would reduce the possibility of impacts to threatened and endangered species. Use of best management practices and reestablishment of ground cover during construction would minimize the potential for adverse impacts to vegetation at and near the construction sites. No significant adverse impacts would be anticipated to wildlife and vegetation provided that the issues concerning the Texas Horned Lizard are addressed.

Mitigation

The use of best management practices to avoid known species and reestablish ground cover from construction activities would reduce the potential for adverse impacts. The Alternative Action site would require a mitigation plan for the Texas Horned Lizard. The following issues would meet mitigation requirements concerning the Texas Horned Lizard; a) Habitat replacement would be required at a cost of approximately \$2,000 per acre. b) A pre-survey would be performed. The funding must be supplied 2 years in advance of project for survey requirements. The estimated cost to complete the Pre-survey would be approximately \$20,000. c) Procedures for pre-construction site searches and lizard encounters along with movement/relocation of lizards would be followed. This plan must specify what these cost are and how they will be supplied and timing prior to construction of the project.

Cumulative Impacts

Other actions occurring during the same time period would be constructed in urbanized portions of the Base and would not impact wildlife and habitat conditions. Therefore, there would be no cumulative impacts from the combined actions.

4.3.2 Threatened and Endangered Species

No Action Alternative

Under the No Action Alternative, the construction of the new medical clinic would not be performed and the Base would be forced to shut down the clinic. There would no change from the baseline condition for T&E species.

Proposed Action

The Proposed Action would take place in previously developed area. No threatened and endangered species have been observed in the area of the Proposed Action. Therefore, no adverse impacts would be anticipated to threatened and endangered species.

Alternative Action

The Alternative Action would take place in previously undeveloped areas. No threatened and endangered species have been observed in the area of the Alternative Action. Therefore, no adverse impacts would be anticipated to threatened and endangered species.

Mitigation

No impacts would be anticipated. Therefore, no mitigation would be required.

Cumulative Impacts

No threatened and endangered species were documented at Tinker AFB. Other actions occurring during this time period would be constructed in urbanized areas unlikely to be colonized by threatened and endangered or special status species. Therefore, no cumulative impacts are expected for these species.

4.3.3 Wetlands and Waterbodies

No Action Alternative

Under the No Action Alternative, replacement of the medical clinic would not be performed and the Base would be forced to shut down the clinic. There would be no change from the baseline condition for wetlands and waterbodies.

Proposed Action

No wetlands are located at the site of the Proposed Action. Therefore, no impacts would be anticipated to wetlands. The Proposed Action lies within the Crutcho Creek watershed, stormwater runoff flows east toward Crutcho Creek. Crutcho Creek flows northward from the Base and ultimately drains into the North Canadian River.

Storm water and erosion best management practices would be incorporated into the construction of the Proposed Action to prevent soil erosion.

Alternative Action

No wetlands are located at the site of the Proposed Action. Therefore, no impacts would be anticipated to wetlands. There are two water bodies located near the Alternative Action in the eastern portion of the project area. Redbud Pond is located to the northeast and Beaver Pond is located to the east. Storm water runoff from this site flows northeast toward Redbud Pond, which acts a drainage basin for the site.

Storm water and erosion best management practices would be incorporated into the construction of the Proposed Action to minimize runoff and prevent pollution from soil erosion in Redbud Pond and Beaver Pond.

Mitigation

Due to the absence of wetlands, no mitigation to wetlands would be required. Mitigation to waterbodies would include erosion control measures and best management practices detailed in the construction contractor's Storm Water Pollution Prevention Plan.

Cumulative Impacts

Other actions would take place in urbanized portions of the Base devoid of wetlands. Potential runoff from these sites are unlikely to contribute to pollution from soil erosion in the Redbud Pond or Beaver Pond. No cumulative impacts are expected for the Proposed or Alternative Action.

4.4 EARTH RESOURCES

- Impacts to earth resources are considered based on the following evaluation criteria:
- Project contribution to erosion; or
- Alternation of soil occurred through activities such as excavation, drilling; or digging, or
- Changes the topography with slopes over 20 percent.

4.4.1 No Action Alternative

Under the No Action Alternative, the replacement of the medical clinic would not be performed and the Base would be forced to shut down the clinic. There would be change from the baseline condition for earth resources.

4.4.2 Proposed Action

The Proposed Action would not affect localized topography during construction of the medical clinic. The topography is level and would not require the site to be graded to change the surface to allow for proper construction.

Soil in the project area has already been compacted during road and construction of surrounding buildings, so no decrease in storm water percolation into the soil at the site of the Proposed Action is expected, therefore no increase in storm water runoff is expected.

Construction activity under the Proposed Action would occur within an area in which the soil has been disturbed and modified by prior construction activities. The contractor would ensure a storm water pollution prevention plan is completed and approved before initiating activities. The plan would include erosion control best management practices that would be used during demolition and construction to minimize erosion.

Earthwork would be planned and conducted in such a manner to minimize the duration of exposure of unprotected soil. Side slopes and back slopes would be protected immediately upon completion of rough grading. Protection would be provided by accelerated growth of permanent vegetation, temporary vegetation, mulching, or netting. Slopes too steep for stabilization by other means would be stabilized by hydroseeding, mulch anchored in place, covering by anchored netting, sodding, or such combination of these and other methods as may be necessary for effective erosion control. Use of best management practices such as rock berms, silt fences, and single point construction entries would minimize erosion during demolition and construction. Grass and other landscaping would be reestablished in the disturbed areas immediately after completion of construction, thereby reducing the potential for erosion. For these reasons, no soil impacts would be expected.

4.4.3 Alternative Action

The topography varies in elevation by up to 20 feet and the site would require considerable grading and hauling activities to change the surface to allow for construction. The change in topography would affect in runoff patterns at the site.

Soil in the project area has not recently been disturbed. An increase in storm water percolation into the soil at the site of the Alternative Action is expected, resulting in an increase in storm water runoff.

The contractor would ensure a storm water pollution prevention plan is completed and approved before initiating activities. The plan would include erosion control best

management practices that would be used during demolition and construction to minimize erosion.

