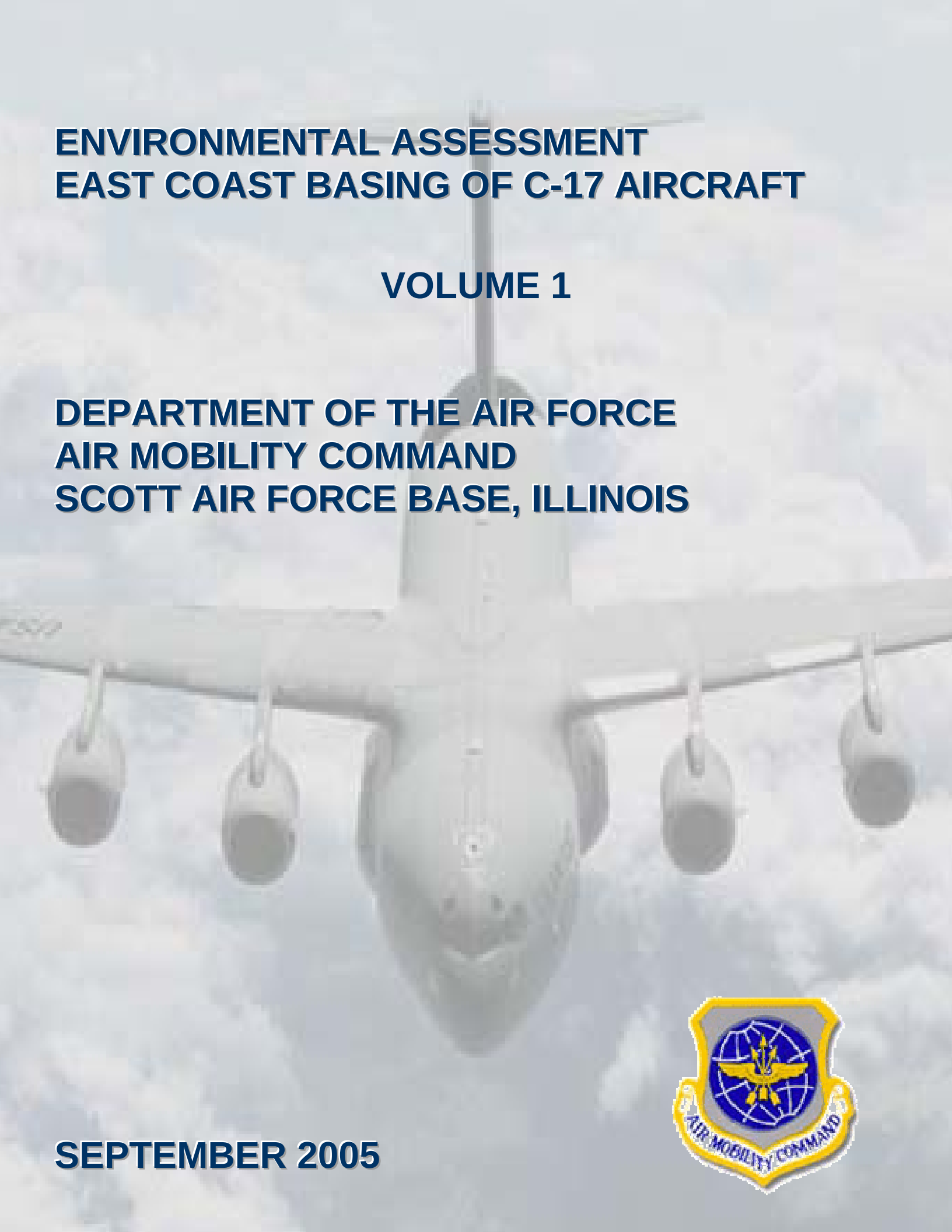
ENVIRONMENTAL ASSESSMENT
EAST COAST BASING OF C-17 AIRCRAFT

VOLUME 1

DEPARTMENT OF THE AIR FORCE
AIR MOBILITY COMMAND
SCOTT AIR FORCE BASE, ILLINOIS



SEPTEMBER 2005

Report Documentation Page

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14. ABSTRACT

Headquarters, AMC has a need to base C-17 aircraft at an east coast active duty Air Force base as part of the airlift Mobility Transformation Plan to improve overall airlift capability. Under the Proposed Action, 12 C-17 aircraft and associated aircrews and aircraft maintenance personnel would be assigned to Dover AFB, Delaware. The action would also include relocating 16 of Dover AFB?s C-5 aircraft to an air reserve component (ARC) installation. The C-17 aircrews would fly worldwide airlift missions as well as training sorties that include air refueling, low-level navigation training on 22 military training routes (MTRs). Seven facility projects would be accomplished at Dover AFB as part of the Proposed Action. Under the McGuire AFB Alternative Action, an additional 12 C-17 aircraft and associated aircrews and aircraft maintenance personnel would be assigned to McGuire AFB, New Jersey, increasing the total number of C-17s to 24 aircraft. The additional C-17 aircrews would fly worldwide airlift missions as well as training sorties that include air refueling, low-level navigation training on 16 MTRs. Ten facility projects would be accomplished at McGuire AFB as part of the alternative. Under the Charleston AFB Alternative Action, an additional 12 C-17 aircraft and associated aircrews and aircraft maintenance personnel would be assigned to Charleston AFB South Carolina, increasing the total number of C-17s to 60 aircraft. The additional C-17 aircrews would fly worldwide airlift missions as well as training sorties that include air refueling, low-level navigation training on 17 MTRs. Seven facility projects would be accomplished at Charleston AFB as part of the alternative. Under the Dover AFB Alternative Action, 24 C-17 aircraft and associated aircrews and aircraft maintenance personnel would be assigned to Dover AFB. The action would also include relocating all 32 of Dover AFB?s C-5 aircraft to an ARC installation. Seven facility projects would be accomplished at Dover AFB as part of the alternative. Under the landing zone (LZ) alternative, a LZ would be constructed and used for tactical training operations at either Dover or McGuire AFBs or Naval Air Engineering Station Lakehurst, New Jersey. Under the No Action Alternative, no additional C-17 aircraft other than the 12 aircraft planned for McGuire AFB would be based at an AMC east coast military installation and a LZ would not be constructed in the northeastern United States. Resources considered in the impact analysis were: air quality; noise; hazardous waste hazardous materials and stored fuels; water resources; biological resources; socioeconomic resources cultural resources; land use; infrastructure and utilities; airspace and airfield operations; environmental management; and environmental justice.

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FINDING OF NO SIGNIFICANT IMPACT
EAST COAST BASING OF C-17 AIRCRAFT

AGENCY

Department of the Air Force, Headquarters (HQ), Air Mobility Command (AMC), Scott Air Force Base (AFB), Illinois.

BACKGROUND

The Air Force Mobility Force Structure Briefing to Congress on April 15, 2002 presented an airlift Mobility Transformation Plan that proposes to standardize airlift aircraft fleets, increase reliability, lower operating and support costs, and increase airlift capability by 33 percent. As part of the Plan, HQ AMC has a need to base C-17 aircraft at one of three active duty east coast Air Force bases. The three bases are: Dover Air Force Base [AFB], Delaware; McGuire AFB, New Jersey; and Charleston AFB, South Carolina. (McGuire AFB is converting from C-141 to 12 C-17 airlift aircraft. It is anticipated the conversion will be complete in 2005.) The east coast C-17 basing action will begin with facility construction projects in fiscal year (FY) 2006 and be complete in FY11 with arrival of the last C-17 aircraft.

Under current acquisition plans, the Air Force will receive a total of 180 C-17s that are either based at or will be based at active duty Air Force and air reserve component (ARC) installations. The Air Force is advocating acquisition of 42 additional C-17s, thereby increasing the total fleet to 222 aircraft.

As a result of the current 180-aircraft acquisition plan and the possible acquisition of 42 additional C-17s, the Air Force is considering east coast alternatives for two basing conditions. The first condition, which is part of the 180 aircraft acquisition and which is considered in the airlift Mobility Transformation Plan, will place 12 additional aircraft at an east coast installation. The second condition, which is part of the 42 additional aircraft acquisition, will place a total of 24 aircraft at an east coast location (i.e., 12 aircraft from the 180-aircraft acquisition plus 12 aircraft from the additional 42 aircraft acquisition). The remaining 30 aircraft that are part of the 42 aircraft acquisition will be based at active duty and ARC units in other sections of the United States.

The Air Force developed nine potential alternatives, including the No Action Alternative, for basing 12 or 24 C-17 aircraft at an east coast military installation. Five basing alternatives were considered in detail: No Action; base 12 C-17 aircraft at Dover AFB; base 12 additional C-17 aircraft at McGuire AFB; base 12 additional C-17 aircraft at Charleston AFB; base 24 C-17 aircraft at Dover AFB.

A key ability of the C-17 aircraft is its capability to land and take off from a short runway called a landing zone (LZ) that is 3,500 feet to 5,000 feet in length and 90 feet wide. The Air Force proposes constructing an LZ at which McGuire AFB aircrews, as well as aircrews from the east coast C-17 basing action, will accomplish tactical arrival, departure, and landing training.

Sixteen locations were identified as potential locations for a northeastern United States LZ. Three LZ alternatives were considered in detail: McGuire AFB; Dover AFB; and Naval Air Engineering Station (NAES) Lakehurst (the Station), New Jersey. Selecting a LZ was not necessary for the Charleston AFB Alternative Action because the Base's C-17 aircrews currently use North Field, South Carolina for tactical arrival, departure, and landing training, and the same LZ will be used under the Charleston AFB Alternative.

There are three possible airfield operational conditions at the northeastern United States LZ depending on the total number of C-17s that could be based at Dover and/or McGuire AFBs under the Proposed Action or Alternative Actions. A combined total of 12, 24, or 36 C-17 aircraft could be based in the northeast, depending on which east coast C-17 basing alternative is selected. Basing 36 total C-17 aircraft in the northeastern United States represents the greatest potential for significant environmental effects of the three possible LZ alternatives. The environmental conditions associated with airfield operations for the 12 or 24 aircraft conditions would be less than those for the 36 aircraft conditions. Therefore, the EA assessed the LZ and other airfield operations for 36 total C-17 aircraft in the

northeastern United States. The LZ construction will begin early in calendar year 2007 (CY07) and be complete in early CY09.

PROPOSED ACTION

DOVER AFB PROPOSED ACTION

HQ AMC will base and operate 12 C-17 aircraft at Dover AFB and realign 16 C-5 aircraft from the Base to an ARC installation, leaving 16 C-5 aircraft at the Base. A net decrease of 161 Air Force active duty, reserve, and civilian personnel authorizations will occur as a result of the action. Dover AFB C-17 aircrews will use 22 military training routes (MTR) for low-level navigation training. Tactical arrival, departure, and landing training will be accomplished at the northeastern United States LZ. Seven facility construction, addition, and alteration projects will occur to support basing and operation activities.

NAES LAKEHURST LANDING ZONE ALTERNATIVE

The LZ, which will be constructed on the NAES Lakehurst airfield, will be 3,500 feet long and 90 feet wide with 300 foot overruns at each end. The imaginary surfaces identified in the Engineering Technical Letter (ETL) 04-7: C-130 and C-17 Landing Zone (LZ) Dimensional, Marking, and Lighting Criteria, will be established for the LZ. The LZ will be constructed parallel to the existing Runway 06/24 with 300 feet between the edge of the runway and the edge of the LZ. The LZ will be constructed in an existing grassland to the immediate north of Runway 06/24, an area in which two bird species listed as endangered by the State of New Jersey have been documented. NAES Lakehurst will establish habitat for these two species in other areas of the Station to offset the loss of grassland due to construction of the LZ.

NO ACTION ALTERNATIVE

HQ AMC will continue to operate its current east coast airlift aircraft fleet until aircraft are retired from service because of age or realigned to another installation. No additional C-17 aircraft other than the 12 aircraft planned for McGuire AFB, New Jersey under a separate action and the 48 aircraft at Charleston AFB will be based at an AMC east coast military installation. A LZ will not be constructed and operated in the northeastern United States.

MCGUIRE AFB ALTERNATIVE ACTION

HQ AMC will base and operate an additional 12 C-17 aircraft at McGuire AFB ultimately increasing the total number of C-17 aircraft at the Base to 24 aircraft. The number of assigned KC-10 and KC-135 aircraft would remain at 32 and 12 aircraft, respectively. A net increase of 631 Air Force active duty, reserve, and civilian personnel authorizations will occur as a result of the action. McGuire AFB C-17 aircrews will use 16 Military Training Routes (MTR) for low-level navigation training. Tactical arrival, departure, and landing training will be accomplished at the northeastern United States LZ. Ten facility construction, addition, and alteration projects will occur to support basing and operation activities.

CHARLESTON AFB ALTERNATIVE ACTION

HQ AMC will base and operate an additional 12 C-17 aircraft at Charleston AFB ultimately increasing the total number of C-17 aircraft at the Base to 60 aircraft. A net increase of 631 Air Force active duty, reserve, and civilian personnel authorizations will occur as a result of the action. Charleston AFB C-17 aircrews will use 17 MTRs for low-level navigation training. Tactical arrival, departure, and landing training will be accomplished at the LZ on the Base's North Auxiliary Airfield, South Carolina. Seven facility construction, addition, and alteration projects will occur to support basing and operation activities.

DOVER AFB ALTERNATIVE ACTION

HQ AMC will base and operate 24 C-17 aircraft at Dover AFB and realign all the Base's 32 C-5 aircraft from the Base to an ARC installation. A net decrease of 322 Air Force active duty, reserve, and

civilian personnel authorizations will occur as a result of the action. Dover AFB C-17 aircrews will use 22 MTRs for low-level navigation training. Tactical arrival, departure, and landing training will be accomplished at the northeastern United States LZ. Seven facility construction, addition, and alteration projects will occur to support basing and operation activities.

MCGUIRE AFB LANDING ZONE ALTERNATIVE

The LZ, which will be constructed on the McGuire AFB airfield, will be 3,500 feet long and 90 feet wide with 300 foot overruns at each end. The imaginary surfaces identified in ETL 04-7 will be established for the LZ.

DOVER AFB LANDING ZONE ALTERNATIVE

The LZ, which will be constructed at one of two locations (Locations A and B, respectively) on the Dover AFB airfield, will be 3,500 feet long and 90 feet wide with 300 foot overruns at each end. The imaginary surfaces identified in the ETL will be established for the LZ.

SUMMARY OF FINDINGS

Pursuant to NEPA guidance, 32 CFR 989 (Air Force Environmental Impact Analysis Process), and other applicable regulations, the Air Force completed an EA of the potential environmental consequences of east coast basing for C-17 aircraft. The attached EA, which is incorporated by reference and supports this Finding of No Significant Impact (FONSI), evaluated the No Action Alternative, the Dover AFB Proposed Action, the McGuire, Charleston, and Dover AFB Alternative Actions, and the three LZ Alternatives.

EVALUATION OF THE NO ACTION ALTERNATIVE

Dover AFB. No significant impacts occur from the baseline activities.

McGuire AFB. No significant impacts occur from the baseline activities.

Charleston AFB. No significant impacts occur from the baseline activities.

EVALUATION OF THE DOVER AFB PROPOSED ACTION

Air Quality. The greatest emissions for any of the criteria pollutants from construction activity will be 12.04 tons per year (tpy) for particulate matter equal to or less than 10 microns in aerodynamic diameter (PM_{10}), equating to 1.8 percent of the emissions inventory for the air quality control region (AQCR). The effects from construction emissions will be temporary, fall off rapidly with distance from the proposed construction site, and will not result in any long-term impacts. The greatest volume for any of the criteria pollutants from recurring aircraft operations will be 891.907 tpy for nitrogen oxides (NOx), which equates to 12.93 percent of the baseline emissions within the AQCR. The Clean Air Act (CAA) General Conformity Applicability Analysis prepared in August 2004 concluded that the net change in emissions for criteria pollutants is not regionally significant, will not exceed de minimis thresholds, and that a Conformity Determination is not required. **MTRs**. Emissions from C-17 operations on the MTRs within the affected AQCRs will not be regionally significant.

Noise. The number of people exposed to Day-Night Average Sound Level (DNL) 65 A-weighted sound level measured in decibels (dBA) and greater will decrease by 30 percent. It is anticipated there will be a corresponding decrease in the potential for sleep awakenings and speech disruption when compared to the baseline condition. Noise-induced hearing loss is not anticipated. The interior noise levels in schools will be below the levels at which a marked increase in pauses and masking will occur and at which teaching will be impaired as a result of disruption of speech communication. Construction noise will be temporary, will occur only during daytime, and will cease when the project is completed. **MTRs**. The on-set rate adjusted monthly Day-Night Average Sound Level (Ldnmr) will range from a low of 40 dBA to a high of 62 dBA on the 22 MTRs, with the maximum increase being 17 dBA on one route. Noise from MTR operations will not exceed the level at which residential and other noise-sensitive

land uses will be unacceptable. The hearing loss, speech interference, sleep disruption, and non-auditory health effects discussions for Dover AFB apply. No structural damage is expected from C-17 MTR operations.

Hazardous Waste, Hazardous Materials, and Stored Fuels. The contractor will comply with all regulatory guidance for the use and disposal of hazardous materials and waste during construction activities. The primary waste producing processes will continue to include aircraft parts cleaning, fluid changes for routine aircraft and vehicle maintenance, aircraft corrosion control, facility, and infrastructure maintenance. It is not anticipated any new hazardous materials will be needed. Hazardous material procurement and hazardous waste generation could decrease by about eight percent, respectively. The existing hazardous materials handling and hazardous waste disposal processes and procedures will accommodate the activities associated with C-17 operation and maintenance. It is anticipated that the amount of fuel needed for operations could decrease by as much as 27 percent.

Biological Resources. Construction, demolition, and renovation activities will occur within developed, maintained areas with highly modified and disturbed landscape that is now either paved or has lawns and landscaping. There will be no disturbance of high quality and/or native vegetation outside either the project or immediately adjacent areas. No endangered, threatened, or special status species are documented in the construction areas. **MTRs**. MTR overflights will be infrequent, random, and pose no threat to wildlife at the behavioral, population, or species level.

Socioeconomic Resources. There will be a decrease in the local and regional population of 364 persons (0.003 percent of the statistical area) as a result of the loss of 161 positions. It is anticipated that approximately 175 housing units (0.003 percent of the statistical area) will become vacant with the loss of personnel, with approximately 65 percent of these units being off-base. There will be an enrollment decrease of approximately 110 children in local schools (0.016 percent in the district nearest the base). Employment generated by construction activities will result in wages paid, and expenditures for local and regional services and supplies during construction. The reduction of 161 personnel authorizations will result in a loss in wages paid, business sales, and income to the local and regional economy. Overall, the proposed action will not result in significant annual regional economic impacts.

Cultural Resources. Dover AFB accomplished Section 106 consultation with the Delaware State Historic Preservation Office (SHPO). The SHPO concurred with the Dover AFB determination that the Proposed Action will not cause any adverse effects to properties on the Base or within the area of potential effect. **MTRs**. Impacts to cultural resources will not occur because the maximum noise from a C-17 is below the level at which vibration impacts occur. The Air Force consulted with Native American tribes pursuant to 36 CFR 800.2.

Land Use. Facility construction will be consistent with existing and future land use plans and programs identified in the Dover AFB General Plan. No additional off-base areas will be exposed to aircraft noise and no additional land use incompatibilities will be anticipated based on the current Air Installation Compatible Land Use (AICUZ) Study. **MTRs.** No significant impacts to sensitive land uses will occur because the noise levels will be below the DNL noise/land use compatibility guidelines.

Infrastructure and Utilities. There will be a 2.06 percent reduction in water consumption when compared to the baseline condition due to the 161 fewer personnel. Use of water for dust control equates to about 2.2 percent of system capacity. Wastewater generation will be reduced by 0.13 percent reduction when compared to the baseline condition. The 0.89 percent increase in impervious cover likely will increase flow in the storm water system. The electricity and natural gas distribution systems capacities can accommodate the respective 1.44 and 1.21 percent increases in consumption for the new buildings. The disposal of construction and demolition debris equates to 1.42 percent of the total remaining landfill capacity. Solid waste generation by personnel will decrease slightly due to the reduction in assigned personnel. The net loss of 161 personnel (2 percent of baseline assigned personnel) will result in a very slight decrease in weekday on-base roadway volumes.

Airspace and Airfield Operations. C-17 aircrews will accomplish tactical events such as arrivals and departures in which the aircraft may spiral up to about 5,000 feet AGL during a departure or down from that altitude on an arrival to a landing. The air traffic control tower and Dover AFB Radar Approach Control (RAPCON) will establish procedures for these tactical events since they start in one

airspace unit (*i.e.,* either tower or RAPCON) and end in the other (*i.e.,* either tower or RAPCON). The volume of traffic in the airspaces in which the tactical arrivals and departures will be accomplished will not preclude establishment of the procedures needed to allow execution of the events. Thus, the airspace has the capacity to accommodate the additional air traffic control procedures needed for the airfield operations. Airfield operations will decrease by 62.63 average daily operations. **MTRs**. Each MTR has the capacity to accommodate the additional operations and the structure for each route can support C-17 operations. The potential for conflict between aircraft operating on the MTRs and other civil aircraft operating in the airspace around the MTRs is low because the existing scheduling and air traffic control procedures are designed to deconflict aircraft. **Aircraft Safety:** The probability is low that an aircraft involved in an accident at or around the Dover AFB airfield or on a MTR will strike a person or structure on the ground. **Bird-Aircraft Strike Hazard:** The potential for bird-aircraft strikes associated with airfield operations at Dover AFB will be expected to decrease from the annual average of 41 strikes to 30 strikes. It is anticipated that about three bird-aircraft strikes will occur annually from Dover AFB C-17 MTR operations. It is unlikely that any of these bird-aircraft strike incidents will result in an aircraft accident, involve injury either to aircrews or to the public, or damage to property (other than the aircraft).

Environmental Management. The activities associated with the action will be accomplished using existing directives and will not impact achieving pollution prevention goals. The demolition contractor will be responsible for asbestos containing material (ACM) and lead-based paint (LBP) removal, which will be accomplished in accordance with existing guidance. The proposed facilities will be constructed or renovated without any ACM and LBP. Facilities design and construction activities will be coordinated with the Base Environmental Flight and Bioenvironmental Engineering to ensure that construction will avoid interference with any ongoing Environmental Restoration Program (ERP) investigation and remediation work and will not worsen the condition of any site.

EVALUATION OF THE NAES LAKEHURST LANDING ZONE ALTERNATIVE

Air Quality. The greatest emissions for any of the criteria pollutants from construction activity will be 206.27 tpy for PM_{10}, equating to 16.00 percent of the emissions inventory for the AQCR. The effects from construction emissions will be temporary, fall off rapidly with distance from the proposed construction site, and will not result in any long-term impacts. The greatest volume for any of the criteria pollutants from recurring aircraft operations will be 680.25 tpy for NOx, which equates to 6.80 percent of the baseline emissions within the AQCR. The Air Force and the Navy consulted with the New Jersey Department of Environmental Protection (NJDEP) and the United States Environmental Protection Agency (USEPA) to include the NAES Lakehurst LZ Alternative in the State Implementation Plan (SIP) to meet the requirements under the General Conformity Rule. The NJDEP agreed to include the NAES Lakehurst LZ Alternative in the 8-hour Attainment Demonstration SIP, which will be submitted to the USEPA in June 2007. Additionally, the NJDEP agreed to provide NAES Lakehurst with a facility-wide emissions budget for VOC and NOX emissions in the 8-hour Attainment Demonstration. A Conformity Determination is not required.

Noise. The noise contours will increase in all directions from the airfield. An additional 605 people, representing about 6 percent of the population living within the airfield airspace, will be exposed to DNL 65 dBA or greater. This could result in an additional 61 people being awakened as compared to the existing, or "baseline," condition. Noise-induced hearing loss is not anticipated from airfield operations associated with the NAES Lakehurst LZ alternative. The potential exists for a slight increase in speech pauses and masking at two schools experiencing increased noise levels. Overall, when compared to baseline conditions, the noise impacts are not considered significant.

Biological Resources. The approximate eight acres of grassland that will be converted to the LZ equates to about 0.5 percent of the total grassland area at NAES Lakehurst. The relatively small loss of habitat will not be expected to adversely effect wildlife populations. There will be no net loss of habitat because an equal area of grassland will be created or enhanced in other areas of the Station. Habitat disturbance will be temporary, lasting only as long as it takes to establish the grasslands. Establishing habitat in other areas of the Station that are more distant from the airfield will have a beneficial effect because the increased distance will reduce the potential for bird-aircraft strikes and disturbance from airfield operations. No activities will occur in wetlands.

Land Use. The construction will be consistent with existing and future land use plans and programs identified in the NAES Lakehurst Vision Plan. The areas exposed to aircraft noise include the wildlife management areas to the north and south of the installation and industrial land to the northeast. Based on the current land uses, no significant impacts to land uses will occur because of the increased noise levels from aircraft operations. No impacts to land ownership or the existing function of the land uses will occur. The NAES Lakehurst AICUZ Study will be updated to reflect the LZ imaginary surfaces.

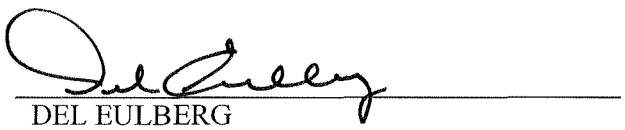
Airspace and Airfield Operations. C-17 aircrews will accomplish tactical events such as arrivals and departures at the LZ in which the aircraft may spiral up to about 5,000 feet AGL during a departure or down from that altitude on an arrival to a landing. The NAES Lakehurst air traffic control tower and the McGuire AFB RAPCON will establish procedures for these tactical events since they start in one airspace unit (*i.e.,* either tower or RAPCON) and end in the other (*i.e.,* either tower or RAPCON). The volume of traffic in the airspaces in which the tactical arrivals and departures will be accomplished will not preclude establishment of the procedures to allow execution of the events. The airfield has the capacity to accommodate the anticipated 234.65 daily operations. **Aircraft Safety:** The probability is low that an aircraft involved in an accident at or around the NAES Lakehurst airfield will strike a person or structure on the ground. **Bird-Aircraft Strike Hazard:** The potential for bird-aircraft strikes associated with airfield C-17 operations at NAES Lakehurst could be as high as 61 annual strikes. It is unlikely that any of these bird-aircraft strike incidents will result in an aircraft accident, involve injury either to aircrews or to the public, or damage to property (other than the aircraft).

ENVIRONMENTAL JUSTICE

Based on analysis conducted for this EA, it is determined that activities associated with the No Action Alternative, Dover AFB Proposed Action, McGuire, Charleston, and Dover AFBs Alternative Actions, and the McGuire and Dover AFBs and NAES Lakehurst Landing Zone Alternatives 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 EA, I conclude that implementation of the Dover AFB Proposed Action and the NAES Lakehurst LZ Alternative will not have a significant impact either by itself or when considering cumulative impacts. Accordingly, requirements of the NEPA, regulations promulgated by the Council on Environmental Quality, and 32 CFR 989 are fulfilled and an environmental impact statement is not required.



13 Oct 05

DEL EULBERG
Brigadier General, USAF
Director, Installations and Mission Support

Date

Environmental Assessment
East Coast Basing of C-17 Aircraft

Department of the Air Force
Air Mobility Command
Scott Air Force Base, Illinois

September 2005


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COVER SHEET
ENVIRONMENTAL ASSESSMENT
East Coast Basing of C-17 Aircraft

Responsible Agency: Department of the Air Force, Air Mobility Command (AMC), Scott Air Force Base, Illinois.

Proposed Action: Base C-17 aircraft at an east coast Air Force base and construct and operate a landing zone in the northeastern United States

Written comments and inquiries regarding this document should be directed to: Mr. Doug Allbright, HQ AMC/A7, 507 Symington Drive, Scott AFB, Illinois 62225-5022, (618) 229-0846.

Report Designation: Environmental Assessment

Abstract: Headquarters, AMC has a need to base C-17 aircraft at an east coast active duty Air Force base as part of the airlift Mobility Transformation Plan to improve overall airlift capability. Under the Proposed Action, 12 C-17 aircraft and associated aircrews and aircraft maintenance personnel would be assigned to Dover AFB, Delaware. The action would also include relocating 16 of Dover AFB's C-5 aircraft to an air reserve component (ARC) installation. The C-17 aircrews would fly worldwide airlift missions as well as training sorties that include air refueling, low-level navigation training on 22 military training routes (MTRs). Seven facility projects would be accomplished at Dover AFB as part of the Proposed Action. Under the McGuire AFB Alternative Action, an additional 12 C-17 aircraft and associated aircrews and aircraft maintenance personnel would be assigned to McGuire AFB, New Jersey, increasing the total number of C-17s to 24 aircraft. The additional C-17 aircrews would fly worldwide airlift missions as well as training sorties that include air refueling, low-level navigation training on 16 MTRs. Ten facility projects would be accomplished at McGuire AFB as part of the alternative. Under the Charleston AFB Alternative Action, an additional 12 C-17 aircraft and associated aircrews and aircraft maintenance personnel would be assigned to Charleston AFB, South Carolina, increasing the total number of C-17s to 60 aircraft. The additional C-17 aircrews would fly worldwide airlift missions as well as training sorties that include air refueling, low-level navigation training on 17 MTRs. Seven facility projects would be accomplished at Charleston AFB as part of the alternative. Under the Dover AFB Alternative Action, 24 C-17 aircraft and associated aircrews and aircraft maintenance personnel would be assigned to Dover AFB. The action would also include relocating all 32 of Dover AFB's C-5 aircraft to an ARC installation. Seven facility projects would be accomplished at Dover AFB as part of the alternative. Under the landing zone (LZ) alternative, a LZ would be constructed and used for tactical training operations at either Dover or McGuire AFBs or Naval Air Engineering Station Lakehurst, New Jersey. Under the No Action Alternative, no additional C-17 aircraft other than the 12 aircraft planned for McGuire AFB would be based at an AMC east coast military installation and a LZ would not be constructed in the northeastern United States. Resources considered in the impact analysis were: air quality; noise; hazardous waste, hazardous materials and stored fuels; water resources; biological resources; socioeconomic resources; cultural resources; land use; infrastructure and utilities; airspace and airfield operations; environmental management; and environmental justice.

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EXECUTIVE SUMMARY

ES 1 Introduction

The Air Force Mobility Force Structure Briefing to Congress on April 15, 2002 presented an airlift Mobility Transformation Plan (the Plan) that proposes to standardize airlift aircraft fleets, increase reliability, lower operating and support costs, and increase airlift capability by 33 percent. The Plan, which extends through the year 2017, would allow the Air Force to address the increasing demand for airlift with newer, more reliable aircraft and improved overall support.

A total of 53 active duty Air Force and air reserve component (ARC, *i.e.*, Air Force Reserve Command [AFRC] and Air National Guard [ANG]) military installations nationwide would be affected by the Plan outlined in the Air Force Mobility Force Structure Briefing. As part of the overall Plan, Headquarters, Air Mobility Command (HQ AMC) at Scott Air Force Base (AFB), Illinois proposes to base C-17 aircraft at an active duty east coast Air Force installation. It is estimated that activities associated with the basing action would begin in 2006. The following bases are being considered in detail as basing alternatives:

- Dover AFB, located in Kent County, Delaware, within the City of Dover, and about 60 miles south of Philadelphia, Pennsylvania.
- McGuire AFB, located in Burlington County, New Jersey, adjacent to the Borough of Wrightstown, and about 30 miles east of Philadelphia, Pennsylvania. McGuire AFB is converting from C-141 to C-17 airlift aircraft. It is anticipated the conversion will be complete in 2005.
- Charleston AFB, located in Charleston County, South Carolina, within the City of North Charleston, and about 10 miles north of Charleston.

A key ability of the C-17 aircraft is its capability to land and take off from a short runway called a landing zone (LZ) that is 3,500 feet to 5,000 feet in length and 90 feet wide. The Air Force proposes constructing an LZ at which McGuire AFB aircrews, as well as aircrews from the east coast C-17 basing action, will accomplish tactical arrival, departure, and landing training.

The following installations are being considered in detail for the northeastern United States LZ: Dover AFB; McGuire AFB; and Naval Air Engineering Station (NAES) Lakehurst, New Jersey. Selecting a LZ was not necessary for the Charleston AFB Alternative Action because the Base's C-17 aircrews currently use North Field at North, South Carolina for tactical arrival, departure, and landing training, and the same LZ would be used under the Charleston AFB Alternative Action.

ES 2 Need for Action

The need for the action is to improve overall airlift capability by basing C-17 aircraft at an active duty east coast Air Force base as part of the airlift Mobility Transformation Plan. There is also a need to construct an LZ in the northeastern United States where C-17 aircrews based in that area of the country could practice tactical arrivals, departures, and landings. As part of the

Plan, the Air Force determined it is operationally prudent to maintain a robust airlift capability on the east coast to contribute to the overall airlift requirement. Specifically, basing C-17 aircraft at an east coast location, as well as conducting LZ training at an airfield in the northeastern United States, would enhance the capability of the Air Force to meet the national military strategy by modernizing strategic and tactical airlift aircraft on the east coast.

ES 3 Alternatives including the Proposed Action

ES 3.1 Alternatives Selection Process

Two separate processes were accomplished as part of the action to base C-17 aircraft on the east coast. The first process considered the base at which the aircraft and personnel would be located. The second process concerned selecting an airfield in the northeastern United States as the location for an LZ.

Base Selection Factors

The airlift Mobility Transformation Plan mentioned in ES-1 includes:

- Retiring C-141 aircraft;
- Acquiring 42 additional C-17s over the next 10 years to replace the C-141s;
- Realigning additional C-5s to the ARC and modernizing the aircraft; and
- Retiring some C-130Es, acquiring new C-130Js, upgrading the C-130Hs and remaining C-130Es and designating them as C-130X aircraft, as well as realigning C-130s to different units.

Under current acquisition plans, the Air Force will receive a total of 180 C-17s that are either based at or will be based at active duty Air Force and ARC installations. As indicated in the second item in the previous paragraph, the Air Force is advocating acquisition of 42 additional C-17s, thereby increasing the total fleet to 222 aircraft.

As a result of the current 180-aircraft acquisition and the possible acquisition of an additional 42 C-17s, the Air Force is considering east coast alternatives for two basing conditions. The first condition, which is part of the 180 aircraft acquisition and which is considered in the airlift Mobility Transformation Plan, would place 12 additional aircraft at an east coast installation. The second condition, which is part of the 42 additional aircraft situation, would place a total of 24 aircraft at an east coast location (*i.e.*, 12 aircraft from the 180-aircraft acquisition plus 12 aircraft from the additional 42 aircraft acquisition). The remaining 30 aircraft that are part of the additional 42 aircraft acquisition would be based at active duty and ARC units in other sections of the United States.

The Air Force identified the following selection factors for use in developing and evaluating alternatives for basing C-17 aircraft at an east coast military installation. The selected installation must:

- Have adequate existing facilities. If the existing facilities are inadequate, the installation must have sufficient space for construction of aircraft parking,

maintenance, and operations work space, and emergency response facilities and equipment to support the safe operation of C-17 aircraft.

- Have an operational runway.
- Have a Reserve Associate unit. Utilization of the C-17 aircraft is increased through the Reserve Associate concept.
- Have an airlift mission. This would avoid the potential for operational incompatibilities that can occur when aircraft with dissimilar operating parameters such as large, slower airlift and small, faster fighter aircraft operate from the same runway.

Northeastern United States Landing Zone Selection Factors

Tactical arrival, departure, and landing training are best accomplished at an airfield that has both an LZ and longer main runway. This allows the aircrew to practice tactical training as well as other non-tactical takeoffs and landings at the same airfield, thereby maximizing use of training time. Landings on the LZ are typically followed by a takeoff from the main runway to a closed pattern to either the LZ or main runway.

The Air Force prepared selection factors for use in developing and evaluating alternatives for the location for a C-17 LZ in the northeastern United States. The following summarizes the factors for the northeastern United States LZ selection process:

- Flying time from Dover AFB (where the Air Force is considering basing 12 or 24 C-17 aircraft under the action considered in the environmental assessment [EA]) and McGuire AFB (which is in the process of converting from C-141 to C-17 aircraft and is also an alternative in the EA) to the LZ should be no longer than 0.3 hour.
- It should take no longer than 1 hour for aircraft maintenance personnel to drive from Dover and McGuire AFBs to the LZ.
- The airfield should have a primary runway that has the weight bearing capacity as well as length and width to support non-LZ C-17 operations such as takeoffs, landings, and closed patterns.
- The airfield should have an existing LZ that is at least 3,500 feet long and 90 feet wide with the weight bearing capacity to support C-17 tactical arrivals, departures, and landings.
- The LZ airfield should be within the airspace controlled by either the McGuire AFB or Dover AFB radar approach control facility.
- Other aircraft traffic at the LZ airfield should not conflict with C-17 tactical arrivals, departures, and landings and other training operations.
- The potential LZ location should have recorded cross-wind, visibility, and precipitation data to determine if weather at the airfield is favorable for LZ operations and other associated aircraft movements such as take-off after a tactical landing.

ES 3.2 Alternatives Considered but Eliminated from Further Consideration

Basing Alternatives

Nine potential alternatives, including the No Action Alternative, were developed for basing C-17 aircraft at an east coast military installation.

- Base 12 C-17 Aircraft at Dover AFB Alternative
- Base 12 Additional C-17 Aircraft at McGuire AFB Alternative
- Base 12 Additional C-17 Aircraft at Charleston AFB Alternative
- Base 12 C-17 Aircraft at Pope AFB, North Carolina Alternative
- Base 24 C-17 Aircraft at Dover AFB Alternative
- Base 24 Additional C-17 Aircraft at McGuire AFB Alternative
- Base 24 Additional C-17 Aircraft at Charleston AFB Alternative
- Base 24 C-17 Aircraft at Pope AFB Alternative
- Continue to operate the current east coast airlift fleet until aircraft are retired or realigned because of age (No Action Alternative).

Only the Base 12 C-17 Aircraft at Dover AFB Alternative, Base an Additional 12 C-17 Aircraft at McGuire AFB Alternative, Base 12 Additional C-17 Aircraft at Charleston AFB Alternative, and Base 24 C-17 Aircraft at Dover AFB Alternative met all the basing criteria. The Base 12 C-17 Aircraft at Dover AFB Alternative is considered in detail as the Proposed Action and the other four alternatives are considered in detail as Alternative Actions.

Northeastern United States Landing Zone Alternatives

Seventeen potential alternatives, including the No Action Alternative, were developed for the northeastern United States LZ Alternative.

- Dover AFB
- McGuire AFB
- NAES Lakehurst
- Fort Dix, New Jersey
- Warren Grove Range, New Jersey
- Griffis Air Park, Rome, New York
- Westover Air Reserve Base, Connecticut
- Muir Army Airfield (AAF), Fort Indiantown Gap, Pennsylvania
- Phillips AAF, Aberdeen Proving Ground, Maryland
- Naval Air Station Patuxent River, Maryland
- NASA Wallops Flight Facility, Virginia

- Wheeler-Sack AAF, Fort Drum, New York
- Naval Air Station Willow Grove, Pennsylvania
- Wilmington/New Castle County, Delaware
- Pope AFB, North Carolina
- North Field, South Carolina
- Not construct a LZ in the northeastern United States

Only Dover and McGuire AFBs and NAES Lakehurst are reasonable alternatives that meet the underlying purpose and need for the northeastern United States LZ. Thus, these three installations are considered in detail as Landing Zone Alternatives.

ES 3.3 No Action Alternative

Under the No Action Alternative, the AMC would continue to operate its current east coast airlift aircraft fleet until aircraft are retired from service because of age or realigned to another installation. No additional C-17 aircraft other than the 12 aircraft planned for McGuire AFB and the 48 aircraft currently assigned to Charleston AFB would be based at an AMC east coast military installation. Additionally, a LZ would not be constructed in the northeastern United States.

Dover AFB

Dover AFB would continue to operate 32 C-5 aircraft. The number of Air Force active duty, reserve, and civilian authorizations, as well as contractor personnel at the Base, would remain at the approximate level in September 2002 *(i.e.*, 7,830 personnel). Likewise, C-5 airfield operations would continue at present levels. Based C-5s and transient aircraft would accomplish about 87,325 airfield operations annually, or an average of 239.25 daily operations.

McGuire AFB

McGuire AFB would continue to operate the 32 KC-10 and 12 KC-135 aircraft, as well as the 12 C-17 aircraft scheduled for the Base when the basing action is completed in FY05. The number of Air Force active duty, reserve, and civilian authorizations, as well as contractor personnel at the Base, would remain at the approximate level in September 2002 *(i.e.*, 12,326 personnel). Likewise, C-17, KC-10, and KC-135 airfield and low-level navigation military training route (MTR) operations would occur at the levels assessed in the McGuire AFB C-17 Basing EA. Based KC-10, KC-135, and C-17 aircraft and transient aircraft would accomplish about 57,133 airfield operations annually, or an average of 228.52 daily operations. Base aircrews would fly about 790 annual sorties on 16 MTRs, or about 65.85 sorties per month.

Charleston AFB

Charleston AFB would continue to operate the 48 C-17 aircraft assigned to the Base. The number of Air Force active duty, reserve, and civilian authorizations, as well as contractor personnel at the Base, would remain at the approximate levels in September 2002 *(i.e.*,

7,842 personnel). Likewise, C-17 sorties, as well as airfield, MTR, and airdrop operations, would occur at the FY04 levels. Charleston AFB C-17 aircraft and transient, general aviation, and commercial aircraft would accomplish about 129,094 airfield operations annually, or an average of 359.61 daily operations at the Base. Charleston AFB C-17s as well as aircraft from other military installations would accomplish about 83,479 airfield operations annually at North Field, or an average of 241.27 daily operations. Base aircrews would fly about 686 annual sorties on 17 MTRs, or about 57.14 sorties per month.

ES 3.4 Basing Alternatives

Dover AFB Proposed Action

Under the Proposed Action, the Air Force would base and operate 12 C-17 aircraft at Dover AFB and realign 16 C-5 aircraft from the Base to an ARC installation, leaving 16 C-5 aircraft at the Base. The number of C-5s would steadily draw down as the number of C-17s increase. A net loss of 161 Air Force active duty, reserve, and civilian personnel authorizations would occur as a result of the action, decreasing the Base workforce to 7,669 persons. Dover AFB C-17 aircrews would use 22 MTRs for low-level navigation training. Seven facility construction, addition, and alteration projects would occur to support basing and operation activities. The basing action would begin in FY06 with facility construction projects and be complete in FY11 with the arrival of the 12th C-17 aircraft.

About 9,315 annual C-17 airfield operations (25.52 daily operations) would occur at Dover AFB, and the total annual operations for based and transient aircraft would be approximately 61,872 operations (176.62 daily operations). C-17 aircrews would fly about 795 annual sorties on 22 MTRs, or about 66 sorties per month.

McGuire AFB Alternative Action

Under the McGuire AFB Alternative Action, the Air Force would base and operate an additional 12 C 17 aircraft at McGuire AFB, ultimately increasing the total number of C-17 aircraft at the Base to 24 aircraft. The number of assigned KC-10s and KC-135s would remain at 32 and 12 aircraft, respectively. A net increase of 631 Air Force active duty, reserve, and civilian personnel authorizations would occur as a result of the action, increasing the Base workforce to 12,957 persons. McGuire AFB C-17 aircrews would use 16 MTRs for low-level navigation training. Ten facility construction, addition, and alteration projects would occur to support basing and operation activities. The basing action would begin with facility construction projects in FY06 and be complete in FY11 upon arrival of the 12^{th} additional C-17 aircraft.

About 40,060 annual C-17 airfield operations (160.24 daily operations) would occur at McGuire AFB, and the total annual operations for based and transient aircraft would be approximately 77,163 (308.64 daily operations). C-17 aircrews would fly about 1,580 annual sorties on 16 MTRs, or about 132 sorties per month.

Charleston AFB Alternative Action

Under the Charleston AFB Alternative Action, the Air Force would base and operate an additional 12 C 17 aircraft at Charleston AFB, ultimately increasing the total number of C-17 aircraft at the Base to 60 aircraft. A net increase of 631 Air Force active duty, reserve, and civilian personnel authorizations would occur as a result of the action, increasing the Base workforce to 8,473 persons. Charleston AFB C-17 aircrews would use 17 MTRs for low-level navigation training. Seven facility construction, addition, and alteration projects would occur to support basing and operation activities. The basing action would begin with facility construction projects in FY06 and be complete in FY11 upon arrival of the 12th additional C-17 aircraft.

About 40,060 annual C-17 airfield operations (160.24 daily operations) would occur at Charleston AFB, and the total annual operations for based, transient, general aviation, and commercial aircraft would be approximately 137,172 (382.60 daily operations). About 92,513 annual C-17 airfield operations (267.38 daily operations) would be accomplished at North Field by aircrews from Charleston AFB and other units, and the total annual operations by all users would be approximately 101,982 operations (294.75 daily operations). C-17 aircrews would fly about 859 annual sorties on 17 MTRs, or about 64 sorties per month.

Dover AFB Alternative Action

Under the Dover AFB Alternative Action, the Air Force would base and operate 24 C-17 aircraft at the Base and realign all 32 C-5 aircraft to an ARC installation. The number of C-5s would steadily draw down as the number of C-17s increase. A net loss of 322 Air Force active duty, reserve, and civilian personnel authorizations would occur as a result of the action, decreasing the Base workforce to 7,508 persons. Dover AFB C-17 aircrews would use 22 MTRs for low-level navigation training. Seven facility construction, addition, and alteration projects would occur to support basing and operation activities. The basing action would begin in FY06 with facility construction projects and be complete in FY11 with the arrival of the 12th C-17 aircraft.

About 18,637 annual C-17 airfield operations (51.06 daily operations) would occur at Dover AFB, and the total annual operations for based and transient aircraft would be approximately 50,615 operations (145.78 daily operations). C-17 aircrews would fly about 1,590 annual sorties on 22 MTRs, or about 133 sorties per month.

ES 3.5 Landing Zone Alternatives

A LZ would be constructed in the northeastern United States and tactical arrival, departure, and landing training would be conducted at the LZ. The LZ would fulfill the need for an LZ for the McGuire AFB C-17 aircrews associated with the current McGuire AFB C-17 Basing action as well as the basing action in the EA. Air Force Engineering Technical Letter (ETL) 04-7: *C-130 and C-17 Landing Zone (LZ) Dimensional, Marking, and Lighting Criteria*, would be used to establish the imaginary surfaces for the LZ. No additional personnel would be assigned to the installation under any of the LZ alternatives. The LZ construction would begin early in calendar year 2007 (CY07) and be complete in early CY09.

McGuire AFB Landing Zone Alternative

One potential location for the LZ was identified on the airfield for the McGuire AFB Landing Zone Alternative. About 41,352 annual C-17 LZ-related operations (113.29 daily operations) would occur at McGuire AFB, and the total annual operations for all aircraft would be approximately 117,999 operations (419.87 daily operations).

Dover AFB Landing Zone Alternative

Two potential locations (Locations A and B, respectively) for the LZ were identified on the airfield for the Dover AFB Landing Zone Alternative. About 41,351 annual C-17 LZ-related operations (113.29 daily operations) would occur at Dover AFB, and the total annual operations for all aircraft would be approximately 103,223 operations (289.91 daily operations).

NAES Lakehurst Landing Zone Alternative

One potential location for the LZ was identified on the airfield for the NAES Lakehurst Landing Zone Alternative. About 42,085 annual C-17 LZ-related operations (115.30 daily operations) would occur at NAES Lakehurst, and the total annual operations for all aircraft would be approximately 80,613 operations (234.65 daily operations). The LZ would be constructed in an existing grassland to the immediate north of Runway 06/24, an area in which two bird species listed by the State of New Jersey have been documented. NAES Lakehurst would establish habitat for these two birds in other areas of the Station to offset the loss of grassland due to the construction of the LZ.

ES 4 Description of Past and Reasonably Foreseeable Future Actions

A cumulative impact, as defined by the Council on Environmental Quality (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."

ES 4.1 Dover AFB

Dover AFB staff identified nine other past and reasonably foreseeable actions that would occur concurrently with the Proposed Action. All nine actions include facilities construction. No personnel would relocate to the Base under any of the actions nor would any of the actions include airfield operations.

ES 4.2 McGuire AFB

McGuire AFB staff identified 18 other past and reasonably foreseeable actions that would occur concurrently with the Alternative Action. All 18 actions include facilities construction. No personnel would relocate to the Base under any of the actions nor would any of the actions include airfield operations.

ES 4.3 Charleston AFB

Charleston AFB staff identified seven other past and reasonably foreseeable actions that would occur concurrently with the Alternative Action. All seven actions include facilities construction. No personnel would relocate to the Base under any of the actions nor would any of the actions include airfield operations.

ES 5 Scope of the Environmental Review

ES 5.1 Resources Considered in the Environmental Assessment

The following biophysical resources are assessed in the EA: air quality; noise; hazardous waste, hazardous materials, and stored fuels; water resources; biological resources; socioeconomic resources; cultural resources (*i.e.*, installations and Native American interests associated with the MTRs); land use; infrastructure and utilities; airspace and airfield operations; environmental management; and environmental justice.

ES 5.2 Resources not Considered in the Environmental Assessment

Preliminary analysis indicated that no significant impacts would occur at the installations and on the MTRs for selected resources. As a result of the preliminary analysis, the following resources were not analyzed further in the EA:

- Dover AFB: earth resources; water resources (*i.e.*, surface water; ground water, and floodplain); wetlands; and coastal zone consistency.
- McGuire AFB: earth resources; floodplain; and coastal zone consistency.
- Charleston AFB: earth resources; biological resources; water resources; and cultural resources.
- NAES Lakehurst: earth resources; water resources; cultural resources; hazardous materials, hazardous waste; stored fuels; socioeconomic resources; infrastructure and utilities; environmental management; and coastal zone consistency.

ES 5.3 Drop Zones

The aircrews associated with the C-17 aircraft that would be based at an east coast location could be required to accomplish air drop operations. These operations would be accomplished as the aircraft enter and leave the drop zone that occurs within the corridor of selected MTR(s) that would be flown under the Proposed and Alternative Actions. No new drop zones would be established under the actions. Military training route operations occur at altitudes of 300 feet AGL and higher and will be assessed at that altitude. Airdrop operations typically occur at 800 feet AGL or higher. Thus, the noise experienced on the ground from an aircraft at air drop altitude would not exceed that generated during the MTR portion because the distance from the aircraft to a receptor on the ground would be greater during the airdrop than during the MTR operation. The air drop would be accomplished as part of the MTR operation. Therefore, air emissions from drop zone operations are included in the emissions from MTR operations. The drop zones occur within the MTR corridor. Therefore, airspace use associated with drop zone operations would occur within the MTR airspace, which is analyzed in this EA. Additionally,

land uses and biological resources for the drop zone would be the same as that for the MTR since the drop zone is located within the route corridor. For these reasons, drop zones will not be assessed as a separate entity, but as an integral element of the MTR.

ES 5.4 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 in this EA, a determination on significance of impacts will be made in a FONSI. 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.

ES 5.5 Indirectly Affected Military Installations

The EA does not assess the basing and operation of C-5 aircraft at the military installation(s) slated to receive the aircraft transferred from Dover AFB. The gaining installation(s) would be responsible for the Environmental Impact Analysis Process (EIAP) associated with receiving and operating the aircraft. Likewise, the EA will not assess any other actions that would be implemented under the airlift Mobility Transformation Plan. The military installation(s) affected by the specific actions under the Plan would be responsible for the EIAP.

ES 5.6 Environmental Coordination with the Office of the Chief of Naval Operations and NAES Lakehurst

The Office of the Chief of Naval Operations (CNO) and NAES Lakehurst were active participants in the LZ planning and EIAP processes for the NAES Lakehurst Landing Zone Alternative assessed in this EA. The NAES Lakehurst Commanding Officer signed a letter that outlines CNO and NAES Lakehurst involvement in the processes and confirms that the EA meets Department of the Navy, Office of Naval Operations guidance regarding a C-17 LZ at the Station.

ES 6 Comparison of Environmental Effects of all Alternatives

Table ES-1 at the end of this section summarizes environmental impacts from the Basing Alternatives and the No Action Alternative. Table ES-2 summarizes the environmental impacts of the Landing Zone Alternatives.

The CAA General Conformity Applicability Analyses prepared for the McGuire AFB Alternative Action and Dover AFB Proposed Action also included the emissions from the respective LZ alternative cumulative condition at the base. The McGuire AFB Alternative Action CAA General Conformity Applicability Analysis concluded that the net change in emissions for criteria pollutants for the McGuire AFB LZ Alternative cumulative condition

would not be regionally significant, would exceed *de minimis* thresholds, would exceed the Base's emissions budget in the State Implementation Plan (SIP), and would require a Conformity Determination. Likewise, the Dover AFB Proposed Action CAA General Conformity Applicability Analysis concluded that the net change in emissions for criteria pollutants for the Dover AFB LZ Alternative cumulative condition would not be regionally significant, would exceed *de minimis* thresholds, and would require a Conformity Determination.

No cumulative impacts would occur to the other resources under the Dover AFB Proposed Action, McGuire AFB Alternative Action, Charleston AFB Alternative Action, Dover AFB Alternative Action, McGuire AFB LZ Alternative, or Dover AFB LZ Alternative.

Numerous construction projects would be accomplished under the Dover AFB Proposed Action, Alternative Actions, or LZ Alternatives. The construction contractors would prepare and implement a Storm Water Pollution Prevention Plans (SWPPP) to comply with Clean Water Act requirements and other federal, state, and local guidance to ensure water quality is not degraded at the construction sites.

McGuire AFB would consult with the State of New Jersey and the Pinelands Commission to coordinate construction of the LZ, which would occur within a wetland. Work within the wetlands would require a Section 404/401 permit from the USACE. Construction would be conducted in accordance with permit conditions.

Charleston AFB would seek a Coastal Zone Finding of Consistency from the South Carolina Department of Health and Environmental Control, Office of Ocean and Coastal Resources Management, before proceeding with the Alternative Action.

ES 7 Identification of the Preferred Alternative

The preferred basing alternative is the Dover AFB Proposed Action and the NAES Lakehurst Landing Zone Alternative is the preferred LZ alternative.

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Table ES-1 Summary of Environmental Impacts for the Basing Alternatives

Resource (Applicable Sections)	Dover AFB Proposed Action	McGuire AFB Alternative Action	Charleston AFB Alternative Action	Dover AFB Alternative Action
Air Quality	**Dover AFB**. The greatest emissions for any of the criteria pollutants from construction activity would be 12.04 tons per year (tpy) for particulate matter equal to or less than 10 microns in aerodynamic diameter (PM_{10}), equating to 1.8 percent of the emissions inventory for the air quality control region (AQCR). The effects from construction emissions would be temporary, fall off rapidly with distance from the proposed construction site, and would not result in any long-term impacts. The greatest volume for any of the criteria pollutants from recurring aircraft operations would be 891.907 tpy for nitrogen oxides (NO_x), which equates to 12.93 percent of the baseline emissions within the AQCR. The Clean Air Act (CAA) General Conformity Applicability Analysis prepared in August 2004 concluded that the net change in emissions for criteria pollutants would not be regionally significant, would not exceed *de minimis* thresholds, and that a Conformity Determination would not be required. **MTRs**. Emissions from C-17 operations on the MTRs within the affected AQCRs would not be regionally significant.	**McGuire AFB**. The greatest emissions for any of the criteria pollutants from construction activity would be 14.06 tpy for NO_x, equating to 0.0156 percent of the emissions inventory for the AQCR. The effects from construction emissions would be temporary, fall off rapidly with distance from the proposed construction site, and would not result in any long-term impacts. The greatest volume for any of the criteria pollutants from recurring aircraft operations would 1,594.219 tpy for carbon monoxide (CO), which equates to 3.17 percent of the baseline emissions within the AQCR. The CAA General Conformity Applicability Analysis prepared in August 2004 concluded that the net change in emissions for criteria pollutants would not be regionally significant, would exceed *de minimis* thresholds but not exceed the Base's emissions budget in the SIP, and that a Conformity Determination would not be required. **MTRs**. Emissions from C-17 operations on the MTRs within the affected AQCRs would not be regionally significant.	**Charleston AFB**. The greatest emissions for any of the criteria pollutants from construction activity would be 158.66 tpy for PM_{10}, equating to 4.53 percent of the emissions inventory for the AQCR. The effects from construction emissions would be temporary, fall off rapidly with distance from the proposed construction site, and would not result in any long-term impacts. The greatest volume for any of the criteria pollutants from recurring aircraft operations would be 725.03 tpy for NO_x, which equates to 1.78 percent of the baseline emissions within the AQCR. The emissions would not be considered regionally significant because the region is in attainment for all criteria pollutants and the General Conformity Rule is not applicable. **North Field**: The greatest volume for any of the criteria pollutants from recurring aircraft operations would be 1,324.46 tpy for NO_x, which equates to 5.43 percent of the baseline emissions within the AQCR. The emissions would not be considered regionally significant because the region is in attainment for all criteria pollutants and the General Conformity Rule is not applicable. **MTRs**. Emissions from C-17 operations on the MTRs within the affected AQCRs would not be regionally significant.	**Dover AFB**. The greatest emissions for any of the criteria pollutants from construction activity would be 12.12 tpy for PM_{10}, equating to 1.81 percent of the emissions inventory for the AQCR. The effects from construction emissions would be temporary, fall off rapidly with distance from the proposed construction site, and would not result in any long-term impacts. The greatest volume for any of the criteria pollutants from recurring aircraft operations would be 334.872 tpy for NO_x, which equates to 4.85 percent of the baseline emissions within the AQCR. The CAA General Conformity Applicability Analysis prepared in August 2004 concluded that the net change in emissions for criteria pollutants would not be regionally significant, would not exceed *de minimis* thresholds, and that a Conformity Determination would not be required. **MTRs**. Emissions from C-17 operations on the MTRs within the affected AQCRs would not be regionally significant.

Table ES-1 Summary of Environmental Impacts for the Basing Proposed Action and Alternatives *(…continued)*

Resource (Applicable Sections)	Dover AFB Proposed Action	McGuire AFB Alternative Action	Charleston AFB Alternative Action	Dover AFB Alternative Action
Noise	**Dover AFB**. The number of people exposed to Day-Night Average Sound Level (DNL) 65 dBA and greater would decrease by 30 percent. It is anticipated there would be a corresponding decrease in the potential for sleep awakenings and speech disruption when compared to the baseline condition. Noise-induced hearing loss would not be anticipated. The interior noise levels in schools would be below the levels at which a marked increase in pauses and masking would occur and at which teaching would be impaired as a result of disruption of speech communication. Construction noise would be temporary, would occur only during daytime, and would cease when the project is completed. **MTRs**. The on-set rate adjusted monthly Day-Night Average Sound Level L_{dnmr}) would range from a low of 40 dBA to a high of 62 dBA on the 22 MTRs, with the maximum increase being 17 dBA on one route. Noise from MTR operations would not exceed the level at which residential and other noise-sensitive land uses would be unacceptable. The hearing loss, speech interference, sleep disruption, and non-auditory health effects discussions for Dover AFB apply. No structural damage would be expected from C-17 operations on an MTR.	**McGuire AFB**. An additional 617 people (43 percent) (0.9 percent of the population within a 5-mile radius of the airfield) would be exposed to DNL 65 dBA and greater. The density of residences in the newly exposed area would be consistent with adjacent residential areas exposed to aircraft noise under the baseline condition. It is anticipated there would be a corresponding increase in the potential for sleep awakenings. About 0.1 percent of the additionally exposed population within five miles of the airfield could experience speech disruption from exposure to DNL 75 dBA and greater. Noise-induced hearing loss would not be anticipated. Construction noise would be temporary, would occur only during daytime, and would cease when the project is completed. **MTRs**. The L_{dnmr} would range from a low of 43 dBA to a high of 62 dBA on the 16 MTRs, increasing 3 dBA on five routes. Noise from MTR operations would not exceed the level at which residential and other noise-sensitive land uses would be unacceptable. The hearing loss, speech interference, sleep disruption, and non-auditory health effects discussions for McGuire AFB apply. No structural damage would be expected from C-17 operations on an MTR.	**Charleston AFB**. An additional 351 people (5 percent) would be exposed to DNL 65 dBA and greater. The density of residences in the newly exposed area would be consistent with adjacent residential areas exposed to aircraft noise under the baseline condition. It is anticipated there would be a corresponding increase in the potential for sleep awakenings and speech disruption when compared to the baseline condition. Noise-induced hearing loss would not be anticipated. The noise level at one school would continue to be above the level at which a marked increase in pauses and masking would occur and at which teaching would be impaired as a result of disruption of speech communication. Construction noise would be temporary, would occur only during daytime, and would cease when the project is completed. **North Field**. An additional 173 people (15 percent) would be exposed to DNL 65 dBA and greater. The density of residences in the newly exposed area would be consistent with adjacent residential areas exposed to aircraft noise under the baseline condition. It is anticipated there would be a corresponding increase in the potential for sleep awakenings and speech disruption when compared to the baseline condition. **MTRs**. The L_{dnmr} would range from a low of 24 dBA to a high of 67 dBA on one MTR, increasing 1 dBA on three of the 17 routes and remaining the same on the other 14 routes. Noise from MTR operations would not exceed the level at which residential and other noise-sensitive land uses would be unacceptable. The hearing loss, speech interference, sleep disruption, and non-auditory health effects discussions for Charleston AFB apply. No structural damage would be expected from C-17 operations on an MTR.	**Dover AFB**. The number of people exposed to DNL 65 dBA and greater would decrease by 88 percent. It is anticipated there would be a corresponding decrease in the potential for sleep awakenings and speech disruption when compared to the baseline condition. Noise-induced hearing loss would not be anticipated. The interior noise levels in schools would be below the levels at which a marked increase in pauses and masking would occur and at which teaching would be impaired as a result of disruption of speech communication. Construction noise would be temporary, would occur only during daytime, and would cease when the project is completed. **MTRs**. The L_{dnmr} would range from a low of 43 dBA to a high of 62 dBA on the 22 MTRs, with the maximum increase being 20 dBA on one route. Noise from MTR operations would not exceed the level at which residential and other noise-sensitive land uses would be unacceptable. Noise from MTR operations would not exceed the level at which residential and other noise-sensitive land uses would be unacceptable. The hearing loss, speech interference, sleep disruption, and non-auditory health effects discussions for Dover AFB apply. No structural damage would be expected from C-17 operations on an MTR.

Table ES-1 Summary of Environmental Impacts for the Basing Proposed Action and Alternatives *(…continued)*

Resource (Applicable Sections)	Dover AFB Proposed Action	McGuire AFB Alternative Action	Charleston AFB Alternative Action	Dover AFB Alternative Action
Hazardous Waste, Hazardous Materials, and Stored Fuels	The contractor would comply with all regulatory guidance for the use and disposal of hazardous materials and waste during construction activities. The primary waste producing processes would continue to include aircraft parts cleaning, fluid changes for routine aircraft and vehicle maintenance, aircraft corrosion control, facility, and infrastructure maintenance. It is not anticipated any new hazardous materials would be needed. Hazardous material procurement and hazardous waste generation could decrease by about eight percent, respectively. The existing hazardous materials handling and hazardous waste disposal processes and procedures would accommodate the activities associated with C-17 operation and maintenance. It is anticipated that the amount of fuel needed for operations could decrease by as much as 27 percent.	The contractor would comply with all regulatory guidance for the use and disposal of hazardous materials and waste during construction activities. It is not anticipated any new hazardous materials would be needed. McGuire AFB would continue to be a large-quantity hazardous waste generator and hazardous material procurement and hazardous waste generation could increase by as much as 21 percent due to the additional 12 aircraft. The existing hazardous waste management processes and procedures should accommodate the waste generated under the alternative. However, it may be necessary to increase waste storage capacity. If needed, McGuire AFB would revise existing guidance to incorporate alternative action activities. It is anticipated that the amount of fuel needed for operations could increase by as much as 17 percent, thereby requiring additional delivery of fuel via pipeline.	The contractor would comply with all regulatory guidance for the use and disposal of hazardous materials and waste during construction activities. It is not anticipated any new hazardous materials would be needed. Charleston AFB would continue to be a large-quantity hazardous waste generator and hazardous material procurement and hazardous waste generation could increase by as much as 25 percent due to the additional 12 aircraft. The existing hazardous waste management processes and procedures should accommodate the waste generated under the alternative. However, it may be necessary to increase waste storage capacity. It is anticipated that the amount of fuel needed for operations could increase by as much as 25 percent, thereby requiring additional delivery of fuel via pipeline.	The Dover AFB Proposed Action summary applies, except that hazardous material procurement and hazardous waste generation could decrease by as much as 25 percent under the alternative. It is anticipated that the amount of fuel needed for operations could decrease by as much as 55 percent.

Table ES-1 Summary of Environmental Impacts for the Basing Proposed Action and Alternatives *(…continued)*

Resource (Applicable Sections)	Dover AFB Proposed Action	McGuire AFB Alternative Action	Charleston AFB Alternative Action	Dover AFB Alternative Action
Water Resources	As indicated in Subchapter 1.4, water resources are not analyzed in detail in the EA.	The construction contractor would prepare and use a storm water pollution prevention plan with erosion control and spill control measures to minimize the potential for surface and groundwater quality degradation. The additional groundwater that would be withdrawn from the aquifer for the additionally assigned personnel would not cause the Base to exceed its permitted pumping amount.	As indicated in Subchapter 1.4, water resources are not analyzed in detail in the EA.	As indicated in Subchapter 1.4, water resources are not analyzed in detail in the EA.
Biological Resources	**Dover AFB**. Construction, demolition, and renovation activities would occur within developed, maintained areas with highly modified and disturbed landscape that is now either paved or has lawns and landscaping. There would be no disturbance of high quality and/or native vegetation outside either the project or immediately adjacent areas. No endangered, threatened, or special status species are documented in the construction areas. **MTRs**. MTR overflights would be infrequent, random, and pose no threat to wildlife at the behavioral, population, or species level.	**McGuire AFB**. The Dover AFB Proposed Action summary applies to the alternative. Additionally, no project activities would occur within 300 feet of a wetland. **MTRs**. The Dover AFB Proposed Action summary applies to the alternative.	**Charleston AFB**. The Dover AFB Proposed Action summary applies to the alternative. **MTRs**. The Dover AFB Proposed Action summary applies to the alternative.	**Dover AFB**. The Dover AFB Proposed Action summary applies to the alternative. **MTRs**. The Dover AFB Proposed Action summary applies to the alternative.

Table ES-1 Summary of Environmental Impacts for the Basing Proposed Action and Alternatives *(…continued)*

Resource (Applicable Sections)	Dover AFB Proposed Action	McGuire AFB Alternative Action	Charleston AFB Alternative Action	Dover AFB Alternative Action
Socioeconomic Resources	There would be a decrease in the local and regional population of 364 persons (0.003 percent of the statistical area) as a result of the loss of 161 positions. It is anticipated that approximately 175 housing units (0.003 percent of the statistical area) would become vacant with the loss of personnel, with approximately 65 percent of these units being off-Base. There would be an enrollment decrease of approximately 110 children in local schools (0.016 percent in the district nearest the base). Employment generated by construction activities would result in wages paid, and expenditures for local and regional services and supplies during construction. The reduction of 161 personnel authorizations would result in a loss in wages paid, business sales, and income to the local and regional economy.	There would be an increase in the local and regional population of 1,500 persons (0.003 percent of the statistical area) as a result of a net gain of 631 positions. The current housing and apartment supply would be adequate to accommodate the demand for approximately 602 housing units, which equates to 0.01 percent of the inventory in the county. Enrollment of the anticipated 430 additional students would equate to a five percent increase in local school districts. Employment generated by construction activities would result in wages paid, and increase expenditures for local and regional services and supplies during construction. The addition of 631 personnel authorizations would result in an increase in wages paid, business sales, and income to the local and regional economy.	There would be an increase in the local and regional population of 1,500 persons (0.002 percent of the statistical area) as a result of a net gain of 631 positions. The current housing and apartment supply would be adequate to accommodate the demand for approximately 602 housing units, which equates to 0.002 percent of the inventory in the local area. Enrollment of the anticipated 430 additional students would equate to less than a one percent increase in local school districts. Employment generated by construction activities would result in wages paid, and increase expenditures for local and regional services and supplies during construction. The addition of 631 personnel authorizations would result in an increase in wages paid, business sales, and income to the local and regional economy.	There would be a decrease in the local and regional population of 727 persons (0.006 percent of the statistical area) as a result of the loss of 322 positions. It is anticipated that approximately 350 housing units (0.007 percent of the statistical area) would become vacant with the loss of personnel, with approximately 65 percent of these units being off-Base. There would be an enrollment decrease of approximately 220 children in local schools (0.032 percent in the district nearest the base). Employment generated by construction activities would result in wages paid, and expenditures for local and regional services and supplies during construction. The reduction of 322 personnel authorizations would result in a loss in wages paid, business sales, and income to the local and regional economy.

Table ES-1 Summary of Environmental Impacts for the Basing Proposed Action and Alternatives *(…continued)*

Resource (Applicable Sections)	Dover AFB Proposed Action	McGuire AFB Alternative Action	Charleston AFB Alternative Action	Dover AFB Alternative Action
Cultural Resources	**Dover AFB**: Dover AFB accomplished Section 106 consultation with the Delaware State Historic Preservation Office (SHPO). The SHPO concurred with the Dover AFB determination that the Proposed Action would not cause any adverse effects to properties on the Base or within the area of potential effect. **MTRs**. Cultural resources analysis for MTRs was limited to Native American interests. The Air Force consulted with Native American tribes pursuant to 36 CFR 800.2 and replied to Native American groups concerning the proximity of their reservation to MTRs.	**McGuire AFB**: No NRHP-eligible archaeological or historical resources are located within or adjacent to the project sites. **MTRs**. Cultural resources analysis for MTRs was limited to Native American interests. The Air Force consulted with Native American tribes pursuant to 36 CFR 800.2 and replied to Native American groups concerning the proximity of their reservation to MTRs.	As indicated in Subchapter 1.4, cultural resources are not analyzed in detail in the EA. **MTRs**. Cultural resources analysis for MTRs was limited to Native American interests. The Air Force consulted with Native American tribes pursuant to 36 CFR 800.2 and replied to Native American groups concerning the proximity of their reservation to MTRs.	The Dover AFB Proposed Action summary applies to the alternative.
Land Use	**Dover AFB**. Facility construction would be consistent with existing and future land use plans and programs identified in the Dover AFB General Plan. No additional off-Base areas would be exposed to aircraft noise and no additional land use incompatibilities would be anticipated based on the current Air Installation Compatible Land Use (AICUZ) Study. **MTRs**. No significant impacts to sensitive land uses would occur because the noise levels would be below the DNL noise/land use compatibility guidelines.	**McGuire AFB**. Facility construction would be consistent with existing and future land use plans and programs identified in the McGuire AFB General Plan. Off-Base areas would experience a slight increase in exposure to aircraft noise. The additionally exposed areas would be consistent with existing land use in the area because other residences occur in these noise zones under the baseline condition. **MTRs**. No significant impacts to sensitive land uses would occur because the noise levels would be below the DNL noise/land use compatibility guidelines.	**Charleston AFB**. Facility construction would be consistent with existing and future land use plans and programs identified in the Charleston AFB General Plan. Off-Base areas would experience a slight increase in exposure to aircraft noise. However, no additional land use incompatibilities would be anticipated based on the current AICUZ Study. **North Field**: Off-installation noise exposure would increase slightly. However, the slight increases would not impact existing land uses. **MTRs**. No significant impacts to sensitive land uses would be anticipated due to the slight increase in noise levels or additional overflights from the proposed operations.	The summary for the Dover AFB Proposed Action applies to the alternative.

Table ES-1 Summary of Environmental Impacts for the Basing Proposed Action and Alternatives *(…continued)*

Resource (Applicable Sections)	Proposed Action	McGuire AFB Alternative Action	Charleston AFB Alternative Action	Dover AFB Alternative Action
Infrastructure and Utilities	There would be a 2.06 percent reduction in water consumption when compared to the baseline condition due to the 161 fewer personnel. Use of water for dust control equates to about 2.2 percent of system capacity. Wastewater generation would be reduced by 0.13 percent reduction when compared to the baseline condition. The 0.89 percent increase in impervious cover likely would increase flow in the storm water system. The electricity and natural gas distribution systems capacities can accommodate the respective 1.44 and 1.21 percent increases in consumption for the new buildings. The disposal of construction and demolition debris equates to 1.42 percent of the total remaining landfill capacity. Solid waste generation by personnel would decrease slightly due to the reduction in assigned personnel. The net loss of 161 personnel (2 percent of baseline assigned personnel) would result in a very slight decrease in weekday on-Base roadway volumes.	There would be a 5.12 percent increase in water consumption when compared to the baseline condition due to the addition of 631 personnel. The resultant water use would be about 89 percent of the state-permitted use. Use of water for dust control equates to about 1.4 percent of the permitted use. Wastewater generation would increase by 0.65 percent when compared to the baseline condition. The 0.31 percent increase in impervious cover likely would increase flow in the storm water system. The electricity and natural gas distribution systems capacities can accommodate the respective 4.14 and 4.10 percent increases in consumption for the new buildings. The disposal of construction and demolition debris equates to 0.19 percent of the total remaining landfill capacity. Solid waste generation by personnel would increase slightly due to the increase in assigned personnel. The net increase of 631 personnel (5 percent of baseline assigned personnel) would result in an increase in weekday on-Base roadway volumes.	There would be an 8.0 percent increase in water consumption when compared to the baseline condition due to the addition of 631 personnel. Use of water for dust control equates to about 0.48 percent the baseline daily consumption. Wastewater generation would increase by 3.17 percent when compared to the baseline condition. The 0.05 percent increase in impervious cover likely would increase flow in the storm water system. The electricity and natural gas distribution systems capacities can accommodate the respective 0.62 and 0.63 percent increases in consumption for the new buildings. The disposal of construction and demolition debris equates to 0.46 percent of the total remaining landfill capacity. Solid waste generation by personnel would increase slightly due to the increase in assigned personnel. The net increase of 631 personnel (8 percent of baseline assigned personnel) would result in an increase in weekday on-Base roadway volumes.	There would be a 4.11 percent reduction in water consumption when compared to the baseline condition due to the 322 fewer personnel. Use of water for dust control equates to about 2.2 percent of system capacity. Wastewater generation would be reduced by 0.2 percent reduction when compared to the baseline condition. The 0.89 percent increase in impervious cover likely would increase flow in the storm water system. The electricity and natural gas distribution systems capacities can accommodate the respective 1.68 and 1.42 percent increases in consumption for the new buildings. The disposal of construction and demolition debris equates to 1.43 percent of the total remaining landfill capacity. Solid waste generation by personnel would decrease slightly due to the reduction in assigned personnel. The net loss of 322 personnel (4 percent of baseline assigned personnel) would result in a very slight decrease in weekday on-Base roadway volumes.

Table ES-1 Summary of Environmental Impacts for the Basing Proposed Action and Alternatives *(…continued)*

Resource (Applicable Sections)	Dover AFB Proposed Action	McGuire AFB Alternative Action	Charleston AFB Alternative Action	Dover AFB Alternative Action
Airspace and Airfield Operations	**Dover AFB**. C-17 aircrews would accomplish tactical events such as arrivals and departures n which the aircraft may spiral up to about 5,000 feet AGL during a departure or down from that altitude on an arrival to a landing. The air traffic control tower and Dover AFB Radar Approach Control (RAPCON) would establish procedures for these tactical events since they start in one airspace unit (*i.e.*, either tower or RAPCON) and end in the other (*i.e*., either tower or RAPCON). The volume of traffic in the airspaces in which the tactical arrivals and departures would be accomplished would not preclude establishment of the procedures needed to allow execution of the events. Thus, the airspace has the capacity to accommodate the additional air traffic control procedures needed for the airfield operations. Airfield operations would decrease by 62.63 average daily operations. **MTRs**. Each MTR has the capacity to accommodate the additional operations and the structure for each route can support C-17 operations. The potential for conflict between aircraft operating on the MTRs and other civil aircraft operating in the airspace around the MTRs is low because the existing scheduling and air traffic control procedures are designed to deconflict aircraft. **Aircraft Safety**: The probability is low that an aircraft involved in an accident at or around the Dover AFB airfield or on a MTR would strike a person or structure on the ground. **Bird-Aircraft Strike Hazard**: The potential for bird-aircraft strikes associated with airfield operations at Dover AFB would be expected to decrease from the annual average of 41 strikes to 30 strikes. It is anticipated that about 3 bird-aircraft strikes would occur annually from Dover AFB C-17 MTR operations. It is unlikely that any of these bird-aircraft strike incidents would result in an aircraft accident, involve injury either to aircrews or to the public, or damage to property (other than the aircraft).	**McGuire AFB**. The existing aircraft ground tracks, pattern altitudes, and instrument approach procedures, as well as the air traffic control procedures, are compatible with the requirements associated with the additional 80.12 average daily C-17 operations. **MTRs and Aircraft Safety**. The airspace management and procedures and aircraft safety discussion and analysis for the Dover AFB Proposed Action apply to the alternative. **Bird-Aircraft Strike Hazard**: The potential for bird-aircraft strikes associated with airfield operations at McGuire AFB would be expected to increase from the annual average of 79 strikes to 108 strikes. It is anticipated that about 6 bird-aircraft strikes would occur annually from McGuire AFB C-17 MTR operations.	**Charleston AFB**. The existing aircraft ground tracks, pattern altitudes, and instrument approach procedures, as well as the air traffic control procedures, are compatible with the requirements associated with the additional 22.99 average daily C-17 operations. **North Field**: The existing aircraft ground tracks, pattern altitudes, and instrument approach procedures, as well as the air traffic control procedures, are compatible with the requirements associated with the additional 53.48 average daily C-17 operations. **MTRs and Aircraft Safety**. The airspace management and procedures and aircraft safety discussion and analysis for the Dover AFB Proposed Action apply to the alternative. **Bird-Aircraft Strike Hazard**: The potential for bird-aircraft strikes associated with airfield operations at Charleston AFB would be expected to increase from the annual average of 32 strikes to 40 strikes. It is anticipated that about 3 bird-aircraft strikes would occur annually from Charleston AFB C-17 MTR operations.	**Dover AFB**. The airspace management summary for the Dover AFB Proposed Action applies to the alternative. Airfield operations would decrease by 93.47 average daily operations. **MTRs and Aircraft Safety**. The airspace management and procedures and aircraft safety discussion and analysis for the Dover AFB Proposed Action apply to the alternative. **Bird-Aircraft Strike Hazard**: The potential for bird-aircraft strikes associated with airfield operations at Dover AFB would be expected to decrease from the annual average of 41 strikes to 19 strikes. It is anticipated that about 6 bird-aircraft strikes would occur annually from Dover AFB C-17 MTR operations.

Table ES-1 Summary of Environmental Impacts for the Basing Proposed Action and Alternatives *(…continued)*

Resource (Applicable Sections)	Proposed Action	McGuire AFB Alternative Action	Charleston AFB Alternative Action	Dover AFB Alternative Action
Environmental Management	The activities associated with the action would be accomplished using existing directives and would not impact achieving pollution prevention goals. The demolition contractor would be responsible for asbestos containing material (ACM) and lead-based paint (LBP) removal, which would be accomplished in accordance with existing guidance. The proposed facilities would be constructed or renovated without any ACM and LBP. Facilities design and construction activities would be coordinated with the Base Environmental Flight and Bioenvironmental Engineering to ensure that construction would avoid interference with any ongoing Environmental Restoration Program (ERP) investigation and remediation work and would not worsen the condition of any site.	The pollution prevention, ACM, and LBP summary for the Dover AFB Proposed Action applies to the alternative. Construction of the 2-bay C-17 hangar, the addition to the aerospace ground equipment facility, and the four C-17 parking spots would occur adjacent to ERP sites ST-22 and SS-30. It is possible that ground water could be encountered during construction since the water occurs at depths of two to four feet below the ground surface. The Dover AFB Proposed Action discussion about facility construction activities and ERP sites applies to the McGuire AFB Alternative Action.	The pollution prevention, ACM, and LBP summary for the Dover AFB Proposed Action applies to the alternative. Construction of the two squadron operations/aircraft maintenance facilities would occur adjacent to an ERP site. It is possible that ground water could be encountered during construction since the water occurs at depths of six feet below the ground surface. The Dover AFB Proposed Action discussion about facility construction activities and ERP sites applies to the Charleston AFB Alternative Action. Charleston AFB would seek a Finding of Consistency from the South Carolina Department of Health and Environmental Control, Office of Ocean and Coastal Resource Management before proceeding with the alternative action.	The summary for the Dover AFB Proposed Action applies to the alternative.

Table ES-2 Summary of Environmental Impacts for the Landing Zone Alternatives

Resource (Applicable Sections)	McGuire AFB Landing Zone Alternative	Dover AFB Landing Zone Alternative	NAES Lakehurst Landing Zone Alternative
Air Quality	The greatest emissions for any of the criteria pollutants from construction activity would be 16.76 tpy for NO_x, equating to 0.02 percent of the emissions inventory for the AQCR. The effects from construction emissions would be temporary, fall off rapidly with distance from the proposed construction site, and would not result in any long-term impacts. The greatest volume for any of the criteria pollutants from recurring aircraft operations would be 1,693.899 tpy for CO, which equates to 3.37 percent of the baseline emissions within the AQCR. The CAA General Conformity Applicability Analysis prepared in August 2004 concluded that the net change in emissions for criteria pollutants would not be regionally significant, would exceed *de minimis* thresholds, would exceed the Base's emissions budget in the SIP, and would require a Conformity Determination. If selected as the preferred LZ alternative, the Air Force would coordinate with the NJDEP to establish General Conformity budgets that ensure the air emissions from the McGuire AFB LZ Alternative conform to the New Jersey State Implementation Plan for attainment of the Ozone National Ambient Air Quality Standard. It is anticipated the coordination process will be completed before this EA is finalized and that, with inclusion of the emissions in the budget, the emissions from the McGuire AFB LZ Alternative would positively conform to the applicable SIP.	The greatest emissions for any of the criteria pollutants from construction activity would be 17.08 tpy for PM_{10}, equating to 2.55 percent of the emissions inventory for the AQCR. The effects from construction emissions would be temporary, fall off rapidly with distance from the proposed construction site, and would not result in any long-term impacts. The greatest volume for any of the criteria pollutants from recurring aircraft operations would be 1,493.747 tpy for NO_x, which equates to 21.65 percent of the baseline emissions within the AQCR. The CAA General Conformity Applicability Analysis prepared in August 2004 concluded that the net change in emissions for criteria pollutants would not be regionally significant, would not exceed *de minimis* thresholds, and that a Conformity Determination would not be required.	The greatest emissions for any of the criteria pollutants from construction activity would be 206.27 tpy for PM_{10}, equating to 16.00 percent of the emissions inventory for the AQCR. The effects from construction emissions would be temporary, fall off rapidly with distance from the proposed construction site, and would not result in any long-term impacts. The greatest volume for any of the criteria pollutants from recurring aircraft operations would be 680.25 tpy for NO_x, which equates to 6.80 percent of the baseline emissions within the AQCR. The Air Force and the Navy consulted with the New Jersey Department of Environmental Protection (NJDEP) and the United States Environmental Protection Agency (USEPA) to include the NAES Lakehurst LZ Alternative in the SIP to meet the requirements under the General Conformity Rule. The NJDEP agreed to include the NAES Lakehurst LZ Alternative in the 8-hour Attainment Demonstration SIP, which will be submitted to the USEPA in June 2007. Additionally, the NJDEP agreed to provide NAES Lakehurst with a facility-wide emissions budget for VOC and NO_X emissions in the 8-hour Attainment Demonstration. The result of the consultation process is that a Conformity Determination would not be required.

Table ES-2 Summary of Environmental Impacts for the Landing Zone Alternatives *(…continued)*

Resource (Applicable Sections)	McGuire AFB Landing Zone Alternative	Dover AFB Landing Zone Alternative	NAES Lakehurst Landing Zone Alternative
Noise	An additional 12,399 people (865 percent) (18.0 percent of the population within a 5-mile radius of the airfield) would be exposed to DNL 65 dBA and greater. The density of residences in the newly exposed area would be consistent with adjacent residential areas exposed to aircraft noise under the baseline condition. It is anticipated there would be a corresponding increase in the potential for sleep awakenings. About 0.5 percent of the additionally exposed population within five miles of the airfield could experience speech disruption from exposure to DNL 75 dBA and greater. Noise-induced hearing loss would not be anticipated. Construction noise would be temporary, would occur only during daytime, and would cease when the project is completed.	**Location A**: The number of people exposed to DNL 65 dBA and greater would decrease by 19 percent. It is anticipated there would be a corresponding decrease in the potential for sleep awakenings and speech disruption when compared to the baseline condition. Noise-induced hearing loss would not be anticipated. The interior noise levels in schools would be below the levels at which a marked increase in pauses and masking would occur and at which teaching would be impaired as a result of disruption of speech communication. Construction noise would be temporary, would occur only during daytime, and would cease when the project is completed. **Location B:** The number of people exposed to DNL 65 dBA and greater would decrease by 22 percent. The summary for Location A applies to Location B.	The noise contours would increase in all directions from the airfield. An additional 605 people, representing about 6 percent of the population living within the airfield airspace, would be exposed to DNL 65 dBA or greater. This could result in an additional 61 people being awakened as compared to the existing, or "baseline," condition. Noise-induced hearing loss would not be anticipated from airfield operations associated with the NAES Lakehurst LZ alternative. The potential exists for a slight increase in speech pauses and masking at two schools experiencing increased noise levels.

Table ES-2 Summary of Environmental Impacts for the Landing Zone Alternatives *(…continued)*

Resource (Applicable Sections)	McGuire AFB Landing Zone Alternative	Dover AFB Landing Zone Alternative	NAES Lakehurst Landing Zone Alternative
Biological Resources	McGuire AFB would consult with the state on an informal basis to avoid an adverse effect to any of the five species state-listed rare species that might be encountered during LZ construction. McGuire AFB also would consult with the state and the Pinelands Commission to coordinate construction within a wetland since the proposed LZ site is within a wetland. Work within the wetlands would require a Section 404/401 permit from the United States Army Corps of Engineers. Construction would be conducted in accordance with permit conditions.	Upland sandpipers, a state-listed endangered species, have been observed at the proposed LZ location. The loss of habitat likely would reduce the number of nesting birds and therefore, the potential for successful breeding. However, past and current mowing practices to reduce the potential for bird-aircraft strikes also have limited the potential for increasing the numbers of the species. Other areas of the base where the bird has been observed would continue to provide habitat for the species. Thus, while there could be a decrease in upland sandpipers at the base due to the loss of habitat, it is likely that the species would not be eliminated from the Base due to construction of the LZ and that the reduction in numbers of the upland sandpiper would not be significant. Dover AFB would consult with the state on an informal basis to avoid an adverse effect to any of the state-listed species that might be encountered during LZ construction.	The approximate eight acres of grassland that would be converted to the LZ equates to about 0.5 percent of the total grassland area at NAES Lakehurst. NAES Lakehurst would create or enhance an equal area of grassland in other areas of the Station to offset the loss of grassland due to construction of the LZ. Therefore, there would be no net loss of habitat. Disturbance to habitat would be temporary, lasting only as long as it takes to establish the grasslands. Establishing habitat in other areas of the Station that would be more distant from the airfield would have a beneficial effect because the increased distance would reduce the potential for bird-aircraft strikes and disturbance from airfield operations. No activities would occur in wetlands.
Cultural Resources	The LZ would be built on a portion of the airfield previously disturbed during construction of the airfield. No NRHP-eligible archaeological or historical resources are located within or adjacent to the project site.	The LZ would be built on a portion of the airfield previously disturbed during construction of the airfield. The summary for the McGuire AFB LZ Alternative applies.	As indicated in Subchapter ES 5.2, cultural resources are not analyzed in detail in the EA.
Land Use	The LZ construction would be consistent with existing and future land use plans and programs identified in the McGuire AFB General Plan. Off-Base areas would experience an increase in exposure to aircraft noise. The additionally exposed areas would be consistent with existing land use in the area because other residences occur in these noise zones under the baseline condition. No significant land use incompatibilities would occur from establishment of the imaginary surfaces associated with the LZ. The McGuire AFB AICUZ Study would be updated to reflect the LZ imaginary surfaces.	The LZ construction would be consistent with existing and future land use plans and programs identified in the Dover AFB General Plan. Some off-Base areas not previously exposed to DNL 65 dBA and greater would be exposed to noise at this level. The additionally exposed areas would be consistent with existing land use in the area because other residences occur in these noise zones under the baseline condition. No significant land use incompatibilities would occur from establishment of the imaginary surfaces associated with the LZ. The Dover AFB AICUZ Study would be updated to reflect the LZ imaginary surfaces.	The construction would be consistent with existing and future land use plans and programs identified in the NAES Lakehurst Vision Plan. The areas exposed to aircraft noise include the wildlife management areas to the north and south of the installation and industrial land to the northeast. Based on the current land uses, no significant impacts to land uses would occur because of the increased noise levels from aircraft operations. No impacts to land ownership or the existing function of the land uses would occur. The NAES Lakehurst AICUZ Study would be updated to reflect the LZ imaginary surfaces.