Earthwork would be planned and conducted in such a manner to minimize the duration of exposure of unprotected soil. Side slopes and back slopes would be protected immediately upon completion of rough grading. Protection would be provided by accelerated growth of permanent vegetation, temporary vegetation, mulching, or netting. Slopes too steep for stabilization by other means would be stabilized by hydroseeding, mulch anchored in place, covering by anchored netting, sodding, or such combination of these and other methods as may be necessary for effective erosion control. Use of best management practices such as rock berms, silt fences, and single point construction entries would minimize erosion during demolition and construction. Grass and other landscaping would be reestablished in the disturbed areas immediately after completion of construction, thereby reducing the potential for erosion. For these reasons, no soil impacts would be expected.

4.4.4 Mitigation

The change in topography and resulting runoff changes would need to be addressed prior to initiating construction activities in order to reduce potential impacts due to stormwater runoff at the site. During construction, the contractor would ensure that a storm water pollution prevention plan is completed and approved before initiating activities. The plan would include erosion control best management practices that would be used during demolition and construction to minimize erosion.

4.4.5 Cumulative Impacts

Due to the distance between the Proposed Action sites and the other action construction sites, and with implementation of storm water control devices at the other action sites, no cumulative soil impacts would be anticipated.

Other actions in the area of the Alternative Action include the child development center and 72 communications and information technology facility. However, the topography of these site will not require the extreme earth work as the Alternative Action site. With storm water controls in place at the Alternative Action construction site and the other action construction sites no adverse cumulative impacts are anticipated.

4.5 LAND USE

Conflicts with current and future Base Land Use Plans is the criterion used to assess the impacts on land use.

4.5.1 No Action Alternative

Under the No Action Alternative, existing land use would not change from current baseline conditions.

4.5.2 Proposed Action

The Proposed Action would require no change to land use designations on the Base. The Proposed Action would construct a new medical facility to the east of the existing facility on land currently categorized as medical and industrial. The Proposed Action is in direct correlation with the current and future land use plans of Tinker AFB.

4.5.3 Alternative Action

The Alternative Action would require a change in land use designations from open space to medical. The Alternative Action would construct a new medical clinic in the South Forty Area immediately to the northeast of the Gott Gate. The greenway trail is located in the area of the Alternative Action as well as the Fam Camp recreational site. Future land use plans for this area indicate that the area is designated for community (commercial) and housing (unaccompanied Tinker AFB has the authority to change land use designations to implement its Base support requirements).

4.5.4 Mitigation

No adverse land use impacts would occur. The greenway trail infrastructure would be maintained during construction efforts and during the operation of the new facility. The construction contractor would need to be made aware of this infrastructure and apply best management practices to ensure that the infrastructure is not altered. Best management practices including; dust suppression, traffic control, and storm water runoff would be adhered to prevent aesthetical impacts to the Fam Camp recreational area. Upon completion of the new facility, revegetation with native grasses and landscaping would lend to the aesthetical value of the new facility.

4.5.5 Cumulative Impacts

The facilities programmed under the other actions would be consistent with the Base land use plan. No cumulative land use impacts would be anticipated from the Proposed Action or the Alternative Action.

4.6 AIR QUALITY

Impacts to air quality were considered based on the following evaluation criteria:

- The federal action caused or contributed to a violation of any national, state, or local ambient air quality standard;
- Exceeded *de minimis* threshold levels and other criteria established in 40 CFR 93.153(b) for individual nonattainment pollutants,
- Represented an increase of ten percent or more in affected AQCR's emissions inventory per the CAA conformity rules, or
- Exceeded any significance criteria established by the Oklahoma SIP.

4.6.1 No Action Alternative

Under the No Action Alternative, demolition of the existing medical clinic and construction of the new medical clinic would not be performed and the Base would be forced to shut down the clinic. There would be change from the baseline condition for air quality.

4.6.2 Proposed Action

Under the Proposed Action, a new medical clinic would be constructed to the east of the existing medical facility as early as 2008 or 2009. Some existing parking would need to be demolished to allow construction of the new medical clinic. The new facility would replace the existing facility and would result in the demolition of the Central Plant (Building 5802). Existing parking area would be utilized for the new medical clinic. The Central Plant contains both chillers and boilers and serves the existing medical clinic as well as other surrounding buildings near Buildings 5801 and 5802. Energy used to operate the boilers originates from diesel fuel stored in an underground storage tank. The Central Plant is a 2,580 ft² one-story structure and would be decentralized from the central heating and cooling system upon completion of the new medical clinic. The Proposed Action also includes a new 7,564 ft² 507th Medical Squadron Building and retains the existing War Readiness Materials (WRM) warehouse (Building 5800).

Fugitive dust from ground disturbing activities and combusive emissions from construction equipment would be generated during construction and demolition. Fugitive dust would be generated from activities associated with site clearing, grading, cut and fill operations, and from vehicular traffic moving over the disturbed site. These emissions would be greatest during the initial site preparation activities and would vary from day to day depending on the construction phase, level of activity, and prevailing weather conditions.

The quantity of uncontrolled fugitive dust emissions from a construction site is proportional to the area of land being worked and the level of construction activity. The USEPA has estimated that uncontrolled fugitive dust emissions from ground-disturbing activities would be emitted at a rate of 80 lbs of TSP per acre per day of disturbance (USEPA 1995). In a USEPA study of air sampling data at a distance of 50 meters downwind from construction activities, PM₁₀ emissions from various open dust sources were determined based on the ratio of PM₁₀ to TSP sampling data. The average PM₁₀ to TSP ratios for top soil removal, aggregate hauling, and cut and fill operations are reported as 0.27, 0.23, and 0.22, respectively (USEPA 1988). Using 0.24 as the average ratio for purposes of analysis, the emission factor for PM₁₀ dust emissions becomes 19.2 lbs per acre per day of disturbance.

The USEPA also assumes that 230 working days are available per year for construction (accounting for weekends, weather, and holidays), and that only half of these working days would result in uncontrolled fugitive dust emissions at the emitted rate described above (USEPA 1995). The construction emissions presented in Table 4-2 include the estimated annual PM₁₀ and PM_{2.5} emissions associated with the Proposed Action at Tinker AFB. It is assumed that approximately 125 percent of the project area

(8.36 acres) would be disturbed during construction, resulting in an average of 10.45 acres being disturbed. These emissions would produce slightly elevated short-term PM₁₀ and PM_{2.5} ambient air concentrations. The USEPA estimates that the impacts of fugitive dust from construction activities would be reduced significantly with an effective watering program. Watering the disturbed area of the construction with approximately 3,500 gallons per acre per day would reduce TSP emissions as much as 50 percent (USEPA 1995).

Table 4-2 Proposed Action Emissions

Criteria Air Pollutant	CO (tpy)	VOC (tpy)	NOx (tpy)	SOx (tpy)	PM ₁₀ (tpy)	PM _{2.5} ^c (tpy)
AQCR CY 02 Totals ^a	481,118	15,925	80,696	9,496	142,797	29,903
Annual Emissions ^b						
Proposed Action	4.76	0.91	10.70	1.16	18.55	3.88
Project Emissions as Percent of AQCR Emissions	0.001%	0.006%	0.013%	0.012%	0.013%	0.013%

^a AIRData 2002.

^b Estimated annualized emissions from Proposed Action activities. It is anticipated construction activities would begin in 2009 and end in 2011 for a total duration of 2 years.

^c Estimated PM_{2.5} emissions calculated from the Proposed Action PM₁₀ emissions based on a ratio of PM₁₀ to PM_{2.5} for the AQCR CY02 Totals. PM_{2.5} is included for information only.

Note: VOC is not a criteria air pollutant. However, VOC is reported because, as an ozone precursor, it is a controlled pollutant.

Specific information describing the types of construction equipment required for a specific task, the hours the equipment is operated, and the operating conditions vary widely from project to project. For purposes of analysis, these parameters were estimated using established cost estimating methodologies for construction and experience with similar types of construction projects (Means 2004). Combustive emissions from construction equipment exhausts were estimated by using USEPA-approved emissions factors for heavy-duty diesel-powered construction equipment (USEPA 1985). The construction emissions presented in Table 4-2 include the estimated annual emissions from construction equipment exhaust associated with the Proposed Action at Tinker AFB. It is estimated the construction activity would last about 2 years and that ground-disturbing activities would occur during the entire project duration, with continuous cut and fill operations.

The total estimated project emissions were calculated to get the anticipated annual emissions. Analysis is based on a 1-year period to align with baseline emissions data, which are for 1 year. As with fugitive dust emissions, combustion emissions would produce slightly elevated air pollutant concentrations. However, the impacts would be temporary, fall off rapidly with distance from the proposed construction site, and would not result in any long-term impacts. Table 4-2 lists the annual emissions from on-Base construction activities and the annual percent of change when compared to the baseline for the Proposed Action.

Review of data in Table 4-2 for AQCR 184 indicates that the greatest increase in emissions from construction activities for the Proposed Action would be from PM₁₀ with 18.55 tons (annualized), which equates to 0.0133 percent of the PM₁₀ emissions within

the AQCR. The emissions would be temporary and would be eliminated after completion of the activity. Emissions that are greater than 10 percent of the AQCR for any of the criteria pollutants, would be considered regionally significant by the USEPA, if the region were in nonattainment for criteria pollutants as stated in 40 CFR 51, Subpart W, Section 852. However, the area is in attainment. Based on the above analysis, air emission impacts from the construction activities associated with the Proposed Action would not be considered significant by the USEPA. Therefore, the general conformity rule described in Subchapter 3.6.1 would not apply because the AQCR is in attainment status. Additionally, no SIP would be required.

4.6.3 Alternative Action

Under the Alternative Action, a new medical facility, approximately 172,000 ft² in size would be constructed as early as 2008 or 2009 in the open land area north east of the Gott Gate. The facility would be similar in function and layout to the facility described under the Proposed Action. Earthwork would be planned and conducted in such a manner to minimize the duration of exposure of unprotected soil. Grass and other landscaping would be reestablished in the disturbed areas immediately after completion of construction, thereby reducing the potential for erosion. The 507th Medical Reserve Unit would also be located in the vicinity of the Alternative Action in a separate facility. The Central Plant (Building 5802) would remain to serve the non-medical facilities it currently serves. The WRM warehouse and TRICARE facility (Building 5803) would be turned over to the Base for other non-medical uses.(Tinker AFB, 2005) Upon construction of the new medical clinic, the existing medical clinic facility would be demolished.

The construction emissions presented in Table 4-3 include the estimated annual emissions from construction equipment exhaust associated with the Alternative Action at Tinker AFB and are almost identical to the emissions calculated for the Proposed Action. It is assumed that approximately 125 percent of the project area (23.64 acres) would be disturbed during construction, resulting in an average of 29.55 acres being disturbed. Construction activity is estimated to last about 2 years and ground-disturbing activities would occur during the entire project duration, with continuous cut and fill operations.

Table 4-3 Alternative Action Emissions

Criteria Air Pollutant	CO (tpy)	VOC (tpy)	NO _x (tpy)	SO _x (tpy)	PM ₁₀ (tpy)	PM _{2.5} ^c (tpy)
AQCR CY 02 Totals ^a	481,118	15,925	80,696	9,496	142,797	29,903
Annual Emissions ^b						
Alternative Action	6.43	1.01	11.12	1.21	50.24	10.52
Project Emissions as Percent of AQCR Emissions	0.001%	0.006%	0.014%	0.013%	0.035%	0.035%

^a AIRData 2002.

^b Estimated annualized emissions from Proposed Action activities. It is anticipated construction activities would begin in 2009 and end in 2011 for a total duration of 2 years.

^c Estimated PM_{2.5} emissions calculated from the Proposed Action PM₁₀ emissions based on a ratio of PM₁₀ to PM_{2.5} for the AQCR CY02 Totals. PM_{2.5} is included for information only.

Note: VOC is not a criteria air pollutant. However, VOC is reported because, as an ozone precursor, it is a controlled pollutant.