Table ES-2 Summary of Environmental Impacts for the Landing Zone Alternatives *(…continued*)

Resource (Applicable Sections)	McGuire AFB Landing Zone Alternative	Dover AFB Landing Zone Alternative	NAES Lakehurst Landing Zone Alternative
Airspace and Airfield Operations	**McGuire AFB**. C-17 aircrews would accomplish tactical events such as arrivals and departures at the LZ in which the aircraft may spiral up to about 5,000 feet AGL during a departure or down from that altitude on an arrival to a landing. The air traffic control tower and McGuire AFB RAPCON would establish procedures for these tactical events since they start in one airspace unit (*i.e.*, either tower or RAPCON) and end in the other (*i.e.*, either tower or RAPCON). The volume of traffic in the airspaces in which the tactical arrivals and departures would be accomplished would not preclude establishment of the procedures to allow execution of the events. Thus, the airspace has the capacity to accommodate the additional air traffic control procedures needed for the combination of the C-17 LZ operations and the airfield operations. The airfield has the capacity to accommodate the anticipated 419.87 daily operations. **Aircraft Safety**: The probability is low that an aircraft involved in an accident at or around the McGuire AFB airfield would strike a person or structure on the ground. **Bird-Aircraft Strike Hazard**: The potential for bird-aircraft strikes associated with airfield operations at McGuire AFB would be expected to increase from the annual average of 79 strikes to 168 strikes. It is unlikely that any of these bird-aircraft strike incidents would result in an aircraft accident, involve injury either to aircrews or to the public, or damage to property (other than the aircraft).	**Dover AFB**. The airspace summary for the McGuire AFB LZ Alternative applies to the alternative. The airfield has the capacity to accommodate the anticipated 289.91 daily operations. **Aircraft Safety**: The probability is low that an aircraft involved in an accident at or around the Dover AFB airfield would strike a person or structure on the ground. **Bird-Aircraft Strike Hazard**: The potential for bird-aircraft strikes associated with airfield operations at Dover AFB would be expected to increase from the annual average of 41 strikes to 71 strikes. It is unlikely that any of these bird-aircraft strike incidents would result in an aircraft accident, involve injury either to aircrews or to the public, or damage to property (other than the aircraft).	**NAES Lakehurst**. The airspace summary for the McGuire AFB LZ Alternative applies to the alternative. The airfield has the capacity to accommodate the anticipated 234.65 daily operations. **Aircraft Safety**: The probability is low that an aircraft involved in an accident at or around the NAES Lakehurst airfield would strike a person or structure on the ground. **Bird-Aircraft Strike Hazard**: The potential for bird-aircraft strikes associated with airfield C-17 operations at NAES Lakehurst could be as high as 61 annual strikes. It is unlikely that any of these bird-aircraft strike incidents would result in an aircraft accident, involve injury either to aircrews or to the public, or damage to property (other than the aircraft).
Environmental Management	The summary for the McGuire AFB Alternative Action for aircraft basing applies.	The summary for the Dover AFB Proposed Action for aircraft basing applies.	As indicated in Subchapter ES 5.2, environmental management is not analyzed in detail in the EA.

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ACRONYMS AND ABBREVIATIONS

$\mu g/m^3$	microgram(s) per cubic meter
AAF	Army airfield
ACM	asbestos containing material
AQCR	air quality control region
AFB	Air Force base
AFI	Air Force Instruction
AFRC	Air Force Reserve Command
AGL	above ground level
AHPA	Archaeological and Historic Preservation Act
AICUZ	air installation compatible use zone
AIRFA	American Indian Religious Freedom Act of 1978
AMC	Air Mobility Command
AMW	Air Mobility Wing
ANG	Air National Guard
APE	area of potential effect
ARC	Air Reserve Command
ARPA	Archaeological Resources Protection Act
ARW	Air Refueling Wing
AST	above-ground storage tank
AW	Airlift Wing
BASH	Bird/Wildlife Aircraft Strike Hazard
BFSA	bulk fuel storage area
bgs	below ground surface
BRAC	base realignment and closure
CAA	Clean Air Act
ccf	hundred cubic feet
CDP	census-designated place
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CNEL	community noise equivalent level
CNO	Office of the Chief of Naval Operations
CO	Carbon monoxide
CO_2	carbon dioxide
CY	calendar year
CZ	clear zone
dB	decibel
dBA	a-weighted sound level measured in decibels
DCR	discharge clean-up and removal
DHEC	Department of Health and Environmental Control
DNL	day-night average sound level
DNREC	Delaware Department of Natural Resources and Environmental Control
DoD	Department of Defense
DoDD	Department of Defense directive
DPCC	discharge prevention containment and countermeasures
DPCC	discharge prevention containment and countermeasures
EA	environmental assessment
EC	environmental compliance
EDMS	Emissions and Dispersion Modeling System
EIAP	environmental impact analysis process
EIFS	Economic Impact Forecast System

EIR	economic impact region
EIS	environmental impact statement
EMTF	expeditionary mobility task forces
EO	executive order
ERA	environmental restoration account
ERP	environmental restoration program
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FFCA	Federal Facility Compliance Act
FICAN	Federal Interagency Committee on Aviation Noise
FICON	Federal Interagency Committee on Noise
FICUN	Federal Interagency Committee on Urban Noise
FONSI	finding of no significant impact
FY	fiscal year
HAER	Historic American Engineering Record
HAP	high accident potential
Hazmart	hazardous materials pharmacy
HAZMAT	hazardous materials
HQ	headquarters
ICRMP	Integrated Cultural Resources Management Plan
IFR	instrument flight rules
IR	instrument route
IRP	Installation Restoration Program (now known as ERP)
JFSA	jet fuel spill area
kWH	kiloWatt hour
LBP	lead-based paint
lbs	pound(s)
lbs/ft^3	pound(s) per cubic foot
L_{dnmr}	on set rate adjusted monthly day-night average a-weighted sound level
L_{max}	maximum sound level
LTO	long-term operations
LZ	landing zone
MAP	management action plan
mgd	million gallons per day
MLS	multiple listing service
MLS	multiple listing service
MOA	military operations area
MOGAS	unleaded engine fuel
MSA	metropolitan statistical area
MSL	mean sea level
MTR	military training route
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NAES	Naval Air Engineering Station
NAGPRA	Native American Graves Protection and Repatriation Act
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NJDEP	New Jersey Department of Environmental Protection
NLR	noise level reduction
NM	nautical mile(s)
NMFS	National Marine Fisheries Service
NO	nitric oxide
NO_2	nitrogen dioxide

NO_X	nitrogen oxides
NPS	National Park Service
NRHP	National Register of Historic Places
NRIS	National Register Information System
O_3	ozone
OCRM	Office of Ocean and Coastal Resources Management
ODS	ozone-depleting substances
OSA	oil spill area
OSHA	Occupational Safety and Health Agency
OU	operable unit
P2	pollution prevention
P2 MAP	Pollution Prevention Management Action Plan
Pb	lead
PCB	Polychlorinated biphenyls
PL	public law
PM_{10}	Particulate matter equal to or less than 10 microns in aerodynamic diameter
$PM_{2.5}$	Particulate matter equal to or less than 2.5 microns in aerodynamic diameter
PMSA	primary metropolitan statistical area
POCO	petroleum-only-contamination
POL	petroleum, oil, and lubricants
ppm	parts per million
RAPCON	radar approach control
RCRA	Resource Conservation and Recovery Act
ROI	region of influence
RTV	rational threshold value
SAC	Strategic Air Command
SCDHEC	South Carolina Department of Health and Environmental Control
SEL	sound exposure level
SHPO	State Historic Preservation Office
SIP	state implementation plan
SO2	sulfur dioxide
SOx	sulfur oxides
SPCC	spill prevention control and countermeasures
SR	slow route
SUA	special use airspace
SVOC	semivolatile organic compound
SWMU	solid waste management unit
SWPPP	storm water pollution prevention plan
the Base	Dover AFB, McGuire AFB, or Charleston AFB
the Plan	mobility transformation plan
the Station	Naval Air Engineering Station Lakehurst
Title X	Residential Lead-Based Paint Hazard Reduction Act of 1992
tpd	tons per day
tpy	tons per year
TRACON	terminal radar approach control
TSD	treatment, storage, or disposal
TSDF	temporary storage and disposal facility
TSP	total suspended particulates
UFC	Uniform Fire Code
USAF	United States Air Force
USDL	United States Department of Labor
USDOC	United States Department of Commerce
USDOI	United States Department of the Interior

USDOT	United States Department of Transportation
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
UST	underground storage tank
VFR	visual flight rules
VOC	volatile organic compounds
VR	visual route
WIC	weapons instructor course
WWTP	wastewater treatment plant

CHAPTER 1
PURPOSE OF AND NEED FOR THE PROPOSED ACTION

This chapter has seven sections: an introduction, a statement of the purpose and need for the action; the objectives of the action; a summary of the scope of the environmental review; a statement of the decision that must be made; identification of applicable regulatory requirements; and an overview of the organization of the document.

1.1 INTRODUCTION

The Air Force Mobility Force Structure Briefing to Congress on April 15, 2002 presented an airlift Mobility Transformation Plan (the Plan) that proposes to standardize airlift aircraft fleets, increase reliability, lower operating and support costs, and increase airlift capability by 33 percent. The Plan, which extends through the year 2017, would allow the Air Force to address the increasing demand for airlift with newer, more reliable aircraft and improved overall support.

A total of 53 active duty Air Force and air reserve component (ARC, *i.e.*, Air Force Reserve Command [AFRC] and Air National Guard [ANG]) military installations nationwide would be affected by the Plan outlined in the Air Force Mobility Force Structure Briefing. As part of the overall Plan, Headquarters, Air Mobility Command (AMC) at Scott Air Force Base (AFB), Illinois proposes to base C-17 aircraft at an active duty east coast Air Force installation. It is estimated that activities associated with the basing action would begin in 2006. The following bases are being considered in detail:

- Dover AFB, located in Kent County, Delaware, within the City of Dover, and about 60 miles south of Philadelphia, Pennsylvania. Dover AFB has 32 C-5 aircraft assigned. The C-5 is a strategic cargo transport aircraft.
- McGuire AFB, located in Burlington County, New Jersey, adjacent to the Borough of Wrightstown, and about 30 miles east of Philadelphia, Pennsylvania. McGuire AFB is converting from C-141 to C-17 airlift aircraft. It is anticipated the conversion will be complete in 2005. The Base also has 32 KC-10 and 12 KC-135 aircraft assigned. Both aircraft are primarily aerial refueling aircraft that also have cargo transport capability.
- Charleston AFB, located in Charleston County, South Carolina, within the City of North Charleston, and about 10 miles north of Charleston. There are 48 C-17 aircraft based at Charleston AFB.

The C-17 aircraft combines the attributes of a strategic airlifter – long range, aerial refueling, and large payload (including outsize cargo) - with those of a tactical airlifter – agility in the air, survivability, ability to operate on austere airfields with short runways, and the ability to air drop cargo and personnel. A key capability of the C-17 aircraft is its ability to land and take off from a short runway called a landing zone (LZ) that is 3,500 feet to 5,000 feet in length and 90 feet wide.

The action to base and operate 12 C-17 aircraft at McGuire AFB was assessed in an environmental assessment (EA) entitled *Environmental Assessment of C-17 Basing at McGuire Air Force Base, New Jersey, April 2002* (United State Air Force [USAF] 2002). This document is referred to as the McGuire AFB C-17 Basing EA in this document. Air Force planning prior to initiation of the McGuire AFB C-17 basing environmental impact analysis process (EIAP) identified the need for an LZ. There were no existing LZs within 30 minutes of the Base; thus, an LZ would needed to be constructed. However, the lack of complete information did not allow selection of an LZ location, and the McGuire AFB C-17 Basing EA was completed without assessing construction of, or aircraft operations at, an LZ. The McGuire AFB C-17 Basing EA states that "…analyses specific to the proposed LZ will be presented in a separate NEPA document…" (USAF 2002a). Thus, the Air Force still needs an LZ at which McGuire AFB C-17 aircrews, as well as aircrews from the basing action considered in this EA, would accomplish tactical arrival, departure, and landing training.

Figure 1.1-1 shows the location of Dover, McGuire, and Charleston AFBs, as well as North Field, which is adjacent to North, South Carolina. Charleston AFB aircrews use North Field, which has both an LZ and long main runway, for tactical arrivals, departures, and landings as well as other takeoff, landing, and airdrop training. The figure also shows the location of Naval Air Engineering Station (NAES) Lakehurst (the Station), New Jersey, which is approximately 14 miles east of McGuire AFB. The Air Force is considering constructing an LZ with associated lighting system and marking panels at NAES Lakehurst, Dover AFB, or McGuire AFB, and then conducting C-17 tactical arrivals, departures, and landings and other airfield operations at the airfield.

1.2 PURPOSE OF AND NEED FOR ACTION

The need for the action is to improve overall airlift capability by basing C-17 aircraft at an active duty east coast Air Force base as part of the airlift Mobility Transformation Plan. There is also a need to construct an LZ in the northeastern United States where C-17 aircrews based in that area of the country could practice tactical arrivals, departures, and landings. As part of the Plan, the Air Force determined it is operationally prudent to maintain a robust airlift capability on the east coast to contribute to the overall airlift requirement. Specifically, basing C-17 aircraft at an east coast location, as well as conducting LZ training at an airfield in the northeastern United States, would enhance the capability of the Air Force to meet the national military strategy by modernizing strategic and tactical airlift aircraft on the east coast.

1.3 OBJECTIVES OF THE ACTION

The objective of the action is to base C-17 aircraft and related aircrew, aircraft maintenance, and support personnel at an east coast active duty Air Force base and then operate the aircraft from that base. Another objective is to establish an LZ in the northeastern United States for tactical arrival, departure, and landing training by C-17 aircrews. The aircrews associated with the C-17 aircraft would accomplish airlift missions to support the worldwide mobility commitments and have the ability to fly training sorties to maintain proficiency.



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Location Map
Dover, McGuire, and Charleston AFBs

Figure 1.1-1

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1.4 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 EIAP 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 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 EA:

- Provide a brief summary of the evidence and analysis to determine whether the Proposed Action or alternative actions might have significant effects that would require preparation of an environmental impact statement (EIS). If analysis determines that the environmental effects would not be significant, a finding of no significant impact (FONSI) will be prepared;
- Facilitate preparation of an EIS, when required; or
- Aid an agency's compliance with NEPA when no EIS is necessary.

The EA assesses the proposed east coast basing and operation of C-17 aircraft at Dover AFB, McGuire AFB, or Charleston AFB; construction of an LZ and subsequent LZ operations at McGuire or Dover AFBs or NAES Lakehurst; the No Action Alternative; and the cumulative conditions at each Base. The EA identifies, describes, and evaluates the potential environmental impacts that may result from implementation of the Proposed Action or Alternative Actions, as well as possible cumulative impacts from other past, present, or reasonably foreseeable actions planned for each Base. The EA also identifies required environmental permits relevant to the Proposed Action and Alternative Actions. As appropriate, the affected environment and environmental consequences of the Proposed Action, Alternative Actions, and No Action Alternative may be described in terms of site-specific descriptions or regional overview. Finally, the EA identifies mitigation measures to prevent or minimize environmental impacts, if required.

1.4.1 Resources Considered in the Environmental Assessment

The following biophysical resources are assessed in this EA: air quality; noise; hazardous waste, hazardous materials, and stored fuels; water resources; biological resources; socioeconomic resources; cultural resources (*i.e.*, installations and Native American interests associated with the low-level navigation military training routes [MTR]); land use; infrastructure and utilities; airspace and airfield operations; environmental management; and environmental justice.

1.4.2 Resources Not Considered in the Environmental Assessment

The following subchapters describe the rationale for not further analyzing specific resources at a particular installation.

1.4.2.1 Dover, McGuire, and Charleston AFBs and NAES Lakehurst

Construction associated with the proposed project activities would occur in portions of Dover, McGuire, and Charleston AFBs and NAES Lakehurst that have been disturbed and altered by previous activities. Soil disturbance would occur primarily on the surface for site preparation and slab construction/demolition. Existing utility service lines would be used to the maximum extent possible. If necessary, trenching for utility lines would occur at depths estimated to be no greater than 6 feet below the surface. Erosion control measures identified in the Storm Water Pollution Prevention Plan that would be prepared for the construction project, and which would be implemented by the construction contractor, would minimize erosion. For these reasons, no geologic, physiographic, or soils impacts would be anticipated from the proposed activities, and earth resources will not be analyzed further in the EA at Dover, McGuire, and Charleston AFBs and NAES Lakehurst.

1.4.2.2 Dover AFB

There are no surface water features on or adjacent to the construction sites associated with proposed activities. The immediate water table below the Base is within 15 feet below the below ground surface (bgs), and construction activity is estimated to occur approximately 5-6 feet below the surface. The shortest distance between the 100-year floodplain and a project site is approximately 1,200 feet. Standard erosion control measures would be implemented during facility construction to minimize the potential for nutrients, pollutants, and sediment from entering a surface or ground water feature. For these reasons, no surface water, ground water, or floodplain impacts would be anticipated, and those resources will not be analyzed further in the EA.

The distance between a construction site and the nearest wetland is approximately 2,000 feet. This distance, along with implementation of standard erosion and storm water control measures, would prevent discharge of contaminants and high volumes of water into a wetland, minimizing the potential for impacts to a wetland. Thus, no adverse effects would be anticipated to wetlands at Dover AFB and the resource will not be analyzed further in the EA.

According to the State of Delaware's Coastal Zone Management Plan, the entire state falls within the state's Coastal Zone Area. However, the portion of the state where coastal regulations are strictly enforced lies east of State Route 9, which forms the eastern and southeastern boundaries of the Base. While the entire Base falls within the state's coastal zone, only the former Bergold farm lies within the heavily regulated enforcement area. Any development proposed within that area would be required to be consistent with the State Coastal Zone Management Plan (Dover AFB undated). None of the activities associated with

the Dover AFB Proposed Action, Dover AFB Alternative Action, or Dover AFB Landing Zone Alternative would occur in the Bergold farm. Thus, coastal zone consistency will not be analyzed further in the EA.

1.4.2.3 McGuire AFB

The shortest distance between the 100-year floodplain and a project site is approximately 3,000 feet. Therefore, floodplains, which are typically analyzed with water resources, will not be analyzed in the EA.

The New Jersey Coastal Area Facility Review Act applies to coastal waters in the southern part of the state. The inland limit of the area identified by the Act varies in width from a few thousand feet to 24 miles, measured perpendicularly inland from the shoreline. Based on these criteria, McGuire AFB is not within the State of New Jersey's Coastal Area Facilities Review Act area. Thus, coastal zone consistency will not be analyzed further in the EA.

1.4.2.4 Charleston AFB

The proposed activities would occur in an area within developed, maintained areas with a highly modified and disturbed landscape. There would be no disturbance of high quality and/or native vegetation outside the developed areas within the Base or outside the Base boundary. A 1993 field survey found no endangered, threatened, or special status species on the Base. One federal species-of-concern, the Painted bunting, was observed at two locations at the southern edge of the Base at the south ends of Runways 03/21 and 15/33 (USAF 2003a). These locations are remote from the areas of proposed activity. None of the proposed activities occur adjacent to a wetland. Charleston AFB guidance requires that on-Base construction activities remain 50 feet from wetlands. This distance, along with implementation of standard erosion and storm water control measures, would prevent discharge of contaminants and high volumes of water into the wetland, minimizing the potential for impacts to the wetland. Thus, no adverse effects would be anticipated to biological resources at Charleston AFB and the resource will not be analyzed further in the EA.

There are no surface water features on or adjacent to construction sites associated with proposed activities. The water table below the sites is approximately 6 feet bgs, and it is anticipated that construction activity would occur at shallower depths. The shortest distance between the 100-year floodplain and a project site is approximately 10,000 feet. Standard erosion control measures would be implemented during facility construction to minimize soil disturbance, erosion, sedimentation, and storm water runoff at the work site. Measures to prevent discharge of contaminants into surface and ground waters would be followed during construction. For these reasons, no surface water, ground water, or floodplain impacts would be anticipated, and the resources will not be analyzed further in the EA.

No significant properties, structures, or sites eligible for the National Register of Historic Places (NRHP) or other formal recognition have been identified on Charleston AFB. A team

from the U.S. Army Corps of Engineers completed a review of the Base's records pertaining to preservation of historical and archaeological sites during a visit in October 1993, and had no significant findings (USAF 2003a). None of the 24 Base buildings inventoried in a 1996 study for Cold War structures is eligible for the NRHP (Charleston AFB 2002b). The project sites are located in areas of the Base that have been disturbed by previous activities. However, if any suspected archaeological sites are encountered during the project, the contractor must protect the site in place and report the discovery to the Charleston AFB Environmental Flight Office. No adverse effects to archaeological or historical resources would be anticipated as a result of the proposed activities at Charleston AFB. Therefore, archaeological and architectural resources will not be analyzed further in the EA.

1.4.2.5 NAES Lakehurst

There are no surface water features on or adjacent to the LZ construction site. The water table below the site is approximately 8 to 12 feet bgs, and it is anticipated that construction activity would occur at shallower depths. The distance between project activity and the 100-year floodplain would be about 1,000 feet. The erosion control discussion for Charleston AFB in Subchapter 1.4.2.4 applies. For these reasons, no surface water, ground water, or floodplain impacts would be anticipated, and the resources will not be analyzed further in the EA.

The area in which LZ construction activity would occur was previously excavated and disturbed by airfield construction activities (NAES Lakehurst 2003) and has no structures. The procedure identified for Charleston AFB in Subchapter 1.4.2.4 would be followed if any suspected archaeological sites are encountered during the project. No adverse effects to archaeological or historical resources would be anticipated as a result of the proposed activities at NAES Lakehurst. Therefore, archaeological and architectural resources will not be analyzed further in the EA.

No aircraft maintenance or refueling activities would occur at the installation because no aircraft would be based at the Station. No impacts would be anticipated to hazardous materials, hazardous waste, and stored fuels and these resources will not be analyzed further in the EA.

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 Air Force personnel would be assigned to NAES Lakehurst. It is not anticipated that construction workers would relocate to the Lakehurst, New Jersey area as a result of the proposed activities. 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 the EA.

There would be no long-term change in water consumption or wastewater generation from the current levels due to the action because no Air Force personnel would be assigned to NAES Lakehurst. For these reasons, no water or wastewater system impacts would be anticipated. Storm water runoff impacts would not be anticipated from LZ runoff because the

sandy and gravelly soils at the proposed site support rapid drainage of storm water and no appreciable flooding has been reported even in severe rainstorms (NAES Lakehurst 2003). No buildings requiring use of electricity and natural gas would be constructed. No solid waste would be generated during construction of the LZ. Construction vehicle traffic would be consistent in both level and type with similar on-going projects. For these reasons, no infrastructure and utilities impacts would be anticipated and the resources will not be analyzed further in the EA.

No structures would be demolished. Therefore, no asbestos or lead-based paint would be encountered. No groundwater Classification Exception Areas occur in or adjacent to the proposed LZ sites. Establishment of a Classification Exception Area is the State of New Jersey's method for ensuring use of the aquifer is restricted until water quality standards are achieved. There are no restrictions for groundwater below the proposed LZ sites because the water meets standards (NAES Lakehurst 2003). Thus, there are no installation restoration program sites where the LZ would be constructed. For these reasons, no environmental management impacts would be anticipated and the resources will not be analyzed further in the EA.

Although NAES Lakehurst has been used as proving grounds and practice bombing ranges, it is not anticipated unexploded ordnance and/or ordnance contamination would be encountered during construction of the LZ because the area was excavated during construction of the existing runways and airfield. If any suspected unexploded ordnance or ordnance contamination is encountered during the project, the contractor would notify NAES Lakehurst and the material would be handled in accordance with the Station's NAWCADLKE INSTRUCTION 8027.1D, 24 March 1995, which contains specific guidance for reporting, evaluating, and disposing of ordnance finds at the Station. For these reasons, no unexploded ordnance or ordnance contamination impacts would be anticipated and the resources will not be analyzed further in the EA.

The proposed site for the LZ is not within the State of New Jersey's Coastal Area Facilities Review Act area. Thus, coastal zone consistency will not be analyzed further in the EA.

1.4.2.6 Military Training Routes

The potential for effects to archaeological and historical sites from aircraft overflight while operating on a MTR would be limited to noise. The lowest altitude at which C-17 aircraft would operate on the MTRs is 300 feet above ground level (AGL). The maximum sound level produced by the C-17 aircraft at 300 feet AGL is approximately 100 dBA. The sound level at or above which damage could be expected for archaeological sites or historical structures is 127 dBA. No effects to archaeological or historic features would be anticipated because the maximum sound produced by the C-17 while flying a MTR would not exceed the minimum level at which damage could be expected. Therefore, these two resources will not be analyzed further in the EA for MTR operations. However, the EA will consider Native American interests associated with MTRs.

The MTRs for the Proposed and Alternative Actions cover a broad geographic area in Vermont, New York, Pennsylvania, New Jersey, Delaware, Maryland, West Virginia, Virginia, North Carolina, Kentucky, South Carolina, Tennessee, Georgia, Alabama, and Florida. The diversity of landforms and geography covered by the routes supports a number of plant communities and associated animal species. There are no known effects of low-level overflights of the MTRs to vegetation communities or plant species (USAF 2003b). Therefore, biological resources associated with the MTRs in the EA will be limited to birds and mammals.

1.4.2.7 Drop Zones

The aircrews associated with the C-17 aircraft that would be based at an east coast location could be required to accomplish air drop operations. These operations would be accomplished as the aircraft enter and leave the drop zone that occurs within the corridor of selected MTRs that would be flown under the Proposed and Alternative Actions. No new drop zones would be established under the actions. Military training route operations occur at altitudes of 300 feet AGL and higher and will be assessed at that altitude. Airdrop operations typically occur at 800 feet AGL or higher. Thus, the noise experienced on the ground from an aircraft at air drop altitude would not exceed that generated during the MTR portion because the distance from the aircraft to a receptor on the ground would be greater during the airdrop than during the MTR operation. The air drop would be accomplished as part of the MTR operation. Therefore, air emissions from drop zone operations are included in the emissions from MTR operations. The drop zones occur within the MTR corridor. Therefore, airspace use associated with drop zone operations would occur within the MTR airspace, which is analyzed in this EA. Additionally, land uses and biological resources for the drop zone would be the same as that for the MTR since the drop zone is located within the route corridor. For these reasons, drop zones will not be assessed as a separate entity, but as an integral element of the MTR.

1.4.3 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 in this EA, a determination on significance of impacts will be made in a FONSI. 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.

1.4.4 Indirectly Affected Military Installations

The EA does not assess the basing and operation of C-5 aircraft at the military installation(s) slated to receive the aircraft transferred from Dover AFB. The gaining installation(s) would be responsible for the EIAP associated with receiving and operating the aircraft. Likewise, the EA will not assess any other actions that would be implemented under the airlift Mobility Transformation Plan. The military installation(s) affected by the specific actions under the Plan would be responsible for the EIAP.

1.4.5 Baseline and Analysis Conditions

Baseline conditions used for environmental evaluation are assumed to be fiscal year (FY) 2003, except for resources directly related to aircraft operations (*e.g.*, airspace and airfield operations, noise, and air quality). However, if FY03 data are not available, the most recent information will be used.

Aircraft operations data obtained during a 2003 aircraft noise study (AFCEE 2003) will be used to describe the baseline condition for airspace and airfield operations, noise, and air quality at Dover AFB. Aircraft operations data obtained for the Charleston AFB Air Installation Compatible Use Zone (AICUZ) Study (Charleston AFB 2004a) will be used to describe the baseline condition for airspace and airfield operations, noise, and air quality at the Base. Likewise, aircraft operations data obtained for the North Field AICUZ Study (Charleston AFB 2004b) will be used to describe the baseline condition for airspace and airfield operations, noise, and air quality at the airfield.

The FONSI for the McGuire AFB C-17 basing action was signed April 16, 2002. The McGuire AFB C-17 Basing EA assessed the Base, as well as the MTRs that McGuire AFB C-17 aircrews would use for low-level navigation training. The Proposed Action airspace and airfield operations and noise conditions from the McGuire AFB C-17 Basing EA for the Base, as well as the Proposed Action MTR operations, are used as the baseline for those resources under the McGuire AFB Alternative in the EA. The McGuire AFB C-17 basing action is anticipated to be completed in FY05.

The Air Force established the C-17 Weapons Instructor Course (WIC) at McGuire AFB in 2003 as part of the Base's Air Mobility Warfare Center. The C-17 WIC is an advanced flying training course that trains graduate-level mission employment experts known as Weapons Officers. C-17 WIC training is accomplished using two or three aircraft that are brought to McGuire AFB temporarily. Annually, 12 Weapons Officers are trained in 10 to 14 deployments to other military installations as well as at McGuire AFB. The environmental documentation for the establishment and operation of the C-17 WIC states that the elements of the activities associated with establishment and operation of the C-17 WIC at McGuire AFB would be within the environmental conditions assessed in the McGuire AFB C-17 Basing EA. Thus, no significant impacts would occur from the C-17 WIC operation, and the WIC activities, except for LZ operations, are included in the McGuire AFB baseline conditions as assessed in the McGuire AFB C-17 Basing EA.

Environmental documentation for the merger of the C-17 WIC into the combined Mobility Weapons School at the Air Mobility Warfare Center states that the elements of the activities associated with the merger would be within the environmental conditions assessed in the McGuire AFB C-17 Basing EA. Thus, no significant impacts would occur from the merger. The Mobility Weapons School will provide aircrews with mobility training in the C-17, KC-135, KC-10, and C-130 aircraft.

It is estimated that the east coast C-17 basing would begin in FY06 and be completed in FY11. For analysis purposes, FY06 (beginning October 2005) through FY11 are assessed, by year, to represent the potential annual impacts of C-17 basing activities as well as operations after basing is complete.

1.4.6 Northeastern United States Landing Zone Operations Conditions

An alternative in the EA would construct an LZ in the northeastern United States and then conduct tactical arrival, departure, and landing training at the LZ. The LZ would fulfill the need for an LZ for McGuire AFB C-17 aircrews (to include WIC) as well as the C-17 aircrews associated with the basing action in this EA.

There would be three possible airfield operations conditions at the northeastern United States LZ depending on the total number of C-17s that could be based at Dover and/or McGuire AFBs under the Proposed Action or Alternative Actions. A combined total of 12, 24, or 36 C-17 aircraft could be based in the northeast, depending on which east coast C-17 basing alternative is selected. Table 1.4.6-1 summarizes the number of C-17s from Dover and McGuire AFBs that could use the LZ under the Proposed Action and Alternative Actions. Basing 36 total C-17 aircraft in the northeastern United States represents the most environmentally conservative condition that could occur for LZ operations. The environmental conditions associated with airfield operations for the 12 or 24 aircraft conditions would be less than those for the 36 aircraft conditions. Therefore, the EA will assess the condition of the LZ and other airfield operations for 36 total C-17 aircraft in the northeastern United States to determine if the impacts are significant.

Table 1.4.6-1 Northeastern United States Landing Zone Operations Conditions

Using Bases	Proposed Action	McGuire AFB Alternative Action	Charleston AFB Alternative Action	Dover AFB Alternative Action
Dover AFB Aircraft	12	0	0	24
McGuire AFB Aircraft	12	24	12	12
Total C-17 Aircraft Using LZ	24	24	12	36

1.4.7 Environmental Coordination with the Office of the Chief of Naval Operations and NAES Lakehurst

The Office of the Chief of Naval Operations (CNO) and NAES Lakehurst were active participants in the LZ planning and EIAP processes for the NAES Lakehurst Landing Zone Alternative assessed in this EA. Appendix C-4 contains documentation that outlines CNO and NAES Lakehurst involvement in the processes and confirms that the EA meets Department of the Navy, Office of Naval Operations guidance regarding a C-17 LZ at the Station.

1.5 DECISION THAT MUST BE MADE

The decision to be made by the Air Force is whether to:

- Base and operate 12 C-17 aircraft at Dover AFB and realign 16 C-5 aircraft from the Base to an ARC installation(s) (Dover AFB Proposed Action);
- Base and operate an additional 12 C-17 aircraft at McGuire AFB, ultimately increasing the total number of C-17 aircraft at the Base to 24 aircraft (McGuire AFB Alternative Action);
- Base and operate an additional 12 C-17 aircraft at Charleston AFB, ultimately increasing the total number of C-17 aircraft at the Base to 60 aircraft (Charleston AFB Alternative Action);
- Base and operate 24 C-17 aircraft at Dover AFB and realign 32 C-5 aircraft from the Base to an ARC installation(s) (Dover AFB Alternative Action); and
- Select a location for one LZ from either McGuire AFB, Dover AFB, or NAES Lakehurst; construct a LZ at the selected location; conduct LZ and other airfield operations at the selected airfield (Landing Zone Alternatives); or
- Not base additional C-17 aircraft other than the 12 aircraft planned for McGuire AFB at an Air Mobility Command (AMC) east coast military installation and not establish a LZ in the northeastern United States (No Action Alternative).

1.6 APPLICABLE REGULATORY REQUIREMENTS

Numerous construction projects would be accomplished under either the Proposed Action or Alternative Actions and the LZ Alternatives. The construction contractors would prepare and implement Storm Water Pollution Prevention Plans (SWPPP) to comply with Clean Water Act requirements and other federal, state, and local guidance to ensure water quality is not degraded at the construction sites.

McGuire AFB would consult with the State of New Jersey and the Pinelands Commission to coordinate construction of the LZ, which would occur within a wetland. Work within the wetlands would require a Section 404/401 permit from the United States Army Corps of Engineers (USACE). Construction would be conducted in accordance with permit conditions.

Charleston AFB would seek a Coastal Zone Finding of Consistency from the South Carolina Department of Health and Environmental Control, Office of Ocean and Coastal Resources Management, before proceeding with the Charleston AFB Alternative Action.

1.7 ORGANIZATION OF THE DOCUMENT

This EA consists of two volumes. Volume I is the EA and has seven chapters.

Chapter 1 Contains an introduction; a statement of the purpose of and need for action; objectives for the action; scope of the environmental review; a statement of the decision that must be made; presentation of the applicable regulatory requirements; and the organization of the EA.

Chapter 2 Has an introduction; lists the selection criteria for alternatives; describes the alternatives considered but eliminated from further consideration; details the proposed alternatives; describes the northeastern United States LZ alternatives; presents information on past and reasonably foreseeable future actions; identifies the preferred alternative; 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 Proposed Action, Alternative Action, or No Action Alternative.

Chapter 4 Discusses the environmental consequences.

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.

Volume II contains the following appendices:

Appendix A Air Force Form 813

Appendix B Military Training Route Information

Appendix C Interagency and Intergovernmental Correspondence for Environmental Planning

Appendix D Clean Air Act General Conformity Applicability Analyses for East Coast Basing of C-17 Aircraft

Appendix E Supporting Information for Air Quality

Appendix F Supporting Information for Biological Resources

Appendix G Supporting Information for Cultural Resources

Appendix H Supporting Information for Land Use

Appendix I *Public Participation*

CHAPTER 2
DESCRIPTION OF THE ALTERNATIVES, INCLUDING THE PROPOSED ACTION

This chapter has eight sections: introduction; listing of the selection criteria used to develop the alternatives; discussion of the alternatives eliminated from further consideration; detailed description of the proposed alternatives; descriptions of the northeastern United States LZ alternatives; descriptions of past and reasonably foreseeable future actions at Dover, McGuire, and Charleston AFBs; identification of the preferred alternative; and comparison of the environmental impacts of all alternatives.

2.1 INTRODUCTION

The mission of the Air Mobility Command is "Responsive Global Reach for America...Every Day." The AMC has one numbered air force, the 18th Air Force, headquartered at Scott AFB, Illinois. Two expeditionary mobility task forces (EMTF), the 15th EMTF at Travis AFB, California, and the 21st EMTF at McGuire AFB, report to the 18th Air Force. The EMTFs serve as lead agencies for conducting mobility operations worldwide. The Air Force and the AMC have determined that overall airlift capability would best be improved by basing C-17 aircraft on the east coast.

2.2 SELECTION FACTORS FOR ALTERNATIVES

Two separate processes were accomplished as part of the action to base C-17 aircraft on the east coast. The first process considered the base at which the aircraft and personnel would be located. The second process concerned selecting an airfield in the northeastern United States as the location for an LZ.

2.2.1 Base Selection Factors

The airlift Mobility Transformation Plan mentioned in Subchapter 1.1 includes:

- Retiring C-141 aircraft;
- Acquiring 42 additional C-17s over the next 10 years to replace the C-141s;
- Realigning additional C-5s to the ARC and modernizing the aircraft; and
- Retiring some C-130Es, acquiring new C-130Js, upgrading the C-130Hs and remaining C-130Es and designating them as C-130X aircraft, as well as realigning C-130s to different units.

Under current acquisition plans, the Air Force will receive a total of 180 C-17s that are either based at or will be based at active duty Air Force and ARC installations. As indicated in the second item in the previous paragraph, the Air Force is advocating acquisition of 42 additional C-17s, thereby increasing the total fleet to 222 aircraft.

As a result of the current 180-aircraft acquisition and the possible acquisition of an additional 42 C-17s, the Air Force is considering east coast alternatives for two basing conditions. The first condition, which is part of the 180 aircraft acquisition and which is considered in the airlift Mobility Transformation Plan, would place 12 additional aircraft at an east coast installation. The second condition, which is part of the 42 additional aircraft acquisition, would place a total of 24 aircraft at an east coast location (*i.e.*, 12 aircraft from the 180-aircraft acquisition plus 12 aircraft from the additional 42 aircraft acquisition). The remaining 30 aircraft that are part of the additional 42 aircraft acquisition would be based at active duty and ARC units in other sections of the United States.

The Air Force identified the following selection factors for use in developing and evaluating alternatives for basing C-17 aircraft at an east coast military installation. The selected installation must:

- Have adequate existing facilities. If the existing facilities are inadequate, the installation must have sufficient space for construction of aircraft parking, maintenance, and operations work space, and emergency response facilities and equipment to support the safe operation of C-17 aircraft.
- Have an operational runway.
- Have a Reserve Associate unit. Utilization of the C-17 aircraft is increased through the Reserve Associate concept.
- Have an airlift mission. This would avoid the potential for operational incompatibilities that can occur when aircraft with dissimilar operating parameters such as large, slower airlift and small, faster fighter aircraft operate from the same runway.

2.2.2 Northeastern United States Landing Zone Selection Factors

Tactical arrival, departure, and landing training are best accomplished at an airfield that has both an LZ and longer main runway. This allows the aircrew to practice tactical training as well as other non-tactical takeoffs and landings at the same airfield, thereby maximizing use of training time. Landings on the LZ are typically followed by a takeoff from the main runway to a closed pattern to either the LZ or main runway.

The Air Force prepared selection factors for use in developing and evaluating alternatives for the location for a C-17 LZ in the northeastern United States. The process was not necessary for Charleston AFB because the Base's C-17 aircrews currently use North Field for tactical arrival, departure, and landing training, and the same LZ would be used under the Charleston AFB Alternative Action. The following summarizes the factors for the northeastern United States LZ selection process:

1. Flying time from Dover AFB (where the Air Force is considering basing 12 or 24 C-17 aircraft under the action considered in the EA) and McGuire AFB (which is in the process of converting from C-141 to C-17 aircraft and is also an alternative in the EA) to the LZ should be no longer than 0.3 hour.

2. It should take no longer than 1 hour for aircraft maintenance personnel to drive from Dover or McGuire AFBs to the LZ.
3. The airfield should have a primary runway that has the weight bearing capacity, length, and width to support non-LZ C-17 operations such as takeoffs, landings, and closed patterns.
4. The airfield should have an existing LZ that is at least 3,500 feet long and 90 feet wide with the weight bearing capacity to support C-17 tactical arrivals, departures, and landings.
5. The LZ airfield should be within the airspace controlled by either the McGuire AFB or Dover AFB radar approach control facility.
6. Other aircraft traffic at the LZ airfield should not conflict with C-17 tactical arrivals, departures, and landings and other training operations.
7. The potential LZ location should have recorded cross-wind, visibility, and precipitation data to determine if weather at the airfield is favorable for LZ operations and other associated aircraft movements such as take-off after a tactical landing.

2.3 ALTERNATIVES FORMULATION AND CONSIDERATION

This section summarizes the alternatives the Air Force identified for the aircraft basing and LZ location processes.

2.3.1 Basing Alternatives

The Air Force developed nine potential alternatives, including the No Action Alternative, for basing C-17 aircraft at an east coast military installation under the 12 and 24 aircraft conditions mentioned in Subchapter 2.2.1.

Base 12 C-17 Aircraft at Dover AFB Alternative

Under this alternative, 12 C-17 aircraft and associated aircrews and aircraft maintenance personnel would be assigned to Dover AFB. The action would also relocate 16 C-5 aircraft to ARC installation(s). Tactical arrivals, departures, and landings would be accomplished at the northeastern United States LZ.

Base 12 Additional C-17 Aircraft at McGuire AFB Alternative

Under this alternative, an additional 12 C-17 aircraft and associated aircrews and aircraft maintenance personnel would be assigned to McGuire AFB, increasing the total number of C-17s to 24 aircraft. There would be no change in the number of assigned KC-10 and KC-135 aircraft. Tactical arrivals, departures, and landings would be accomplished at the northeastern United States LZ.

Base 12 Additional C-17 Aircraft at Charleston AFB Alternative

Under this alternative, an additional 12 C-17 aircraft and associated aircrews and aircraft maintenance personnel would be assigned to Charleston AFB, increasing the total number of C-17s to 60 aircraft. Tactical arrivals, departures, and landings would be accomplished at North Field.

Base 12 C-17 Aircraft at Pope AFB Alternative

Under this alternative, 12 C-17 aircraft and associated aircrews and aircraft maintenance personnel would be assigned to AMC's Pope AFB, North Carolina, which has C-130 and A-10 aircraft. Tactical arrivals, departures, and landings would be accomplished at North Field

Base 24 C-17 Aircraft at Dover AFB Alternative

Under this alternative, 24 C-17 aircraft and associated aircrews and aircraft maintenance personnel would be assigned to Dover AFB. The action would also relocate 32 Dover AFB C-5 aircraft to ARC installation(s). Tactical arrivals, departures, and landings would be accomplished at the northeastern United States LZ.

Base 24 Additional C-17 Aircraft at McGuire AFB Alternative

Under this alternative, an additional 24 C-17 aircraft and associated aircrews and aircraft maintenance personnel would be assigned to McGuire AFB, increasing the total number of C-17s to 36 aircraft. There would be no change in the number of assigned KC-10 and KC-135 aircraft. Tactical arrivals, departures, and landings would be accomplished at the northeastern United States LZ.

Base 24 Additional C-17 Aircraft at Charleston AFB Alternative

Under this alternative, an additional 24 C-17 aircraft and associated aircrews and aircraft maintenance personnel would be assigned to Charleston AFB, increasing the total number of C-17s to 72 aircraft. Tactical arrivals, departures, and landings would be accomplished at North Field

Base 24 C-17 Aircraft at Pope AFB Alternative

Under this alternative, 24 C-17 aircraft and associated aircrews and aircraft maintenance personnel would be assigned to Pope AFB. Tactical arrivals, departures, and landings would be accomplished at North Field

No Action Alternative

Under the No Action Alternative, AMC would continue to operate its current east coast airlift fleet until aircraft are retired or realigned because of age. Additionally, an LZ would not be established in the northeastern United States.

2.3.2 Northeastern United States Landing Zone Location Alternatives

The Air Force identified 16 potential LZ locations by reviewing aeronautical charts for the northeastern United States. Table 2.3.2-1 lists the 16 potential sites.

Table 2.3.2-1 Potential Airfields for a Landing Zone in the Northeastern United States

Airfield
Dover AFB
McGuire AFB
NAES Lakehurst
Fort Dix, New Jersey
Warren Grove Range, New Jersey
Griffis Air Park, Rome, New York
Westover Air Reserve Base, Connecticut
Muir Army Airfield (AAF), Fort Indiantown Gap, Pennsylvania
Phillips AAF, Aberdeen Proving Ground, Maryland
Naval Air Station Patuxent River, Maryland
NASA Wallops Flight Facility, Virginia
Wheeler-Sack AAF, Fort Drum, New York
Naval Air Station Willow Grove, Pennsylvania
Wilmington/New Castle County, Delaware
Pope AFB, North Carolina
North Field, South Carolina

2.3.3 Summary of Alternatives Consideration Processes

Subchapter 2.3.3.1 summarizes the alternatives evaluation process for the basing alternatives and Subchapter 2.3.3.2 presents the LZ alternatives evaluation.

2.3.3.1 Basing Alternatives Evaluation

The Air Force evaluated each potential alternative using the factors in Subchapter 2.2.1. The following paragraphs summarize evaluation of each alternative.

Base 12 C-17 Aircraft at Dover AFB Alternative

The alternative meets all the factors identified in Subchapter 2.2.1 and will be considered in detail in the EA.

Base 12 Additional C-17 Aircraft at McGuire AFB Alternative

The alternative meets all the factors identified in Subchapter 2.2.1 and will be considered in detail in the EA.

Base 12 Additional C-17 Aircraft at Charleston AFB Alternative

The alternative meets all the factors identified in Subchapter 2.2.1 and will be considered in detail in the EA.

Base 12 C-17 Aircraft at Pope AFB Alternative

Pope AFB does not meet factors A and C identified in Subchapter 2.2.1. For these reasons, this alternative was eliminated from further consideration.

Base 24 C-17 Aircraft at Dover AFB Alternative

The alternative meets all the factors identified in Subchapter 2.2.1 and will be considered in detail in the EA.

Base 24 C-17 Aircraft at McGuire AFB Alternative

McGuire AFB does not meet factor A in Subchapter 2.2.1. For this reason, this alternative was eliminated from further consideration.

Base 24 C-17 Aircraft at Charleston AFB Alternative

Charleston AFB does not meet factor A in Subchapter 2.2.1. For this reason, this alternative was eliminated from further consideration.

Base 24 C-17 Aircraft at Pope AFB Alternative

Pope AFB does not meet factors A and C identified in Subchapter 2.2.1. For these reasons, this alternative was eliminated from further consideration.

No Action Alternative

The Air Force EIAP (32 CFR 989.8(d)) states: "…except in those rare instances where excused by law, the Air Force must always consider and assess the environmental impacts of the 'no action' alternative." The No Action Alternative relative to the action that will be assessed in the EA would not be excused by law. Therefore, the No Action Alternative will be assessed in the EA.

2.3.3.2 Northeastern United States Landing Zone Location Alternatives Evaluation

The Air Force EIAP (32 CFR 989.8(b)) states: "…Reasonable alternatives are those that meet the underlying purpose and need for the proposed action…." The guidance also states: "If the Air Force identifies a large number of reasonable alternatives, it may limit alternatives selected for detailed environmental analysis to a reasonable range or to a reasonable number of examples covering the full spectrum of alternatives." Based on this guidance, the Air Force decided that, of the 16 potential locations (see Table 2.3.2-1), Dover and McGuire AFBs and NAES Lakehurst will be considered as the site at which an LZ could be constructed as the northeastern United States LZ. Each of the three locations will be assessed independently instead of under the Proposed Action or an alternative action since C-17 aircrews from both McGuire and Dover AFBs would use the one LZ that would be constructed. Table 2.3.3-1 compares the factors in Subchapter 2.2.2 for the 16 potential LZ locations.

Table 2.3.3-1 Northeastern United States Landing Zone Site Selection

Location	(1) Estimated Flying Time from McGuire AFB	(1) Estimated Flying Time from Dover AFB	(2) Estimated Drive Time from McGuire AFB	(2) Estimated Drive Time from Dover AFB	(3) Airfield Support non-LZ Operations	(4) Existing LZ	(5) Within McGuire or Dover AFB Airspace	(6) Other Aircraft Traffic	(7) Weather
Dover AFB	0.3	0.0	--	--	Y	N	Y	Y	Y
McGuire AFB	0.0	0.3	--	--	Y	N	Y	Y	Y
NAES Lakehurst	0.1	0.3	0.8	--	Y	N	Y	Y	Y
Fort Dix	0.1	0.3	0.3	--	N	N	Y	Y	Y
Warren Grove Range	0.2	0.3	1.0	--	N	N	N	N	Y
Griffis Air Park	1.0	1.3	5.7	7.0	Y	N	N	Y	N
Westover Air Reserve Base	1.0	1.3	3.8	5.3	Y	N	N	N	N
Muir AAF	0.7	0.8	3.2	4.2	Y	N	N	Y	Y
Phillips AAF	0.7	0.7	2.2	3.2	Y	N	N	N	Y
Naval Air Station Patuxent River	1.0	0.7	4.7	3.4	Y	N	N	N	Y
NASA Wallops Flight Facility	1.0	0.7	4.5	3.2	Y	N	N	N	Y
Wheeler-Sack AAF	0.8	1.1	6.8	9.1	Y	N	N	Y	N
Willow Grove	0.3	0.3	0.9	1.1	Y	N	N	Y	Y
Wilmington/ New Castle County	0.4	0.2	1.4	1.0	Y	N	N	N	Y
Pope AFB	1.6	1.3	8.5	7.2	N	N (see note)	N	N	Y
North Field	1.6	1.3	1.0	1.0	Y	Y	N	Y	Y

Notes: Y=yes; N=no. Flying and drive times reflected as hours. Drive time not considered for McGuire and Dover AFBs because each base would have C-17 aircraft maintenance personnel at the location to support required aircraft maintenance. Drive time not considered for Dover AFB to NAES Lakehurst, Fort Dix, and Warren Grove Range because it is anticipated maintenance would be supported by McGuire AFB personnel due to proximity of the airfield to McGuire AFB. The drive time listed for North Field is estimated as the time it takes to drive from Charleston AFB, which has C-17 aircraft, to North Field and because it is anticipated Charleston AFB would support aircraft maintenance requirements at North Field. Although there is a LZ on the Pope AFB airfield, it is 60 feet wide and the C-17 LZ width requirement is 90 feet.

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2.4 DESCRIPTION OF PROPOSED BASING ALTERNATIVES

Throughout this document, three terms are used to describe flying operations: sortie, airfield operation, and sortie operation. Each has a distinct meaning and is commonly applied to a specific set of activities in particular airspace areas

- A sortie is a single military aircraft flight from initial takeoff through final landing.
- An airfield operation is the single movement or individual portion of a flight in the airfield airspace environment, such as one departure (takeoff), one arrival (landing), or one transit of the airport traffic area. The airfield airspace environment typically is referred to as the airspace allocated to the air traffic control tower and includes the airspace within an approximate 5-mile radius of the airfield and up to 2,500 feet AGL. A low approach or a missed approach consists of two airfield operations, *i.e.*, one arrival and one departure. A closed pattern consists of two airfield operations (*i.e.*, one takeoff and one landing accomplished as a touch and go). A touch and go operation occurs when the aircraft touches down and transitions into a takeoff without stopping. The minimum number of airfield operations for one sortie is two operations, one takeoff (departure) and one landing (arrival).
- A sortie operation is defined as the use of one airspace unit (*e.g.*, military operations area, restricted area, MTR, or radar approach control airspace) by one aircraft. A sortie aircraft operation applies to flight activities outside the airfield airspace environment. Each time a single aircraft conducting a sortie operates in a different airspace unit, one sortie operation is counted for that unit.

There are three types of MTRs. Routes flown using instrument flight rules (IFR) procedures (instrument routes [IR] routes) allow aircraft to operate below 10,000 feet above mean sea level (MSL) at speeds in excess of 250 knots along Department of Defense (DoD)/Federal Aviation Administration (FAA) mutually developed and published routes in IFR conditions. Routes flown using visual flight rules (VFR) procedures (visual routes [VR] routes) are guided by the same restrictions as IR routes but are limited to VFR conditions. Slow routes (SR) are slow speed low altitude training routes that operate below 1,500 feet AGL at airspeeds of 250 knots or less. MTRs are defined along a route centerline with boundaries that parallel the centerline on each side. The boundaries for the routes extend to distances as great as 10 miles from the centerline. The term MTR corridor includes the airspace and ground surface between the route boundaries.

2.4.1 No Action Alternative

Under the No Action Alternative, AMC would continue to operate its current east coast airlift aircraft fleet until aircraft are retired from service because of age or realigned to another installation. No additional C-17 aircraft other than the 12 aircraft planned for McGuire AFB and the 48 aircraft currently assigned to Charleston AFB would be based at an AMC east coast military installation. Additionally, a LZ would not be constructed in the northeastern United States.

2.4.1.1 Dover AFB No Action Alternative

Dover AFB would continue to provide airlift support for the national military strategy by operating 32 C-5 aircraft. The number of Air Force active duty, reserve, and civilian authorizations, as well as contractor personnel at the Base, would remain at the approximate level in September 2002 *(i.e.*, 7,830 personnel) (Dover AFB 2002). Likewise, C-5 airfield operations would continue at present levels. Table 2.4.1-1 lists the average daily and annual airfield operations for the baseline condition at Dover AFB. No MTR operations would occur since Dover AFB aircrews do not have a requirement for low-level navigation training.

Table 2.4.1-1 Annual and Average Daily Airfield Operations, Dover AFB Baseline Condition (No Action Alternative)

	Arrival and Departure Operations		Closed Pattern Operations		Total Operations	
Aircraft	**Annual**	**Avg. Daily**	**Annual**	**Avg. Daily**	**Annual**	**Avg. Daily**
C-5	3,708	10.16	37,449	102.60	41,157	112.76
Aero Club	14,162	38.80	748	2.05	14,910	40.85
Transient Military	5,841	16.00	17,681	48.44	23,522	64.44
Civil	6,992	19.16	744	2.04	7,736	21.20
Total	30,703	54.12	56,622	155.13	87,325	239.25

Note: Approximately 7 percent of the C-5 airfield operations occur during the nighttime (10:00 p.m. to 7:00 a.m.). Table 3.1.10-1 details the operations for aero club, transient military, and civil aircraft. Annual operations are based on 365 days per year for all aircraft.

Source: AFCEE 2003.

2.4.1.2 McGuire AFB No Action Alternative

McGuire AFB would provide airlift support for the national military strategy by operating the 12 C-17 aircraft scheduled for the Base when the basing action assessed in the McGuire AFB C-17 Basing EA is completed in FY05, as well as the 32 assigned KC-10 aircraft. The 108th Air Refueling Wing (108 ARW), a tenant ANG unit at the Base, would continue to operate its 12 KC-135 aircraft. The number of Air Force active duty, reserve, and civilian authorizations, as well as contractor personnel at the Base, would remain at the approximate level in September 2002 *(i.e.*, 12,326 personnel) (McGuire AFB 2002). Likewise, C-17, KC-10, and KC-135 airfield and MTR operations would occur at the levels assessed in the McGuire AFB C-17 Basing EA. Table 2.4.1-2 lists the projected average daily and annual airfield operations for the baseline condition at McGuire AFB. Table 2.4.1-3 presents the projected annual and monthly MTR operations for the baseline, and Figure 2.4.1-1 depicts the routes. No C-17 specific facility construction other than those identified and assessed in the McGuire AFB C-17 Basing EA would occur.



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McGuire Air Force Base

LEGEND

Military Training Route Centerline

Corridor Boundary

SR	Slow-Speed, Low Altitude Training Route
VR	MTR Flown Using Visual Flight Rules
IR	MTR Flown Using Instrument Flight Rules

Military Training Routes, McGuire AFB Baseline Condition

Figure 2.4.1-1

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Table 2.4.1-2 Annual and Average Daily Airfield Operations, McGuire AFB Baseline Condition (No Action Alternative)

	Arrival and Departure Operations		Closed Pattern Operations		Total Operations	
Aircraft	**Annual**	**Avg. Daily**	**Annual**	**Avg. Daily**	**Annual**	**Avg. Daily**
C-17	2,320	9.28	17,710	70.84	20,030	80.12
KC-10	5,778	15.83	20,002	54.80	25,780	70.63
KC-135E	5,621	15.40	19,962	53.76	25,243	69.16
subtotal	10,128	40.51	44,850	179.40	54,978	219.91
Other Aircraft	2,050	8.19	105	0.42	2,115	8.61
Total	12,178	48.70	44,955	179.82	57,133	228.52

Note: The C-17 airfield operations are the total operations associated with the mission and training sorties for 12 assigned aircraft and the WIC operation. Approximately 13 percent of the total airfield operations occur during nighttime (10:00 p.m. to 7:00 a.m.). Table 3.2.11-1 lists the operations for other aircraft. Annual operations are based on 250 days per year for based aircraft and 350 days per year for other aircraft.

Source: derived from noise modeling files for USAF 2002a.

Table 2.4.1-3 McGuire AFB C-17 Military Training Route Operations, McGuire AFB Baseline Condition (No Action Alternative)

	Operations	
Route	**Annual**	**Monthly**
IR-801	80	6.67
VR-704	18	1.50
VR-705	137	11.42
VR-707	137	11.42
VR-725	18	1.50
VR-1709	137	11.42
VR-1711	18	1.50
VR-1712	18	1.50
SR-800	18	1.50
SR-801	18	1.50
SR-805	18	1.50
SR-844	18	1.50
SR-845	18	1.50
SR-846	137	11.42
Total	790	65.85

Note: The MTR operations are the total operations for 12 assigned aircraft and the WIC. Approximately 30 percent of the MTR operations occur during nighttime (10:00 p.m. to 7:00 a.m.).

Source: USAF 2002a.

2.4.1.3 Charleston AFB No Action Alternative

Charleston AFB would provide airlift support for the national military strategy by operating the Base's 48 C-17 aircraft. The number of Air Force active duty, reserve, and civilian authorizations, as well as contractor personnel at the Base, would remain at the approximate levels in September 2002 *(i.e.,* 7,842 personnel) (Charleston AFB 2002a).

Likewise, C-17 sorties, as well as airfield, MTR, and airdrop operations, would occur at the FY04 levels. Table 2.4.1-4 lists the average daily and annual airfield operations for the baseline condition at Charleston AFB, and Table 2.4.1-5 presents data for North Field, the airfield Charleston AFB aircrews use for tactical arrival, departure, and landing training. Table 2.4.1-6 presents the annual and monthly MTR operations for the baseline and Figure 2.4.1-2 depicts the routes.

Table 2.4.1-4 Annual and Average Daily Airfield Operations, Charleston AFB Baseline Condition (No Action Alternative)

	Arrival and Departure Operations		Closed Pattern Operations		Total Operations	
Aircraft	**Annual**	**Avg. Daily**	**Annual**	**Avg. Daily**	**Annual**	**Avg. Daily**
C-17	10,384	29.34	21,906	62.59	32,290	91.93
Aero Club	902	4.93	0	0.00	902	4.93
Transient Military Aircraft	5,466	14.98	10,650	29.17	16,116	44.15
Charleston International Airport	42,060	115.24	0	0.00	42,060	115.24
General Aviation	19,476	53.36	18,250	41.00	37,726	53.36
Total	78,288	217.85	50,806	141.76	129,094	359.61

Note: The C-17 airfield operations are the total operations associated with the mission and training sorties for 48 assigned aircraft. Approximately 25 percent of the C-17 airfield operations occur during nighttime (10:00 p.m. to 7:00 a.m.). Table 3.3.10-1 lists the operations for transient military, Charleston International Airport, and general aviation aircraft. Annual operations are based on 350 days per year for based aircraft training sorties, 365 days per year for based aircraft mission sorties, and 365 days per year for all other aircraft.

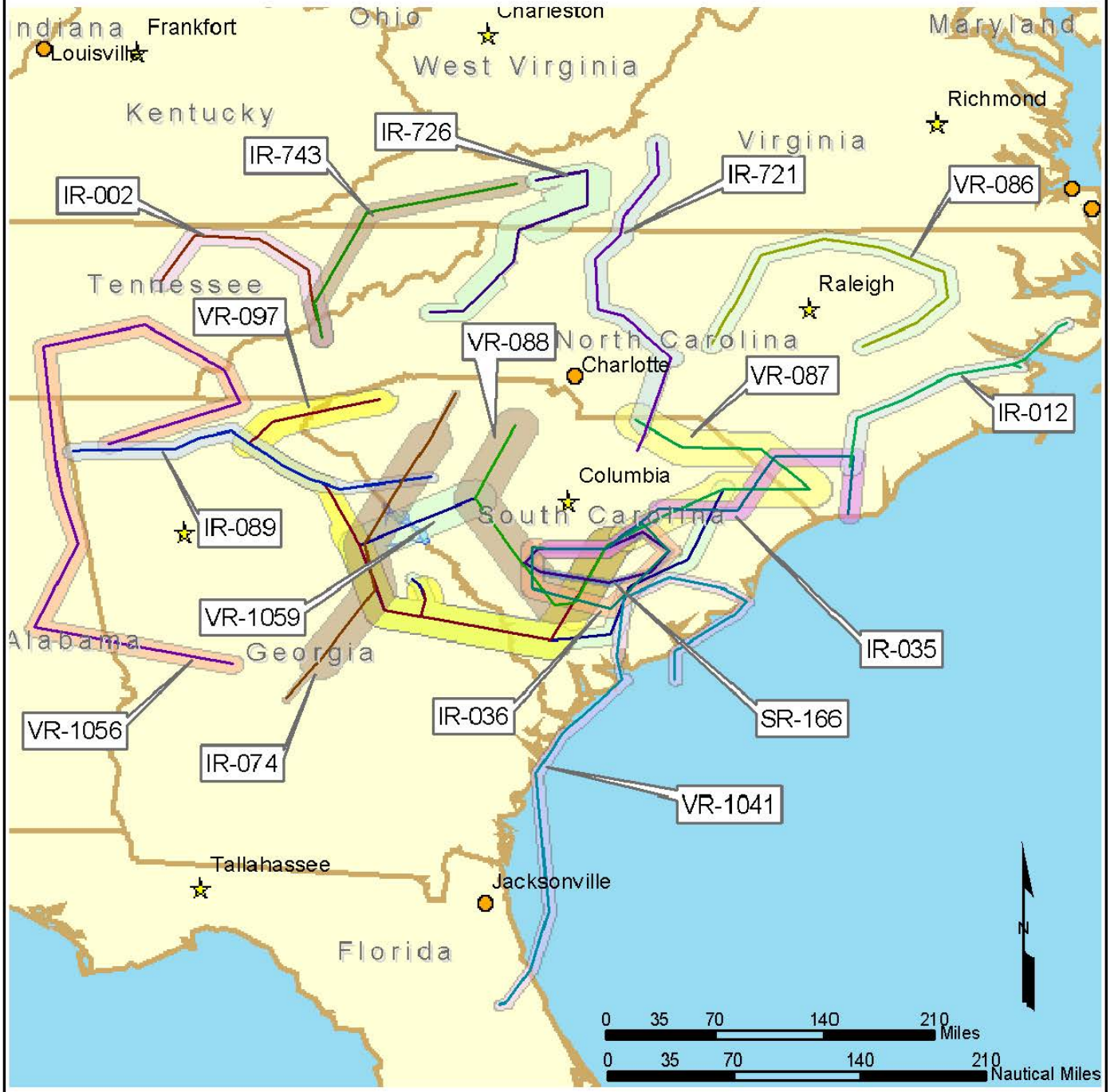
Source: Charleston AFB 2004a.

Table 2.4.1-5 Annual and Average Daily Landing Zone Operations, North Field Baseline Condition (No Action Alternative)

	Arrival and Departure Operations		Closed Pattern Operations		Total Operations	
Aircraft	**Annual**	**Avg. Daily**	**Annual**	**Avg. Daily**	**Annual**	**Avg. Daily**
Charleston AFB C-17	18,276	52.82	55,734	161.08	74,010	213.90
Other Military	2,096	6.06	7,373	21.31	9,469	27.37
Total	20,372	59.88	63,107	182.39	83,479	241.27

Note: The C-17 airfield operations are the training operations associated with 48 assigned aircraft. Approximately 56 percent of Charleston AFB C-17 airfield operations and 55 percent of all airfield operations occur during nighttime (10:00 p.m. to 7:00 a.m.). Table 3.2.10-2 details the operations for the other military aircraft. Annual operations are based on 346 days per year for all aircraft.

Source Charleston AFB 2004b.



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Charleston Air Force Base

LEGEND

Military Training Route Centerline

Corridor Boundary

SR	Slow-Speed, Low Altitude Training Route
VR	MTR Flown Using Visual Flight Rules
IR	MTR Flown Using Instrument Flight Rules

Military Training Routes, Charleston AFB Baseline Condition

Figure 2.4.1-2

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Table 2.4.1-6 Charleston AFB C-17 Military Training Route Operations, Charleston AFB Baseline Condition (No Action Alternative)

	Operations	
Route	**Annual**	**Monthly**
IR-002	16	1.33
IR-012	70	5.83
IR-035	339	28.25
IR-036	15	1.25
IR-074	1	0.08
IR-089	1	0.08
IR-721	13	1.08
IR-726	30	2.50
IR-743	3	0.25
VR-086	10	0.83
VR-087	1	0.08
VR-088	5	0.42
VR-097	1	0.08
VR-1041	48	4.00
VR-1056	2	0.17
VR-1059	1	0.08
SR-166	130	10.83
Total	686	57.14

Note: The MTR operations are the total operations for 48 assigned aircraft. One operation on VR-1059 and 120 operations on SR-166 occurred during nighttime (10:00 p.m. to 7:00 a.m.), all other operations were during the daytime (7:00 a.m. to 10:00 p.m.).

Source: Charleston AFB 2004c.

2.4.2 Dover AFB Proposed Action

The Air Force would base and operate 12 C-17 aircraft at Dover AFB and realign 16 C-5 aircraft from the Base to an ARC installation(s), leaving 16 C-5 aircraft at the Base. The number of C-5s would steadily draw down as the number of C-17s increases. A net loss of 161 Air Force active duty, reserve, and civilian personnel authorizations would occur as a result of the action, decreasing the Base workforce to an estimated 7,669 persons. Seven facility construction, addition, and alteration projects would occur to support basing and operation activities. The basing action would begin in FY06 with facility construction projects and be complete in FY11 with the arrival of the 12th C-17 aircraft.

2.4.2.1 Airfield and Military Training Route Operations

Table 2.4.2-1 lists the projected annual and average daily airfield operations for Dover AFB under the Proposed Action. Operations include mission arrivals and departures as well as training sortie arrivals, departures, and closed pattern operations. Assault landing operations and other practice instrument approaches, takeoffs, and landings would be accomplished at the northeastern United States LZ.

Table 2.4.2-1 Annual and Average Daily Airfield Operations, Dover AFB Proposed Action

	Arrival and Departure Operations		Closed Pattern Operations		Total Operations	
Aircraft	**Annual**	**Avg. Daily**	**Annual**	**Avg. Daily**	**Annual**	**Avg. Daily**
C-17	2,789	7.64	6,526	17.88	9,315	25.52
C-5	1,845	5.08	18,725	51.30	20,579	56.38
Aero Club	14,162	38.80	748	2.05	14,910	40.85
Transient Military	5,880	16.11	5,004	13.71	8.292	29.82
Civil	8,032	22.01	744	2.04	8,776	24.05
Total	32,717	89.64	31,747	86.98	61,872	176.62

Note: The C-17 airfield operations are the total operations associated with the mission and training sorties for 12 assigned aircraft. Approximately 29 percent of the combined C-17 and C-5 airfield operations would occur during nighttime (10:00 p.m. to 7:00 a.m.). Table 4.4.10-1 lists the specific operations for the transient military and civil aircraft. Annual operations are based on 365 days per year for all aircraft.

Dover AFB C-17 aircrews would accomplish low-level navigation training on 22 existing MTRs that are scheduled and coordinated by Air Force, Navy, and ANG units at other Air Force bases and military installations. Table 2.4.2-2 lists the MTRs and the annual and monthly Proposed Action C-17 operations for each route. Dover AFB C-17 aircrews would use the 14 routes projected in the McGuire AFB C-17 Basing EA to be flown by McGuire AFB C-17 aircrews as well as eight other routes. Figure 2.4.1-1 depicts the routes.

Table 2.4.2-2 Dover AFB C-17 Military Training Route Operations, Dover AFB Proposed Action

	Operations	
Route	**Annual**	**Monthly**
IR-714	8	0.67
IR-720	8	0.67
IR-721	16	1.33
IR-726	16	1.33
IR-743	16	1.33
IR-760	16	1.33
IR-761	16	1.33
IR-762	16	1.33
IR-801	63	5.25
VR-704	16	1.33
VR-705	119	9.92
VR-707	119	9.92
VR-725	16	1.33
VR-1709	119	9.92
VR-1711	16	1.33
VR-1712	16	1.33
SR-800	16	1.33
SR-801	16	1.33
SR-805	16	1.33
SR-844	16	1.33
SR-845	16	1.33
SR-846	119	9.92
Total	795	66.22

Note The MTR operations are the total operations for 12 assigned aircraft. Approximately 30 percent of the MTR operations occur during nighttime (10:00 p.m. to 7:00 a.m.).

2.4.2.2 Construction and Building Addition/Alteration Projects

The Air Force would accomplish seven construction and building addition/alteration projects to support basing of C-17 aircraft and ensuing operations at Dover AFB. Table 2.4.2-3 lists the size of the project in square feet as well as the estimated start dates and project durations. The location number in the table corresponds to the project location on Figure 2.4.2-1. The following paragraphs briefly describe the construction actions.

Table 2.4.2-3 Construction Project Information, Dover AFB Proposed Action

Project	Location Number	Construction (Square Feet)	Demolition (Square Feet)	Start Date (FY)	Duration (months)
Construct Flight Simulator Facility	1	13,600	0	06	18
Construct Life Support Facility	2	20,600	32,544	07	18
Construct Composite Materials Shop Addition	3	10,800	1,000	07	12
Alter Doors on Hangars 714, 715, and 945	4	0	0	07	12
Pave Taxiways B, D, and E Shoulders	5	770,000	0	07	12
Construct Squadron Operations/Aircraft Maintenance Unit Facility	6	40,728	0	07	18
Repave Roads	7	undetermined	undetermined	09	6
Total	NA	855,728	33,544	NA	NA

Note: Location number corresponds to project location on Figure 2.4.2-1. NA=not applicable.

Construct Flight Simulator Facility. The facility would house aircraft flight simulators and other special training devices used by the aircrews. The building would also have space for administration and records, a learning center, briefing rooms, a break room, and storage.

Construct Life Support Facility. This facility would provide space for three functional activities: life support function office; aircrew training; and life support equipment maintenance and storage. Buildings 707 (9,312 square feet), 708 (2,729 square feet), and 789 (20,503 square feet) would be demolished as part of the project.

Construct Composite Materials Shop Addition. Building 721 would be expanded to provide space for repair of composite (nonmetallic) materials, plastic carbon reinforced epoxy, honeycomb, and composite/metal-bonded material. The facility would have a triple dry filter system to reduce particulate matter emissions and a filter system to reduce emissions of volatile organic compounds. Building 724 would be demolished as part of the project.

Alter Doors on Hangars 714, 715, and 945. The doors would be modified to accommodate C-17 aircraft.

Pave Taxiways B, D, and E Shoulders. Approximately 25 feet along each side of all taxiways would be paved with asphalt.

Construct Squadron Operations/Aircraft Maintenance Unit Facility. The facility would provide space for command, administration, briefing rooms, flight planning, standardization/evaluation, readiness, and other flying squadron functions, as well as a ready room, readiness, and other aircraft maintenance personnel functions.

Repave Roads. The top 2 inches of asphalt on the roads in the areas of the Base that would be used by construction equipment and trucks would be removed and repaved after all other C-17 related construction activities are complete.

2.4.3 McGuire AFB Alternative Action

As an alternative to the Proposed Action, the Air Force would base and operate an additional 12 C-17 aircraft at McGuire AFB, ultimately increasing the total number of C-17 aircraft at the Base to 24. The number of assigned KC-10s and KC-135s would remain at 32 and 12 aircraft, respectively. A net increase of 631 Air Force active duty, reserve, and civilian personnel authorizations would occur as a result of the action, increasing the Base workforce to an estimated 12,957 persons. Ten facility construction, addition, and alteration projects would occur to support basing and operation activities. The basing action would begin in FY06 with facility construction projects and be complete in FY11 with the arrival of the 12th additional C-17 aircraft.

2.4.3.1 Airfield and Military Training Route Operations

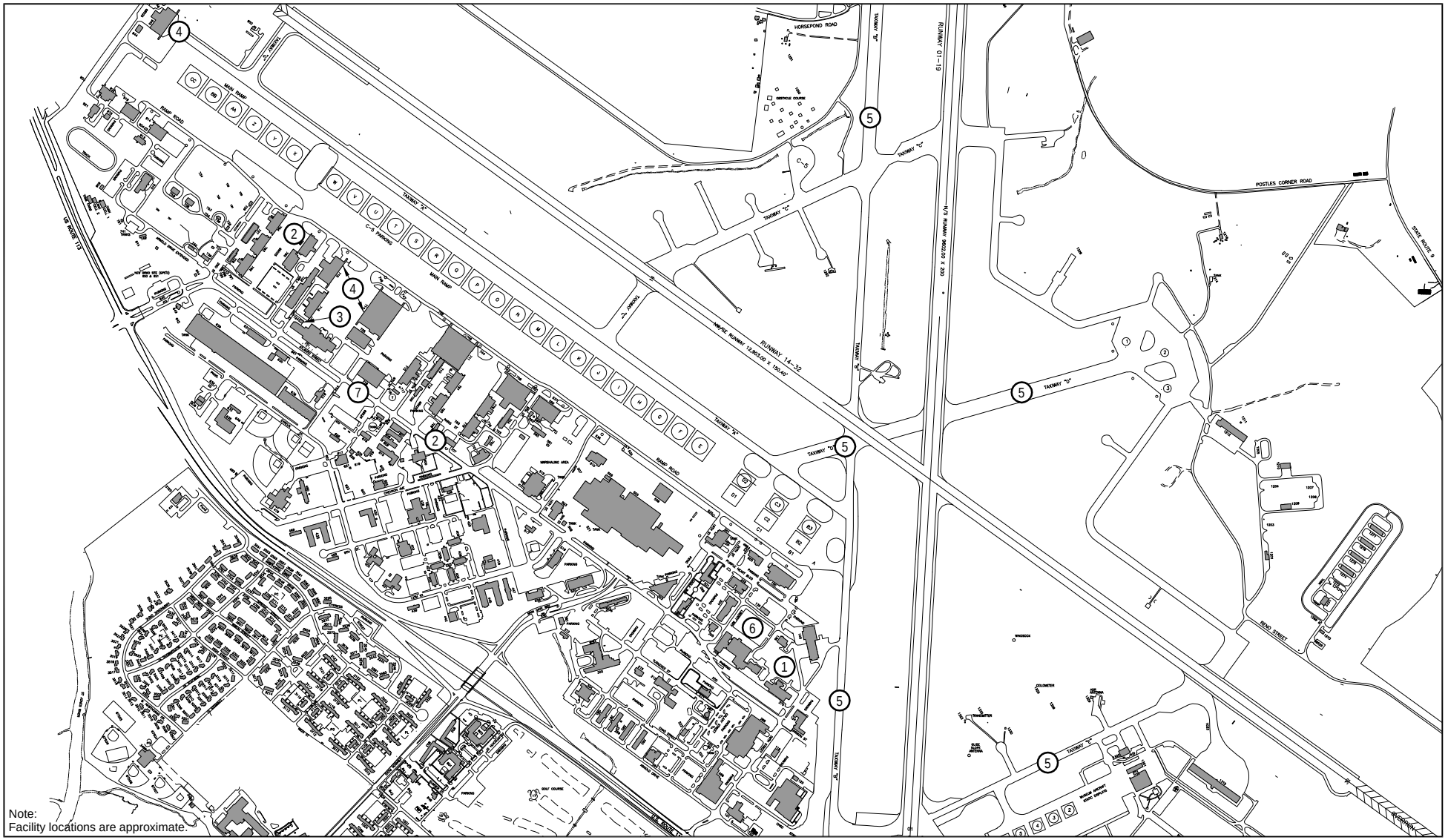
Table 2.4.3-1 lists the projected annual and average daily airfield operations for McGuire AFB under the Alternative Action. Operations include mission arrivals and departures as well as training sortie arrivals, departures, and closed pattern operations. Assault landing operations and other practice instrument approaches, takeoffs, and landings would be accomplished at the northeastern United States LZ.

Table 2.4.3-1 Annual and Average Daily Airfield Operations, McGuire AFB Alternative Action

	Arrival and Departure Operations		Closed Pattern Operations		Total Operations	
Aircraft	**Annual**	**Avg. Daily**	**Annual**	**Avg. Daily**	**Annual**	**Avg. Daily**
C-17	4,640	18.56	35,420	141.68	40,060	160.24
KC-10	3,958	15.83	13,700	54.80	17,658	70.63
KC-135	3,850	15.40	13,440	53.76	17,290	69.16
subtotal	12,448	49.79	62,560	250.24	75,008	300.03
Other Aircraft	2,050	8.19	105	0.42	2,155	8.61
Total	14,498	57.98	62,665	250.66	77,163	308.64

Note: The C-17 airfield operations are the total operations associated with the mission and training sorties for 24 assigned C-17 aircraft. Approximately 13 percent of the overall airfield operations would occur during nighttime (10:00 p.m. to 7:00 a.m.). Table 3.2.11-1 lists the operations for other aircraft. Annual operations are based on 250 days per year for based aircraft and 350 days per year for other aircraft.

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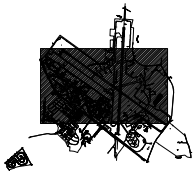


Note:
Facility locations are approximate.

Dover Air Force Base

LEGEND

1. Construct Flight Simulator Facility
2. Construct Life Support Facility
3. Construct Composite Materials Shop Addition
4. Alter Doors on Hangars 714, 715, & 945
5. Pave Taxiway Shoulders
6. Construct Squadron Operations/ Aircraft Mainenance Unit Facility
7. Repair Roads



Location Map

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Feet

Construction Project Locations, Dover AFB Proposed Action

Figure 2.4.2-1

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McGuire AFB C-17 aircrews would accomplish low-level navigation training on the 14 MTRs from the McGuire AFB C-17 Basing EA plus two additional routes (IR-714 and IR-720). Table 2.4.2-2 lists the MTRs and the proposed annual and monthly McGuire AFB Alternative Action C-17 operations for each route (see Figure 2.4.1-1).

Table 2.4.3-2 McGuire AFB C-17 Military Training Route Operations, McGuire AFB Alternative Action

	Operations	
Route	**Annual**	**Monthly**
IR-714	25	2.08
IR-720	25	2.08
IR-801	160	13.33
VR-704	36	3.00
VR-705	274	22.83
VR-707	274	22.83
VR-725	36	3.00
VR-1709	274	3.00
VR-1711	36	3.00
VR-1712	36	3.00
SR-800	36	3.00
SR-801	36	3.00
SR-805	36	3.00
SR-844	36	3.00
SR-845	36	3.00
SR-846	274	22.83
Total	1,580	131.65

Note: The MTR operations are the total operations for 24 assigned aircraft and the WIC. Approximately 30 percent of the MTR operations occur during nighttime (10:00 p.m. to 7:00 a.m.).

2.4.3.2 Construction and Building Addition/Alteration Projects

The Air Force would accomplish 10 construction and building alteration projects to support basing of C-17 aircraft and ensuing operations at McGuire AFB. Table 2.4.3-3 lists the size of the project in square feet as well as the estimated project start dates and durations. The location number in the table corresponds to the project location on Figure 2.4.3-1. The following paragraphs briefly describe the construction actions**.**

Construct Seven C-17 Parking Spots. The project would construct space to park C-17 aircraft and would include installation of a hydrant fuel system for the four spots.

Construct Squadron Operations/Aircraft Maintenance Unit Facility. The facility would provide space for command, administration, briefing rooms, flight planning, standardization/evaluation, readiness, and other flying squadron functions, life support, as well as a ready room, readiness, and other aircraft maintenance personnel functions.

Table 2.4.3-3 Construction Project Information, McGuire AFB Alternative Action

Project	Location Number	Construction (Square Feet)	Demolition (Square Feet)	Start Date (FY)	Duration (months)
Construct Four C-17 Parking Spots	1	112,000	0	05	12
Construct Squadron Operations/Aircraft Maintenance Unit Facility	2	41,929	0	06	18
Construct Addition to Hangar 3210	3	45,000	0	06	18
Construct 2-Bay C-17 Aircraft Hangar	4	90,000	45,104	06	25
Construct Addition to Aerospace Ground Equipment Facility	5	10,000	0	07	12
Construct Addition for Flight Line Support Facility	6	20,000	0	07	18
Construct Maintenance Group	7	20,000	20,559	07	24
Construct Space for an Additional Simulator	8	5,000	0	07	12
Construct Addition for Maintenance Training Classrooms	9	8,000	0	08	12
Repave Roads	10	undetermined	undetermined	09	6
Total	NA	351,929	65,663	NA	NA

Note: Location number corresponds to project location on Figure 2.4.3-1. NA=not applicable.

Construct Addition to Hangar 3210. This project would construct an addition to an existing hangar to house one C-17 aircraft.

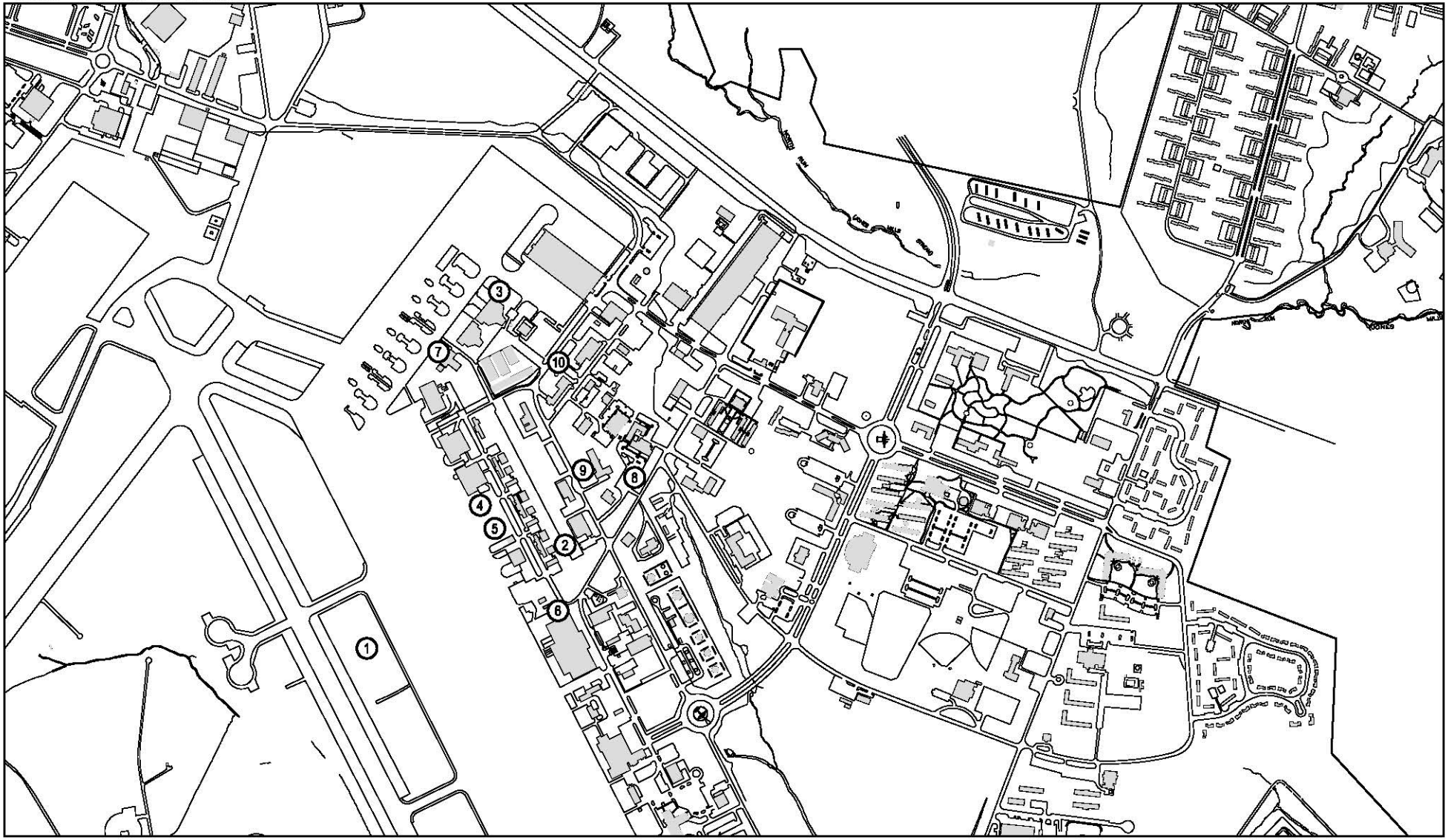
Construct 2-Bay C-17 Aircraft Hangar. The facility would accommodate two C-17 aircraft and would support heavy aircraft maintenance. The facility would have a high expansion foam fire extinguishing system in the maintenance bay area and a water sprinkler system in the administration area. The hangar would have a trench drain to accumulate spilled materials as well as high expansion foam and water fire suppression systems. A containment trench would be constructed to trap the high expansion foam should the chemical be released. The trapped high expansion foam would be pumped from the trench and disposed in accordance with applicable regulatory guidance. The wash down trench would have environmental control features. Building 2251 would be demolished under the project.

Construct Addition to Aerospace Ground Equipment Facility. The project would provide additional space for functions such as the maintenance and repair of aircraft support equipment as well as vehicle refueling.

Construct Addition for Flight Line Support Facility. An addition would be constructed to the air freight terminal to house flight line support personnel.

Construct Maintenance Group Headquarters. The building would provide administrative space for the maintenance headquarters functions. The existing maintenance facility would be demolished under the project.

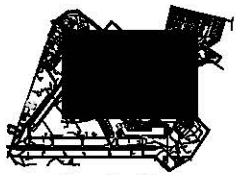
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McGuire Air Force Base

LEGEND

1. Construct Four C-17 Parking Spots
2. Construct Squadron Operations/ Aircraft Maintenance Unit Facility
3. Construct Addition to Hangar 3210
4. Construct 2-Bay C-17 Aircraft Hangar
5. Construct Addition to Aerospace Ground Equipment Facility
6. Construct Flight Support Facility
7. Construct Maintenance Group Headquarters
8. Construct Space for an Additional Simulator
9. Construct Maintenance Training Classroom
10. Repave Pads



Location Map

N

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Feet

Construction Projects Locations, McGuire AFB Alternative Action

Figure 2.4.3-1

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Construct Space for an Additional Simulator. This project would construct an addition to the existing simulator facility to provide space to house another flight simulator.

Construct Addition for Maintenance Training Classrooms. Training classrooms and bays for two additional maintenance training devices would be constructed as an addition to the existing Maintenance Training Facility.

Repave Roads. The top 2 inches of asphalt on the roads in the areas of the Base that would be used by construction equipment and trucks would be removed and repaved after all other C-17-related construction activities are complete.

2.4.4 Charleston AFB Alternative Action

As an alternative to the Proposed Action, the Air Force would base and operate an additional 12 C-17 aircraft at Charleston AFB, ultimately increasing the total number of C-17 aircraft at the Base to 60. A net increase of 631 Air Force active duty, reserve, and civilian personnel authorizations would occur as a result of the action, increasing the Base workforce to an estimated 8,473 persons. Seven facility construction, addition, and alteration projects would occur to support basing and operation activities. The basing action would begin in FY06 with facility construction projects and be complete in FY11 with the arrival of the 12th additional C-17 aircraft.

2.4.4.1 Airfield and Military Training Route Operations

Table 2.4.4-1 lists the projected annual and average daily airfield operations for Charleston AFB under the Alternative Action. Operations include mission arrivals and departures as well as training sortie arrivals, departures, and closed pattern operations. Table 2.4.4-2 lists the airfield operations anticipated at North Field.

Table 2.4.4-1 Annual and Average Daily Airfield Operations, Charleston AFB Alternative Action

	Arrival and Departure Operations		Closed Pattern Operations		Total Operations	
Aircraft	**Annual**	**Avg. Daily**	**Annual**	**Avg. Daily**	**Annual**	**Avg. Daily**
C-17	12,982	36.68	27,386	78.24	40,368	114.92
Other Aircraft	67,904	188.51	28,900	79.17	96,804	267.68
Total	80,886	225.19	56,286	157.41	137,172	382.60

Note: The C-17 airfield operations are the total operations associated with the mission and training sorties for 60 assigned aircraft. Approximately 25 percent of the C-17 airfield operations would occur during nighttime (10:00 p.m. to 7:00 a.m.). Table 3.3.10-1 lists the operations for the other aircraft categories (i.e., aero club, transient military, Charleston International Airport, and general aviation). Annual operations are based on 350 days per year for based aircraft training sorties, 365 days per year for mission sorties, and 365 days per year for all other aircraft.

Table 2.4.4-2 Annual and Average Daily Landing Zone Operations, North Field, Charleston AFB Alternative Action

	Arrival and Departure Operations		Closed Pattern Operations		Total Operations	
Aircraft	**Annual**	**Avg. Daily**	**Annual**	**Avg. Daily**	**Annual**	**Avg. Daily**
C-17	22,846	66.03	69,667	201.35	92,513	267.38
Other Aircraft	2,096	6.06	7,373	21.31	9,469	27.37
Total	24,942	72.09	77,040	222.66	101,982	294.75

Note: The C-17 airfield operations are the training operations associated with 60 assigned aircraft. Approximately 57 percent of the Charleston AFB C-17 and 55 percent of the overall airfield operations would occur during nighttime (10:00 p.m. to 7:00 a.m.). Table 3.3.10-2 lists the specific operations for the other aircraft. The Other Aircraft data include C-17 operations by aircrews from McGuire and Dover AFBs and the C-17 WIC. Annual operations are based on 346 days per year for all aircraft.