The total estimated project emissions were calculated to get the anticipated annual emissions. Analysis is based on a 1-year period to align with baseline emissions data, which are for 1 year. As with fugitive dust emissions, combustion emissions would produce slightly elevated air pollutant concentrations. However, the impacts would be temporary, fall off rapidly with distance from the proposed construction site, and would not result in any long-term impacts. Table 4-3 lists the annual emissions from on-Base construction activities and the annual percent of change when compared to the baseline for the Alternative Action.

Review of data in Table 4-3 for AQCR 184 indicates that the greatest increase in emissions from construction activities for the Alternative Action would be from PM₁₀ with 50.24 tons (annualized), which equates to less than 0.04 percent of the PM₁₀ emissions within the AQCR. The emissions would be temporary and would be eliminated after completion of the activity. Emissions that are greater than 10 percent of the AQCR for any of the criteria pollutants, would be considered regionally significant by the USEPA, if the region were in nonattainment for criteria pollutants as stated in 40 CFR 51, Subpart W, Section 852. However, the area is in attainment. Based on the above analysis, air emission impacts from the construction activities associated with the Alternative Action would not be considered significant by the USEPA. Therefore, the general conformity rule described in Subchapter 3.6.1 would not apply because the AQCR is in attainment status. Additionally, no SIP would be required.

4.6.4 Mitigation

No air quality impacts would be anticipated. No mitigation would be required.

4.6.5 Cumulative Impacts

Seven other actions would be considered for cumulative impacts with the Proposed Action. These projects are the construction of new dormitories, new transient alert facilities, new physical fitness center, chapel care addition, demolition of VOQs, construction of new VOQs and collocated officer's club, and the MFH Privatization.

Six other actions would be considered for cumulative impacts with the Alternative Action. These projects are the child development center, the 72 communication and information technology facility, consolidate security forces squadron, expand and upgrade Air Depot Boulevard to a four lane facility, upgrade Gott Gate, and MFH privatization.

The USEPA also assumes that 230 working days are available per year for construction (accounting for weekends, weather, and holidays), and that only half of these working days would result in uncontrolled fugitive dust emissions at the emitted rate described above (USEPA 1995). The construction emissions presented in Table 4-4 include the estimated annual PM₁₀ and PM_{2.5} emissions associated with other actions at Tinker AFB. These emissions would produce slightly elevated short-term PM₁₀ and PM_{2.5} ambient air concentrations. The USEPA estimates that the impacts of fugitive dust from construction activities would be reduced significantly with an effective watering program. Watering the disturbed area of the construction with approximately

3,500 gallons per acre per day would reduce TSP emissions as much as 50 percent (USEPA 1995).

When considering area, the largest of the other projects would be the construction of the new dormitories, new VOQs and collocated officers club, and the housing Privatization. For analysis purposes, the emissions from these projects were combined with the Proposed Action emissions to represent the most conservative condition that would occur in any one year for cumulative condition impacts. Similarly, for the Alternative Action site, scoped projects including the 72 communication and information technology facility, consolidation of security forces squadron, and the housing privatization were analyzed. The methodology used to calculate the emissions for the Proposed was used for the cumulative conditions. Table 4-4 lists the annual emissions and the annual percent of change when compared to the baseline for the Proposed and Alternative Action cumulative condition.

Table 4-4 Proposed and Alternative Action and Other Actions Emissions

Criteria Air Pollutant	CO (tpy)	VOC (tpy)	NO _x (tpy)	SO _x (tpy)	PM ₁₀ (tpy)	PM _{2.5} ^c (tpy)
AQCR CY02 Totals ^a	481,118	15,925	80,696	9,496	142,797	29,903
Annual Emissions:						
Proposed Action	4.76	0.91	10.70	1.16	18.55	3.88
Other Actions near Proposed Action	13.58	2.22	26.27	2.86	23.13	4.84
Total Annual Proposed Action and Other Action Emissions ^b	18.34	3.13	36.97	4.01	41.68	8.73
Project Emissions as Percent of AQCR Emissions	0.004%	0.020%	0.046%	0.042%	0.029%	0.029%
Annual Emissions:						
Alternative Action	6.43	1.01	11.12	1.21	50.24	10.52
Other Actions near Alternative Action	6.97	1.13	13.41	1.46	10.53	2.20
Total Annual Alternative Action and Other Action Emissions ^b	13.40	2.14	24.53	2.67	60.77	12.73
Project Emissions as Percent of AQCR Emissions	0.003%	0.013%	0.030%	0.028%	0.043%	0.043%

^a AIRData 2002.

^b Estimated annualized emissions from Proposed Action activities. It is anticipated construction activities would begin in 2008 and end in 2010, for a total duration of 2 yrs.

^c Estimated PM_{2.5} emissions calculated from the Proposed Action PM₁₀ emissions based on a ratio of PM₁₀ to PM_{2.5} for the AQCR CY02 Totals. PM_{2.5} is included for information only.

Note: VOC is not a criteria air pollutant. However, VOC is reported because, as an ozone precursor, it is a controlled pollutant.

Review of the data in Tables 4-4 indicates that the greatest increase in emissions from construction activities for the proposed action and its cumulative actions would be PM₁₀ (41.68 tons) under the cumulative condition. The PM₁₀ emissions equate to less than 0.03 percent of the PM₁₀ emissions within the AQCR. The greatest increase in emissions from construction activities for the alternative action and its cumulative actions would be PM₁₀ (60.77 tons) under the cumulative condition. The PM₁₀ emissions equate to less than 0.05 percent of the PM₁₀ emissions within the AQCR.

The emissions for either the Proposed or Alternative Action cumulative condition would be temporary and would be eliminated after completion of the activity. Emissions for all cumulative conditions that are greater than 10 percent of the AQCR for any of the criteria pollutants would be considered regionally significant by the USEPA if the region were in nonattainment for criteria pollutants as stated in 40 CFR 51, Subpart W, Section 852. However, the area is in attainment. Therefore, air emissions from construction activities associated with the Proposed Action, Alternative Action or their cumulative conditions would not impact air quality. Additionally, no SIP would be required for any or the Proposed or Alternative actions or their cumulative conditions.

4.7 INFRASTRUCTURE AND UTILITIES

The criteria used to evaluate impact on utility systems were

- Increased the demands on systems; and
- Need for additional capacity or new facilities.