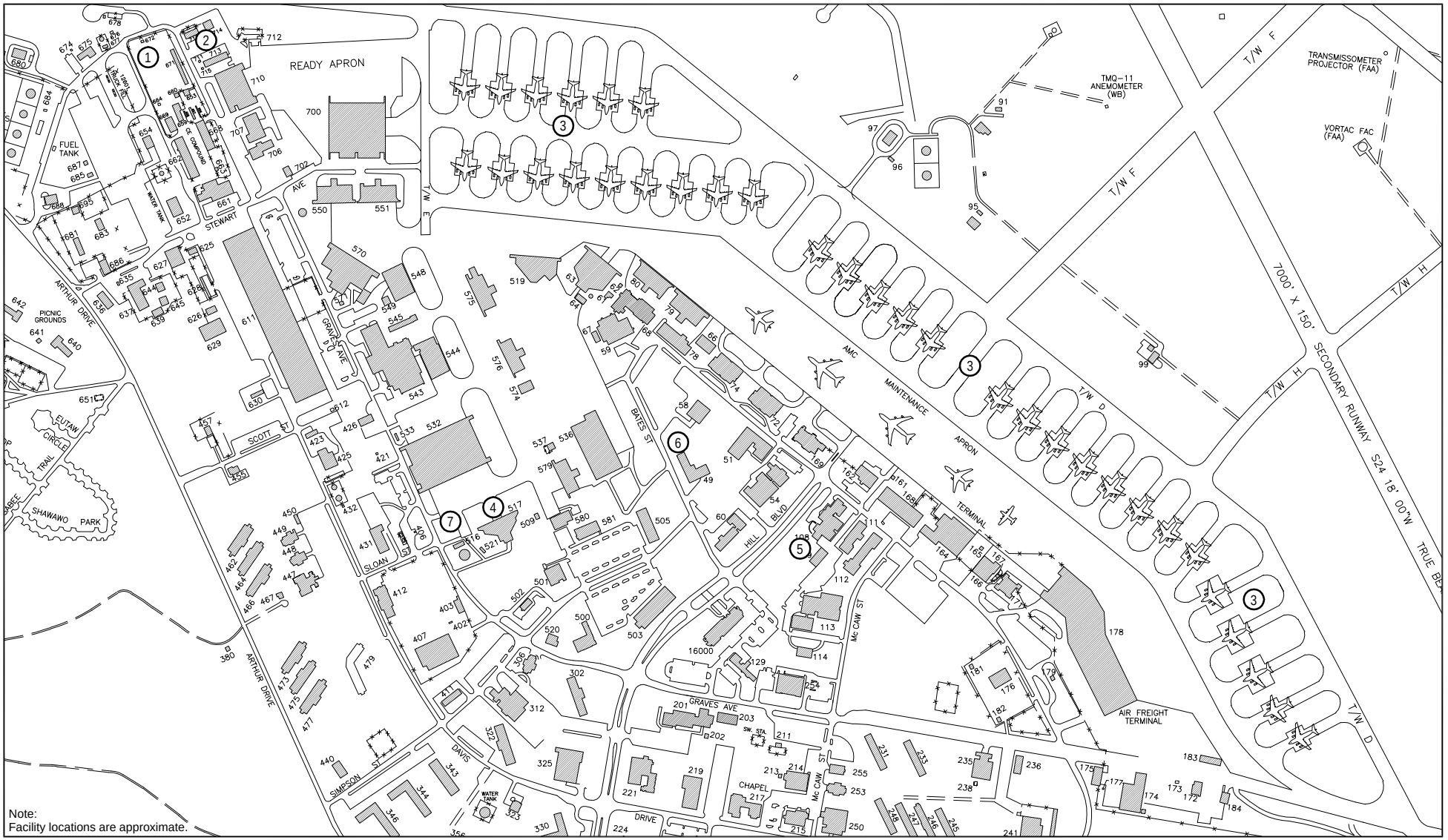
Charleston AFB aircrews would accomplish low-level navigation training on the 17 existing MTRs currently used for training. Table 2.4.4-3 lists the routes and the number of annual and monthly operations for each route. Figure 2.4.1-2 depicts the MTRs.

Table 2.4.4-3 Charleston AFB C-17 Military Training Route Operations, Charleston AFB Alternative Action

	Operations	
Route	**Annual**	**Monthly**
IR-002	20	1.67
IR-012	88	7.33
IR-035	424	35.33
IR-036	19	1.58
IR-074	1	0.08
IR-089	1	0.08
IR-721	16	1.33
IR-726	38	3.17
IR-743	4	0.33
VR-086	13	1.08
VR-087	1	0.08
VR-088	6	0.50
VR-097	1	0.08
VR-1041	60	5.00
VR-1056	3	0.25
VR-1059	1	0.08
SR-166	163	13.58
Total	859	64.22

Note: The MTR operations are the total operations for 60 assigned aircraft. One operation on VR-1059 and 120 operations on SR-166 occurred during nighttime (10:00 p.m. to 7:00 a.m.), all other operations were during the daytime (7:00 a.m. to 10:00 p.m.).

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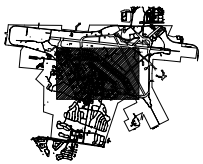


Note:
Facility locations are approximate.

Charleston Air Force Base

LEGEND

1. Construct Squadron Operations/ Aircraft Maintenance Unit for AFRC
2. Construct Squadron Operations/ Aircraft Maintenance Unit for 437AW
3. Reconfigure Aircraft Parking/ Install Hydrant Fuel System
4. Construct I-Bay C-17 Aircraft Hangar
5. Construct Space for an Additional Flight Simulator
6. Construct Avionics Facility
7. Construct Wheel and Tire Shop



Location Map

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Construction Project Locations, Charleston AFB Alternative Action

Figure 2.4.4-1

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2.4.4.2 Construction and Building Addition/Alteration Projects

The Air Force would accomplish seven construction and building addition alteration projects to support basing of C-17 aircraft and ensuing operation at Charleston AFB. Table 2.4.4-4 lists the construction and demolition area of the projects as well as the estimated project start dates and durations. The location number in the table corresponds to the project location on Figure 2.4.4-1. The following paragraphs briefly describe the construction actions.

Table 2.4.4-4 Construction Project Information, Alternative Action, Charleston AFB

Project	Location Number	Construction (Square Feet)	Demolition (Square Feet)	Start Date (FY)	Duration (months)
Construct Squadron Operations/Aircraft Maintenance Unit Facility for AFRC	1	14,050	11,520	07	18
Construct Squadron Operations/Aircraft Maintenance Unit Facility for 437 AW	2	41,929	16,164	07	18
Reconfigure Aircraft Parking/Install Hydrant Fuel System	3	12,080,000	12,080,000	07	24
Construct 1-Bay C-17 Aircraft Hangar	4	36,000	0	07	24
Construct Space for an Additional Flight Simulator	5	5,000	0	08	12
Construct Avionics Facility	6	8,300	20,237	09	12
Construct Wheel and Tire Shop	7	8,120	38,046	10	12
Total	NA	12,193,399	12,165,967	NA	NA

Note: Location number corresponds to project location on Figure 2.4.4-1. NA=not applicable.

Construct Squadron Operations/Aircraft Maintenance Unit Facility for AFRC. The facility would provide space for command, administration, briefing rooms, flight planning, standardization/evaluation, readiness, and other flying squadron functions, life support, as well as a ready room, readiness, and other aircraft maintenance personnel functions. Buildings 659 (1,920 square feet) and 668 (9,600 square feet) would be demolished under the project.

Construct Squadron Operations/Aircraft Maintenance Unit Facility for 437 AW. The facility would provide space for command, administration, briefing rooms, flight planning, standardization/evaluation, readiness, and other flying squadron functions, life support, as well as a ready room, readiness, and other aircraft maintenance personnel functions. Building 661 would be demolished under the project.

Reconfigure Aircraft Parking/Install Hydrant Fuel System. The aircraft parking spaces would be reconfigured to accommodate the 12 additional aircraft. The project would include rearranging the hydrant fuel system.

Construct 1-Bay C-17 Aircraft Hangar. The facility would accommodate one C-17 aircraft and would support heavy aircraft maintenance. The facility would have a high expansion foam fire extinguishing system in the maintenance bay area and a water sprinkler system in the administration area. The hangar would have a trench drain to accumulate spilled materials as well as high expansion foam and water fire suppression systems. A containment trench would be constructed to trap the high expansion foam should the chemical be released. The trapped high expansion foam would be pumped from the trench and disposed in accordance with applicable regulatory guidance. The wash down trench would have environmental control features to remove petroleum materials from wastewater prior to entry into a wastewater collection system.

Construct Space for an Additional Flight Simulator. This project would construct an addition to the existing simulator facility to provide space to house another flight simulator.

Construct Avionics Facility. A facility would be constructed to provide space for the administration and aircraft avionics repair functions. Building 579 would be demolished under the project.

Construct Wheel and Tire Shop. The facility would provide space for the maintenance and repair of aircraft landing gear wheel and tire assemblies as well as equipment storage. The wash down trench would have environmental control features to remove petroleum materials from wastewater prior to entry into a wastewater collection system. Buildings 517 (17,809 square feet) and 550 (20,237 square feet) would be demolished under the project.

2.4.5 Dover AFB Alternative Action

As an alternative to the Proposed Action, the Air Force would base and operate 24 C-17 aircraft at Dover AFB. All 32 C-5 aircraft would be reassigned to other units. A net decrease of 322 Air Force active duty, reserve, and civilian personnel authorizations would occur as a result of the action, decreasing the Base workforce to an estimated 7,508 persons. Seven facility construction, addition, and alteration projects would occur to support basing and operation activities. The basing action would begin in FY06 with facility construction projects and be complete in FY11 with the arrival of the 24th additional C-17 aircraft.

2.4.5.1 Airfield and Military Training Route Operations

Table 2.4.5-1 lists the projected annual and average daily airfield operations for Dover AFB under the Dover AFB Alternative Action. Operations include mission arrivals and departures as well as training sortie arrivals, departures, and closed pattern operations. Assault landing operations and other practice instrument approaches, takeoffs, and landings would be accomplished at the northeastern United States LZ.

Table 2.4.5-1 Annual and Average Daily Airfield Operations, Dover AFB Alternative Action

	Arrival and Departure Operations		Closed Pattern Operations		Total Operations	
Aircraft	**Annual**	**Avg. Daily**	**Annual**	**Avg. Daily**	**Annual**	**Avg. Daily**
C-17	5,577	15.28	13,060	35.78	18,637	51.06
Other Aircraft	28,074	76.92	6,496	17.80	31,978	94.72
Total	33,651	92.20	19,556	53.58	50,615	145.78

Note: The C-17 airfield operations are the total operations associated with the mission and training sorties for 24 assigned aircraft. Approximately 29 percent of the C-17 airfield operations would occur during nighttime (10:00 p.m. to 7:00 a.m.). Table 4.4.10-1 details the operations for the other aircraft (i.e., aero club and transient aircraft). Annual operations are based on 365 days per year for all aircraft.

Dover AFB aircrews would accomplish low-level navigation training on the 22 existing MTRs. Table 2.4.5-2 lists the routes and the number of annual and monthly operations for each route. Figure 2.4.1-1 depicts the 22 MTRs.

Table 2.4.5-2 Dover AFB C-17 Military Training Route Operations, Dover AFB Alternative Action

	Operations	
Route	**Annual**	**Monthly**
IR-714	16	1.33
IR-720	16	1.33
IR-721	32	2.67
IR-726	32	2.67
IR-743	32	2.67
IR-760	32	2.67
IR-761	32	2.67
IR-762	32	2.67
IR-801	126	10.50
VR-704	32	2.67
VR-705	238	19.83
VR-707	238	19.83
VR-725	32	2.67
VR-1709	238	19.83
VR-1711	32	2.67
VR-1712	32	2.67
SR-800	32	2.67
SR-801	32	2.67
SR-805	32	2.67
SR-844	32	2.67
SR-845	32	2.67
SR-846	238	19.83
Total	1,590	132.54

Note: The MTR operations reflect the total operations for 24 assigned aircraft. Approximately 30 percent of the MTR operations occur during nighttime (10:00 p.m. to 7:00 a.m.).

2.4.5.2 Construction and Building Addition/Alteration Projects

The seven facility projects identified for the Dover AFB Proposed Action also would be accomplished to support the basing and operation of 24 C-17 aircraft at Dover AFB. Two of

the projects would be expanded when compared to the scope of the particular Dover AFB Proposed Action project. Specifically, additional space would be added to the flight simulator project to house another simulator, and the doors on Hangar 711 would be altered as part of the project to alter the doors on Hangars 714, 715, and 945. Table 2.4.5-3 lists the construction and demolition areas for the projects as well as the estimated project start dates and durations for the alternative. The location number in the table corresponds to the project location on Figure 2.4.2-1. The project description for the facility at Dover AFB under the Proposed Action (see Subchapter 2.4.2.2) applies to the facility at Dover AFB under the alternative.

Table 2.4.5-3 Construction Project Information, Dover AFB Alternative Action

Project	Location Number	Construction (Square Feet)	Demolition (Square Feet)	Start Date (FY)	Duration (months)
Construct Flight Simulator Facility plus Additional Space	1	19,600	0	06	18
Construct Life Support Facility	2	23,290	32,544	07	18
Construct Composite Materials Shop Addition	3	10,800	1,000	07	12
Alter Doors on Hangars 714, 715, 945, and 711	4	0	0	07	12
Pave Taxiway Shoulders	5	770,000	0	07	12
Construct Squadron Operations/Aircraft Maintenance Unit Facility	6	40,728	0	07	18
Repave Roads	7	undetermined	undetermined	07	6
Total	NA	864,418	33,544	NA	NA

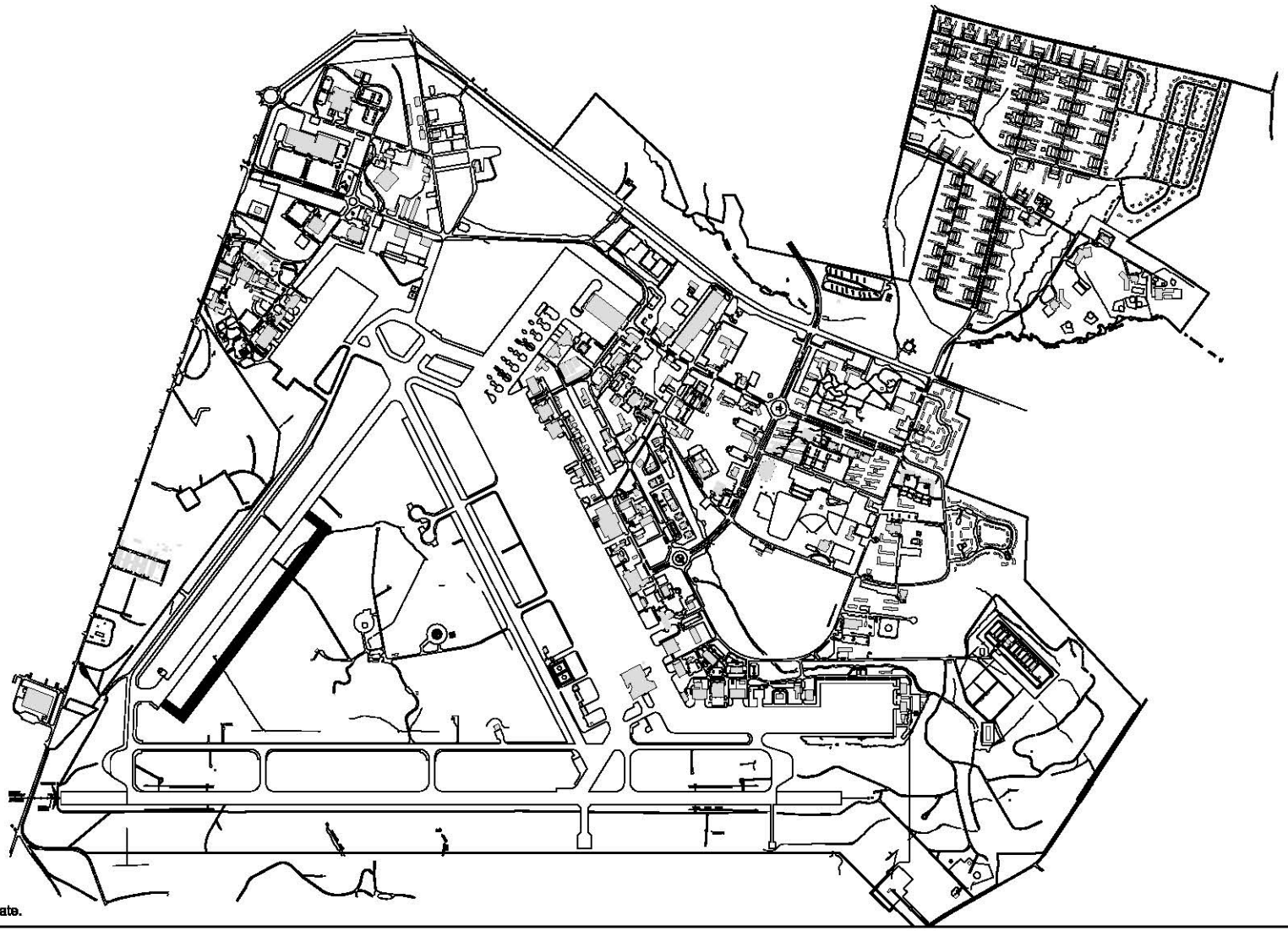
Note: Location number corresponds to project location on Figure 2.4.2-1. NA=not applicable.

2.5 DESCRIPTION OF NORTHEASTERN UNITED STATES LANDING ZONE ALTERNATIVES

Air Force Engineering Technical Letter 04-7: *C-130 and C-17 Landing Zone (LZ) Dimensional, Marking, and Lighting Criteria*, Mar 29, 2004 establishes imaginary surfaces for LZs. The following imaginary surfaces would be established for the LZ:

- A 1,000-foot exclusion area centered on the longitudinal axis of the runway (500 feet to each side of the runway centerline) for LZs in built up and occupied areas. The width of the exclusion area in unoccupied areas is 700 feet (350 feet to each side of the runway centerline). The purpose of the exclusion area is to restrict development around the LZ. Only features necessary to operate the LZ are permitted in the area.
- A clear zone (CZ) that extends outward 500 feet from the end of the runway, is centered on the end of the runway, and is 320 feet wide at the end of the runway for C-17s and 270 feet wide for C-130s, flaring to 500 feet in width at the outer end.
- An accident potential zone (APZ) that begins at the outer end of the CZ, extends outward 2,500 feet, and is 1,000 feet wide in occupied and built-up areas (500 feet in unoccupied area).

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Note:
ALZ location is approximate.

McGuire Air Force Base
LEGEND

Landing Zone

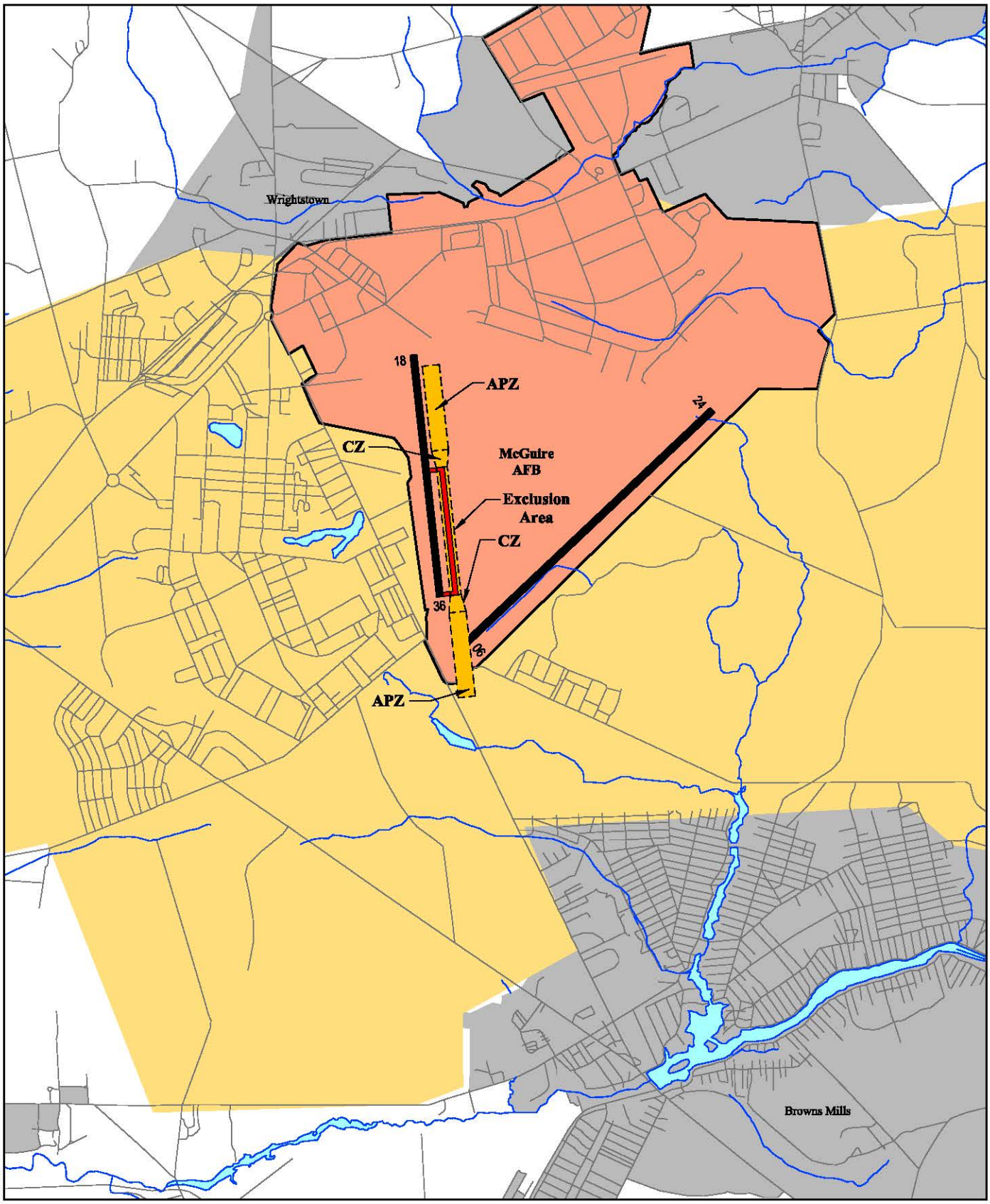
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Landing Zone Location, McGuire AFB Landing Zone Alternative

Figure 2.5.1-1

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McGuire Air Force Base

LEGEND

- LZ Imaginary Surfaces
- LZ Alternative Runway
- Existing Runway
- Roadway
- McGuire AFB
- Fort Dix
- Urban Area
- CZ Clear Zone
- APZ Accident Potential Zone

N

0 4,000

Feet

Landing Zone Imaginary Surfaces, McGuire AFB Landing Zone Alternative

Figure 2.5.1-2

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Maintained grassland areas temporarily disturbed during construction would be revegetated with native grasses under the supervision of the installation Natural Resources Manager. The construction contractor would prepare and implement a SWPPP in accordance with federal, state, and local guidance prior to initiation of construction activities. The LZ construction would begin early in calendar year 2007 (CY07) and be complete in early CY09.

2.5.1 McGuire AFB Landing Zone Alternative

Assault landing operations would be accomplished on the LZ that would be constructed on the McGuire AFB airfield. Figure 2.5.1-1 depicts the estimated location for the LZ and associated taxiways. Figure 2.5.1-2 depicts the exclusion area, CZ, and APZ surfaces for a C-17 LZ in a built-up and occupied area based on the estimated location for the LZ at McGuire AFB.

Table 2.5.1-1 reflects the anticipated LZ operations for the 36-aircraft operating condition, along with the other airfield operations that would occur at the airfield.

Table 2.5.1-1 Annual and Average Daily Airfield Operations, McGuire AFB 36 Aircraft Landing Zone Operating Condition

	Arrival and Departure Operations		Closed Pattern Operations		Total Operations	
Aircraft	**Annual**	**Avg. Daily**	**Annual**	**Avg. Daily**	**Annual**	**Avg. Daily**
C-17 LZ Related Operations	10,900	29.86	30,452	83.43	41,352	113.29
Other Aircraft	14,498	57.98	62,665	250.66	77,163	308.64
Total	24,882	85.78	93,117	334.09	117,999	419.87

Note: Approximately 42 percent of the C-17 airfield operations would occur during nighttime (10:00 p.m. to 7:00 a.m.). Table 2.4.3-1 lists the other aircraft operations. C-17 LZ operations include LZ operations as well as operations on other runways while wheel brakes are cooled after a tactical landing. C-17 LZ data include the operations associated with C-17 aircraft from Dover and McGuire AFBs as well as the WIC. Annual operations are based on 250 days per year for based aircraft, 350 days per year for other aircraft, and 365 days per year for LZ operations since aircraft from other installations also would use the LZ.

2.5.2 Dover AFB Landing Zone Alternative

Assault landing operations would be accomplished on the LZ that would be constructed on the Dover AFB airfield. The LZ and associated taxiways would be constructed on one of two sites identified as potential locations for the LZ. The sites are referred to as Location A and Location B. Figure 2.5.2-1 depicts the estimated locations for the LZ and Figure 2.5.2-2 shows the imaginary surfaces in a built-up and occupied area that would be established should the LZ be constructed at Dover AFB. Table 2.5.1-1 reflects the anticipated LZ operations for the 36-aircraft operating condition, along with the other airfield operations that would occur at the airfield. The number of LZ operations would be the same for either siting location.

Table 2.5.2-1 Annual and Average Daily Airfield Operations, Dover AFB 36 Aircraft Landing Zone Operating Condition

	Arrival and Departure	Closed Pattern Operations	Total Operations

	Operations					
Aircraft	**Annual**	**Avg. Daily**	**Annual**	**Avg. Daily**	**Annual**	**Avg. Daily**
C-17 LZ Related Operations	10,903	29.87	30,448	83.42	41,351	113.29
Other Aircraft	32,717	89.64	31,747	86.98	61,872	176.62
Total	43,620	119.51	62,195	170.40	103,223	289.91

Note: Approximately 52 percent of the C-17 airfield operations would occur during nighttime (10:00 p.m. to 7:00 a.m.). Table 2.4.2-1 lists the other aircraft operations. C-17 LZ operations include LZ operations as well as operations on other runways while wheel brakes are cooled after a tactical landing. C-17 LZ data include the operations associated with C-17 aircraft from Dover and McGuire AFBs as well as the WIC. Annual operations are based on 365 days per year for all aircraft.

2.5.3 NAES Lakehurst Landing Zone Alternative

Assault landing operations would be accomplished on the LZ that would be constructed on the NAES Lakehurst airfield. The LZ would be constructed to parallel to the existing Runway 06/24 with 300 feet between the edge of the runway and the edge of the LZ. A taxiway would be constructed between the northeastern ends of the LZ and Runway 06/24. The overrun at the southwest end of the LZ would serve as a taxiway.

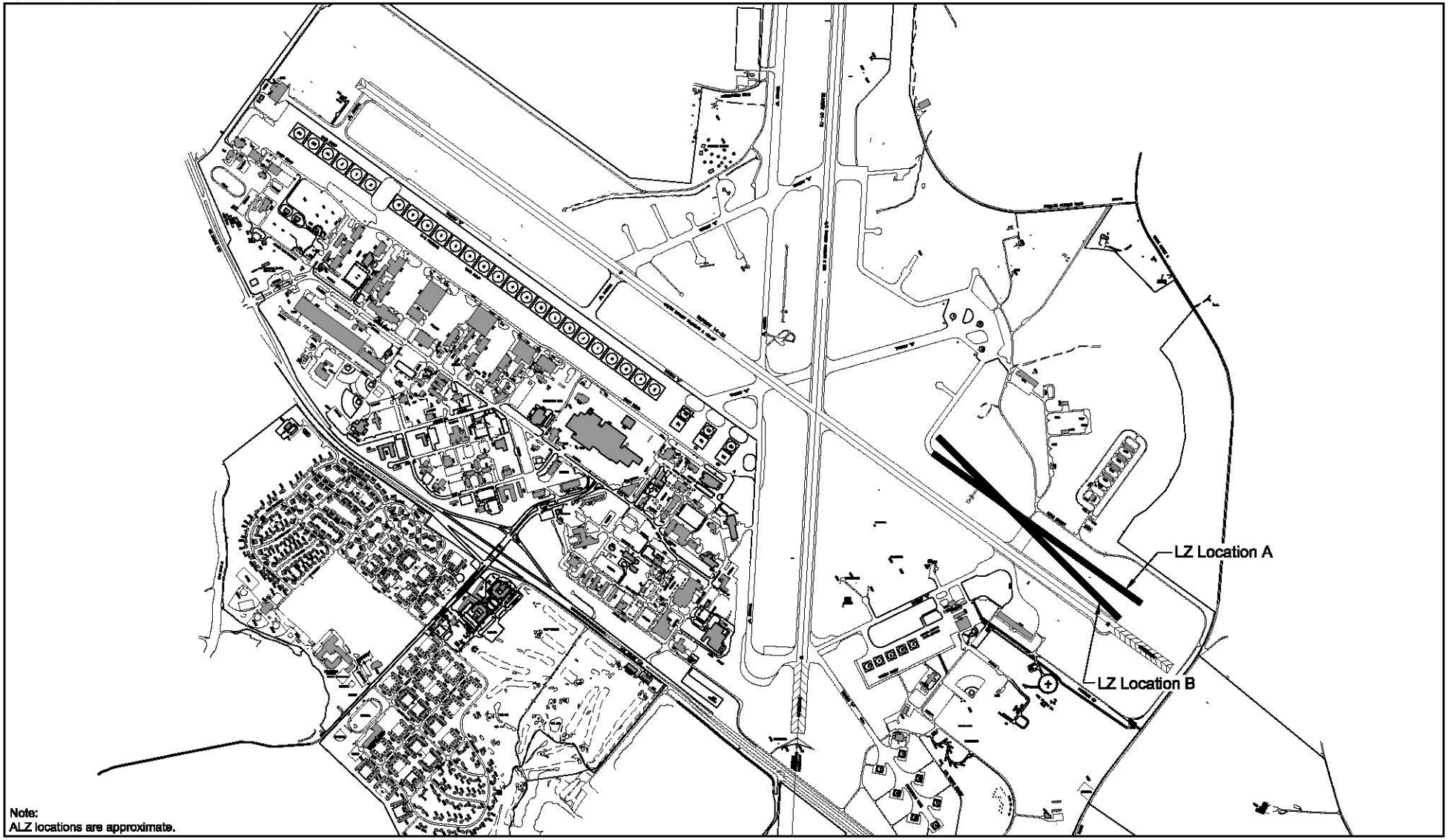
Figure 2.5.3-1 depicts the estimated location for the LZ and Figure 2.5.3-2 shows the imaginary surfaces in a built-up and occupied area that would be established should the LZ be constructed at NAES Lakehurst. Table 2.5.3-1 reflects the anticipated LZ operations for the 36-aircraft operating condition, along with the other airfield operations that would occur at the airfield.

Table 2.5.3-1 Annual and Average Daily Airfield Operations, NAES Lakehurst 36 Aircraft Landing Zone Operating Condition

	Arrival and Departure Operations		Closed Pattern Operations		Total Operations	
Aircraft	**Annual**	**Avg. Daily**	**Annual**	**Avg. Daily**	**Annual**	**Avg. Daily**
C-17 LZ Related Operations	10,903	29.87	31,182	85.43	42,085	115.30
Military and Federal Government	18,366	61.67	20,162	57.68	38,528	119.35
Total	29,269	91.54	51,344	143.11	80,613	234.65

Note: Approximately 55 percent of the C-17 airfield operations would occur during nighttime (10:00 p.m. to 7:00 a.m.). None of the other aircraft operations occur at nighttime. Table 3.4.7-1 lists the other aircraft operations. C-17 LZ operations include LZ operations as well as operations on other runways while wheel brakes are cooled after a tactical landing. C-17 LZ data include the operations associated with C-17 aircraft from Dover and McGuire AFBs as well as the WIC. Annual operations are based on 234 and 355 days per year, respectively, for other aircraft (depending on the unit operating the aircraft) and 365 days per year for LZ operations since aircraft from other installations would use the LZ.

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Dover Air Force Base

LEGEND

Landing Zone

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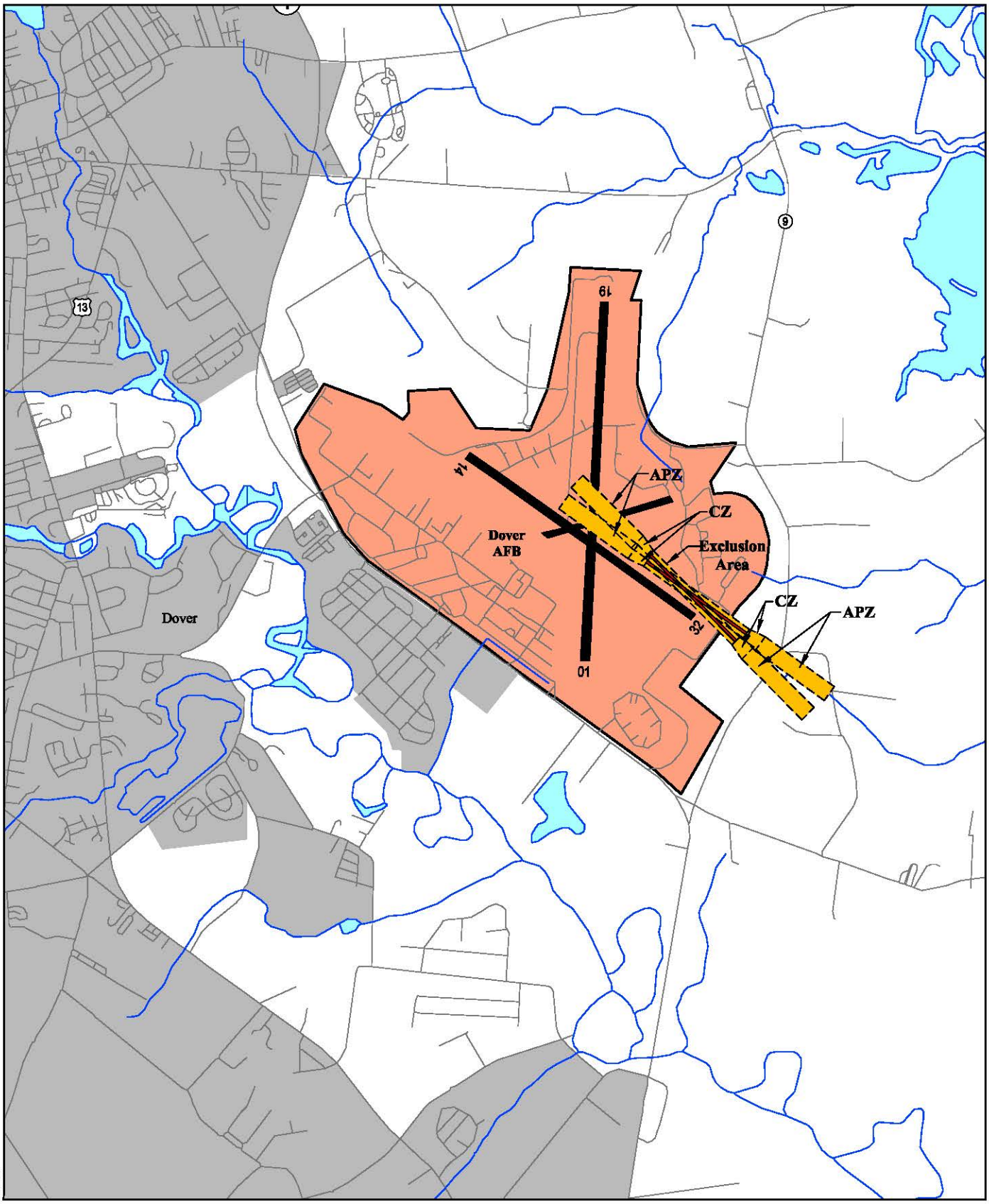
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Landing Zone Locations, Dover AFB
Landing Zone Alternative

Figure 2.5.2-1

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Dover Air Force Base

LEGEND

- LZ Imaginary Surfaces
- LZ Alternative Runway
- Existing Runway
- Roadway
- Dover AFB
- Urban Area
- CZ Clear Zone
- APZ Accident Potential Zone

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Feet

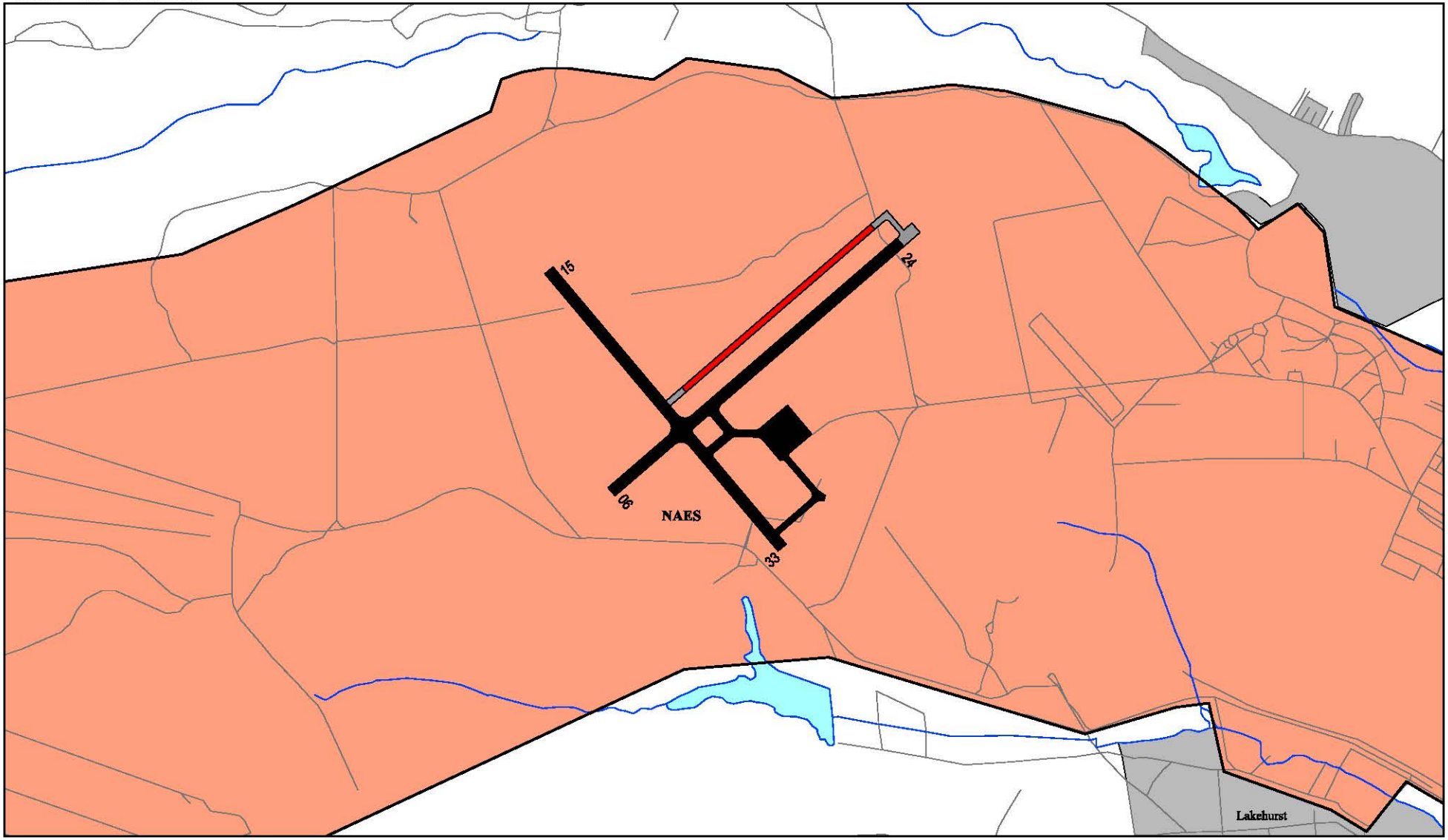
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Landing Zone Imaginary Surfaces, Dover AFB Landing Zone Alternative

Figure 2.5.2-2

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NAES Lakehurst

LEGEND

- Landing Zone
- LZ Taxiway or Overrun
- Existing Runway
- NAES Lakehurst
- Urban Area

Note: ALZ locations are approximate.

N

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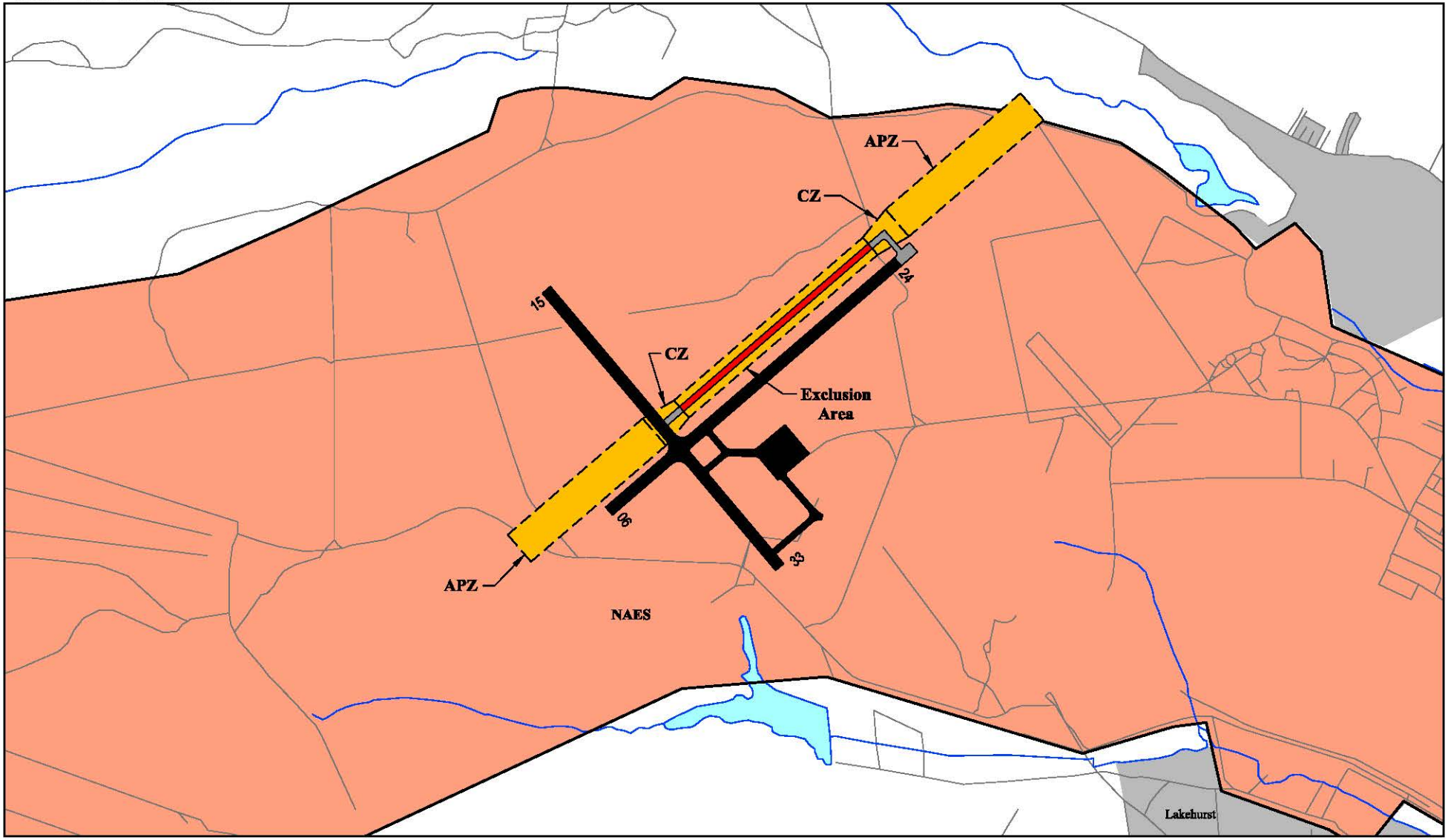
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Landing Zone Location, NAES Lakehurst Landing Zone Alternative

Figure 2.5.3-1

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743528 EC17-LKH-ALZ-CZ.DWG



NAES Lakehurst

LEGEND

- LZ Imaginary Surfaces
- LZ Alternative
- Existing Runway
- Roadway
- NAES Lakehurst
- Urban Area

Note: LZ locations are approximate.

N

0 2,000 Feet

Landing Zone Imaginary Surfaces, NEAS Lakehurst Landing Zone Alternative

Figure 2.5.3-2

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The LZ would be constructed in an existing grassland to the immediate north of Runway 06/24, an area in which two bird species listed by the State of New Jersey have been documented. NAES Lakehurst would establish habitat for these two birds in other areas of the Station to offset the loss of grassland due to the construction of the LZ.

2.6 DESCRIPTION OF PAST, PRESENT, AND REASONABLY FORESEEABLE FUTURE ACTIONS

The complete EIAP of the Proposed Action and alternatives must consider cumulative impacts due to 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." Personnel at Dover McGuire, and Charleston AFBs identified other actions that could occur during the respective Proposed Action and Alternative Actions.

2.6.1 Dover AFB Proposed Action Cumulative Condition

Table 2.6.1-1 lists the nine other past and reasonably foreseeable actions for Dover AFB that could occur during the same time period as the Dover AFB Proposed Action. Figure 2.6.1-1 depicts the locations of the projects.

Table 2.6.1-1 Construction Project Information, Dover AFB Proposed Action Cumulative Condition

Project	Location Number	Construction (Square Feet)	Demolition (Square Feet)	Start Date (FY)	Duration (months)
Construct Air Freight Terminal	1	350,000	0	04	36
Construct Air Traffic Control Tower/Radar Approach Control Facility	2	18,550	0	05	24
Construct Dormitory	3	40,000	0	06	24
Construct Visiting Officers' Quarters	4	32,543	0	08	18
Construct Addition/Alteration to Physical Fitness Center	5	10,000	0	08	12
Construct Dormitory	6	40,000	0	08	24
Construct Communications Facility	7	20,000	0	08	24
Repave Taxiway C	8	750,000	750,000	09	12
Repave Runway 14/32	9	2,580,400	1,935,300	10	12
Construct Youth Center	10	10,000	0	06	12
Anti-Terrorism/Force Protection Upgrades	11	76,800	0	04	24
Total	NA	4,619,493	2,685,300	NA	NA

Note: Location number corresponds to project location on Figure 2.6.1-1. Size depicts total surface area for the facility. Start date reflected as FY. NA=not applicable. Construction area for the Anti-Terrorism/Force Protection Upgrades reflects the estimated additional square feet based on the EA accomplished for the action.

Construct Air Freight Terminal. This project would construct a new building to house functions such as administration, storage, air cargo pallet build-up, *etc*.

Construct Air Traffic Control Tower/Radar Approach Control Facility. The new structure would be constructed to collocate the air traffic control and radar approach control functions in one facility.

Construct Dormitory. This project would construct a new dormitory for enlisted personnel.

Construct Visiting Officers' Quarters. This project would construct a new facility to house visiting officers.

Construct Addition/Alteration to Physical Fitness Center. This project would construct an addition to the physical fitness center as well as accomplish interior renovations to the existing facility. The Wellness Center would be located in the new space.

Construct Communications Facility. This project would construct a new facility for the Base communications functions.

Construct Dormitory. This project would construct a new dormitory for enlisted personnel.

Repave Taxiway C. This project would remove the existing pavement and then repave the taxiways. The project would also pave 25-foot wide shoulders for the taxiways as well as remove and replace the existing lighting systems.

Repave Runway 14/32. This project would mill about 6 inches of asphalt from the runway and then repave with asphalt. The project also would remove all the asphalt from the first 5,500 feet of each end of the runway and repave with concrete. Twenty-five foot wide shoulders would be paved along each side of the runway.

Construct Youth Center. The project would construct a new facility to house Dover AFB youth activities.

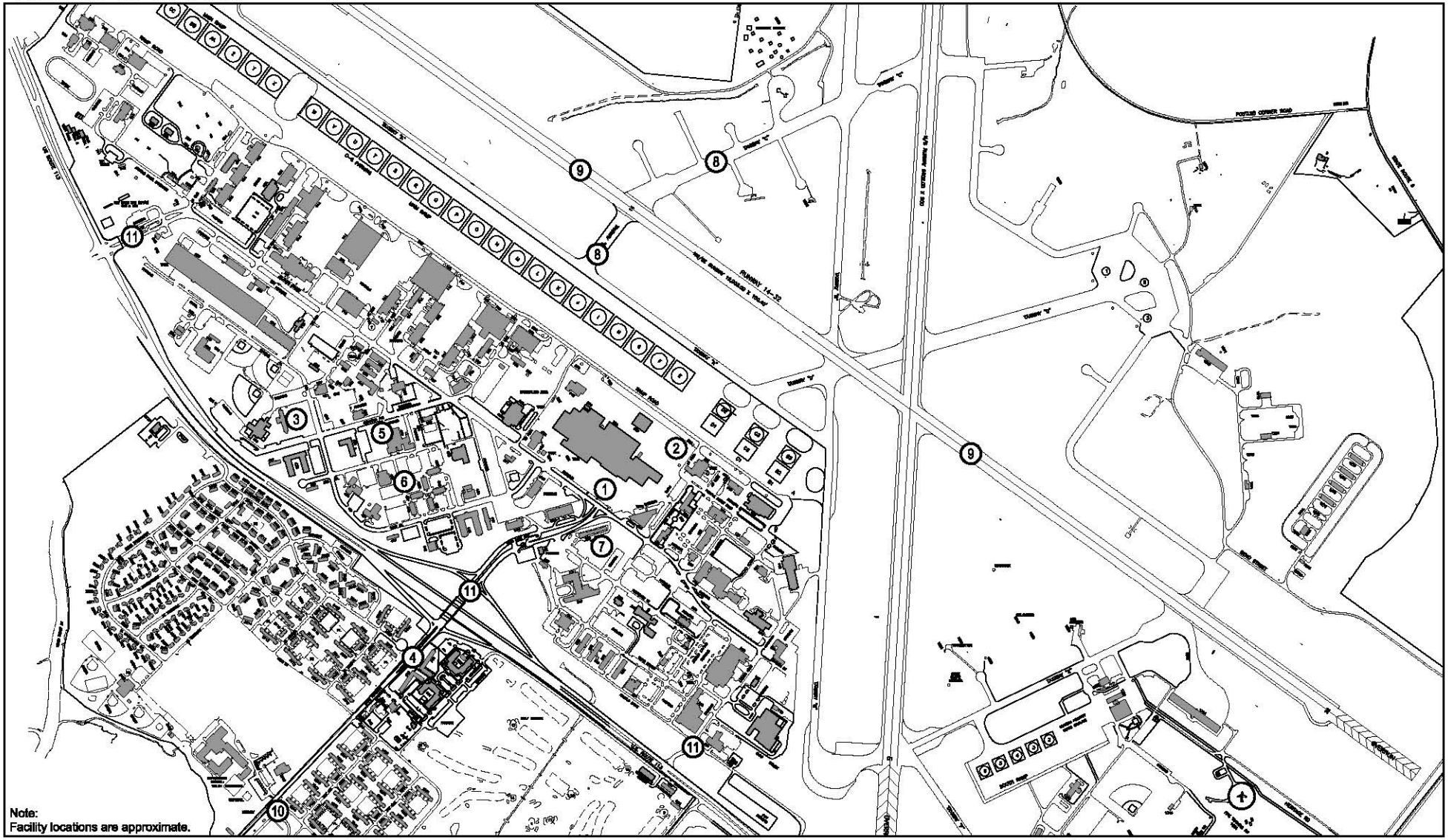
Anti-Terrorism/Force Protection Upgrades. This project would modify the entry control points at the Main, North, and South Gates to meet the force protection standards for these facilities.

2.6.2 McGuire AFB Alternative Action Cumulative Condition

The Air Force has 18 other past and reasonably foreseeable actions for McGuire AFB that could occur during the same time period as the McGuire AFB Alternative Action. Table 2.6.2-1 lists the projects, and Figure 2.6.2-1 depicts the locations of the projects.

Construct Unified Headquarters Building for the 305th and 514th Air Mobility Wings. This project would construct a unified headquarters for the 305/514 Air Mobility Wings (AMW). One facility would be demolished under the project.

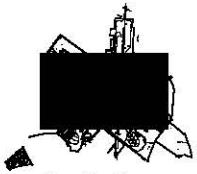
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Dover Air Force Base

LEGEND

1. Construct Air Freight Terminal
2. Construct Air Traffic Control Tower/ Radar Approach Control Facility
3. Construct Dormitory
4. Construct Visiting Officer's Quarters
5. Construct Addition/Alteration to Physical Fitness Center
6. Construct Dormitory
7. Construct Communications Facility
8. Repave Taxiway C
9. Repave Runway 14/32
10. Construct Youth Center
11. Anit-Terrorism/Force Protection Upgrades



N

0 1,400

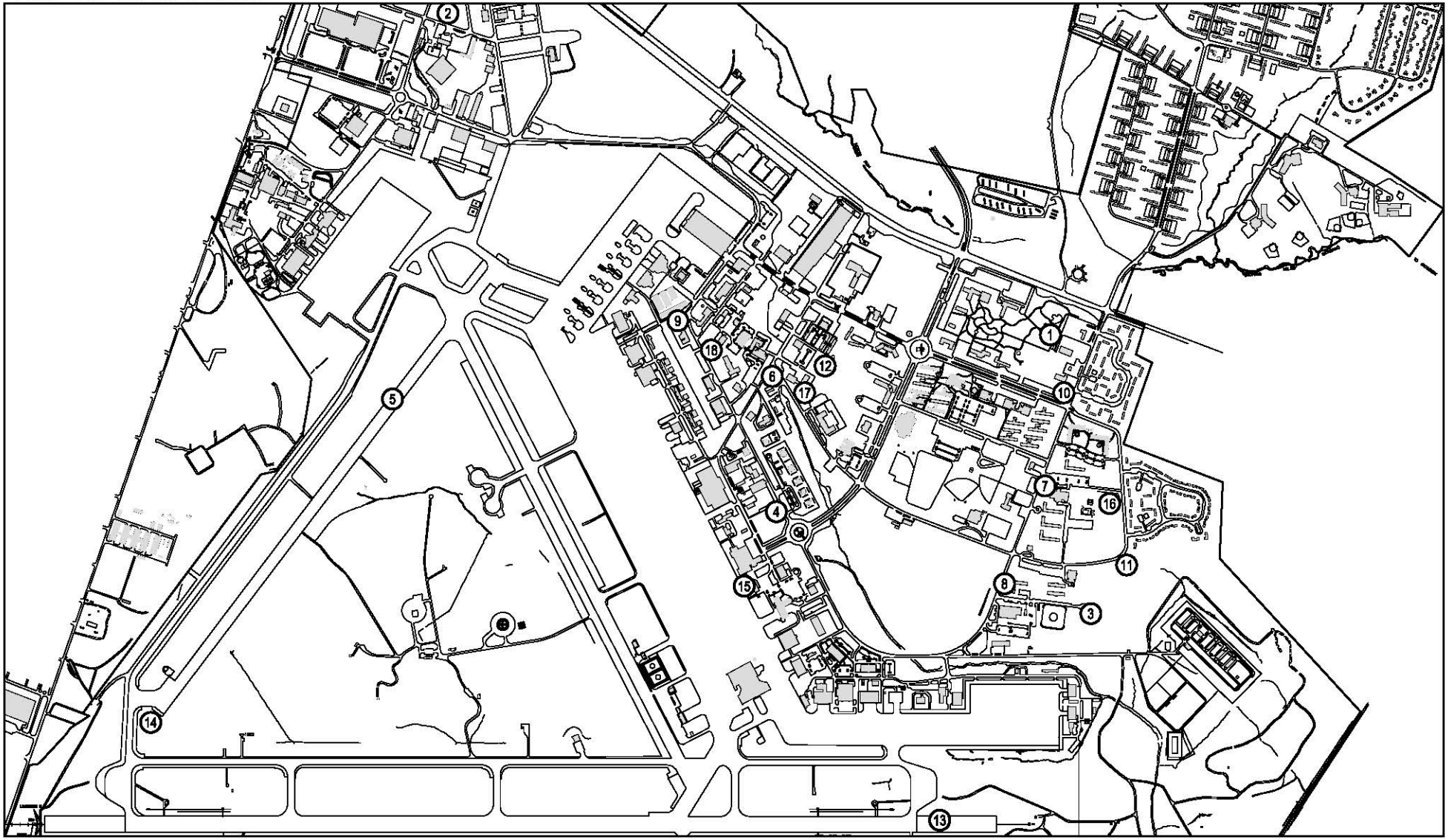
Feet

Construction Project Locations, Dover AFB Proposed Action Cumulative Condition

Figure 2.6.1-1

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McGuire Air Force Base

LEGEND

1. Construct Unified Headquarters Bldg. for the 305th and 514th AMWs
2. Construct Consolidated Air Mobility Squadron Facility
3. Construct Consolidated Education and Training Center
4. Construct Liquid Fuels Maintenance Facility
5. Construct Shoulders on Runway 18/36
6. Construct Communications Warehouse
7. Construct Addition/Alter Building 2705 for Consolidated Club
8. Construct Air Mobility Weapons School Consolidated Facility
9. Construct Addition to Building 2217
10. Construct Noncommissioned Officers Professional Military Education Center
11. Construct Precision Measurement Equipment Laboratory
12. Construct 2400 Area Base Civil Engineering Complex
13. Improve Runway 06/24
14. Construct Runway 36 Overrun
15. Construct Central Deployment Center
16. Construct Visiting Officer's Quarters
17. Construct Consolidated Base Support Facility
18. Construct Airlift Control Flight Facility

N

0 1,800

Feet

Construction Projects Locations, McGuire AFB Alternative Action Cumulative Condition

Figure 2.6.2-1

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Construct Consolidated Air Mobility Squadron Facility. This project would collocate the three McGuire AFB air mobility squadrons into one facility located in the 621st Air Mobility Group campus. Four facilities would be demolished under the project.

Construct Consolidated Education and Training Center. This project would construct an education center/training facility. This facility would combine all base educational and training functions into a single facility, eliminating multiple conference rooms, student lounges, auditoriums, and other functions associated with education and training.

Table 2.6.2-1 Construction Project Information, McGuire AFB Alternative Action Cumulative Condition

Project	Location Number	Construction (Square Feet)	Demolition (Square Feet)	Start Date (FY)	Duration (months)
Construct Unified Headquarters Building for the 305th and 514th AMWs	1	79,179	37,560	06	22
Construct Consolidated Air Mobility Squadron Facility	2	69,965	67,124	06	22
Construct Consolidated Education and Training Center	3	47,038	48,438	06	20
Construct Liquid Fuels Maintenance Facility	4	3,400	Not sited	06	10
Construct Shoulders on Runway 18/36	5	142,480	0	06	6
Construct Communications Warehouse	6	8,000	0	06	10
Construct Addition/Alter Building 2705 for Consolidated Club	7	14,200	0	06	20
Construct Air Mobility Weapons School Consolidated Facility	8	50,526	39,187	06	18
Construct Addition to Building 2217	9	7,998	0	06	12
Construct Noncommissioned Officers Professional Military Education Center	10	43,056	30,320	06	24
Construct Precision Measurement Equipment Laboratory	11	22,884	0	07	18
Construct 2400 Area Base Civil Engineering Complex	12	79,179	0	07	
Improve Runway 06/24	13	312,153	0	07	6
Construct Runway 36 Overrun	14	150,000	0	07	6
Construct Central Deployment Center	15	47,372	30,182	07	30
Construct Visiting Officers' Quarters	16	56,511	37,814	08	22
Construct Consolidated Base Support Facility	17	99,027	0	09	24
Construct Airlift Control Flight Facility	18	6,000	0	10	10
Total	NA	1,266,058	290,625	NA	NA

Note: Location number corresponds to project location on Figure 2.6.2-1. NA=not applicable.

Construct Liquid Fuels Maintenance Facility. This project would construct a structure for personnel performing maintenance functions and would include adequate floor space and height to house the equipment, supplies, and materials to assure efficient operations.

Construct Shoulders on Runway 18/36. This project would construct 25-foot wide shoulders on Runway 18/36.

Construct Communications Warehouse. This project would construct a facility to house the Base's fire alarm, local area network, and security alarm systems.

Construct Addition/Alter Building 2705 for Consolidated Club. This project would renovate the existing building as well as construct an addition to consolidate the Officers' and Noncommissioned Officers' Clubs into one facility.

Construct an Air Mobility Weapons School Consolidated Facility. This project would construct a facility to support the consolidation of the C-17, C-130, KC-135, and KC-10 WICs at the Air Mobility Weapons School. Buildings 1911 and 1912 would be demolished.

Construct Addition to Building 2217. This project would construct an addition to provide office space and renovate/reconfigure existing office areas to accommodate Operations Support Group, administrative space for Readiness and PRIME RIBS personnel, TNET area, training and storage space.

Construct Noncommissioned Officers Professional Military Education Center. This project would construct a new center to include functional space for administration and support, seminar rooms, instructor offices, staff locker room, learning resource center, auditorium, student lounge, restrooms, storage, and mechanical rooms. Buildings 2604 and 2605 would be demolished.

Construct Precision Equipment Measurement Equipment Laboratory. This project would construct a new facility to support McGuire AFB's role as the designated AMC Core Precision Equipment Measurement Facility mission.

Construct 2400 Area Base Civil Engineering Complex. This project would expand the civil engineering facility in the 2400 area of the Base by consolidating civil engineering resources and personnel to provide equitable levels of facilities support to base agencies and organizations with the minimum amount of wasted effort.

Improve Runway 06/24. This project would extend Runway 06/24 to support the KC-10 aircraft's maximum gross take off weight under all weather conditions.

Construct Runway 36 Overrun. This project would construct a 1,000 foot long and 150 foot wide asphalt overrun at the south end of Runway 36.

Construct Central Deployment Center. This project would construct a facility to consolidate all activities necessary to prepare and process personnel and equipment for deployment.

Construct Visiting Officers' Quarters. This project would construct a facility for visiting personnel.

Construct Consolidated Base Support Facility. This project would construct a facility to allow the McGuire AFB Support Group greater consolidation of its key elements to maximize efficiency and effectiveness.

Construct Airlift Control Flight Facility. This project would construct a facility for the airlift control flight.

2.6.3 Charleston AFB Alternative Action Cumulative Condition

The Air Force has seven other past and reasonably foreseeable actions for Charleston AFB that could occur during the same time period as the Charleston AFB Alternative Action. Table 2.6.3-1 lists the projects, and Figure 2.6.3-1 depicts the locations of the projects.

Table 2.6.3-1 Construction Project Information, Charleston AFB Alternative Action Cumulative Condition

Project	Location Number	Construction (Square Feet)	Demolition (Square Feet)	Start Date (FY)	Duration
Alter/Repair Communications Facility – B302	1	24,684	0	04	16 months
Construct New Dormitory	2	42,600	0	05	12 Months
Alter/Repair Base Theater – B219	3	16,225	0	05	14 Months
Construct Child Development Center	4	33,750	0	06	14 Months
Construct Base Civil Engineer/Contracting Complex	5	96,500	119,000	07	26 months
Construct Base Fire Station	6	31,400	0	08	14 months
Construct Flight Line Support Facility	7	191,000	68,000	NA	20 months
Total	NA	436,159	187,000	04	NA

Note: Location number corresponds to project location on Figure 2.6.3-1. NA=not applicable.

Alter/Repair Communications Facility – B302. This project would renovate a 40-year-old facility, originally constructed as a Visiting Airman Quarters, to accommodate Base communications command/administration and crypto functions.

Construct New Dormitory. This project constructs new multi-story dormitory conforming to current Air Force standards with the capability of supporting enlisted residents including parking, site improvements, and anti-terrorism/force protection measures as required.

Alter/Repair Base Theater. This project would expand the lobby area and renovate the existing forty-eight year-old auditorium facility. Completion of the project will provide a

modern auditorium/theater facility capable of accommodating the primary function of public assembly for speakers, briefings, training, etc., and the secondary function of public entertainment including the viewing of movies.

Construct Child Development Center. This project would construct a new 33,750 square foot Child Development Center to replace the existing Center. The existing facility can only accommodate 114 children – the new Center will be designed for a capacity of 305 children.

Construct Base Civil Engineering Complex. This project would construct a new multi-facility complex consolidating Base Civil Engineer administration, engineering, and operations with Base contracting to create a modern, conveniently located, and properly configured area providing one-stop service for customers and non-government visitors. This collocation will improve the efficiency and effectiveness of these complementary functions and demolish 23 facilities totaling 119,000 square feet.

Construct New Base Fire Station. This project would construct a new combination one/two-story station conforming to Air Force standards of size and interior configuration to replace the existing station that is over thirty years old and that has less than two-thirds of the needed space and has numerous National Fire Protection Act safety/health issues, deteriorated or obsolete utility systems, and crew rest quarters that are not in compliance with current standards of space, livability, configuration, or security.

Construct Flight Line Support Facility. This project would construct a new adequately sized, properly configured, and suitably located facility to serve as the centralized staging point for the assembly and maintenance of readiness spares packages, and the sustaining and issuing of required flight line stock of avionics, components, spare parts, and assemblies in support of the C-17 aircraft. Project includes demolition of four facilities totaling 68,000 square feet.

2.6.4 Dover AFB Alternative Action Cumulative Condition

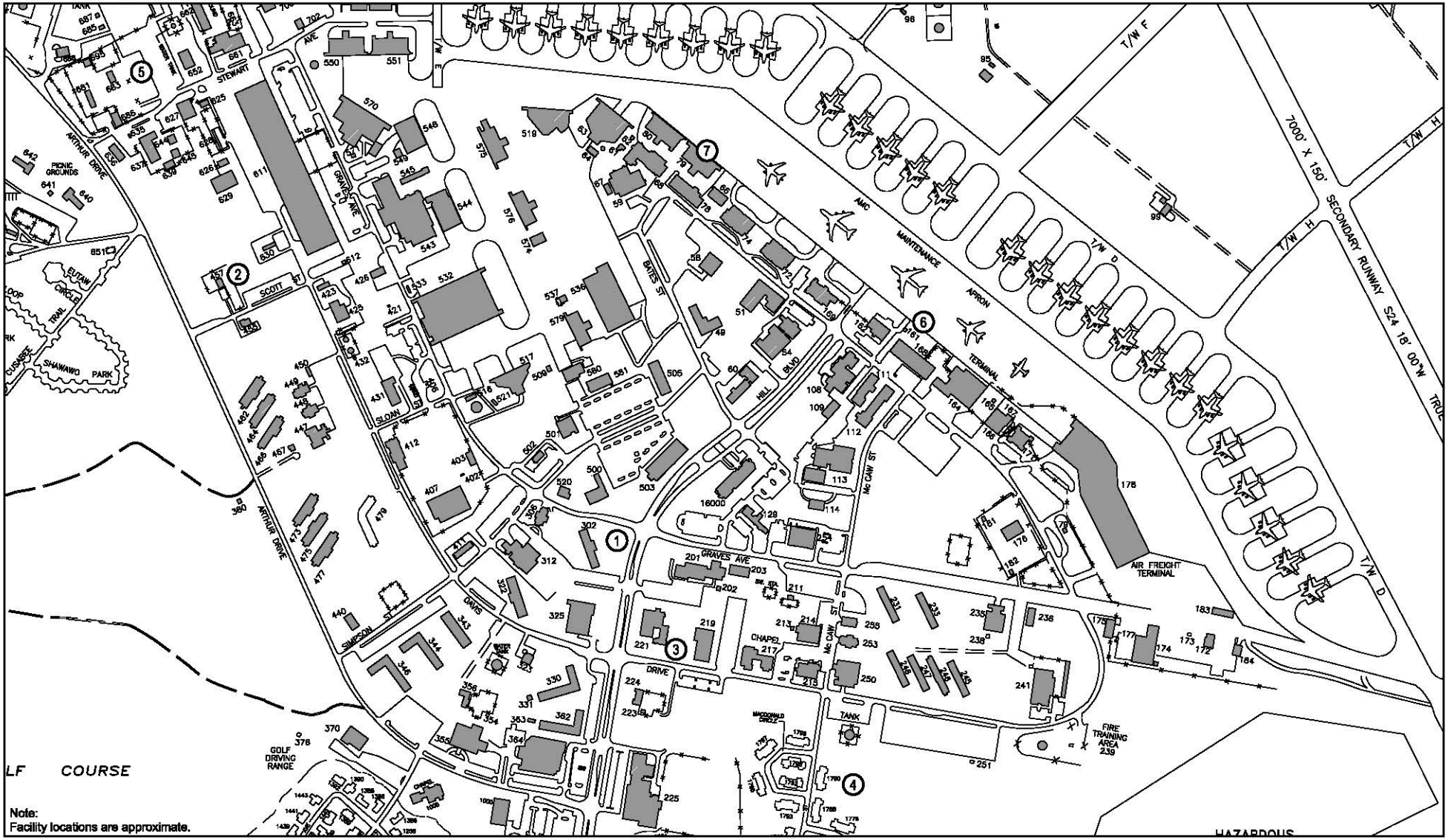
The other actions described in Subchapter 2.6.1 would apply to the Dover AFB Alternative Action cumulative condition.

2.7 IDENTIFICATION OF THE PREFERRED ALTERNATIVE

The preferred alternative for the basing action is the Dover AFB Proposed Action, which includes: basing 12 C-17 aircraft at Dover AFB; relocating 16 C-5 aircraft to another installation; using 22 MTRs for low-level navigation training; decreasing the number of personnel authorizations by 161 positions; and implementing seven facilities projects at the Base.

The preferred alternative for the northeastern United States LZ action is NAES Lakehurst, which includes constructing the LZ and then conducting C-17 operations on the LZ and at the airfield.

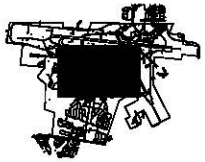
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Charleston Air Force Base

LEGEND

1. Alter/Repair Communications Facility
2. Construct New Dormitory
3. Alter/Repair Base Theater
4. Construct Child Development Center
5. Construct Base Civil Engine Contracting Complex
6. Construct Base Fire Station
7. Construct Flightline Support Facility



Location Map

N

0 800

Feet

Construction Project Locations, Charleston AFB Alternative Action Cumulative Condition

Figure 2.6.3-1

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2.8 COMPARISON OF ENVIRONMENTAL EFFECTS OF ALL ALTERNATIVES

Basing and Landing Zone Alternatives

Table 2.8-1 summarizes the impacts of the basing alternatives and Table 2.8-2 summarizes the impacts associated with the LZ alternatives. No significant impacts occur from the baseline activities at Dover, McGuire, or Charleston AFBs or NAES Lakehurst.

Cumulative Impacts

The CAA General Conformity Applicability Analyses prepared for the McGuire AFB Alternative Action and Dover AFB Proposed Action also included the emissions from the respective LZ alternative cumulative condition at the base. The McGuire AFB Alternative Action CAA General Conformity Applicability Analysis concluded that the net change in emissions for criteria pollutants for the McGuire AFB LZ Alternative cumulative condition would not be regionally significant, would exceed *de minimis* thresholds, would exceed the Base's emissions budget in the State Implementation Plan (SIP), and would require a Conformity Determination. Likewise, the Dover AFB Proposed Action CAA General Conformity Applicability Analysis concluded that the net change in emissions for criteria pollutants for the Dover AFB LZ Alternative cumulative condition would not be regionally significant, would exceed *de minimis* thresholds, and would require a Conformity Determination.

No cumulative impacts would occur to the other resources under the Dover AFB Proposed Action, McGuire AFB Alternative Action, Charleston AFB Alternative Action, Dover AFB Alternative Action, McGuire AFB LZ Alternative, or Dover AFB LZ Alternative.

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Table 2.8-1 Summary of Environmental Impacts for the Basing Alternatives

Resource (Applicable Sections)	Dover AFB Proposed Action	McGuire AFB Alternative Action	Charleston AFB Alternative Action	Dover AFB Alternative Action
Air Quality	**Dover AFB**. The greatest emissions for any of the criteria pollutants from construction activity would be 12.04 tons per year (tpy) for particulate matter equal to or less than 10 microns in aerodynamic diameter (PM_{10}), equating to 1.8 percent of the emissions inventory for the air quality control region (AQCR). The effects from construction emissions would be temporary, fall off rapidly with distance from the proposed construction site, and would not result in any long-term impacts. The greatest volume for any of the criteria pollutants from recurring aircraft operations would be 891.907 tpy for nitrogen oxides (NO_x), which equates to 12.93 percent of the baseline emissions within the AQCR. The Clean Air Act (CAA) General Conformity Applicability Analysis prepared in August 2004 concluded that the net change in emissions for criteria pollutants would not be regionally significant, would not exceed *de minimis* thresholds, and that a Conformity Determination would not be required. **MTRs**. Emissions from C-17 operations on the MTRs within the affected AQCRs would not be regionally significant.	**McGuire AFB**. The greatest emissions for any of the criteria pollutants from construction activity would be 14.06 tpy for NO_x, equating to 0.0156 percent of the emissions inventory for the AQCR. The effects from construction emissions would be temporary, fall off rapidly with distance from the proposed construction site, and would not result in any long-term impacts. The greatest volume for any of the criteria pollutants from recurring aircraft operations would be 1,594.219 tpy for carbon monoxide (CO), which equates to 3.17 percent of the baseline emissions within the AQCR. The CAA General Conformity Applicability Analysis prepared in August 2004 concluded that the net change in emissions for criteria pollutants would not be regionally significant, would exceed *de minimis* thresholds but not exceed the Base's emissions budget in the SIP, and that a Conformity Determination would not be required. **MTRs**. Emissions from C-17 operations on the MTRs within the affected AQCRs would not be regionally significant.	**Charleston AFB**. The greatest emissions for any of the criteria pollutants from construction activity would be 158.66 tpy for PM_{10}, equating to 4.53 percent of the emissions inventory for the AQCR. The effects from construction emissions would be temporary, fall off rapidly with distance from the proposed construction site, and would not result in any long-term impacts. The greatest volume for any of the criteria pollutants from recurring aircraft operations would be 725.03 tpy for NO_x, which equates to 1.78 percent of the baseline emissions within the AQCR. The emissions would not be considered regionally significant because the region is in attainment for all criteria pollutants and the General Conformity Rule is not applicable. **North Field**: The greatest volume for any of the criteria pollutants from recurring aircraft operations would be 1,324.46 tpy for NO_x, which equates to 5.43 percent of the baseline emissions within the AQCR. The emissions would not be considered regionally significant because the region is in attainment for all criteria pollutants and the General Conformity Rule is not applicable. **MTRs**. Emissions from C-17 operations on the MTRs within the affected AQCRs would not be regionally significant.	**Dover AFB**. The greatest emissions for any of the criteria pollutants from construction activity would be 12.12 tpy for PM_{10}, equating to 1.81 percent of the emissions inventory for the AQCR. The effects from construction emissions would be temporary, fall off rapidly with distance from the proposed construction site, and would not result in any long-term impacts. The greatest volume for any of the criteria pollutants from recurring aircraft operations would be 334.872 tpy for NO_x, which equates to 4.85 percent of the baseline emissions within the AQCR. The CAA General Conformity Applicability Analysis prepared in August 2004 concluded that the net change in emissions for criteria pollutants would not be regionally significant, would not exceed *de minimis* thresholds, and that a Conformity. **MTRs**. Emissions from C-17 operations on the MTRs within the affected AQCRs would not be regionally significant.

Table 2.8-1 Summary of Environmental Impacts for the Basing Proposed Action and Alternatives *(…continued)*

Resource (Applicable Sections)	Dover AFB Proposed Action	McGuire AFB Alternative Action	Charleston AFB Alternative Action	Dover AFB Alternative Action
Noise	**Dover AFB**. The number of people exposed to Day-Night Average Sound Level (DNL) 65 dBA and greater would decrease by 30 percent. It is anticipated there would be a corresponding decrease in the potential for sleep awakenings and speech disruption when compared to the baseline condition. Noise-induced hearing loss would not be anticipated. The interior noise levels in schools would be below the levels at which a marked increase in pauses and masking would occur and at which teaching would be impaired as a result of disruption of speech communication. Construction noise would be temporary, would occur only during daytime, and would cease when the project is completed. **MTRs**. The on-set rate adjusted monthly Day-Night Average Sound Level (L_{dnmr}) would range from a low of 40 dBA to a high of 62 dBA on the 22 MTRs, with the maximum increase being 17 dBA on one route. Noise from MTR operations would not exceed the level at which residential and other noise-sensitive land uses would be unacceptable. Noise from MTR operations would not exceed the level at which residential and other noise-sensitive land uses would be unacceptable. The hearing loss, speech interference, sleep disruption, and non-auditory health effects discussions for Dover AFB apply. No structural damage would be expected from C-17 operations on an MTR.	**McGuire AFB**. An additional 617 people (43 percent) (0.9 percent of the population within a 5-mile radius of the airfield) would be exposed to DNL 65 dBA and greater. The density of residences in the newly exposed area would be consistent with adjacent residential areas exposed to aircraft noise under the baseline condition. It is anticipated there would be a corresponding increase in the potential for sleep awakenings. About 0.1 percent of the additionally exposed population within five miles of the airfield could experience speech disruption from exposure to DNL 75 dBA and greater. Noise-induced hearing loss would not be anticipated. Construction noise would be temporary, would occur only during daytime, and would cease when the project is completed. **MTRs**. The L_{dnmr} would range from a low of 43 dBA to a high of 62 dBA on the 16 MTRs, increasing 3 dBA on five routes. Noise from MTR operations would not exceed the level at which residential and other noise-sensitive land uses would be unacceptable. The hearing loss, speech interference, sleep disruption, and non-auditory health effects discussions for McGuire AFB apply. No structural damage would be expected from C-17 operations on an MTR.	**Charleston AFB**. An additional 351 people (5 percent) would be exposed to DNL 65 dBA and greater. The density of residences in the newly exposed area would be consistent with adjacent residential areas exposed to aircraft noise under the baseline condition. It is anticipated there would be a corresponding increase in the potential for sleep awakenings and speech disruption when compared to the baseline condition. Noise-induced hearing loss would not be anticipated. The noise level at one school would continue to be above the level at which a marked increase in pauses and masking would occur and at which teaching would be impaired as a result of disruption of speech communication. Construction noise would be temporary, would occur only during daytime, and would cease when the project is completed. **North Field**. An additional 173 people (15 percent) would be exposed to DNL 65 dBA and greater. The density of residences in the newly exposed area would be consistent with adjacent residential areas exposed to aircraft noise under the baseline condition. It is anticipated there would be a corresponding increase in the potential for sleep awakenings and speech disruption when compared to the baseline condition. **MTRs**. The L_{dnmr} would range from a low of 24 dBA to a high of 67 dBA on one MTR, increasing 1 dBA on three of the 17 routes and remaining the same on the other 14 routes. Noise from MTR operations would not exceed the level at which residential and other noise-sensitive land uses would be unacceptable. The hearing loss, speech interference, sleep disruption, and non-auditory health effects discussions for Charleston AFB apply. No structural damage would be expected from C-17 operations on an MTR.	**Dover AFB**. The number of people exposed to DNL 65 dBA and greater would decrease by 88 percent. It is anticipated there would be a corresponding decrease in the potential for sleep awakenings and speech disruption when compared to the baseline condition. Noise-induced hearing loss would not be anticipated. The interior noise levels in schools would be below the levels at which a marked increase in pauses and masking would occur and at which teaching would be impaired as a result of disruption of speech communication. Construction noise would be temporary, would occur only during daytime, and would cease when the project is completed. **MTRs**. The L_{dnmr} would range from a low of 43 dBA to a high of 62 dBA on the 22 MTRs, with the maximum increase being 20 dBA on one route. Noise from MTR operations would not exceed the level at which residential and other noise-sensitive land uses would be unacceptable. Noise from MTR operations would not exceed the level at which residential and other noise-sensitive land uses would be unacceptable. The hearing loss, speech interference, sleep disruption, and non-auditory health effects discussions for Dover AFB apply. No structural damage would be expected from C-17 operations on an MTR.

Table 2.8-1 Summary of Environmental Impacts for the Basing Proposed Action and Alternatives *(…continued)*

Resource (Applicable Sections)	Dover AFB Proposed Action	McGuire AFB Alternative Action	Charleston AFB Alternative Action	Dover AFB Alternative Action
Hazardous Waste, Hazardous Materials, and Stored Fuels	The contractor would comply with all regulatory guidance for the use and disposal of hazardous materials and waste during construction activities. The primary waste producing processes would continue to include aircraft parts cleaning, fluid changes for routine aircraft and vehicle maintenance, aircraft corrosion control, facility, and infrastructure maintenance. It is not anticipated any new hazardous materials would be needed. Hazardous material procurement and hazardous waste generation could decrease by about eight percent, respectively. The existing hazardous materials handling and hazardous waste disposal processes and procedures would accommodate the activities associated with C-17 operation and maintenance. It is anticipated that the amount of fuel needed for operations could decrease by as much as 27 percent.	The contractor would comply with all regulatory guidance for the use and disposal of hazardous materials and waste during construction activities. It is not anticipated any new hazardous materials would be needed. McGuire AFB would continue to be a large-quantity hazardous waste generator and hazardous material procurement and hazardous waste generation could increase by as much as 21 percent due to the additional 12 aircraft. The existing hazardous waste management processes and procedures should accommodate the waste generated under the alternative. However, it may be necessary to increase waste storage capacity. If needed, McGuire AFB would revise existing guidance to incorporate alternative action activities. It is anticipated that the amount of fuel needed for operations could increase by as much as 17 percent, thereby requiring additional delivery of fuel via pipeline.	The contractor would comply with all regulatory guidance for the use and disposal of hazardous materials and waste during construction activities. It is not anticipated any new hazardous materials would be needed. Charleston AFB would continue to be a large-quantity hazardous waste generator and hazardous material procurement and hazardous waste generation could increase by as much as 25 percent due to the additional 12 aircraft. The existing hazardous waste management processes and procedures should accommodate the waste generated under the alternative. However, it may be necessary to increase waste storage capacity. If needed, Charleston AFB would revise existing guidance to incorporate alternative action activities. It is anticipated that the amount of fuel needed for operations could increase by as much as 25 percent, thereby requiring additional delivery of fuel via pipeline.	The Dover AFB Proposed Action summary applies, except that hazardous material procurement and hazardous waste generation could decrease by as much as 25 percent under the alternative. It is anticipated that the amount of fuel needed for operations could decrease by as much as 55 percent.
Water Resources	As indicated in Subchapter 1.4, water resources are not analyzed in detail in the EA.	The construction contractor would prepare and use a storm water pollution prevention plan with erosion control and spill control measures to minimize the potential for surface and groundwater quality degradation. The additional groundwater that would be withdrawn from the aquifer for the additionally assigned personnel would not cause the Base to exceed its permitted pumping amount.	As indicated in Subchapter 1.4, water resources are not analyzed in detail in the EA.	As indicated in Subchapter 1.4, water resources are not analyzed in detail in the EA.

Table 2.8-1 Summary of Environmental Impacts for the Basing Proposed Action and Alternatives *(…continued)*

Resource (Applicable Sections)	Dover AFB Proposed Action	McGuire AFB Alternative Action	Charleston AFB Alternative Action	Dover AFB Alternative Action
Biological Resources	**Dover AFB**. Construction, demolition, and renovation activities would occur within developed, maintained areas with highly modified and disturbed landscape that is now either paved or has lawns and landscaping. There would be no disturbance of high quality and/or native vegetation outside either the project or immediately adjacent areas. No endangered, threatened, or special status species are documented in the construction areas. **MTRs**. MTR overflights would be infrequent, random, and pose no threat to wildlife at the behavioral, population, or species level.	**McGuire AFB**. The Dover AFB Proposed Action summary applies to the alternative. Additionally, no project activities would occur within 300 feet of a wetland. **MTRs**. The Dover AFB Proposed Action summary applies to the alternative.	**Charleston AFB**. The Dover AFB Proposed Action summary applies to the alternative. **MTRs**. The Dover AFB Proposed Action summary applies to the alternative.	**McGuire AFB**. The Dover AFB Proposed Action summary applies to the alternative. **MTRs**. The Dover AFB Proposed Action summary applies to the alternative.
Socioeconomic Resources	There would be a decrease in the local and regional population of 364 persons (0.003 percent of the statistical area) as a result of the loss of 161 positions. It is anticipated that approximately 175 housing units (0.003 percent of the statistical area) would become vacant with the loss of personnel, with approximately 65 percent of these units being off-Base. There would be an enrollment decrease of approximately 110 children in local schools (0.016 percent in the district nearest the base). Employment generated by construction activities would result in wages paid, and expenditures for local and regional services and supplies during construction. The reduction of 161 personnel authorizations would result in a loss in wages paid, business sales, and income to the local and regional economy.	There would be an increase in the local and regional population of 1,500 persons (0.003 percent of the statistical area) as a result of a net gain of 631 positions. The current housing and apartment supply would accommodate the demand for approximately 602 housing units, which equates to 0.01 percent of the inventory in the county. Enrollment of the anticipated 430 additional students would equate to a five percent increase in local school districts. Employment generated by construction activities would result in wages paid, and increase expenditures for local and regional services and supplies during construction. The addition of 631 personnel authorizations would result in an increase in wages paid, business sales, and income to the local and regional economy.	There would be an increase in the local and regional population of 1,500 persons (0.002 percent of the statistical area) as a result of a net gain of 631 positions. The current housing and apartment supply would accommodate the demand for approximately 602 housing units, which equates to 0.002 percent of the inventory in the local area. Enrollment of the anticipated 430 additional students would equate to less than a one percent increase in local school districts. Employment generated by construction activities would result in wages paid, and increase expenditures for local and regional services and supplies during construction. The addition of 631 personnel authorizations would result in an increase in wages paid, business sales, and income to the local and regional economy..	There would be a decrease in the local and regional population of 727 persons (0.006 percent of the statistical area) as a result of the loss of 322 positions. It is anticipated that approximately 350 housing units (0.007 percent of the statistical area) would become vacant with the loss of personnel, with approximately 65 percent of these units being off-Base. There would be an enrollment decrease of approximately 220 children in local schools (0.032 percent in the district nearest the base). Employment generated by construction activities would result in wages paid, and expenditures for local and regional services and supplies during construction. The reduction of 322 personnel authorizations would result in a loss in wages paid, business sales, and income to the local and regional economy.

Table 2.8-1 Summary of Environmental Impacts for the Basing Proposed Action and Alternatives *(…continued)*

Resource (Applicable Sections)	Dover AFB Proposed Action	McGuire AFB Alternative Action	Charleston AFB Alternative Action	Dover AFB Alternative Action
Cultural Resources	**Dover AFB**: Dover AFB accomplished Section 106 consultation with the Delaware State Historic Preservation Office (SHPO). The SHPO concurred with the Dover AFB determination that the Proposed Action would not cause any adverse effects to properties on the Base or within the area of potential effect. **MTRs**. As indicated in Subchapter 1.4, cultural resources analysis for MTRs was limited to Native American interests. The Air Force consulted with Native American tribes pursuant to 36 CFR 800.2 and replied to Native American groups concerning the proximity of their reservation to MTRs.	**McGuire AFB**: No NRHP-eligible archaeological or historical resources are located within or adjacent to the project sites. **MTRs**. As indicated in Subchapter 1.4, cultural resources analysis for MTRs was limited to Native American interests. The Air Force consulted with Native American tribes pursuant to 36 CFR 800.2 and replied to Native American groups concerning the proximity of their reservation to MTRs.	As indicated in Subchapter 1.4, cultural resources are not analyzed in detail in the EA. **MTRs**. Cultural resources analysis for MTRs was limited to Native American interests. The Air Force consulted with Native American tribes pursuant to 36 CFR 800.2 and replied to Native American groups concerning the proximity of their reservation to MTRs.	The Dover AFB Proposed Action summary applies to the alternative.
Land Use	**Dover AFB**. Facility construction would be consistent with existing and future land use plans and programs identified in the Dover AFB General Plan. No additional off-Base areas would be exposed to aircraft noise and no additional land use incompatibilities would be anticipated based on the current Air Installation Compatible Land Use (AICUZ) Study. **MTRs**. No significant impacts to sensitive land uses would occur because the noise levels would be below the DNL noise/land use compatibility guidelines.	**McGuire AFB**. Facility construction would be consistent with existing and future land use plans and programs identified in the McGuire AFB General Plan. Off-Base areas would experience a slight increase in exposure to aircraft noise. The additionally exposed areas would be consistent with existing land use in the area because other residences occur in these noise zones under the baseline condition. **MTRs**. No significant impacts to sensitive land uses would occur because the noise levels would be below the DNL noise/land use compatibility guidelines.	**Charleston AFB**. Facility construction would be consistent with existing and future land use plans and programs identified in the Charleston AFB General Plan. Off-Base areas would experience a slight increase in exposure to aircraft noise. However, no additional land use incompatibilities would be anticipated based on the current AICUZ Study. **North Field**: Off-installation noise exposure would increase slightly. However, the slight increases would not impact existing land uses. **MTRs**. No significant impacts to sensitive land uses would be anticipated due to the slight increase in noise levels or additional overflights from the proposed operations.	The summary for the Dover AFB Proposed Action applies to the alternative.

Table 2.8-1 Summary of Environmental Impacts for the Basing Proposed Action and Alternatives *(…continued)*

Resource (Applicable Sections)	Dover AFB Proposed Action	McGuire AFB Alternative Action	Charleston AFB Alternative Action	Dover AFB Alternative Action
Infrastructure and Utilities	There would be a 2.06 percent reduction in water consumption when compared to the baseline condition due to the 161 fewer personnel. Use of water for dust control equates to about 2.2 percent of system capacity. Wastewater generation would be reduced by 0.13 percent reduction when compared to the baseline condition. The 0.89 percent increase in impervious cover likely would increase flow in the storm water system. The electricity and natural gas distribution systems capacities can accommodate the respective 1.44 and 1.21 percent increases in consumption for the new buildings. The disposal of construction and demolition debris equates to 1.42 percent of the total remaining landfill capacity. Solid waste generation by personnel would decrease slightly due to the reduction in assigned personnel. The net loss of 161 personnel (2 percent of baseline assigned personnel) would result in a very slight decrease in weekday on-Base roadway volumes.	There would be a 5.12 percent increase in water consumption when compared to the baseline condition due to the addition of 631 personnel. The resultant water use would be about 89 percent of the state-permitted use. Use of water for dust control equates to about 1.4 percent of the permitted use. Wastewater generation would increase by 0.65 percent when compared to the baseline condition. The 0.31 percent increase in impervious cover likely would increase flow in the storm water system. The electricity and natural gas distribution systems capacities can accommodate the respective 4.14 and 4.10 percent increases in consumption for the new buildings. The disposal of construction and demolition debris equates to 0.19 percent of the total remaining landfill capacity. Solid waste generation by personnel would increase slightly due to the increase in assigned personnel. The net increase of 631 personnel (5 percent of baseline assigned personnel) would result in an increase in weekday on-Base roadway volumes.	There would be an 8.0 percent increase in water consumption when compared to the baseline condition due to the addition of 631 personnel. Use of water for dust control equates to about 0.48 percent the baseline daily consumption. Wastewater generation would increase by 3.17 percent when compared to the baseline condition. The 0.05 percent increase in impervious cover likely would increase flow in the storm water system. The electricity and natural gas distribution systems capacities can accommodate the respective 0.62 and 0.63 percent increases in consumption for the new buildings. The disposal of construction and demolition debris equates to 0.46 percent of the total remaining landfill capacity. Solid waste generation by personnel would increase slightly due to the increase in assigned personnel. The net increase of 631 personnel (8 percent of baseline assigned personnel) would result in an increase in weekday on-Base roadway volumes.	There would be a 4.11 percent reduction in water consumption when compared to the baseline condition due to the 322 fewer personnel. Use of water for dust control equates to about 2.2 percent of system capacity. Wastewater generation would be reduced by 0.2 percent reduction when compared to the baseline condition. The 0.89 percent increase in impervious cover likely would increase flow in the storm water system. The electricity and natural gas distribution systems capacities can accommodate the respective 1.68 and 1.42 percent increases in consumption for the new buildings. The disposal of construction and demolition debris equates to 1.43 percent of the total remaining landfill capacity. Solid waste generation by personnel would decrease slightly due to the reduction in assigned personnel. The net loss of 322 personnel (4 percent of baseline assigned personnel) would result in a very slight decrease in weekday on-Base roadway volumes.