4.7.1 Electrical Energy

No Action Alternative

Under the No Action Alternative, replacement of the medical clinic would not be performed and the Base would be forced to shut down the clinic. There would be no change from the baseline condition for energy resources.

Proposed Action

An increase in electrical energy or upgrade of distribution system would not be needed to support the new facility. Consumption would be about the same level as the No action alternative.

Alternative Action

Electricity is available from existing lines in the area of the Alternative Action. However, a new 40 MVA electrical substation with a 138/12.47 KV transformer and 12.47 KV feeder circuits to connect the substation to the existing distribution system and provide looped service throughout this area of Tinker Air Force Base would be required. A new substation in the south forty area is currently planned. The substation will alleviate inadequacies with the current electrical distribution system in the South Forty area and support future development.

Mitigation

No mitigation is required. The Alternative Action would require system upgrades to maintain electrical energy for the new medical clinic, the construction of a new substation located in the immediate vicinity would meet this need. No additional mitigation would be necessary for the Proposed Action.

Cumulative Impacts

Other Actions occurring the same time period can be supported by the existing capacity of the electrical system. These actions combined with the proposed action or alternative action would not put the demand on the system that would require an upgrade of the system. However, other actions planned for the South Forty area would result in an increase energy demand not currently supported by the current electrical system.

4.7.2 Storm Water Management

Impacts to storm water management are based on the following evaluation criteria:

- Storm water runoff due to substantial increases in impervious cover, or
- Degradation of water quality due to runoff.

No Action Alternative

Under the No Action Alternative, replacement of the medical clinic would not be performed and the Base would be forced to shut down the clinic. There would be no change from the baseline condition for storm water management.

Proposed Action

The Proposed Action would not affect any surface water bodies. The Proposed Action is not located in the 100 year floodplain. The Proposed Action would disturb approximately 5.1 acres of soil. Storm water discharges for construction projects with area greater than 1 acre are regulated by 40 CFR 9, 122, 123 and 124. The contractor would be required to prepare a storm water pollution prevention plan to mitigate any possible erosion caused by storm water. Appropriate erosion-control measures would be taken during construction to avoid water quality impacts to rainfall runoff.

The Proposed Action would result in an increase in impervious cover of 5.1 acres, which would be offset by the demolition of the existing facility, which would result in a decrease of impervious cover of 5.7 acres. The overall decrease in impervious cover resulting from the Proposed Action would remain the same. The water table at the Base is generally about 20 feet bgs and the depth of construction or demolition activity is estimated to be no deeper than 10 feet bgs. Soil in this portion of the Base has been compacted due to previous disturbances

The contractor would ensure a storm water pollution prevention plan is completed and approved before initiating construction activities. The plan would include erosion control best management practices that would be used during construction to minimize erosion. The construction site would have silt fences and other erosion control features such as absorbent materials down gradient. Hay bales or other absorbent materials would be installed around the construction site to prevent sediment or other contaminants from

entering the storm water system or waterways during the project. If site characteristics present the potential for storm water sediment to enter the storm water system, drains in the area would be protected with silt fences, hay bales, or an approved equivalent to prevent any degradation of storm water. Therefore, no storm water management impacts would be anticipated from project site runoff.

Alternative Action

The Alternative Action would affect the amount of runoff received by Redbud Pond and Beaver Pond. The Alternative Action is not located in the 100 year floodplain. The Alternative Action would disturb approximately 6.2 acres of soil. Storm water discharges for construction projects with area greater than 1 acre are regulated by 40 CFR 9, 122, 123 and 124. The contractor would be required to prepare a storm water pollution prevention plan to mitigate any possible erosion caused by storm water. Appropriate erosion-control measures would be taken during construction to avoid water quality impacts to rainfall runoff.

The Alternative Action would result in an increase in impervious cover of 8.0 acres in an area that was previously open space. The decrease in impervious cover in the area of the existing medical clinic would be 5.5 acres. The Alternative Action would result in an increase in impervious cover on the Base of 2.5 acres. Soil used for fill, the construction of the new medical clinic and associated parking areas in the South Forty area would result in increase in storm water runoff. However, through the adoption of a storm water pollution prevention plan (SWPPP), storm water runoff and subsequent water quality changes would be minimized and kept to acceptable levels.

Mitigation

The SWPPP would be prepared and implemented at the time of construction, to reduce the amount of runoff received by the Redbud Pond in the area of the Alternative Action.

Cumulative Impacts

Tinker AFB has a large area of impervious cover. Buildings and roadways account for approximately 1,369.5 acres of impervious cover. The airfield pavement has 545.5 acres of impervious cover. The Alternative Action would increase impervious cover by approximately 209,564 ft² (6.2 acres). Total impervious cover resulting from cumulative impacts would increase to 203,080 ft² (6 acres) or approximately 0.3 percent increase over the baseline impervious cover condition.

Under the Proposed Action, the new medical clinic would have a negligible change in impervious cover because as it is being built on the footprint of the existing facility. The demolition of the VOQs and the Proposed Action would not increase impervious cover. Total impervious cover resulting from other actions would increase to 328,550 ft² (9.7 acres) or approximately 0.5 percent increase over the baseline impervious cover condition. This small increase for other actions would be negligible for cumulative impacts.

Implementing erosion control techniques and storm water best management practices will prevent degradation of storm water runoff, cumulative storm water impacts would be minimal for the cumulative condition.

4.7.3 Transportation

Criteria used to assess the impact on transportation are:

- The degree to which a transportation system would have to alter operating practices and personnel requirements to support the action;
- The capacity required from new or revised transportation systems; and
- The degree to which the increased demands from the proposed program would reduce the reliability of transportation systems or aggravate already existing adverse conditions on Base.

No Action Alternative

Under the No Action Alternative, the replacement of the medical facility would not be performed and the Base would be forced to shut down the clinic. There would be no change from the baseline condition for transportation.

Proposed Action

Under the Proposed Action, the new medical clinic would be accessed through the Vance Gate off Sooner Road under the same conditions that currently apply for the existing medical clinic. There are no current transportation problems associated with the existing medical clinic. During construction of the new medical clinic some minor traffic delays may result. These cease once construction is complete. No changes to transportation impacts are anticipated for the Proposed Action other than during construction.