Table 2.8-1 Summary of Environmental Impacts for the Basing Proposed Action and Alternatives *(…continued)*

Resource (Applicable Sections)	Dover AFB Proposed Action	McGuire AFB Alternative Action	Charleston AFB Alternative Action	Dover AFB Alternative Action
Airspace and Airfield Operations	**Dover AFB**. C-17 aircrews would accomplish tactical events such as arrivals and departures in which the aircraft may spiral up to about 5,000 feet AGL during a departure or down from that altitude on an arrival to a landing. The air traffic control tower and Dover AFB Radar Approach Control (RAPCON) would establish procedures for these tactical events since they start in one airspace unit (*i.e.*, either tower or RAPCON) and end in the other (*i.e.*, either tower or RAPCON). The volume of traffic in the airspaces in which the tactical arrivals and departures would be accomplished would not preclude establishment of the procedures to allow execution of the events. Thus, the airspace has the capacity to accommodate the additional air traffic control procedures needed for the combination of the C-17 airfield operations. Airfield operations would decrease by 62.63 average daily operations. **MTRs**. Each MTR has the capacity to accommodate the additional operations and the structure for each route can support C-17 operations. The potential for conflict between aircraft operating on the MTRs and other civil aircraft operating in the airspace around the MTRs is low because the existing scheduling and air traffic control procedures are designed to deconflict aircraft. **Aircraft Safety**: The probability is low that an aircraft involved in an accident at or around the Dover AFB airfield or on a MTR would strike a person or structure on the ground. **Bird-Aircraft Strike Hazard**: The potential for bird-aircraft strikes associated with airfield operations at Dover AFB would be expected to decrease from the annual average of 41 strikes to 30 strikes. It is anticipated that about 3 bird-aircraft strikes would occur annually from Dover AFB C-17 MTR operations.	**McGuire AFB**. The existing aircraft ground tracks, pattern altitudes, and instrument approach procedures, as well as the air traffic control procedures, are compatible with the requirements associated with the additional 80.12 average daily C-17 operations. **MTRs and Aircraft Safety**. The airspace management and procedures and aircraft safety discussion and analysis for the Dover AFB Proposed Action apply to the alternative. **Bird-Aircraft Strike Hazard**: The potential for bird-aircraft strikes associated with airfield operations at McGuire AFB would be expected to increase from the annual average of 79 strikes to 108 strikes. It is anticipated that about 6 bird-aircraft strikes would occur annually from McGuire AFB C-17 MTR operations.	**Charleston AFB**. The existing aircraft ground tracks, pattern altitudes, and instrument approach procedures, as well as the air traffic control procedures, are compatible with the requirements associated with the additional 22.99 average daily C-17 operations. **North Field**: The existing aircraft ground tracks, pattern altitudes, and instrument approach procedures, as well as the air traffic control procedures, are compatible with the requirements associated with the additional 53.48 average daily C-17 operations. **MTRs and Aircraft Safety**. The airspace management and procedures and aircraft safety discussion and analysis for the Dover AFB Proposed Action apply to the alternative. **Bird-Aircraft Strike Hazard**: The potential for bird-aircraft strikes associated with airfield operations at Charleston AFB would be expected to increase from the annual average of 32 strikes to 40 strikes. It is anticipated that about 3 bird-aircraft strikes would occur annually from Charleston AFB C-17 MTR operations.	**Dover AFB**. The summary for the Dover AFB Proposed Action applies. Airfield operations would decrease by 93.47 average daily operations. **MTRs and Aircraft Safety**. The airspace management and procedures and aircraft safety discussion and analysis for the Dover AFB Proposed Action apply to the alternative. **Bird-Aircraft Strike Hazard**: The potential for bird-aircraft strikes associated with airfield operations at Dover AFB would be expected to decrease from the annual average of 41 strikes to 19 strikes. It is anticipated that about 6 bird-aircraft strikes would occur annually from Dover AFB C-17 MTR operations.

Table 2.8-1 Summary of Environmental Impacts for the Basing Proposed Action and Alternatives *(…continued)*

Resource (Applicable Sections)	Dover AFB Proposed Action	McGuire AFB Alternative Action	Charleston AFB Alternative Action	Dover AFB Alternative Action
Environmental Management	The activities associated with the action would be accomplished using existing directives and would not impact achieving pollution prevention goals. The demolition contractor would be responsible for asbestos containing material (ACM) and lead-based paint (LBP) removal, which would be accomplished in accordance with existing guidance. The proposed facilities would be constructed or renovated without any ACM and LBP. Facilities design and construction activities would be coordinated with the Base Environmental Flight and Bioenvironmental Engineering to ensure that construction would avoid interference with any ongoing Environmental Restoration Program (ERP) investigation and remediation work and would not worsen the condition of any site.	The pollution prevention, ACM, and LBP summary for the Dover AFB Proposed Action applies to the alternative. Construction of the 2-bay C-17 hangar, the addition to the aerospace ground equipment facility, and the four C-17 parking spots would occur adjacent to ERP sites ST-22 and SS-30. It is possible that ground water could be encountered during construction since the water occurs at depths of two to four feet below the ground surface. The Dover AFB Proposed Action discussion about facility construction activities and ERP sites applies to the McGuire AFB Alternative Action.	The pollution prevention, ACM, and LBP summary for the Dover AFB Proposed Action applies to the alternative. Construction of the two squadron operations/aircraft maintenance facilities would occur adjacent to an ERP site. It is possible that ground water could be encountered during construction since the water occurs at depths of six feet below the ground surface. The Dover AFB Proposed Action discussion about facility construction activities and ERP sites applies to the Charleston AFB Alternative Action. Charleston AFB would seek a Finding of Consistency from the South Carolina Department of Health and Environmental Control, Office of Ocean and Coastal Resource Management before proceeding with the Alternative Action.	The summary for the Dover AFB Proposed Action applies to the alternative.

Table 2.8-2 Summary of Environmental Impacts for the Landing Zone Alternatives

Resource (Applicable Sections)	McGuire AFB LZ Alternative	Dover AFB LZ Alternative	NAES Lakehurst LZ Alternative
Air Quality)	The greatest emissions for any of the criteria pollutants from construction activity would be 16.76 tpy for NO_x, equating to 0.02 percent of the emissions inventory for the AQCR. The effects from construction emissions would be temporary, fall off rapidly with distance from the proposed construction site, and would not result in any long-term impacts. The greatest volume for any of the criteria pollutants from recurring aircraft operations would be 1,693.899 tpy for CO, which equates to 3.37 percent of the baseline emissions within the AQCR. The CAA General Conformity Applicability Analysis prepared in August 2004 concluded that the net change in emissions for criteria pollutants would not be regionally significant, would exceed *de minimis* thresholds, would exceed the Base's emissions budget in the SIP, and would require a Conformity Determination. If selected as the preferred LZ alternative, the Air Force would coordinate with the NJDEP to establish General Conformity budgets that ensure the air emissions from the McGuire AFB LZ Alternative conform to the New Jersey State Implementation Plan for attainment of the Ozone National Ambient Air Quality Standard. It is anticipated the coordination process would be completed before this EA is finalized and that, with inclusion of the emissions in the budget, the emissions from the McGuire AFB LZ Alternative would positively conform to the applicable SIP.	The greatest emissions for any of the criteria pollutants from construction activity would be 17.08 tpy for PM_{10}, equating to 2.55 percent of the emissions inventory for the AQCR. The effects from construction emissions would be temporary, fall off rapidly with distance from the proposed construction site, and would not result in any long-term impacts. The greatest volume for any of the criteria pollutants from recurring aircraft operations would be 1,493.747 tpy for NO_x, which equates to 21.65 percent of the baseline emissions within the AQCR. The CAA General Conformity Applicability Analysis prepared in August 2004 concluded that the net change in emissions for criteria pollutants would not be regionally significant, would not exceed *de minimis* thresholds, and that a Conformity Determination would not be required.	The greatest emissions for any of the criteria pollutants from construction activity would be 206.27 tpy for PM_{10}, equating to 16.00 percent of the emissions inventory for the AQCR. The effects from construction emissions would be temporary, fall off rapidly with distance from the proposed construction site, and would not result in any long-term impacts. The greatest volume for any of the criteria pollutants from recurring aircraft operations would be 680.25 tpy for NO_x, which equates to 6.80 percent of the baseline emissions within the AQCR. The Air Force and the Navy consulted with the New Jersey Department of Environmental Protection (NJDEP) and the United States Environmental Protection Agency (USEPA) to include the NAES Lakehurst LZ Alternative in the SIP to meet the requirements under the General Conformity Rule. The NJDEP agreed to include the NAES Lakehurst LZ Alternative in the 8-hour Attainment Demonstration SIP, which will be submitted to the USEPA in June 2007. Additionally, the NJDEP agreed to provide NAES Lakehurst with a facility-wide emissions budget for VOC and NO_X emissions in the 8-hour Attainment Demonstration. The result of the consultation process is that a Conformity Determination would not be required.

Table 2.8-2 Summary of Environmental Impacts for the Landing Zone Alternatives *(…continued)*

Resource (Applicable Sections)	McGuire AFB LZ Alternative	Dover AFB LZ Alternative	NAES Lakehurst LZ Alternative
Noise	An additional 12,399 (18.0 percent of the population within a 5-mile radius of the airfield) would be exposed to DNL 65 dBA and greater. The density of residences in the newly exposed area would be consistent with adjacent residential areas exposed to aircraft noise under the baseline condition. It is anticipated there would be a corresponding increase in the potential for sleep awakenings. About 0.5 percent of the additionally exposed population within five miles of the airfield could experience speech disruption from exposure to DNL 75 dBA and greater. Noise-induced hearing loss would not be anticipated. Construction noise would be temporary, would occur only during daytime, and would cease when the project is completed.	**Location A**: The number of people exposed to DNL 65 dBA and greater would decrease by 19 percent. It is anticipated there would be a corresponding decrease in the potential for sleep awakenings and speech disruption when compared to the baseline condition. Noise-induced hearing loss would not be anticipated. The interior noise levels in schools would be below the levels at which a marked increase in pauses and masking would occur and at which teaching would be impaired as a result of disruption of speech communication. Construction noise would be temporary, would occur only during daytime, and would cease when the project is completed. **Location B:** The number of people exposed to DNL 65 dBA and greater would decrease by 22 percent. The summary for Location A applies to Location B.	The noise contours would increase in all directions from the airfield. An additional 605 people, representing about 6 percent of the population living within the airfield airspace, would be exposed to DNL 65 dBA or greater. This could result in an additional 61 people being awakened as compared to the existing, or "baseline," condition. Noise-induced hearing loss would not be anticipated from airfield operations associated with the NAES Lakehurst LZ alternative. The potential exists for a slight increase in speech pauses and masking at two schools experiencing increased noise levels.

Table 2.8-2 Summary of Environmental Impacts for the Landing Zone Alternatives *(…continued)*

Resource (Applicable Sections)	McGuire AFB LZ Alternative	Dover AFB LZ Alternative	NAES Lakehurst LZ Alternative
Biological Resources	McGuire AFB would consult with the state on an informal basis to avoid an adverse effect to any of the five species state-listed rare species that might be encountered during LZ construction. McGuire AFB also would consult with the state and the Pinelands Commission to coordinate construction within a wetland since the proposed LZ site is within a wetland. Work within the wetlands would require a Section 404/401 permit from the United States Army Corps of Engineers. Construction would be conducted in accordance with permit conditions.	Upland sandpipers, a state-listed endangered species, have been observed at the proposed LZ location. The loss of habitat likely would reduce the number of nesting birds and therefore, the potential for successful breeding. However, past and current mowing practices to reduce the potential for bird-aircraft strikes also have limited the potential for increasing the numbers of the species. Other areas of the base where the bird has been observed would continue to provide habitat for the species. Thus, while there could be a decrease in upland sandpipers at the base due to the loss of habitat, it is likely that the species would not be eliminated from the Base due to construction of the LZ and that the reduction in numbers of the upland sandpiper would not be significant. Dover AFB would consult with the state on an informal basis to avoid an adverse effect to any state-listed species that might be encountered during LZ construction.	The approximate eight acres of grassland that would be converted to the LZ equates to about 0.5 percent of the total grassland area at NAES Lakehurst. NAES Lakehurst would create or enhance an equal area of grassland in other areas of the Station to offset the loss of grassland due to construction of the LZ. Therefore, there would be no net loss of habitat. Disturbance to habitat would be temporary, lasting only as long as it takes to establish the grasslands. Establishing habitat in other areas of the Station that would be more distant from the airfield would have a beneficial effect because the increased distance would reduce the potential for bird-aircraft strikes and disturbance from airfield operations. No activities would occur in wetlands.
Cultural Resources	The LZ would be built on a portion of the airfield previously disturbed during construction of the airfield. No NRHP-eligible archaeological or historical resources are located within or adjacent to the project site.	The summary for the McGuire AFB LZ Alternative applies.	As indicated in Subchapter 1.4, cultural resources are not analyzed in detail in the EA.
Land Use	The LZ construction would be consistent with existing and future land use plans and programs identified in the McGuire AFB General Plan. Off-Base areas would experience an increase in exposure to aircraft noise. The additionally exposed areas would be consistent with existing land use in the area because other residences occur in these noise zones under the baseline condition. No significant land use incompatibilities would occur from establishment of the imaginary surfaces associated with the LZ. The McGuire AFB AICUZ Study would be updated to reflect the LZ imaginary surfaces.	The LZ construction would be consistent with existing and future land use plans and programs identified in the Dover AFB General Plan. Some off-Base areas not previously exposed to DNL 65 dBA and greater would be exposed to noise at this level. The additionally exposed areas would be consistent with existing land use in the area because other residences occur in these noise zones under the baseline condition. No significant land use incompatibilities would occur from establishment of the imaginary surfaces associated with the LZ. The Dover AFB AICUZ Study would be updated to reflect the LZ imaginary surfaces.	The construction would be consistent with existing and future land use plans and programs identified in the NAES Lakehurst Vision Plan. The areas exposed to aircraft noise include the wildlife management areas to the north and south of the installation and industrial land to the northeast. Based on the current land uses, no significant impacts to land uses would occur because of the increased noise levels from aircraft operations. No impacts to land ownership or the existing function of the land uses would occur. The NAES Lakehurst AICUZ Study would be updated to reflect the LZ imaginary surfaces.

Table 2.8-2 Summary of Environmental Impacts for the Landing Zone Alternatives *(…continued)*

Resource (Applicable Sections)	McGuire AFB LZ Alternative	Dover AFB LZ Alternative	NAES Lakehurst LZ Alternative
Airspace and Airfield Operations	**McGuire AFB**. C-17 aircrews would accomplish tactical events such as arrivals and departures at the LZ in which the aircraft may spiral up to about 5,000 feet AGL during a departure or down from that altitude on an arrival to a landing. The air traffic control tower and McGuire AFB RAPCON would establish procedures for these tactical events since they start in one airspace unit (*i.e.*, either tower or RAPCON) and end in the other (*i.e.*, either tower or RAPCON). The volume of traffic in the airspaces in which the tactical arrivals and departures would be accomplished would not preclude establishment of the procedures to allow execution of the events. Thus, the airspace has the capacity to accommodate the additional air traffic control procedures needed for the combination of the C-17 LZ operations and the airfield operations. The airfield has the capacity to accommodate the anticipated 419.87 daily operations. **Aircraft Safety**: The probability is low that an aircraft involved in an accident at or around the McGuire AFB airfield would strike a person or structure on the ground. **Bird-Aircraft Strike Hazard**: The potential for bird-aircraft strikes associated with airfield operations at McGuire AFB would be expected to increase from the annual average of 79 strikes to 168 strikes.	**Dover AFB**. The airspace summary for the McGuire AFB LZ Alternative applies to the alternative. The airfield has the capacity to accommodate the anticipated 289.91 daily operations. **Aircraft Safety**: The probability is low that an aircraft involved in an accident at or around the Dover AFB airfield would strike a person or structure on the ground. **Bird-Aircraft Strike Hazard**: The potential for bird-aircraft strikes associated with airfield operations at Dover AFB would be expected to increase from the annual average of 41 strikes to 71 strikes.	**NAES Lakehurst**. The airspace summary for the McGuire AFB LZ Alternative applies to the alternative. The airfield has the capacity to accommodate the anticipated 234.65 daily operations. **Aircraft Safety**: The probability is low that an aircraft involved in an accident at or around the NAES Lakehurst airfield would strike a person or structure on the ground. **Bird-Aircraft Strike Hazard**: The potential for bird-aircraft strikes associated with airfield C-17 operations at NAES Lakehurst could be as high as 61 annual strikes.
Environmental Management	The summary for the McGuire AFB Alternative Action for aircraft basing applies.	The summary for the Dover AFB Proposed Action for aircraft basing applies.	As indicated in Subchapter 1.4, environmental management is not analyzed in detail in the EA.

CHAPTER 3
AFFECTED ENVIRONMENT

This chapter describes the existing environmental resources that could be affected by or could affect the No Action Alternative, the Proposed and Alternative Actions, and the LZ alternatives. Only those specific resources identified in the scope of the environmental review (Subchapter 1.4) are described in detail.

3.1 DOVER AFB

3.1.1 Introduction

The 436th Airlift Wing (436 AW) is the host unit at Dover AFB and reports to the Air Mobility Command, headquartered at Scott AFB, Illinois. The mission of the 436 AW is to "Provide combat ready professionals and equipment to enhance global reach for America." During wartime, the 436 AW is responsible for deployment and resupply of the major combat units of the United States. The 436 AW also provides administrative, logistical, and medical support to 436 AW units, tenant agencies, and retirees and their families who live in the Dover community. Major tenant units at Dover AFB include the 512th Airlift Wing (AFRC) (512 AW), a Reserve Associate unit, the Air Force Office of Special Investigations, the Army and Air Force Exchange Service, and the Defense Commissary Agency.

3.1.2 Air Quality

3.1.2.1 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 ($\mu g/m^3$). 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 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. Those criteria pollutants are usually referred to as pollutants for which the USEPA established National Ambient Air Quality Standards (NAAQS). The ceilings were based on the latest scientific information regarding effects 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 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 effects to a pollutant.

Air quality standards are currently in place for six pollutants or "criteria" pollutants: carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), sulfur oxides (SO_x, measured as sulfur dioxide [SO_2]), lead (Pb), and particulate matter with an aerodynamic diameter less than or equal to 10 micrometers (PM_{10}). There are many suspended particles in the atmosphere with aerodynamic diameters larger than 10 micrometers. The collective of all particle sizes is commonly referred to as total suspended particulates (TSP). TSP is defined as particulate matter as measured by 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 establishment of emission limitations by the states for pollutants USEPA determines to be a danger to public health or welfare.

Ozone (ground-level ozone), 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 VOC. NO_x is the designation given to the group of all oxygenated nitrogen species, including nitric oxide (NO), NO_2, nitrous oxide (N_2O), and others. However, only NO, NO_2, and N_2O 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 (CO_2), and carbonic acid. Some VOCs are considered non-reactive under atmospheric conditions and include methane, ethane, and several other organic compounds.

As noted above, O_3 is a secondary pollutant and is not directly emitted from common emissions sources. Therefore, to control O_3 in the atmosphere, the effort is made to control NO_x and VOC emissions. For this reason, NO_x and VOC emissions are calculated and reported in emission inventories.

The CAA does not make the NAAQS directly enforceable. However, it does require each state to establish 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. The ambient air quality standards for Delaware are contained in the Delaware Department of Natural Resources and Environmental Control, Division of Air and Waste Management, Air Quality Management Regulations, Regulation Number 3 – Ambient Air Quality Standards. Table 3.1.2-1 lists the national and Delaware ambient air quality standards.

Table 3.1.2-1 National and Delaware Ambient Air Quality Standards

Criteria Pollutant	Averaging Time	Primary NAAQS	Secondary NAAQS	Delaware Standards
Carbon Monoxide	8-hour	9 ppm (10,000 µg/m3)	No Standard	9 ppm (10,000 µg/m3)
	1-hour	35 ppm (40,000 µg/m3)	No Standard	35 ppm (40,000 µg/m3)
Lead	Quarterly	1.5 µg/m3	1.5 µg/m3	1.5 µg/m3
	30 Day Average	No Standard	No Standard	No Standard
Nitrogen Oxides (measured as NO_2)	Annual	0.0543 ppm (100 µg/m3)	0.0543 ppm (100 µg/m3)	0.0543 ppm (100 µg/m3)
	1-hour	No Standard	No Standard	No Standard
Ozone	8-hour	0.08 ppm (157 µg/m3)	0.08 ppm (157 µg/m3)	0.08 ppm (157 µg/m3)
	1-hour	0.12 ppm (235 µg/m3)	0.12 ppm (235 µg/m3)	0.12 ppm (235 µg/m3)
Particulate Matter (measured as PM_{10})	Annual	50 µg/m3	50 µg/m3	50 µg/m3
	24-hour	150 µg/m3	150 µg/m3	150 µg/m3
Sulfur Oxides (measured as SO_2)	Annual	0.03 ppm (80 µg/m3)	No Standard	0.03 ppm (80 µg/m3)
	24-hour	0.14 ppm (365 µg/m3)	No Standard	0.14 ppm (365 µg/m3)
	3-hour	No Standard	0.50 ppm (1,300 µg/m3)	No Standard

3.1.2.2 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 in compliance with the NAAQS (attainment);
- Those that do not 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 O_3, CO, and PM_{10}, 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 Delaware Department of Natural Resources and Environmental Control has regulatory authority for air pollution control in the State of Delaware. Two counties comprise the Southern Delaware Intrastate AQCR (AQCR 46), the AQCR in which Dover AFB is

located. According to federal regulations (40 CFR 81.308), both counties are classified as described in the following paragraphs.

Sulfur dioxide. AQCR 46 has been designated as better than national standards.

Particulate matter. Limited monitoring has been accomplished for PM_{10} in Delaware. Based upon the results of monitoring, all of Delaware is in attainment for PM_{10}; however, there is no information concerning PM_{10} in 40 CFR 81.308 for any part of Delaware.

Carbon monoxide. AQCR 46 has been designated unclassified/attainment for CO.

Nitrogen dioxide. AQCR 46 has been designated as cannot be classified or better than national standards.

Ozone. On April 15, 2004, USEPA issued the first 8-hour ozone designations. Prior to that date, ozone attainment designations were determined by the 1-hour ozone standard of 0.12 ppm. The new 8-hour standard became effective 60 days after promulgation (June 15, 2004), while the existing 1-hour standard, for most purposes, remains in effect until USEPA determines an area has air quality meeting the 1-hour standard.

In relation to General Conformity, the proper *de minimis* threshold to use to determine conformity depends upon when the federal action begins. Actions beginning before June 15, 2005 must meet the 1-hour ozone *de minimis* threshold. Actions beginning on or after June 15, 2005 must meet the 8-hour ozone *de minimis* threshold. Since this Proposed Action is scheduled to start in calendar year 2006, the 8-hour ozone threshold applies.

In 1990, Kent County was classified as severe-15 nonattainment for the federal 1-hour ozone NAAQS. An area designated as severe-15 has a design value of 0.180 up to 0.190 ppm and has 15 years to attain that value. For the past 5 years, the 1-hour ozone standard in Kent County has been exceeded every year except in 2002 when no exceedances were recorded. According to 40 CFR 81.308, AQCR 46 remains designated as a severe-15 nonattainment area for ozone.

In 1997, the USEPA promulgated the 8-hour ozone standard. Kent County has exceeded this standard every year since its inception. The lowest number of exceedances recorded was five in 2000. According to 40 CFR 81.308, AQCR 46 has been designated as moderate nonattainment for the 8-hour ozone standard.

3.1.2.3 Baseline Air Emissions

Dover AFB

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 (lbs) per year or tons per year (tpy). All emissions sources may be categorized as either mobile or stationary.

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 1999 air emissions inventory summary for AQCR 46, which includes reported permitted stationary, mobile, and grandfathered air emissions sources, is presented in Table 3.1.2-2. Dover AFB emissions are included in the AQCR 46 summary. Table 3.1.2-3 lists the emissions calculated for the Dover AFB C-5 aircraft operations activities in AQCR 46. The data in Table 3.1.2-2 are used as the baseline for air emissions analysis in this EA.

Table 3.1.2-2 Air Emissions Inventory, Southern Delaware Intrastate Air Quality Control Region (AQCR 46)

Criteria Air Pollutant	CO (tpy)	VOC (tpy)	NOx (tpy)	SOx (tpy)	PM10 (tpy)
AQCR 46 CY99 Emissions Inventory	430	2,730	6,900	28,770	670

Note: VOC is not an air pollutant criterion. However, VOC is reported because, as an O_3 precursor, it is a controlled pollutant. Data are reflected as tpy.

Source: AIRData 2004.

Table 3.1.2-3 Emissions from Dover AFB Aircraft Operations Activities in AQCR 46

Activity	CO (tpy)	VOC (tpy)	NOx (tpy)	SOx (tpy)	PM10 (tpy)
Airfield Operations	133.000	48.000	1,326.000	0.000	61.000
AGE Operation	1.123	0.315	3.949	0.448	0.254
Aircraft Trim/Power Checks	11.000	3.000	91.000	0.000	4.000
Total	145.823	51.315	1,420.949	0.448	65.254

Note: VOC is not an air pollutant criterion. However, VOC is reported because, as an ozone precursor, it is a controlled pollutant. Data reflected as tons per year.

Military Training Routes

The MTRs proposed for use occur within Delaware, Kentucky, Maryland, North Carolina, New Jersey, New York, Pennsylvania, South Carolina, Tennessee, Virginia, Vermont, and West Virginia. Table 3.1.2-4 lists the emissions inventory for the air basin, as well as the attainment status for each AQCR. The data in this table are used as the baseline for air emissions analysis in this EA. Proposed Action MTRs also occur in AQCR 46. Table 3.1.2-2 contains the emissions inventory for that air basin. Dover AFB aircrews did not accomplish MTR operations under the baseline condition. Therefore, there are no baseline emissions from Dover AFB operations on the MTRs.

Table 3.1.2-4 Baseline Air Emissions Inventories for Air Quality Control Regions Associated with Dover AFB Proposed Action, McGuire AFB Alternative Action, and Dover AFB Alternative Action Military Training Routes

AQCR	CO (tpy)	VOC (tpy)	NO_X (tpy)	SO_X (tpy)	PM_{10} (tpy)	Attainment Status
AQCR 45	50,300	**45,780**	**89,880**	101,050	12,600	nonattainment
AQCR 47	2,880	**1,100**	**47,970**	111,340	2,150	nonattainment
AQCR 101	1,104	808	3,535	666	2,597	attainment
AQCR 103	21,483	**8,277**	**239,223**	516,624	7,947	nonattainment
AQCR 113	160	1,286	8,401	21,971	1,486	attainment
AQCR 114	876	**1,047**	**1,795**	4,839	528	nonattainment
AQCR 116	800	**170**	**22,720**	76,970	1,480	nonattainment
AQCR 136	7,570	23,250	85,470	97,560	4,310	attainment
AQCR 150	1,450	**680**	**10,000**	19,660	1,290	nonattainment
AQCR 151	23,420	**9,360**	**33,600**	**84,680**	7,440	nonattainment
AQCR 158	5,260	15,810	10,700	12,820	7,010	attainment
AQCR 159	16,874	**1,682**	**5,539**	9,474	3,747	nonattainment
AQCR 160	4,340	7,950	19,210	84,960	6,830	attainment
AQCR 164	2,190	1,460	15,410	74,160	2,800	attainment
AQCR 165	5,680	18,320	38,180	101,110	8,030	attainment
AQCR 166	13,090	9,250	64,550	154,370	9,620	attainment
AQCR 167	20,990	18,580	35,020	77,680	5,550	attainment
AQCR 168	5,139	2,659	4,654	4,534	1,174	attainment
AQCR 169	1,340	5,070	7,880	10,940	1,680	attainment
AQCR 171	3,610	5,620	14,020	34,740	1,100	attainment
AQCR 178	125,380	**10,350**	**47,890**	159,000	6,440	nonattainment
AQCR 195	12,610	**5,680**	**34,930**	169,280	5,340	nonattainment
AQCR 196	6,810	**9,300**	**29,260**	90,430	5,400	nonattainment
AQCR 197	52,000	8,000	163,000	**611,000**	17,000	nonattainment
AQCR 201	7,710	3,840	11,940	20,010	1,660	attainment
AQCR 207	25,863	**71,029**	**111,615**	339,973	15,656	nonattainment
AQCR 221	1,181	1,444	631	1,124	367	attainment
AQCR 222	15,770	13,710	26,240	9,100	3,000	attainment
AQCR 223	32,747	6,198	32,073	89,014	3,573	attainment
AQCR 224	6,344	2,262	14,702	17,908	1,754	attainment
AQCR 225	10,884	12,260	38,993	77,589	3,506	attainment
AQCR 226	8,890	9,850	24,250	42,420	3,770	attainment
AQCR 231	606	1,615	3,144	340	1,165	attainment
AQCR 232	2,352	1,170	6,065	42	1,090	attainment
AQCR 234	4,000	4,000	77,000	129,000	1,000	attainment
AQCR 235	4,120	960	76,240	129,530	1,870	attainment
AQCR 236	936	881	4,005	321	1,632	attainment

Note: VOC is not an air pollutant criterion. However, VOC is reported because, as an O_3 precursor, it is a controlled pollutant. Data reflected as tpy. Bold indicates pollutant for which air basin is nonattainment or maintenance.

Source: AIRData 2004.

3.1.3 Noise

Aviation-related activities at Dover AFB dominate the acoustic environment. Equipment used during the facilities construction would also generate noise. Vehicular activity associated with airfield operations contributes little to the general background noise levels around the airfield. Thus, vehicle generated noise will not be analyzed. Therefore, construction-related noise will be analyzed in addition to noise from aviation activity.

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 (dB) is the accepted standard unit for describing levels of sound. Decibels are expressed in logarithmic units to account for the variations in amplitude. On the decibel scale, an increase of 3 dB represents a doubling of sound energy. A difference on the order of 10 dB represents a subjective doubling of loudness.

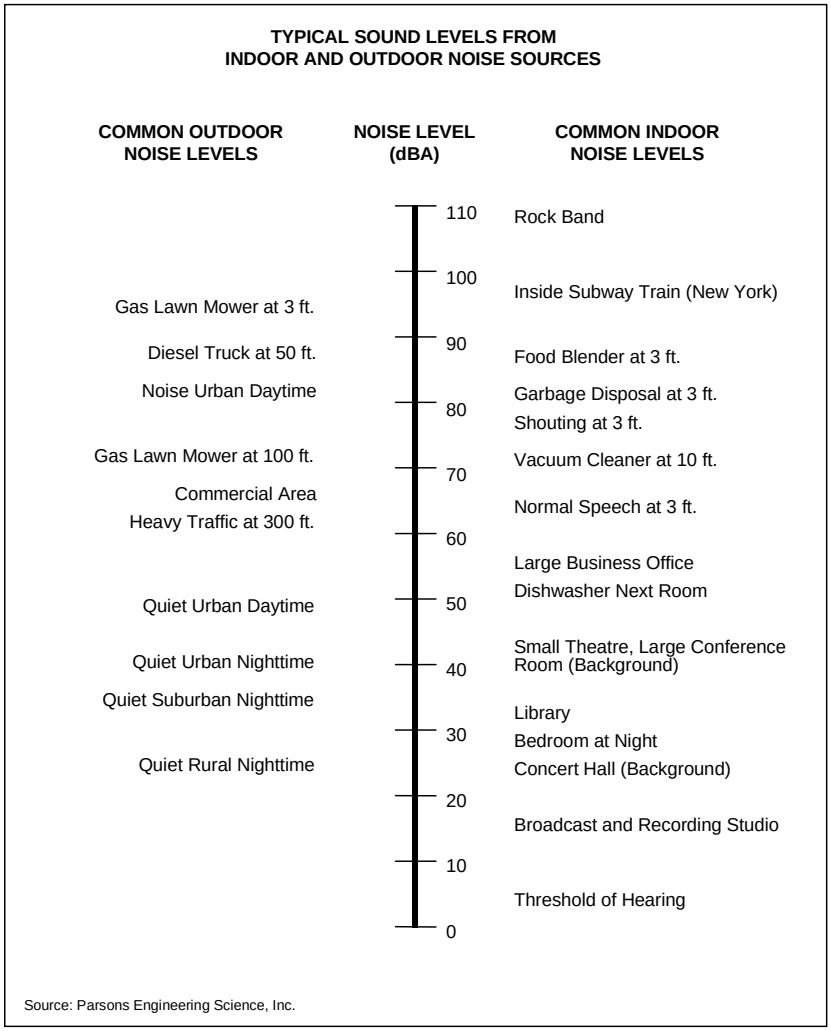
Different sounds have different frequency contents. Because the human ear is not equally sensitive to sound at all frequencies, a frequency-dependent adjustment, called A-weighting, was developed to measure sound similar to the way the human hearing system responds. The adjustments in amplitude, established by the American National Standards Institute (ANSI 1983), are applied to the frequency content of the sound. Figure 3.1.3-1 depicts typical A-weighted sound pressure levels (dBA) for various sources. As indicated in the figure, 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 change with time and the distance of the receptor from the noise source.

3.1.3.1 Noise Metrics and Analysis Methods

A variety of metrics may be used to assess the impacts of noise. Depending on the specific situation, appropriate analysis may include single event or averaged metrics. Single event metrics are used to assess the potential impacts of noise on structures and animals, and are sometimes used in the assessment of human effects. Sound exposure level (SEL), a single event metric, is commonly used to evaluate sleep disturbance. Averaged noise metrics are useful in characterizing the overall noise environment and are primarily used to analyze community (population) exposure to noise. Averaged noise exposure is expressed as the DNL metric. The United States Environmental Protection Agency (USEPA) selected DNL as the uniform descriptor of averaged noise exposure. Subsequently, Federal agencies, including the DoD, adopted DNL for expressing averaged sound.

Figure 3.1.3-1 Typical A-Weighted Noise Levels



Single Event Sound Metrics

Although the highest dBA level measured during an event (*i.e.*, maximum sound level or L_{max}) is the most easily understood descriptor for a noise event, alone it provides little information. Specifically, it provides no information concerning either the duration of the event or the amount of sound energy. Thus, SEL, which is a measure of the physical energy of the noise event and accounts for both intensity and duration, is used for single event noise analysis. Subjective tests indicate that human response to noise is a function not only of the maximum level, but also of the duration of the event and its variation with respect to time. Evidence indicates that two noise events with equal sound energy will produce the same response. For example, a noise at a constant level of 85 dBA lasting for 10 seconds would be judged to be equally as annoying as a noise event at a constant level of 82 dBA and duration of 20 seconds (*i.e.*, 3 dBA decrease equals one half the sound energy but lasting for twice the time period). This is known as the "equal energy principle." The SEL value represents the

A-weighted level of a constant sound with a duration of 1 second, providing an amount of sound energy equal to the event under consideration. By definition, SEL values are referenced to a duration of 1 second and should not be confused with either the average or maximum noise levels associated with a specific event. When an event lasts longer than 1 second, the SEL value will be higher than the L_{max} of the event. Table 3.1.3-1 provides SEL and L_{max} values for Dover AFB C-5 aircraft at a distance of 1,000 feet from the aircraft. The L_{max} would typically be 5 to 10 dBA below the SEL value for aircraft overflights. SEL is used in this report when discussing sleep disturbance and L_{max} is used for effects on structures in the single event noise analysis sections of this EA.

Table 3.1.3-1 Sound Exposure Level and Maximum Sound Level for Dover AFB Aircraft at 1,000 Feet from the Aircraft

Aircraft Type	Sound Exposure (SEL) (dBA)	Maximum Sound Level (L_{max}) (dBA)
C-5	114	106

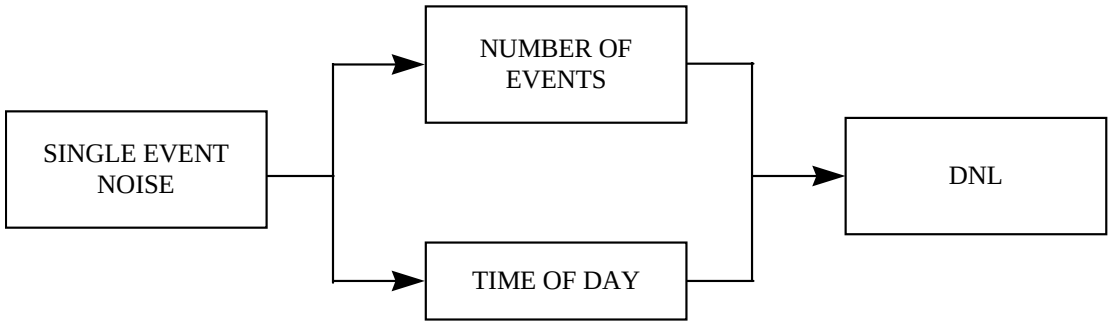
Note: At nominal takeoff thrust and airspeed and at a slant distance of 1,000 feet from the aircraft.

The frequency, sound level, and duration of aircraft overflight noise events depend on variables including aircraft type and model (engine type), aircraft configuration (*i.e.,* flaps, landing gear, *etc.*), engine power setting, aircraft speed, distance between the observer and the aircraft flight track, temperature, humidity, and altitude above sea level. Therefore, extensive noise data are collected for various types of aircraft/engines at different power settings and phases of flight. This database of aircraft noise provides a basis for calculation of average individual-event sound descriptors for specific aircraft operations at any location under varying meteorological conditions. The reference values are adjusted to any location by applying appropriate corrections for the variables.

Averaged Noise Metrics

Single event analysis has a major shortcoming -- single event metrics do not describe the overall noise environment. DNL is the measure of the total noise environment. DNL averages the sum of all aircraft noise producing events over a 24-hour period, with a 10 dBA upward adjustment added to the nighttime events (between 10:00 p.m. and 7:00 a.m.). Figure 3.1.3-2 depicts the relationship of the single event, the number of events, the time of day, and DNL. This adjustment is an effort to account for increased human sensitivity to nighttime noise events. The summing of sound during a 24-hour period does not ignore the louder single events, it actually tends to emphasize both the sound level and number of those events. The logarithmic nature of the dB unit causes sound levels of the loudest events to control the 24-hour average.

Figure 3.1.3-2 Day-Night Average A-Weighted Sound Level



DNL is the accepted unit for quantifying annoyance to humans from general environmental noise, including aircraft noise. The Federal Interagency Committee on Urban Noise (FICUN) developed land use compatibility guidelines for noise exposure areas (FICUN 1980). Based upon these FICUN guidelines, the FAA developed recommended land uses in aircraft noise exposure areas. The Air Force uses DNL as the method to estimate the amount of exposure to aircraft noise and predict impacts. Land use compatibility and incompatibility are determined by comparing the predicted DNL level at a site with the recommended land uses.

Noise Analysis Methods

The noise analysis methods used for airfield operations in this EA is based on the noise contours produced by the NOISEMAP noise model. NOISEMAP is a suite of computer programs developed by the Air Force to predict noise exposure in the vicinity of an airfield due to aircraft flight, maintenance, and ground run-up operations. Data describing flight tracks and flight profile use, power settings, ground run-up information by type of aircraft/engine, and meteorological variables are assembled and processed for input into NOISEMAP. The model uses this information to calculate SEL and DNL values at points on a regularly spaced grid surrounding the airfield. A plotting program generates contour lines connecting points of equal DNL values in a manner similar to elevation contours shown on topographic maps. Contours are generated as 5 dB intervals beginning at DNL 65 dBA, the maximum level considered acceptable for unrestricted residential use. The contours produced by NOISEMAP are used in the averaged noise analysis sections in this EA. While there is no technical reason why a lower level cannot be measured or calculated for comparison purposes, DNL 65 dBA:

- Provides a valid basis for comparing and assessing community noise effects; and
- Represents a noise exposure level which is normally dominated by aircraft noise and not other community or nearby highway noise sources.

3.1.3.2 Baseline Noise Analysis, Dover AFB

The primary source of noise in the vicinity of Dover AFB is airfield operations. Baseline noise conditions are based on the airfield operations shown on Table 2.4.1-1 (No Action

Alternative). About 239.25 average daily airfield operations occurred at Dover AFB under the baseline condition. Approximately 7 percent of the C-5 operations occur during the nighttime (10:00 p.m. to 7:00 a.m.). These operations and the resultant baseline noise environment are based on airfield operations noise modeling accomplished in 2003 (AFCEE 2003). Figure 3.1.3-3 shows the baseline condition aircraft ground tracks and Figure 3.1.3-4 depicts the noise exposure area for the baseline. Residences and public use facilities such as schools, libraries, hospitals, churches, and nursing homes are more sensitive to noise than those in other types of facilities because the activities that take place in these structures require lower sound levels and, for that reason, are used as analysis points. Table 3.1.3-2 lists the DNL and outdoor C-5 SEL values at the analysis points.

Table 3.1.3-2 Baseline DNL and C-5 SEL at Analysis Points, Dover AFB

Number	Description	DNL (dBA)	C-5 SEL (dBA)
1	Golf Course	67	104
2	Hospital	72	112
3	High School	61	96
4	School	61	99
5	Residences	64	100
6	Residences	57	96
7	Residences	57	95
8	Residences	59	91

Note: NOISEMAP determines the SEL for the 18 noisiest flight track events affecting the analysis point. Noise modeling indicates the C-5 is the loudest aircraft at all points for all the aircraft operating at Dover AFB. The analysis point number and description correspond to the point as reflected on the noise contour and aircraft ground track figures. There may be minor differences when comparing the DNL for a point from the table to the DNL for the point as depicted on the noise contour figure. This difference is a result of small misalignments during the process of printing the noise contours on top of the background map.

Single Event Sound Analysis, Dover AFB

Single event analysis is conducted to evaluate sleep disturbance and effects on structures. Figures 3.1.3-3 and 3.1.3-4 show the eight points identified for analysis in the area surrounding the airfield. These points are facilities that may be sensitive to noise from single aircraft overflight events.

Sleep Disturbance

Noise from low-flying aircraft arriving at and departing from an airfield at night may cause sleep disturbance. DNL incorporates consideration of sleep disturbance by assigning a 10 dBA penalty to the SELs of nighttime noise events (10:00 p.m. to 7:00 a.m.). However, single noise events, not average sound levels, correlate better with sleep disturbance.

Studies have estimated the percentage of awakenings that may be experienced by people exposed to different SELs. Based on those studies, the Federal Interagency Committee on Noise (FICON) in 1992 recommended use of an interim dose-response curve to predict the

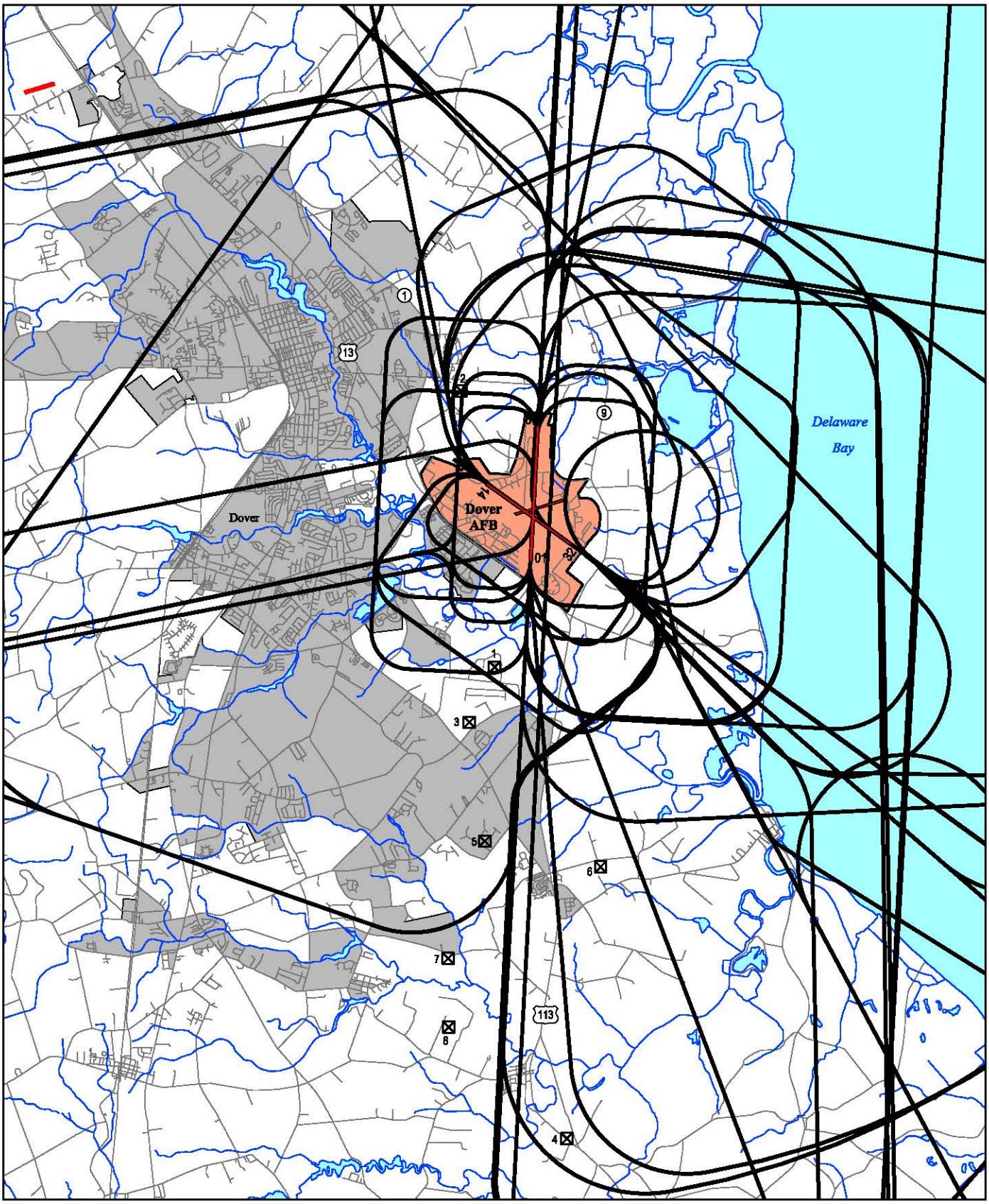
percentage of the exposed population expected to be awakened as a function of the exposure to single-event noise levels expressed in terms of SEL. Since the adoption of the interim curve in 1992, substantial field research has been completed using a variety of test methods and a number of locations. The data from these studies show a consistent pattern, with a smaller percentage of the exposed population expected to be behaviorally awakened than had been shown in laboratory studies.

The Federal Interagency Committee on Aviation Noise (FICAN) (formed in 1993 as recommended by FICON) now recommends a new dose-response curve for predicting awakening. Figure 3.1.3-5 compares the FICAN recommendation of 1997 to the FICON recommendation of 1992. FICAN takes the conservative position that, because the adopted curve represents the upper limit of the data presented, it should be interpreted as predicting the maximum percentage of the exposed population expected to be awakened. Based on this new position, it is estimated that outdoor SELs of 80 to 100 dBA could result in 4 to 10 percent awakenings in the exposed population. Noise must penetrate the residence to disturb sleep. Interior noise levels are lower than exterior levels due to the attenuation of the sound energy by the structure. The amount of attenuation provided by the building is dependent on the type of construction and whether the windows are open or closed. The approximate national average attenuation factors are 15 dBA for open windows and 25 dBA for closed windows. Twenty dBA is conservatively used to estimate attenuation for a typical dwelling unit (USEPA 1974).

Effects of Noise on Structures

Possible noise-related impacts on structures should be considered in the context of accepted research results. The recent development of larger commercial and military aircraft has prompted research into the effects of noise vibrations on both modern and historic structures.

Some building materials are more sensitive than others to external pressures and induced vibrations. Windows with large panes of glass are most vulnerable. Plaster walls in frame buildings are susceptible to cracking. Components that are least likely to experience damage are masonry walls of stone, concrete block, adobe, or brick. Appropriate building design can also reduce the possibility of damage from vibration. Research has not proven categorically that old buildings are more vulnerable to vibration than newer buildings, but prudence dictates special consideration be given to unique structures of historical significance. Table 3.1.3-3 lists the effects of sound on structures. Historical properties located just south of Dover AFB are not overflown by arriving aircraft.



Dover Air Force Base

LEGEND

- Flight Track
- Runway
- Roadway
- Analysis Point
- Dover AFB
- Urban Area

N

0 2

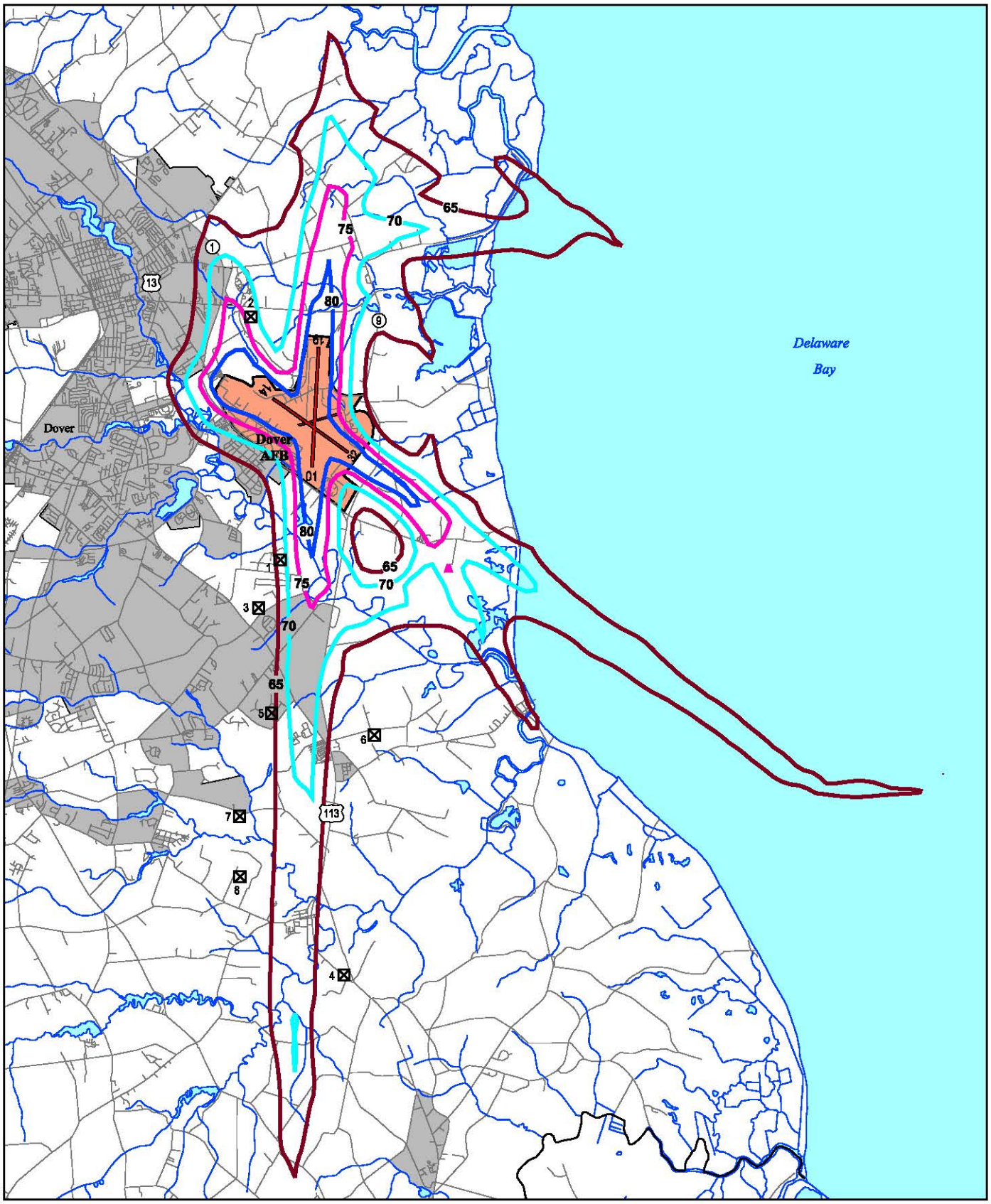
Miles

Baseline Aircraft Ground Tracks, Dover AFB

Figure 3.1.3-3

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Dover Air Force Base

LEGEND

- 65 dBA Contour
- 70 dBA Contour
- 75 dBA Contour
- 80 dBA Contour
- Runway
- Roadway
- Analysis Point
- Dover AFB
- Urban Area

N

0 12,000

Feet

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Baseline Noise Contours, Dover AFB

Figure 3.1.3-4

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Table 3.1.3-3 Effects of Sound on Structures

dBA	Effects Summary	
0-127	Typical community exposures	No damage to structures No significant public reaction
127-131	(generally below 2 psf)	Rare minor damage Some public reaction
131-140	Window damage possible, increasing public reaction, particularly at night	
140-146	Incipient damage to structures	
146-171	Measured booms at minimum altitudes experienced by humans; no injury	
185	Estimated threshold for eardrum rupture (maximum overpressure)	
194	Estimated threshold for lung damage (maximum overpressure)	

Source: Speakman 1992.

Day-Night Average Noise Analysis, Dover AFB

Figure 3.1.3-4 shows the DNL noise contours for the baseline airfield operations condition at Dover AFB. Noise annoyance is defined by the USEPA as any negative subjective reaction to noise by an individual or group. Table 3.1.3-4 presents the results of over a dozen studies on the relationship between noise and annoyance levels. This relationship was suggested by Schultz (1978) and was reevaluated (Fidell *et al.* 1988) for use in describing the reaction of people to environmental noise. These data provide a perspective on the level of annoyance that might be anticipated. For example, 12 to 22 percent of people exposed on a long-term basis to DNL of 65 to 70 dBA are expected to be highly annoyed by noise events. The study results summarized in Table 3.1.3-4 are based on outdoor noise levels.

Table 3.1.3-4 Theoretical Percentage of Population Highly Annoyed by Noise Exposure

DNL Intervals in dBA	Percentage of Persons Highly Annoyed
<65	<12
65-70	12-22
70-75	22-37
75-80	37-54
>80	61

Note: Noise impacts on individuals vary as do individual reaction to noise. This is a general prediction of the percent community highly annoyed based on environmental noise surveys conducted around the world.

Source: Adapted from NAS 1977

Figure 3.1.3-5 Recommended Sleep Disturbance Dose Response Relationship

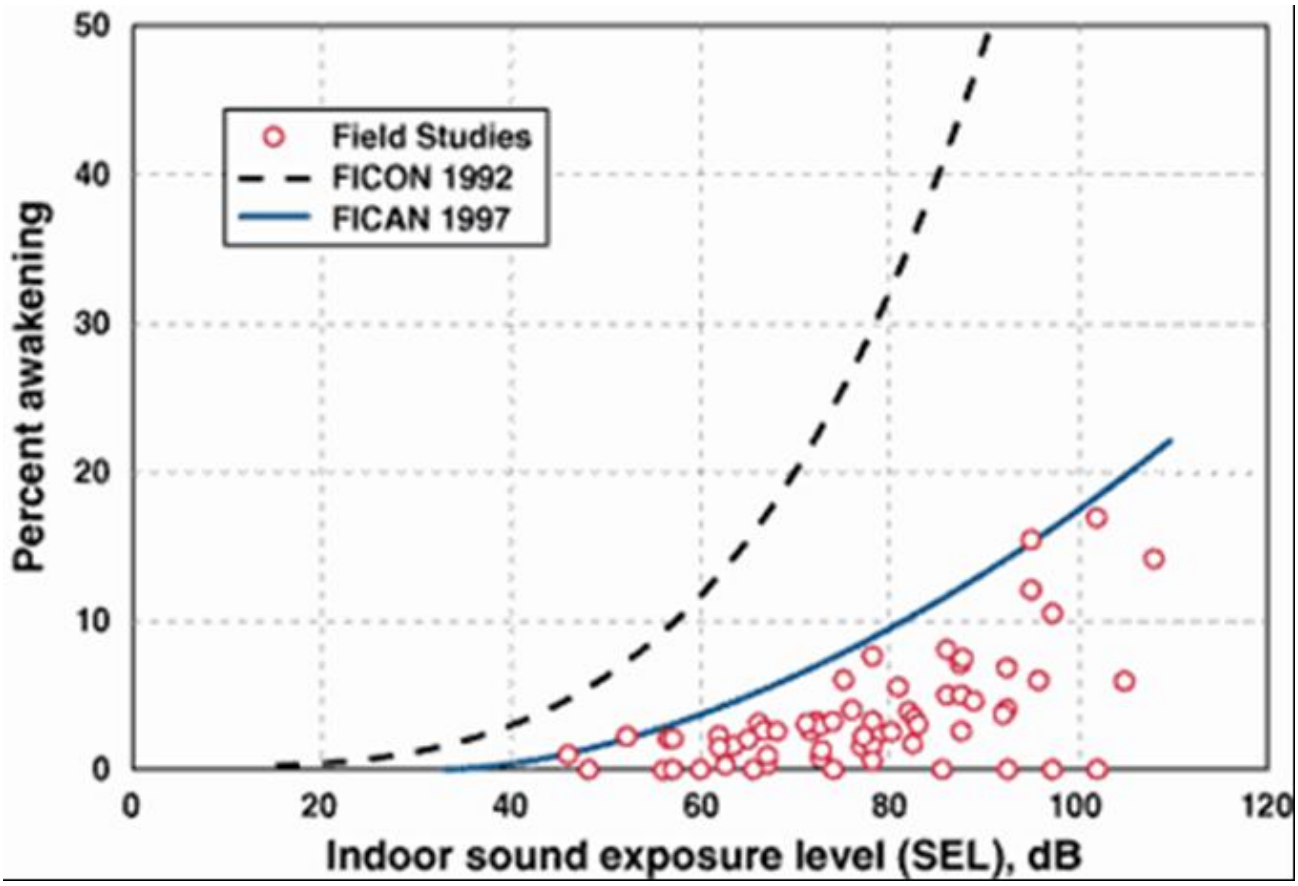


Table 3.1.3-5 lists the number of acres and number of people within the DNL 65 dBA and greater noise exposure area for the baseline condition, as well as the estimated number of people who might be highly annoyed by noise at those levels.

Table 3.1.3-5 Baseline Noise Exposure, Dover AFB

	DNL Interval (dBA)				
Category	**65-70**	**70-75**	**75-80**	**80+**	**Total**
Acres	15,233	6,256	2,527	2,228	26,244
People	5,308	2,137	201	192	7,839
People Highly Annoyed	1,168	791	109	117	2,185

Note: Population data used to determine the number of people within a noise zone were obtained from the United States Census Bureau 2000 census. It was assumed that population was equally distributed within a census tract area to estimate affected population. Using the noise contour information, the number of acres of land in each noise zone (i.e., DNL 65-70 dBA, 70-75 dBA, 75-80 dBA, and 80 dBA and greater) were divided by the number of acres of land in each census block to determine the portion of the census tract within each noise zone. The population total in each block-group was then multiplied by this ratio to estimate affected population within each zone. This process was used throughout the EA. People highly annoyed were determined by multiplying the total number of people in the noise zone times the higher percent number for the interval in Table 3.1.3-4.

Elevated noise levels can interfere with speech, cause annoyance or communication difficulties, and disrupt sleep. Based on a variety of studies, there is a good probability of frequent speech disruption at DNL 75 dBA. This level produces ratings of "barely acceptable" for intelligibility of spoken communication (AIHA 1996).

3.1.3.3 Military Training Route Noise Analysis

Aircraft operations on a MTR are not as regular as airfield operations and exhibit substantial variation throughout the year. Particular training phases or exercises can exist for periods of weeks or months. Because of the differences in the levels of operations on MTRs and at airfields, a different noise descriptor, the onset rate-adjusted monthly day-night average A-weighted sound level (L_{dnmr}) was developed to assess noise on MTRs. It is based on an integration period equal to one calendar month with the highest number of monthly operations. L_{dnmr} is calculated similarly to DNL with a 10 dB upward adjustment factor for nighttime events. In addition, L_{dnmr} incorporates an onset rate adjustment for noise events with an onset rate equal to or greater than 15 dB per second. This onset rate adjustment provides a noise penalty to account for increased intrusiveness due to the surprise factor of low altitude, high-speed aircraft. The Air Force recommends L_{dnmr} values be applied to the same interpretive criteria as DNL values.

The ROUTEMAP computer program calculates the noise level on the ground along a low-level flight corridor or track such as a MTR. The information needed for each aircraft type is the number of daytime and nighttime operations during a month, nominal values for the airspeed, engine power setting, and altitude. The program computes the L_{dnmr}, DNL, and equivalent sound level in dBA for ground positions located within 13 miles of the route centerline. The ROUTEMAP noise model calculates and presents the results based on a monthly average; that is, if there are only two operation days in a month, the model will average the two operation days over a typical 30-day month. Measurements on several low-level flight corridors (Plotkin and Croughwell 1986; Plotkin 1987) have established that a

Gaussian distribution in the horizontal plane is the distribution that best describes the spatial activity along an MTR. The impact of flight track dispersion in the vertical plane on sound exposure level has a minimal, and often negligible, effect compared with dispersion in the horizontal plane. For purposes of the present ROUTEMAP model, vertical dispersion is not considered; therefore, the aircraft tracks are distributed laterally at a constant altitude above the ground.

Table B-1 in Appendix B lists the baseline operations for all aircraft types on the MTRs proposed for use by C-17 aircrews under the Dover AFB Proposed Action and McGuire AFB Alternative Action. The C-17 operations are those forecast in the McGuire AFB C 17 Basing EA, while the other aircraft operations reflect the scheduled operations data provided by the route originating/scheduling activity. Figure 2.4.1-1 shows the general location of the MTRs. Appendix B-1 contains a more detailed figure depicting the location of each route.

As indicated in Table 3.1.3-6, the L_{dnmr} for baseline MTR operations ranges from a low of 23 dBA to a high of 62 dBA. Table 3.1.3-7 lists the SEL values for the various aircraft that use the route at points directly below and lateral to the aircraft ground track. Both the L_{dnmr} and SEL decrease as the distance between the receptor and the route centerline increases. The L_{dnmr} is a maximum of 5 dBA greater than the values stated in Table 3.1.3-6 at the points at which the MTRs intersect or when there are common route segments. Thus, the maximum L_{dnmr} for any route is about 67 dBA.

Table 3.1.3-6 Aircraft Noise Levels Below Military Training Routes, Proposed Action and McGuire AFB Alternative Action Military Training Routes, Baseline Condition

Route	L_{dnmr} (dBA)	Route	L_{dnmr} (dBA)
IR-714	49	VR-707	57
IR-720	45	VR-725	45
IR-721	56	VR-1709	62
IR-726	61	VR-1711	54
IR-743	53	VR-1712	51
IR-760	--	SR-800	40
IR-761	--	SR-801	45
IR-762	23	SR-805	40
IR-801	54	SR-844	40
VR-704	57	SR-845	40
VR-705	57	SR-846	50

Note: L_{dnmr} is represented for MTR operations at 300 feet AGL. No L_{dnmr} listed for IRs 760 and 761 because routes were not flown.

Table 3.1.3-7 Aircraft Noise Levels as a Function of Distance from Aircraft Ground Track Centerline, Proposed Action and McGuire AFB Alternative Action Military Training Routes, Baseline Condition

	SEL (dBA)				
Aircraft	**200 Feet**	**315 Feet**	**1,000 Feet**	**2,000 Feet**	**3,150 Feet**
C-17	106	103	92	84	78
F-15	122	119	110	104	100
F-18	121	118	108	101	96
A-10	102	99	89	82	77
F-16	109	106	98	92	87
EA-6B	126	123	114	107	103
S-3	115	112	101	91	84
T-45	94	91	82	76	72
T-6	94	90	81	75	71
T-1	108	105	97	92	88
AV-8	118	115	105	99	94
C-130	103	100	91	86	82
B-52	118	115	104	96	89
T-38	103	100	91	84	79
F-14	116	113	103	96	90

3.1.4 Hazardous Waste, Hazardous Materials, and Stored Fuels

3.1.4.1 Hazardous Waste

Hazardous waste is defined and regulated by the Resource Conservation and Recovery Act (RCRA) of 1976, as amended by the Hazardous and Solid Waste Amendments of 1984. Subtitle C of the Solid Waste Disposal Act, as amended by RCRA, directed the USEPA to promulgate the hazardous waste management system rules and regulations to protect human health and the environment from improper management of hazardous waste. Hazardous waste must be handled, stored, transported, disposed, or recycled in accordance with these regulations. The amendments require increased management of hazardous waste by all organizations at Dover AFB. Because the State of Delaware has developed a program to implement RCRA requirements, the USEPA has delegated RCRA implementation to the Delaware Department of Natural Resources and Environmental Control (DNREC).

Responsibility for hazardous waste management lies with the generating location and 436 CES/CEV. The *Dover AFB Hazardous Waste, Universal Waste, and Used Petroleum Management Plan* (also known as 436 AW OPLAN 32-3) fulfills the requirements in Title 40, CFR Parts 260-270 and the State of Delaware Title 7 Conservation, Chapter 63, Hazardous Waste Management, which establishes procedures to achieve and maintain regulatory compliance regarding accumulation, transportation, and disposal of hazardous waste (USAF 2002b).

The Federal Facility Compliance Act (FFCA) of 1992 requires all DoD facilities to comply with all applicable federal, state, interstate, and local environmental regulations in the same manner as private facilities. The FFCA allows federal and state agencies to assess fines against DoD facilities that have RCRA violations. The provisions of the *Dover AFB*

Hazardous Waste, Universal Waste, and Used Petroleum Management Plan are used to comply with federal and Delaware environmental regulations.

Hazardous waste at Dover AFB is collected in 55-gallon drums and characterized. All waste is disposed off-Base within 90 days of generation. Waste is transported from the Base by a licensed contractor and disposed in an approved disposal site. Waste petroleum products, such as oil, hydraulic fluids, and reclaimed JP-4 and JP-8 fuels are stored in above ground storage tanks (AST) located throughout the Base (USAF 2002b).

3.1.4.2 Hazardous Materials

Hazardous materials are defined and regulated by the U.S. Department of Transportation (USDOT). The USDOT amended the hazardous materials regulations with respect to hazard communication, classification, and packaging requirements to reflect the congressional mandate outlined in the Hazardous Materials Transportation Act of 1974. The amendments established specific guidelines for identification, classification, labeling, marking, placarding, and packaging of hazardous materials.

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.

The Superfund Amendments and Reauthorization Act (SARA Title III, 40 CFR 300-372) and the Uniform Fire Code (UFC) require facilities to furnish information to local and state officials and local fire departments about hazardous and toxic chemicals used in its operations. The UFC regulates storage of hazardous materials and requires facilities to report information regarding the identity, quantity, location and properties of hazardous substances. The law also requires facilities to immediately notify local and state officials whenever a significant release of hazardous materials occurs.

Hazardous materials management at Air Force installations is established primarily by Air Force Instruction (AFI) 32-7080, *Pollution Prevention Program.* The AFI incorporates requirements of all federal regulations, other AFIs, and DoD Directives, for reduction of hazardous material uses and purchases.

Dover AFB has an Oil and Hazardous Substance Spill Prevention and Response Plan and a Hazardous Material (HAZMAT) Plan (OPLAN 32-7) that are distributed to all Base activities that either generate or store hazardous materials and hazardous waste. Emergency response activities relating to hazardous waste spills, fires, or explosions involving hazardous waste must be in accordance with the HAZMAT OPLAN 32-7.

The purchase and use of hazardous materials on Dover AFB is managed by a contractor, who operates a Hazardous Materials Pharmacy (Hazmart). Building 630 includes a warehouse for corrosives and flammables and Building 634 is used for storage of compressed gas cylinders (Dover AFB undated). All hazardous materials enter the Base through the Hazmart. Base functions request a quantity of hazardous material from the Hazmart and the

material is delivered to or picked up by the requesting function. No hazardous material may be used until it is entered into the Environmental Management Information System and approved for use. Under this system, Hazmart personnel maintain positive records for location of the containers, from issue to return and ultimate disposal.

Some fuels, hazardous materials, and hazardous waste are stored and handled along the flight line in the northwestern area of the Base. Most surface drainage from this portion of the Base drains to Morgan Branch and Pipe Elm Branch, both of which flow into Little River. Historic handling and disposal of hazardous materials and hazardous waste in this same area of the Base have resulted in numerous IRP sites within these drainages (Dover AFB undated).

3.1.4.3 Stored Fuels

Dover AFB accomplishes numerous fueling operations to support aircraft and vehicle operation. The majority of fuel handled at Dover AFB is aviation jet fuel. Other activities include receiving, storage and dispensing of petroleum, oils, or lubricants (POL), including on-Base consumption of diesel fuel and gasoline by motor vehicles, consumption of containerized lubricants and other petroleum products, and consumption of diesel fuel for emergency power generation (Dover AFB undated).

The Dover AFB Fuels Management Branch is responsible for management, control, handling, and storage of petroleum and cryogenics. Dover AFB has the capacity to store 4,732,000 gallons of jet fuel at the base. Approximately 77,062,897 gallons of jet fuel were consumed in 2003 (Dover AFB 2004).

All ASTs in the Bulk POL Storage area have secondary containment. The ASTs at the Bulk POL Storage area are surrounded by containment dikes constructed of sloped earth covered with asphaltic concrete. Dike bottoms are all concrete with the exception of two, which have clay liners. These two clay-lined bottoms are expected to be changed to concrete in the near future. All the tanks and underground lines have a cathodic protection system (Dover AFB undated).

3.1.5 Biological Resources

3.1.5.1 Dover AFB

Vegetation and Wildlife

A vast majority of the grounds at Dover AFB are intensively maintained, resulting in landscaped property and a predominance of short turf grasses. Approximately 130 acres of the Base's 3,300 acres are native woodland and wetlands, with the rest being semi-improved and improved lawn, open fields, and impervious surfaces. A biological survey conducted by the Delaware Natural Heritage Inventory identified several areas on Base that continue to support native vegetation, though some have been disturbed or degraded to various degrees (Dover AFB 2001). A review of the Dover AFB Proposed Action project sites and map in the

Dover AFB INRMP indicates that none of the project sites would occur in an area that supports native vegetation.

Wildlife abundance and diversity are low at Dover AFB. Faunal surveys conducted in 1990-1991 recorded 45 fish species, 22 of which are freshwater and 23 are tidal species. Fifty-one species of birds were surveyed and 23 of the species are neotropical migrants. Woodland species on Dover AFB include the gray treefrog, gray squirrel, downy woodpecker, eastern pewee, and Carolina chickadee. Groundhogs are the most notable mammalian pest on Base, and deer are not overly abundant given the lack of suitable habitat. Small numbers of raccoons, skunks, and fox occur on or around the Base (Dover AFB 2001).

Threatened, Endangered, and Rare Species

No federally listed threatened or endangered species were found on base during the surveys conducted by the Delaware Natural Heritage Inventory in 1990-1991. However, six species of rare state fauna have been observed at the Base (Dover AFB 2001). Table 3.1.5-1 lists the species.

Table 3.1.5-1 Special Status Species Occurring or Potentially Occurring on Dover AFB

Common Name	Federal Status	State Status
Birds		
great blue heron	NL	rare
broad-winged hawk	NL	rare
upland sandpiper	NL	endangered
northern harrier	NL	endangered if breeding
eastern meadowlark	NL	state concern
bobolink	NL	state concern
American redstart	NL	state concern if breeding
broad-winged hawk	NL	state concern if breeding
cliff swallow	NL	state concern if breeding
bank swallow	NL	state concern if breeding
black vulture	NL	state concern if breeding
great blue heron	NL	state concern if breeding
American kestrel	NL	state concern if breeding
black and white warbler	NL	state concern if breeding
grasshopper sparrow	NL	state concern if breeding
common moorhen	NL	state concern if breeding
short-eared owl	NL	endangered if breeding
Fish		
Mud sunfish	NL	rare
Four-spine stickleback	NL	rare

Note: NL=not listed.

Source: Dover AFB 2001

Upland sandpipers were observed at various locations on Base during a mid-August 1997 survey. The only project associated with the Proposed Action, Dover AFB Alternative Action, or Dover AFB LZ Alternative that would be affected by the upland sandpiper would be the proposed location of the LZ. The Dover AFB INRMP mentions that approximately 30 adult birds and 15 juveniles were observed flying around and occasionally landing in the potential LZ site during the survey. Based on the numbers of birds, the indication is that the

survival rate for the sandpiper eggs is not very good. The loss of eggs and chicks is probably due to airfield mowing operations. Efforts have been undertaken to establish an upland sandpiper management area on the Bergold Farm area of the Base, which is southeast of the proposed LZ site. Wing Safety opposes this action because it could possibly create a Bird/Wildlife Aircraft Strike Hazard (BASH) problem from the sandpipers or predator birds the sandpipers may attract. Wing Safety also considered taking action to drive the sandpipers from Base property to reduce BASH potential. Base personnel agreed to discontinue both the effort to establish a sandpiper management area on the Bergold Farm as well as the effort to drive sandpipers from Base property. The basis for the agreement was no evidence that sandpipers currently create BASH problems (Dover AFB 2001).

3.1.5.2 Military Training Routes

The MTRs for the Dover AFB Proposed Action cover a broad geographic area in Maine, Vermont, New York, Pennsylvania, New Jersey, Delaware, Maryland, West Virginia, Virginia, Kentucky, North Carolina, and South Carolina. The diversity of landforms and geography covered by the routes support a number of plant communities and associated animal species. There are no known effects of noise or overflight disturbance to plant species. An increasing number of studies show low-level, fixed-wing military overflight of varying intensity of sonic or sub-sonic noise (dBA) elicit little response from most free-roaming species, particularly birds and mammals (Platt 1977; Ellis 1981; USAF 1992; Grubb and Bowerman 1997; Johnson and Reynolds 2002). The USFWS reports numerous studies show there is little or no effect on wildlife from aircraft-related noise and visual disturbances (Gladwin *et al*. 1988). Therefore, biological resources associated with the MTRs are limited to birds, specifically, threatened, endangered, and special status species.

The Endangered Species Act (ESA) recognizes that many species of fish, wildlife, and plants are in danger of, or threatened with, extinction. The ESA established a national policy that all federal agencies should work toward conservation of these species. Tables F-1 through F-7 in Appendix F-1 contain the federally listed bird species of concern within the MTR corridors that Dover AFB aircrews would use under the Proposed Action.

3.1.6 Socioeconomic Resources

3.1.6.1 Population

Dover AFB is located within the City of Dover, which is the state capital and largest city in Delaware. Dover AFB is located in Kent County which comprises the Dover Metropolitan Statistical Area (MSA), and is 60 miles south of Philadelphia, Pennsylvania. Other larger communities within Kent County include the City of Milford and the Town of Smyrna, which are located, respectively, near the southern and northern boundaries of Kent County. Table 3.1.6-1 provides a comparative summary of the population trends from 1990-2000 and population projections for these geographic jurisdictions through 2010, as well as the Dover AFB census designated place (CDP).

Table 3.1.6-1 Population Trends and Projections, 1990 through 2010

Geographic Area	2010 Projected Population[1]	Percent Population Change (1990-2000)	2000 Population[3]	1990 Population[4]
Kent County[1]	139,375	14	126,697	110,993
City of Dover	34,499	16	32,135	27,630
City of Milford	NA	11	6,732	6,040
Town of Smyrna	NA	9	5,679	5,231
Dover AFB CDP[2]	NA	-22	3,394	4,376

NA = Population estimates not available at this geographic level.

1. Kent County comprises the Dover MSA.

2. CDP=Census Designated Place.

3. Source: USDOC 2000.

4. Source: USDOC 1990.

As reflected in Table 3.1.6-1, the population of Kent county (*i.e.*, Dover MSA) increased by approximately 14 percent between 1990 and 2000 according to the U.S. Census Bureau. Approximately 40 percent of this increase was the result of migration into Kent County. During the same time period the population of the City of Dover increased by 16 percent, with lesser increases for the City of Milford and the Town of Smyrna. The on-Base population decreased by 22 percent between 1990 and 2000, reflecting the cyclical nature of military downsizing and realignments. The current on-Base residential population is estimated at 3,762 persons. The population growth rate for the City of Dover approximates the growth rate for the State of Delaware during the 1990-2000 period. Population growth rates of 10 percent for Kent County and 7 percent for the City of Dover are projected during the current decade (2000-2010) by the U.S. Census Bureau. Approximately 25 percent of the population in Kent County is minority according to the 2000 U.S. Census.

3.1.6.2 Housing

Table 3.1.6-2 portrays selected housing characteristics of Kent County and the largest communities within the county. According to the 2000 U.S. Census, there were 50,481 housing units in Kent County, representing a 20 percent increase from 1990. During the same time period, there was a 25 percent increase in housing units in the City of Dover. Approximately 58 percent of the housing units in Kent County are detached single family dwellings. According to the 2000 U.S. Census, over 25 percent of the housing units in Kent County were built during the 1990s. In 2001, building permits for new construction were issued for 1,088 housing units in Kent County, of which almost 90 percent were for single-family units (DSHA 2003). There are 1,245 MFH units on Dover AFB in addition to dormitories and temporary quarters.

Table 3.1.6-2 Housing Characteristics, 2000

Geographic Area	Total Housing Units	Percent Owner-Occupied	Percent Vacant	Median Value (Owner-Occupied)	Median Monthly Contract Rent	Median Household Income
Kent County	50,481	70	6.5	$103,300	$463	$40,950
City of Dover	13,195	52	6.5	107,700	521	38,669
City of Milford	2,897	50	8.0	93,600	425	32,525
Town of Smyrna	2,242	61	5.7	98,300	404	36,212

Source: USDOC 2000.

According to the 2000 U.S. Census, 70 percent of the housing units in Kent County were owner-occupied, with the City of Dover having an owner-occupancy rate of 50 percent. Both Kent County and the City of Dover have housing vacancy rates approximating 7 percent. The median value of owner-occupied housing was $103,300 in Kent County in 2000, lower than the median value of $107,700 for the City of Dover. Median values in the other incorporated cities and towns was generally lower. Excluding on-Base housing, median monthly rents range from approximately $400 in the Town of Smyrna to $521 in the City of Dover, with the overall county median monthly rent being $463 according to the 2000 U.S. Census. The median household income in 2000 was $40,950 in Kent County, and ranged from $32,525 in the City of Milford to $38,669 in the City of Dover. According to the Dover Multiple Listing Service (MLS), there were 535 single-family homes for sale in April 2004, with approximately one-half of the listings within the $200,000-$300,000 price range, and 10 percent in the $75,000-$150,000 price range (MLS 2004a).

3.1.6.3 Education

Six public school districts serve Kent County, with kindergarten through 12th grade enrollment exceeding 24,800 in the 2002-2003 school year. Two of the school district boundaries extend into adjacent Sussex and New Castle Counties. Additionally, there are numerous private and parochial schools within the county. There are five colleges and universities in Kent County: the University of Delaware; Delaware State University (Dover); Delaware Technical and Community College (Dover); Wesley College (Dover); and Wilmington College. Both Wilmington and Wesley Colleges have satellite facilities on Dover AFB.

The majority of the school-age dependents of Dover AFB military and civilian personnel attend schools within the Caesar Rodney School District and Capital School District which serve the City of Dover and surrounding area. The Caesar Rodney School District operates 10 elementary schools, two middle schools, and one high school. Total enrollment in the district was 6,600 in the 2002-2003 school year, a slight decrease from the 1999-2000 enrollment (NJDE 2003). The Capital School District operates 11 schools, including two middle schools and one high school. Total enrollment in the Capital School District was 5,853 in the 2002-2003 school year, which represented a 5 percent decrease from the 1999-2000 school year (NJDE 2003).

The Caesar Rodney School District, which encompasses Dover AFB, under contract with the federal government, currently operates two on-Base schools which serve students of military families residing on-Base. These schools include the Major George Welch Elementary School and Dover AFB Middle School. A third on-Base school, the General Henry H. Arnold Elementary School, which was closed at the end of the 2002-2003 school year, is being used as a special-needs school for the Caesar Rodney School District. Total enrollment in the on-Base schools was 650 during the 2000-2001 school year, decreasing to 514 during the 2002-2003 school year (NJDE 2003). It is estimated that approximately 20 percent of the students enrolled in the Caesar Rodney School District are military dependent students.

New development and associated population growth has begun to exert pressure on school facilities in Kent County. Four of the six school districts, including the Caesar Rodney District, are in a major growth zone. This growth and associated demands on the schools are expected to continue with the current and planned residential developments within the district. In 1999, school district residents approved a referendum for funding renovation and expansion of the Caesar Rodney High School and several other district schools. Two new 800-pupil middle schools were opened in the district in 1999, and are currently nearing capacity. The district has recently purchased land for construction of a new elementary school near Town of Magnolia.

3.1.6.4 Economy

Kent County (Dover MSA) had an average annual civilian labor force of 74,400 in 2002 and an unemployment rate of 4.0 percent, which was lower than the State of Delaware unemployment rate of 4.2 percent. The 2002 labor force represented a six percent increase over the average annual 1995 civilian labor force of 70,168 (United States Department of Labor (2003). Labor force data are based on place of residence and not place of work.

Table 3.1.6-3 portrays employment by major industry sector, including the government sector, for Kent County (Dover MSA) for 1995 and 2000. Employment data by industry are based on place of work. As indicated in Table 3.1.6-3, total employment increased by approximately 6,100, or nine percent during this 5-year period. The services and finance-insurance-real estate sectors accounted for almost 90 percent of the increase in employment during this time period. However, the retail trade and manufacturing sectors, in addition to the military, experienced decreases in employment. Government, services, and retail trade continue to be the largest industry sector employers, respectively, comprising almost 70 percent of the total employment (USDOC 2001). The largest individual employers in Kent County include Dover Air Force Base, Playtex Manufacturing and Products, Kent General Hospital, Kraft Foods, and ILC Industries.

Table 3.1.6-3 Total Full-and Part-Time Employment by Major Industry Sector by Place of Work, Kent County (Dover MSA), 1995 and 2000

Industry Sector	Percent Change (1995-2000)	Percent of Total Employment (2000)	2000 Employment	Percent of Total Employment (1995)	1995 Employment
Farming	11	2	1,458	2	1,333
Agriculture, Forestry, Fishing	--	--	D	1	728
Mining	--	--	D	-	11
Construction	15	5	4,209	5	3,660
Manufacturing	-1	9	6,445	10	6,520
Transportation, Utilities	25	4	2,663	3	2,133
Wholesale Trade	5	2	1,507	2	1,430
Retail Trade	-5	18	12,883	20	13,624
Financial, Insurance, Real Estate	46	6	4,600	4	3,150
Services	27	25	18,079	21	14,235
Government (Military)	2 -16	28 -6	20,284 -4,504	30 -8	19,850 -5,378
Total	100	100	72,821	100	66,674

D = Not shown to avoid disclosure of confidential information (estimates included in totals).

Source: USDOC 2001.

Based on Delaware Department of Labor (DDL) projections, employment in the service sector is projected to grow by 25 percent between 2000 and 2008, with the construction and transportation/communication/public utility sectors in the State of Delaware each projected to grow by 20 percent. Employment projections for Kent County reflect a similar growth pattern, with a slight decrease projected for the manufacturing and agricultural sectors (DDL 2001). This employment distribution and growth is generally reflective of national trends. There has been a commensurate increase in business activity with taxable retail sales of $2.1 billion in 2001, representing a 60 percent increase from 1997 for Kent County (DEDO 2003).

Dover AFB is a major contributor to the local and regional economy in the form of employment and purchase of goods and supplies from the business community. Dover AFB is the largest employer in Kent County with over 7,800 military and civilian employees, including active duty and reserve/ANG military personnel (USAF 2002f). It is estimated these jobs create an additional 2,222 indirect jobs in the business community. The annual Dover AFB payroll of $240.6 million generates an additional $85.9 million in wages and salaries for the indirect jobs created. In addition, Dover AFB contributes to the local economy in the form of construction and services, and purchase of materials, equipment and supplies. The total annual Dover AFB economic impact for FY2002 was estimated at $376.6 million (USAF 2002a) for the economic impact region (EIR) or region of influence (ROI), which is defined as being Kent County (Dover MSA).

3.1.7 Cultural Resources

Cultural resources include prehistoric and historical archaeological sites, buildings, structures, districts, artifacts, objects, or any other physical evidence of human activity considered important to a culture, subculture, or community for scientific, traditional, or religious purposes. Pursuant to Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended, and its implementing regulations at 36 CFR 800, federal agencies must take into consideration the potential effect of an undertaking on "historic properties," which refers to cultural resources listed in, or eligible for inclusion in, the NRHP. The quality of significance is considered in terms of applicability of the NRHP criteria. Cultural resources, either prehistoric or historic in age, are referred to as "historic properties." Sites not yet evaluated are considered potentially eligible for inclusion in the NRHP and, as such, are afforded the same regulatory consideration as nominated properties.

Cultural resources on Air Force installations are managed in accordance with environmental laws that include: AFI 32-7065, *Cultural Resources Management*; 32 CFR 989; 36 CFR 800.2, EO 11593 of 1971; National Historic Preservation Act of 1966, as amended; Archeological and Historic Preservation Act (AHPA) of 1974 (PL 93-291); the Archaeological Resources Protection Act (ARPA) of 1979 (PL 96-95); the American Indian Religious Freedom Act (AIRFA) of 1978 (PL 95-341); and, the Native American Graves Protection and Repatriation Act (NAGPRA) of 1990 (PL 101-601). In addition, any proposed undertaking must comply with the State Historic Preservation Office (SHPO) guidelines for the ROI.

For this analysis, the ROI is synonymous with the Area of Potential Effect (APE), as defined by the NHPA. The ROI for the analysis of cultural resources includes:

- All areas subject to disturbance from facility construction, addition, and alteration accomplished to support the C-17 beddown at Dover AFB. The ROI for the Dover AFB Proposed Action consists solely of the built environment (*i.e.*, buildings/structures, paved parking areas, flightline, and minor landscaped areas). One hundred percent of the ROI on Dover AFB has been disturbed previously by some form of activity.
- All MTR corridors in Delaware, Kentucky, Maryland, New Jersey, New York, North Carolina, Pennsylvania, South Carolina, Tennessee, Vermont, Virginia, and West Virginia shown on Figure 2.4.1-1 relative to Native American interests.

Identification of cultural resources potentially impacted by the Dover AFB Proposed Action and MTRs was accomplished by reviewing the 2000 Dover AFB Integrated Cultural Resources Management Plan (ICRMP) (USAF 2000), the National Register Information System (NRIS) (National Park Service [NPS] 2004), and selected cultural resources technical reports.

A total of 13 cultural resource investigations have been conducted on or near Dover AFB since 1985 in compliance with Section 106 and Section 110 of the NHPA. Three of those cultural resources investigations were conducted within or adjacent to the ROI on Dover AFB, as identified in Table 3.1.7-1.

Table 3.1.7-1 Previous Cultural Resources Investigations Within or Adjacent to the Dover AFB Region of Influence

Year	Study
1985	Cultural Resources Management Recommendations
1987	Request for Delaware SHPO Review of World War II Facilities
1991	Delaware SHPO Eligibility of Building 1301
1991-1996	Section 110 Survey of Five Area on Dover AFB (242.2 acres)
1993-1995	Section 106 Survey for Delaware Department of Transportation (15.1 acres)
1994	Section 106 Historical Overview for Main Gate Area
1994	Section 106 Survey for the Fire Training Area (43.7 acres)
1995	Management Plan for the John Wesley Methodist Episcopal Cemetery Site (0.7 acres)
1995-1996	Section 106 and 110 Basewide Documentary Archaeological Assessment for the IRP Program
1994-1996	Inventory of Cold War Properties
1998	Section 110 Basewide Archaeological Survey (1,092 acres)
2002	National Register Evaluation and Protection Plan for the John Wesley Methodist Episcopal Cemetery Site
2003	Section 106 Evaluation of the Hoffecker Site

Source: USAF 2000; Bupp et al. 2003; Crane and Sperling 2002

3.1.7.1 Archaeological Resources

Archaeological resources are prehistoric or historic places where human activity has measurably altered the earth or left deposits of physical remains. Archaeological resources may include some surface deposits and below ground (subsurface) deposits. Prehistoric archaeological resources may include village sites, campsites, lithic scatters, burials, hearths (or hearth features), processing sites, caves, and rock shelters. Historical archaeological resources may include farmsteads, roads, privies, trash deposits, and/or middens.

The 2000 Dover AFB ICRMP identified 11 archaeological sites on the Base. The sites consist of four prehistoric archaeological sites and seven historical archaeological sites (USAF 2000). None of these sites are located within the ROI for Proposed Action activities.

3.1.7.2 Historical Resources

For purposes of this analysis, historical resources include buildings and structures, and other physical remains of historic significance present above the ground. Historical resources date from the period of initial European contact in this area (*circa* A.D. 1770) and extend to the present. These may include houses, homesteads, farmsteads (and associated support structures or buildings), cabins, forts, schools, bridges, dams, logging sites, military facilities, structures, or buildings, and items of a similar nature. Historical buildings on Dover AFB include military housing, World War II-Era structures, and Cold War Era buildings.

Eight World War II-Era facilities remain at Dover AFB. All the facilities have been reviewed for potential eligibility for inclusion in the NRHP by the Delaware SHPO and one, Building 1301, was determined to be eligible (Delaware Division of Historical and Cultural

Affairs 1987, 1991). Building 1301 is not within the ROI for Dover AFB Proposed Action activities.

The Cold War inventory identified 23 post-World War II facilities as potentially eligible for the NRHP and requiring evaluation, and recommended two as potentially eligible and 10 as requiring re-evaluation as they reached 50 years of age (USAF 1996). Potentially eligible Cold War Era historic buildings are identified in Table 3.1.7-2. Building 714, a double cantilever medium bomber hangar, was built by the Kuljian Corporation of Philadelphia for the Strategic Air Command (SAC) program in 1956. This hangar was associated with the first intercontinental aircraft designed to carry nuclear bombs, the B-37 and the B-47.

Table 3.1.7-2 Cold War Era Historic Resources on Dover AFB

Bldg.	Original Use	Year Built	NRHP Status
714	Bomber Hangar	1954-56	Not eligible for listing in NRHP
1269	Hazardous Storage	1958-59	Re-evaluation required in 2006
1270	Guardhouse	1956-57	Re-evaluation required in 2006
1271	Water System	1956-57	Re-evaluation required in 2006
1272	Checkout and Assembly	1956-57	Re-evaluation required in 2006
1273	Missile Storage Igloo	1956-57	Re-evaluation required in 2006
1274	Missile Storage Igloo	1956-57	Re-evaluation required in 2006
1275	Missile Storage Igloo	1956-57	Re-evaluation required in 2006
1276	Missile Storage Igloo	1956-57	Re-evaluation required in 2006
1277	Missile Storage Igloo	1956-57	Re-evaluation required in 2006
1301	Hangar	1944/ Modified for ADC 1955	Eligible (As a WWII Resource)/ HABS Mitigation
1303	SAC Readiness Crew	1958-60	Potentially Eligible

Sources: Dover AFB 2005 for Bldg. 714; USAF 1996 for all other buildings.

3.1.7.3 Native American Interests

Native American resources or traditional sites can include, but are not limited to, archaeological sites, burial sites, ceremonial areas, caves, mountains, water sources, trails, plant habitat or gathering areas, or any other natural area important to a culture for religious or heritage reasons. NRHP-eligible traditional sites are subject to the same regulations, and afforded the same protection, as other types of historic properties. Early and effective participation of Native American tribes and groups is an integral component to the successful completion of the NRHP Section 106 process.

Dover AFB

No Native American concerns or interests are known to exist for Dover AFB. There is no evidence that any Native American burial grounds, sacred areas, or traditional sites are located on Dover AFB that would be subject to the provisions of American Indian Religious Freedom Act of 1978 (AIRFA) or Native Americans Grave Protection and Repatriation Act (NAGPRA) (USAF 2000). There are no federally recognized Native American Tribes in Delaware; however, there are two federally recognized Delaware Native American groups living in Oklahoma. The Nanticoke Indian Association, Inc. represents the only

state-recognized group. To ensure that any sites of traditional cultural value are identified and adequately considered under the Dover AFB Proposed Action and pursuant to 36 CFR 800.2, the Air Force sent correspondence to the tribes announcing the action and requesting concerns regarding the Proposed Action (Appendix G).

Military Training Routes

Native American groups that may be present or have concerns within the ROI of the proposed MTRs in Delaware, Kentucky, Maryland, New Jersey, New York, North Carolina, Pennsylvania, South Carolina, Tennessee, Vermont, Virginia, and West Virginia were identified based on publications by the U.S. Department of the Interior (USDOI), Bureau of Indian Affairs (USDOI 2003) the *Native American Directory* (Snyder 1996) and selected state, general (*e.g.*, access genealogy) and Native American Webpages (*e.g.*, 500 Nations, Comanche lodge). Table G-1 in Appendix G-1 lists the federally recognized and state-recognized Native American groups identified within the ROI for the MTRs of the Proposed Action. To ensure that any sites of traditional cultural value are identified and adequately considered under the Dover AFB Proposed Action and pursuant to 36 CFR 800.2, the Air Force sent correspondence to the tribes announcing the action and requesting concerns regarding the Proposed Action (Appendix G).

3.1.8 Land Use

3.1.8.1 Dover AFB

The Dover AFB General Plan details the Base's existing and future land use plans. The 12 land use categories for both existing and future conditions are: airfield; aircraft operations/maintenance facilities; industrial facilities; community (commercial) facilities; community (service) facilities; outdoor recreational facilities; medical; housing (unaccompanied); housing (accompanied); administrative; open areas, and water.

Dover AFB was originally established in a relatively undeveloped area in Kent County, Delaware. In recent years development increased northwest of the Base in the City of Dover, in residential areas west of the Base, and southwest of the Base near the Town of Magnolia.

Existing land uses adjacent to the Base are mostly commercial and industrial, with residential areas lying within the City of Dover. Land uses to the north, south, and east of the Base are generally composed of agricultural and conservation areas. Pockets of residential use also exist in the municipalities of Magnolia, Frederica, Little Creek, and Bowers Beach.

The AICUZ program is an on-going DoD program based on noise and safety that is designed to promote compatible land uses in the areas surrounding military airfields. AICUZ land use guidelines (see Table 3.1.8-1) reflect land use recommendations for CZs, APZs I and II, and four noise zones. The following paragraphs define the CZ and APZs.

- Clear Zone Surface—The CZ width is 3,000 feet (1,500 feet to either side of runway centerline) and extends outward 3,000 feet. Some obstructions may occur within the

CZ if permitted under AICUZ land use guidelines, or if appropriate authorities waive airfield planning guidance. Of the three zones (*i.e.*, CZ, APZI and APZ II, the CZ is the area with the greatest potential for an accident (see Figure 3.1.10-3).

- Accident Potential Zone Surfaces—APZ I begins at the outer end of the CZ and is 5,000 feet long and 3,000 feet wide. APZ II begins at the outer end of APZ I and is 7,000 feet long and 3,000 feet wide. APZ I has less accident potential than the CZ and APZ II has less potential than APZ I.

Table 3.1.8-1 Recommended Land Use

	Clear Zones and Accident Potential Zones			Noise Zones			
Generalized Land Use	**CZ**	**APZ I**	**APZ II**	**65-69 dBA**	**70-74 dBA**	**75-79 dBA**	**80+ dBA**
Residential	No	No	Yes[1]	Not Recommended[4]	Not Recommended[4]	Not Recommended	Not Recommended
Commercial	No	No	Yes[2]	Recommended	Recommended	Recommended	Not Recommended
Industrial	No	Yes[2]	Yes[2]	Recommended	Recommended	Recommended	Recommended
Public/Quasi-Public	No	No	Yes[2]	Recommended	Not Recommended[4]	Not Recommended[4]	Not Recommended
Recreational	No	Yes[2]	Yes[2]	Recommended	Recommended	Not Recommended	Not Recommended
Open/Agriculture/Low Density	No[3]	Yes[2]	Yes[2]	Recommended	Recommended	Recommended	Recommended

1. Suggested maximum density one dwelling unit per acre.

2. Only limited low-density, low-intensity uses recommended.

3. Except for limited agricultural uses.

4. Unless sound attenuation materials are installed.

Source: Adapted from USAF 1999a.

The guidelines in Table 3.1.8-1 were established on the basis of studies prepared and sponsored by several federal agencies, including the Department of Housing and Urban Development, USEPA, Air Force, and state and local agencies. The guidelines recommend land uses that are compatible with airfield operations while allowing maximum beneficial use of adjacent properties. The Air Force has no desire to recommend land use regulations that render property economically useless. It does, however, have an obligation to the inhabitants of the areas surrounding Dover AFB and to the citizens of the United States to point out ways to protect the people in adjacent areas, as well as the public investment in the installation itself.

The Base works closely with the City of Dover and Kent County planning offices to ensure compatible development in areas adjacent to the Base. Kent County and the City of Dover incorporated zoning ordinances which utilize the APZs and noise zones from the Dover AFB 1999 AICUZ Study for zoning overlay purposes.

The Kings Cliffe Mobile Park and Doverbrook Gardens, situated north of the Base, are incompatible for single-family residential land use. A recently completed housing development to the southwest of the Base near Magnolia encroaches on the AICUZ noise exposure area of the Base. There is a sand and gravel operation located south of the Base; the

associated water and dredging activities create incompatibilities with Runway 01 CZ and APZ I.

The Air Force owns the majority of the land within the four runway CZs, but portions of all CZs fall onto off-Base property. Industrial uses exist on some of the off-Base land within the Runway 01 CZ. Portions of the APZs I, as well as APZs II, also extend off-Base.

3.1.8.2 Military Training Routes

The land use areas affected by proposed operations on the MTRs consist of those lands within the route corridors. The area potentially affected by the low-level routes involves primarily rural regions of Vermont, New York, Pennsylvania, New Jersey, Delaware, Maryland, West Virginia, Kentucky, Virginia, North Carolina, and South Carolina. Broad areas of open space and public lands are present, as are scattered population centers, including a few larger towns and cities. A review of existing land uses that underlie the MTRs identified the following generalized land uses: urban/populated areas, industrial, recreational areas, agricultural, commercial, and transportation corridors. The majority of land under the MTRs is undeveloped.

Land uses associated with urban/populated centers underlying these routes include residential, commercial, industrial, and institutional (*e.g.*, schools, hospitals). Sensitive land uses are areas of environmental importance and concern, or areas reserved for specific public activities (*e.g.*, recreation, camping). Tables H-1, H-2, and H-3 in Appendix H-1 list the primary recreational lands beneath the IRs, VRs, and SRs associated with the Dover AFB Proposed and Alternative Actions and the McGuire AFB Alternative Action.

3.1.9 Infrastructure and Utilities

3.1.9.1 Water Supply

Dover AFB generates all potable water consumed on Base through seven on-Base production wells permitted by the State of Delaware (Dover AFB undated). Total water consumption for CY02 was 309,848,494 gallons (Dover AFB 2003a), an average of 0.849 million gallons per day (mgd). This is equivalent to about 108 gallons per person per day when considering Dover AFB had approximately 7,830 personnel. Maximum daily demand has been as high as 2.89 mgd and the system has a capacity of about 3.05 mgd (Dover AFB undated). The water distribution system operated at approximately 95 percent when comparing maximum daily demand to system capacity.

3.1.9.2 Waste Water Treatment

Domestic and industrial wastewater at Dover AFB is collected by a central wastewater system and transferred to the Kent County Regional Waste Water Treatment Plant (WWTP). Total wastewater generation by Dover AFB in CY02 was 290,967,333 gallons, an average of 0.797 mgd. This is equivalent to about 102 gallons per person per day when considering the

Base had approximately 7,830 personnel. The Kent County WWTP has a permitted capacity of 15.0 mgd and treats an average 11.0 mgd (Dover AFB 2003a). Thus, the plant operates at about 73 percent of capacity.

3.1.9.3 Storm Water Management

Stormwater runoff is discharged into Dover AFB's drainage network which consists of a series of inlets, manholes, pipes, culverts, and ditches. Runoff is transmitted to natural low-lying areas to the north, east, and southwest of the Base. There are nine drainage subdivisions based on topography and the storm water collection system. Altogether, there are 3,046 acres in the drainage subdivisions, of which 2,146 acres, or about 70 percent of the Base, are impervious cover (Dover AFB undated).

3.1.9.4 Energy

Electricity

Electrical power is supplied to Dover AFB by the City of Dover. Electricity enters the Base through two substations respectively named the North and South Substations. Base records indicate that for FY03, the electrical consumption at Dover AFB was 60,829,789 kilowatt hours (kWH) of electricity. There are currently 3,637,581 square feet of building space on Base, which is equivalent to 0.046 kWH per day per square foot of building space (Dover AFB 2003a).

Natural Gas

Natural gas for Dover AFB is provided by Chesapeake Utilities Corporation through four pressure regulated and metering stations. Consumption of natural gas at Dover AFB was 3,137,740 hundred cubic feet (ccf) in FY03 (Dover AFB 2003a). With approximately 3,637,581 square feet of building space on Base, this equates to 0.002 ccf of natural gas per day per square foot of building space.

3.1.9.5 Solid Waste Management

Approximately 3,200 tons of solid waste were generated at Dover AFB during CY 02, and 1,723 tons were recycled for the year (Dover AFB 2003a). The net annual solid waste that was landfilled was 1,488 tons, or 4.08 tons per day (tpd). Average daily per capita solid waste generation from all activities is estimated at 1.04 pounds per day based on 1,488 tons, 365 days per year, and 7,830 assigned personnel.

There are no active landfills at Dover AFB (Dover AFB undated). Solid waste at the Base is collected by a private contractor and transported to the Delaware Solid Waste Authority Landfill in Sandtown. This landfill has approximately 15 years of life remaining based on current disposal rates. The landfill receives approximately 30,000 to 35,000 tons per year of solid waste. About 25,000 tons are recycled, equating to a net annual disposal of

10,000 tons per year based on the higher disposal rate of 35,000 tons (Miller 2004). About 27 tpd are disposed in the landfill based on 10,000 tons per year and 7 days a week.

3.1.9.6 Transportation Systems

Vehicular traffic currently enters and exits Dover AFB through two gates.

1. Main Gate; and
2. North Gate.

The Main Gate is accessed from State Route (SR) 1. The Main Gate overpass provides for a grade-separated entrance to the cantonment part of the Base as well as the Eagle Heights military family housing area which is separated from the remainder of the Base by State Route 1. The North Gate is accessed from Route 10, SR 1, and US 113. Traffic signals control movements at the North Gate. Two other gates, the South Gate, and an unnamed gate on the east side of the airfield, are currently closed (Dover AFB undated). The South Gate will be improved and then reopened under an antiterrorism/force protection initiative. The South Gate will primarily be used for commercial vehicle entrance and exit (Dover AFB 2003b). This gate project will be completed before the Proposed Action would occur.

The Dover AFB roadway system handles and distributes vehicular movement with a minimum amount of congestion and delay. This includes traffic movement entering and exiting the Base as well as within the Base. Pavement conditions should not inhibit this movement (Dover AFB undated).

3.1.10 Airspace and Airfield Operations

3.1.10.1 Dover AFB

Airspace Operations

Airspace is a finite resource defined vertically, horizontally, and temporally. As such, it must be managed and used in a manner that best serves commercial, general, and military aviation needs. The FAA is responsible for overall management of airspace and has established different airspace designations to protect aircraft while operating to or from an airport, transiting enroute between airports, or operating within "special use" areas identified for defense-related purposes. Rules of flight and air traffic control procedures have been established to govern how aircraft must operate within each type of designated airspace. The federal aviation regulations apply to both civil and military aircraft operations unless the FAA grants the military service an exemption or a regulation specifically excludes military operations. All aircraft operate under either IFR or VFR.

Radar vectoring, sequencing, and separation service between participating VFR and all IFR aircraft operating within the airspace around the Base is provided by Dover AFB Radar Approach Control (RAPCON). There are seven public and private use airports within the airspace around Dover AFB. There are numerous low-altitude federal airways associated

with a aircraft navigation aid that is about 2 miles northwest of the airfield. The low-altitude federal airways, defined from ground based navigation aids, are used by civilian and military air traffic extending from 1,200 feet AGL up to, but not including 18,000 feet MSL. The MTRs nearest Dover AFB occur about 10 miles north and east of the airfield.

Airfield Operations

The airspace around Dover AFB, including the airspace allocated to the Dover AFB air traffic control tower and which extends out to about 5 miles and up to about 2,500 feet AGL, has high-density military aircraft operations. The majority of these operations occur as training operations at Dover AFB. Transient aircrews may conduct practice approaches provided their operations do not interfere with Dover AFB related aircraft operations training.

Dover AFB RAPCON provides radar service to aircraft arriving and departing the Base. There are seven instrument approaches available for arrivals to the airfield. The Base has two runways, 01/19 and 14/32. Runway 01/19 is 9,600 feet long and 200 feet wide, while Runway 14/32 is 12,900 feet long and 150 feet wide. Tower-controlled traffic patterns are flown at approximately 1,800 feet AGL for rectangular patterns (typically flown by large aircraft), 2,500 feet AGL for overhead patterns (flown by fighter aircraft), and 700 feet AGL for aero club and light aircraft. The airfield elevation is 28 feet MSL and the air traffic control tower is operational 24 hours a day year around.

There is a hangar located 3,750 feet from the departure end of Runway 32 and 535 feet west of the runway centerline that reduces the length of runway available for takeoffs on the runway to 10,070 feet beginning at the southeast end of the runway. The full length of the runway is available for full stop landings. Turns to a north heading are made after takeoff from Runway 32 to avoid overflight of developed areas off the northwest end of the runway. Runway 14 is normally used only for takeoffs and the full length is available. Landings on Runway 14 are restricted to helicopters and aero club aircraft. Practice approaches for all other aircraft types are not authorized on the runway except when Runway 01/19 is closed and crosswind conditions prevent landing on the other runways. Due to the hangar to the northwest, about 8,650 feet of runway are available when landings are made on Runway 14.

The majority of aircraft operations at Dover AFB are generated by based C-5 and aero club aircraft. Table 3.1.10-1 presents the average daily and total annual operations at Dover AFB.

Table 3.1.10-1 Annual and Average Daily Airfield Operations, Baseline, Dover AFB

	Arrival and Departure Operations		Closed Pattern Operations		Total Operations	
Aircraft	**Annual**	**Avg. Daily**	**Annual**	**Avg. Daily**	**Annual**	**Avg. Daily**
Based						
C-5	3,708	10.16	37,449	102.60	41,157	112.76
Aero Club	14,162	38.80	748	2.05	14,910	40.85
subtotal	17,870	48.96	38,197	104.65	56,067	153.61
Transient Military						
A-10	102	0.28	0	0.00	102	0.28
C-9	37	0.10	0	0.00	37	0.10
C-12	73	0.20	0	0.00	73	0.20
C-17	292	0.80	0	0.00	292	0.80
C-21	161	0.44	0	0.00	161	0.44
F-18	51	0.14	0	0.00	51	0.14
T-37	44	0.12	0	0.00	44	0.12
T-38	44	0.12	0	0.00	44	0.12
UH-1	248	0.68	0	0.00	248	0.68
KC-10	453	1.24	4,161	11.40	4,614	12.64
C-130	686	1.88	2,599	7.12	3,285	9.00
KC-135	796	2.18	4,161	11.40	4,957	13.58
C-141	2,584	7.08	4,161	11.40	6,745	18.48
P-3	270	0.74	2,599	7.12	2,869	7.86
subtotal	5,841	16.00	17,681	48.44	23,522	64.44
Civil Aircraft						
B-747	431	1.18	0	0.00	431	1.18
B-707	372	1.02	0	0.00	372	1.02
L-1011	44	0.12	0	0.00	44	0.12
Gulfstream	2,029	5.56	372	1.02	2,401	6.58
Learjet	2,029	5.56	365	1.02	2,394	6.58
Cessna	2,029	5.56	0	0.00	2,029	5.56
Beech Baron	58	0.16	0	0.00	58	0.16
subtotal	6,992	19.19	744	2.04	7,736	21.20
Total	30,703	84.12	56,622	155.13	87,325	239.25

Note: Annual operations based on 365 days per year for all aircraft.

Source: AFCEE 2003.

3.1.10.2 Military Training Routes

The FAA established special use airspace (SUA) to meet the needs of military aviation. MTRs, along with military operations areas (MOA) and restricted airspace, are examples of SUA.

Several factors reduce risks between MTRs and other airspace used by civil aviation activities. The ceiling of many MTRs is below the minimum enroute altitude established for most of the federal airways with which they intersect. Additionally, IR and VR routes are clearly designated on aeronautical charts. However, SRs are not on aeronautical charts used by civil pilots. Both military and civil pilots follow the general "see and avoid" rules of flight. MTRs may also interact with other elements of military training airspace, either transiting through MOAs, restricted areas, or intersecting and merging with other MTRs. MTRs are coordinated through the scheduling unit's operations plan to eliminate simultaneous aircraft operations on conflicting routes scheduled by the Base. Aircrews

monitor radio frequencies assigned by air traffic control or as stated in the DoD Flight Information Publications for the type of route being flown (*i.e.*, IR, VR, or SR) or the specific route. These actions advise aircrews of the location of other aircraft and help reduce the potential for airspace conflicts between aircraft operating on MTRs and other aircraft.

FAA guidance places limitations on low-altitude flying for pilots. AFI 11-202, Volume 3 (*General Flight Rules*), which implements FAA guidance for Air Force operations, states aircraft cannot be flown:

- Over congested areas (*e.g.*, cities, towns, and groups of people) at an altitude of less than 1,000 feet above the highest obstacle within 2,000 feet of the aircraft; and
- Over non-congested areas at an altitude of less than 500 feet above the surface except over open water, in special use airspace, or in sparsely populated areas. Under such exceptions, aircraft must not operate closer than 500 feet to any person, vehicle, vessel, or structure.

Additionally, AFI 11-202 states that, except for SUA and MTRs, aircraft should not be flown lower than 2,000 feet above the terrain of national parks, monuments, seashores, lakeshores, recreation areas, and scenic river ways administered by the NPS, national wildlife refuges, big game refuges, game ranges, and wildlife refuges administered by the USFWS; and wilderness and primitive areas administered by the U.S. Forest Service.

FAA Handbook 7610.4 does not establish minimum altitudes for MTRs. Establishment of minimum MTR altitudes considers the above restrictions and an altitude that corresponds with the primary aircraft type for which the route is developed. Additionally, MTR operations attempt to duplicate, to the maximum extent practicable, conditions in which they would operate in a combat environment. Therefore, MTRs for highly maneuverable (fighter) aircraft that have special equipment such as terrain-following radar tend to fly lower altitudes. Larger aircraft that are less maneuverable and do not have equipment that safely allows low level flight (transport aircraft) fly MTRs at higher altitudes. Typical effective low-level training altitudes for transport aircraft (*e.g.*, C-130 and C-17) are 300 feet AGL. However, the minimum altitudes flown consider the restrictions for overflying congested areas and people.

Appendix B contains specific information such as the route entry and exit points, enroute turn points, route width, route minimum and maximum altitudes, federal airways that intersect the MTR, other MTRs that intersect the MTR, and airports within the MTR corridor for each MTR anticipated for use under the Proposed Action. Appendix B also contains maps of each MTR.

Table B-1 in Appendix B lists the aircraft types and baseline number of operations for the MTRs proposed for use by C-17 aircraft under the Dover AFB Proposed Action. As shown in the table, aircraft types such as fighters (*e.g.*, F/A-18, F-16, F-15), trainers (*e.g.*, T-1, T-6, and T-45), and transports (*e.g.*, C-130, C-5, and C-17) use the routes. Monthly use ranges from no operations operation (IRs 760, 761, 762, and 804) to as many as 152.27 operations on VR-1709. Appendix B contains additional information for the 22 MTRs.

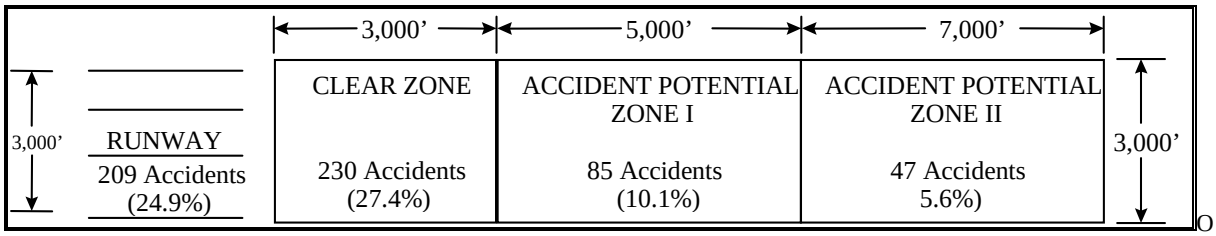
3.1.10.3 Aircraft Safety

Areas around airports are exposed to the possibility of aircraft accidents even with well-maintained aircraft and highly trained aircrews. Despite stringent maintenance requirements and countless hours of training, past history makes it clear that accidents are going to occur.

The risk of people on the ground being killed or injured by aircraft accidents is miniscule. However, an aircraft accident is a high-consequence event and, when a crash does occur, the result is often catastrophic. Because of this, the Air Force does not attempt to base its safety standards on accident probabilities. Instead it approaches this safety issue from a land-use-planning perspective through its AICUZ program. Designation of safety zones around the airfield and restriction of incompatible land uses reduces the public's exposure to safety hazards.

Subchapter 3.1.8.1 describes the CZ and APZs developed from analysis of over 800 major Air Force accidents that occurred within 10 miles of an Air Force installation between 1968 and 1995. The study found that 61 percent of the accidents were related to landing operations and 39 percent occurred during takeoff. Fighter and trainer aircraft accounted for 80 percent of the accidents, with large aircraft and helicopters accounting for the remaining 20 percent. Figure 3.1.10-1 depicts the three safety zones and summarizes the location of the accidents within a 10 nautical miles (NM) radius of the airfield.

Figure 3.1.10-1 Air Force Aircraft Accident Data (838 Accidents - 1968-1995)



Other Accidents Within 10 NMs: 267 Accidents, 32.0%

The Air Force defines five categories of aircraft flight mishaps: Classes A, B, C, E, and High Accident Potential (HAP). Class A mishaps result in loss of life, permanent total disability, a total cost in excess of $1 million, destruction of an aircraft, or damage to an aircraft beyond economical repair. Class B mishaps result in total costs ranging between $200,000 and $1 million or result in permanent partial disability, but do not involve fatalities. Class C mishaps result in more than $100,000 (but less than $200,000) in total costs, or a loss of worker productivity exceeding 8 hours. Class E mishaps represent minor incidents not meeting the criteria for Classes A through C. HAP events are significant occurrences with a high potential for causing injury, occupational illness, or damage if they occur and do not have a reportable mishap cost. Class C and E mishaps, the most common types of accidents, represent relatively unimportant incidents because they generally involve minor damages and injuries, and they rarely affect property or the public.

Class A mishaps are the most serious of aircraft-related accidents and represent the category of mishap most likely to result in a crash. Table 3.1.10-2 lists the number of class A mishaps, the lifetime class A mishap rate, the number of years for which data are maintained, and the cumulative flight hours for the C-5 aircraft. The table reflects the Air Force-wide data for all elements of all missions and sorties for each aircraft.

Table 3.1.10-2 C-5 Class A Aircraft Mishap Information

Aircraft	Class A Mishaps	Class A Mishap Rate	Years of Data	Cumulative Flight Hours
C-5	16	0.85	34	1,889,403

Note: The mishap rate is an annual average based on the total mishaps and 100,000 flying hours. The greatest number of Class A mishaps in any one year for both aircraft is 2 mishaps.

Source: USAF 2003a.

3.1.10.4 Bird-Aircraft Strike Hazard

Bird strikes constitute a safety concern because of the potential for damage to aircraft, injury to aircrews, or local populations if an aircraft strike and subsequent aircraft accident should occur in a populated area. Aircraft may encounter birds at altitudes of 30,000 feet MSL or higher; however, most birds fly close to the ground. Over 95 percent of reported bird strikes occur below 3,000 feet AGL. Approximately 49 percent of bird strikes occur in the airport environment, and 15 percent during low-level cruise (USAF 2003d). About 90 percent of the low-level cruise strikes occur between 300 and 5,000 feet AGL, the altitude range for most MTR operations (USAF 2003c).

AFI 91-202 (*The US Air Force Mishap Prevention Program*) requires that Air Force installations supporting a flying mission have a BASH plan for the base. The Dover AFB plan provides guidance for reducing the incidents of bird strikes in and around areas where flying operations are being conducted. The plan is reviewed annually and updated as needed.

Table 3.1.10-3 lists the monthly bird-aircraft strike information for 2003 within the Dover AFB airspace, as well as the monthly average for each month for the 4-year period ending December 2003. None of the bird-aircraft strikes resulted in a class A mishap.

Table 3.1.10-3 Dover AFB Bird-Aircraft Strike Information

Month	2003	4-Year Average	Average Strikes per Operation
Jan	1	0.5	0.000146
Feb	1	1.0	0.000292
Mar	4	2.3	0.000671
Apr	0	1.5	0.000437
May	2	4.5	0.001312
Jun	1	2.3	0.000671
Jul	1	4.8	0.001399
Aug	2	5.3	0.001545
Sep	2	5.5	0.001603
Oct	6	7.3	0.002128
Nov	5	3.5	0.001020
Dec	--	2.7	0.000787
Total	25	41.2	--

Note: The December average is based on 3 years since the data for December 2003 were not provided. Average strikes per month based on the 4-year average monthly bird-aircraft strikes divided by average monthly C-5 aircraft operations.

Source: Dover AFB 2003a.

3.1.11 Environmental Management

3.1.11.1 Pollution Prevention

The Air Force has taken a proactive role in developing a pollution prevention (P2) program to implement the regulatory mandates in the Pollution Prevention Act of 1990; EO 12856, Federal Compliance with Right-to-Know Laws and Pollution Prevention Requirements; EO 12873, Federal Acquisition, Recycling, and Waste Prevention; and EO 12902 Energy Efficiency and Water Conservation at Federal Facilities. The Air Force P2 program incorporates the following principles in priority order:

- Generation of hazardous substances, pollutants, or contaminants would be reduced or eliminated at the source whenever feasible (source reduction).
- Pollution that cannot be prevented would be recycled in an environmentally safe manner.
- Disposal, or other releases to the environment, would be employed only as a last resort and would be conducted in an environmentally safe manner, according to regulatory guidance.

AFI 32-7080 provides the directives for the Air Force P2 program. The AFI incorporates by reference applicable federal, DoD, and Air Force level regulations and directives for pollution prevention and prescribes the establishment of Pollution Prevention Management Plans. Dover AFB fulfills this requirement with the *Pollution Prevention Management Action Plan*, the *Hazardous Waste and Used Petroleum Management Plan*, and the *Solid Waste Management Plan*. These plans ensure Dover AFB maintains a waste reduction program and meets the requirements of the Clean Water Act, the National Pollution Discharge Elimination

System permit program, and federal, state, and local laws and regulations for spill prevention, control, and countermeasures.

3.1.11.2 Asbestos and Lead-based Paint

Asbestos

Since the 1950s, asbestos was commonly added to a variety of building materials, including cement to enhance strength. Asbestos containing cement products generally contain Portland cement, aggregate, and asbestos fibers. Asbestos cement products have many uses, including use as pipes for water and wastewater utilities. Serious health effects associated with exposure to airborne asbestos fibers include asbestosis, lung cancer, and mesothelioma. Although the USEPA promulgated a ban on asbestos and phase out of its use in 1989, many materials were being manufactured at that time. Therefore, without a specific cut-off date, the only way to determine the presence or absence of asbestos is through proper sampling and analysis.

Asbestos management at Air Force installations is established in AFI 32-1052, *Facility Asbestos Management*. AFI 32-1052 incorporates by reference applicable requirements of 29 CFR 669 *et seq.,* 29 CFR 1910.1025, 29 CFR 1926.58, 40 CFR 61.140, Section 112 of the CAA, and other applicable AFIs and DoDDs. AFI 32-1052 requires installations to develop an asbestos management plan for the purpose of maintaining a permanent record of the current status and condition of all asbestos-containing material (ACM) in the installation's facility inventory and documenting all asbestos management efforts. In addition, the instruction requires installations to develop an asbestos operating plan that details how the installation would conduct asbestos-related projects. Asbestos is regulated by the USEPA with the authority promulgated under the Occupational Safety and Health Act (OSHA), 29 USC §§ 669 *et seq*. Emissions of asbestos fibers to ambient air are regulated under Section 112 of the CAA.

The Dover AFB asbestos management plan includes the responsibilities of key organizations, operational processes, management controls to prevent personnel exposure, and procedures, and specifications to capture asbestos data. The asbestos management plan is based on an asbestos survey that originally was performed in 1988-1989 and revised in 1999. Suspect ACM is addressed on an as-needed basis prior to disturbance of the material. Material to be disturbed that has been confirmed to contain asbestos is handled by qualified outside contractors. Buildings on Dover AFB were constructed when ACM use was common. Due to the age of these buildings, ACM is likely to be present in all properties that have not been completely renovated. It is also possible that water lines on the Base are made of concrete containing asbestos.

Lead-based Paint

The Residential Lead-Based Paint (LBP) Hazard Reduction Act of 1992, Subtitle B, Section 408 (commonly called Title X), was passed by Congress on October 28, 1992, and regulates the use and disposal of LBP at federal facilities. Federal agencies are required to

comply with all applicable federal, state, interstate, and local laws relating to LBP activities and hazards.

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, PL 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. Dover AFB prepared a Lead-Based Paint Management Plan, dated February 19, 2004.

Lead-based paint identification in buildings or structures on Dover AFB is an on-going process. The Lead-Based Paint Management Plan states that all painted surfaces constructed before 1980 are assumed to contain LBP unless the paint has been tested and determined to be lead-free. Since some of the buildings on Dover AFB were built before 1980, it is possible that buildings on the Base may contain LBP. All suspect or confirmed LBP is addressed prior to any activities that may disturb the LBP such as renovation, construction, or demolition.

3.1.11.3 Environmental Restoration Program

The Air Force established the Installation Restoration Program (IRP) in 1983 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 ecological resources, human health, and the environment in accordance with CERCLA requirements. The program has since been renamed the Environmental Restoration Program (ERP). This program has two parts: former IRP sites that are Environmental Restoration Account (ERA)–eligible; and sites not eligible for ERA funds. There are no non-ERA eligible sites within the project areas. Therefore, the remainder of this discussion focuses on Dover AFB's ERA-eligible sites (Dover AFB 2004).

On the basis of ERP data evaluated by the USEPA, Dover AFB was placed on the National Priority List (NPL) in 1989. Fifty-nine (59) ERA-eligible contaminant release sites have been identified at Dover AFB. The preliminary assessment, site inspection, and remedial investigation phases of the cleanup process have been completed for all sites. Based on the remedial investigation results, there is no current risk to human health or the environment from any of the release sites. However, there is a potential risk for hypothetical future use of groundwater. Of the 59 sites, 33 require no further action, 10 have remedies in place, and 16 are undergoing feasibility studies (Dover AFB 2004).

Based on comparison of ERP site documentation and the proposed locations for the Dover AFB Proposed Action, the Dover AFB Alternative Action, and Dover AFB Landing Zone Alternative projects, two ERP sites associated with groundwater contamination could be affected by project activities. Site OT50 is associated with an oil-water separator and attached underground storage tank on the south side of Building 715. OT51 is a former oil-water separator at Building 794. Groundwater elevation for these two sites ranges from about 12 to 15 feet below the ground surface (Dover AFB 2003a).

3.2 MCGUIRE AFB

3.2.1 Introduction

McGuire AFB is the home of the 305th Airlift Mobility Wing (305 AMW). Primary tenant units include the 514th AMW (514 AMW), an AFRC Reserve Associate unit, the 108 ARW, and the Air Mobility Warfare Center. The McGuire AFB's primary mission is to provide for airlift, airdrop, and air refueling support, including the movement of troops, passengers, military equipment, cargo, and mail. The 305 Wing also provides administrative, logistical, and medical support to 305 AMW units, tenant agencies, and the McGuire AFB community, including retirees and their families.

3.2.2 Air Quality

3.2.2.1 Air Pollutants and Regulations

The air pollutants and regulations discussion for Dover AFB in Subchapter 3.1.2.1 applies to McGuire AFB. The ambient air quality standards for New Jersey are defined in The New Jersey Department of Environmental Protection (NJDEP) New Jersey Administrative Code, Title 7, Chapter 27, Subchapter 13, Ambient Air Quality Standards. Table 3.2.2-1 lists the national and New Jersey ambient air quality standards.

3.2.2.2 Regional Air Quality

The regional air quality background information pertaining to attainment status of the NAAQS discussed in Subchapter 3.1.2.2 for Dover AFB applies to McGuire AFB. The NJDEP has regulatory authority for air pollution control in the State of New Jersey. McGuire AFB is located in AQCR 45.

Eleven counties in Delaware, New Jersey, and Pennsylvania comprise AQCR 45. According to federal regulations (40 CFR 81.308), the AQCR is classified as described in the following paragraphs.

Table 3.2.2-1 National and New Jersey Ambient Air Quality Standards

Criteria Pollutant	Averaging Time	Primary NAAQS	Secondary NAAQS	New Jersey Primary Standards	New Jersey Secondary Standards
Carbon Monoxide	8-hour 1-hour	9 ppm (10,000 µg/m3) 35 ppm (40,000 µg/m3)	No Standard No Standard	9 ppm (10,000 µg/m3) 35 ppm (40,000 µg/m3)	9 ppm (10,000 µg/m3) 35 ppm (40,000 µg/m3)
Lead	Quarterly	1.5 µg/m3	1.5 µg/m3	1.5 ug/m3	1.5 µg/m3
Nitrogen Oxides (measured as NO2)	Annual	0.0543 ppm (100 µg/m3)	0.0543 ppm (100 µg/m3)	0.0543 ppm (100 µg/m3)	0.0543 ppm (100 µg/m3)
Ozone	8-hour 1-hour	0.08 ppm (157 µg/m3) 0.12 ppm (235 µg/m3)	0.08 ppm (157 µg/m3) 0.12 ppm (235 µg/m3)	No Standard 0.12 ppm (235 µg/m3)	No Standard 0.08 ppm (157 µg/m3)
Particulate Matter (measured as PM10)	Annual 24-hour	50 µg/m3 150 µg/m3	50 µg/m3 150 µg/m3	No individual limit for PM10, only TSP	No individual limit for PM10, only TSP
Sulfur Oxides (measured as SO2)	Annual 24-hour 3-hour	0.03 ppm (80 µg/m3) 0.14 ppm (365 µg/m3) No Standard	No Standard No Standard 0.50 ppm (1,300 µg/m3)	0.03 ppm (80 µg/m3) 0.14 ppm (365 µg/m3) No Standard	0.02 ppm (60 µg/m3) 0.1 ppm (260 µg/m3) 0.50 ppm (1,300 µg/m3)

Sulfur dioxide. AQCR 45 has been designated as better than national standards.

Particulate matter. Limited monitoring has occurred for PM_{10} in New Jersey. Based upon the results of this monitoring, all of New Jersey is in attainment for PM_{10}; however, there is no information concerning PM_{10} in 40 CFR 81.331 for any part of New Jersey. The state is unclassified for $PM_{2.5}$.

Carbon monoxide. AQCR 45 has been designated as attainment for CO.

Nitrogen dioxide. AQCR45 has been designated as cannot be classified or better than national standards.

Ozone. The information on USEPA issuance of the first 8-hour and 1-hours ozone designations and the *de minimis* threshold to use to determine conformity in Subchapter 3.1.2.2 for AQCR 46 applies to AQCR 45. In 1990, AQCR 45 was classified as nonattainment with the federal 1-hour ozone NAAQS. For the past 5 years, the 1-hour ozone standard at the Colliers Mills monitoring site (the site closest to McGuire AFB) has been exceeded every year. The number of exceedances in the past 5 years has continued to increase each year. The maximum 1-hour concentration exceedance occurred in 2002 with a measurement of 0.153 ppm. According to 40 CFR 81.331, this area remains designated as a severe-15 nonattainment area for ozone.

In 1997, the USEPA promulgated the 8-hour ozone standard. AQCR 45 has exceeded this standard every year since its inception. The lowest number of exceedances recorded was

11 in 2000. The highest number of exceedances recorded was 30 in 2002. The highest 8-hour concentration exceedance occurred in 2002 with a measurement of 0.138 ppm. The highest 8 hour concentration recorded at Colliers Mills has been increasing every year since the 8 hour ozone standard's inception. According to 40 CFR 81.331, this area has been designated as moderate nonattainment for the 8-hour ozone standard.

3.2.2.3 Baseline Air Emissions

McGuire AFB

Table 3.2.2-2 lists the CY99 air emissions inventory summary for AQCR 45 and Table 3.2.2-3 lists the emissions calculated for the baseline C-17, KC-10, and KC-135 aircraft operations activities at McGuire AFB in AQCR 45. McGuire AFB emissions are included in the AQCR 45 summary. The data in Table 3.2.2-2 are used as the baseline for air emissions analysis in this EA. The information on what is included in the air emissions inventory summary for Dover AFB in Subchapter 3.1.2.3 applies to McGuire AFB.

Table 3.2.2-2 Air Emissions Inventory, AQCR 45

Criteria Air Pollutant	CO (tpy)	VOC (tpy)	NO_x (tpy)	SO_x (tpy)	PM_{10} (tpy)
AQCR 45 CY99 Emissions Inventory	50,300	45,780	89,880	101,050	12,600

Note: VOC is not an air pollutant criterion. However, VOC is reported because, as an O_3 precursor, it is a controlled pollutant. Data are reflected as tpy.

Source: AIRData 2004.

Table 3.2.2-3 Emissions from McGuire AFB Aircraft Operations Activities within AQCR 45

Activity	CO (tpy)	VOC (tpy)	NO_x (tpy)	SO_x (tpy)	PM_{10} (tpy)
Airfield Operations	786.000	548.000	470.000	0.000	107.000
AGE Operation	4.477	1.257	15.748	1.786	1.013
Aircraft Trim/Power Checks	17.000	8.000	65.000	0.000	7.000
SR-800 Operations	0.010	0.010	0.770	0.000	0.060
SR-801 Operations	0.010	0.000	0.530	0.000	0.040
SR-805 Operations	0.010	0.010	0.800	0.000	0.060
SR-844 Operations	0.000	0.000	0.160	0.000	0.010
SR-845 Operations	0.000	0.000	0.410	0.000	0.030
SR-846 Operations	0.010	0.010	0.720	0.000	0.060
VR-1709 Operations	0.080	0.040	6.400	0.000	0.490
Total	807.597	557.327	560.538	1.786	115.763

Note: VOC is not an air pollutant criterion. However, VOC is reported because, as an O_3 precursor, it is a controlled pollutant. Data are reflected as tpy.

McGuire AFB was assigned an emission budget under the General Conformity rule in 1990. To ensure that increases in activity at McGuire AFB conform to the state SIP and the General Conformity Rule, emission budgets for VOC and NO_X for 1990, 1996, and 1999 were established in cooperation with the Air Force. In 2001, the emission budgets for

McGuire AFB were extended to 2002 and 2005. The most recent revision to the state SIP has allowed for another change in McGuire AFB's emission budget. Table 3.2.2-4 lists the most emission budgets for VOC and NO_X in the New Jersey SIP.

Table 3.2.2-4 Emission Budgets for McGuire AFB in the New Jersey SIP (Tons/Year)

Year	VOC	NO_X
1990 Baseline	1,112	1,038
1996	1,186	1,107
1999	1,223	1,142
2002	1,405	875
2005	1,198	1,084

Military Training Routes

Sixteen of the 22 MTRs proposed for use under the Dover AFB Proposed Action would be used by McGuire AFB C-17 aircrews under the McGuire AFB Alternative Action. Subchapter 3.1.2.3 contains the status for the AQCRs associated with the 16 MTRs associated with the McGuire AFB Alternative Action. Table 3.2.2-5 lists the total emissions from McGuire AFB C-17 operations on the MTRs within the respective AQCR. The data in this table are used as the baseline for air emissions analysis in this EA. Table E-2 in Appendix E details the emissions by each respective MTR within the AQCR.

Table 3.2.2-5 Baseline Emissions from Aircraft Operations on McGuire AFB Alternative Action Military Training Routes

AQCR/MTR	CO (tpy)	VOC (tpy)	NO_X (tpy)	SO_X (tpy)	PM10 (tpy)
AQCR 46					
CY99 Emissions Inventory	430	2,730	6,900	28,770	670
SR-800	0.00	0.00	0.10	0.00	0.01
SR-801	0.01	0.00	0.70	0.00	0.05
SR-844	0.00	0.00	0.05	0.00	0.00
SR-845	0.01	0.01	0.85	0.00	0.07
VR-1709	0.09	0.05	7.44	0.00	0.57
Total MTR Emissions	0.11	0.06	9.14	0.00	0.70
AQCR 47					
CY99 Emissions Inventory	2,880	1,100	47,970	111,340	2,150
VR-1712	0.00	0.00	0.32	0.00	0.02
Total MTR Emissions	0.00	0.00	0.32	0.00	0.02

Table 3.2.2-5 Baseline Emissions from Aircraft Operations on McGuire AFB Alternative Action Military Training Routes *(…continued)*

AQCR/MTR	CO (tpy)	VOC (tpy)	NO_X (tpy)	SO_X (tpy)	PM10 (tpy)
AQCR 114					
CY99 Emissions Inventory	876	1,047	1,795	4,839	528
SR-800	0.01	0.00	0.55	0.00	0.04
SR-801	0.02	0.01	1.81	0.00	0.14
SR-805	0.01	0.00	0.55	0.00	0.04
SR-845	0.02	0.01	1.35	0.00	0.10
VR-1709	0.05	0.03	3.99	0.00	0.31
VR-1711	0.01	0.00	0.70	0.00	0.05
VR-1712	0.01	0.00	0.70	0.00	0.05
Total MTR Emissions	0.12	0.07	9.66	0.00	0.74
AQCR 116					
CY99 Emissions Inventory	800	170	22,720	76,970	1,480
VR-1711	0.01	0.00	0.69	0.00	0.05
VR-1712	0.01	0.01	0.97	0.00	0.07
Total MTR Emissions	0.02	0.01	1.66	0.00	0.13
AQCR 150					
CY99 Emissions Inventory	1,450	680	10,000	19,660	1,290
SR-800	0.02	0.01	1.85	0.00	0.14
SR-801	0.02	0.01	1.64	0.00	0.13
SR-805	0.03	0.01	2.13	0.00	0.16
SR-844	0.03	0.01	2.13	0.00	0.16
SR-845	0.02	0.01	1.59	0.00	0.12
SR-846	0.10	0.06	8.62	0.00	0.66
VR-1709	0.13	0.08	10.93	0.00	0.84
Total MTR Emissions	0.35	0.20	28.89	0.00	2.22
AQCR 151					
CY 9 Emissions Inventory	23,420	9,360	33,600	84,680	7,440
VR-707	0.16	0.09	12.93	0.00	0.99
Total MTR Emissions	0.16	0.09	12.93	0.00	0.99
AQCR 158					
CY99 Emissions Inventory	5,260	15,810	10,700	12,820	7,010
IR-801	0.37	0.22	30.78	0.00	2.37
VR-725	0.03	0.02	2.73	0.00	0.21
Total MTR Emissions	0.40	0.23	33.51	0.00	2.58
AQCR 159					
CY99 Emissions Inventory	16,874	1,682	5,539	9,474	3,747
IR-801	0.37	0.21	30.69	0.00	2.36
VR-725	0.04	0.03	3.66	0.00	0.28
Total MTR Emissions	0.41	0.24	34.35	0.00	2.64

Table 3.2.2-5 Baseline Emissions from Aircraft Operations on McGuire AFB Alternative Action Military Training Routes *(…continued)*

AQCR/MTR	CO (tpy)	VOC (tpy)	NO_X (tpy)	SO_X (tpy)	PM10 (tpy)
AQCR 160					
CY99 Emissions Inventory	4,340	7,950	19,210	84,960	6,830
VR-725	0.00	0.00	0.01	0.00	0.00
Total MTR Emissions	0.00	0.00	0.01	0.00	0.00
AQCR 164					
CY99 Emissions Inventory	2,190	1,460	15,410	74,160	2,800
VR-707	0.13	0.07	10.49	0.00	0.81
Total MTR Emissions	0.13	0.07	10.49	0.00	0.81
AQCR 166					
CY99 Emissions Inventory	13,090	9,250	64,550	154,370	9,620
IR-720	0.00	0.00	0.00	0.00	0.00
Total MTR Emissions	0.00	0.00	0.00	0.00	0.00
AQCR 168					
CY99 Totals	5,139	2,659	4,654	4,534	1,174
IR-720	0.00	0.00	0.00	0.00	0.00
Total MTR Emissions	0.00	0.00	0.00	0.00	0.00
AQCR 178					
CY99 Emissions Inventory	125,380	10,350	47,890	159,000	6,440
VR-704	0.03	0.02	3.27	0.00	0.25
VR-705	0.11	0.06	24.85	0.00	1.91
VR-707	0.20	0.12	14.54	0.00	1.12
Total MTR Emissions	0.34	0.20	42.67	0.00	3.28
AQCR 195					
CY99 Emissions Inventory	12,610	5,680	34,930	169,280	5,340
VR-704	0.04	0.02	3.27	0.00	0.25
VR-705	0.30	0.17	24.85	0.00	1.91
VR-707	0.17	0.10	14.54	0.00	1.12
Total MTR Emissions	0.51	0.30	42.67	0.00	3.28
AQCR 196					
CY99 Emissions Inventory	6,810	9,300	29,260	90,430	5,400
VR-704	0.02	0.01	1.55	0.00	0.12
VR-705	0.14	0.08	11.78	0.00	0.91
VR-707	0.08	0.05	6.44	0.00	0.50
Total MTR Emissions	0.24	0.14	19.76	0.00	1.52
AQCR 197					
CY99 Emissions Inventory	52,000	8,000	163,000	611,000	17,000
VR-704	0.01	0.01	0.83	0.00	0.06
Total MTR Emissions	0.01	0.01	0.83	0.00	0.06

Table 3.2.2-5 Baseline Emissions from Aircraft Operations on McGuire AFB Alternative Action Military Training Routes *(…continued)*

AQCR/MTR	CO (tpy)	VOC (tpy)	NO_X (tpy)	SO_X (tpy)	PM10 (tpy)
AQCR 221					
CY99 Emissions Inventory	1,181	1,444	631	1,124	367
IR-801	0.05	0.03	3.80	0.00	0.29
Total MTR Emissions	0.05	0.03	3.80	0.00	0.29
AQCR 222					
CY99 Emissions Inventory	15,770	13,710	26,240	9,100	3,000
IR-720	0.00	0.00	0.00	0.00	0.00
Total MTR Emissions	0.00	0.00	0.00	0.00	0.00
AQCR 223					
CY99 Emissions Inventory	32,747	6,198	32,073	89,014	3,573
IR-720	0.00	0.00	0.00	0.00	0.00
Total MTR Emissions	0.00	0.00	0.00	0.00	0.00
AQCR 224					
CY99 Emissions Inventory	6,344	2,262	14,702	17,908	1,754
IR-714	0.00	0.00	0.00	0.00	0.00
IR-720	0.00	0.00	0.00	0.00	0.00
VR-1711	0.01	0.01	0.99	0.00	0.08
VR-1712	0.02	0.01	1.83	0.00	0.14
Total MTR Emissions	0.03	0.02	2.82	0.00	0.22
AQCR 225					
CY99 Emissions Inventory	10,884	12,260	38,993	77,589	3,506
IR-720	0.00	0.00	0.00	0.00	0.00
Total MTR Emissions	0.00	0.00	0.00	0.00	0.00
AQCR 226					
CY99 Emissions Inventory	8,890	9,850	24,250	42,420	3,770
IR-714	0.00	0.00	0.00	0.00	0.00
IR-720	0.00	0.00	0.00	0.00	0.00
Total MTR Emissions	0.00	0.00	0.00	0.00	0.00
AQCR 231					
CY99 Emissions Inventory	606	1,615	3,144	340	1,165
IR-714	0.00	0.00	0.00	0.00	0.00
IR-720	0.00	0.00	0.00	0.00	0.00
Total MTR Emissions	0.00	0.00	0.00	0.00	0.00

Note: VOC is not an air pollutant criterion. However, VOC is reported because, as an O_3 precursor, it is a controlled pollutant. Data reflected as tpy.

3.2.3 Noise

The background information in Subchapter 3.1.3 applies to McGuire AFB.

3.2.3.1 Noise Metrics and Analysis Methods

The noise metrics and analysis methods discussion for Dover AFB in Subchapter 3.1.3.1 applies to McGuire AFB.

Single Event Noise Metrics

The single event sound metrics discussion for Dover AFB in Subchapter 3.1.3.1 applies to McGuire AFB. Table 3.2.3-1 provides SEL and L_{max} values for the C-17, KC-10, and KC-135E aircraft at a distance of 1,000 feet from the aircraft.

Table 3.2.3-1 Sound Exposure Level and Maximum Sound Level for McGuire AFB Aircraft at 1,000 Feet from the Aircraft

Aircraft Type	Sound Exposure (SEL) (dBA)	Maximum Sound Level (L_{max}) (dBA)*
C-17	99	91
KC-10	99	92
KC-135E	93	86

Note: At nominal takeoff thrust and airspeed and at a slant distance of 1,000 feet from the aircraft.

Averaged Noise Metrics

The averaged noise metrics discussion for Dover AFB in Subchapter 3.1.3.1 applies to McGuire AFB.

Noise Analysis Methods

The single event noise metrics and noise analysis methods discussion for Dover AFB in Subchapter 3.1.3.1 apply to McGuire AFB.

3.2.3.2 Baseline Noise Analysis, McGuire AFB

The primary source of noise in the vicinity of McGuire AFB is airfield operations. As indicated in Table 2.4.1-2 (No Action Alternative), 283.61 average daily airfield operations occurred at McGuire AFB under the baseline condition. These operations and the resultant baseline noise environment are based on the assigned C-17, KC-10, and KC-135 and transient aircraft. Approximately 13 percent of airfield operations occur between 10:00 p.m. and 7:00 a.m. Figure 3.2.3-1 shows the baseline condition aircraft ground tracks, and Figure 3.2.3-2 depicts the noise exposure area for the baseline. Table 3.2.3-2 lists the DNL and outdoor C-17, KC-10, and KC-135 SEL values at the analysis points.

Table 3.2.3-2 Baseline DNL and C-17, KC-10, and KC-135E SEL at Analysis Points, McGuire AFB

Number	Description	DNL (dBA)	SEL (dBA)		
			C-17	KC-10	KC-135E
1	Residence	59	98	84	85
2	New Egypt	58	88	86	77
3	Farm House	64	96	96	96
4	Fort Dix Cantonment	54	97	80	81
5	McGuire AFB Family Housing	52	98	79	83

Note: The analysis point number and description correspond to the point as reflected on the noise contour and aircraft ground track figures. There may be minor differences when comparing the DNL for a point from the table to the DNL for the point as depicted on the noise contour figure. This difference is a result of small misalignments during the process of printing the noise contours on top of the background map.

Source: USAF 2002a.

Single Event Noise Analysis, McGuire AFB

The sleep disturbance and effects of noise on structures discussion for Dover AFB in Subchapter 3.1.3.2 applies to McGuire AFB. Figures 3.2.3-1 and 3.2.3-2 show the five points identified for analysis in the area surrounding the airfield. These points are facilities that may be sensitive to noise from single aircraft overflight events.

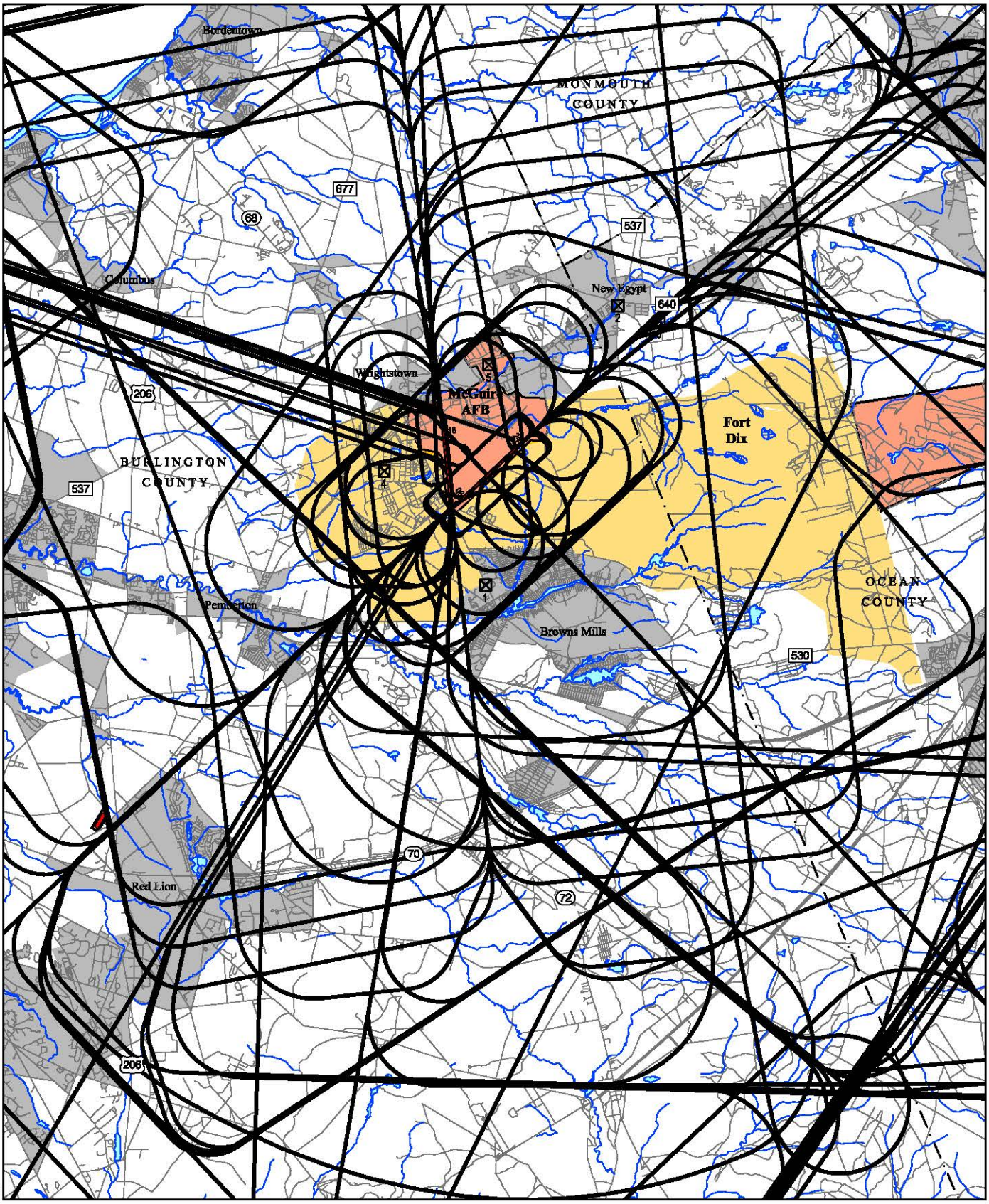
Day-Night Noise Analysis, McGuire AFB

Figure 3.2.3-2 shows the DNL noise contours for the baseline airfield operations condition at McGuire AFB. The noise annoyance, percentage of persons highly annoyed by noise, and speech disruption discussion in Subchapter 3.1.3.2 applies to McGuire AFB. Table 3.2.3-3 lists the number of acres and people within the DNL 65 dBA and greater noise exposure area, as well as the number of people who might be highly annoyed by noise at those levels.

Table 3.2.3-3 Baseline Noise Exposure, McGuire AFB

	DNL Interval (dBA)				
Category	65-70	70-75	75-80	80+	Total
Acres	2,727	1,350	618	345	5,040
People	1,017	342	75	0	1,434
People Highly Annoyed	224	126	40	0	390

Note: The noise annoyance and percentage of persons highly annoyed by noise discussion in Subchapter 3.1.3.2 applies to McGuire AFB.



McGuire Air Force Base

LEGEND

- Flight Track
- Runway
- Roadway
- Analysis Point
- McGuire AFB
- Fort Dix
- Urban Area

N

0 3

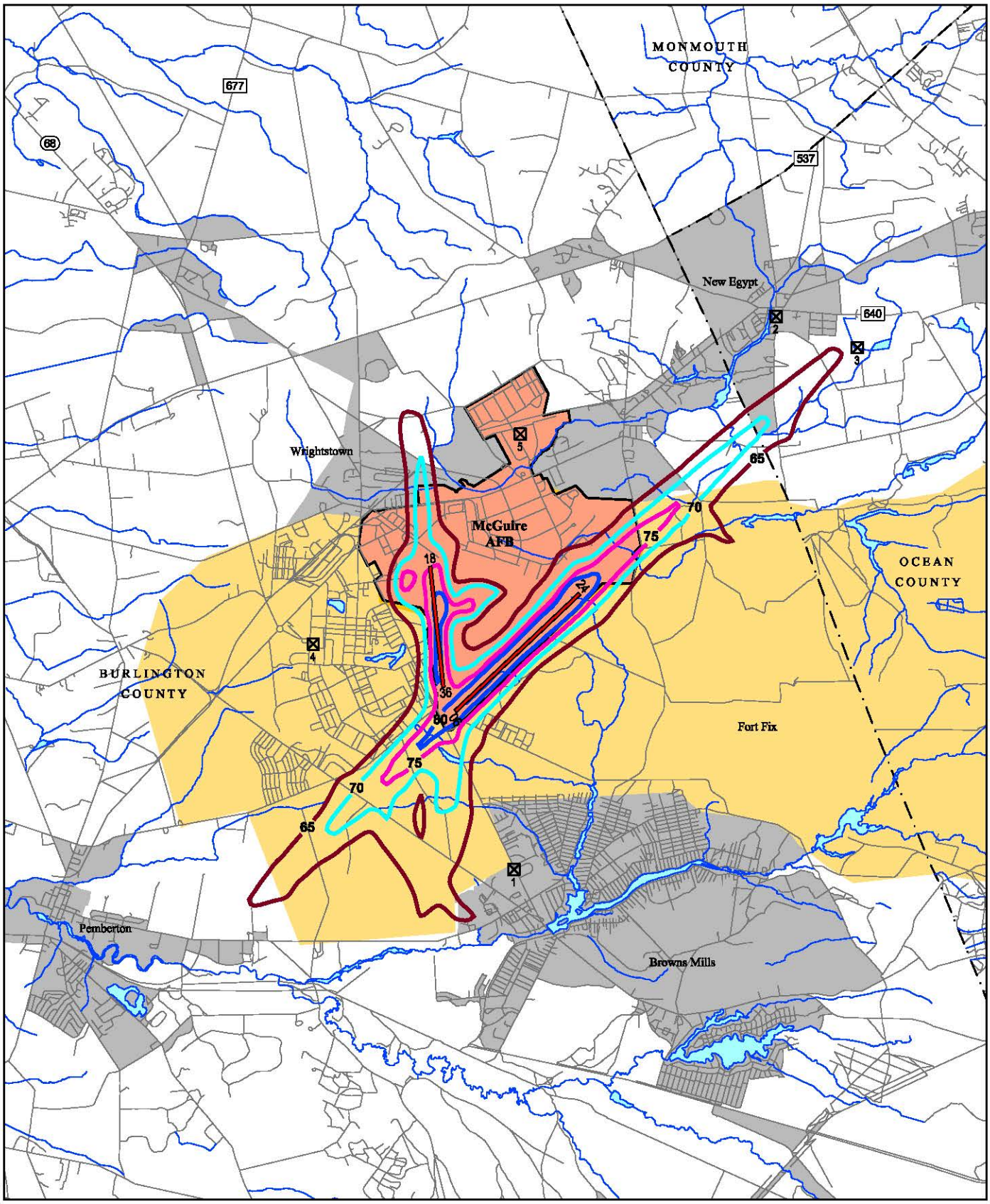
Miles

Baseline Aircraft Ground Tracks, McGuire AFB

Figure 3.2.3-1

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McGuire Air Force Base

LEGEND

- 65 dBA Contour
- 70 dBA Contour
- 75 dBA Contour
- 80 dBA Contour
- Runway
- Roadway
- Analysis Point
- McGuire AFB
- Fort Dix
- Urban Area

N

0 8,000

Feet

Baseline Noise Contours, McGuire AFB

Figure 3.2.3-2

743528 EC17-MCG-BLNC.DWG

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3.2.3.3 Military Training Route Noise Analysis

Sixteen of the MTRs that McGuire AFB would use are the same as those proposed for use by Dover AFB aircrews. Therefore, the baseline noise description for the 16 MTRs in Subchapter 3.1.3.3 applies to the MTRs proposed for use by McGuire AFB aircrews.

3.2.4 Hazardous Waste, Hazardous Materials, and Stored Fuels

3.2.4.1 Hazardous Waste

The regulatory information for hazardous waste management for Dover AFB in Subchapter 3.1.4.1 applies to McGuire AFB. The Base has a *Hazardous Waste Management Plan* that fulfills the requirements in Title 40, CFR Parts 260-270 and the NJDEP hazardous waste management regulations pursuant to the New Jersey Administrative Code 7:26G-1.1 *et seq*., which establishes procedures to achieve and maintain regulatory compliance regarding accumulation, transportation, and disposal of hazardous waste. The USEPA delegated RCRA implementation to the State. The plan addresses ongoing aircraft operations and maintenance activities, and is recertified each year (USAF 2002c).

McGuire AFB is a large-quantity hazardous waste generator, with waste from industrial activities primarily associated with aircraft operations and maintenance. Hazardous waste is generated from the storage and use of POLs; however, they are normally associated with fuel spill cleanup materials, contaminated media, and/or contaminated fuel. Except for two ASTs used for 90-day accumulation of contaminated jet fuel and used oil, McGuire AFB does not operate any 90-day accumulation sites. The Base has a RCRA Part B permit for a treatment, storage or disposal (TSD) facility of hazardous waste (permit #HWP030001). The permitted storage facility is located in Building 2310 (USAF 2002c).

The TSD facility contains indoor and outdoor storage areas that are both secured in the event of accidental spills. The indoor storage area has a concrete pad with an adequate secondary containment system; the outdoor storage area is an asphalt covered area surrounded by 6-inch curbs that act as containment in case of accidental spills.

3.2.4.2 Hazardous Materials

The discussion for hazardous materials regulations for Dover AFB in Subchapter 3.1.4.2 applies to McGuire AFB. The management of discharges of hazardous materials is described in AFI 32-4002, HAZMAT Emergency Planning Response Program for McGuire AFB, the Facility Response Plan, and the SPCC Plan. McGuire AFB operates a Hazmart in Building 2302 (MAFB Pharmacy Program) for procurement and distribution of hazardous materials (USAF 2002c).

Reclaimed jet fuel, used oil, and contaminated fuels are collected in ASTs, bowsers, and drums and sent off-Base for reclamation/reuse in fuel-burning operations. Solvents used in parts and paint gun washers are reclaimed by DoD-approved solvent recovery systems. The

Plastics Shop operates an acetone recovery system that recycles waste material for use on-site.

Chemicals that are off-specification or discontinued and other hazardous materials are collected by the Defense Reutilization and Management Office and offered for resale to other installations or contractors (USAF 2002c).

3.2.4.3 Stored Fuels

Bulk fuel storage systems at McGuire AFB include fuel and petroleum ASTs and underground storage tanks (UST). The bulk storage areas include the BRAC facility, the bulk fuel storage area (BFSA), the New Jersey Air National Guard facility, and the bulk heating oil storage facility at the central heat plant. Jet fuel is delivered to the Base via interstate pipeline. An upgraded hydrant fueling system is located along the flightline and consists of fuel hydrant pits and a fuel pipeline running from the BFSA to the hydrants (McGuire AFB undated).

McGuire AFB has the capacity to store 7,961,000 gallons of jet fuel in a total of 18 tanks. Approximately 77,327,566 gallons of jet fuel were consumed in 2003 (McGuire AFB 2004b).

McGuire AFB has an SPCC Plan that identifies the procedures, methods, equipment, and other requirements to prevent discharge of oil from non-transportation-related facilities into or upon waters of the United States. The SPCC Plan includes a spill history, inspection records and requirements, training procedures, and improvement projects.

In accordance with 40 CFR 112.20, *Facility Response Plans*, the Air Force implemented a Facility Response Plan for McGuire AFB that complements the SPCC Plan. The Facility Response Plan is used by the Base to prevent the spill and release of POL products into navigable waters. The Facility Response Plan includes facility information, emergency response information, hazard evaluations, discharge scenarios, discharge detection systems, and training requirements.

Numerous other required plans address the management, spill containment, and cleanup of POL products. The Discharge Prevention, Containment, and Countermeasures (DPCC) Plan describes the facilities and operational procedures in place for managing the storage and transfer of POL and hazardous substances. The Discharge Cleanup and Removal (DCR) Plan describes the contingency systems and plans in place for responding to, and cleaning up after, any discharges that could occur. These plans are required to comply with New Jersey Spill Prevention Regulations (NJAC 7:E-1 *et seq*.) (McGuire AFB undated).

3.2.5 Water Resources

3.2.5.1 Surface Water

The surface water feature nearest any of the McGuire AFB Alternative Action project sites (project number 8 on Figure 2.4.3-1) is the headwaters of South Run, which is about 500

feet east of the project. This stream drains the central portion of the Base, which flows into Crosswicks Creek, which, in turn, flows into the Delaware River. Crosswicks Creek is classified as a medium-sized creek under New Jersey Administrative Code 7:77E-4.3 and as fresh water non-trout waters. A medium-sized creek is a flowing waterway with a watershed area of less than 1,000 square miles. South Run is not classified under New Jersey Administrative Code 7:77E-4.3. McGuire AFB has installed a diversion pond and sluice gate on South Run to protect the water from spills that might occur (McGuire AFB 2003c).

3.2.5.2 Groundwater

Groundwater below McGuire AFB hydrologically is within the northern Pinelands Section of the New Jersey Coastal Plain. Several major hydrogeologic units have been identified in the McGuire AFB area, particularly three shallow units and one deep unit (the Potomac-Raritan-Magothy System) (McGuire AFB 2003c).

The depth to groundwater is relatively shallow (less than five feet in some areas). The Potomac-Raritan-Magothy aquifer is the primary source of potable water in the McGuire AFB area. The Base obtains water from four deep wells in the Potomac-Raritan-Magothy aquifer at depths of 800 to 1,100 feet below ground surface (McGuire AFB 2003c).

3.2.6 Biological Resources

3.2.6.1 McGuire AFB

Vegetation and Wildlife

McGuire AFB comprises approximately 3,600 acres located along the western limit of the Oak-Pine Forest Region, Atlantic Slope Section. In addition, the Base is located in the Pinelands National Reserve, a one-million acre tract of largely undeveloped mixed forest that is protected under the New Jersey Pinelands Protection Act of 1979. A regional Pinelands Commission was established by the State of New Jersey to manage the resource. The New Jersey Pinelands Comprehensive Management Plan, developed by the Commission, provides protection of the reserve. All counties, townships, or municipalities located within the Pinelands National Reserve are required to comply with the plan. This directive extends to McGuire AFB to the extent that there is a permit required pursuant to another federal law where there is a valid waiver of sovereign immunity (McGuire AFB 2003c).

The original flora was more diverse than at present and the majority of land at the Base is improved and/or highly disturbed. Vegetation in such areas includes grasslands in the airfield region, a golf course, and lawns or landscaped areas adjacent to buildings and other structures such as that in the cantonment area of the Base. Common species in the runway areas, which are mowed twice a year after July 15 to protect grassland nesting bird reproduction, include: broomsedge, little bluestem, barnyard grass, several species of foxtail, Canada thistle, milkweed, early goldenrod, and common reed. Lawn areas typically consist of fescue and bluegrass. The golf course is planted with Kentucky bluegrass, perennial ryegrass, and fescue. Trees commonly planted throughout the base in developed areas include: American

sycamore, thornless honey locust, silver maple, red maple, white pine, and sweet gum. Remnants of native upland forests and forested wetlands occur largely around the periphery of the Base (McGuire AFB 2001).

Wildlife species and diversity are relatively low at McGuire AFB, principally due to extensively developed areas and/or degraded natural habitats. Airfield grassland areas may provide suitable habitat for herpetiles (reptiles and amphibians) such as the American toad and eastern garter snake. Because of the considerable open habitats, bird species are the most diverse group of vertebrate animals, with approximately 135 species with the potential to occur on base. Mammals observed or documented as occurring on McGuire AFB or known to occur in the area surrounding the Base include fox, coyote, striped skunk, white-tailed deer, beaver, eastern cottontail rabbit, red squirrel, white-footed mouse, and meadow vole (McGuire AFB 2001).

Wetlands

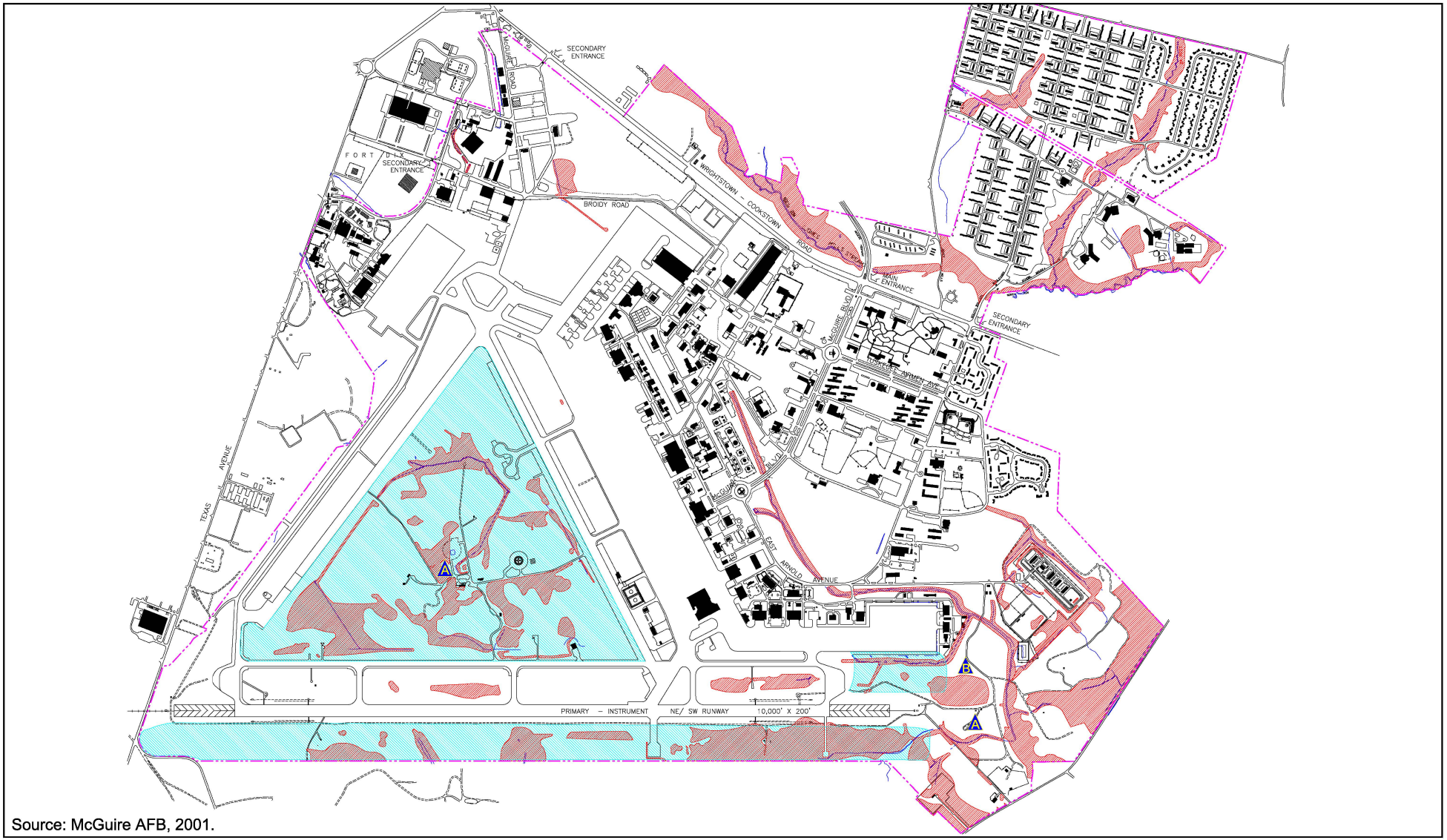
Approximately 500 acres of wetlands have been identified on McGuire AFB, occurring within the airfield infield triangle where the LZ could be constructed, along the southeast side of Runway 06/24, in the southeastern corner of the base, and along the northern boundary of the base (McGuire AFB 2001). Figure 3.2.6-1 depicts wetlands on McGuire AFB.

Wetlands are protected and managed in accordance with Air Force natural resources plans, policies and procedures. The wetlands in the airfield triangle have been delineated as jurisdictional by the United States Army Corps of Engineers. Development in a wetland should include coordination with the New Jersey Department of Environmental Protection (NJDEP) and the Pinelands Commission. The State of New Jersey also requires that additional wetlands buffer areas (up to 300 feet) be protected from development. Although the Pinelands Commission requires the 300 foot buffer, the distance is negotiable (McGuire AFB 2001).

Threatened, Endangered, and Rare Species

The McGuire AFB Integrated Natural Resources Management Plan (INRMP) identifies the areas within the airfield triangle, along the southeast side of Runway 06/24, and adjacent to the east end of the runway as sensitive habitat (see Figure 3.2.6-1). Twelve federally and state-listed threatened, endangered, and rare species occur on or in proximity to McGuire AFB. Surveys for endangered and threatened vertebrate species were conducted in 1994 and additional biological surveys for threatened and endangered plant and animal species were conducted in 1997 and 2000. Of the 12 species having the potential to occur at McGuire AFB, three species of state-listed rare breeding birds and two plant species were observed in the surveys. All sightings were within the maintained grassland community bounded by and adjacent to the runways and taxiways. No federally listed or candidate threatened or endangered species were observed or known to breed at McGuire AFB (McGuire AFB 2001). However eight species are known to occur within proximity of the Base. Table 3.2.6-1 lists the status for the five rare state-listed species.

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Source: McGuire AFB, 2001.

McGuire Air Force Base

LEGEND

- Sensitive Habitat Areas
- Sensitive Species
  - A = Greene's Rush
  - B = Clustered Bluets
- Wetlands
- Base Boundary
- Buildings
- Primary Roads
- Secondary Roads
- Surface Waters

N

0 2,400

Feet

Composite Natural Resources Constraints at McGuire AFB

Figure 3.2.6-1

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Table 3.2.6-1 Threatened, Endangered, or Rare Species Occurring on McGuire AFB

Common Name	Federal Status	State Status
Plants		
Clustered bluets	NL	rare
Greene's rush	NL	imperiled
Birds		
Grasshopper sparrow	NL	threatened
Savannah sparrow	NL	threatened
Upland sandpiper	NL	endangered

Note: NL=not listed.

Source: McGuire AFB 2001

The USFWS, the NJDEP, and the New Jersey Pinelands Commission cooperate in managing the presence of threatened and endangered species in the McGuire AFB area pursuant to federal and state laws. As policy and when practical, the Air Force provides state-listed threatened, endangered, or rare species the same protection that is given to USFWS-listed species.

3.2.6.2 Military Training Routes

The MTRs proposed for use by McGuire AFB would be the same as those proposed for use by Dover AFB aircrews. Therefore, the baseline biological resources description for the MTRs in Subchapter 3.1.5.2 applies to the MTRs proposed for use by McGuire AFB aircrews. Tables F-1 through F-7 in Appendix F-1 contain the federally listed bird species of concern within the MTR corridors that McGuire AFB aircrews use.

3.2.7 Socioeconomic Resources

McGuire AFB is located in Burlington County approximately 30 miles east of Philadelphia, PA, and 15 miles south of Trenton, NJ. Burlington County is part of the Philadelphia, PA-NJ Primary Metropolitan Statistical Area (PMSA), which is a component of the Philadelphia-Wilmington-Atlantic City, PA, NJ, DE, MD, Consolidated Metropolitan Statistical Area. McGuire AFB is located in New Hanover Township, and is bordered on the north by the Borough of Wrightstown and on the east, south and west by Fort Dix. North Hanover, Pemberton, and Springfield represent townships adjacent to New Hanover Township. Table 3.2.7-1 provides a comparative summary of the population trends from 1990-2000 for these geographic jurisdictions and the McGuire AFB CDP.

As reflected in Table 3.1.7-1, the population of Burlington County increased by approximately 7 percent between 1990 and 2000 according to the U.S. Census Bureau. This modest rate of growth was less than the 9 percent growth rate for the State of New Jersey, but greater than the 5 percent rate of growth for the Philadelphia PMSA during the same time period. Twelve of the 21 counties in New Jersey had a higher growth rate during the 1990-2000 period. The McGuire AFB on-Base residential population was 6,557 in 2000 according to the U.S. Census Bureau.

Table 3.2.7-1 Population Trends and Projections, 1990 - 2010

Geographic Area	2010 Projected Population[1]	Percent Population Change (1990-2000)	2000 Population[3]	1990 Population[4]
Philadelphia PMSA[1]	5,245,000	5	5,100,931	4,856,881
Burlington County	461,800	7	423,394	395,056
Wrightstown Borough	NA	-81	748	3,843
Pemberton Township	NA	-9	26,691	31,332
New Hanover Township	NA	2	9,744	9,546
North Hanover Township	NA	-27	7,347	9,994
Springfield Township	NA	7	3,227	3,028
McGuire AFB, CDP[2]	NA	-13	6,557	7,580

NA=Population projections not available at this geographic level.

1. *PMSA=Primary Metropolitan Statistical Area.*
2. *CDP=Census Designated Place.*
3. *Source: USDOC 2000.*
4. *Source: USDOC 1990.*

Although Burlington County gained population, the Townships of North Hanover and Pemberton, and the Borough of Wrightstown lost population during the 1990-2000 period. This population loss was due primarily to the closing and realignment in 1992 of Fort Dix, which is adjacent to McGuire AFB. Considering the out-migration from the closing and realignment of Fort Dix during the inter-census period, only 20 percent of the population growth in Burlington County during the 1990-2000 period was due to net in-migration. According to the 2000 U.S. Census, approximately 22 percent of the population of Burlington County was minority. The U.S. Census Bureau projects a population growth rate of 9 percent for Burlington County over the next 10 years (2000 to 2010) compared to an approximate 8 percent growth rate projected for the State of New Jersey.

3.2.7.1 Housing

Table 3.2.7-2 portrays selected housing characteristics of Burlington County and the selected jurisdictions within the county. According to the 2000 U.S. Census, there are 61,311 housing units in Burlington County, which represents a 13 percent increase in units from 1990. Approximately 65 percent of the housing units are detached single family. In 2002, building permits were issued for 2,359 housing units in Burlington County, of which approximately 85 percent were for single-family units. A total of only 73 residential building permits were issued in 2002 in New Hanover, North Hanover, Pemberton and Springfield Townships. An average of approximately 2,100 residential building permits have been issued annually in Burlington County since 1990 (NJDED 2003). There are 1,747 MFH units on McGuire AFB in addition to 1,200 unaccompanied enlisted units.

Table 3.2.7-2 Housing Characteristics in the Vicinity of McGuire AFB, 2000

Geographic Area	Total Housing Units	Percent Owner-Occupied	Percent Vacant	Median Value (Owner-Occupied)	Median Monthly Contract Rent	Median Household Income
Burlington County	61,311	77	4.3	$134,000	$672	$58,608
Wrightstown Borough	339	25	8.0	98,300	582	27,500
Pemberton Township	10,788	73	6.8	96,600	558	47,394
New Hanover Township	1,381	19	15.9	135,700	905	44,386
North Hanover Township	2,670	51	6.4	160,900	553	39,988
Springfield Township	1,138	91	3.5	194,800	529	69,268
McGuire AFB, CDP	1,652	NA	9.0	NA	829	36,347

NA not applicable.

Source: USDOC 2000.

According to the 2000 U.S. Census, 77 percent of the housing units in Burlington County are owner-occupied, with Springfield and Pemberton Townships having the highest owner-occupancy rates. Twenty-five percent or less of the units were owner-occupied in the Borough of Wrightstown and New Hanover Township, which most likely reflects a higher percentage of military residents. Approximately 4 percent of the housing units were vacant in Burlington County, with Springfield Township having the lowest vacancy rate and New Hanover Township the highest vacancy rate. The median value of owner-occupied housing was $134,000 in Burlington County in 2000, with median values ranging from $98,300 in the Borough of Wrightstown to $194,800 in Springfield Township. Median monthly rents range from $529 in Springfield Township to $905 in New Hanover Township, with the overall county median monthly rent being $672 according to the 2000 U.S. Census. The median household income in 2000 was $58,608 for Burlington County, and ranged from $27,500 in the Borough of Wrightstown to $69,268 in Springfield Township.

According to the Burlington County MLS, there were 1,527 single-family homes for sale in the county in April 2004. Of this total, 296 homes were in the $50,000-$100,000 price range; 145 in the $100,000-$150,000 price range; and 218 in the $150,000-$200,000 price range, with the majority of the remainder having a listing price of over $250,000 (MLS 2004b). There is an ample supply of rental housing primarily in the form of apartments in Burlington County.

3.2.7.2 Education

There are 42 school districts serving Burlington County, the majority of which are coterminous with township political boundaries. McGuire AFB is served primarily by the North Hanover Township School District, New Hanover Township School District, Pemberton Township School District, and the Mt. Holly Township Public Schools. The

North Hanover Township School District operates five schools, four of which are located on McGuire Air Force Base. The latter consist of the Atlantis, Challenger, and Columbia Elementary Schools, and the Discovery Kindergarten/Pre-Kindergarten School. The North Hanover Township District's other school, the Clarence B. Lamb Elementary School, is located in Wrightstown near McGuire AFB. Total enrollment in the North Hanover Township School District during the 2002-2003 school year was 1,428, or a decrease of 12 percent from the 1999-2000 enrollment of 1,607 students (NJDE 2003).

The New Hanover Township School District consists of one small pre-kindergarten through eighth grade school located in Wrightstown, with a 2002-2003 school year enrollment of 166. The Pemberton School District operates nine elementary schools, a middle school, and a high school. Total enrollment during the 2002-2003 school year was 5,786 students. Mount Holly Public Schools consist of two elementary and one middle school, with a total 2002-2003 enrollment of 1,156 students, compared to a 1999-2000 enrollment of 1,186 students (NJDE 2003). In addition, there is the Rancocas Valley Regional High School in Mount Holly with a 2002-2003 enrollment of 2,081, which represented almost a 20 percent enrollment increase over the 1999-2000 school year. It is estimated that approximately 65-70 percent of military dependent children attend off-Base schools.

Higher education facilities within Burlington County include Burlington County College, located in Pemberton, and the Burlington County Institute of Technology, a secondary-post secondary institution with facilities in Medford and West Hampton. Other colleges within commuting distance of McGuire AFB include Camden County College in Blackwood, Ocean County College in Toms River, and Rutgers University in New Brunswick. In addition, there are several satellite campuses of other major universities within the area**.**

3.2.7.3 Economy

Burlington County had an average annual civilian labor force of 232,622 in 2003 with an unemployment rate of 4.6 percent, which was lower than the State of New Jersey unemployment rate of 5.9 percent. The 2003 labor force represented a 9 percent increase over the average annual 1995 civilian labor force of 213,000. The New Jersey Department of Labor projects a 12.7 percent rate of growth in the Burlington County civilian labor force during the 2000-2010 period, similar to the projected growth rate for the State of New Jersey (12.3 percent) and the Philadelphia PMSA (USDL 2003). Labor force data are based on place of residence and not on place of work.

Table 3.2.7-3 portrays employment by major industry sector, including the government sector, for Burlington County for 1995 and 2000. Employment data by industry are based on place of work. As indicated in Table 3.2.7-3, total employment increased by almost 32,600, or 16 percent during this 5-year period, with the greatest absolute increases in the services, retail trade, and finance-insurance-real estate sectors. Services, retail trade, and government continue to be the largest industry sector employers, comprising over 60 percent of the total employment (USDOC 2001). The largest private employers in Burlington County

include Cendant Mortgage Corporation (Mount Laurel), Lockheed Martin (Moorestown), and Virtua Memorial Hospital (Mount Holly), which, combined, have over 3,000 employees.

Table 3.2.7-3 Total Full-and Part-Time Employment by Major Industry Sector by Place of Work, Burlington County, 1995 and 2000

Industry Sector	Percent Change (1995-2000)	Percent of Total Employment (2000)	2000 Employment	Percent of Total Employment (1995)	1995 Employment
Farming	14	1	1,628	1	1,432
Agriculture, Forestry, Fishing	-	-	(D)	1	2,146
Mining	-	-	(D)	Neg.	114
Construction	7	4	10,668	5	9,973
Manufacturing	11	10	22,735	10	20,422
Transportation, Commercial, Utilities	15	5	11,143	5	9,709
Wholesale Trade	20	7	16,041	7	13,365
Retail Trade	13	18	42,079	18	37,346
Financial, Insurance, Real Estate	47	10	24,729	8	16,766
Services	20	30	72,146	29	60,143
Government (Military)	Neg. -22	14 -2	33,909 -5,888	16 -4	33,861 -7,517
Total	16	100	237,876	100	205,277

Neg negligible.

Source: USDOC 2001.

Based on projections by the New Jersey Department of Labor, employment in the service sector in Burlington County is projected to grow by 30 percent between 2000 and 2010, with the construction and retail trade sectors both projected to grow by 10 percent or more during the same period. Employment in the construction industry is projected to continue to diminish (NJDL 2003). This employment distribution and projected growth is reflective of the current and projected sector employment for the State of New Jersey.

McGuire AFB is a major contributor to the local and regional economy in the form of employment and purchase of goods and supplies from the business community. The Base is the largest employer in Burlington County, with over 12,300 military and civilian employees, including active duty, reserve/ANG personnel (USAF 2002f). It is estimated these jobs create an additional 4,337 indirect jobs in the business community. The annual McGuire AFB payroll of $353 million for military and civilian employees generates an additional $174.4 million in wages and salaries for the indirect jobs created. In addition, McGuire AFB contributes to the economy in the form of construction and services, and purchase of materials, equipment, and supplies. The total annual economic impact of McGuire AFB for FY2002 was estimated at $605 million (USAF 2002b) for the EIR or ROI, which is defined as Burlington County.

3.2.8 Cultural Resources

Other than Base and/or state-specific information, the regulatory and ROI discussion in Subchapter 3.1.7 applies to McGuire AFB and the MTRs that would be used for the McGuire AFB Alternative Action. The ROI for analysis of cultural resources includes:

- All areas subject to disturbance from facility construction, addition, and alteration accomplished to support the C-17 beddown at McGuire AFB.
- All MTR corridors in Maine, Vermont, New York, Pennsylvania, New Jersey, Delaware, Maryland, West Virginia, Virginia, North Carolina, and South Carolina shown on Figure 2.4.1-1 are relative to Native American interests.

Identification of cultural resources potentially impacted by the McGuire AFB Alternative Action was conducted by reviewing the 2002 McGuire AFB ICRMP (USAF 2002).

A total of 10 cultural resource investigations have been conducted on or near McGuire AFB since the 1930s. None of these were conducted within or adjacent to the ROI on McGuire AFB. Cultural resources surveys of McGuire AFB are summarized in Table 3.2.8-1.