Alternative Action

Under the Alternative Action, the new medical clinic would be accessed from the Gott Gate off Air Depot Boulevard and SE 59th Street. This area currently relies on stop signs to control traffic flow onto Air Depot and Industrial Boulevard located on Base. Additional traffic delays would occur during the construction of the new clinic and minor delay during the operation of the new clinic as well. A widening project is planned for Air Depot Boulevard on Base, changing the current two-lane road to a four-lane road. The Alternative Action is located on the opposite side of the Base from the BX and Commissary. The location of the new medical clinic in this area would result in an increase in traffic flow along Air Depot Boulevard between the new medical clinic and the north parts of the Base. This route takes dual visitors to the medical clinic and/or BX or Commissary visitors through a highly industrialized portion of the Base.

Mitigation

No mitigation would be required for the Proposed Action other than temporary off-site parking during construction. The need for off-site parking would be short lived and would be mitigated through the demolition and construction completion. Existing traffic conditions in the area of the Alternative Action would be mitigated through the on-Base

Air Depot widening project and the addition of traffic lights inside the Gott Gate entrance.

Cumulative Impacts

Demolition and construction activities associated with the other actions would occur in separate areas of the Base. The separation between the other actions project sites and the Proposed Action and Alternative Action sites would minimize the potential for combining the traffic from all activities. Cumulative impacts would be minimal due to other actions.

4.7.4 Solid Waste Management

The following criteria were used in assessing the environmental impact for solid waste management:

- The degree to which waste generation could affect the existing solid waste management program; and
- The capacity of the area landfill.

Analysis of the impacts associated with the proposed demolition and construction activities was based on the following assumptions:

- The weight of concrete debris is 150 pounds per cubic foot (lb/ft³) (Merritt 1976);
- The weight of asphaltic concrete roadways is 130 lb/ft³ (AI 1983);
- Approximately 4 pounds of construction debris is generated for each square foot of floor area for new structures (Davis 1995);
- Approximately 92 pounds of demolition debris is generated for each square foot of floor area of demolished structures (USACE 1976);
- Approximately 1 pound of construction debris is generated for each square foot new asphaltic concrete pavement;
- The Southeast Landfill is permitted for its projected remaining life of 8 years from the beginning of the construction period (2005-2013) and the average deposition rate for construction and demolition debris in the landfill is 1,622 tons per day, 260 days per year; and
- The project construction duration would be 2 years and debris would be disposed 5 days per week, or a total of 520 days for the entire project.

No Action Alternative

Under the No Action Alternative, construction of the Medical Clinic would not be performed the Base would be forced to shut down the clinic. No significant solid waste impacts occur under the existing conditions.

Proposed Action

Type IV solid waste would be generated from implementation of the Proposed Action. This waste would consist of building debris and construction materials such as concrete, metals (roofing, reinforcement bars, conduit, piping, *etc.*), fiberglass (roofing

materials and insulation), cardboard, plastics (PVC piping, packaging material, shrink wrap, *etc.*), and lumber. Based on these data and the assumptions listed above, it is estimated that 6,757 tons of demolition and construction debris would be generated by the Proposed Action.

It is assumed the debris would be disposed in the Southeast Landfill. Disposal of demolition and construction debris from the Proposed Action would increase the disposal rate at the Southeast Landfill by approximately 13 tons per day over the 2-year construction period. This rate is conservative and reflects that all waste would be disposed in the landfill. It is assumed the contractor would recycle materials to the maximum extent possible, thereby reducing the amount of construction and demolition debris disposed in the landfill. However, the exact amount of debris cannot be estimated at this time and this analysis assesses the most conservative condition.

As mentioned in paragraph 3.7.5, the landfill has a projected life expectancy of 8 years, with an average disposal rate of 1,622 tons per day. Based on an average disposal of 260 days per year (*i.e.*, 5 days per week) for 8 years, there would be 520 days when construction and demolition debris would be disposed in the landfill. Thus, the total remaining capacity of the landfill is estimated at 3,373,760 tons. The projected disposal from the Proposed Action (6,757 tons) equates to about 0.2 percent of the total remaining capacity. The 8-year life expectancy of the landfill would be expected to decrease by approximately 1 day (0.2 percent of 520 days). Disposal of construction and demolition debris from the Proposed Action would slightly reduce the life expectancy of the landfill. Disposal would be consistent with the Base Solid Waste Management program.

Alternative Action

The amount of construction debris (Type IV solid waste) would be the same as for the Proposed Action and have the same impacts on disposal in the landfill.

Mitigation

No significant impacts would be anticipated. Therefore, no mitigation would be required.

Cumulative Impacts

Based on the information in paragraph 2.4, a total of about 591,024 ft² of facility space would be constructed under other actions, and 59,394 ft² would be demolished. Based on these data and the assumptions listed in paragraph 4.7.4, it is estimated that 3,914 tons of debris would be generated by the other actions. Disposal of demolition, construction, and renovation debris from the other actions would increase the disposal rate at the Southeast Landfill by an average 1.4 tons per day over an 8-year period.

Using the remaining capacity, remaining days of disposal, and average daily disposal information stated in paragraph 4.7.4, projected disposal from the Proposed Action and other actions (9,374 tons, or 4.5 tons per day) equates to about 0.3 percent of the total remaining capacity of the landfill. The 8-year life expectancy of the landfill would be expected to decrease by 6.2 days (0.3 percent of 2,080 days). Disposal of construction and demolition debris from the Proposed Action and other actions would not significantly

reduce the life expectancy of the landfill. Therefore, cumulative impacts from implementation of the Proposed Action and other actions would not be considered significant.

Using the remaining capacity, remaining days of disposal, and average daily disposal information stated in paragraph 4.7.4, the projected disposal from the Alternative Action and other actions (9,490 tons, or 18.25 tons per day) equates to about 0.3 percent of the total remaining capacity of the landfill. The 8-year life expectancy of the landfill would be expected to decrease by 6.2 days (0.3 percent of 2,080 days). Disposal of construction and demolition debris from the Alternative Action and other actions would have only a minor additive impact on reducing the life expectancy of the landfill over the Proposed action or the Alternative Action.