Table 3.2.8-1 Previous Cultural Resources Investigations Within or Adjacent to the McGuire AFB Region of Influence

Year	Study
1930s	New Jersey Indian Site Survey
1985	Inventory Survey- 10 percent sample of Fort Dix
1986	Section 106 Inventory for a Wastewater Treatment Project
1992	Section 106 Inventory for a Wastewater Treatment Project
1993	Section 110 Assessment
1993	Section 106 Data Recovery of Site 28-BU-413 (Cherry Valley Tavern)
1995	Phase I Survey for Archaeological Sites and World War II resources
1997	Phase I Archaeological Survey of Areas 4100 and 4200
1998	Phase II Evaluation of Four Historical Sites
1998	Reconnaissance Survey of Cold War Properties

Source: USAF 2002

3.2.8.1 Archaeological Resources

The archaeological resources definition in Subchapter 3.1.7.1 applies to this Subchapter.

No NRHP-eligible prehistoric sites occur on McGuire AFB. A base-wide-survey identified 11 historic sites, eight of which were considered to be potentially eligible for the NRHP and for New Jersey Pinelands Commission designations (Moeller, *et al*. 1995). The eight sites were then evaluated; three were found to be eligible for the NRHP, and the other five were found to be ineligible (Holmes 1995, Mariah Associates, Inc. 1998). None of the sites are located within or adjacent to the ROI for McGuire AFB.

3.2.8.2 Historical Resources

The historical resources definition in Subchapter 3.1.7.2 applies to this Subchapter.

A total of 32 World War II-Era (pre-1947) buildings are extant on McGuire AFB. Eighteen of these buildings are of temporary construction design and are covered under the Memorandum of Agreement for World War II temporary structures. The remaining 14 World War II-Era buildings are permanent construction design and are still actively used. None of the 14 buildings retain sufficient integrity for inclusion in the NRHP (Moeller, *et al*. 1995).

Over 702 buildings and structures at McGuire AFB were constructed between 1947 and the present. Based on the mission of McGuire AFB during the Cold War-era, 47 of these buildings and structures were inventoried and evaluated for eligibility in the NRHP (Moeller, *et al*. 1995). Of the 47, the draft report recommends the Semi-Automatic Ground Environment building as exceptionally significant on individual merit. No other individual buildings at McGuire AFB, built between 1945 and 1989, were recommended as potentially eligible.

3.2.8.3 Native American Interests

McGuire AFB

There are no federally recognized Native American Tribes in New Jersey; however, there are many federally recognized Native American groups with historic ties to the area living in other states. The Echota Chickamauga Cherokee Tribe of New Jersey, the Nanticoke-Lenni Lenape Indians of New Jersey, the Powhattan-Renape Nation, and the Ramapough Mountain Indians, Inc. represent the four state-recognized groups. Cultural resources surveys at McGuire AFB have not identified areas of traditional sites important to Native American groups.

Military Training Routes

The MTRs proposed for use by McGuire AFB and assessed in the McGuire AFB C-17 Basing EA are the same as those proposed for use by Dover AFB aircrews under the Proposed Action. Therefore, the baseline Native American description for the MTRs in Subchapter 3.1.7.3 apply to the MTRs proposed for use by McGuire AFB aircrews. Table G-1 in Appendix G lists the federally recognized and state-recognized Native American groups identified within the ROI for the MTRs associated with the McGuire AFB Alternative Action. To ensure that any sites of traditional cultural value are identified and adequately considered under the McGuire AFB Alternative Action, the Air Force sent correspondence to the tribes announcing the action and requesting concerns regarding the alternative (Appendix G).

3.2.9 Land Use

3.2.9.1 McGuire AFB

The McGuire AFB General Plan details the Base's existing and future land use plans. The 11 land use categories for both the existing and future conditions are: airfield; aircraft operations/maintenance facilities; industrial facilities; community (commercial); community (service); medical; housing (unaccompanied); housing (accompanied); administrative; open space; and outdoor recreation.

McGuire AFB is located in central Burlington County, adjacent to and southeast of Wrightstown Borough and within New Hanover Township. Fort Dix surrounds McGuire AFB on the east, south, and west. Existing land use within these portions of Burlington and Ocean counties is largely low-density residential, with several open and agricultural areas adjacent to the Base.

A strip of commercial businesses which serve Base residents exists east of the Base along Wrightstown-Cookstown Road. The residential zone of New Hanover Township is located at the intersection of Wrightstown-Cookstown Road and Main Street, about 1 mile from the Base. The Borough of Wrightstown is located northwest of the Base. Wrightstown is very small and represents the only major developed area in the immediate vicinity. Non-military land use in the 3 square miles comprising Hanover Township is primarily agricultural or residential. The main thoroughfares in Wrightstown, Fort Dix Street, and Main Street, are composed of commercial uses and lead to and from Fort Dix and McGuire AFB. The remainder of the township's land use is a mixture of low and medium-density residential.

The AICUZ definitions and land use recommendations for Dover AFB in Subchapter 3.1.8.1 apply to McGuire AFB. Only industrial and recreational/open land uses are compatible with the safety criteria established for APZ I. Incompatible commercial and small amounts of residential land uses exist in the Runway 18 APZ I. Incompatible off-Base land use also occurs from noise exposure in residential areas north of the Base.

The New Jersey Pinelands Commission was established in 1979 with the enactment of the New Jersey Pinelands Protection Act and Section 502 of the National Parks and Recreation Act of 1978. Both the state and federal acts require preparation of a comprehensive management plan to govern development of the New Jersey pinelands. The Federal Act established the Pinelands National Reserve, which consists of approximately 1.1 million acres in southern New Jersey. The State Act established the Pinelands Area, approximately 934,000 acres within the Pinelands National Reserve. The State Act also gave the Pinelands Commission direct regulatory authority over most development activity occurring with the two components of the Pinelands Area: the Preservation Area and the Protection Area.

Military installations within the Pinelands Area are required to submit master plans for approval by the Pinelands Commission. Any proposed development that requires federal, state, or local permits requires Pinelands Commission application (with prior public

notification). Except as noted in an intergovernmental memorandum of agreement, the Pinelands Commission reviews development within a federal military installation or another federal agency only where a state or local permit is required by federal law regulations. Such reviews are done in accordance with provisions of the New Jersey Pinelands Comprehensive Management Plan. In accordance with the Pinelands Commission's Comprehensive Management Plan, all development on military and federal installations must be in substantial conformance with the minimum standards and guidelines contained in the plan, except where incompatible with national defense or other national security requirements.

3.2.9.2 Military Training Routes

The 16 MTRs proposed for use by McGuire AFB are the same as those proposed for use by Dover AFB aircrews. Therefore, the baseline land use description for the MTRs in Subchapter 3.1.8.2 applies to the MTRs proposed for use by McGuire AFB aircrews. Tables H-1, H-2, and H-3 in Appendix H list the primary recreational lands beneath the IRs, VRs, and SRs associated with the McGuire AFB Alternative Action.

3.2.10 Infrastructure and Utilities

3.2.10.1 Water Supply

McGuire AFB generates all potable water consumed on Base through four on-base production wells. The Base can pump 451,000,000 gallons per year (1.24 mgd) based on a permit from the State of New Jersey. The total amount of water pumped by the Base in FY03 was about 385,000,000 gallons (1.055 mgd), of which approximately 198,000,000 gallons (0.54 mgd) were used in the main Base area (McGuire AFB 2003b). The 1.055 mgd daily use equates to about 85 percent of the permitted pumping amount. Overall daily personal use equates to about 85.57 gallons per person per day when considering the Base had approximately 12,326 personnel in 2003.

3.2.10.2 Waste Water Treatment

Wastewater at McGuire AFB is collected by a central wastewater system and transferred to the Fort Dix WWTP, which has a rated capacity of 4.6 mgd (McGuire AFB undated). The WWTP had a peak load of approximately 1.5 mgd in FY03. Approximately 217,419,000 gallons of wastewater were generated at McGuire AFB in FY03, which equates to an average of 0.596 mgd (McGuire AFB 2003b). This is equivalent to about 48.68 gallons per person per day when considering the base had approximately 12,326 personnel.

3.2.10.3 Storm Water Management

Stormwater runoff is discharged into the drainage network at McGuire AFB which consists of a series of inlets, manholes, pipes, culverts, and ditches. Runoff leaves the Base at six locations, ultimately flowing into the Delaware River. McGuire AFB has a total of about 3,600 acres, of which about 1,190 acres, or 33 percent of the Base, are impervious cover.

McGuire AFB has a storm water discharge permit issued by the New Jersey Department of Environmental Protection, an Base-wide Stormwater Pollution Prevention Plan (SWPPP), and requires individual permits for management of storm water from construction projects on the Base.

3.2.10.4 Energy

Electricity

Electrical power to McGuire AFB is supplied by GPU Energy through a substation on the Base. Base records indicate that electrical consumption at McGuire AFB in FY03 was 80,804,222 kWH. It is estimated there are about 6,979,738 square feet of building space on McGuire AFB. Based on the annual electricity consumption, the square feet of space, and 365 days per year, electricity consumption is 0.032 kWh per square foot per day (McGuire AFB 2003b).

Natural Gas and Heating Oil

Natural gas for McGuire AFB is provided by Public Service Electric and Gas Company. There are three on-Base distribution systems: one that feeds the west end of the Base; another that supplies the north family housing area; and the third system that supplies the main portion of McGuire AFB. Approximately 466,416,000 ccf of natural gas were consumed at the Base in FY03. Based on the annual natural gas consumption, the square feet of space (6,979,738 square feet), and 365 days per year, natural gas consumption is 0.183 ccf per square foot per day (McGuire AFB 2003b).

McGuire AFB also uses heating oil at some facilities. The Base used about 697,242 gallons of heating oil in FY03, or 1,910.3 gallons per day (McGuire AFB 2003).

3.2.10.5 Solid Waste Management

Approximately 8,465 tons of solid waste were generated at McGuire AFB during CY 03 and about 1,627 tons were recycled for the year (McGuire AFB 2003b). The result is about 6,838 tons per year eventually being disposed in the landfill. Average daily per capita solid waste generation from all activities is estimated at 3.04 pounds per day based on the 6,838 tons, 365 days per year, and 12,326 assigned personnel.

There are no active landfills on the Base (McGuire AFB undated). Solid waste at the Base is collected by a private contractor and transported to the Burlington County Resource Recovery Complex in Mansfield and Florence Townships, New Jersey. The facility is home to a 522-acre tract of land encompassing a landfill, bulk storage area, transfer facility, leachate treatment, and other ancillary facilities. A large portion of construction/demolition debris the Base sends to the Recovery Complex is reground, crushed, and reused rather than land filled. Material excluded from acceptance at the landfill is sent to a landfill operated by Burlington County located approximately 8 miles from McGuire AFB (McGuire AFB 2003a). This landfill has approximately 16-20 years of operational life remaining based on current

receipts. The landfill receives about 100,000 tons per year of solid waste (about 274 tons per day based on 7 days a week) (McGuire AFB 2003b).

3.2.10.6 Transportation Systems

Vehicular traffic enters and exits McGuire AFB through four gates:

- Main Gate (Gate 1);
- Gate 2;
- Broidy Road Gate (Gate 8); and
- New Jersey Air National Guard Gate (Gate 5).

The Main Gate receives the majority of the off-Base traffic and provides direct access to the cantonment area of the main Base. Gate 2 is a secondary entrance located east of the Main Gate and connects the north family housing area with the main Base. The Broidy Road Gate is located near the commissary and Base exchange facilities, and is used to access activities on the west side of McGuire AFB. The New Jersey Air National Guard Gate provides direct access to the ANG compound and is open for limited hours, primarily serving morning and evening rush-hour traffic (McGuire AFB undated).

3.2.11 Airspace and Airfield Operations

3.2.11.1 McGuire AFB

Airspace Operations

Radar vectoring, sequencing, and separation service between participating VFR and all IFR aircraft operating within the airspace around McGuire is provided by the McGuire AFB RAPCON. The airspace around McGuire AFB is identified as an alert area. The purpose of an alert area is not to restrict aircraft from transitioning the airspace, but to alert pilots of high-density military aircraft operations within the specified area.

The airspace controlled by the McGuire AFB RAPCON includes 13 public and private use airports (to include NAES Lakehurst about 12 miles east of the Base), generating a high volume of VFR traffic. The close proximity of high-density airspace associated with commercial operations at the Philadelphia, Pennsylvania International Airport, the Newark, New Jersey International Airport, and the Atlantic City, New Jersey Airport, respectively located to the immediate west, north, and southeast of McGuire AFB RAPCON airspace, tends to "flow" VFR aircraft not associated with one of these three airports into the RAPCON airspace at altitudes typically used by RAPCON for vectoring aircraft in the McGuire AFB radar pattern. The areas experiencing the highest levels of aircraft concentration occur about 10 miles southeast and southwest of McGuire AFB.

Low-altitude federal airways occur at distances of about 8 to 10 miles to the north, east, south, and west of the McGuire AFB airfield. (See Subchapter 3.1.10.1 for a description of

low-altitude federal airways.) The western edge of the restricted airspace associated with the Fort Dix ranges is about 1 mile east of the McGuire AFB airfield. The restricted airspace extends to about 8,000 feet MSL. The MTRs nearest McGuire AFB occur about 10 miles south of the airfield.

Airfield Operations

As mentioned in the preceding Airspace Operations section, the airspace around McGuire AFB, including the airspace allocated to the McGuire AFB air traffic control tower and which extends out to about 5 miles and up to about 2,500 feet AGL, has high-density military aircraft operations. The majority of these operations occur as training operations at McGuire AFB. As a result, transient aircraft at McGuire AFB should expect only an approach to a full-stop landing and no training operations.

The McGuire AFB RAPCON provides radar service to aircraft arriving and departing McGuire AFB. There are seven instrument approaches available for arrivals to McGuire AFB. McGuire AFB has two runways, 06/24 and 18/36 Runway 06/24 is 10,000 feet long and 200 feet wide, while Runway 18/36 is 7,140 feet long and 150 feet wide. Tower-controlled traffic patterns are flown at approximately 1,500 feet AGL for rectangular patterns (typically flown by large aircraft), 2,000 feet AGL for overhead patterns (flown by fighter aircraft), and 700 feet AGL for helicopters. Traffic patterns are flown to the north of Runway 06/24 and the west of Runway 18/36. The airfield elevation is 131 feet MSL and the air traffic control tower is operational 24 hours a day year around. Table 3.2.11-1 presents the average daily and total annual operations at McGuire AFB.

Table 3.2.11-1 Annual and Average Daily Airfield Operations, Baseline, McGuire AFB

	Arrival and Departure Operations		Closed Pattern Operations		Total Operations	
Aircraft	**Annual**	**Avg. Daily**	**Annual**	**Avg. Daily**	**Annual**	**Avg. Daily**
McGuire AFB Aircraft						
C-17	2,320	9.28	17,710	70.84	20,030	80.12
KC-10	3,958	15.83	13,700	54.80	17,658	70.63
KC-135E	3,850	15.40	13,440	53.76	17,290	69.16
subtotal	10,128	40.51	44,850	179.40	54,978	219.91
Transient Military Aircraft						
A-10	78	0.31	70	0.28	148	0.59
C-12	110	0.44	0	0.00	110	0.44
C-130	195	0.78	0	0.00	195	0.78
C-141	410	1.64	0	0.00	410	1.64
C-17	43	0.17	0	0.00	43	0.17
C-21	175	0.70	0	0.00	175	0.70
C-5	115	0.46	0	0.00	115	0.46
C-9	85	0.34	0	0.00	85	0.34
KC-10	105	0.42	0	0.00	105	0.42
KC-135R	140	0.56	0	0.00	140	0.56
P-3	35	0.14	35	0.14	70	0.28
H-53	43	0.17	0	0.00	43	0.17
subtotal	1,534	6.13	105	0.42	1,639	6.55

Table 3.2.11-1 Annual and Average Daily Airfield Operations, Baseline, McGuire AFB (…*continued*)

	Arrival and Departure Operations		Closed Pattern Operations		Total Operations	
Aircraft	**Annual**	**Avg. Daily**	**Annual**	**Avg. Daily**	**Annual**	**Avg. Daily**
Transient Civil Aircraft						
B-747	43	0.17	0	0.00	43	0.17
B-707	78	0.31	0	0.00	78	0.31
DC-8	175	0.70	0	0.00	175	0.70
B-727	220	0.88	0	0.00	220	0.88
subtotal	516	2.06	0	0.00	516	2.06
Total	12,178	48.70	44,955	179.82	57,133	228.52

Note: Annual operations based on 250 days per year for based aircraft and 350 days per year for other aircraft.

Source: Noise modeling files from USAF 2002a

3.2.11.2 Military Training Routes

The MTRs proposed for use by McGuire AFB and assessed in the McGuire AFB C-17 Basing EA would be the same as 16 of those proposed for use by Dover AFB aircrews. Therefore, the baseline airspace description for the MTRs in Subchapter 3.1.10.3 apply to the MTRs proposed for use by McGuire AFB aircrews.

3.2.11.3 Aircraft Safety

The aircraft accident distribution and general Class A mishap data in Subchapter 3.1.10.3 apply to McGuire AFB. Table 3.2.11-2 lists the number of class A mishaps, the lifetime class A mishap rate, the number of years for which data are maintained, and the cumulative flight hours for the C-17, KC-10, and KC-135 aircraft. The table reflects the Air Force-wide data for all elements of all missions and sorties for the aircraft.

Table 3.2.11-2 C-17, KC-10, and KC-135 Class A Aircraft Mishap Information

Aircraft	Class A Mishaps	Class A Mishap Rate	Years of Data	Cumulative Flight Hours
C-17	5	1.22	12	410,690
KC-135	16	0.85	34	1,889,403
KC-10	7	0.77	22	911,868

Note: The mishap rate is an annual average based on the total mishaps and 100,000 flying hours. The greatest number of Class A mishaps in any one year for both aircraft is 2 mishaps.

Sources: USAF 2003a and USAF 2003b.

3.2.11.4 Bird-Aircraft Strike Hazard

The background and BASH plan information in Subchapter 3.1.10.4 applies to McGuire AFB. Table 3.2.11-3 lists the monthly bird-aircraft strike information for 2003 within the McGuire AFB airspace, as well as the monthly average for each month for the 8-year period ending December 2003. None of the bird-aircraft strikes resulted in a class A mishap.

Table 3.2.11-3 McGuire AFB Bird-Aircraft Strike Information

Month	2003	8-Year Average	Average Strikes per Operation
Jan	0	0.5	0.000109
Feb	3	1.4	0.000306
Mar	3	2.5	0.000546
Apr	4	6.4	0.001397
May	13	10.3	0.002248
Jun	6	3.6	0.000786
Jul	12	7.3	0.001593
Aug	18	11.9	0.002597
Sep	13	13.3	0.002903
Oct	22	14.9	0.003252
Nov	5	5.5	0.001200
Dec	3	1.6	0.000349
Total	102	79.2	--

Note: Average strikes per month based on the 8-year average monthly bird-aircraft strikes divided by average monthly KC-10, C-17, and KC-135 aircraft operations.

Source: McGuire AFB 2004a.

Air Force-wide, 5,902 bird-aircraft strikes occurred during MTR operations in 2002 (USAF 2003d) during at total of 1,127,064 flying hours (USAF 2003e), or a rate of 0.0052 strikes per flying hour. Based on an estimated average of 45 minutes of flying time for each route flown, McGuire AFB C-17 aircrews flew a combined 593 hours annually on all the MTRs. Using this estimate of flying time and the Air Force-wide data for 2002, it is anticipated that about three bird-aircraft strikes occur annually from McGuire AFB C-17 MTR operations.

3.2.12 Environmental Management

3.2.12.1 Pollution Prevention

The background information for pollution prevention at Dover AFB in Subchapter 3.1.11.1 applies to McGuire AFB. The following plans are used for pollution prevention management at McGuire AFB: *Resource Recovery and Recycling Program*; *Stormwater Pollution Prevention Plan*; *Hazardous Waste Management Plan*; *McGuire AFB Hazmat Plan Appendix to Operations Plan 32-1*; *Discharge, Prevention, Containment, and Countermeasure Plan; Discharge Cleanup and Removal Plan; Facilities Response Plan*; and *McGuire AFB Spill Prevention, Control, and Countermeasures Plan*.

3.2.12.2 Asbestos and Lead-based Paint

Asbestos

The background information for asbestos management for Dover AFB in Subchapter 3.1.11.2 applies to McGuire AFB. Asbestos at McGuire AFB is managed in accordance with the *McGuire AFB Asbestos Management Plan*, which specifies procedures for the removal, encapsulation, enclosure, and repair activities associated with ACM abatement projects.

McGuire AFB buildings have been surveyed to locate, identify, and evaluate any materials containing asbestos. Materials that may contain asbestos include pipe insulation and floor tiles. Asbestos materials are removed on an as needed basis to minimize health risks from release of asbestos fibers during normal activities, maintenance, renovation, or demolition.

Lead-based Paint

The background information for LBP management for Dover AFB in Subchapter 3.1.11.2 applies to McGuire AFB. A comprehensive LBP survey was accomplished in 1995. The survey led to a project to remove and replace window and door frames throughout the military family housing area on the Base.

3.2.12.3 Environmental Restoration Program

The background information for the ERP in Subchapter 3.1.11.3 applies to McGuire AFB. On the basis of ERP data evaluated by the USEPA, McGuire AFB was placed on the NPL in Oct 1999. McGuire AFB has 42 validated ERP sites. All restoration activities for the high relative risk areas are programmed to be in place by the end of 2009.

The Base has mapped its Environmental Compliance Cleanup Sites into 21 non-ERA-eligible open case files for the NJDEP. These sites are located in the flight line industrial areas, the interior of the base, and the New Jersey Air National Guard area. These areas of concern are primarily from leaking underground storage tanks and spills from jet fuel, gasoline, and fuel oil. It is anticipated that many of these cases would be closed (McGuire AFB 2004c). However, none of these identified non-ERA eligible sites occur within the proposed locations for the McGuire AFB Alternative Action and Landing Zone Alternative projects.

Based on comparison of ERP site documentation and the proposed locations for the McGuire AFB Alternative Action and Landing Zone Alternative projects, two ERP sites could be affected by project activities. Site ST-22, which lies beneath the aircraft parking ramp adjacent to where the four C-17 aircraft parking spots would be constructed under the McGuire AFB Alternative Action, is a jet fuel contaminated site first identified when fuel was observed as surface flow (McGuire AFB undated). SS-30 is associated with the existing hydrant fuel system and occurs in the soil below the existing aircraft parking apron. The 2-bay C-17 hangar, in addition to the aerospace ground equipment facility, and site for the four C-17 aircraft parking spots are adjacent to SS-30. Depth to groundwater is two to four feet in the infield area of the airfield, which is immediately adjacent to the proposed location for the four aircraft parking spots. Neither ST-22 nor SS-30 are considered high relative risk areas (McGuire AFB 2004c).

3.3 CHARLESTON AFB

3.3.1 Introduction

The 437th Airlift Wing (437 AW) is the host unit at Charleston AFB. The mission of the 437 AW is to provide rapid mobility for America's armed forces to any problem area in the world through airlift of troops and equipment. During wartime, the 437 AW is responsible for deployment and resupply of major combat units of the United States. It also provides administrative, logistical, and medical support to 437 AW units, tenant agencies, and the Charleston AFB community, including retirees and their families. There are several tenant units at Charleston AFB, one of which is the 315th AW (315 AW), an AFRC Reserve Associate unit. The 315 AW augments the 437 AW in its airlift mission. On a day-to-day basis, reserve flight crews join active duty counterparts in the 437 AW to complete airlift missions.

3.3.2 Air Quality

3.3.2.1 Air Pollutants and Regulations

The air pollutants and regulations discussion for Dover AFB in Subchapter 3.1.2.1 applies to Charleston AFB and North Field. The ambient air quality standards for South Carolina are defined in the Department of Health and Environmental Control (DHEC) Air Pollution Control Regulations and Standards, Standard Number 2 – Ambient Air Quality Standards. Table 3.3.2-1 lists the national and South Carolina ambient air quality standards.

Table 3.3.2-1 National and South Carolina Ambient Air Quality Standards

Criteria Pollutant	Averaging Time	Primary NAAQS	Secondary NAAQS	South Carolina Standards
Carbon Monoxide	8-hour 1-hour	10 mg/m^3 40 mg/ m^3	No standard No standard	10 mg/ m^3 40 mg/ m^3
Lead	Quarterly	1.5 μg/ m^3	1.5 μg/ m^3	1.5 μg/ m^3
Nitrogen Oxides (measured as NO_2)	Annual	0.053 ppm (100 μg/ m^3)	0.053 ppm (100 μg/ m^3)	0.053 ppm (100 μg/ m^3)
Ozone [f]	8-hour [d] 1-hour [d]	0.08 ppm (157 μg/ m^3) 0.12 ppm (235 μg/ m^3)	0.08 ppm (157 μg/ m^3) 0.12 ppm (235 μg/ m^3)	0.12 ppm (235 μg/ m^3)
Particulate Matter (measured as PM_{10})	Annual [d] 24-hour [d]	50 μg/ m^3 150 μg/ m^3	50 μg/ m^3 150 μg/ m^3	50 μg/ m^3 150 μg/ m^3
Particulate Matter (measured as $PM_{2.5}$)	Annual 24-hour	15 μg/ m^3 66 μg/ m^3	15 μg/ m^3 66 μg/ m^3	No standard
Total Suspended particulates	Annual Geometric Mean	No standard	No standard	75 μg/ m^3
Sulfur Oxides (measured as SO_2)	Annual 24-hour [e] 3-hour [e]	0.03 ppm (80 μg/ m^3) 0.14 ppm (365 μg/ m^3) No standard	No standard No standard 0.50 ppm (1,300 μg/ m^3)	0.03 ppm (80 μg/ m^3) 0.14 ppm (365 μg/ m^3) 0.50 ppm (1,300 μg/ m^3)

3.3.2.2 Regional Air Quality

The regional air quality background information pertaining to attainment status of the NAAQS discussed in Subchapter 3.1.2.2 for Dover AFB applies to Charleston AFB and North Field. The DHEC has regulatory authority for air pollution control in the State of South Carolina. Charleston AFB is located in AQCR 199. North Field is located in AQCR 53.

Three counties in South Carolina compose AQCR 199 and 20 counties in South Carolina and Georgia compose AQCR 53. According to federal regulations (40 CFR 81.341), all counties in AQCRs 199 and 53, respectively, are classified as described in the following paragraphs.

Sulfur dioxide. Each AQCR has been designated as better than national standards.

Particulate matter. Each AQCR is in attainment for PM_{10} and is unclassified for $PM_{2.5}$.

Carbon monoxide. Each AQCR has been has been designated as unclassifiable for CO.

Nitrogen dioxide. Each AQCR has been designated as unclassified or better than national standards

Ozone. The information on USEPA issuance of the first 8-hour and 1-hours ozone designations and the *de minimis* threshold to use to determine conformity in Subchapter 3.1.2.2 for AQCR 46 applies to AQCRs 199 and 53. AQCRs 199 and 53 have been designated as unclassifiable for 1-hour ozone standard. In 1997, the USEPA promulgated the 8-hour ozone standard. According to 40 CFR 81.341, the two AQCRs have been designated as unclassified for the 8-hour ozone standard

3.3.2.3 Baseline Air Emissions

The air emissions inventory summary information for Dover AFB in Subchapter 3.1.2.3 applies to Charleston AFB and North Field.

Charleston AFB

Table 3.3.2-2 lists the CY99 air emissions inventory summary for AQCR 199, and Table 3.3.2-3 lists the emissions calculated for Charleston AFB C-17 aircraft operations activities in AQCR 199. Charleston AFB emissions are included in the AQCR 199 summary. The data in Table 3.3.2-2 are used as the baseline for air emissions analysis in this EA.

Table 3.3.2-2 Air Emissions Inventory, AQCR 199

Criteria Air Pollutant	CO (tpy)	VOC (tpy)	NO_x (tpy)	SO_x (tpy)	PM_{10} (tpy)
AQCR 199 CY99 Emissions Inventory	22,210	4,830	40,750	80,080	3,500

Note: VOC is not an air pollutant criterion. However, VOC is reported because, as an O_3 precursor, it is a controlled pollutant. Data are reflected as tpy.
Source: AIRData 2004.

Table 3.3.2-3 Emissions from Charleston AFB C-17 Aircraft Operations Activities within AQCR 199

Activity	CO (tpy)	VOC (tpy)	NO_x (tpy)	SO_x (tpy)	PM_{10} (tpy)
Airfield Operations	91.000	12.000	480.000	0.000	120.000
AGE Operation	3.144	0.882	11.058	1.255	0.712
Aircraft Trim/Power Checks	6.000	1.000	79.000	0.000	13.000
IR-036 Operations	0.010	0.010	0.990	0.000	0.080
SR-166 Operations	0.050	0.030	4.250	0.000	0.330
VR-088 Operations	0.000	0.000	0.000	0.000	0.000
VR-097 Operations	0.000	0.000	0.000	0.000	0.000
VR-1041 Operations	0.060	0.040	5.280	0.000	0.410
VR-1059 Operations	0.000	0.000	0.050	0.000	0.000
Total	100.264	13.962	580.628	1.255	134.532

Note: VOC is not an air pollutant criterion. However, VOC is reported because, as an O_3 precursor, it is a controlled pollutant. Data are reflected as tpy.

North Field

Table 3.3.2-4 lists the CY99 air emissions inventory summary for AQCR 53 and Table 3.3.2-5 lists the emissions calculated for Charleston AFB C-17 aircraft operations in AQCR 53. North Field emissions are included in the AQCR 53 summary. The data in Table 3.3.2-4 are used as the baseline for air emissions analysis in this EA. No routine aircraft maintenance activities occur at North Field. Therefore, emissions are not calculated for AGE and aircraft power/trim checks.

Table 3.3.2-4 Air Emissions Inventory, AQCR 53

Criteria Air Pollutant	CO (tpy)	VOC (tpy)	NO_x (tpy)	SO_x (tpy)	PM_{10} (tpy)
AQCR CY99 Emissions Inventory	11,317	24,382	4,388	43,158	8,255

Note: VOCs are not an air pollutant criterion. However, VOC is reported because, as an O_3 precursor, it is a controlled pollutant. Data reflected as tpy.

Source: AIRData 2004.

Table 3.3.2-5 Emissions from Charleston AFB Aircraft Operations Activities within AQCR 53

Activity	CO (tpy)	VOC (tpy)	NO_x (tpy)	SO_x (tpy)	PM_{10} (tpy)
Airfield Operations	170.00	23.00	1,094.00	0.00	258.00
IR-035	0.18	0.11	15.05	0.00	1.16
IR-036	0.01	0.01	1.21	0.00	0.09
IR-074	0.00	0.00	0.08	0.00	0.01
SR-166	0.24	0.14	19.61	0.00	1.51
VR-088	0.01	0.01	0.73	0.00	0.06
VR-097	0.00	0.00	0.27	0.00	0.02
VR-1059	0.00	0.00	0.25	0.00	0.02
Total	170.44	23.27	1,131.20	0.00	260.87

Note: VOC is not an air pollutant criterion. However, VOC is reported because, as an O_3 precursor, it is a controlled pollutant. Data reflected as tpy.

Military Training Routes

The MTRs proposed for use occur within the States of Virginia, Tennessee, North Carolina, South Carolina, Georgia, and Alabama. Table 3.3.2-6 lists the baseline emissions inventory, as well as the attainment status for each AQCR. The data in this table are used as the baseline for air emissions analysis in this EA. Table 3.3.2-7 lists the baseline emissions from C-17 MTR operations. Table E-4 in Appendix E details the emissions by each respective MTR within the AQCR.

Table 3.3.2-6 Baseline Air Emissions Inventories for Air Quality Control Regions Associated with Charleston AFB Alternative Action Military Training Routes

AQCR	CO (tpy)	VOC (tpy)	NO_x (tpy)	SO_x (tpy)	PM_{10} (tpy)	Attainment Status
AQCR 2	18,732	7,650	10,387	13,806	4,993	attainment
AQCR 3	5,650	5,300	17,190	21,710	3,780	attainment
AQCR 7	15,204	21,234	61,015	128,139	5,572	attainment
AQCR 49	79,410	12,280	95,348	148,015	16,263	attainment
AQCR 53	11,317	4,388	24,382	43,158	8,255	attainment
AQCR 54	16,561	4,141	85,894	189,940	15,190	attainment
AQCR 55	13,883	**7,761**	**63,422**	186,332	6,948	nonattainment
AQCR 57	2,118	2,639	2,998	293	595	attainment
AQCR 58	40,140	8,020	23,580	37,040	11,620	attainment
AQCR 136	7,570	23,250	85,470	97,560	4,310	attainment
AQCR 165	5,678	18,320	38,184	101,117	8,022	attainment
AQCR 166	13,090	9,250	64,550	154,370	9,620	attainment
AQCR 167	11,216	18,042	34,610	74,945	5,415	attainment
AQCR 168	5,139	2,659	4,654	4,534	1,174	attainment
AQCR 169	1,340	5,070	7,880	10,940	1,680	attainment
AQCR 170	29,900	9,070	26,000	56,170	5,050	attainment
AQCR 171	3,610	5,620	14,020	34,740	1,100	attainment
AQCR 198	1,030	2,060	1,680	3,050	140	attainment
AQCR 199	22,210	4,830	40,750	80,080	3,500	attainment
AQCR 200	4,570	4,600	16,840	58,660	4,160	attainment
AQCR 201	7,710	3,840	11,940	20,010	1,660	attainment
AQCR 202	2,880	7,080	9,060	11,360	840	attainment
AQCR 203	661	1,025	431	187	356	attainment
AQCR 204	8,750	1,790	29,500	56,310	1,580	attainment
AQCR 207	126,263	**68,729**	**111,565**	339,923	15,466	nonattainment
AQCR 222	14,780	11,200	24,760	7,170	2,600	attainment
AQCR 226	3,940	5,650	16,560	30,820	2,340	attainment

Note: VOC is not an air pollutant criterion. However, VOC is reported because, as an O_3 precursor, it is a controlled pollutant. Data reflected as tpy. Bold indicates pollutant for which air basin is nonattainment or maintenance.

Source: AIRData 2004.

Table 3.3.2-7 Baseline Emissions from Aircraft Operations on Charleston AFB Alternative Action Military Training Routes

AQCR/MTR	CO (tpy)	VOC (tpy)	NOX (tpy)	SOX (tpy)	PM10 (tpy)
AQCR 2					
CY99 Emissions Inventory	18,732	7,650	10,387	13,806	4,993
Total MTR Operations	0.14	0.08	11.61	0.00	0.89
MTR Emissions as Percent of AQCR Emissions	0.0007%	0.0011%	0.1118%	0.0000%	0.0179%
AQCR 3					
CY99 Emissions Inventory	5,650	5,300	17,190	21,710	3,780
Total MTR Operations	0.01	0.00	0.43	0.00	0.03
MTR Emissions as Percent of AQCR Emissions	0.0001%	0.0001%	0.0025%	0.0000%	0.0009%
AQCR 7					
CY99 Emissions Inventory	15,204	21,234	61,015	128,139	5,572
Total MTR Operations	0.66	0.38	54.65	0.00	4.21
MTR Emissions as Percent of AQCR Emissions	0.0043%	0.0018%	0.0896%	0.0000%	0.0755%
AQCR 49					
CY99 Emissions Inventory	79,410	12,280	95,348	148,015	16,263
Total MTR Operations	0.00	0.00	0.09	0.00	0.01
MTR Emissions as Percent of AQCR Emissions	0.0000%	0.0000%	0.0001%	0.0000%	0.0000%
AQCR 53					
CY99 Emissions Inventory	11,317	4,388	24,382	43,158	8,255
Total MTR Operations	0.45	0.26	37.19	0.00	2.86
MTR Emissions as Percent of AQCR Emissions	0.0039%	0.0059%	0.1525%	0.0000%	0.0347%
AQCR 54					
CY99 Emissions Inventory	16,561	4,141	85,894	189,940	15,190
Total MTR Operations	0.00	0.00	0.12	0.00	0.01
MTR Emissions as Percent of AQCR Emissions	0.0000%	0.0000%	0.0001%	0.0000%	0.0001%
AQCR 55					
CY99 Emissions Inventory	13,883	7,761	63,422	186,332	6,948
Total MTR Operations	0.00	0.00	0.28	0.00	0.02
MTR Emissions as Percent of AQCR Emissions	0.0000%	0.0000%	0.0004%	0.0000%	0.0003%
AQCR 57					
CY99 Emissions Inventory	2,118	2,639	2,998	293	595
Total MTR Operations	0.00	0.00	0.34	0.00	0.03
MTR Emissions as Percent of AQCR Emissions	0.0002%	0.0001%	0.0112%	0.0000%	0.0043%
AQCR 58					
CY99 Emissions Inventory	40,140	8,020	23,580	37,040	11,620
Total MTR Operations	0.02	0.01	2.01	0.00	0.15
MTR Emissions as Percent of AQCR Emissions	0.0001%	0.0002%	0.0085%	0.0000%	0.0013%

Table 3.3.2-7 Baseline Emissions from Aircraft Operations on Charleston AFB Alternative Action Military Training Routes *(…continued)*

AQCR/MTR	CO (tpy)	VOC (tpy)	NOX (tpy)	SOX (tpy)	PM10 (tpy)
AQCR 136					
CY99 Emissions Inventory	7,570	23,250	85,470	97,560	4,310
Total MTR Operations	0.02	0.01	1.70	0.00	0.13
MTR Emissions as Percent of AQCR Emissions	0.0003%	0.0001%	0.0020%	0.0000%	0.0030%
AQCR 165					
CY 99 Emissions Inventory	5,678	18,320	38,184	101,117	8,022
Total MTR Operations	0.19	0.11	16.05	0.00	1.24
MTR Emissions as Percent of AQCR Emissions	0.0034%	0.0006%	0.0420%	0.0000%	0.0154%
AQCR 166					
CY99 Emissions Inventory	13,090	9,250	64,550	154,370	9,620
Total MTR Operations	0.03	0.02	2.88	0.00	0.22
MTR Emissions as Percent of AQCR Emissions	0.0003%	0.0002%	0.0045%	0.0000%	0.0023%
AQCR 167					
CY99 Emissions Inventory	11,216	18,042	34,610	74,945	5,415
Total MTR Operations	0.00	0.00	0.32	0.00	0.02
MTR Emissions as Percent of AQCR Emissions	0.0000%	0.0000%	0.0009	0.0000%	0.0005
AQCR 168					
CY99 Emissions Inventory	5,139	2,659	4,654	4,534	1,174
Total MTR Operations	0.05	0.03	4.04	0.00	0.31
MTR Emissions as Percent of AQCR Emissions	0.0009%	0.0011%	0.0868%	0.0000%	0.0265%
AQCR 169					
CY99 Emissions Inventory	1,340	5,070	7,880	10,940	1,680
Total MTR Operations	0.11	0.06	8.98	0.00	0.69
MTR Emissions as Percent of AQCR Emissions	0.0080%	0.0012%	0.1139%	0.0000%	0.0411%
AQCR 170					
CY99 Emissions Inventory	29,900	9,070	26,000	56,170	5,050
Total MTR Operations	0.41	0.24	33.83	0.00	2.60
MTR Emissions as Percent of AQCR Emissions	0.0014%	0.0026%	0.1301%	0.0000%	0.0516%

Table 3.3.2-7 Baseline Emissions from Aircraft Operations on Charleston AFB Alternative Action Military Training Routes *(…continued)*

AQCR/MTR	CO (tpy)	VOC (tpy)	NOX (tpy)	SOX (tpy)	PM10 (tpy)
AQCR 171					
CY99 Emissions Inventory	3,610	5,620	14,020	34,740	1,100
Total MTR Operations	0.00	0.00	0.39	0.00	0.03
MTR Emissions as Percent of AQCR Emissions	0.0001%	0.0000%	0.0028%	0.0000%	0.0027%
AQCR 198					
CY99 Emissions Inventory	1,030	2,060	1,680	3,050	140
Total MTR Operations	0.19	0.11	15.48	0.00	1.19
MTR Emissions as Percent of AQCR Emissions	0.0180%	0.0053%	0.9217%	0.0000%	0.8511%
AQCR 200					
CY99 Emissions Inventory	4,570	4,600	16,840	58,660	4,160
Total MTR Operations	0.00	0.00	0.15	0.00	0.01
MTR Emissions as Percent of AQCR Emissions	0.0000%	0.0000%	0.0009%	0.0000%	0.0003%
AQCR 201					
CY99 Emissions Inventory	7,710	3,840	11,940	20,010	1,660
Total MTR Operations	0.02	0.01	1.36	0.00	0.10
MTR Emissions as Percent of AQCR Emissions	0.0002%	0.0002%	0.0114%	0.0000%	0.0063%
AQCR 202					
CY99 Emissions Inventory	2,880	7,080	9,060	11,360	840
Total MTR Operations	0.00	0.00	0.08	0.00	0.01
MTR Emissions as Percent of AQCR Emissions	0.0000%	0.0000%	0.0009%	0.0000%	0.0008%
AQCR 203					
CY99 Emissions Inventory	661	1,025	431	187	356
Total MTR Operations	0.00	0.00	0.36	0.00	0.03
MTR Emissions as Percent of AQCR Emissions	0.0007%	0.0002%	0.0838%	0.0000%	0.0078%
AQCR 204					
CY99 Emissions Inventory	8,750	1,790	29,500	56,310	1,580
Total MTR Operations	0.21	0.12	17.26	0.00	1.33
MTR Emissions as Percent of AQCR Emissions	0.0024%	0.0067%	0.0585%	0.0000%	0.0841%

Table 3.3.2-7 Baseline Emissions from Aircraft Operations on Charleston AFB Alternative Action Military Training Routes *(…continued)*

AQCR/MTR	CO (tpy)	VOC (tpy)	NOX (tpy)	SOX (tpy)	PM10 (tpy)
AQCR 207					
CY99 Emissions Inventory	126,263	68,729	111,565	339,923	15,466
Total MTR Operations	0.07	0.04	5.46	0.00	0.42
MTR Emissions as Percent of AQCR Emissions	0.0001%	0.0001%	0.0049%	0.0000%	0.0027%
AQCR 222					
CY99 Emissions Inventory	14,780	11,200	24,760	7,170	2,600
Total MTR Operations	0.01	0.01	0.88	0.00	0.07
MTR Emissions as Percent of AQCR Emissions	0.0001%	0.0001%	0.0036%	0.0000%	0.0026%
AQCR 226					
CY99 Emissions Inventory	3,940	5,650	16,560	30,820	2,340
Total MTR Operations	0.01	0.01	1.23	0.00	0.09
MTR Emissions as Percent of AQCR Emissions	0.0004%	0.0002%	0.0074%	0.0000%	0.0040%

Note: VOC is not an air pollutant criterion. However, VOC is reported because, as an O_3 precursor, it is a controlled pollutant. Data reflected as tpy.

3.3.3 Noise

The background information in Subchapter 3.1.3 applies to Charleston AFB and North Field.

3.3.3.1 Noise Metrics and Analysis Methods

The noise metrics and analysis methods discussion for Dover AFB in Subchapter 3.1.3.1 applies to Charleston AFB and North Field.

Single Event Noise Metrics

The single event sound metrics discussion for Dover AFB in Subchapter 3.1.3.1 applies to Charleston AFB and North Field. Table 3.2.3-1 provides SEL and L_{max} values for the C-17 at a distance of 1,000 feet from the aircraft.

Averaged Noise Metrics

The averaged noise metrics discussion for Dover AFB in Subchapter 3.1.3.1 applies to Charleston AFB and North Field.

Noise Analysis Methods

The single event noise metrics and noise analysis methods discussion for Dover AFB in Subchapter 3.1.3.1 applies to Charleston AFB and North Field.

3.3.3.2 Baseline Noise Analysis, Charleston AFB

The primary source of noise in the vicinity of Charleston AFB is airfield operations. As indicated in Table 2.4.1-4 (No Action Alternative), 359.61 average daily airfield operations occurred at Charleston AFB under the baseline condition. These operations and the resultant baseline noise environment are based on the 48 assigned C-17 and transient aircraft. Approximately 25 percent of the C-17 airfield operations occur between 10:00 p.m. and 7:00 a.m. Figure 3.3.3-1 shows the baseline condition aircraft ground tracks, and Figure 3.3.3-2 depicts the noise exposure area for the baseline. Table 3.3.3-1 lists DNL and outdoor C-17 SEL values at the analysis points.

Table 3.3.3-1 Baseline DNL and C-17 Analysis Points, Charleston AFB

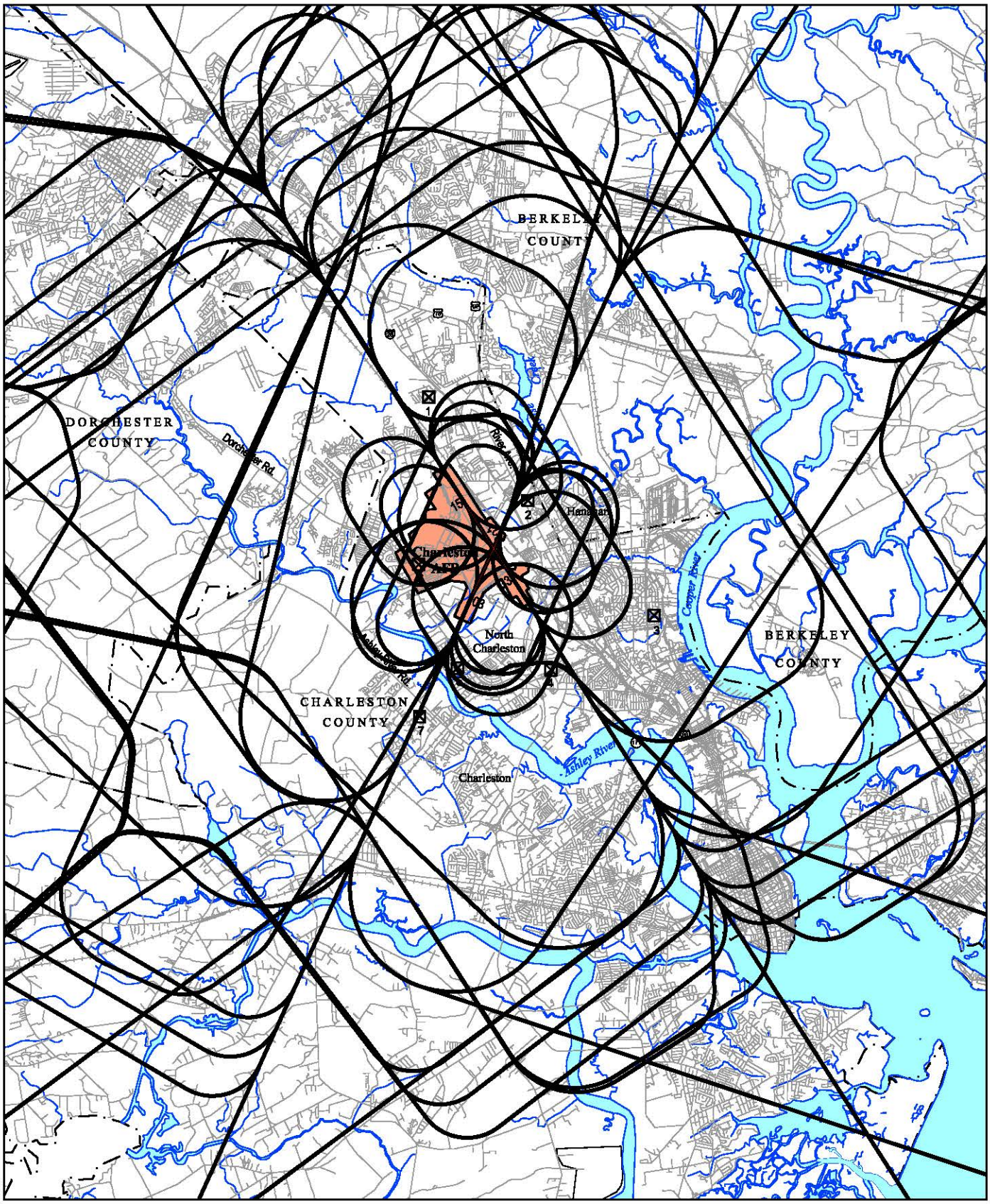
Number	Description	DNL (dBA)	C-17 SEL (dBA)
1	High School	63	91
2	Post Office	67	98
3	Park Circle	51	76
4	Coliseum	65	101
5	School	66	106
6	Charleston AFB Housing	58	92
7	Residences	63	97

Note: The specific analysis point number and description correspond to the point as reflected on the noise contour and aircraft ground track figures. There may be minor differences when comparing the DNL for a point from the table to the DNL for the point as depicted on the noise contour figure. This difference is a result of small misalignments during the process of printing the noise contours on top of the background map.

Source: Charleston AFB 2004.

Single Event Noise Analysis, Charleston AFB

The sleep disturbance and effects of noise on structures discussion for Dover AFB in Subchapter 3.1.3.2 applies to Charleston AFB. Figures 3.3.3-1 and 3.3.3-2 show the seven points identified for analysis in the area surrounding the airfield. These points are facilities that may be sensitive to noise from single aircraft overflight events.



Charleston Air Force Base

LEGEND

- Flight Track
- Runway
- Roadway
- Analysis Point
- Charleston AFB

N

0 3

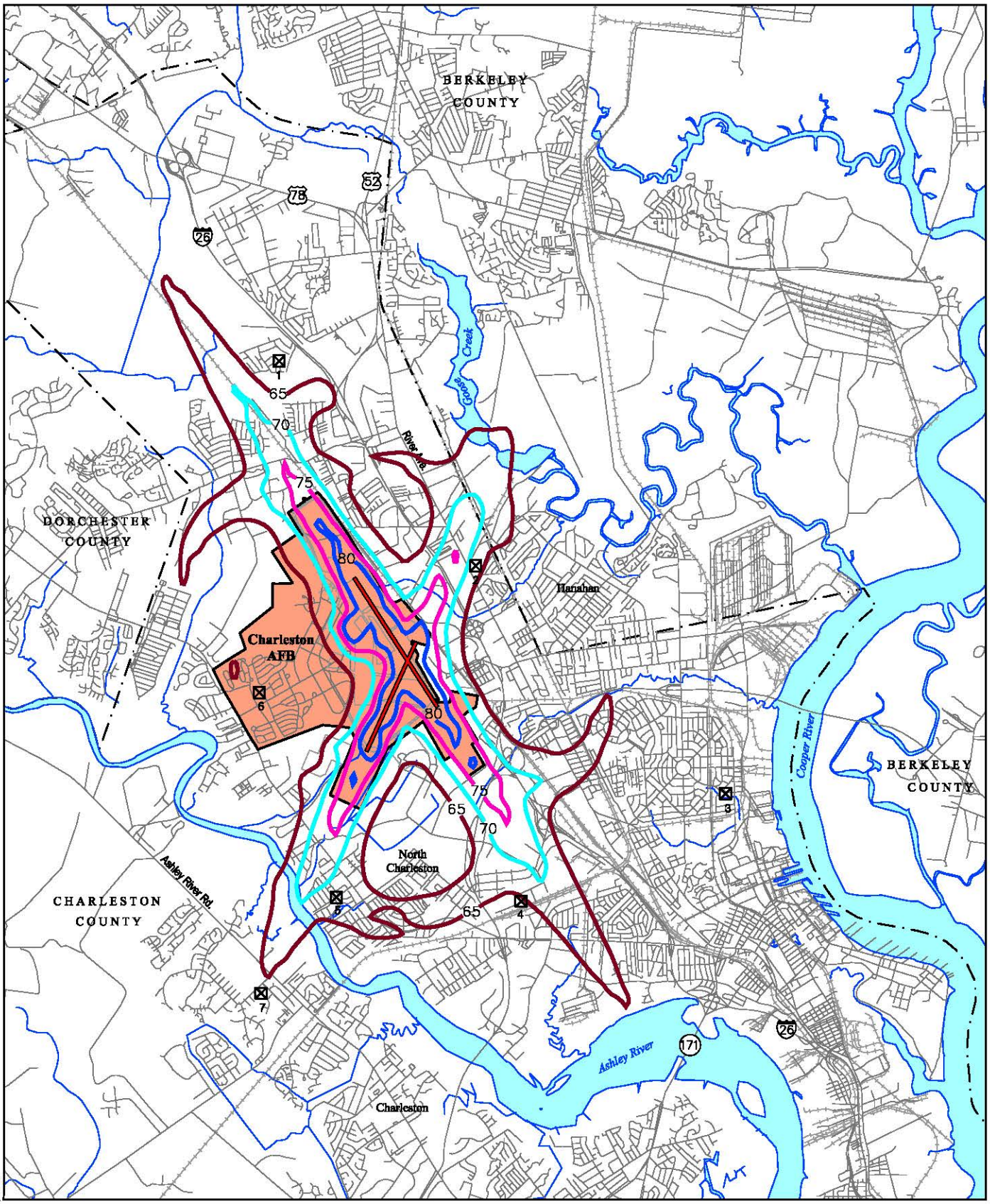
Miles

Baseline Aircraft Ground Tracks, Charleston AFB

Figure 3.3.3-1

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743528 EC17-CHAR-BLNC..DWG

Charleston Air Force Base

LEGEND

- 65 dBA Contour
- 70 dBA Contour
- 75 dBA Contour
- 80 dBA Contour
- Runway
- Roadway
- Analysis Point
- Charleston AFB

N

0 8,000 Feet

Baseline Noise Contours, Charleston AFB

Figure 3.3.3-2

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Day-Night Noise Analysis, Charleston AFB

Figure 3.3.3-2 shows the DNL noise contours for the baseline airfield operations condition at Charleston AFB. The noise annoyance and percentage of persons highly annoyed by noise discussion in Subchapter 3.1.3.2 applies to Charleston AFB. Table 3.3.3-2 lists the number of acres and people within the DNL 65 dBA and greater noise exposure area, as well as the number of people who might be highly annoyed by noise at those levels.

Table 3.3.3-2 Baseline Base Noise Exposure, Charleston AFB

	DNL Interval (dBA)				
Category	**65-70**	**70-75**	**75-80**	**80+**	**Total**
Acres	4,927	1,837	876	590	8,230
People	5,191	2,201	52	0	7,444
People Highly Annoyed	1,142	814	28	0	1,984

Note: The noise annoyance and percentage of persons highly annoyed by noise discussion in Subchapter 3.1.3.2 applies to Charleston AFB.

3.3.3.3 Baseline Noise Analysis, North Field

The primary source of noise in the vicinity of North Field is airfield operations. As indicated in Table 2.4.1-5 (No Action Alternative), 241.27 average daily airfield operations occurred at North Field under the baseline condition. Approximately 56 percent of airfield operations occur between 10:00 p.m. and 7:00 a.m. Figure 3.3.3-3 shows the baseline condition aircraft ground tracks. Figure 3.3.3-4 depicts the noise exposure area for the baseline condition. Table 3.3.3-3 lists the DNL and outdoor C-17 SEL values at the analysis points.

Table 3.3.3-3 Baseline DNL and C-17 SEL at Analysis Points, North Field

			SEL (dBA)			
Number	**Description**	**DNL (dBA)**	**C-17**	**C-5**	**C-130**	**CH-53**
1	Subdivision	75	102	113	NA	NA
2	Residences	63	102	106	NA	NA
3	Church	72	93	89	NA	NA

Note: NA=not applicable. NOISEMAP rand orders the SEL for the 18 noisiest flight track events affecting the analysis point. Thus, NA indicates the particular aircraft type does not produce one of the 18 noisiest events for the point. The analysis point number and description correspond to the point as reflected on the noise contour and aircraft ground track figures. There may be minor differences when comparing the DNL for a point from the table to the DNL for the point as depicted on the noise contour figure. This difference is a result of small misalignments during the process of printing the noise contours on top of the background map.

Table 3.3.3-4 Baseline Noise Exposure, North Field

	DNL Interval (dBA)				
Category	**65-70**	**70-75**	**75-80**	**80+**	**Total**
Acres	14,693	4,267	1,142	959	21,061
People	862	233	32	7	1,134
People Highly Annoyed	190	86	17	4	297

Note: The noise annoyance and percentage of persons highly annoyed by noise discussion in Subchapter 3.1.3.2 applies to North Field.

Single Event Noise Analysis, North Field

The sleep disturbance and effects of noise on structures discussion for Dover AFB in Subchapter 3.1.3.2 applies to the North Field. Figures 3.3.3-3 and 3.3.3-4 show the three points identified for analysis in the area surrounding the airfield. These points are facilities that may be sensitive to noise from single aircraft flyover events.

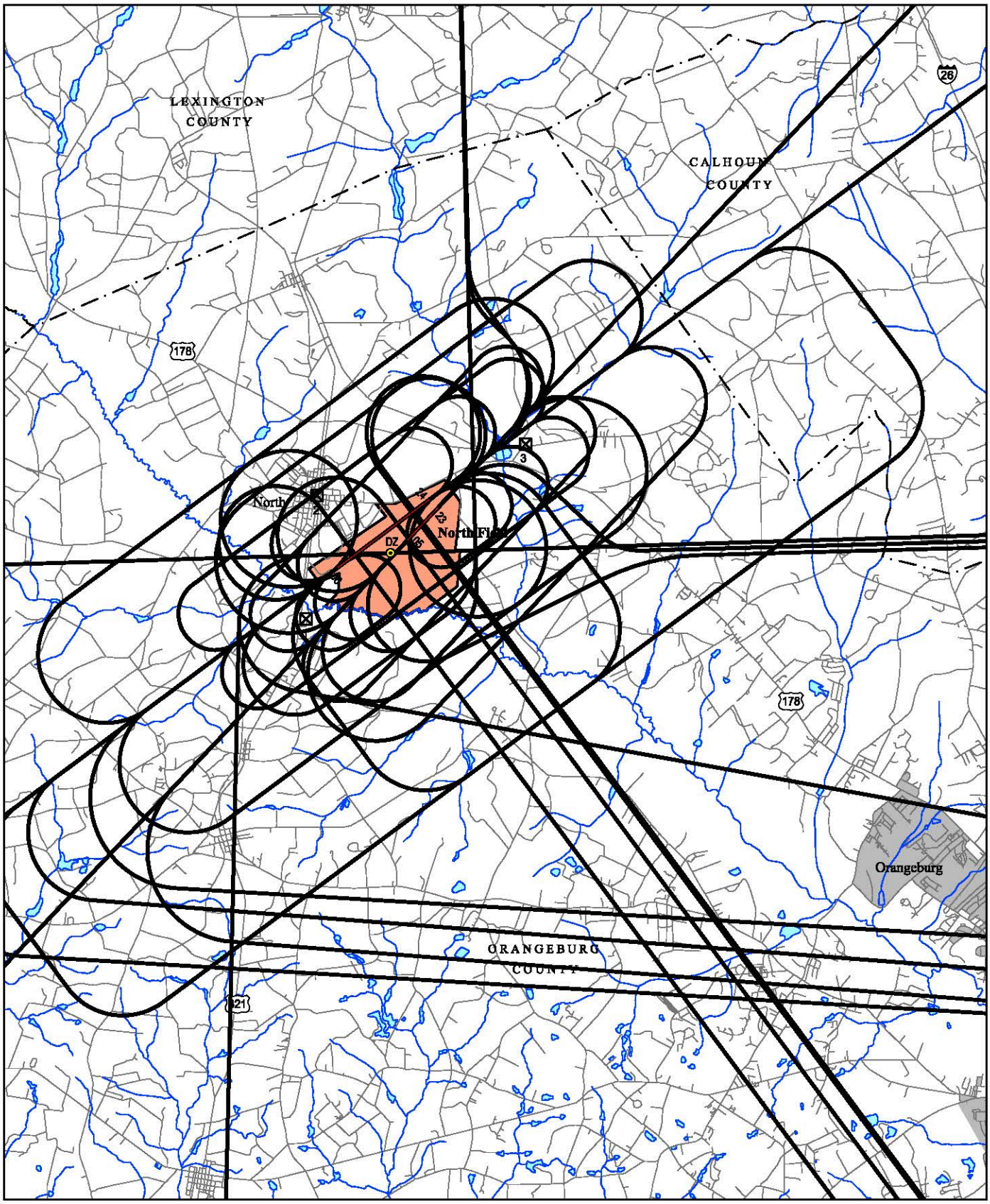
Day-Night Noise Analysis, North Field

Figure 3.3.3-4 shows the DNL noise contours for the baseline airfield operations condition at the North Field. Table 3.3.3-4 lists the number of acres and people within the DNL 65 dBA and greater noise exposure area for the baseline condition, as well as the estimated number of people who might be highly annoyed by noise at those levels.

3.3.3.4 Military Training Route Noise Analysis

Table B-2 in Appendix B lists the baseline operations for all aircraft types on the MTRs used by Charleston AFB C-17 aircrews under the alternative. The background information on MTRs in Subchapter 3.1.3.3 applies to the MTRs used by Charleston AFB aircrews.

As indicated in Table 3.3.3-5, the Ldnmr for baseline MTR operations ranges from a low of 24 dBA to a high of 67 dBA. Table 3.3.3-6 lists the SEL values for the aircraft at points directly below and lateral to the aircraft ground track. Both the Ldnmr and SEL decrease as the distance between the receptor and the route centerline increases. The Ldnmr is a maximum of 5 dBA greater than the values stated in Table 3.3.3-5 at the points at which the MTRs intersect or when there are common route segments. Thus, the maximum Ldnmr for any route is about 72 dBA.



North Field
LEGEND

- Flight Track
- Runway
- Drop Zone
- Analysis Point
- North Field
- Urban Area
- Roadway

N

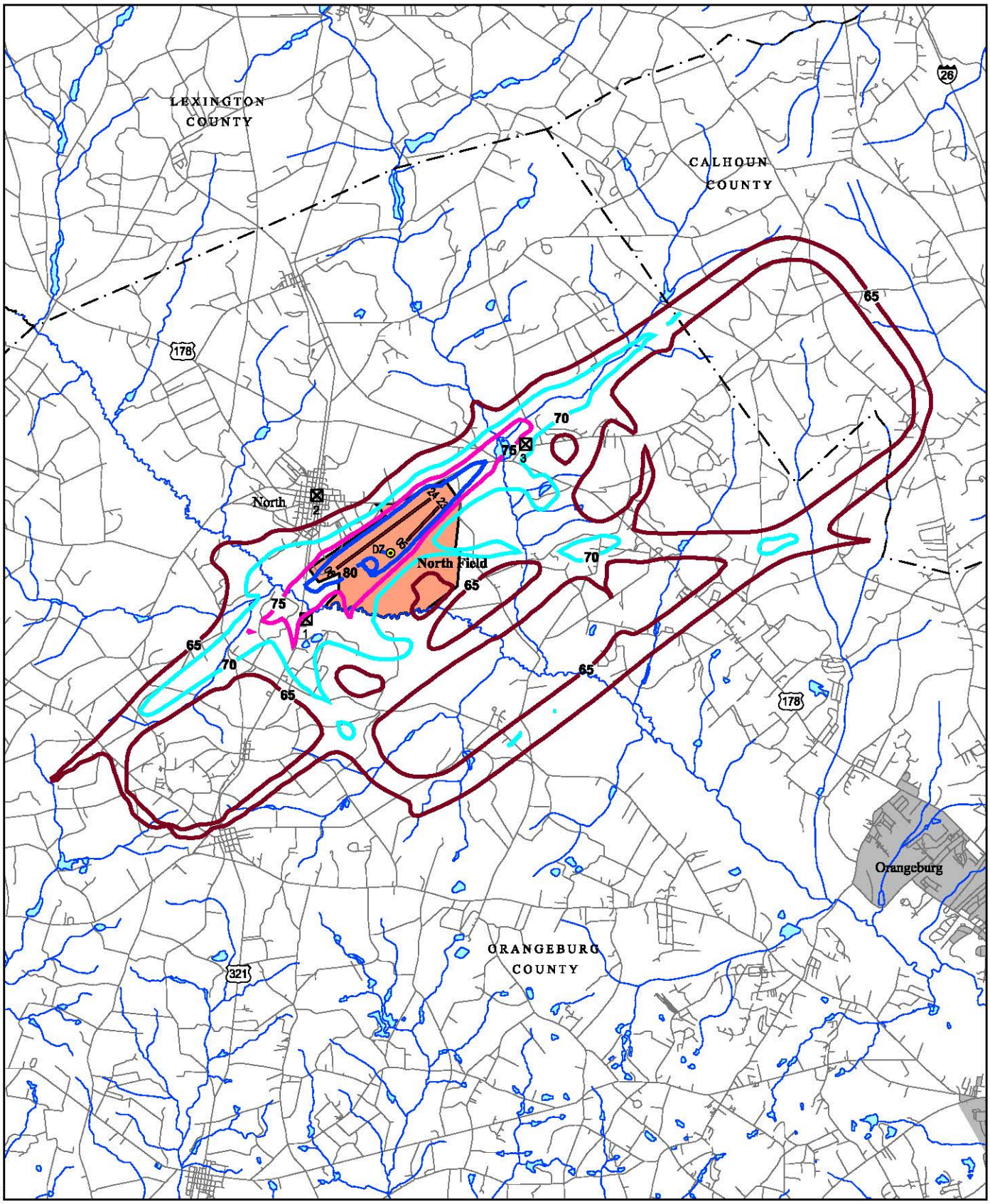
0 12,000
Feet

Baseline Aircraft Ground Tracks, North Field

Figure 3.3.3-3

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North Field
LEGEND

- 65 dBA Contour
- 70 dBA Contour
- 75 dBA Contour
- 80 dBA Contour
- Runway
- Roadway
- Analysis Point
- Drop Zone

Baseline Noise Contours, North Field

Figure 3.3.3-4

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Table 3.3.3-5 Aircraft Noise Levels Below Military Training Routes, Charleston AFB Alternative Action Military Training Routes, Baseline Condition

Route	L_{dnmr} (dBA)	Route	L_{dnmr} (dBA)
IR-002	50	VR-086	58
IR-012	41	VR-087	67
IR-035	49	VR-088	65
IR-036	35	VR-097	58
IR-074	26	VR-1041	53
IR-089	24	VR-1056	50
IR-721	58	VR-1059	60
IR-726	61	SR-166	53
IR-743	53	--	--

Note: L_{dnmr} is represented for 300 feet AGL.

Table 3.3.3-6 Aircraft Noise Levels as a Function of Distance from Aircraft Ground Track Centerline, Charleston AFB Alternative Action Military Training Routes, Baseline Condition

	SEL (dBA)				
Aircraft	200 Feet	315 Feet	1,000 Feet	2,000 Feet	3,150 Feet
T-39	105	102	93	86	81
T-34	87	84	77	72	68
T-2	105	101	92	85	80
T-37	100	97	86	80	75

See Table 3.1.3-8 for data for the following aircraft: F-15, F-18, A-10, F-16, EA-6B, S-3, T-45, T-6, T-1, AV-8, and C-130.

3.3.4 Hazardous Waste, Hazardous Materials, and Stored Fuels

3.3.4.1 Hazardous Waste

The regulatory information for hazardous waste management for Dover AFB in Subchapter 3.1.4.1 applies to Charleston AFB. Charleston Air Force Base Instruction 32-7042, *Hazardous Waste Management Plan*, fulfills the requirements in Title 40, CFR Parts 260-270 and the South Carolina Hazardous Waste Management Regulations (Reg. 61-79.261-264), which establishes procedures to achieve and maintain regulatory compliance regarding accumulation, transportation, and disposal of hazardous waste. The USEPA delegated RCRA implementation to the State. The plan addresses ongoing C-17 aircraft operations and maintenance activities.

Charleston AFB is a large-quantity hazardous waste generator, with waste from industrial activities primarily associated with aircraft operations and maintenance. Hazardous waste is generated from the storage and use of POLs; however, they are normally associated with fuel

spill cleanup materials, contaminated media, and/or contaminated fuel. Charleston AFB does not operate any 90-day accumulation sites. The Base has a RCRA Part B permit for a TSD facility of hazardous waste (permit #SC3570024460). The permitted storage facility is located in Building 691 (USAF 1999b). Hazardous waste is managed in accordance with the Charleston AFB Hazardous Waste Management Plan.

The permitted hazardous waste container storage area, Hazardous Waste Storage Yard, is divided into seven storage pad areas. The storage pads are surrounded by trenches 3 feet wide by 3 feet deep. Pad G is used for storing solid waste and is surrounded by a trench 12 inches wide and 18 inches deep. The maximum permitted volume of container storage is 11,770 gallons. The bulk oil storage tanks, which contain used oil, are surrounded by a 26-inch high dike with valved drainage to an oil/water separator (USAF 1999b).

Four 5,000-gallon bulk storage tanks are also located at the Hazardous Waste Storage Yard. These tanks are used for collection of hydraulic, synthetic, and mixed oils, and off-specification oil. These waste products are recycled off-Base for energy recovery (burning) and are not considered hazardous waste (USAF 1999b).

3.3.4.2 Hazardous Materials

The discussion for hazardous materials regulations for Dover AFB in Subchapter 3.1.4.2 applies to Charleston AFB. The management of discharges of hazardous materials is described in the SPCC Plan for Charleston AFB as well as the Facility Response Spill Plan, and the HAZMAT Emergency Planning and Response Plan. Charleston AFB operates a Hazmart for procurement and distribution of hazardous materials.

3.3.4.3 Stored Fuels

Bulk fuel storage systems at Charleston AFB include fuel and petroleum ASTs and USTs. Charleston AFB has the capacity to store 3,064,020 gallons of jet fuel at the base. Approximately 118,000,000 gallons of jet fuel were consumed in 2003 (Charleston AFB 2004d).

Charleston AFB has an SPCC Plan that identifies procedures, methods, equipment and other requirements to prevent discharge of oil from non-transportation-related facilities into or upon waters of the United States. The SPCC Plan includes a spill history, inspection records and requirements, training procedures, and improvement projects.

In accordance with 40 CFR 112.20, *Facility Response Plans*, the Air Force implemented a Facility Response Plan for Charleston AFB that complements the SPCC Plan. The Facility Response Plan is used by the Base to prevent the spill and release of POL products into navigable waters. The Facility Response Plan includes facility information, emergency response information, hazard evaluations, discharge scenarios, discharge detection systems, and training requirements.

3.3.5 Biological Resources

As discussed in Subchapter 1.4.2.4., proposed activities occur in developed-disturbed areas at Charleston AFB. Therefore, biological resources associated with the Charleston AFB Alternative are limited to the MTRs.

The MTRs for the Charleston AFB Alternative Action cover a broad geographic area in Virginia, Tennessee, North Carolina, South Carolina, Georgia, and Alabama. The diversity of landforms and geography covered by the routes support a number of plant communities and associated animal species. The discussion of effects to plant species in Subchapter 3.1.5.1 applies to the Charleston AFB Alternative Action. Therefore, biological resources associated with the MTRs are limited to birds, specifically, threatened, endangered, and special status species.

Tables F-8 through F-11 in Appendix F contain the federally listed bird species of concern within the MTR corridors used by Charleston AFB aircrews. IRs 721, 726, and 743 are used by aircrews from both McGuire AFBs and are proposed for use by Dover AFB aircrews. The bird species associated with these three MTRs are listed in Table F-1 in Appendix F.

3.3.6 Socioeconomic Resources

Charleston AFB is located in Charleston County, South Carolina within the North Charleston City Limits, approximately 10 miles from downtown Charleston. The Base is within the Charleston-North Charleston MSA, which is composed of Berkeley, Charleston, and Dorchester Counties. Table 3.3.6-1 provides a comparative summary of the population trends from 1990-2000 for these geographic jurisdictions.

Table 3.3.6-1 Population Trends and Projections, 1990 - 2000

Geographic Area	2010 Projected Population[1]	Percent Population Change (1990-2000)	2000 Population[2]	1990 Population[3]
Charleston-North Charleston MSA (Total)	598,970	8	(549,033)	(506,875)
Berkeley County[1]	165,750	11	142,651	128,776
Charleston County[1]	319,480	5	309,969	295,039
Dorchester County[1]	113,740	16	96,413	83,060
City of Charleston	NA	20	96,650	80,414
City of North Charleston	NA	13	79,641	70,218

NA=Population projections not available at this geographic level.

1. *Berkeley, Charleston and Dorchester Counties compose the Charleston-North Charleston MSA.*
2. *Source: USDOC 2000.*
3. *Source: USDOC 1990.*

As reflected in Table 3.3.6-1, the population of the Charleston-North Charleston MSA increased by approximately 8 percent between 1990 and 2000 according to the U.S. Census Bureau. This growth rate was considerably less than the 15 percent rate of growth for the State of South Carolina during the same time period. Population growth within the Charleston-North Charleston MSA during the 1990-2000 period was quite equitably distributed between the three counties comprising the MSA. Meanwhile, the City of Charleston's population increased by 20 percent during this period. Approximately 35 percent of the Charleston-North Charleston MSA population is minority, with the highest concentration in Charleston County. The on-Base residential population is approximately 3,449 (USAF 2002c). A population growth rate of 9 percent is projected for the Charleston-North Charleston MSA for the 2000-2010 period, with the majority of this growth projected to occur in Berkeley and Dorchester Counties.

Table 3.3.6-2 portrays the components of population change for the three counties during the 1990-2000 period. The population increases in Berkeley and Charleston Counties were due entirely to a natural increase in population as there was a net out-migration of the population in both counties. However, approximately one-half of the population increase in Dorchester County was due to a net in-migration of population.

Table 3.3.6-2 Components of Population Change

County	Total	Natural Increase	Net Migration
Berkeley	13,993	14,451	-458
Charleston	14,810	23,156	-8,346
Dorchester	13,353	6,960	6,393

Source: USDOC 2000.

3.3.6.1 Housing

Table 3.3.6-3 portrays selected housing characteristics of the Charleston-North Charleston MSA, and the Cities of Charleston and North Charleston. According to the 2000 U.S. Census, there are 232,985 housing units in the MSA, which represents a 16 percent increase from 1990. Approximately 60 percent of the MSA's housing units are in Charleston County. There are 1,352 military family housing units on Charleston AFB in addition to 587 dormitory quarters and additional temporary quarters (USAF 2002c).

Table 3.3.6-3 Housing Characteristics in the Vicinity of Charleston AFB, 2000

Geographic Area	Total Housing Units	Percent Owner-Occupied	Percent Vacant	Median Value (Owner-Occupied)	Median Monthly Contract Rent	Median Household Income
Charleston-North Charleston MSA (Total)	232,985	67	10.7	$96,700	$475	$39,491
Berkeley County	54,717	74	8.8	79,900	448	39,908
Charleston County	141,031	61	12.6	117,700	492	37,810
Dorchester County	37,237	75	6.8	92,200	444	43,316
City of Charleston	44,563	51	8.5	137,800	518	35,295
City of North Charleston	33,631	46	11.4	64,500	401	29,307

Source: USDOC 2000.

According to the 2000 U.S. Census, 67 percent of the housing units in the Charleston-North Charleston MSA are owner-occupied, with Dorchester County and Charleston County having the highest and lowest owner occupancy rates, respectively. Lower owner-occupancy rates prevail in the City of Charleston and North Charleston. Almost 11 percent of the housing units were vacant in the MSA, with the lowest vacancy rate in Dorchester County and the highest vacancy rate in Charleston County.

The median value of owner occupied housing was $96,700 in the MSA in 2000, with median values ranging from $79,900 in Berkeley County to $117,700 in Charleston County. Median monthly rents range from $444 in Dorchester County to $492 in Charleston County, with higher monthly rents in the City of Charleston. The overall median monthly rent in the MSA was $475 according to the 2000 U.S. Census. The median annual MSA household income in 2000 was $39,491, and ranged from $37,810 in Charleston County to $43,316 in Dorchester County. Median annual household incomes are lower in the City of Charleston and the City of North Charleston.

According to the Charleston/Trident MLS, there were 4,883 single-family homes for sale in the Charleston-North Charleston MSA in April 2004. Properties for sale included 566 homes in the $55,000-$105,000 price range; 1,028 homes in the $105,000-$155,000 price range; and 771 homes in the $155,000-$205,000 price range (MLS 2004c). There is an abundant supply of rental apartments in the MSA.

3.3.6.2 Education

The Charleston County, Berkeley County, and Dorchester County School Districts are the primary providers of elementary and secondary education for Charleston AFB military and civilian personnel. There are no on-Base schools serving dependent children of military personnel. Military dependent children residing on-Base attend Charleston County School District Schools, specifically Lambs Elementary School, Hunley Park Elementary School, Morningside Middle School, and North Charleston High School. The combined 2003 enrollment for the two elementary schools was 1,172 students, and 2,540 students in the middle school and high school. Enrollment in each of these four schools has decreased since

2001. A $4 million renovation was recently completed to Lambs Elementary School for the addition of a new media center, science lab, and computer lab (SCDE 2003).

The Charleston County School District is divided into eight Constituent Districts, which had a total enrollment in 2003 of 41,524 students, excluding magnet and charter schools, compared to 42,045 students in 2001. The district has 41 elementary schools, 13 middle schools, eight high schools, and 12 magnet schools. The Charleston County School District has an on-going and continuing capital improvements program with major proposed improvements, including construction of a new high school, and renovation and expansion of selected overcrowded elementary and middle schools (SCDE 003).

The Dorchester County School District had a total enrollment of 16,650 in 2003 with nine elementary schools, five middle schools and two high schools. The Berkeley County School District had a 2003 enrollment of 26,508, with 20 primary and elementary schools, 10 middle schools and six high schools (SCDE 2003).

In addition to public schools, there are private and parochial schools within the Charleston-North Charleston area. Major higher educational facilities include the College of Charleston, The Citadel, Charleston Southern University, and the University of Charleston, in addition to a number of technical schools and university-affiliated satellite campuses.

3.3.6.3 Economy

The Charleston-North Charleston MSA had an average annual civilian labor force of 281,016 in 2002 and an unemployment rate of 4.0 percent, which was lower than the State of South Carolina unemployment rate of 6.0 percent. The 2002 civilian labor force for the Charleston-North Charleston MSA represented a 14 percent increase over the MSA's average annual 1995 civilian labor force of 247,332 (USDL 2003). Labor force data are based on place of residence and not place of work.

Table 3.3.6-4 portrays employment by major industry sector, including the government sector, for the Charleston-North Charleston MSA for 1995 and 2000. Employment data by industry are based on place of work. As indicated in Table 3.3.6-4, total employment increased by almost 42,000, or 15 percent during this 5-year period, with the greatest absolute increases in the services, retail trade, and construction sectors. Services, government, and retail trade continue to be the largest sector employers comprising almost 70 percent of the total employment. Based on projections by the South Carolina Employment Security Commission, employment is projected to increase 15 percent between 2000-2010, with the services and retail trade sectors projected to experience the greatest absolute and relative increases during this period (SCESC 2003).

Table 3.3.6-4 Total Full-and Part-Time Employment by Major Industry Sector by Place of Work, Charleston-North Charleston MSA, 1995 and 2000

Industry Sector	Percent Change (1995-2000)	Percent of Total Employment (2000)	2000 Employment	Percent of Total Employment (1995)	1995 Employment
Farming	-9	<1	1,511	<1	1,667
Agriculture, Forestry, Fishing	-	-	(D)	1	3,849
Mining	-	-	(D)	Neg.	172
Construction	35	7	24,044	6	17,790
Manufacturing	11	7	23,445	7	21,047
Transportation, Commercial, Utilities	30	6	18,323	5	14,044
Wholesale Trade	30	3	10,766	3	8,250
Retail Trade	10	18	60,008	19	54,587
Financial, Insurance, Real Estate	15	6	19,652	6	17,122
Services	28	30	99,165	27	77,737
Government (Military)	(5) -18	20 -4	64,949 -13,141	24 -6	68,307 -16,122
Total	15	100	326,736	100	284,522

Neg negligible.

Source: USDOC 2001.

Charleston AFB is a major contributor to the local and regional economy in the form of employment and purchase of goods and supplies from the business community. Charleston AFB is the largest employer in Charleston County and in the Charleston-North Charleston MSA with 7,842 military and civilian employees, including active duty, reserve/ANG personnel. It is estimated these jobs create an additional 2,724 indirect jobs in the business community. The annual payroll of $194.7 million for the Charleston AFB military and civilian employees generates an additional $82.4 million in wages and salaries for indirect jobs created. In addition, Charleston AFB contributes to the economy in the form of construction and services, and purchase of materials, equipment, and supplies in the amount of $272.5 million a year. The total annual economic impact of Charleston AFB for FY2002 was estimated at $549.6 million (USAF 2002c) for the EIR or ROI, which is defined as the three counties composing the Charleston-North Charleston MSA.

3.3.7 Cultural Resources

As mentioned in Subchapter 1.4, no significant properties, structures, or sites eligible for the NRHP or other formal recognition have been identified on Charleston AFB. Therefore, cultural resources for the Charleston AFB Alternative Action are limited to Native American interests associated with the Base and the MTRs.

The Native American resources discussion in Subchapter 3.1.6.3 applies to the Charleston AFB Alternative Action. The ROI for Native American traditional resources associated with project activities includes extensive areas throughout Alabama, Florida,

Georgia, North Carolina, South Carolina, Tennessee, and Virginia. Federally recognized and state recognized Native American groups were identified based on publications by the USDOI, Bureau of Indian Affairs (USDOI 2003) the *Native American Directory* (Snyder 1996) and selected state (*e.g.*, Alabama Indian Affairs Commission, North Carolina Commission of Indian Affairs), general (*e.g.*, access genealogy), and Native American Webpages (*e.g.*, 500 Nations, Comanche lodge).

Table G-2 in Appendix G lists the federally recognized and state recognized Native American groups identified within the ROI for the MTRs of the Charleston AFB Alternative Action. To ensure that any sites of traditional cultural value are identified and adequately considered under the Charleston AFB Alternative Action, the Air Force sent correspondence to the tribes announcing the action and requesting concerns regarding the alternative (Appendix G).

3.3.8 Land Use

3.3.8.1 Charleston AFB

The Charleston AFB General Plan details the Base's existing and future land use plans. The 11 land use categories for both the existing and future conditions are: airfield; aircraft operations/maintenance facilities; industrial facilities; community; outdoor recreation; medical; housing (unaccompanied); housing (accompanied); administrative; open space, and water.

The City of North Charleston, located in Charleston County, surrounds Charleston AFB on all sides. Small pockets of land under the jurisdiction of Charleston County are interspersed in the area surrounding the base, but the majority of the land within the base environs is located within the City of North Charleston. The City of Hanahan is located northeast of the base, within Berkeley County. The majority of the land surrounding the base can be characterized as low-density urban developed, with only small sections of less desirable areas remaining undeveloped, generally to the north of the base. The most predominant existing development patterns are strip commercial development along Rivers Road, Ashley Phosphate Road, Interstate 26, and Dorchester Road.

Land to the east of the Base, along the Intestate 26 and Rivers Avenue corridors is almost exclusively highway commercial development with a few large commercial centers, including Northwoods Mall, interspersed along the corridors. The residential areas east of the base are composed largely of single family residences and multi-family units that occur behind the principal commercial uses along Rivers Avenue.

To the west of the Base, the Dorchester Road corridor parallels the Ashley River and is developed with a mix of commercial and residential uses, mostly suburban in character. Land uses to the south of the base are a mixture of industrial, residential, and commercial, with commercial uses prevalent along the Dorchester Road corridor. Residential development south of the base is generally located in isolated pockets paralleling Dorchester Road. A significant amount of open space exists directly off the approach end of Runway 33, but the

recently completed North Charleston Coliseum and Convention and Visitors Center development is planned as a centerpiece for commercial expansion in the area and development is gradually increasing. A large area of industrial uses is located between Dorchester Road and the Ashley River, anchored by the Stark Industrial Park.

The area north of the Base contains heavy concentrations of commercial uses along Ashley Phosphate Road and significant light industrial uses along Cross Country Road. Most of the land east of Goose Creek remains undeveloped, primarily due to a lack of adequate transportation access.

The AICUZ definitions and land use recommendations for Dover AFB in Subchapter 3.1.8.1 apply to Charleston AFB. Incompatible medium-density residential development exists in the Runway 03 APZ I between Dorchester Road and the Ashley River. Incompatible commercial uses also exist along the Dorchester Road corridor. Medium-density residential development exists in the northeast corner of the Runway 03 APZ II and along Ashley River Road in Charleston.

The Wildwood Subdivision contains medium density residential units in the northwest corner of the Runway 21 CZ and the South Carolina Department of Highways and Public Transportation facility is in the northeast corner of the Runway 21 CZ. Large areas of commercial development exist in the Runway 21 APZ I, predominantly between Interstate 26 and Rivers Avenue including the Wildwood Office Park. A United States Postal Service facility is located in the eastern portion of APZ I. Small areas of incompatible residential development exist south of Rivers Avenue.

Approximately six acres of off-Base land exist in the Runway 15 CZ northeast of the railroad tracks, containing a mixture of commercial and residential land uses. The Runway 15 APZ II contains a residential subdivision north of Ashley Phosphate Road that exceeds the recommended density limits and is considered to be incompatible.

Commercial uses, including several hotels, are clustered along the Interstate 26 and Montague Avenue interchange. Portions of the Green Grove and Brentwood subdivision are located in the extreme south end of the Runway 33 APZ II. The Brentwood Middle School is also located in the south end of APZ II.

Medium and high density residential development exists in the DNL 65-69 dB and 70-74 dBA noise contours in several areas surrounding the base to the north, south, and east. Several hotels clustered along the Interstate 26 and Montague Avenue interchange are incompatibly located within the DNL 70-74 dB noise contour.

3.3.8.2 North Field

North Field is located southeast of the municipal boundaries of the Town of North, South Carolina. Land within the airfield environs is primary located within the Town of North or in unincorporated Orangeburg County. The predominant land uses surrounding the airfield are undeveloped (open space), agricultural, or low-density residential.

The Town of North, just northwest of the airfield, is the principal development in the vicinity of North Field. The town is comprised of a few commercial uses clustered along U.S. Highways 178 and 321 in the center of town, two schools, library, administrative offices, several churches, and mostly medium-density single family residential uses. The two schools, North High School and North Elementary School, are located east of U.S. 321.

With the exception of the land within the municipal boundaries of North, all other land uses in the vicinity of the airfield are agricultural, open space, or low-density residential. Land classified as residential is located in a few areas southwest of North Field at Neeses, Livingston, and along Ninety Six Road. The AICUZ definitions and land use recommendations for Dover AFB in Subchapter 3.1.8.1 apply to North Field.

3.3.8.3 Military Training Routes

The land use areas affected by proposed operations on the MTRs consist of those lands directly beneath MTRs flown by Charleston AFB aircrews. The area potentially affected by the MTRs involves primarily rural regions of Virginia, Tennessee, North Carolina, South Carolina, Georgia, and Alabama. Broad areas of cropland and range land are present, as are scattered population centers, including a few larger towns and cities. A review of existing land uses that underlie the MTRs identified the following generalized land uses: urban/populated areas, industrial, recreational areas, agricultural, commercial, and transportation corridors.

Land uses associated with urban/populated centers underlying these routes include residential, commercial, industrial, and institutional (*e.g.*, schools, hospitals). Sensitive land uses are areas of environmental importance and concern, or areas reserved for specific public activities (*e.g.*, recreation, camping). Table H-4 in Appendix H lists the primary recreational lands beneath the IRs, VRs, and SRs associated with the Charleston AFB Alternative Action.

3.3.9 Infrastructure and Utilities

3.3.9.1 Water Supply

Charleston AFB purchases water from the Charleston Commissioners of Public Works. The total amount of water consumed by the Base in FY03 was about 256,500,000 gallons, which averages about 0.73 mgd (Charleston AFB 2003), equivalent to 92.76 gallons per person per day when considering Charleston AFB had approximately 7,842 personnel.

3.3.9.2 Waste Water Treatment

Wastewater is conveyed to the North Charleston Sewer District for treatment under contract at the Ashley River plant. The maximum flow from Charleston AFB to the treatment plant in accordance with the contract is 2.16 mgd. Approximately 355,400,000 gallons of wastewater were generated at Charleston AFB in FY03, which equates to an average of 0.974 mgd (Charleston AFB 2003). This is equivalent to 124.16 gallons per person per day

when considering Charleston AFB had approximately 7,842 personnel. Based on FY03 average daily generation rate, the Base is using about 45 percent of the contract treatment volume.

3.3.9.3 Storm Water Management

The stormwater system consists of underground concrete pipes and catchment basins that guide stormwater through a combination of paved and unpaved ditches, canals, and natural drainage features. Runoff is transmitted to three streams that flow to the Ashley or Cooper Rivers. Charleston AFB has a total of 3,733 acres, of which about 730 acres, or 20 percent of the Base, are impervious cover.

3.3.9.4 Energy

Electricity

Electrical power to Charleston AFB is supplied by South Carolina Public Service Authority-Santee Cooper (about 99 percent) and South Carolina Electric and Gas (about 1 percent). Base records indicate that electrical consumption at Charleston AFB in FY03 was 96,463,545 kWH. There is an estimated 4,385,212 square feet of building space on Charleston AFB. Based on the annual electricity consumption, the square feet of space, and 365 days per year, electricity consumption is 0.060 kWh per square foot per day (Charleston AFB 2003).

Natural Gas

Natural gas for Charleston AFB is provided by South Carolina Electric and Gas. Approximately 218,232,000,000 BTUs of natural gas were consumed at the Base in FY03. Based on the annual natural gas consumption, the amount of space (4,385,212 square feet), and 365 days per year, natural gas consumption is 136.344 BTUs per square foot per day (Charleston AFB 2003).

3.3.9.5 Solid Waste Management

Non-hazardous solid waste generated at Charleston AFB during FY03 totaled 13,598 tons (37.25 tpd), including both diverted waste and waste sent to a disposal facility. The amount of diverted waste, which includes composting, mulching, recycled, reused, donated, and concrete (construction/demolition) totaled 10,337 tons for the year (Charleston AFB 2003). The result is about 3,260 tons per year eventually being disposed in the landfill. Average daily solid waste generation from all activities is estimated at 2.28 pounds per day based on the 3,260 tons, 365 days per year, and 7,842 assigned personnel.

Solid waste is collected by a contractor in both the residential and commercial portions of the Base and transported to the Charleston County Incinerator and Bees Ferry Landfill. This landfill has approximately 9 years of life remaining based on current disposal rates.

Approximately 100,000 tons per year of solid waste (approximately 274 tpd based on 7 days per week) are disposed in the landfill (Lawing 2004).

3.3.9.6 Transportation Systems

Vehicular traffic enters and exits Charleston AFB primarily through two gates:

- Rivers Gate; and
- Dorchester Gate.

The Rivers Gate is located in the northwest portion of the Base and provides access to Interstate 26. The Dorchester Gate, on the west side of the Base, provides access to Dorchester Road (SH 642). Improvements to the existing on-Base transportation system focus primarily on providing parking and improving flow in the central part of the Base (Charleston AFB undated).

3.3.10 Airspace and Airfield Operations

3.3.10.1 Charleston AFB

Airspace Operations

Radar vectoring, sequencing, and separation service between participating VFR and all IFR aircraft operating within the airspace around Charleston is provided by the Charleston AFB RAPCON. Other airports around the Base include the East Cooper Airport (about 13 miles east of Charleston AFB), the Charleston Executive Airport (approximately 14 miles south), the Summerville Airport (about 15 miles northwest), and the Moncks Corner Airport (approximately 16 miles north). There are numerous low-altitude federal airways associated with an aircraft navigation aid located adjacent to Charleston AFB. (See Subchapter 3.1.10.1 for a description of low-altitude federal airways.) The MTR nearest Charleston AFB occurs about 8 miles west of the airfield.

Airfield Operations

The Charleston AFB RAPCON provides radar service to aircraft arriving and departing Charleston AFB. There are four instrument approaches available for arrivals to Charleston AFB. Runway 03/21 is 7,000 feet long and 150 feet wide, and does not have overruns at either end. Runway 15/33 is about 9,000 feet long and is 200 feet wide, and has overruns at the runway ends. Overhead traffic patterns accomplished by fighter and trainer type aircraft are flown at an altitude of approximately 1,700 feet AGL. Rectangular patterns for large, heavy aircraft are accomplished at 1,200 feet AGL, except for C-5 patterns which are flown at 2,000 feet AGL. Light aircraft such as aero club aircraft fly patterns at 700 feet AGL. The airfield elevation is 46 feet above mean sea level and the air traffic control tower is operational 24 hours a day year around.

Aircraft activities at Charleston AFB include takeoffs, landings, and closed pattern operations generated by aircraft based at Charleston AFB C-17s and aero club aircraft, transient military aircraft, Charleston International Airport aircraft, and general aviation aircraft. Table 3.3.10-1 presents the average daily and total annual operations at Charleston AFB.

Table 3.3.10-1 Annual and Average Daily Airfield Operations, Baseline, Charleston AFB

	Arrival and Departure Operations		Closed Pattern Operations		Total Operations	
Aircraft	**Annual**	**Avg. Daily**	**Annual**	**Avg. Daily**	**Annual**	**Avg. Daily**
Based Aircraft						
C-17	10,384	29.34	21,906	62.59	32,290	91.93
Aero Club	902	4.93	0	0.00	902	4.93
subtotal	11,286	34.27	21,906	62.59	33,192	96.86
Transient Military Aircraft						
AV-8	394	1.08	4,680	12.82	5,074	13.90
A-10	128	0.35	0	0.00	128	0.35
C-5	262	0.72	0	0.00	262	0.72
C-9	106	0.29	0	0.00	106	0.29
C-17	200	0.55	0	0.00	200	0.55
C-130	1,032	2.83	0	0.00	1,032	2.83
KC-135	408	1.12	0	0.00	408	1.12
C-141	512	1.40	0	0.00	512	1.40
F-16	824	2.26	4,680	12.82	5,504	15.08
H-60	260	0.71	0	0.00	260	0.71
T-1	428	1.17	412	1.13	840	2.30
T-6	358	0.98	344	0.94	702	1.92
T-37	310	0.85	300	0.82	610	1.67
T-38	244	0.67	234	0.64	478	1.31
subtotal	5,466	14.98	10,650	29.17	16,116	44.15
Charleston International Airport Aircraft						
Regional Jet	24,958	68.38	0	0.00	24,958	68.38
B-737	3,650	10.00	0	0.00	3,650	10.00
B-757	2,190	6.00	0	0.00	2,190	6.00
MD-80	2,190	6.00	0	0.00	2,190	6.00
Dornier 38	5,840	16.00	0	0.00	5,840	16.00
A-319/320	1,460	4.00	0	0.00	1,460	4.00
Beech 1900	1,772	4.86	0	0.00	1,772	4.86
subtotal	42,060	115.24	0	0.00	42,060	115.24
General Aviation Aircraft						
Single Engine	6,650	18.22	10,914	29.90	17,564	48.12
Twin Engine	4,468	12.24	7,336	20.10	11,804	32.24
Turboprop	6,198	16.98	0	0.00	6,198	16.98
Jet	2,160	5.92	0	0.00	2,160	5.92
subtotal	19,476	53.36	18,250	50.00	37,726	103.36
Total	78,288	217.85	50,806	141.76	129,094	359.61

Note: Annual operations based on 350 days per year for based aircraft training sorties, 365 days per year for based aircraft mission sorties, and 365 days per year for all other aircraft.

Source: Charleston AFB 2004.

3.3.10.2 North Field

Airspace Operations

Radar vectoring, sequencing, and separation service between participating VFR and all IFR aircraft operating within the airspace around North Field is provided by the Columbia, South Carolina Approach Control. The public use airports closest to North AAF are the Corporate Airport about 14 miles to the northwest and the Orangeburg Airport, approximately 14 miles southeast. There is a private airport about seven miles northeast of North Field. (See Subchapter 3.1.10.1 for a description of low-altitude federal airways.) IR-35, which is associated with the drop zone located on North Field and which is used by Charleston AFB and other military unit aircrews, passes through the airspace associated with North Field.

Airfield Operations

Columbia Approach Control provides radar service to aircraft arriving and departing North Field. However, pilots terminate radar service prior to operations at North Field and reestablish contact with the TRACON when departing the airfield. Runway 06/24 is 10,000 feet long and 500 feet wide. The LZ is 4,000 feet long and 90 feet wide. Runway 06/24 has 1,000 foot-long overruns at the ends and the LZ has 300 foot long overruns. The airfield elevation is 290 feet above mean sea level. Traffic patterns are accomplished at 1,000 feet AGL. Tactical approaches are initiated at altitudes of 5,000 feet AGL and greater in the area around the airfield. Airdrop operations at the drop zone on the airfield occur at altitudes as low as 550 feet AGL.

No instrument approaches for arrival to the airfield currently exist. However, Charleston AFB is in the process of establishing an instrument approach and anticipates the process would be implemented prior to implementation of the Charleston AFB Alternative if it is the preferred alternative.

North Field does not currently have a control tower. However, air traffic advisory services are provided by controllers an average of 14 hours per day, five days per week. The actual hours of operation depend on the flying training schedule for North Field and the controllers provided service during scheduled training. The airfield can be used during the times the advisory controllers are not present. In these instances, the using organization provides personnel to accomplish the air traffic advisory service. Charleston AFB is in the process of establishing a control tower and anticipates the process would be implemented prior to implementation of the Charleston AFB Alternative if it is the preferred alternative.

The majority of aircraft operations at North Field are accomplished by Charleston AFB C-17 aircraft. Operations also are accomplished by aircraft by Air Force units from Dover and McGuire AFBs, McChord AFB, Washington, and Hurlburt Field, Florida and ARC units at Savannah and Atlanta, Georgia, and Charlotte, North Carolina. Airfield operations include instrument and visual traffic pattern work, tactical arrivals, departures, and landings, and return to home station, all in one day. Table 3.3.10-2 summarizes North Field aircraft operations.

Table 3.3.10-2 Annual and Average Daily Airfield Operations, Baseline, North Field

	Arrival and Departure Operations		Closed Pattern Operations		Total Operations	
Aircraft	**Annual**	**Avg. Daily**	**Annual**	**Avg. Daily**	**Annual**	**Avg. Daily**
Charleston AFB						
C-17	18,224	52.67	55,727	161.06	73,951	213.73
Other Military						
C-5	97	0.28	529	1.53	626	1.81
C-17	2,661	7.69	4,789	13.84	7,450	21.53
C-130	287	0.83	3,311	9.57	3,598	10.40
H-53	48	0.14	554	1.60	602	1.74
subtotal	3,093	8.94	9,183	26.54	12,276	35.48
Total	21,317	61.61	64.910	187.60	86,227	249.21

Note: Annual operations based on 346 days per year for all aircraft.

Source: Charleston AFB 2003.

3.3.10.3 Military Training Routes

Table B-2 in Appendix B lists the aircraft types and baseline number of operations for the MTRs proposed for use by C-17 aircraft under the Charleston AFB Alternative Action. As shown in the table, aircraft types such as fighters (*e.g.*, F/A-18, F-16, F-15), trainers (*e.g.*, T-1, T-6, and T-45), and transports (*e.g.*, C-130 and C-17) use the routes. Monthly use ranges from a low of 0.16 operation (IR-074) to as many as 128.52 operations per route (VR-1056). Figure 2.4.1-2 depicts the location of the 17 MTRs, which are managed and flown using the processes and procedures identified in Subchapter 3.1.10.2. The air traffic control processes and procedures identified in the baseline description for the routes that would be used for the Dover AFB Proposed Action (*i.e.*, Subchapter 3.1.10.2) are used for the MTRs flown by Charleston AFB aircrews. Appendix B contains additional information for the 17 MTRs.

3.3.10.4 Aircraft Safety

The aircraft accident distribution and general Class A mishap data in Subchapter 3.1.10.3 apply to Charleston AFB. The C-17 data in Table 3.2.11-2 for McGuire AFB apply to Charleston AFB.

3.3.10.5 Bird-Aircraft Strike Hazard

The background and BASH plan information in Subchapter 3.1.10.4 applies to Charleston AFB. Table 3.3.10-3 lists the monthly bird-aircraft strike information for 2003 within the Charleston AFB airspace, as well as the monthly average for each month for the 6-year period ending December 2003. None of the bird-aircraft strikes resulted in a class A mishap.

Table 3.3.10-3 Charleston AFB Bird-Aircraft Strike Information

Month	2003	4-Year Average	Average Strikes per Operation
Jan	2	1.0	0.000372
Feb	2	1.3	0.000495
Mar	1	2.2	0.000805
Apr	3	2.7	0.000991
May	8	2.8	0.001053
Jun	7	4.2	0.001548
Jul	2	2.5	0.000929
Aug	0	2.7	0.000991
Sep	2	3.7	0.001363
Oct	8	5.2	0.001920
Nov	3	2.2	0.000805
Dec	2	1.0	0.000372
Total	40	31.5	--

Note: Average strikes per month based on the 6-year average monthly bird-aircraft strikes divided by average monthly C-17 aircraft operations.

Source: Charleston AFB 2004e.

Based on an estimated average of 45 minutes of flying time for each route flown, Charleston AFB C-17 aircrews flew a combined 515 hours annually on all the MTRs. Using this estimate of flying time and the Air Force-wide data for 2002, it is anticipated that about three bird-aircraft strikes occur annually from Charleston AFB C-17 MTR operations.

3.3.11 Environmental Management

3.3.11.1 Pollution Prevention

The background information for pollution prevention at Dover AFB in Subchapter 3.1.11.1 applies to Charleston AFB. The Charleston AFB pollution prevention program mandates industrial hazardous waste collection and recycling opportunities in both the industrial and military family housing portions of the Base.

3.3.11.2 Asbestos and Lead-based Paint

Asbestos

The background information for asbestos management for Dover AFB in Subchapter 3.1.11.2 applies to Charleston AFB. Buildings on Charleston AFB were constructed when ACM use was common. Due to the age of these buildings, ACM is likely to be present in all properties that have not been completely renovated. It is also possible that water lines on the Base are made of concrete containing asbestos.

Lead-based Paint

The background information for LBP management for Dover AFB in Subchapter 3.1.11.2 applies to Charleston AFB. It is possible that buildings may contain LBP since some of the buildings on the Base were built before 1978 LBP was banned.

3.3.11.3 Environmental Restoration Program

The background information for the ERP in Subchapter 3.1.11.3 applies to Charleston AFB. Historical industrial activities conducted at Charleston AFB have resulted in the contamination of several areas. As part of its proactive commitment to restore and protect the environment, Charleston AFB has initiated an environmental cleanup program to identify, investigate, and remediate identified contaminated sites. The Base has a total of 148 solid waste management units (SWMU) and 19 AOCs. Currently, 37 of the SWMUs are eligible for ERA funding and are managed under the IRP. The remainder of these SWMUs are not eligible for ERA funding. Additionally, the Base has several non-ERA eligible sites addressed under the South Carolina Department of Health and Environmental Control (SCDHEC) tank program. None of these non-ERA eligible SWMUs or sites would be affected by the Charleston AFB Alternative Action projects (Charleston AFB 2004f).

The two squadron operations/aircraft maintenance facilities that would be constructed under the Charleston AFB Alternative Action would be located adjacent to an IRP site. Groundwater below the site occurs approximately 6 feet below the ground surface (Charleston AFB 2004f).

3.3.12 Coastal Zone Consistency

Since Charleston AFB is located within the South Carolina coastal zone, all base projects must be reviewed to ensure consistency with the South Carolina Coastal Zone Management Act. Details of the Act can be found in the South Carolina State Statutes, 1976 Code Sections 48-39-10 through 48-39-230. Coastal zone consistency is reviewed by the SCDHEC, Office of Ocean and Coastal Resource Management (OCRM). OCRM's charge is to guide the wise preservation and utilization of coastal resources through the efforts of an overall coastal zone management program and permitting process.

3.4 NAES LAKEHURST

3.4.1 Introduction

NAES Lakehurst is the Shore-Station Management component of the Naval Air Warfare Center Aircraft Division Lakehurst. The Station provides and maintains facilities and centralized support services (*e.g.*, facility support, security, fire department, safety, and supply) for the Naval Air Warfare Center Aircraft Division Lakehurst and tenant activities. The installation mission is: (1) to conduct U.S. Navy, Joint-Service, and international defense advanced Research and Development programs to develop and support current and future

weapon systems and provide modernization and in-service support to U.S. war fighters; (2) to conduct U.S. Navy and Joint operations and training exercises with DoD activities in support of national defense priorities and initiatives; and (3) to cooperate with other agencies and private industry to further technology development.

3.4.2 Air Quality

3.4.2.1 Air Pollutants and Regulations

The air pollutants and regulations discussion for McGuire AFB in Subchapter 3.2.2 applies to NAES Lakehurst since both installations are in New Jersey.

3.4.2.2 Regional Air Quality

The regional air quality background information pertaining to attainment status of the NAAQS discussed in Subchapter 3.1.2 for Dover AFB applies NAES Lakehurst. The NJDEP has regulatory authority for air pollution control in the State of New Jersey. NAES Lakehurst is located in AQCR 150.

Four counties in New Jersey compose AQCR 150. According to federal regulations (40 CFR 81.308), the AQCR is classified as described in the following paragraphs.

Sulfur dioxide. AQCR 150 has been designated as better than national standards.

Particulate matter. Limited monitoring has occurred for PM_{10} in New Jersey. Based upon the results of this monitoring, all of New Jersey is in attainment for PM_{10}; however, there is no information concerning PM_{10} in 40 CFR 81.331 for any part of New Jersey. The State is unclassified for $PM_{2.5}$.

Carbon monoxide. AQCR 150 has been designated as attainment for CO.

Nitrogen dioxide. AQCR 150 has been designated as cannot be classified or better than national standards.

Ozone. The information on USEPA issuance of the first 8-hour and 1-hours ozone designations and the *de minimis* threshold to use to determine conformity in Subchapter 3.1.2.2 for AQCR 46 applies to AQCR 150. In 1990, AQCR 150 was classified as nonattainment with the federal 1-hour ozone NAAQS. The 1-hour ozone standard at the Colliers Mills monitoring site (the site closest to NAES Lakehurst) has been exceeded every year for the past 5 years. The number of exceedances in the past 5 years has continued to increase each year. The maximum 1-hour concentration exceedance occurred in 2002 with a measurement of 0.153 ppm. According to 40 CFR 81.331, this area remains designated as a severe-17 nonattainment area for ozone.

In 1997, the USEPA promulgated the 8-hour ozone standard. AQCR 150 has exceeded this standard every year since its inception. The lowest number of exceedances recorded was

11 in 2000. The highest number of exceedances recorded was 30 in 2002. The highest 8-hour concentration exceedance occurred in 2002 with a measurement of 0.138 ppm. The highest 8-hour concentration recorded at Colliers Mills has been increasing every year since the 8-hour ozone standard's inception. According to 40 CFR 81.331, this area has been designated as moderate nonattainment for the 8-hour ozone standard.

3.4.2.3 Baseline Air Emissions

Table 3.4.2-1 lists the CY99 air emissions inventory summary for AQCR 150 and Table 3.4.2-2 lists the emissions calculated for C-17 baseline aircraft operations activities in AQCR 150. C-17 emissions are included in the AQCR 150 summary. The information on what is included in the air emissions inventory summary for Dover AFB in Subchapter 3.1.2 applies to NAES Lakehurst. The data in Table 3.4.2-1 are used as the baseline for air emissions analysis in this EA.

Table 3.4.2-1 Air Emissions Inventory, AQCR 150

Criteria Air Pollutant	CO (tpy)	VOC (tpy)	NO_x (tpy)	SO_x (tpy)	PM_{10} (tpy)
AQCR 150 CY99 Totals	1,450	680	10,000	19,660	1,290

Note: VOC is not an air pollutant criterion. However, VOC is reported because, as an O_3 precursor, it is a controlled pollutant. Data are reflected as tpy.

Source: AIRData 2004.

Table 3.4.2-2 Emissions from C-17 Aircraft Operations Activities within AQCR 150

Activity	CO (tpy)1	VOC (tpy)	NO_x (tpy)	SO_x (tpy)	PM_{10} (tpy)
Airfield Operations	1.00	0.00	3.00	0.00	1.00
SR-800	0.02	0.01	1.85	0.00	0.14
SR-801	0.02	0.01	1.64	0.00	0.13
SR-805	0.03	0.01	2.13	0.00	0.16
SR-844	0.03	0.01	2.13	0.00	0.16
SR-845	0.02	0.01	1.59	0.00	0.12
SR-846	0.10	0.06	8.62	0.00	0.66
VR-1709	0.13	0.08	10.93	0.00	0.84
Total	1.35	0.19	31.89	0.00	3.21

Note: VOC is not an air pollutant criterion. However, VOC is reported because, as an O_3 precursor, it is a controlled pollutant. Data are reflected as tpy.

3.4.3 Noise

The background information in Subchapter 3.1.3 applies to NAES Lakehurst.

3.4.3.1 Noise Metrics and Analysis Methods

The sound metrics and analysis methods discussion for Dover AFB in Subchapter 3.1.3.1 applies to NAES Lakehurst.

Single Event Noise Metrics

The single event sound metrics discussion for Dover AFB in Subchapter 3.1.3.1 applies to NAES Lakehurst.

Noise Analysis Methods

The single event noise metrics and noise analysis methods discussion for Dover AFB in Subchapter 3.1.3.1 apply to NAES Lakehurst.

3.4.3.2 Baseline Noise Analysis, NAES Lakehurst

The primary source of noise in the vicinity of NAES Lakehurst is airfield operations. As indicated in Table 3.4.6-1, 119.35 average daily airfield operations occurred at NAES Lakehurst under the baseline condition. Although operations occur between 10:00 p.m. and 7:00 a.m., the number of operations and types of aircraft accomplishing the operations is unknown because the air traffic control tower, which logs airfield operations, does not operate 24 hours per day. Figure 3.4.3-1 shows the baseline condition aircraft ground tracks, and Figure 3.4.3-2 depicts the noise exposure area for the baseline. Table 3.4.3-1 lists DNL and outdoor SEL values at the analysis points for selected aircraft that operate at the airfield.

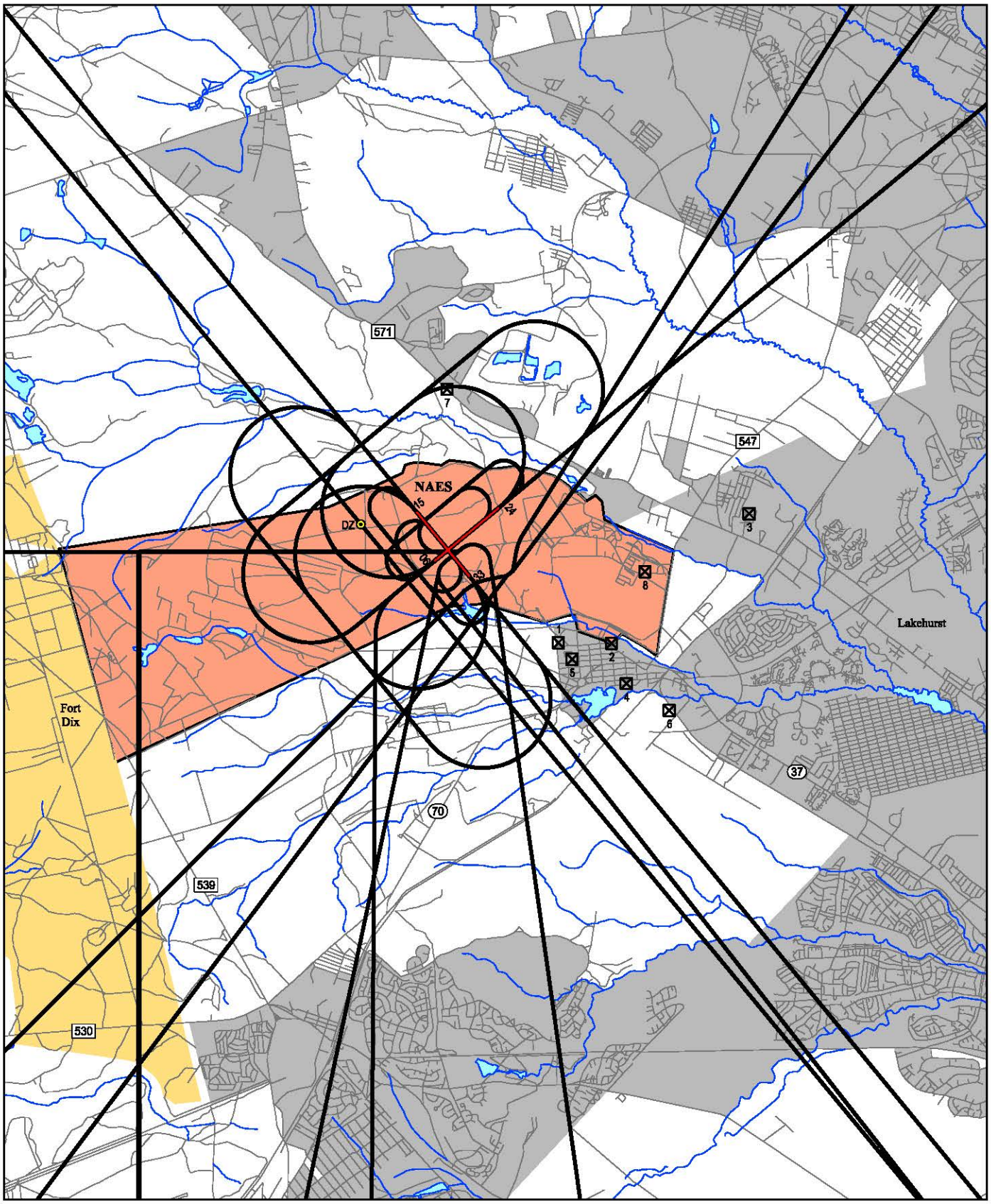
Table 3.4.3-1 Baseline DNL and SEL at Analysis Points, NAES Lakehurst

			SEL (dBA)					
Number	Description	DNL (dBA)	C-17	UH-60	F-18	KC-10	C-130	E-2
1	Church	48	96	75	107	91	88	77
2	Church	40	87	61	100	83	76	NA
3	Subdivision	39	76	61	91	75	NA	66
4	Elementary School	37	89	70	100	84	79	77
5	Navy Housing	42	96	75	106	90	88	77
6	High School	35	85	68	97	76	79	75
7	Vocational School	48	102	67	103	87	89	87
8	On-Station High School	40	77	65	102	83	NA	NA

Note: NOISEMAP determines the SEL for the 18 noisiest flight track events affecting the analysis point. Thus, NA indicates that the particular aircraft type does not produce one of the 18 noisiest events for the point. The specific analysis point number and description correspond to the point as reflected on the noise contour and aircraft ground track figures. There may be minor differences when comparing the DNL for a point from the table to the DNL for the point as depicted on the noise contour figure. This difference is a result of small misalignments during the process of printing the noise contours on top of the background map.

Single Event Noise Analysis, NAES Lakehurst

The sleep disturbance and effects of noise on structures discussion for Dover AFB in Subchapter 3.1.3.2 applies to NAES Lakehurst. Figures 3.4.3-1 and 3.4.3-2 show the eight points identified for analysis in the area surrounding the airfield. These points are facilities that may be sensitive to noise from single aircraft overflight events.



NAES Lakehurst
LEGEND

- Flight Track
- Runway
- Roadway
- Analysis Point
- NAES Lakehurst
- Fort Dix
- Urban Area
- Drop Zone

N

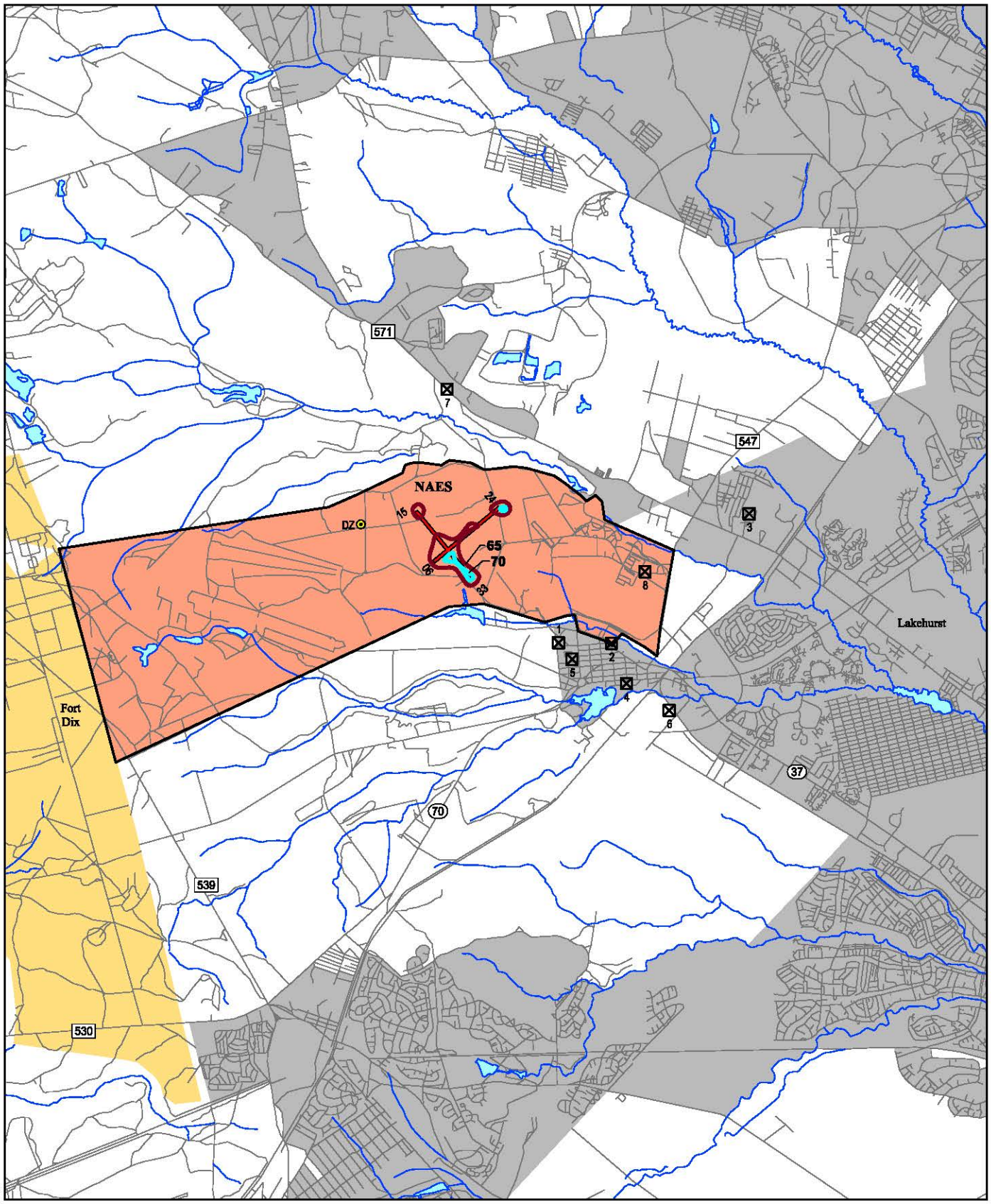
0 8,000
Feet

Baseline Aircraft Ground Tracks, NAES Lakehurst

Figure 3.4.3-1

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NAES Lakehurst
LEGEND

65 dBA Contour
70 dBA Contour
Runway
Roadway
Analysis Point
Drop Zone
NAES Lakehurst
Fort Dix
Urban Area

N
0
8,000
Feet

Baseline Noise Contours, NAES Lakehurst

Figure 3.4.3-2

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Day-Night Noise Analysis, NAES Lakehurst

Figure 3.4.3-2 shows the DNL noise contours for the baseline airfield operations condition at NAES Lakehurst. The noise annoyance and percentage of persons highly annoyed by noise discussion in Subchapter 3.1.3.2 applies to NAES Lakehurst. Table 3.4.3-2 lists the number of acres and people within the DNL 65 dBA and greater noise exposure area, as well as the number of people who might be highly annoyed by noise at those levels.

Table 3.4.3-2 Baseline Noise Exposure, NAES Lakehurst

	DNL Interval (dBA)				
Category	**65-70**	**70-75**	**75-80**	**80+**	**Total**
Acres	103	12	0	0	115
People	0	0	0	0	0
People Highly Annoyed	0	0	0	0	0

Note: The noise annoyance and percentage of persons highly annoyed by noise discussion in Subchapter 3.1.3.2 applies to NAES Lakehurst.

3.4.4 Biological Resources

Vegetation

NAES Lakehurst consists of 7,430 acres. Figure 3.4.4-1 shows the location of environmentally critical areas on NAES Lakehurst and Figure 3.4.4-2 details threatened and endangered species and wetlands in the area in which the LZ would be constructed. These areas were developed as part of NAES Lakehurst's Integrated Natural Resource Management Plan. To be considered environmentally critical, an area must be designated/delineated as a wetland of ecological value, a known location of a federal or state listed threatened or endangered species or Pinelands Commission listed plant, or be recognized as a significant habitat or breeding area for threatened and endangered species.

Vegetation communities at NAES Lakehurst are diverse, ranging from open grasslands to mature forest communities. The station consists of approximately 45 percent upland forests, 28 percent brushland/shrubland (including maintained grasslands), 1.3 percent surface waters, 12 percent wetlands, and 13 percent developed/disturbed areas. Vegetation at and adjacent to the proposed LZ, taxiway, exclusion area, and CZs consists of maintained grasslands associated with Runway 06/24. These grasslands are subject to routine mowing to meet airfield safety requirements and minimize BASH.

Wildlife

The large area of undeveloped land and the diversity of habitats at NAES Lakehurst support a variety of wildlife species. Numerous systematic wildlife surveys have been conducted at the station. At least 85 bird species breed or overwinter at the station. Eighteen reptile and 10 amphibian species have been observed. Thirteen fish species are know to occur or are expected to occur on the station's five lakes and ponds. Some of the bird, reptile, and amphibian species are federally or state listed species. Thirty-seven mammalian species are known or expected to occur at the Station (NAES Lakehurst 2002). Wildlife habitat within

proposed LZ area is limited to maintained grasslands associated with the existing runways. These grasslands provide foraging habitat for various birds, including some species that are state listed. Nesting habitat is limited by the mowing regime required to meet airfield safety requirements. Various mammals and reptiles also use the grasslands. However, the number and type of species found within the grasslands is limited by the lack of surface water and wetland resources, and the required airfield maintenance regime.

Wetlands

Approximately 960 acres of wetlands (including open water and streams) occur within the boundaries of NAES Lakehurst. The wetland communities at the station are representative of the wetlands typically found throughout the Pinelands and include forested, scrub/shrub, and herbaceous wetland communities. Large wetland complexes are also located off-Station, north of the existing runways. No wetlands or state open water and streams are located within the area of disturbance for the proposed LZ. The area associated with the proposed LZ and taxiway is not a wetland transition area (see Figure 3.4.5-2).

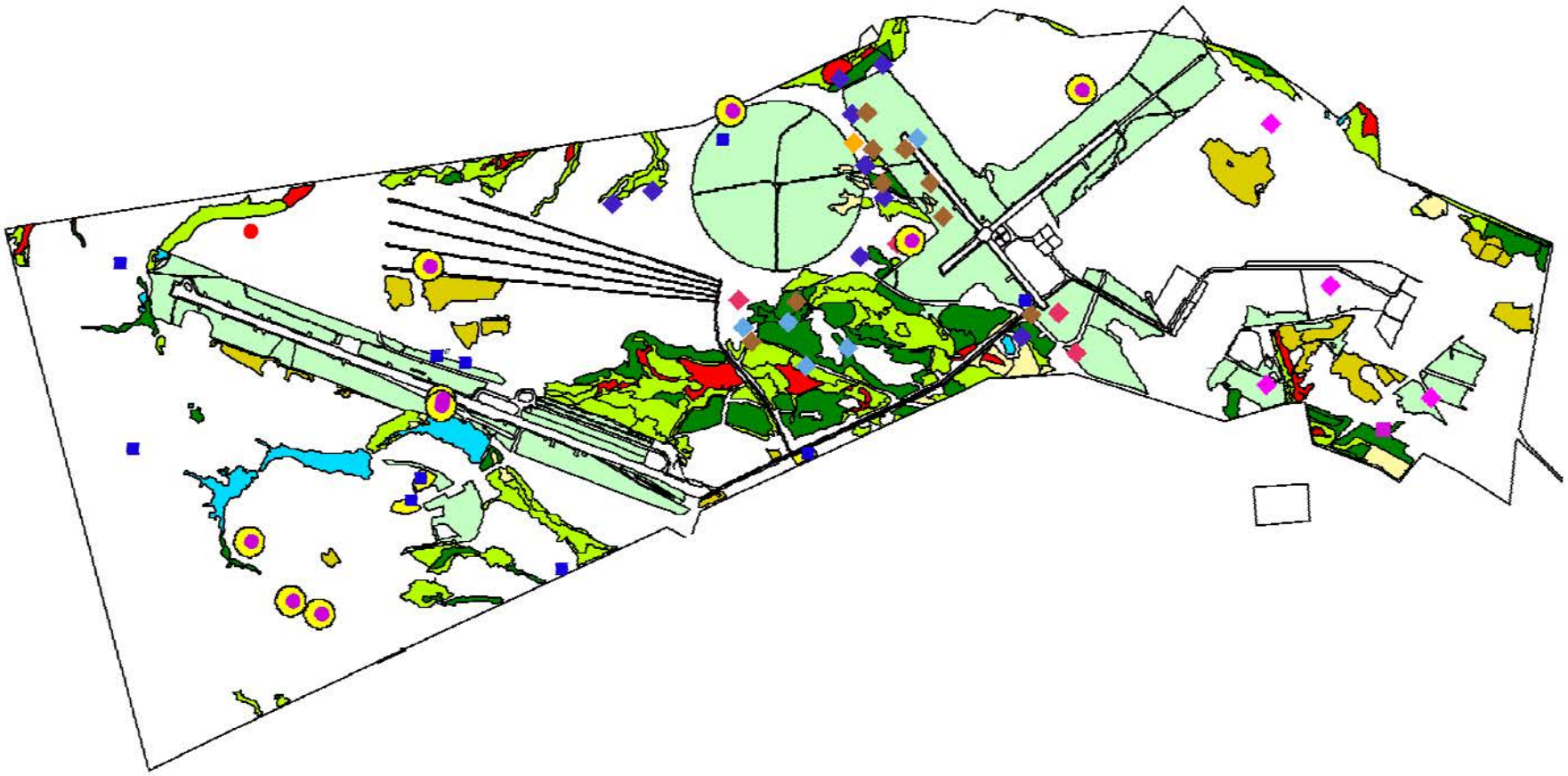
Threatened, Endangered, and Pinelands Commission Listed Species

The large areas of undeveloped land and diversity of habitats at NAES Lakehurst support a variety of threatened and endangered species. Table 3.4.5-1 lists threatened, endangered, and Pinelands Commission listed species that have been documented at NAES Lakehurst during various surveys that have been conducted since 1988. Three of the species (Knieskern's beaked-rush, bog turtle, and bald eagle) are federally listed. No critical habitat has been designated in New Jersey under the ESA for these federally listed species. The remaining species are stated-listed as threatened or endangered species or are Pinelands Commission listed.

None of the federally listed species have been documented within the grasslands associated with the existing runways during surveys conducted by NAES Lakehurst. The area of disturbance for associated with the proposed LZ lacks suitable habitat for Knieskern's beaked-rush, bog turtle, and bald eagle.

Of the species listed in Table 3.4.5-1, only two state listed birds, the grasshopper sparrow and the upland sandpiper, have been documented within the grasslands associated with the existing runways. The grasslands also provide potentially suitable habitat for other grassland birds, including the savannah sparrow and the vesper sparrow. The NJDEP Landscape Project also maps this area as grassland habitat.

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NAES Lakehurst

LEGEND

- Den
- Nest
- Pine Snake Buffer
- Barred owl
- Bog turtle
- Pine Barrens Reed Grass
- Barratt's Sedge
- Sickle-leaved Golden Aster
- Torrey's Dropseed
- Pale Beak Rush
- Slender Nut Rush

Wetlands - sensitive

- Atlantic White Cedar
- Palustrine Emergent
- Palustrine Forested
- Open Water
- Palustrine Scrub/Shrub

Grasslands

- Current
- Future

N

0 4,000

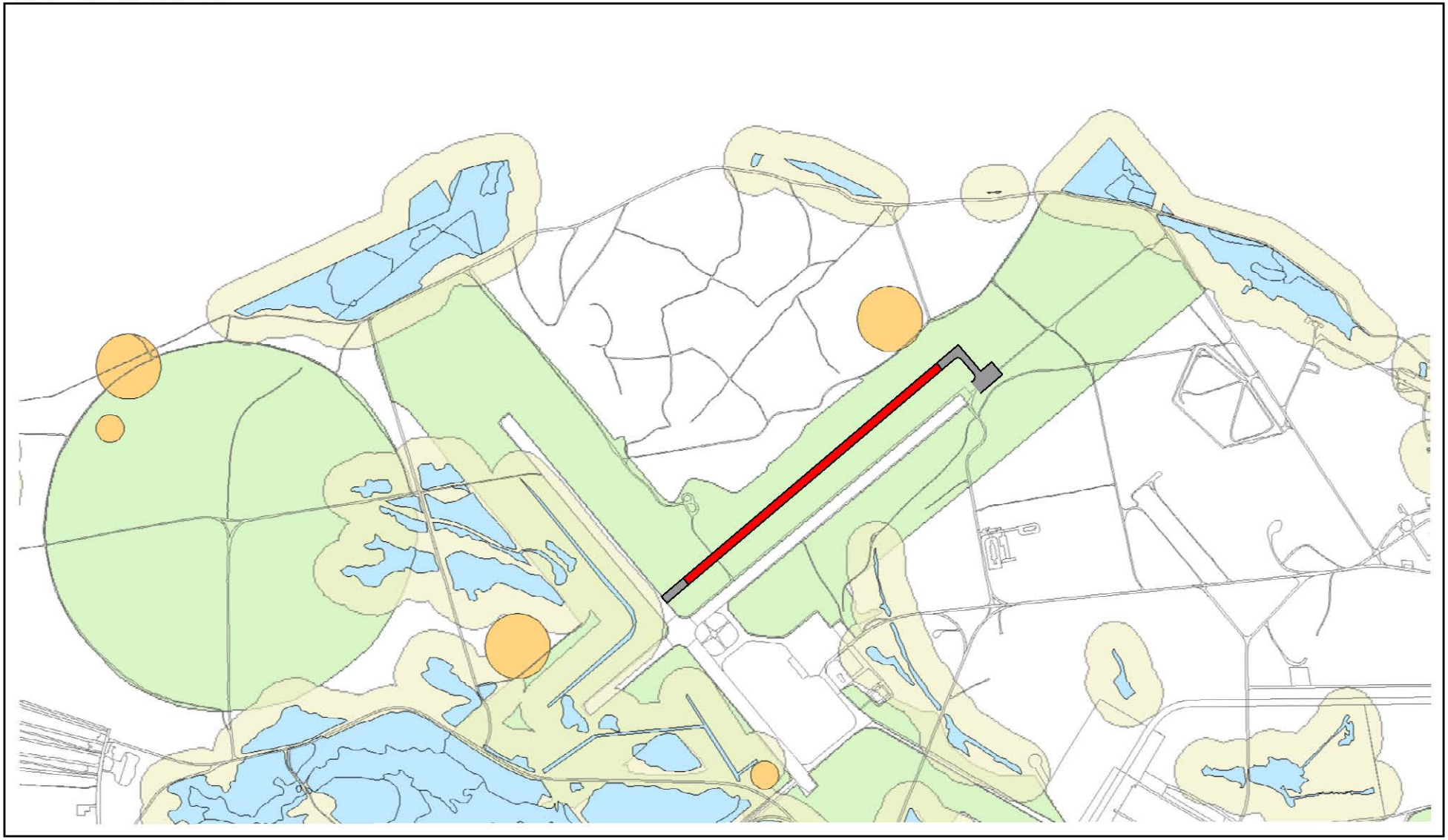
Feet

Ecologically Sensitive Areas, NAES Lakehurst

Figure 3.4.4-1

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NAES Lakehurst

LEGEND

- Approximate Proposed Landing Zone Location
- Pine Snake Buffer
- Wetlands
- 300' Buffer Around Wetlands
- Sensitive Grasslands

N

0 1,500

Feet

Threatened and Endangered Species and Wetlands Buffers in Landing Zone Consruction Area, NAES Lakehurst

Figure 3.4.4-2

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1 **Table 3.4.5-1 Threatened, Endangered, or Rare Species Occurring on NAES Lakehurst**

COMMON NAME	Federal Status	State Status	Other Status	Global Rank	State Rank	Habitat
Mammals						
Bobcat		E		G5	S3	Swamps and forests.
Birds						
American Bittern		E/S		G4	S2B	Large, open freshwater marshes, occasionally brackish marshes.
Bald eagle	LT	E		G4	S1B,S2N	Open or forested habitats near large bodies of water.
Barred owl		T/T		G5	S3B	Woodlands.
Bobolink		T/T		G5	S2B	Tall grass areas or flooded meadows.
Cooper's hawk		T/T		G5	S3B,S4N	Nests in mature woodlands of all types, feeds in open fields.
Dickcissel		EX/U		G5	S1B,S4N	Prairies, weedy fields.
Grasshopper sparrow		T/S		G5	S2B	Open grasslands, cultivated fields, fallow weedy fields.
Henslow's sparrow		E		G5	S1B	Open fields interspersed with weeds or shrubby vegetation.
Northern harrier		E/U	SC	G5	S1B,S3N	Open fields and grasslands.
Osprey		T/T		G5	S2B	Suitable nesting structures near water.
Savannah sparrow		T/T		G5	S2B,S4N	Large fields with short or sparse grass.
Upland sandpiper		E		G5	S1B	Dry grasslands, open bogs.
Vesper sparrow		E		G5	S1B, S2N	Large fields with clumped grasses.
Herpetiles						
Bog turtle	LT	E		G3	S2	Bogs and wet meadows, clean standing or slow-moving shallow water.
Timber rattlesnake		E		G4T4	S2	Forested areas with undergrowth and rocky areas for cover.
Corn snake		E		G5T5	S1	Dry woodlands of pine and oak, elevations of 50 ft.
Pine Barrens treefrog		E		G4	S3	Low areas with standing acidic water, bogs and lowlands.
Northern pine snake	C2	T		G5T4	S3	Dry, sandy pine-oak woods 40 ft+ elevations.

Table 3.4.5-1 Threatened, Endangered, or Rare Species Occurring on NAES Lakehurst *(…continued)*

COMMON NAME	Federal Status	State Status	Other Status	Global Rank	State Rank	Habitat
Plants						
Barratt's sedge			LP	G4	S4	Open areas in pitch pine lowlands and margins of Atlantic white cedar bogs.
Pine Barren reedgrass			LP	G4	S4	Open areas in pitch pine lowlands.
Torrey's dropseed			LP	G3	S3	Open areas of damp sand, sedge thickets along stream corridors.
Sickle-leaved golden aster			LP	G3G4	S3	Dry sandy roadsides and openings in pine/oak woods.
Knieskern's beaked rush	LT	E	LP	G1	S1	Early successional wetlands, often on bog-iron substrate or mud deposits.
Slender nut-rush			LP	G4	S4	Moist to wet sandy Pine Barren swales and thickets.
Two-flowered bladderwort		E		G5	S1	Open water of ponds and streams.
Purple bladderwort			LP	G5	S3	Open waters of ponds, streams, and occasional borrow pits.

Federal Status: LE = Taxa formally listed as endangered. LT = Taxa formally listed as threatened. C = Taxa for which USFWS has sufficient information to support proposals to list as endangered or threatened.

State Status (Status for animals separated by a slash (/) indicates a duel status. The first status refers to the state breeding population, the second status refers to the migratory or winter population.) EX = Extirpated in the state. E = Endangered. T = Threatened. INC = Increasing. D = Declining. S = Stable. U = Undetermined.

Other Status. LP = Listed by the Pinelands Commission.. W = Watchlist species (+ in Natural Heritage Database). SC = Special Concern

Global Rank. G1 = Critically imperiled globally because of extreme rarity (5 or fewer occurrences or very few remaining individuals or acres) or otherwise very vulnerable to extinction. G2 = Imperiled globally because of rarity (6-20 occurrences or few remaining individuals or acres) or because of some factors making it very vulnerable to extinction. G3 = Very rare and local throughout its range or found locally in a restricted area or because of other factors making it vulnerable to extinction. G4 = Apparently secure globally, although it may be quite rare in parts of its range (especially at the periphery). G5 = Demonstrably secure globally, although it may be quite rare in parts of its range (especially at the periphery).

State Rank. S1 = Critically imperiled in New Jersey because of extreme rarity (5 or fewer occurrences remaining individuals or acres) or otherwise very vulnerable to extirpation in the state. S2 = Imperiled in New Jersey because of rarity (6-20 occurrences) or otherwise vulnerable to extirpation in the state. S3 = Rare or uncommon (21-100 occurrences) in the state. S4 = Apparently secure in the state with many occurrences. B = Breeding population. N = Non-breeding population.

Species Sources: New Jersey Natural Heritage Program 2001, New Jersey Endangered and Nongame Species Program 2001, and Jenkins and Blades 1990a.
Habitat Descriptions: Jenkins and Blades 1990b and Conant and Collins 1998.

A number of threatened and endangered birds feed and nest in the extensive grassland areas associated with the heliport, drop zone, catapult test runway, and West Field. The heliport is southeast of the intersection of Runways 06/24 and 15/33, while the drop zone, catapult test runway, and West Field are west of the airfield. State listed threatened or endangered grassland birds observed at NAES Lakehurst include grasshopper sparrow, upland sandpiper, savannah sparrow, vesper sparrow, Henslow's sparrow, bobolink, and dickcissel. Since 1999, standardized surveys covering 58 permanent survey points have been conducted annually to monitor populations of these birds by counting individual birds seen or heard. The data show the grasshopper sparrow, which prefers dry open grasslands or weedy fields, is the most commonly found rare species. An average of 135 individuals was observed annually during the 1999 to 2000 survey period. An average of nine upland sandpipers was observed each year during the bird survey. Only one to two individuals of each species, the savannah sparrow, vesper sparrow, and Henslow's sparrow, have been observed on the Station during surveys conducted since 1988. A number of migrant bobolinks were observed during the first three years of the study, but have not been recorded since and one to two dickcissels (extirpated for breeding in the state) were observed in 1997 and 1998.

The northern pine snake is found throughout NAES Lakehurst in its preferred dry pitch pine/oak habitat. The pine snake is common on the Station and over the course of a three-year study period, 350 northern pine snakes were captured and released (Zappalorti and Torocco 1997). This number includes 238 new hatchlings that were hatched in a laboratory in 1995 and 1996 and released at their nest site. The NJDEP Landscape Project maps the grasslands associated with the runways as northern pine snake habitat. This area contains preferred soils (Evesboro sand and Lakewood sand), but lacks preferred vegetative cover (pine-oak, pine, and oak-pine) for the pine snake. The grasslands are likely mapped as suitable habitat due to their adjacency to preferred habitat and proximity to a den site. A known den site is located in a forested area northwest of Runway 06/24. NAES Lakehurst has established a 350-foot buffer around this and other den sites. The area of disturbance associated with the proposed LZ would not encroach upon the den site or the associated buffer. Other than transient individuals, northern pine snakes would not be expected to routinely use habitats within the proposed LZ area.

3.4.5 Land Use

The Vision Plan for NAES Lakehurst (NAES Lakehurst Vision Plan) details the Station's existing and future land use plans. The seven land use categories for both the existing and future conditions are: aircraft activities; military support; research, development, test and engineering; support services; and tenant.

NAES Lakehurst prepared an AICUZ Study in the late 1970s and updated the noise contours from that document in January 1989. The updated study did not identify incompatible land uses.

NAES Lakehurst is located within the northern portion of Ocean County, New Jersey, which is in the central section of New Jersey and is bordered on the east by the Atlantic

Ocean. The Station lies approximately 50 miles south of New York City, New York, 45 miles east of Philadelphia, Pennsylvania, and 14 miles inland from the Atlantic Ocean.

Most of the Station's land area lies within Jackson Township, New Jersey, but the heavily developed southeastern portion is located in Manchester Township. Lakehurst Borough lies along a segment of the southeastern boundary of the Station, and the Manchester Fish and Wildlife Management Area is on the south. The western border of the Station abuts the Fort Dix Military Reservation, and the Colliers Mills Wildlife Management Area is adjacent to more than half of the northern boundary of the Station.

Most of the land area in the vicinity is either held by the federal government, the State of New Jersey, or privately held undeveloped land. Much of this undeveloped land is located in the Pinelands Preservation Area or the Pinelands Protection Area (Forest District). The remaining areas are agricultural, scattered residential, industrial, with some high-density residential development in the Borough of Lakehurst.

The discussion and applicability of the Pinelands Commission relative to land use planning in Subchapter 3.2.9.1 for McGuire AFB applies to NAES Lakehurst. In 1984, the Station entered into a Memorandum of Agreement with the New Jersey Pinelands Commission to set forth the understanding, arrangements, and agreements to assure that the defense mission of the Station is adequately provided for as required by the National Parks and Recreation Act of 1978 and to implement the goal and policies of the Pinelands Comprehensive Management Plan. Any actions planned at the Station that require state or local permits also require review by the Pinelands Commission.

3.4.6 Airspace and Airfield Operations

Airspace Operations

Radar vectoring, sequencing, and separation service between participating VFR and all IFR aircraft operating within the airspace around NAES Lakehurst is provided by the McGuire AFB RAPCON. As mentioned in Subchapter 3.2.11.1, the airspace around McGuire AFB, to include NAES Lakehurst, is identified as an alert area.

There is one public use airport about 8 miles east northeast of the NAES Lakehurst airfield, another public use airport is about 7 miles south southeast of the airfield, and McGuire AFB is approximately 12 miles west of the airfield. One low-altitude federal airway passes on a northeast-southwest orientation about 5 miles east southeast of the NAES Lakehurst airfield, while another airway is located on a northwest-southeast basis about 8 miles to the north. (See Subchapter 3.1.10.1 for a description of low-altitude federal airways.) The eastern edge of the restricted airspace associated with the Fort Dix ranges is about 5 miles west of the NAES Lakehurst airfield. The restricted airspace extends to about 8,000 feet MSL. The MTRs nearest NAES Lakehurst occur about 15 miles to the east and south.

Airfield Operations

McGuire AFB RAPCON provides radar service to some aircraft arriving and departing NAES Lakehurst. Other aircraft arrive and depart without radar control and under visual flight rules. There are five instrument approaches available for arrivals to NAES Lakehurst.

NAES Lakehurst has two paved runways, 06/24 and 15/33. Both runways are 5,000 feet long and 150 feet wide. There also are two helipads. One pad is about 400 feet southeast of the intersection of the two runways and the other pad is an additional 3,600 feet beyond the first pad. The traffic pattern altitude is 1,000 feet above ground level (AGL). Traffic patterns are typically flown to the west side of Runway 15/33 and north side of Runway 06/24 if compatible with the particular aircraft. The NAES Lakehurst airfield elevation is 103 feet MSL. The air traffic control tower is operational from 7:00 a.m. to 7:00 p.m., Monday through Friday, and is closed weekend days and holidays. The tower also is closed every other Friday. Aircraft also may operate at the airfield when the tower is closed. There is a drop zone about 0.5 mile west of Runway 15/33. NAES Lakehurst also has another non-certified runway west of the airfield that is used only for Navy test operations.

Aircraft activities at NAES Lakehurst include takeoffs, landings, and closed pattern operations on the runways and airdrop operations at the drop zone. Airdrops at the drop zone occur from altitudes as low as 800 feet AGL. Aircraft operations at NAES Lakehurst are generated by Army, Army National Guard, and Department of Justice aircraft based at the station, transient aircraft, and aircraft from Air Force installations such as McGuire AFB that use the airfield for practice approaches and landings. Table 3.4.6-1 presents the average daily and total annual operations at NAES Lakehurst.

Table 3.4.6-1 Annual and Average Daily Airfield Operations, Baseline, NAES Lakehurst

	Arrival and Departure Operations		Closed Pattern Operations		Total Operations	
Aircraft	**Annual**	**Avg. Daily**	**Annual**	**Avg. Daily**	**Annual**	**Avg. Daily**
Military and Federal Government						
C-172	2,742	11.72	445	1.90	3,187	13.62
Beech 200	634	2.71	33	0.14	667	2.85
KC-10	122	0.52	0	0.00	122	0.52
Cessna 208	255	1.09	28	0.12	283	1.21
C-17	136	0.58	40	0.17	176	0.75
C-130	154	0.66	30	0.13	184	0.79
E-2	110	0.47	33	0.14	143	0.61
F-18	7	0.03	0	0.00	7	0.03
Learjet	28	0.12	0	0.00	28	0.12
H-60	2,633	11.25	0	0.00	2,633	11.25
subtotal	6,821	29.15	609	2.60	7,430	31.75

Table 3.4.6-1 Annual and Average Daily Airfield Operations, Baseline, NAES Lakehurst (…*continued*)

	Arrival and Departure Operations		Closed Pattern Operations		Total Operations	
Aircraft	**Annual**	**Avg. Daily**	**Annual**	**Avg. Daily**	**Annual**	**Avg. Daily**
New Jersey Army National Guard						
UH-60	4,505	12.69	7,630	21.49	12,135	34.18
OH-58	5,294	14.91	8,966	25.26	14,260	40.17
UH-1	1,746	4.92	2,957	8.33	4,703	13.25
subtotal	11,545	32.52	19,553	55.08	31,098	87.60
Total	18,366	61.67	20,162	57.68	38,528	119.35

Note: C-130 arrival and departure data include 23 annual airdrop events at the drop zone to the west of the runways. Other federal government operations include Department of Justice and United States Army activity. New Jersey Air National Guard operations include the UH-60, OH-58, and UH-1 helicopters. Annual operations for military and federal government aircraft are based on 234 days per year. Annual operations for New Jersey Army National Guard operations are based on 355 days per year.

Source: NAES Lakehurst 2004.

CHAPTER 4
ENVIRONMENTAL CONSEQUENCES

This chapter provides the scientific and analytic basis for the environmental consequences of the No Action Alternatives; the Dover AFB Proposed Action; the McGuire, Charleston, and Dover AFBs Alternative Actions; and the LZ Alternatives.

4.1 DOVER AFB NO ACTION ALTERNATIVE

4.1.1 Introduction

There would be no change to the Dover AFB primary mission of providing rapid global mobility: the airlift and air refueling assets needed to deliver military aircraft, people and equipment wherever and whenever needed. The 436 and 512 AWs would continue to fly worldwide airlift missions and conduct training for C-5 aircrew positions to ensure crews are current in airlift and air refueling procedures. However, AMC would not meet the national military strategy to modernize strategic and tactical airlift aircraft on the east coast.

4.1.2 Air Quality

Impacts to air quality in attainment areas would be considered significant if pollutant emissions associated with implementation of the federal action caused or contributed to a violation of any national, state, or local ambient air quality standard, exposed sensitive receptors to substantially increased pollutant concentrations, represented an increase of 10 percent or more in the affected AQCR's emissions inventory, or exceeded any significance criteria established by the SIP. Impacts to air quality in nonattainment areas would be considered significant if the net change in proposed pollutant emissions caused or contributed to a violation of any national, state, or local ambient air quality standard; increased the frequency or severity of a violation of any ambient air quality standard; or delayed the attainment of any standard or other milestone contained in the SIP. With respect to the General Conformity Rule, impacts to air quality would be considered significant if emissions increased a nonattainment area's emissions inventory by 10 percent or more for individual nonattainment pollutants; or exceeded *de minimis* threshold levels established in 40 CFR 91.153 (b) for individual nonattainment pollutants or pollutants for which an area has been redesignated as a maintenance area. These significance criteria apply to air quality for the Dover, McGuire, and Charleston AFBs No Action Alternatives, the Dover AFB Proposed Action, the McGuire, Charleston, and Dover AFBs Alternative Actions, and the McGuire and Dover AFBs and NAES Lakehurst LZ Alternatives.

Emissions would continue to be generated by Dover AFB activities such as aircraft operations and other aircraft maintenance activities, as well as vehicle, boiler, generator, and fueling operations, and industrial processes. It is anticipated that emissions from these activities would continue at the levels generated under the baseline condition.

4.1.3 Noise

Several items were examined in evaluating potential noise impacts, including the degree to which noise levels generated by construction and airfield operation activities would: (1) exceed HUD, FAA, or Air Force standards; (2) cause prolonged periods of speech interference; (3) cause structural damage; (4) cause sleep disturbance; (5) annoy people; (6) cause hearing loss; and (7) interference with classroom instruction (where applicable). These significance criteria apply to noise for the Dover, McGuire, and Charleston AFBs No Action Alternatives, the Dover AFB Proposed Action, the McGuire, Charleston, and Dover AFBs Alternative Actions, and the McGuire and Dover AFBs and NAES Lakehurst LZ Alternatives.

There would be no change in the number of assigned C-5 aircraft. The primary source of noise would be from aircraft operations which would be expected to continue at the current level of activity. The number of persons exposed to noise would remain at the current levels.

4.1.4 Hazardous Waste, Hazardous Materials, and Stored Fuels

Impacts to hazardous materials management would be considered significant if the federal action resulted in noncompliance with applicable federal and state regulations, or increased the amounts generated or procured beyond the Base's current waste management procedures and capacities. Impacts to fuels management would be significant if the established management policies, procedures, and handling capacities could not accommodate the activities associated with the action. These significance criteria apply to hazardous waste, hazardous materials, and stored fuels for the Dover, McGuire, and Charleston AFBs No Action Alternatives, the Dover AFB Proposed Action, and the McGuire, Charleston, and Dover AFBs Alternative Actions.

The mission of Dover AFB would not change. Thus, the Base would continue to accomplish the activities that occur under the current condition. The existing processes and procedures, which accommodate current activities, would continue to be used to manage hazardous waste, hazardous materials, and stored fuels. It is also anticipated that the volumes of the materials used, generated, and stored would remain at current levels.

4.1.5 Biological Resources

An effect to biological resources would be considered significant if the action would adversely effect a threatened or endangered species by substantially diminishing habitat for a plant or animal species, substantially diminishing a regionally or locally important plant or animal species, interfering substantially with wildlife movement or reproductive behavior, and/or resulting in a substantial infusion of exotic plants or animal species. These significance criteria apply to biological resources for the Dover, McGuire, and Charleston AFBs No Action Alternatives, the Dover AFB Proposed Action, the McGuire, Charleston, and Dover AFBs Alternative Actions, and the McGuire and Dover AFBs and NAES Lakehurst LZ Alternatives.

No facilities actions associated with C-17 basing would be accomplished at Dover AFB under the No Action Alternative. The potential for adverse effects to biological resources on Dover AFB would be minimized through the use of existing natural resources management plans. The potential for bird-aircraft strikes at Dover AFB would remain at current levels.

4.1.6 Socioeconomic Resources

The DoD standard (operations and maintenance) and construction models of the U.S. Army Construction Engineering and Research Laboratory Economic Impact Forecast System (EIFS) were used to forecast the effects of the Proposed and Alternative Actions. The EIFS model provides a systematic method for evaluating the regional socioeconomic effects of government actions, particularly military actions. The standard model estimates the impacts of ongoing mission and operations as well as assessment of a change in operations on population, housing, education, and the economy. The construction model predicts the economic impacts of the expenditures and employment from construction activities and the long-term economic impacts associated with project operations. Using a technique termed the rational threshold value (RTV), EIFS estimates are compared to historic trends for each economic indicator (business volume [using non-farm income], personal income, employment, and population) to determine whether the impacts are significant. The RTV model analyzes annual changes since 1969, and establishes significance criteria based on historic deviations in the value of these four socioeconomic indicators. These significance criteria apply to socioeconomic resources for the Dover, McGuire, and Charleston AFBs No Action Alternatives, the Dover AFB Proposed Action, the McGuire and the Charleston, and Dover AFBs Alternative Actions.

No facilities actions associated with C-17 basing would be accomplished at Dover AFB under the No Action Alternative. Although there could be minor variations in the number of personnel authorizations at the Base, no large-scale changes such as those associated with unit changes would occur. The economic influence of Dover AFB on the local communities and governmental agencies would continue at the levels experienced under the baseline conditions.

4.1.7 Cultural Resources

The significance of environmental effects to cultural resources is indicated by the adverse effects determination under the NRHP. These effects are tied to the anticipated undertaking (the activities associated with the alternatives) at the time.

An undertaking is considered to have an effect on a historic property when the undertaking may alter characteristics of the property that qualify the property for inclusion in the NRHP. An effect is considered adverse when it diminishes the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Adverse effects on historic properties would include, but not be limited to:

- Physical destruction, damage, or alteration of all or part of the property;
- Isolation of the property from or alteration of the character of the property's setting when that character contributes to the property's qualification for inclusion in the National Register of Historic Places;
- Introduction of visual, audible, or atmospheric elements that are out of character with the property or alter its setting;
- Neglect of a property resulting in its deterioration or destruction; and
- Transfer, lease, or sale of the property (36 CFR 800.9[b]).

Any ground-disturbing action in the area of an NRHP-eligible or potentially eligible archaeological site, or modification to such a site, can affect the integrity of that cultural resource, resulting in alteration or destruction of those characteristics or qualities which make it potentially eligible for inclusion in the NRHP. While archaeological sites or historic buildings or structures can be destroyed during a single event, more often it is the cumulative effect of recurrent disturbing actions that diminish the integrity of the cultural resource and its important characteristics.

For this analysis, the ROI is synonymous with the APE, as defined by the NHPA. The ROI is the geographic area within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist. The above mentioned criteria apply to the cultural resources analysis for the other basing and LZ alternatives.

No facilities actions associated with C-17 basing would be accomplished at Dover AFB under the No Action Alternative. However, facilities construction typical of that in previous years likely would occur as part of the Base's overall facilities modernization plan. Cultural resources would continue to be managed under existing regulations and the Base's ICRMP. Dover AFB would not cause adverse effects to cultural resources along the MTRs since the Base's mission would not require its aircrews to accomplish low-level navigation training.

4.1.8 Land Use

An impact to land use would be considered significant if one or more of the following occur as a result of the proposed action: (1) conflict with applicable ordinances and/or permit requirements; (2) nonconformance with applicable land use plans; (3) preclusion of adjacent or nearby properties being used for existing activities; or (4) conflict with established uses of an area. These significance criteria apply to land use for the Dover, McGuire, and Charleston AFBs No Action Alternatives, the Dover AFB Proposed Action, the McGuire, Charleston, and Dover AFBs Alternative Actions, and the McGuire and Dover AFBs and NAES Lakehurst LZ Alternatives.

None of the facilities actions associated with C-17 basing would occur. Routine facilities actions at Dover AFB would be accomplished in accordance with the Base's General Plan.

4.1.9 Infrastructure and Utilities

Impacts to the infrastructure and utility systems would be significant if the federal action substantially increased the demands on the water supply, wastewater treatment, electrical and natural gas distribution, and transportation systems and storm water and solid waste management, resulting in the need for additional capacity or new facilities. These significance criteria apply to infrastructure and utilities for the Dover, McGuire, and Charleston AFBs No Action Alternatives, the Dover AFB Proposed Action, the McGuire and the Charleston, and Dover AFBs Alternative Actions.

No facilities actions associated with C-17 basing would be accomplished at Dover AFB under the No Action Alternative. Although there could be minor variations in the number of personnel authorizations at Dover AFB, no large-scale changes such as those associated with unit changes would occur. For these reasons, water consumption, as well as wastewater and solid waste generation, would continue at the levels experienced under the current conditions. The volume of vehicular traffic would remain at current levels due to no significant change in assigned personnel.

4.1.10 Airspace and Airfield Operations

Airspace and airfield operations impacts would be considered significant if: (1) the airspace does not have the capacity to accommodate the changes with the action; or (2) the changes associated with the action would conflict with the baseline operations condition. An aircraft safety impact would be significant if there would be a high probability that an aircraft involved in an accident would strike a person or structure on the ground. A bird-aircraft strike would be significant if it would likely result in an aircraft accident, involve injury either to aircrews or to the public, or damage to property (other than the aircraft). These significance criteria apply to airspace and airfield operations for the Dover, McGuire, and Charleston AFBs No Action Alternatives, the Dover AFB Proposed Action, the McGuire, Charleston, and Dover AFBs Alternative Actions, and the McGuire and Dover AFBs and NAES Lakehurst LZ Alternatives.

No C-17 aircraft would be located at Dover AFB, and no C-5s would be transferred from the Base, under the No Action Alternative. The types of aircraft operating at the Base, as well as airspace and runway use, would remain the same as the baseline. The air traffic control procedures, which accommodate the current level of activity, would continue to be used to control aircraft operations. The potential for aircraft accidents or bird-aircraft strikes would remain at the baseline conditions.

4.1.11 Environmental Management

Impacts to pollution prevention would be considered significant if the federal action resulted in generated quantities of pollution prevention elements over and above established baseline levels. Impacts to asbestos and LBP management would be considered significant if the federal action resulted in worker, resident, or visitor exposure to these materials, or if the action generated quantities of these materials beyond the capacity of current management

procedures. Impacts to the installation restoration program would be considered significant if the federal action disturbed (or created) contaminated sites resulting in adverse effects to human health or the environment. An impact is considered significant if it would result in one or more of the following: (1) occurrence of substantial erosion or siltation; (2) uncontrolled release of chemicals/fuels into the environment; (3) occurrence of substantial landsliding; or (4) substantial damage to project structures/facilities. These significance criteria apply to environmental management for the Dover, McGuire, and Charleston AFBs No Action Alternatives, the Dover AFB Proposed Action, the McGuire and the Charleston, and Dover AFBs Alternative Actions.

The mission of Dover AFB would not change under the No Action Alternative. Thus, the Base would continue to accomplish the activities that occur under the current condition. The existing processes and procedures, which accommodate current activities, would continue to be used to manage pollution prevention, asbestos and LBP, and the ERP.

4.2 MCGUIRE AFB NO ACTION ALTERNATIVE

4.2.1 Introduction

There would be no change to the McGuire AFB primary mission of providing airlift of troops, equipment, and passengers. The 305 and 514 AMWs and the 108 ARW would continue to fly worldwide airlift missions and conduct training for all aircrew positions to ensure crews are current in air refueling procedures. However, AMC would not meet the national military strategy to modernize strategic and tactical airlift aircraft on the east coast.

4.2.2 Air Quality

Emissions would continue to be generated by McGuire AFB activities such as aircraft operations and other aircraft maintenance activities, as well as vehicle, boiler, generator, and fueling operations, and industrial processes. It is anticipated that emissions from these activities would continue at the levels generated under the baseline condition.

4.2.3 Noise

McGuire AFB would accomplish it mission with C-17, KC-10, and KC-135E aircraft. The primary source of noise would be from aircraft operations which would be expected to continue at the current level of activity. The number of persons exposed to noise would remain at the current levels

4.2.4 Hazardous Waste, Hazardous Materials, and Stored Fuels

The mission of McGuire AFB would not change under the No Action Alternative. Thus, the Base would continue to accomplish the activities that occur under the current condition. The existing processes and procedures, which accommodate current activities, would continue to be used to manage hazardous waste, hazardous materials, and stored fuels. It is

also anticipated that the volumes of the materials used, generated, and stored would remain current levels.

4.2.5 Water Resources

The significance of water quality impacts is based on the applicable regulations, codes, and plans for the resources affected. Impacts would be considered significant if any of the following conditions would occur as a result of the project: (1) a discharge that creates a chronic and/or critical condition, damage to the ecosystem, or pollution as defined in federal, state, or local regulations; (2) a discharge, as a result of construction or operation of the proposed project, that impairs the beneficial uses of surface and groundwater beneath or adjacent to the proposed project as set forth in federal, state, or local regulations; and (3) release of contaminants to the groundwater in such concentrations that they would exceed maximum contaminant levels specified in the Safe Drinking Water Act (40 CFR 141) for drinking water in monitoring wells in the immediate area. These significance criteria apply to water resources for the McGuire No Action Alternative and the McGuire Alternative Action.

None of the facilities actions associated with basing 12 additional C-17 aircraft would occur. The existing SWPPP would be used to comply with directives to ensure water quality is not degraded at McGuire AFB.

4.2.6 Biological Resources

No facilities actions associated with C-17 basing would be accomplished at McGuire AFB under the No Action Alternative. The potential for adverse effects to biological resources on McGuire AFB would be minimized through the use of existing natural resources management plans. The potential for bird-aircraft strikes at McGuire AFB and on the MTRs would remain at current levels.

4.2.7 Socioeconomic Resources

No facilities actions associated basing 12 additional C-17 aircraft at McGuire AFB would be accomplished under the No Action Alternative. Although there could be minor variations in the number of personnel authorizations at the Base, no large-scale changes such as those associated with unit changes would occur. The economic influence of McGuire AFB on the local communities and governmental agencies would continue at the levels experienced under the baseline conditions.

4.2.8 Cultural Resources

No facilities actions associated with C-17 basing would be accomplished at McGuire AFB under the No Action Alternative. Cultural resources would continue to be managed under existing regulations and the Base's CRMP. The potential for adverse effects to cultural resources along the MTRs would continue to be minimized through the Base's interaction with the Native American tribes associated with the routes.

4.2.9 Land Use

None of the facilities actions associated basing 12 additional C-17 aircraft would occur. The level of operations on the MTRs would remain at baseline levels.

4.2.10 Infrastructure and Utilities

No facilities actions associated with basing 12 additional C-17 aircraft would occur under the No Action Alternative. Although there could be minor variations in the number of personnel authorizations at McGuire AFB, no large-scale changes such as those associated with unit changes would occur. For these reasons, water consumption, as well as wastewater and solid waste generation, would continue at the levels experienced under the current conditions. The volume of vehicular traffic would remain at current levels due to no significant changes in assigned personnel.

4.2.11 Airspace and Airfield Operations

McGuire AFB would operate C-17, KC-10, and KC-135E aircraft under the No Action Alternative. The types of aircraft operating at the Base, as well as airspace, runway, and MTR use, would remain the same as the baseline. The air traffic control procedures, which accommodate the current levels of activity, would continue to be used to control aircraft operations at the Base and on the MTRs. The potential for aircraft accidents or bird-aircraft strikes would remain at the baseline conditions.

4.2.12 Environmental Management

The mission of McGuire AFB would not change under the No Action Alternative. Thus, the Base would continue to accomplish the activities that occur under the current condition. The existing processes and procedures, which accommodate current activities, would continue to be used to manage pollution prevention, asbestos and LBP, and the ERP

4.3 CHARLESTON AFB NO ACTION ALTERNATIVE

4.3.1 Introduction

There would be no change to the Charleston AFB primary mission of providing airlift of troops, equipment, and passengers. The 437 and 315 AWs would continue to fly worldwide airlift missions and conduct training for all C-17 aircrew positions to ensure crews are current in airlift, air refueling, and airdrop procedures. However, AMC would not meet the national military strategy to modernize strategic and tactical airlift aircraft on the east coast.

4.3.2 Air Quality

Emissions would continue to be generated by Charleston AFB activities such as aircraft operations and other aircraft maintenance activities, as well as vehicle, boiler, generator, and

fueling operations, and industrial processes. It is anticipated that emissions from these activities would continue at the levels generated under the baseline condition.

4.3.3 Noise

Charleston AFB would accomplish it mission with 48 C-17 aircraft. The primary source of noise would be from aircraft operations which would be expected to continue at the current level of activity. The number of persons exposed to noise would remain at the current levels

4.3.4 Hazardous Waste, Hazardous Materials, and Stored Fuels

The mission of Charleston AFB would not change under the No Action Alternative. Thus, the Base would continue to accomplish the activities that occur under the current condition. The existing processes and procedures, which accommodate current activities, would continue to be used to manage hazardous waste, hazardous materials, and stored fuels. It is also anticipated that the volumes of the materials used, generated, and stored would remain current levels.

4.3.5 Biological Resources

No facilities actions associated with C-17 basing would be accomplished at Charleston AFB under the No Action Alternative. The potential for adverse effects to biological resources on Charleston AFB would be minimized through the use of existing natural resources management plans. The potential for bird-aircraft strikes at Charleston AFB and on the MTRs would remain at current levels.

4.3.6 Socioeconomic Resources

No facilities actions associated basing 12 additional C-17 aircraft at Charleston AFB would be accomplished under the No Action Alternative. Although there could be minor variations in the number of personnel authorizations at the Base, no large-scale changes such as those associated with unit changes would occur. The economic influence of Charleston AFB on the local communities and governmental agencies would continue at the levels experienced under the baseline conditions.

4.3.7 Cultural Resources

No facilities actions associated with C-17 basing would be accomplished at Charleston AFB under the No Action Alternative. Cultural resources would continue to be managed under existing regulations and the Base's CRMP. The potential for adverse effects to cultural resources along the MTRs would continue to be minimized through the Base's interaction with the Native American tribes associated with the MTRs.

4.3.8 Land Use

None of the facilities actions associated basing 12 additional C-17 aircraft would occur. The level of operations on the MTRs would remain at baseline levels.

4.3.9 Infrastructure and Utilities

No facilities actions associated with basing 12 additional C-17 aircraft would occur under the No Action Alternative. Although there could be minor variations in the number of personnel authorizations at Charleston AFB, no large-scale changes such as those associated with unit changes would occur. For these reasons, water consumption, as well as wastewater and solid waste generation, would continue at the levels experienced under the current conditions. The volume of vehicular traffic would remain at current levels due to no significant change in assigned personnel.

4.3.10 Airspace and Airfield Operations

Charleston AFB would operate 48 C-17 aircraft under the No Action Alternative. The types of aircraft operating at the Base, as well as airspace, runway, and MTR use, would remain the same as the baseline. The air traffic control procedures, which accommodate the current levels of activity, would continue to be used to control aircraft operations at the Base and on the MTRs. The potential for aircraft accidents or bird-aircraft strikes would remain at the baseline conditions.

4.3.11 Environmental Management

The mission of Charleston AFB would not change under the No Action Alternative. Thus, the Base would continue to accomplish the activities that occur under the current condition. The existing processes and procedures, which accommodate current activities, would continue to be used to manage pollution prevention, asbestos and LBP, and the ERP.

4.4 DOVER AFB PROPOSED ACTION

4.4.1 Introduction

Basing 12 C-17 aircraft at Dover AFB and transferring 16 C-5 aircraft to an ARC installation(s) would enhance the capability of the Air Force to meet the national military strategy by modernizing strategic and tactical airlift aircraft on the east coast. The Dover AFB mission of providing rapid global mobility through airlift would be improved with the addition of C-17 aircraft.

4.4.2 Air Quality

4.4.2.1 Dover AFB

Under the Dover AFB Proposed Action, 12 total C-17 aircraft would be based at Dover AFB and 16 C-5s would be transferred to another installation, leaving 16 C-5s at Dover AFB. Aircraft maintenance activities and airfield operations would be accomplished at Dover AFB, and MTR operations would occur on the 22 MTRs. Portions of five of the MTRs occur in AQCR 46, the AQCR in which Dover AFB is located. Seven consecutive, concurrent construction projects would be accomplished at Dover AFB.

Fugitive dust from ground-disturbing activities, combustive emissions from construction equipment, and emissions from asphalt paving operations 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 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 estimates 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, PM_{10} emissions from various open dust sources were determined based on the ratio of PM_{10} to TSP sampling data. The average PM_{10} to TSP ratios for top soil removal, aggregate hauling, and cut and fill operations is 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 PM_{10} dust emissions becomes 19.2 pounds per acre per day of disturbance. Fugitive dust emissions from demolition activities would be generated primarily from building dismemberment, debris loading, and debris hauling. The USEPA has established a recommended emission factor of 0.011 pounds of PM_{10} per square foot of demolished floor area. This emission factor is based on air sampling data taken from the demolition of a mix of commercial brick, concrete, and steel buildings (USEPA 1988).

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 4.4.2-1 include the estimated annual PM_{10} emissions associated with the Proposed Action at Dover AFB. These emissions would produce slightly elevated short-term PM_{10} ambient air concentrations. The USEPA estimates that the effects of fugitive dust from construction activities would be reduced significantly with an effective watering program. Watering the disturbed area of the construction site twice per day with approximately 3,500 gallons per acre per day would reduce TSP emissions by as much as 50 percent (USEPA 1995).

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 1996). Combustive emissions from construction equipment exhausts were estimated by using USEPA-approved emissions factors for heavy-duty diesel-powered construction equipment (USEPA 1985). The seven projects would be accomplished over an approximate 4-year period. Therefore, the year with the greatest construction equipment emissions (CY07) was used to present the extreme condition for emissions analysis. As with fugitive dust emissions, combustion emissions would produce slightly elevated air pollutant concentrations. However, the effects would be temporary, fall off rapidly with distance from the proposed construction site, and would not result in any long-term impacts.

Table 4.4.2-1 Dover AFB Proposed Action Emissions within AQCR 46

Criteria Air Pollutant	CO (tpy)	VOC (tpy)	NO_X (tpy)	SO_X (tpy)	PM_{10} (tpy)
AQCR 46 CY 99 Emissions Inventory	430.000	2,730.000	6,900.000	28,770.000	670.000
Construction Emissions					
Construction Emissions[(a)]	9.540	1.090	7.140	0.790	12.040
Construction Emissions as Percent of AQCR Emissions	2.22%	0.04%	0.10%	0.00%	1.80%
Aircraft Emissions					
AGE Operation	1.404	0.394	4.937	0.560	0.318
Airfield Operations	91.000	27.000	802.000	0.000	65.000
Aircraft Trim/Power Checks	7.00	3.000	67.000	0.000	4.000
SR-800 Operations	0.000	0.000	0.090	0.000	0.010
SR-801 Operations	0.010	0.000	0.620	0.000	0.050
SR-844 Operations	0.000	0.000	0.040	0.000	0.000
SR-845 Operations	0.010	0.010	0.760	0.000	0.060
VR-1709 Operations	0.080	0.050	6.460	0.000	0.500
Annual Aircraft Emissions	99.504	30.454	891.907	0.560	69.938
Annual Aircraft Emissions as Percent of AQCR Emissions	23.14%	1.12%	12.93%	0.00%	10.44%

(a) CY07 used for the construction emissions.

Note: VOC is not an air pollutant criterion. However, VOC is reported because, as an O_3 precursor, it is a controlled pollutant. $PM_{2.5}$ is included for information only. Emissions listed for an MTR are those that would occur from operations on that portion of the MTR within the AQCR. Emissions for the remainder of the MTR are listed in Table 4.4.2-4.

Emissions also would be expected from asphalt paving operations. The primary pollutant from asphalt paving is CO; however, minor emissions of other criteria pollutants can be expected. To determine potential emissions from asphalt paving operations, it was assumed that the unit weight of asphalt concrete is 149 pounds per cubic foot (lbs/ft^3). The quantity of asphalt concrete required for each construction project is based on an assumed pavement depth of 12 inches. The USEPA establishes emission factors for CO, VOC, SO_x, NO_x, and PM_{10} of 0.340, 0.017, 0.005, 0.025, 0.020 pounds of pollutant per ton of asphalt concrete, respectively. Emissions anticipated from asphalt paving are included in the construction emissions in Table 4.4.2-1. Emissions from paving would last only as long as the duration of

construction activity, fall off rapidly with distance from the construction site, and would not result in long-term impacts.

Aerospace ground equipment, airfield, and MTR operations, as well as aircraft trim/power checks, would generate emissions on a recurring basis (*i.e.*, CY11 and beyond). Table 4.4.2-1 lists the annual emissions from these operations for the Dover AFB Proposed Action condition of 12 C-17 and 16 C-5 aircraft at Dover AFB. Emissions for airfield and MTR operations were determined using United States Air Force Institute for Environmental, Safety and Occupational Health Risk Analysis: Air Emissions Inventory Guidance for Mobile Sources at Air Force Installations, January 2002. Emissions from AGE and aircraft trim/power checks were determined by using the Emissions and Dispersion Modeling System (EDMS), an emissions/dispersion model jointly developed by the Air Force and the FAA. The EDMS is also approved by the USEPA. As indicated in Table 4.4.2-1, the greatest volume of emissions for any of the criteria pollutants from recurring aircraft operations would be 891.907 tpy for NO_X, which equates to 12.93 percent of the AQCR emissions inventory.

A CAA General Conformity Applicability Analysis for the Dover AFB Proposed Action was prepared in August 2004 (USAF 2004a). Table 4.4.2-2 summarizes the net change in emissions associated with the Dover AFB Proposed Action, and Table 4.4.2-3 compares the change in emissions for regional significance and *de minimis* purposes.

Table 4.4.2-2 Net Change in Emissions from Dover AFB Proposed Action Activities in AQCR 46

Category	Pollutants Emitted (tons/year)				
	CO	NO_X	VOC	SO_X	PM_{10}
Net Change in Airfield Operations Emissions	-42.000	-524.000	-21.000	0.000	+4.000
Net Change in AGE Operation Emissions	+0.281	+0.988	+0.079	+0.112	+0.064
Net Change in Trim/Power Check Emissions	-4.000	-24.000	0.000	0.000	0.000
Net Change in Construction Emissions	+9.540	+7.140	+1.090	+0.790	+12.040
Net Change in Military Training Route Operation Emissions	+0.100	+7.970	+0.060	+0.000	+0.620
Net Change in Emissions for the Proposed Action	-36.079	**-531.902**	**-19.771**	+0.902	+16.724

Note: Bold indicates the pollutant is nonattainment within AQCR 46.

Source USAF 2004a.

Table 4.4.2-3 Regional Significance Analysis and Comparison to Conformity *de minimis* Thresholds for AQCR 46 for the Dover AFB Proposed Action

Category	Pollutants Emitted (tons/year)				
	CO	NO_X	VOC	SO_X	PM_{10}
Emissions Inventory	430.000	6,900.000	2,730.000	28,770.000	670.000
Net Change in Emissions	-36.079	**-531.902**	**-19.771**	+0.902	+16.724
Percent Change Compared to Emissions Inventory	-8.39%	**-7.71%**	**-0.72%**	0.00%	+2.50%
Regionally Significant? (>10%)	NA	**No**	**No**	NA	NA
de minimis Threshold (tpy)	NA	100	50	NA	NA
Exceed *de minimis* Threshold?	NA	**No**	**No**	NA	NA

NA not applicable. De minimis does not apply since AQCR 46 is in attainment for pollutant.

Source USAF 2004a.

Based on the requirements outlined in the USEPA's General Conformity Rule published in 58 Federal Register 63214 (November 30, 1993) and codified in 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 (*i.e., de minimis*) 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 a process for analyzing and determining whether a proposed project in a nonattainment area conforms to the SIP and federal standards. A federal action would be considered regionally significant when the net change in emissions from the Proposed Action equal or exceed 10 percent of the nonattainment or maintenance area's emissions inventory for any criteria air pollutant. A full conformity determination is not required if a federal action meets *de minimis* requirements and is *not* considered a regionally significant action. Ongoing activities currently being conducted are exempt from the rule so long as there is no increase in emissions equal to or greater than the *de minimis* thresholds as the result of the federal action.

As indicated in the previous paragraph, emissions that exceed 10 percent of the emissions inventory would be considered regionally significant by the USEPA if the region were nonattainment for any of the criteria pollutants as stated in 40 CFR 51, Subpart W, Section 852. Emissions that exceed 10 percent of the emissions inventory for a criteria pollutant in attainment within an air basin would not be considered regionally significant.

The CAA General Conformity Applicability Analysis for the Dover AFB Proposed Action concluded that, although the Dover AFB Proposed Action would occur within an air basin designated as moderate nonattainment for ozone, the net change in emissions for NO_x and VOC (the pollutants of concern), as well as other criteria pollutants, would be less than 10 percent of the emissions inventory, and the action would not be considered regionally significant (see Table 4.4.2-3). Additionally, the net change in emissions would not exceed the *de minimis* thresholds of 100 tpy for NO_X and 50 tpy for VOC. The Applicability Analysis determined that the Dover AFB Proposed Action positively conforms to the applicable SIP for AQCR 46. The Dover AFB Proposed Action has been demonstrated by USEPA standards not to cause or contribute to new violations of any national ambient air

quality standard in the affected area, nor increase the frequency or severity of an existing violation. Implementation of the Proposed Action would not delay timely attainment of the ozone standards in the air basin, and the Proposed Action is in compliance or consistent with all relevant requirements and milestones contained in the applicable SIP. This conclusion of positive General Conformity Determination for the federal action planned for Dover AFB fulfilled the Air Force's obligation and responsibility under 40 CFR Part 93, Subpart B.

The USEPA has promulgated new NAAQS for fine particles less than 2.5 microns in aerodynamic diameter ($PM_{2.5}$). The CY99 AQCR 46 emissions inventory is the most recent and complete inventory made available to the public. This inventory, however, was completed prior to enforcement of the $PM_{2.5}$ NAAQS, and $PM_{2.5}$ emissions are not included in the emissions summaries. For this reason, it is assumed that $PM_{2.5}$ emissions would be the same as the PM_{10} emissions for all analyses in this EA.

In summary, emissions from construction activities would be temporary and would be eliminated when the activities are completed, and would not be regionally significant. Emissions from aircraft, AGE, and MTR operations, as well as aircraft trim/power checks, would not exceed *de minimis* thresholds, nor would they be considered regionally significant. A Conformity Determination would not be required.

4.4.2.2 Military Training Routes

Dover AFB C-17 aircrews would accomplish training flights on 22 MTRs in Delaware, Kentucky, Maryland, North Carolina, New Jersey, New York, Pennsylvania, South Carolina, Tennessee, Virginia, Vermont, and West Virginia. Table 4.4.2-4 lists the estimated emissions for C-17 operations on the Dover AFB Proposed Action MTRs within the respective AQCR or air basin, and compares the emissions to the AQCR or basin emissions inventory. As indicated in Table 4.4.2-4, many MTRs occur in more than one AQCR due to the length and locations of the routes. Emissions from aircraft operations on the portions of the MTRs that occur within AQCR 46 are included in the analyses for Dover AFB in Subchapter 4.4.2.1. Table E-1 in Appendix E details the emissions from the Dover AFB Proposed Action MTR operations on the portion of each route that occurs within the respective AQCR.