4.8 HAZARDOUS MATERIALS AND HAZARDOUS WASTE MANAGEMENT

Impacts to hazardous materials and waste management are considered based on the following evaluation criteria:

- The federal action resulted in noncompliance with applicable federal and ODEQ regulations;
- Caused waste generation that could not be accommodated by current Tinker AFB waste management capacities;
- Interfered with the ERP; or
- Violated ACM, LBP, or pesticide guidance.

4.8.1 Environmental Restoration Program

No Action Alternative

Under the No Action Alternative, the replacement of the medical clinic would not be performed and the Base would be forced to shut down the clinic. There would be no change from the baseline condition for the ERP.

Proposed Action

There are no ERP sites associated with the Proposed Action location; therefore, no adverse impacts are anticipated.

Alternative Action

ERP site CG038, Subunit 2E is located at the Alternative Action location. The primary organic contaminant in CG038 groundwater is TCE; secondary organic contaminants include *cis*-1,2-dichloroethene (*cis*-1,2-DCE), 1,2-dichloroethane (1,2-DCA), and vinyl chloride. The contaminant plumes are primarily within the USZ and, to a lesser extent, the overlying HWBZ and underlying LSZ. The locations of HWBZ wells exhibiting the highest detections of TCE, which exceeded the maximum contaminant level (MCL) in only one well in Subunit 2E, and *cis*-1,2-DCE generally correspond to well locations that exhibit the highest concentrations of the same compounds in the USZ.

Based on widespread soil sampling done at Tinker it is highly unlikely that any solvent type contaminants would remain in the shallow surface (including up to 10 foot depth for the excavation) due to volatilization of the organics and there is no known history of disposal at the site. Vapor intrusion, although always a possibility above a groundwater plume is also highly unlikely due to the depth to contaminated groundwater (USZ around 60 feet deep), the clayey nature of overlying Hennessey Group sediments, and the relatively low volatile organic concentrations in the groundwater under the site. Desiccation cracks (fractures) generally extend downward for only 30 feet or so, and therefore there is a very limited pathway to get vapors to the surface. Finally, an extraction and treatment system (Pump and Treat) is operating in the area with extraction wells both up gradient and down gradient of the Alternative Action location, and there are additional plans to further remediate the source of the groundwater contamination. Groundwater contaminant levels are expected to decrease over time.

Mitigation

There are no ERP sites associated with the Proposed Action; therefore, no adverse impacts are anticipated. Although there are ERP sites in the vicinity of the Alternative Action, it is unlikely that contaminants would be encountered during construction or become a problem during operation of the new clinic due to the depth of the contamination and the clayish soil present at this location.

Cumulative Impacts

Facilities including other actions would need to be constructed to avoid interfering with existing monitoring wells and other groundwater remediation appurtenances.

4.8.2 Hazardous Materials

No Action Alternative

Under the No Action Alternative, replacement of the medical clinic would not be performed and the Base would be forced to shut down the clinic. Hazardous materials would continue to be managed through the Base's Hazmat Pharmacy Program.

Proposed Action

Products containing hazardous materials may be procured and used by the contractor during the construction of the medical clinic (*i.e.*, hydraulic fluid, motor oil). The use of hazardous materials on Tinker AFB must be authorized by the Base's Hazmat Pharmacy Program (HPP). The hazardous materials management program applies to all Base activities, including contractors, and operating locations. No hazardous material will be used by the contractor until it is entered into the Hazardous Materials Management System, approved for use, and issued a serial tracking label. Under this system, Environmental Compliance Operations Branch (EMCO) personnel maintain positive records for the location of the containers, from issue to return, and ultimate disposal of hazardous materials. No hazardous materials would be used for the Proposed Action that could not be accommodated by current Tinker AFB waste management capacities.

Fueling and lubrication of equipment would be conducted in a manner that affords maximum protection against spills. Secondary containment is required around temporary

fuel oil or petroleum storage tanks larger than 660 gallons. There are three aquifer systems in the area of Tinker AFB and each system is isolated from the others by clayey sequences. The isolation of groundwater systems would preclude downward migration of any hazardous material should a spill occur during demolition and construction activities.

Alternative Action

Products containing hazardous materials may be procured and used by the contractor during the construction of the medical clinic (*i.e.*, hydraulic fluid, motor oil). The use of hazardous materials on Tinker AFB must be authorized by the Base's HPP. The hazardous materials management program applies to all Base activities, including contractors, and operating locations. No hazardous material will be used by the contractor until it is entered into the Hazardous Materials Management System, approved for use, and issued a serial tracking label. Under this system, EMCO personnel maintain positive records for the location of the containers, from issue to return, and ultimate disposal of hazardous materials. No hazardous materials would be used for the Proposed Action that could not be accommodated by current Tinker AFB waste management capacities.

Fueling and lubrication of equipment would be conducted in a manner that affords maximum protection against spills. Secondary containment is required around temporary fuel oil or petroleum storage tanks larger than 660 gallons. There are three aquifer systems in the area of Tinker AFB and each system is isolated from the others by clayey sequences. The isolation of groundwater systems would preclude downward migration of any hazardous material should a spill occur during demolition and construction activities.

Mitigation

No significant impacts would be anticipated. Therefore, no mitigation would be required.

Cumulative Impacts

Activities associated with the other actions would be managed in accordance with Tinker AFB hazardous materials management directives and federal, state, and local regulations. Other activity would include routine construction activities and would not cause the Base to be out of compliance.

4.8.3 Asbestos-Containing Materials

No Action Alternative

Under the No Action Alternative, replacement of the medical clinic would not be performed and the Base would be forced to shut down the clinic. ACM would continue to be managed through the Base AMP.

Proposed Action

The demolition of the existing medical clinic could potentially release contained asbestos fibers. The demolition contractor would ensure that demolition activities are compliant with the Tinker AFB AMP.

Alternative Action

The demolition of the existing medical clinic could potentially release contained asbestos fibers. The demolition contractor would ensure that demolition activities are compliant with the Tinker AFB AMP.

Mitigation

No impacts would be anticipated. Therefore, no mitigation would be required.

Cumulative Impacts

As with the Proposed Action, the construction contractor for the other projects would comply with applicable regulatory guidance. No cumulative ACM impacts would be anticipated from the Proposed Action, Alternative Action and the other projects.

4.8.4 Lead Based Paint

No Action Alternative

Under the No Action Alternative, lead based paint would continue to be present in the existing medical clinic.

Proposed Action

Under the Proposed Action, the existing medical clinic would be demolished. Lead based paint present in the existing facility could be disposed of as construction debris.

Alternative Action

Under the Alternative Action, the existing medical clinic would be demolished. Lead based paint present in the existing facility could be disposed of as construction debris.

Mitigation

Since the existing medical clinic is being demolished, any lead based paint present would be disposed of as construction debris.

Cumulative Impacts

No cumulative impacts are anticipated with either the Proposed Action or the Alternative Action.

4.8.5 Hazardous Waste

No Action Alternative

Under the No Action Alternative, replacement of the medical clinic would not be performed and the Base would be forced to shut down the clinic. Hazardous waste would continue to be managed by the Base's Hazardous Waste Management Program.

Proposed Action

The construction contractor would maintain records of all waste determinations, including appropriate results of analysis performed, substances and sample locations, date

and time of collection, and other pertinent data as required by 40 CFR Part 280, Section 74 and 40 CFR, Part 262, Subpart D. Any hazardous waste generated would be handled in accordance with all federal, state, and local laws and regulations, including RCRA requirements for waste management and USDOT requirements for waste transport.

In the event of a spill of any amount or type of hazardous material or waste (petroleum products included), the contractor would take immediate action to contain and clean up the spill. Contractor spill clean up personnel would be trained and certified to perform spill clean up. All waste and associated clean up material would be removed from the project site and transported and/or stored in accordance with regulations until final disposal.

Alternative Action

The construction contractor would maintain records of all waste determinations, including appropriate results of analysis performed, substances and sample locations, date and time of collection, and other pertinent data as required by 40 CFR Part 280, Section 74 and 40 CFR, Part 262, Subpart D. Any hazardous waste generated would be handled in accordance with all federal, state, and local laws and regulations, including RCRA requirements for waste management and USDOT requirements for waste transport.

In the event of a spill of any amount or type of hazardous material or waste (petroleum products included), the contractor would take immediate action to contain and clean up the spill. Contractor spill clean up personnel would be trained and certified to perform spill clean up. All waste and associated clean up material would be removed from the project site and transported and/or stored in accordance with regulations until final disposal.

Mitigation

No impacts would be anticipated. Therefore, no mitigation would be required.

Cumulative Impacts

As with the Proposed Action, the construction contractor for the other projects would comply with applicable regulatory guidance. When completed, the activities at the other facilities would be managed in accordance with Tinker AFB hazardous waste management directives. No cumulative hazardous waste impacts would be anticipated from the Proposed Action and the other projects.

4.9 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

Irreversible and irretrievable resource commitments are related to the use of nonrenewable resources and the impacts the use of these resources would have on consumption or destruction of a resource that could not be replaced in a reasonable period of time. The irreversible environmental changes that could result from implementation of the proposed action include the consumption of material resources, energy resources, and human resources.

Material resources used for the Proposed Action and Alternative Action include building materials (for construction), cement for the house slabs, driveways, and sidewalks, asphalt for the streets, and other various materials. The materials that would be consumed are not in short supply and are readily available from suppliers in the region. Use of these materials would not limit other unrelated construction activities, and therefore, would not be considered significant.

Energy resources would be irretrievably lost. These include petroleum-based products such as gasoline and diesel fuel, natural gas, and electricity. During construction, gasoline and diesel fuel would be used for operation of construction equipment and other vehicles. Natural gas and electricity would be used in the new medical clinic after completion. However, because the new medical clinic would be more energy efficient than the existing medical clinic, consumption of these resources would be expected to decrease. Consumption of these energy resources would not place a significant demand on their availability in the region. Therefore, no significant impacts would be expected.

The use of human resources for construction is considered an irretrievable loss, only in that it would preclude such personnel from engaging in other work activities. However, the use of human resources for the proposed action represents employment opportunities, and is considered beneficial.

CHAPTER 5 LIST OF PREPARERS

Name	Degree	Resource	Years of Experience
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Ryon, Christopher, EIT	B.S., Environmental Engineering	Hazardous Materials and Wastes	8
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Wooten, R.C., Ph.D.	Ph.D., Ecology and Biology	Technical Management	35

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CHAPTER 6 PERSONS AND AGENCIES CONSULTED

The following persons and agencies consulted during preparation of this EA.

Brooks Air Force Base, Texas, Headquarters Air Force Center for Environmental Excellence

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APPENDIX A INTERAGENCY AND INTERGOVERNMENTAL COORDINATION FOR ENVIRONMENTAL PLANNING

Air Force Instruction (AFI) 32-7060, *Interagency and Intergovernmental Coordination for Environmental Planning*, provides the procedures to comply with applicable federal, state, and local directives for Interagency and Intergovernmental Coordination for Environmental Planning (IICEP). The AFI implements the following:

- Air Force Planning Document 32-70, *Environmental Quality*;
- Department of Defense (DoD) Directive 4165.61, *Intergovernmental coordination of DoD Federal Development Programs and Activities*;
- Executive Order 12372, *Intergovernmental Review of Federal Programs*;
- Title IV of the *Intergovernmental Coordination Act (ICA)* of 1968; and
- Section 204 of the *Demonstration Cities and Metropolitan Development Act of 1966*.

Section 401(b) of the ICA states that, "All viewpoints-national, regional, state, and local...will be fully considered...when planning federal or federally assisted development programs and projects." To comply with the IICEP, Tinker AFB distributed the Description of Proposed Action and Alternatives (DOPAA) for Replacement of the Medical Clinic on December 23, 2004. This draft environmental assessment (EA) has been distributed to the same list of agencies as the DOPAA requesting review and comments. Tinker AFB did not receive any responses from these agencies.

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No comments received from the reviewers.

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