Table 4.4.2-4 Dover AFB Proposed Action Military Training Route Emissions

Criteria Pollutant	CO (tpy)	VOC (tpy)	NO_X (tpy)	SO_X (tpy)	PM_{10} (tpy)
AQCR 45					
CY 99 Emissions Inventory	50,300	**45,780**	**89,880**	101,050	12,600
Total MTR Operations	0.24	0.14	20.27	0.00	1.56
MTR Emissions as Percent of AQCR Emissions	0.0005%	0.0003%	0.0226%	0.0000%	0.0124%

Table 4.4.2-4 Dover AFB Proposed Action Military Training Route Emissions (*…continued*)

Criteria Pollutant	CO (tpy)	VOC (tpy)	NO_X (tpy)	SO_X (tpy)	PM_{10} (tpy)
AQCR 47					
CY 99 Emissions Inventory	2,880	**1,100**	**47,970**	111,340	2,150
Total MTR Operations	0.01	0.00	0.61	0.00	0.05
MTR Emissions as Percent of AQCR Emissions	0.0003%	0.0004%	0.0013%	0.0000%	0.0022%
AQCR 101					
CY 99 Emissions Inventory	1,104	808	3,535	666	2,597
Total MTR Operations	0.01	0.01	0.84	0.00	0.06
MTR Emissions as Percent of AQCR Emissions	0.0009%	0.0007%	0.0238%	0.0000%	0.0025%
AQCR 103					
CY 99 Emissions Inventory	21,483	**8,277**	**239,223**	516,624	7,947
Total MTR Operations	0.01	0.00	0.54	0.00	0.04
MTR Emissions as Percent of AQCR Emissions	0.0000%	0.0000%	0.0002%	0.0000%	0.0005%
AQCR 113					
CY 99 Emissions Inventory	160	1,286	8,401	21,971	1,486
Total MTR Operations	0.02	0.01	1.32	0.00	0.10
MTR Emissions as Percent of AQCR Emissions	0.0099%	0.0007%	0.0158%	0.0000%	0.0069%
AQCR 114					
CY 99 Emissions Inventory	876	**1,047**	**1,795**	4,839	528
Total MTR Operations	0.22	0.13	18.16	0.00	1.40
MTR Emissions as Percent of AQCR Emissions	0.0249%	0.0121%	1.0116%	0.0000%	0.2646%
AQCR 116					
CY 99 Emissions Inventory	800	**170**	**22,720**	76,970	1,480
Total MTR Operations	0.04	0.02	3.14	0.00	0.24
MTR Emissions as Percent of AQCR Emissions	0.0047%	0.0129%	0.0138%	0.0000%	0.0163%
AQCR 136					
CY 99 Emissions Inventory	7,570	23,250	85,470	97,560	4,310
Total MTR Operations	0.04	0.02	3.43	0.00	0.26
MTR Emissions as Percent of AQCR Emissions	0.0005%	0.0001%	0.0040%	0.0000%	0.0061%
AQCR 150					
CY 99 Emissions Inventory	1,450	**680**	**10,000**	19,660	1,290
Total MTR Operations	0.65	0.38	54.18	0.00	4.17
MTR Emissions as Percent of AQCR Emissions	0.0448%	0.0557%	0.5418%	0.0000%	0.3232%

Table 4.4.2-4 Dover AFB Proposed Action Military Training Route Emissions (*…continued*)

Criteria Pollutant	CO (tpy)	VOC (tpy)	NO_X (tpy)	SO_X (tpy)	PM_{10} (tpy)
AQCR 151					
CY 99 Emissions Inventory	23,420	**9,360**	**33,600**	**84,680**	7,440
Total MTR Operations	0.36	0.21	30.09	0.00	2.32
MTR Emissions as Percent of AQCR Emissions	0.0015%	0.0022%	0.0896%	0.0000%	0.0311%
AQCR 158					
CY 99 Emissions Inventory	5,260	15,810	10,700	12,820	7,010
Total MTR Operations	0.72	0.42	60.17	0.00	4.63
MTR Emissions as Percent of AQCR Emissions	0.0137%	0.0027%	0.5623%	0.0000%	0.0660%
AQCR 159					
CY 99 Emissions Inventory	16,874	**1,682**	**5,539**	9,474	3,747
Total MTR Operations	0.81	0.47	67.62	0.00	5.20
MTR Emissions as Percent of AQCR Emissions	0.0048%	0.0281%	1.2209%	0.0000%	0.1389%
AQCR 160					
CY 99 Emissions Inventory	4,340	7,950	19,210	84,960	6,830
Total MTR Operations	0.00	0.00	0.02	0.00	0.00
MTR Emissions as Percent of AQCR Emissions	0.0000%	0.0000%	0.0001%	0.0000%	0.0000%
AQCR 164					
CY 99 Emissions Inventory	2,190	1,460	15,410	74,160	2,800
Total MTR Operations	0.24	0.14	19.60	0.00	1.51
MTR Emissions as Percent of AQCR Emissions	0.0107%	0.0094%	0.1272%	0.0000%	0.0539%
AQCR 165					
CY 99 Emissions Inventory	5,680	18,320	38,180	101,110	8,030
Total MTR Operations	0.36	0.21	30.30	0.00	2.33
MTR Emissions as Percent of AQCR Emissions	0.0064%	0.0012%	0.0794%	0.0000%	0.0290%
AQCR 166					
CY 99 Emissions Inventory	13,090	9,250	64,550	154,370	9,620
Total MTR Operations	0.00	0.00	0.26	0.00	0.02
MTR Emissions as Percent of AQCR Emissions	0.0000%	0.0000%	0.0004%	0.0000%	0.0002%
AQCR 167					
CY 99 Emissions Inventory	20,990	18,580	35,020	77,680	5,550
Total MTR Operations	0.00	0.00	0.38	0.00	0.03
MTR Emissions as Percent of AQCR Emissions	0.0000%	0.0000%	0.0011%	0.0000%	0.0005%

Table 4.4.2-4 Dover AFB Proposed Action Military Training Route Emissions (*…continued*)

Criteria Pollutant	CO (tpy)	VOC (tpy)	NO_X (tpy)	SO_X (tpy)	PM_{10} (tpy)
AQCR 168					
CY 99 Emissions Inventory	5,139	2,659	4,654	4,534	1,174
Total MTR Operations	0.00	0.00	0.04	0.00	0.00
MTR Emissions as Percent of AQCR Emissions	0.0000%	0.0000%	0.0008%	0.0000%	0.0002%
AQCR 169					
CY 99 Emissions Inventory	1,340	5,070	7,880	10,940	1,680
Total MTR Operations	0.03	0.02	2.19	0.00	0.17
MTR Emissions as Percent of AQCR Emissions	0.0020%	0.0003%	0.0278%	0.0000%	0.0100%
AQCR 171					
CY 99 Emissions Inventory	3,610	5,620	14,020	34,740	1,100
Total MTR Operations	0.00	0.00	0.34	0.00	0.03
MTR Emissions as Percent of AQCR Emissions	0.0001%	0.0000%	0.0024%	0.0000%	0.0024%
AQCR 178					
CY 99 Emissions Inventory	125,380	**10,350**	**47,890**	159,000	6,440
Total MTR Operations	0.63	0.37	52.46	0.00	4.04
MTR Emissions as Percent of AQCR Emissions	0.0005%	0.0035%	0.0096%	0.0000%	0.0627%
AQCR 195					
CY 99 Emissions Inventory	12,610	**5,680**	**34,930**	169,280	5,340
Total MTR Operations	0.96	0.56	79.79	0.00	6.14
MTR Emissions as Percent of AQCR Emissions	0.0076%	0.0098%	0.2284%	0.0000%	0.1150%
AQCR 196					
CY 99 Emissions Inventory	6,810	**9,300**	**29,260**	90,430	5,400
Total MTR Operations	0.44	0.26	36.96	0.00	2.84
MTR Emissions as Percent of AQCR Emissions	0.0065%	0.0028%	0.1263%	0.0000%	0.0527%
AQCR 197					
CY 99 Emissions Inventory	52,000	8,000	163,000	**611,000**	17,000
Total MTR Operations	0.02	0.01	1.57	0.00	0.12
MTR Emissions as Percent of AQCR Emissions	0.0000%	0.0001%	0.0010%	0.0000%	0.0007%
AQCR 201					
CY 99 Emissions Inventory	7,710	3,840	11,940	20,010	1,660
Total MTR Operations	0.01	0.01	0.92	0.00	0.07
MTR Emissions as Percent of AQCR Emissions	0.0001%	0.0002%	0.0077%	0.0000%	0.0043%

Table 4.4.2-4 Dover AFB Proposed Action Military Training Route Emissions (*…continued*)

Criteria Pollutant	CO (tpy)	VOC (tpy)	NO_X (tpy)	SO_X (tpy)	PM_{10} (tpy)
AQCR 207					
CY 99 Emissions Inventory	25,863	**71,029**	**111,615**	339,973	15,656
Total MTR Operations	0.11	0.06	8.93	0.00	0.69
MTR Emissions as Percent of AQCR Emissions	0.0004%	0.0001%	0.0080%	0.0000%	0.0044%
AQCR 221					
CY 99 Emissions Inventory	1,181	1,444	631	1,124	367
Total MTR Operations	0.08	0.05	6.80	0.00	0.52
MTR Emissions as Percent of AQCR Emissions	0.0069%	0.0033%	1.0775%	0.0000%	0.1426%
AQCR 222					
CY 99 Emissions Inventory	15,770	13,710	26,240	9,100	3,000
Total MTR Operations	0.05	0.03	3.94	0.00	0.30
MTR Emissions as Percent of AQCR Emissions	0.0003%	0.0002%	0.0150%	0.0000%	0.0101%
AQCR 223					
CY 99 Emissions Inventory	32,747	6,198	32,073	89,014	3,573
Total MTR Operations	0.00	0.00	0.15	0.00	0.01
MTR Emissions as Percent of AQCR Emissions	0.0000%	0.0000%	0.0005%	0.0000%	0.0003%
AQCR 224					
CY 99 Emissions Inventory	6,344	2,262	14,702	17,908	1,754
Total MTR Operations	0.15	0.08	12.10	0.00	0.93
MTR Emissions as Percent of AQCR Emissions	0.0023%	0.0037%	0.0823%	0.0000%	0.0531%
AQCR 225					
CY 99 Emissions Inventory	10,884	12,260	38,993	77,589	3,506
Total MTR Operations	0.02	0.01	1.46	0.00	0.11
MTR Emissions as Percent of AQCR Emissions	0.0002%	0.0001%	0.0038%	0.0000%	0.0032%
AQCR 226					
CY 99 Emissions Inventory	8,890	9,850	24,250	42,420	3,770
Total MTR Operations	0.11	0.07	9.32	0.00	0.72
MTR Emissions as Percent of AQCR Emissions	0.0013%	0.0007%	0.0384%	0.0000%	0.0190%
AQCR 231					
CY 99 Emissions Inventory	606	1,615	3,144	340	1,165
Total MTR Operations	0.08	0.05	6.74	0.00	0.52
MTR Emissions as Percent of AQCR Emissions	0.0133%	0.0029%	0.2145%	0.0000%	0.0445%

Table 4.4.2-4 Dover AFB Proposed Action Military Training Route Emissions (*…continued*)

Criteria Pollutant	CO (tpy)	VOC (tpy)	NO_X (tpy)	SO_X (tpy)	PM_{10} (tpy)
AQCR 232					
CY 99 Emissions Inventory	2,352	1,170	6,065	42	1,090
Total MTR Operations	0.02	0.01	1.51	0.00	0.12
MTR Emissions as Percent of AQCR Emissions	0.0008%	0.0009%	0.0250%	0.0000%	0.0107%
AQCR 234					
CY 99 Emissions Inventory	4,000	4,000	77,000	129,000	1,000
Total MTR Operations	0.01	0.01	0.80	0.00	0.06
MTR Emissions as Percent of AQCR Emissions	0.0002%	0.0001%	0.0010%	0.0000%	0.0062%
AQCR 235					
CY 99 Emissions Inventory	4,120	960	76,240	129,530	1,870
Total MTR Operations	0.01	0.01	1.14	0.00	0.09
MTR Emissions as Percent of AQCR Emissions	0.0003%	0.0008%	0.0015%	0.0000%	0.0047%
AQCR 236					
CY 99 Emissions Inventory	936	881	4,005	321	1,632
Total MTR Operations	0.02	0.01	2.02	0.00	0.16
MTR Emissions as Percent of AQCR Emissions	0.0026%	0.0016%	0.0504%	0.0000%	0.0095%

Note: VOC is not an air pollutant criterion. However, VOC is reported because, as an O_3 precursor, it is a controlled pollutant. ***Bold*** *indicates pollutants not in attainment. Data are reflected as tpy.*

As indicated in Table 4.4.2-4, AQCRs 45, 47, 103, 114, 116, 150, 151, 159, 178, 195, 196, 197, and 207 are nonattainment for one or more criteria pollutants. Based on the emissions calculations summarized in Table 4.4.2-4, the Proposed Action emissions for any of the criteria pollutants in any of these 13 AQCRs would not exceed *de minimis* and would be less than 10 percent of the particular emissions inventory, and the action would not be considered regionally significant. The Proposed Action has been demonstrated by USEPA standards not to cause or contribute to new violations of any national ambient air quality standard in the affected area, nor increase the frequency or severity of an existing violation. Implementation of the Proposed Action would not delay timely attainment of the air quality standards in the AQCR, and the action is in compliance or consistent with all relevant requirements and milestones contained in the applicable SIP.

Review of the data in Table 4.4.2-4 for AQCRs 101, 113, 136, 158, 160, 164, 165, 166, 167, 168, 169, 171, 201, 221, 222, 223, 224, 225, 226, 231, 232, 234, 235 and 236, all of which are in attainment, indicates that the greatest increase in emissions from MTR operations would be NO_X (60.17 tpy) from recurring aircraft operations in AQCR 158, which equates to 0.5623 percent of the NO_X emissions within the AQCR. Emissions in each of these AQCRs fall below the 10 percent level that would be considered regionally significant by the USEPA if the region were nonattainment for any of the criteria pollutants as stated in 40 CFR 51, Subpart W, Section 852. However, AQCRs 101, 113, 136, 158, 160, 164, 165,

166, 167, 168, 169, 171, 201, 221, 222, 223, 224, 225, 226, 231, 232, 234, 235 and 236 are in attainment. Therefore, air emissions impacts from the activities associated with the Proposed Action in these AQCRs would not be considered significant, and a Conformity Determination would not be required.

4.4.2.3 Mitigation

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

4.4.2.4 Cumulative Impacts

Numerous construction projects would occur under other actions announced for Dover AFB. The methodologies for calculating emissions for the Dover AFB Proposed Action were used to estimate emissions for the cumulative condition at Dover AFB. Cumulative condition construction projects would occur over an approximate 7-year period. Therefore, the year with the greatest construction equipment emissions (CY10) was used to present the extreme condition for emissions analysis. Table 4.4.2-5 summarizes the emissions from the other actions as well as the Dover AFB Proposed Action and compares the emissions to the baseline AQCR emissions inventory.

Table 4.4.2-5 Dover AFB Proposed Action Cumulative Condition Emissions

Criteria Air Pollutant	CO (tpy)	VOC (tpy)	NO_X (tpy)	SO_X (tpy)	PM_{10} (tpy)
AQCR CY99 Emissions Inventory	430.000	2,730.000	6,900.000	28,770.000	670.000
Extreme Condition Construction Emissions[(a)]	30.420	21.350	99.300	10.720	41.720
Annual Emissions from Proposed Action Aircraft Operations	99.504	30.454	891.907	0.560	69.938
Cumulative Condition Emissions	129.924	51.804	991.207	11.28	111.658
Cumulative Condition Emissions as Percent of AQCR Emissions	30.00%	2.00%	14.00%	0.00%	17.00%

(a) CY10 used for the extreme condition construction emissions. Data include the combined emissions from the Dover AFB Proposed Action and the other actions.

Note: VOC is not an air pollutant criterion. However, VOC is reported because, as an O_3 precursor, it is a controlled pollutant.

Review of data in Table 4.4.2-5 indicates that the 991.207 tons of NO_X from Dover AFB Proposed Action cumulative condition activities would equate to 14.00 percent of the emissions inventory. However, the 129.924 tons of CO emissions constitute the greatest percent of baseline emissions inventory at 30.00 percent.

The CAA General Conformity Applicability Analysis for the Dover AFB Proposed Action prepared in August 2004 also included the cumulative condition (USAF 2004a). Table 4.4.2-6 summarizes the net change in emissions associated with the Dover AFB Proposed Action cumulative condition, and Table 4.4.2-7 compares the change in emissions for regional significance and *de minimis* purposes.

Table 4.4.2-6 Net Change in Emissions from Aircraft Operations Activities in AQCR 46, Dover AFB Proposed Action Cumulative Condition

Category	Pollutants Emitted (tons/year)				
	CO	NO_X	VOC	SO_X	PM_{10}
Net Change Aircraft Operations Emissions	-45.619	**-539.042**	**-20.861**	+0.112	+4.684
Net Change in Construction Emissions	+30.420	+99.300	+21.35	+10.720	+41.720
Net Change in Cumulative Condition Emissions	-15.199	**-439.742**	**+0.489**	+10.382	+46.404

Note: Bold indicates the pollutant is nonattainment within AQCR 46.

Source USAF 2004a.

Table 4.4.2-7 Regional Significance Analysis and Comparison to Conformity *de minimis* Thresholds for AQCR 46 for the Dover AFB Proposed Action Cumulative Condition

Category	Pollutants Emitted (tons/year)				
	CO	NO_X	VOC	SO_X	PM_{10}
Emissions Inventory	430.000	6,900.000	2,730.000	28,770.000	670.000
Net Change in Emissions	-15.199	**-439.742**	**+0.489**	+10.382	+46.404
Percent Change Compared to Emissions Inventory	-3.53%	**-6.37%**	**-0.02%**	+0.04%	+6.93%
Regionally Significant? (>10%)	NA	**No**	**No**	NA	NA
de minimis Threshold (tpy)	NA	100	50	NA	NA
Exceed *de minimis* Threshold?	NA	**No**	**No**	NA	NA

NA not applicable. De minimis does not apply since AQCR 46 is in attainment for pollutant.

Source USAF 2004a.

The CAA General Conformity Applicability Analysis prepared for the Proposed Action at Dover AFB also included emissions from the other actions. Based on the emissions calculations summarized in Table 4.4.2-7, the analysis concluded that, although the Proposed Action cumulative condition would occur within an air basin designated as moderate nonattainment for O_3, the net increase in emissions for NO_X and VOC, as well as the other criteria pollutants, would be less than 10 percent of the emissions inventory, and the action would not be considered regionally significant. Additionally, the net change in emissions would not exceed the *de minimis* thresholds of 100 tpy for NO_X and 50 tpy for VOC. The analysis determined that the Proposed Action cumulative condition positively conforms to the applicable SIP for AQCR 46. The Proposed Action cumulative condition has been demonstrated by USEPA standards not to cause or contribute to new violations of any national ambient air quality standard in the affected area, nor increase the frequency or severity of an existing violation. The Proposed Action cumulative condition would not delay timely attainment of the ozone standards in the air basin, and the action is in compliance or consistent with all relevant requirements and milestones contained in the applicable SIP. This conclusion of positive General Conformity Determination for the federal action planned for

Dover AFB fulfills the Air Force's obligation and responsibility under 40 CFR Part 93, Subpart B.

4.4.3 Noise

4.4.3.1 Dover AFB

Figure 4.4.3-1 shows the aircraft ground tracks and Figure 4.4.3-2 depicts the noise exposure area from the aircraft operations condition at the Base after the 12 C-17 aircraft would be based at Dover AFB and the 16 C-5 aircraft are relocated to another installation, leaving 16 C-5s at the Base. Figure 4.4.3-3 compares the Dover AFB Proposed Action and baseline noise contours. The aircraft operations modeled include transient aircraft operations as well as the anticipated C-17 and C-5 operations.

Table 4.4.3-1 compares the baseline and Dover AFB Proposed Action DNL and presents the C-17 SEL at the analysis points. There would be no change to the SEL from C-5 operations since the flight tracks used by C-5 aircraft would be the same as the baseline (see Table 3.1.3-2 for C-5 SEL). Table 4.4.3-2 compares the land area and population exposed to noise of DNL 65 dBA and greater, as well as the population potentially highly annoyed, for the Proposed Action with the baseline condition. There would be an overall 30 percent decrease in the number of people exposed to DNL 65 dBA and greater. Data from these tables are used in the single event and day-night sound analysis sections.

Table 4.4.3-1 SEL and Comparison of DNL from Proposed Airfield Operations at Analysis Points with Baseline, Dover AFB Proposed Action

Number	Description	DNL (dBA)			C-17 SEL (dBA)
		BL	PA	Chg	
1	Golf Course	67	66	-1	94
2	Hospital	72	70	-2	99
3	High School	61	61	0	85
4	School	61	61	0	91
5	Residences	64	64	0	91
6	Residences	57	56	-1	89
7	Residences	57	57	0	83
8	Residences	59	59	0	84

Note: BL=baseline. PA=Proposed Action. Chg=change. The analysis point number and description correspond to the point as reflected on the noise contour and aircraft ground track figures. There may be minor differences when comparing the DNL for a point from the table to the DNL for the point as depicted on the noise contour figure. This difference is a result of small misalignments during the process of printing the noise contours on top of the background map.

Table 4.4.3-2 Summary of Land Area and Population Exposed to, and Population Potentially Highly Annoyed by DNL 65 dBA and Greater, Dover AFB Proposed Action

	DNL Interval (dBA)				
Category	**65-70**	**70-75**	**75-80**	**80+**	**Total**
Acres					
Baseline Acres	15,233	6,256	2,527	2,228	26,244
Proposed Action	9,848	4,276	1,998	1,778	17,900
Change	-5,385	-1,980	-529	-450	-8,344
Percent Change	-35%	-32%	-21%	-20%	-32%
Population					
Baseline Population	5,308	2,137	201	192	7,839
Proposed Action	4,368	805	231	62	5,466
Change	-941	-1,333	+30	-130	-2,373
Percent Change	-18%	-62%	+15%	-68%	-30%
Population Highly Annoyed					
Baseline Population	1,168	791	109	117	2,185
Proposed Action	961	298	125	38	1,422
Change	-207	-493	+16	-79	-763
Percent Change	-18%	-62%	+15%	-68%	-35%

Note: People highly annoyed determined by multiplying the total number of people in the noise zone times the higher percent number for the interval in Table 3.1.3-4.

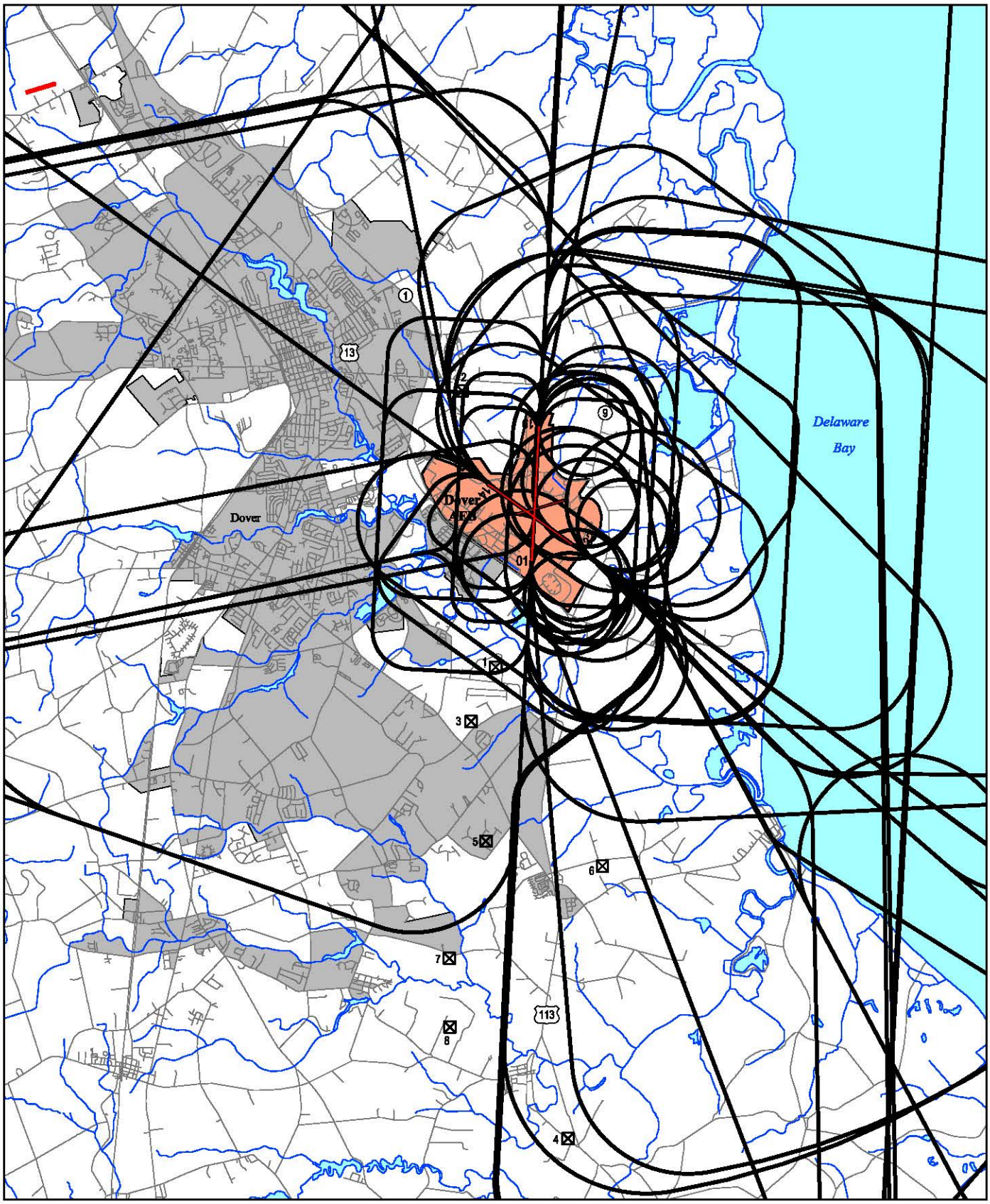
4.4.3.2 Sound Exposure Level

Single Event Noise Analysis

Each aircraft overflight near an analysis point yields a single-event noise level, presented as SEL. A total of eight representative analysis points were selected under the traffic patterns and around the airfield to calculate the SEL from aircraft overflight. The noise contour and aircraft ground track figures show the locations of the analysis points. There would be no change in the C-5 flight tracks and profiles when comparing the Dover AFB Proposed Action to the baseline. Therefore, the C-5 SEL would be expected to remain the same as the baseline. Noise from C-17 events would be less than that for the C-5 at each of the analysis points (see Tables 4.4.3-1 and 3.1.3-2).

Sleep Disturbance

Based on FICAN recommendations, outdoor SELs of 80 to 100 dBA (60 to 80 dBA indoors) could result in 4 to 10 percent awakenings, respectively, in the exposed population. Over the course of sleeping, different individuals might be awakened by different events, and some individuals might be awakened more than once. Individuals in residences in the area around the Base would continue to be exposed to indoor SEL of 60 to 80 dBA during normal sleep periods (10:00 p.m. to 7:00 a.m.). There would be 2,373 fewer persons exposed to DNL 65 dBA and greater as a result of the Dover AFB Proposed Action. Assuming the number of sleep awakenings would be proportional to the decrease in exposed population, it is anticipated there would be the potential for about 237 fewer persons awakened when comparing the Dover AFB Proposed Action to the baseline condition.



Dover Air Force Base

LEGEND

- Flight Track
- Runway
- Roadway
- Analysis Point
- Dover AFB
- Urban Area

N

0 2

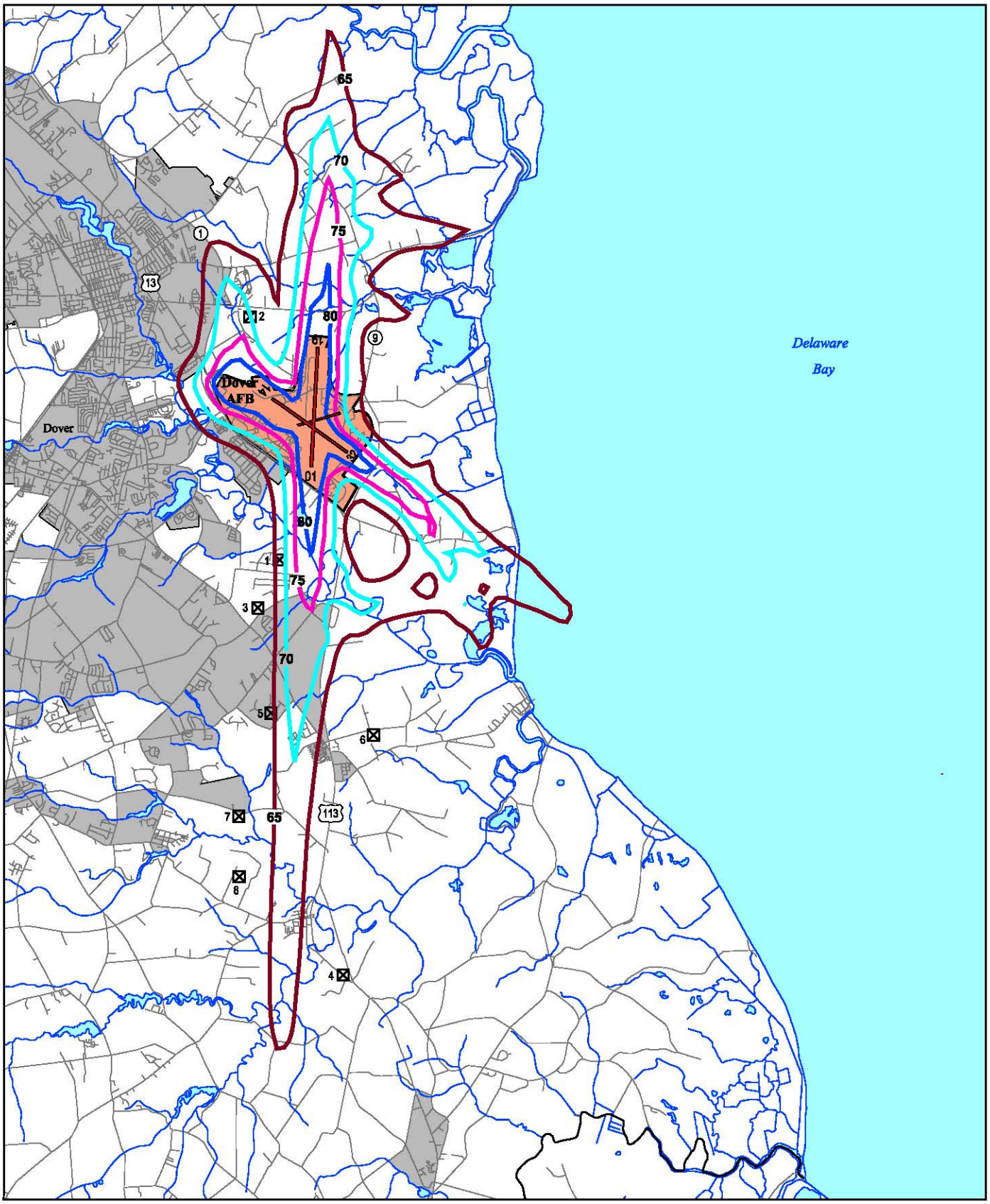
Miles

Proposed Action Ground Tracks, Dover AFB

Figure 4.4.3-1

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Dover Air Force Base

LEGEND

- 65 dBA Contour
- 70 dBA Contour
- 75 dBA Contour
- 80 dBA Contour
- Runway
- Roadway
- Analysis Point
- Dover AFB
- Urban Area

N

0 12,000

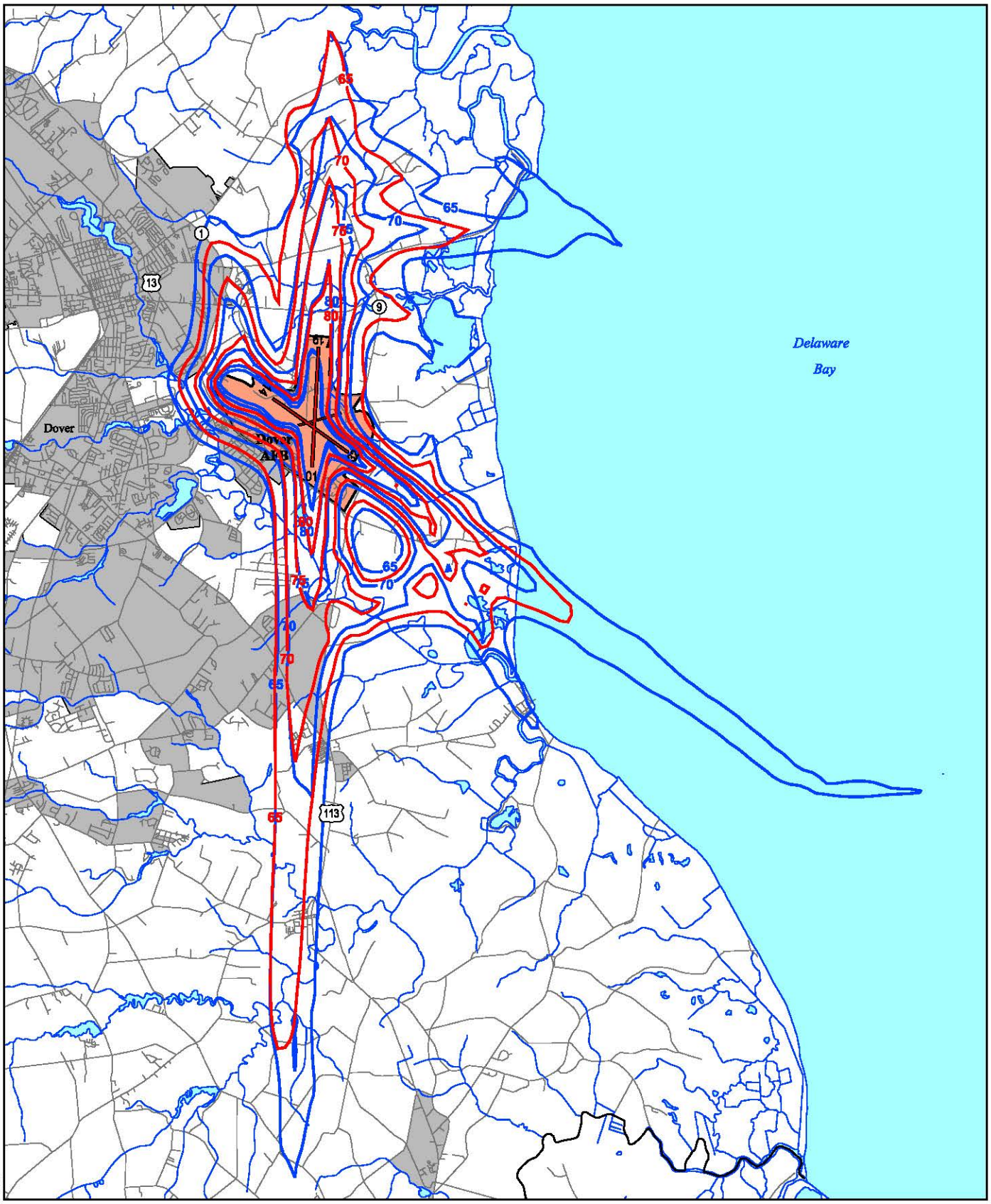
Feet

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Proposed Action Noise Contours, Dover AFB

Figure 4.4.3-2

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Comparison of Baseline and Proposed Action Noise Contours, Dover AFB
Figure 4.4.3-3

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Effects of Noise on Structures

Studies have shown that damage to structures (*e.g.*, window breakage, wall cracks, foundation cracks) from external pressures and induced vibrations would not occur at 127 dB and below (see Table 3.1.3-3). The highest maximum sound pressure level produced by any of the aircraft assigned to Dover AFB at a distance of 1,000 feet would continue to be 106 dBA generated by the C-5 aircraft. The maximum sound pressure levels and at a distance of 1,000 feet for the C-17 would be 91 dBA. The maximum sound pressure at 100 feet from a C-17 would be about 112 dBA. The maximum sound pressure is the highest instantaneous sound pressure during a single noise event, no matter how long the sound may persist. Maximum sound pressure is different than SEL, which is the A-weighted sound level integrated over the duration of the noise event and adjusted to a length of 1 second. Therefore, no damage to structures in the area surrounding Dover AFB would be anticipated because the sound pressure produced by the aircraft would not exceed the level at which structural damage could occur. Aircraft would continue to avoid overflying the historical properties just south of the Base.

Construction Noise

The primary source of noise from the facilities would be the equipment involved in construction activities. Construction noise would be intermittent and short-term in duration. Typical noise levels from heavy equipment ranges from 75 to 89 dBA at 50 feet from the source (Table 4.4.3-3).

Table 4.4.3-3 Heavy Equipment Noise Levels at 50 Feet

Equipment Type	Number Used	Generated Noise Levels, L_p (dBA)
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

It is estimated the shortest distance between a noise source from construction activity and a person in or outside a building adjacent to the construction site would be about 100 feet. Conservatively, outdoor noise for a person at this distance could range from as high as 71 to 85 dB at 100 feet from the source. Interior noise levels would be reduced from the 71 to 85 dB level by approximately 20 dBA due to the noise level reduction properties of the building's construction materials (United States Department of Transportation [USDOT] 1992). It is anticipated that demolition and construction activities would occur between 7:30 a.m. and 4:00 p.m., 5 days per week for the duration of the project. The noise would be temporary and occur only during hours of construction, demolition, or renovation activity and would cease when the project is completed.

Elevated noise levels from construction activity 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 verbal communication. Persons conducting conversations within the construction area could have their speech disrupted by construction, demolition, or renovation-generated noise. Speech disruption would be temporary, lasting only as long as the noise-producing event.

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, construction, and renovation activities would occur only during daytime.

The primary source of noise at Dover AFB during construction activities would continue to be from airfield operations and aircraft maintenance activities. Noise from these sources would tend to mask the noise generated by construction projects for the same exposure area. The perception is that construction noise would likely not be discernible during periods of airfield operations and aircraft maintenance activity. However, there could be periods of time during which construction noise could be discerned. This condition would occur when construction activity is underway and aviation-related activity is low.

Day-Night Noise Analysis, Dover AFB

Overall, the Dover AFB Proposed Action noise contours essentially would retain the same shape as the baseline contours (see Figure 4.3.3-2), with the number of acres in the DNL 65 dBA and greater exposure area decreasing by 32 percent. The primary areas of decrease are to the northeast and southeast where the degree to which the DNL 65 dBA contour extends over the Delaware Bay and to the south where the contour does not extend as far along the extended runway centerline.

As indicated in Table 4.3.3-1, the DNL would decrease by as much as 2 dBA at three of the analysis points and remain the same at the other five points. Assuming the analysis points are representative of points within the area around the airfield and based on the fact that the DNL would remain the same or decrease at each of the eight points, it is anticipated that the DNL would not increase at any point within the noise exposure area.

While there would be a 15 percent increase in the number of persons (30 people) in the DNL 75-80 dBA noise zone (see Table 4.4.3-2), there would be 941 (-18 percent), 1,333 (-62 percent), and 130 (-68 percent) fewer persons, respectively, in the DNL 65-70, 70-75, and 80+ dBA noise zones. The total number of people exposed to DNL 65-dBA and greater would decrease by 2,373 persons (30 percent). The overall number of persons who would be highly annoyed by noise exposure would decrease by 763 people (35 percent).

On the basis of a variety of studies, there is good probability of frequent speech disruption from aircraft overflight that produces outdoor DNL 75 dBA. This level produces ratings of "barely acceptable" for intelligibility of spoken communication. However, since the total duration is no more than a few seconds during each overflight, only a few syllables may

be lost. As a result of potential Dover AFB Proposed Action aircraft overflight noise above this level, speakers may have to raise their voices during conversation, or move closer to listeners to compensate for intruding noise in face-to-face communication. As the intruding (masking) noise level rises, speakers may cease talking until conversation can be resumed at comfortable levels. If the speech source is a radio or television, the listener may increase the volume during noise intrusion. In addition to losing information contained in masked speech, the listener may lose concentration because of the interruptions and become annoyed. Assuming the number of conversations is proportional to the decrease in exposed population and the reduction in airfield operations, it is anticipated there would be a corresponding decrease in the potential for speech disruption.

An outdoor DNL 75 dBA is considered the threshold above which the risk of noise-induced hearing loss should be evaluated. An average of 1 dBA of 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 the calculations are based on an average daily outdoor exposure of 15 hours (7:00 a.m. to 10:00 p.m.) over a 40-year period. It is doubtful that any individual would spend this amount of time outdoors within the noise exposure area. Therefore, noise-induced hearing loss would not be anticipated from airfield operations associated with the Dover AFB Proposed Action.

Predictions of nonauditory health effects from aircraft noise cannot be made. Therefore, nonauditory health effects cannot be analyzed.

Speech in school classrooms exposed to aircraft noise could become masked or the teacher could stop talking altogether during an aircraft noise event. Teachers may choose to pause their speech to avoid interference with noise when it reaches a level of 60 dBA. Masking of the speech of teachers who do not pause would start about the same level. At levels of 75 dBA, some masking would occur for 15 percent of the specific noise events. Masking would increase to nearly 100 percent at 82 dBA, and pauses would occur for about 80 percent of the specific noise events. Since a marked increase in pauses and masking would occur when levels exceed 75 dBA, this level is sometimes considered to be the level above which teaching would be impaired as a result of disruption of speech communication. However, the effect that the disruption would have on learning is unclear.

Under the Dover AFB Proposed Action, the outdoor DNL at the schools identified for analysis (*i.e.*, analysis points 3 and 4) would remain the same as the baseline condition. The DNL at both schools would be 61 dBA, while the C-17 outdoor SEL would be 85 and 91 dBA, respectively. Indoor noise levels are generally 20 dBA lower than outdoor noise levels because building structures attenuate the outdoor noise levels. Thus, the interior noise levels in the schools would be approximately 65 and 71 dBA, respectively. Both these noise levels are below the levels (*i.e.*, 75 dBA) at which a marked increase in pauses and masking would occur and at which teaching would be impaired as a result of disruption of speech communication.

In summary, there would be a reduction in speech disruption from aircraft overflight and there should be no noise-induced hearing loss impacts. Classroom disruption would remain at

approximately the baseline condition. The overall effect of the Dover AFB Proposed Action would be a 30 percent decrease in the number of people exposed to DNL 65 dBA and greater.

Military Training Routes

Annually, 795 C-17 sorties (66.22 monthly) would be accomplished by the 12 aircraft proposed for Dover AFB. The sorties by other aircraft types would remain at the baseline levels. Table 4.4.3-4 lists the annual and monthly operations anticipated for the 22 MTRs under the Proposed Action.

Table 4.4.3-4 Anticipated Dover AFB Proposed Action Military Training Route Operations

	C-17 Operations				Other Aircraft Operations		Total Operations	
	Dover AFB		McGuire AFB					
Route	Annual	Monthly	Annual	Monthly	Annual	Monthly	Annual	Monthly
IR-714	8	0.67	0	0.00	8	0.67	16	0.67
IR-720	8	0.67	0	0.00	2	0.16	10	0.83
IR-721	16	1.33	0	0.00	39	3.25	55	4.58
IR-726	16	1.33	0	0.00	103	8.58	119	9.91
IR-743	16	1.33	0	0.00	34	2.84	50	4.17
IR-760	16	1.33	0	0.00	0	0.00	16	1.33
IR-761	16	1.33	0	0.00	0	0.00	16	1.33
IR-762	16	1.33	0	0.00	1	0.08	17	1.41
IR-801	63	5.25	80	6.67	203	16.92	266	22.17
VR-704	16	1.33	18	1.50	52	4.32	68	5.65
VR-705	119	9.92	137	11.42	206	17.16	325	27.08
VR-707	119	9.92	137	11.42	60	5.00	179	14.92
VR-725	16	1.33	18	1.50	90	7.50	106	8.83
VR-1709	119	9.92	137	11.42	1,690	140.85	1,809	150.77
VR-1711	16	1.33	18	1.50	41	3.42	57	4.75
VR-1712	16	1.33	18	1.50	67	5.57	83	6.90
SR-800	16	1.33	18	1.50	0	0.00	16	1.33
SR-801	16	1.33	18	1.50	480	40.00	496	41.33
SR-805	16	1.33	18	1.50	0	0.00	16	1.33
SR-844	16	1.33	18	1.50	0	0.00	16	1.33
SR-845	16	1.33	18	1.50	0	0.00	16	1.33
SR-846	119	9.92	137	11.42	120	10.00	239	19.92

Table 4.4.3-5 compares the L_{dnmr} for the C-17 and other aircraft operations that would occur on the specific routes from the baseline condition. As indicated in the table, the L_{dnmr} ranges from a low of 40 dBA to a high of 62 dBA. As indicated in Table 4.4.3-5, the L_{dnmr} would exceed 55 dBA on six routes. Although the L_{dnmr} would increase minimally (*i.e.*, 1 dBA on two routes) on four of these six routes, it would remain the same as the existing condition on the other four routes. There is no reason to expect the general population to be at risk from any of the effects of noise for sound levels at and below L_{dnmr} 55 dBA (USEPA 1974). Additionally, the L_{dnmr} 62 dBA anticipated for VR-1709 would not exceed the HUD, FAA, and Air Force noise level (*i.e.*, L_{dnmr} 65 dBA) at which residential and other noise-sensitive land uses would be unacceptable. The L_{dnmr} would be a maximum of 5 dBA

greater than the values stated in Table 4.4.3-5 at the points at which the MTRs intersect or when there are common route segments. Thus, the maximum L_{dnmr} for any route could be about 67 dBA.

Table 4.4.3-5 Comparison of Aircraft Noise Levels as a Function of Distance from Aircraft Ground Track Centerline, Dover AFB Proposed Action

	L_{dnmr} (dBA)				L_{dnmr} (dBA)		
Route	**Baseline**	**PA**	**Chg.**	**Route**	**Baseline**	**PA**	**Chg.**
IR-714	49	49	0	VR-707	57	58	+1
IR-720	45	46	+1	VR-725	45	46	+1
IR-721	56	56	0	VR-1709	62	62	0
IR-726	61	61	0	VR-1711	54	54	0
IR-743	53	53	0	VR-1712	51	51	0
IR-760	--	40	--	SR-800	40	43	+3
IR-761	--	43	--	SR-801	45	46	+1
IR-762	23	40	+17	SR-805	40	43	+3
IR-801	54	54	0	SR-844	40	43	+3
VR-704	57	58	+1	SR-845	40	43	+3
VR-705	57	57	0	SR-846	50	52	+2

Note: L_{dnmr} is represented for 300 feet AGL. PA=Proposed Action. Chg=change from baseline. No baseline L_{dnmr} listed for IRs 760 and 761 because routes were not flown.

The noise anticipated from MTR operations would not exceed the level used for hearing loss and speech interference analysis (*i.e.*, L_{dnmr} 75 dBA), and the discussion for these two items in the Proposed Action (Subchapter 4.4.3.1) apply to MTR operations. Likewise, the sleep disruption and non-auditory health effects discussions from the subchapter apply.

Table 3.1.3-8 lists the SEL values for the C-17 for points directly below and lateral to the aircraft ground track. The SEL for a C-17 at 300 feet AGL would be approximately 103 dBA. It is assumed the other aircraft types using the routes would be the same as the baseline condition. Thus, the SEL information in Table 3.1.3-8 would apply to the other aircraft that would continue to use the MTRs under the Proposed Action. Both the L_{dnmr} and SEL decrease as the distance between the receptor and the route centerline increases.

The L_{max} for a C-17 at 300 feet AGL, the minimum altitude flown on an MTR, would be about 100 dBA, which is well below the threshold at which structural damage would occur (*i.e.*, 127 dBA). Thus, no structural damage would be expected from C-17 operations on an MTR.

Studies of aircraft noise and sonic booms, both in the U.S. and overseas, have addressed acute effects, including effects of startle responses (sheep, horses, cattle, fowl), and effects on reproduction and growth (sheep, cattle, fowl, swine); parental behaviors (fowl, mink); milk letdown (dairy cattle, dairy goats, swine); and egg production. High noise may trigger a startle response which raises the heart rate, but heart rate returns to normal in a very short

time. There are good dose-response relationships describing the startle tendency to various levels of noise. However, studies have determined that there would be no long-term behavioral nor breeding effects.

4.4.3.3 Mitigation

No significant noise impacts were identified. Therefore, no mitigation would be required.

4.4.3.4 Cumulative Impacts

None of the other actions have aircraft operations associated with them. Therefore, there would be no cumulative noise impacts associated with aircraft noise.

Under the cumulative condition, other facilities would be constructed at Dover AFB. As depicted in Figures 2.4.2-1 and 2.6.1-1, the distance between one of the other action construction sites and a Proposed Action site could be as close as 100 feet. For analysis purposes, it is assumed the noisiest piece of construction equipment (89 dB scraper which produces 85 dB at 100 feet from the noise source) is being operated simultaneously at each site and the distance to a receptor is 100 feet from each construction site. If the intensity of a sound is doubled, the sound level increases by 3 dBA, regardless of the initial sound level. Thus, the combined noise from equipment operation at the receptor would be 88 dB. Construction noise would be temporary and occur only during the hours that construction, demolition, or renovation activity would occur and would cease when the project is completed.

4.4.4 Hazardous Waste, Hazardous Materials, and Stored Fuels

4.4.4.1 Dover AFB

Hazardous Waste

Hazardous waste would be generated during construction activities. It is anticipated that the quantity of hazardous waste generated during the construction period would be negligible and limited to fuel and equipment maintenance products. 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 regulatory guidance.

In the event of a spill of any amount or type of hazardous material or waste (including petroleum products), the construction 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. The contractor would be responsible for proper characterization and disposal of any waste and clean up materials generated. 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.

Hazardous waste generated by C-17 operation and maintenance activities would be similar in nature with baseline condition waste streams from existing activities at Dover AFB. The primary waste producing processes would continue to include aircraft parts cleaning, fluid changes for routine aircraft and vehicle maintenance, aircraft corrosion control, facility, and infrastructure maintenance. Any hazardous waste generated would be handled in accordance with federal, state, and local laws and regulations, including RCRA requirements for waste management and USDOT requirements for waste transport.

Since the overall number of aircraft assigned to Dover AFB would decrease by four, and because the C-17 and C-5 are similar aircraft (*i.e.*, both four-engine transport), it is anticipated the volume of hazardous waste generated under the Proposed Action would decrease by about 8 percent when compared to the baseline. Additional storage capacity should not be needed and the Base would continue to be a large quantity generator. If needed, Dover AFB would revise its existing *Hazardous Waste, Universal Waste, and Used Petroleum Management Plan* to incorporate the activities of the Proposed Action. The plan would be revised to reflect any additional procedures necessary to achieve and maintain regulatory compliance regarding accumulation, transportation, and disposal of hazardous waste.

Hazardous Materials

Products containing hazardous materials would be procured and used during the proposed construction activities for the Proposed Action. Contractors would be required to use and store hazardous materials in accordance with all federal, state, and local regulations.

Since the overall number of aircraft assigned to Dover AFB would decrease by four aircraft and because the maintenance activities for C-17 and C-5 are similar, it is anticipated that no new hazardous material types would be needed and that hazardous material procurement could decrease by 8 percent. The existing hazardous materials handling processes and procedures could accommodate the activities associated with C-17 operation and maintenance.

Stored Fuels

The petroleum products that would be used under the Proposed Action are similar in nature to those used by the current aircraft activities at Dover AFB. Fueling and lubrication of equipment would be conducted in a manner that affords maximum protection against spills. The number of airfield operations by based C-17 and C-5 at Dover AFB would decrease by about 27 percent. Assuming there is a relationship between airfield operations (which equates to flying time) and fuel use, it is anticipated that the amount of fuel needed for operations could decrease as much as 27 percent. Fuel consumption could decrease from the 77,062,879 gallons of jet fuel used in 2003 to 56,255,915 gallons annually. The existing fuels storage and handling processes and procedures could accommodate the activities associated with C-17 operation and maintenance.

4.4.4.2 Mitigation

No significant hazardous materials, hazardous waste, or stored fuels impacts would be anticipated. Therefore, no mitigation would be required.

4.4.4.3 Cumulative Impacts

The construction contractor for other projects at Dover AFB would comply with applicable regulatory guidance as described for the Proposed Action. Hazardous materials would be procured and used for operations at some of the other action facilities after construction is completed. Likewise, hazardous waste could be generated at the other action facilities. However, it is not anticipated that any hazardous materials not currently used at facilities would be used at the new facilities nor would any new waste streams be generated. The existing hazardous materials and waste management procedures would accommodate the cumulative condition construction and facility operation. No significant cumulative hazardous waste, hazardous materials, and stored fuels impacts would be anticipated.

4.4.5 Biological Resources

4.4.5.1 Dover AFB

Vegetation and Wildlife

The construction, demolition, and renovation activities would occur within developed, maintained areas with highly modified and disturbed landscape that is now either paved or has lawns and landscaping. There would be no disturbance of high quality and/or native vegetation outside either the project or immediately adjacent areas. The Proposed Action would not result in any adverse effects to vegetation and wildlife at Dover AFB.

Threatened, Endangered, and Rare Species

As mentioned in Subchapter 3.1.5.1, no threatened, endangered, or rare species occur within the project areas associated with the Dover AFB Proposed Action.

4.4.5.2 Military Training Routes

The diversity of landforms and geography covered by the MTRs support a number of plant communities, which are categorized into several life zones. Travel across remote, less-densely populated sections of the states results in increased contact between military overflights and natural resources. There are no known effects of low-level overflights of the MTRs to vegetation communities or plant species.

In some situations, noise and visual disturbance caused by military overflight may cause short-duration effects to wildlife, or conflict with conservation purposes of national wildlife refuges (GAO 1989; Dewey and Mead 1994). Only when animals have little freedom of movement (*i.e.*, for escape) and/or are subjected to intense sound volume and frequency

would negative effects likely to be measurable or long-lasting (Janis and Busnel 1978). The Proposed Action would not restrict movement of birds and mammals.

An increasing number of studies show low-level, fixed-wing military overflight of varying intensity of sonic or sub-sonic noise (dBA) elicit little response from most free-roaming species, particularly birds and mammals (Platt 1977; Ellis 1981; USAF 1992; Grubb and Bowerman 1997; Johnson and Reynolds 2002). The USFWS reports numerous studies show there is little or no effect on wildlife from aircraft-related noise and visual disturbances (Gladwin *et al*. 1988).

The Dover AFB Proposed Action would result in C-17 aircraft flying within the MTR corridors. Activities would most likely result in immediate, non-harmful and short-duration responses by some wildlife. Wildlife would be expected to quickly habituate to sights and sounds associated with low-level aircraft overflights. In general, military overflights would be random and pose no threat to wildlife at the behavioral (individual), population, or species level.

Threatened, Endangered, and Special Status Species

There are no known effects of noise or overflight disturbance to threatened and endangered species of plants. The noise effects discussion in the previous paragraphs also applies to listed mammal species. Birds would have the greatest potential for effect from aircraft overflight. Thus, this analysis focuses on birds.

Little research has been done comparing the differences in bird responsiveness to aircraft overflight and ground-based disturbances. Four studies that examined the effects of aircraft overflight on nesting birds noted a slight, insignificant decrease in nesting success and productivity when comparing disturbed and undisturbed nests (USACE 2000).

Birds may be more susceptible to disturbance-caused nest abandonment early in the nesting season. Studies have shown the following nest abandonment after being exposed to ground-based and aircraft overflight disturbances (USACE 2000).

- 30 percent of ferruginous hawk abandoned the nest after exposure to various ground-based disturbances (no control group was used for comparison).
- 2 of 29 red-tailed hawk nests were abandoned after being flushed by helicopter overflight compared to 0 of 12 for the control group.
- 1 of 19 prairie falcon nests was abandoned when exposed to frequent low-altitude jet overflight (no control group was used for comparison).
- 1 of 11 gyrfalcon nests failed (reportedly due to snow damage) compared to 0 of 12 for the control group.
- 1 of 6 peregrine falcon nests exposed to helicopter flights were abandoned (apparently due to inclement weather) compared to 0 of 3 control sites.

An Arizona study on the affect of anthropogenic disturbances on bald eagles found that the highest response frequency and severity of response was to ground-based, aquatic, and aerial disturbances, respectively. Another study involving the Mexican spotted owl found that chain saws resulted in a greater flush response than helicopters at comparable distances and noise levels. Birds not previously exposed to specific disturbance types (*e.g.*, aircraft approach distance) are more likely to flush (USACE 2000).

Studies associated with the stimulus distance have indicated it was rare for birds to flush when the stimulus distance was greater than 197 feet. Many studies imply that animal response to noise disturbance events increases with a decrease in the distance to the stimulus source. One study found that owl flushing in response to a disturbance was "strongly and negatively related to stimulus distance and positively related to noise level." Another study found similar results when experimentally exposing red-cockaded woodpeckers to military training noise (USACE 2000).

A study found that snail kites living near an airport and thus accustomed to aircraft noise did not flush even when the noise levels were as high as 105 dBA. Mexican spotted owls did not flush during the nesting season when the SEL from helicopters was equal to or less than 92 dBA and the equivalent average sound level for chain saws was equal to or less than 46 dBA. (Equivalent average sound level is the steady-state A-weighted sound level that contains the same acoustical energy as the time varying A-weighted sound level during the same interval.) Noise response thresholds for the nonnesting season were comparable with those for the nesting season (USACE 2000).

The USACE completed a study to determine the effect of military noise on the Red-cockaded woodpecker (USACE 2000). Although specific to the red-cockaded woodpecker, it is anticipated the findings of the study would apply to other bird species.

Three types of sample sites were chosen: passive disturbed; undisturbed; and experimental. A passive disturbed site received potentially significant noise disturbance as part of normal training operations; however, there was no control over time, number, or level of noise events at the site. Noise sources at the passive disturbed sites were from firing large-caliber weapons, small arms, and grenade and artillery simulators and helicopter overflight. An undisturbed site was one where the noise levels were judged to be consistently low or absent for all these noise types. Birds at experimental sites were exposed to either artillery simulators or 0.50-caliber blank fire under controlled conditions at distances ranging from 50 to 801 feet from the nest tree.

Summary of the USACE 2000 study focuses on the results from passive disturbance since aircraft overflight would not produce ground-based noise sources such as weapons firing. No red-cockaded woodpeckers were observed flushing the nest when a passive noise source was equal to or greater than 656 feet from the nest. More specifically, birds did not flush when helicopters were equal to or greater than 328 feet from the nest site and SEL noise levels were less than 88 dBA (USACE 2000), which would be about 85 dBA at 500 feet from the source.

The USACE study indicated that red-cockaded woodpeckers that renested after initial nest failure due to disturbance were as successful and productive as sites that nested only once (*i.e.*, were not disturbed). Disturbed and undisturbed nest sites did not differ significantly in the number of eggs, nestlings, or successful fledglings per nest. Table 4.4.5-1 summarizes the success and productivity results from the study.

Table 4.4.5-1 Summary of Red-Cockaded Woodpecker Nesting Data

Condition	Disturbed Nest Site	Undisturbed Nest Site
Successful sites	42	23
Total sites	48	25
Average eggs per nest	3.47	3.56
Average nestlings per nest	2.27	2.28
Average young/occupied per nest	1.84	1.80
Average young/successful per nest	2.14	1.96

Source: USACE 2000.

C-17 aircraft altitude on the MTRs would be no lower than 300 feet AGL. The greatest daily use for any of the MTRs by Dover AFB Proposed Action C-17s would be 0.33 sorties per day based on seven days of flying per week (see Table 2.4.2-2). Thus, the routes would be flown infrequently. As indicated in Table 3.1.3-8, the SEL for a C-17 aircraft directly overhead on a MTR at 315 feet AGL would be 103 dBA. Overflight noise would be less as the slant range to the nest increases. Specific studies involving bald eagles and peregrine falcons have shown both to tolerate low-flying jets without short- or long-term behavioral or reproductive impacts (Platt 1977; Ellis, 1981; Grubb and Bowerman 1997). For the reasons in this and preceding paragraphs, it is not likely that MTR operations by Dover AFB C-17 aircraft would adversely affect listed bird species.

Air Force Instruction 11-202 and Federal Aviation Regulations recommend all aircraft maintain a minimum altitude of 2,000 feet AGL over national wildlife refuges, National Parks, and Forest Service lands in order to minimize aircraft-wildlife conflicts including BASH. Operating procedures for C-17 aircraft mention avoiding overflight of known sensitive areas. These flight restrictions would be implemented for the proposed operation of C-17 aircraft at Dover AFB. Use of the MTRs, including associated noise would not adversely affect listed wildlife species.

4.4.5.3 Mitigation

No significant adverse biological effects would be anticipated. Therefore, no mitigation would be necessary.

4.4.5.4 Cumulative Impacts

Dover AFB is a managed landscape; mowing, disking, building construction and urban-like improvements would be expected to continue into the foreseeable future, with or without the Dover AFB Proposed Action. Natural species diversity and continuity and connectivity of habitats would be expected to decline over the long term. Some species would thrive while others would be displaced and exotic species would most likely continue to increase and

displace native species and communities. The Dover AFB Proposed Action cumulative condition biological resources impacts would not be considered significant.

4.4.6 Socioeconomic Resources

4.4.6.1 Dover AFB

Population

When compared to the Kent County population of 126,697 in 2000, the Dover AFB Proposed Action would result in a decrease in the local and regional population of 364 (0.003 percent) due to the net loss of 161 military and civilian positions. This anticipated population loss includes military personnel and family members directly impacted, as well as a portion of civilian personnel anticipated to relocate outside the Base.

Housing

It is anticipated that approximately 175 housing units would become vacant with the loss of military and civilian personnel, with the majority of the loss being housing occupied by military personnel and family members. The 175 housing units equate to 0.003 percent of the 50,481 units in Kent County. Based on the current on- and off-Base distribution of housing occupied by military personnel, approximately 65 percent of these units would consist of off-Base housing. The Cities of Dover and Milford, and the Town of Smyrna would be expected to experience the most housing vacancies based on the present distribution of off-Base housing units occupied by military personnel.

Education

The net loss of the military and civilian population expected from the Dover AFB Proposed Action would result in a decrease in local school district enrollments. Assuming a factor of 0.75 school age children per military household, there would be an enrollment decrease of approximately 110 military dependent children in addition to a small number of children from affected civilian households who are assumed to relocate. It is anticipated that the 0.016 percent decrease in school enrollments would occur primarily within the Caesar Rodney School District based on the current enrollment distribution of military dependent children.

Economy

Direct and indirect short-term beneficial economic impacts would be realized by the regional and local economy during the construction phase of the Dover AFB Proposed Action, while adverse long-term economic impacts would be expected after construction is completed. Employment generated by construction activities would result in wages paid and expenditures for local and regional services and supplies. However, the loss of 161 military and civilian personnel authorizations under the Dover AFB Proposed Action would result in an overall loss in wages, retail sales, and income to the local and regional economy.

The estimated construction cost (capital costs) for project implementation and annual average income for construction laborers were the inputs used in the execution of the EIFS construction model. The estimated construction cost is approximately $88.1 million over a 4.5-year period. The ROI is considered to be Kent County.

Using employment and income multipliers developed with a comprehensive regional/local database combined with economic export base techniques, the EIFS model estimates the regional economic impacts with respect to changes in employment generated, and expenditures directly and indirectly resulting from project construction. The EIFS model evaluates economic impacts in terms of regional change in sales (business) volume, employment and personal income. Since the economic projections generated by the EIFS model are on an annual basis, the primary model input for construction costs ($88 million) was pro-rated over an estimated 4.5-year construction period.

As indicated in Table 4.4.6-1, the direct annual regional economic impacts of project construction over this 4.5-year period consist of increases of $13,279,190 in business volume (sales); 354 jobs in the construction, retail trade, services, and industrial sectors; and $9,280,188 in direct personal income. The latter value represents the earnings of employees in the construction, retail, wholesale, and service establishments who are initially or directly affected by the construction activity. The increase in business volume reflects increases in the sales of goods, services, and supplies associated with project construction activity.

Table 4.4.6-1 EIFS Annual Economic Impacts, Dover AFB Proposed Action

	Direct Impacts	Indirect Impacts	Total
Construction			
Sales (Business) Volume	$13,279,190	$19,387,620	$32,666,810
Income	$9,280,188	$4,013,259	$13,293,450
Employment	354	103	457
Operations			
Sales (Business) Volume	-$2,719,862	-$3,970,999	-$6,690,862
Income	-$6,137,225	-$822,001	-$6,959,226
Employment	-175	-21	-197

Source: U.S. Army Construction Engineering Research Laboratory 1999

Table 4.4.6-1 also portrays the indirect annual regional impacts on secondary sales, employment, and income generated by the employment and business activity directly associated with project construction. The direct increase in sales and employment generates secondary sales of $19,387,620; creates an additional 103 jobs indirectly in the retail trade, services, and industry sectors; and results in an additional $4,013,259 in indirect income. Income is indirectly impacted as a result of the indirect increase in sales and employment resulting from the initial economic impacts.

Long-term adverse economic benefits of the Dover AFB Proposed Action would be realized as a result of the loss of 161 military and civilian employees during operations. The primary inputs for the EIFS operations model are: estimated loss of military and civilian employees (161); and annual average incomes of $37,900 and $40,255, respectively, for displaced military and civilian employees.

As indicated in Table 4.4.6-1, the direct annual regional economic impacts as a result of a decrease of 161 employees consist of a loss to the regional economy of $2,719,862 in business volume (sales); 175 jobs in the government, retail trade, services, and industrial sectors; and $6,137,225 in direct personal income. The latter represents earnings of employees in the retail, wholesale, and service establishments who are initially or directly affected by the net loss of military and civilian employees. The decrease in business volume reflects decreases in the sales of goods, services, and supplies to the military and civilian personnel associated with project operations.

Table 4.4.6-1 also portrays the indirect annual regional impacts on secondary sales, employment, and income generated by the employment and business activity directly associated with operations. The indirect decrease in sales and employment generates losses in secondary sales of $3,970,999; loss of an additional 21 jobs indirectly in the retail trade, services, and industry sectors; and a loss of an additional $822,001 in indirect income. Income is indirectly impacted as a result of the decrease in sales and employment resulting from the initial economic impacts.

The EIFS model also includes an RTV profile that is used in conjunction with the forecast models to assess the significance of impacts of an activity for a specific geographic area. For each variable (sales volume, employment, income, and population), the current time-series data available from the USDOC Bureau of Economic Analysis (USDOC 2000, 2001) are calculated along with the annual change, deviation from the average annual change, and the percent deviation for each of these variables, which then defines a threshold for significant annual regional economic impacts for a variable. Within the EIFS model, the RTV is also calculated for each of these variables when assessing the regional economic impacts of a specific project. If the RTV for a particular variable associated with the impacts of a specific project exceeds the annual regional RTV for that variable, then the economic impacts are considered to be significant. If the RTV for a variable is less than the regional RTV for that variable, then the regional economic impacts are not considered significant. With respect to the EIFS model assessment of the economic impacts of construction and decrease in operations-related personnel, the RTVs for each of the four variables (population, sales volume, income, and employment) were found to be less than the regional RTVs. For this reason, short-term project construction and the long-term decrease in military and civilian personnel associated with the Proposed Action would not result in significant annual regional economic impacts.

4.4.6.2 Mitigation

No significant population, housing, education, or economic impacts would be anticipated. Therefore, no mitigation would be required.

4.4.6.3 Cumulative Impacts

There would be a decrease of 161 personnel as a result of the Dover AFB Proposed Action. Additionally, nine facilities projects would be constructed under other actions during the same period as the seven Proposed Action projects. Table 4.4.6-2 presents cumulative

impacts to population, housing, and education, and Table 4.4.6-3 summarizes the economic impacts of the cumulative condition.

Table 4.4.6-2 Cumulative Population, Housing, and Education Impacts, Dover AFB Proposed Action

Category	Proposed Action	Other Actions	Cumulative Condition	Percent Change
Population (persons)	-364	-	-364	0.003 percent of Kent County population
Housing (units)	-175	-	-175	0.003 percent of Kent County housing units
Education (students)	-112	-	-112	0.016 percent of Caesar Rodney students

Table 4.4.6-3 Cumulative Economic Impacts, Dover AFB Proposed Action

	Direct Impacts	Indirect Impacts	Total
Construction			
Sales (Business Volume)			
Other Actions	$43,603,060	$63,660,460	$107,263,520
Proposed Action	$13,279,190	$19,387,620	$32,666,810
Cumulative Impact	$56,882,250	$83,048,080	$139,930,330
Income			
Other Actions	$27,281,440	$13,177,790	$40,459,230
Proposed Action	$9,280,188	$4,013,259	$13,293,450
Cumulative Impact	$36,561,628	$17,191,049	$53,752,680
Employment			
Other Actions	1,023	339	1,362
Proposed Action	354	103	457
Cumulative Impact	1,377	442	1,819
Operations			
Sales (Business) Volume			
Other Actions	-	-	-
Proposed Action	-$2,719,862	-$3,970,999	-$6,690,862
Cumulative Impact	-$2,719,862	-$3,970,999	-$6,690,862
Income			
Other Actions	-	-	-
Proposed Action	-$6,137,225	-$822,001	-$6,959,226
Cumulative Impact	-$6,137,225	-$822,001	-$6,959,226
Employment			
Other Actions	-	-	-
Proposed Action	-175	-21	-197
Cumulative Impact	-175	-21	-197

As indicated in Table 4.4.6-2, population within Kent County would decrease by 364 persons, 175 housing units would become vacant, and there would be a decrease of 112 students in school enrollment. The greatest decrease for any of these categories for the Dover AFB Proposed Action cumulative condition when compared to the baseline condition would be the 0.016 percent decrease in the number of students, the majority assumed to be in the Caesar Rodney School District.

With respect to the EIFS model assessment of the economic impacts of construction and a decrease of 161 operations-related personnel, the RTVs for each of the four variables (population, sales volume, income, employment) were found to be less than regional RTVs. For this reason, short-term project construction and long-term increase in military and civilian personnel associated with the Dover AFB Proposed Action cumulative condition would not be expected to result in significant annual regional economic impacts.

4.4.7 Cultural Resources

4.4.7.1 Dover AFB

Archaeological Resources

No NRHP-eligible archaeological resources are located within or adjacent to the ROI at Dover AFB. The Proposed Action would not result in any effects to archaeological resources on Dover AFB.

Historical Resources

Under the Proposed Action, four buildings (707, 708, 724, and 789) are scheduled for demolition; three hangars (714, 715, and 945) are identified for modification; and one building (721) would undergo an addition. Buildings 707, 708, 714, and 789 are Cold War resources built in 1956 and 1957. Only building 714 was identified in the Cold War Properties Inventory (USAF 1996). Evaluation of building 714 revealed that it is not eligible for listing in the NRHP (Dover AFB 2005).

Dover AFB accomplished Section 106 consultation with the Delaware State Historic Preservation Office. The SHPO concurred with the Dover AFB determination that the Proposed Action would not cause any adverse effects to properties on the Base or within the APE. Appendix C-1 contains the Dover AFB letter to the SHPO and the SHPO's response.

Native American Interests

No traditional cultural properties or other Native American interests have been identified within or immediately adjacent to the ROI for Dover AFB. A list of federally recognized and state-recognized Native American tribes and groups identified at the time of preparation of this document is presented in Table G-1 of Appendix G. The Air Force consulted with these entities pursuant to 36 CFR 800.2 (Appendix G). Responses to consultation were resolved by the Air Force's answer.

4.4.7.2 Military Training Routes

As mentioned in Subchapter 1.4.2.6, no effects to archaeological or historic features would be anticipated because the maximum sound produced by the C-17 while flying a MTR would not exceed the minimum level of 127 dBA at which damage could be expected. Therefore, the analysis is limited to Native American interests associated with MTRs.

Table G-1 in Appendix G contains a list of federally recognized and state-recognized Native American tribes and groups identified at the time of preparation of this document. The Air Force consulted with these entities pursuant to 36 CFR 800.2 (Appendix G). Responses to consultation were resolved by the Air Force's answer.

4.4.7.3 Mitigation

No significant archaeological or Native American effects have been identified. Therefore, no mitigation measures would be required for these resources. HAER documentation may be required for building 714 in consultation with the NPS.

4.4.7.4 Cumulative Impacts

The relationship between Dover AFB Proposed Action sites and sites for other actions would be considered for mitigation and consultation with SHPO to reveal cumulative effects should an other action project include an eligible facility. The consultation documentation and process with Native American interests for the Dover AFB Proposed Action would include the other action sites. When combining the other actions with the Dover AFB Proposed Action through the consultation process, no cumulative adverse cultural resources effects, including visual, would be anticipated under the cumulative condition.

4.4.8 Land Use

4.4.8.1 Dover AFB

On-Base land use conflicts would not be expected under the Proposed Action. Most land uses would be compatible with the general character of existing and planned Base land use patterns. The Dover AFB General Plan incorporated mission beddown scenarios such as the Proposed Action in the future land use and future development components of the General Plan. Thus, facility construction anticipated under the C-17 beddown would be consistent with existing and future land use plans and programs identified in the General Plan. Facility construction and alteration activities may have a temporary minor constraint on existing operations and land uses; however, after construction, these facilities would not be expected to impact any adjacent land use.

The Dover AFB Proposed Action would decrease the noise contours when compared to baseline conditions, and no additional areas would be exposed to greater noise levels. The incompatible land uses in the vicinity of the airfield would continue to be incompatible with AICUZ recommendations. There would be no change to the dimensions of the CZs or APZs at Dover AFB. No additional land use incompatibilities would be anticipated under the Dover AFB Proposed Action.

4.4.8.2 Military Training Routes

Lands below the MTRs were reviewed to determine if increased aircraft noise or additional MTR operations would affect land uses. Sensitive land uses (*e.g.*, wildlife management areas, parks, residential) would be exposed to increased noise levels between L_{dnmr} 40 and 62 dBA. The maximum increase on any route would be L_{dnmr} 17 dBA (IR-762). However, the resultant noise level on that route would be L_{dnmr} 40 dBA. There would be no increase in noise on the route that had the highest noise under the baseline (VR-1709, L_{dnmr} 62 dBA). These resultant noise levels would be below the DNL noise/land use compatibility guidelines synopsized in Table 3.1.8-1. There are numerous recreational/wilderness areas below the MTRs (see Subchapter 3.1.8) where visitors may be annoyed by aircraft overflight. However, based on the sensitive land uses, exposed noise levels and consideration of the noise and overflight studies described in Subchapter 3.1.3, no significant impacts to sensitive land uses would be anticipated due to the slight increase in noise levels or additional overflights from the proposed operations. No impacts to land ownership or the existing function of sensitive land uses would occur.

4.4.8.3 Mitigation

No significant land use impacts would occur as a result of the Dover AFB Proposed Action. Therefore, no mitigative actions would be required. The local planning agencies could use the noise contours for future land use planning and zoning.

4.4.8.4 Cumulative Impacts

Under the cumulative condition, other facilities would be constructed on Dover AFB and some would be in the general area associated with C-17 basing activities. As with the Dover AFB Proposed Action facilities, the other facility actions would be compatible with the Dover AFB General Plan. Thus, the facility construction anticipated under the cumulative condition would be consistent with existing and future land use plans and programs identified in the General Plan.

4.4.9 Infrastructure and Utilities

4.4.9.1 Dover AFB

Water Supply

Under the Dover AFB Proposed Action, there would be a net loss of 161 Air Force active duty, reserve, and civilian personnel, decreasing the Base workforce to 7,669 persons. The average daily per capita consumption for CY02 was approximately 108 gal/day. Assuming the same consumption rate, there would be a net reduction of about 17,465 gallons of water per day used as a result of the Dover AFB Proposed Action. This represents a 2.06 percent reduction when compared to the baseline condition. The resultant maximum daily demand would be 2.87 mgd. Dover AFB Proposed Action water consumption would be about

94 percent of the system capacity, which equates to an approximate 1 percent reduction when compared to the baseline condition.

In addition to personal use, up to 0.0035 mgd of water per acre would be applied for dust control during demolition, construction, and renovation. This water would be supplied by the Base water system. It is estimated that water application for dust control would occur approximately 115 days per year and that approximately 19 acres would be disturbed during the duration of the project, resulting in about 0.07 mgd of water being used during this time, or about 2.2 percent of system capacity. Use of water for dust suppression would end when demolition and construction activities are completed.

Wastewater Treatment

Under the Dover AFB Proposed Action, there would be a net loss of 161 Air Force active duty, reserve, and civilian personnel, decreasing the Base workforce to 7,669 persons. The average per capita generation of wastewater for FY02 was about 101.81 gal/day. Assuming the same generation rate, there would be a net reduction of about 16,391 gallons of wastewater produced per day as a result of the Dover AFB Proposed Action. The average daily wastewater treated at the WWTP would be 10.98 mgd (73.20 percent of capacity), or about 0.13 percent less than the baseline condition.

Storm Water Management

All proposed demolition and construction activities would occur within the existing boundaries of Dover AFB. The amount of impervious cover on the Base is approximately 2,146 acres (93,479,760 square feet). The amount of impervious cover would increase by 822,184 square feet (19 acres), which represents about 0.89 percent increase over baseline conditions. Therefore, the amount of storm water runoff should not increase significantly above the existing conditions. Curbs and gutters installed during any street and off-street parking construction would be connected to the existing storm water system. If required, a new storm water system or connections would be designed and constructed to comply with current regulations and to accommodate any storm water flow increases. Since the amount of disturbed area would be greater than 5,000 square feet, a storm water permit for construction activities would be required.

The construction contractor would ensure a SWPPP is completed and approved before initiating activities. The SWPPP likely would include the erosion control techniques used during demolition and construction to minimize erosion. The construction sites would have silt fences and other erosion control features such as absorbent booms for oils and greases down gradient. Hay bales or other absorbent materials would be installed around storm drainage system inlets to prevent sediment or other contaminants from entering the storm water system during the project. The rate of runoff from the construction site would be retarded and controlled mechanically. Diversion ditches would be constructed to retard and divert runoff to protected drainage courses. 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.

Energy

As a result of the Dover AFB Proposed Action, there would be a net increase of 52,184 square feet of climate-controlled space, and daily electricity and natural gas use would increase by 2,400 kWH (52,184 square feet x 0.046 kWH per square foot) and 104 ccf (52,184 square feet x 0.002 ccf per square foot), respectively. The net increases represent 1.44 and 1.21 percent, respectively, of the baseline electrical and natural gas consumption. The energy system capacities are adequate to handle the increases as a result of the proposed new buildings.

Solid Waste Management

In considering the basis for evaluating the significance of impacts on solid waste management resulting from the Dover AFB Proposed Action, two preliminary items were considered. These include evaluating the degree to which waste generation could affect the existing solid waste management program and the capacity of the area landfill.

Under the Dover AFB Proposed Action, there would be an estimated 161 fewer personnel working on Base. Thus, approximately 184 fewer pounds per day (0.09 tpd) of solid waste would be generated by all activities based on an average daily generation of 1.04 pounds per person.

Solid waste would be generated from implementation of the Dover AFB 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. Analysis of the impacts associated with the proposed demolition and construction activities is based on the following assumptions:

- The weight of concrete debris is 150 lb/ft^3 (Merritt 1976);
- The weight of asphaltic concrete roadways is 130 lb/ft^3 (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 debris is generated for each square foot of floor area of demolished structures (USACE 1976);
- Approximately 96 pounds of demolition and construction debris are generated for each square foot of floor area of renovated structures; and
- Approximately 1 pound of construction debris is generated for each square foot of new asphaltic concrete pavement.

Based on estimations for the action, 85,728 square feet of new facilities would be constructed, 33,544 square feet would be demolished, and 770,000 square feet of additional area would be paved. Based on these data and the assumptions listed above, it is estimated that 2,099 tons of demolition and construction debris would be generated by the Dover AFB Proposed Action.

As mentioned in Section 3.1.9.5, the Delaware Solid Waste Authority Landfill has a remaining projected life expectancy of 15 years, with an average disposal rate of 27 tpd. Based on an average disposal of 365 days per year (*i.e.*, 7 days per week) for 9 years (the more conservative condition), there would be 5,475 days when construction and demolition debris would be disposed in the landfill. Thus, the total remaining capacity of the landfill is estimated at 147,825 tons. The projected disposal from the project (2,099 tons) equates to 1.42 percent of the total remaining capacity. 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. The exact amount of debris that would be recycled cannot be estimated at this time and this analysis assessed the most conservative condition.

Transportation Systems

There would be a temporary increase in construction-related traffic associated with construction activities. It is anticipated construction-related traffic would be localized to the specific construction project area and as the route between the project site and the Base gates. Construction-related traffic would be temporary, lasting as long as the project activity in that area. The net loss of 161 Air Force active duty, reserve, and civilian personnel (2 percent when compared to the baseline 7,830 personnel) would result in a slight decrease in weekday on-Base roadway volumes and vehicular traffic at Base gates.

4.4.9.2 Mitigation

No significant impacts would be anticipated as a result of the Dover AFB Proposed Action. Therefore, no mitigation would be required.

4.4.9.3 Cumulative Impacts

Water Supply

There would be no changes in personnel associated with the other actions. Therefore, there would be no water consumption cumulative impacts.

As with the Dover AFB Proposed Action, water would be applied for dust control for the other actions. It is estimated approximately 12 acres would be disturbed as a result of the other actions. Based on the acres and application data used for the Dover AFB Proposed Action, about 0.04 mgd of water would be applied for dust control for the other actions. The cumulative condition use of 0.11 mgd of water for dust control equates to about 3.6 percent of system capacity. Use of water for dust suppression would end when demolition and construction activities are completed.

Wastewater Treatment

There would be no changes in the number of personnel at the Base under the other actions. Therefore, there would be no wastewater treatment cumulative impacts.

Storm Water Management

The amount of impervious cover associated with the other actions would increase by 1,934,193 square feet (44 acres). Thus, when combining the area associated with the Dover AFB Proposed Action with the other actions, there would be a net increase of 2,756,377 square feet (63 acres) under the cumulative condition, which equates to a 2.94 percent increase when compared to the baseline condition. The SWPPP discussion and erosion control techniques for the Dover AFB Proposed Action apply to the Dover AFB Proposed Action cumulative condition.

Energy

As a result of the other actions, there would be a net increase of 511,093 square feet of climate-controlled space. Daily electricity and natural gas use would increase by 23,510 kWH (511,093 square feet x 0.046 kWH per square foot) and 1,022 ccf (511,093 square feet x 0.002 ccf per square foot), respectively. When combining the other actions with the Dover AFB Proposed Action consumption, daily electricity and natural gas use would be 25,910 kWH and 1,126 ccf, respectively. The consumption would represent daily increases of 15.55 and 13.10 percent, respectively, for electricity and natural gas under the Dover AFB Proposed Action cumulative condition. The energy system capacities are adequate to handle the increases as a result of the proposed new buildings.

Solid Waste Management

Under the Dover AFB Proposed Action cumulative condition, there would be an estimated 161 fewer personnel working on Base. Thus, approximately 184 fewer pounds per day of solid waste would be generated by all activities based on an average daily generation of 1.04 pounds per person.

Based on the information in Section 2.6.1, a total of about 587,893 square feet of facility space would be constructed, 10,000 square feet would be altered or renovated, and 3,330,400 square feet of additional area would be paved under other actions. It is estimated that the concrete and asphalt removed under the runway and taxiway repaving projects would be reused in another project and not disposed in a landfill. Based on the solid waste generation assumptions for the Dover AFB Proposed Action, it is estimated 3,321 tons of debris would be generated by the other actions.

The life expectancy and disposal information used for the Dover AFB Proposed Action analysis apply to the cumulative condition. The projected disposal from the Dover AFB Alternative Action cumulative condition (2,099 plus 3,321 equals 5,420 tons) equates to 3.67 percent of the total remaining capacity. The recycling discussion for the Dover AFB Proposed Action applies to the cumulative condition.

Transportation

Construction projects associated with the other actions would increase project-related traffic as described for the Dover AFB Proposed Action. Since some of the other actions are

in the same area as the Proposed Action construction activities, there could be a slight cumulative increase in traffic. As with the Proposed Action, construction-related traffic would be temporary and last only as long as the project activity in that area. As reflected in Subchapter 2.6, there would be no personnel changes associated with the other actions. Thus, there would be a net loss of 161 personnel under the Dover AFB Proposed Action cumulative condition, or a 2 percent decrease when compared to the baseline. The Dover AFB Proposed Action cumulative condition would result in a slight decrease in weekday on-Base roadway volumes and vehicular traffic at Base gates.

4.4.10 Airspace and Airfield Operations

4.4.10.1 Dover AFB

Airspace Operations

Given the size and operating similarities (*i.e.*, airspeed, flight profiles) of the C-17 and C-5 aircraft, the type of sortie aircraft operations and airspace requirements associated with the Dover AFB Proposed Action would be consistent with the baseline operations. The existing air traffic control procedures and airspace infrastructure surrounding Dover AFB have the capacity to accommodate the anticipated C-17 and C-5 operations. The low altitude federal airways and MTRs that transit the airspace would not be impacted, nor would they affect, operations in the airspace.

Airfield Operations

Under the Dover AFB Proposed Action, average daily airfield operations at the Base would decrease by 62.63 operations from 239.25 to 176.62 operations (see Tables 2.4.1-1 and 2.4.2-1, respectively), a 26 percent decrease. Table 4.4.10-1 contains the anticipated airfield operations. The operating characteristics of the C-17 are similar to the C-5. Therefore, many of the existing traffic patterns could be used by C-17s. Since the C-17 has increased tactical capability when compared to the C-5, additional flight tracks associated with tactical training events would be added at Dover AFB. C-17 aircrews would accomplish tactical events such as arrivals and departures in which the aircraft may spiral up to about 5,000 feet AGL during a departure or down from that altitude on an arrival to a landing. The air traffic control tower and Dover AFB RAPCON would establish procedures for these tactical events since they start in one airspace unit (*i.e.*, either tower or RAPCON) and end in the other (*i.e.*, either tower or RAPCON). The volume of traffic in the airspaces in which the tactical arrivals and departures would be accomplished would not preclude establishment of the procedures to allow execution of the events. Thus, the airspace has the capacity to accommodate the additional air traffic control procedures needed for the combined C-17 and C-5 operations at Dover AFB. The airfield has the capacity to accommodate the reduced anticipated level of operations as well as the C-17 tactical events that would be accomplished at the airfield.

Table 4.4.10-1 Annual and Average Daily Airfield Operations, Proposed Action, Dover AFB

	Arrival and Departure Operations		Closed Pattern Operations		Total Operations	
Aircraft	**Annual**	**Avg. Daily**	**Annual**	**Avg. Daily**	**Annual**	**Avg. Daily**
Dover AFB Aircraft						
C-17	2,789	7.64	6,526	17.88	9,315	25.52
C-5	1,854	5.08	18,725	51.30	20,579	56.38
Aero Club	14,162	38.80	748	2.05	14,910	40.85
subtotal	18,805	51.52	25,999	71.23	44,804	122.75
Transient Military Aircraft						
A-10	102	0.28	0	0.00	102	0.28
C-9	102	0.28	0	0.00	102	0.28
C-17	1,329	3.64	0	0.00	1,329	3.64
C-5	2,672	7.32	0	0.00	2,672	7.32
C-21	69	0.19	0	0.00	69	0.19
F-18	51	0.14	0	0.00	51	0.14
T-37	44	0.12	0	0.00	44	0.12
T-38	44	0.12	0	0.00	44	0.12
UH-1	248	0.68	0	0.00	248	0.68
C-130	248	0.68	945	2.59	1,193	3.27
KC-135	91	0.25	482	1.32	573	1.57
C-141	610	1.67	978	2.68	1,588	4.35
P-3	270	0.74	2,599	7.12	277	7.86
subtotal	5,880	16.11	5,004	13.71	8,292	29.82
Civil Aircraft						
B-747	1,613	4.42	0	0.00	1,613	4.42
DC-10	274	0.75	0	0.00	274	0.75
Gulfstream	2,029	5.56	372	1.02	2,030	6.58
Learjet	2,029	5.56	372	1.02	2,030	6.58
Cessna	2,029	5.56	0	0.00	2,029	5.56
Beech Baron	58	0.16	0	0.00	58	0.16
subtotal	8,032	22.01	744	2.04	8,776	24.05
Total	32,717	89.64	31,747	86.98	61,872	176.62

Note: Annual operations based on 365 days per year for all aircraft.

4.4.10.2 Military Training Routes

Under the Dover AFB Proposed Action, individual route use by Dover AFB C-17s would range from as few as 0.67 monthly operations on IRs-714 and 720 to as many as 9.92 monthly operations on VRs-705, 707, 1709, and SR-846 (see Table 2.4.2-2). Route use by all aircraft types would range from as few as 0.67 monthly operations on IR-714 to as many as 150.77 monthly operations on VR-1709 (see Table 4.4.3-4). None of the 22 MTRs would require modification to support C-17 operations. Thus, there would be no need to change to the specific data for any route in Appendix B.

Several conditions reduce the potential "competition" for the same airspace at intersecting points by aircraft on an airway and aircraft on an MTR. The airway can be flown under both VFR and IFR conditions, as can an IR. Under IFR conditions, aircraft are radar identified and controlled by air traffic control, and the pilots maintain radio communication

with air traffic control agencies, thereby improving aircraft separation conditions. When flying in visual meteorological conditions, pilots use the "see and avoid" concept. A VR is flown only under VFR conditions. Therefore, potential for conflict between aircraft during VFR conditions is greater than for IFR because aircraft are not necessarily radar identified. However, VFR conditions provide a better opportunity for pilots to "see and avoid" each other. Additionally, aircraft on airways and aircraft on the MTR monitor common air traffic control frequencies for air traffic advisories and guard frequencies for emergency notification. Air traffic control personnel monitor aircraft directly by radar monitoring and communication with aircraft through periodic receipt of aircraft position through position reporting. Position reporting and traffic advisories, combined with visual contact between pilots and radar control of aircraft, reduce the potential for two aircraft at the same altitude, at the same point, at the same time. Given the conditions mentioned in this paragraph, the probability would be very low that an aircraft on an airway and an aircraft on a MTR or transition corridor would be at the same altitude at the same position.

As indicated in Appendix B, some MTRs could penetrate airspace associated with instrument approaches at airports along the routes. Operating procedures direct aircrews flying an MTR to contact the air traffic control tower associated with the airport for traffic advisories and route alteration, if necessary, to avoid other traffic. Additionally, directives request that aircraft on an MTR avoid airports by 3 NMs and 1,500 feet AGL where practicable. Continuation of these procedures would assist Dover AFB C-17 aircrews to deconflict operations with aircraft executing an instrument approach to an airport along the route.

In summary, each MTR has the capacity to accommodate the additional operations associated with the Dover AFB Proposed Action and the structure for each route can support C-17 operations. The potential for conflict between aircraft operating on the MTRs as well as other civil aircraft operating in the airspace around the MTRs is low because the existing scheduling and air traffic control procedures are designed to deconflict aircraft. The proposed MTR operations would not place significant demands on, nor impact, the airspace infrastructure.

4.4.10.3 Aircraft Safety

It is impossible to predict the precise location of an aircraft accident. However, aircraft flight tracks are developed to avoid overflying residences and built-up areas to the maximum extent practicable. As mentioned in Subchapter 3.1.10.3, 68 percent of the Air Force aircraft accidents that occur within a 10-NM radius of an airfield happen either on the airfield or within an area that is 3,000 feet wide and extends out to a distance of 15,000 feet from the end of the runway. Historical data show that large aircraft such as the C-17 and C-5 would have lower probability of being involved in an accident within the 10-NM radius (20 percent) when compared to fighter and trainer aircraft (80 percent). The types of landing and takeoff operations the C-17 and C-5 aircraft would accomplish at Dover AFB, as well as MTR operations (C-17 only), would be consistent with those flown over the lifetime for each aircraft. Thus, it is anticipated the mishap distribution discussed in Subchapter 3.1.10.3 for takeoffs and landings, as well as the baseline class A mishap rates for all phases of flight for the C-5 and

C-17 aircraft (see Tables 3.1.10-2 and 3.2.11-2, respectively), would apply to the operations anticipated under the Dover AFB Proposed Action. For these reasons, the probability is low that an aircraft involved in an accident at or around the Dover AFB airfield or on a MTR would strike a person or structure on the ground.

4.4.10.4 Bird-Aircraft Strike Hazard

Bird-aircraft strike hazards can be assessed using a combination of bird distribution and behavior factors and aircraft operational factors. Some of these factors include:

- The size and behavior of the predominant bird species;
- The presence of specialized habitat or location that favors migration patterns or large concentrations of birds;
- The frequency and location of takeoffs and landings;
- The altitude of flight operations; and
- The flight characteristics of the aircraft, including size, airspeed, and number of engines.

Overall, it is estimated the total airfield operations for Dover AFB's two aircraft types (C-17 and C-5) would decrease under the Dover AFB Proposed Action by about 27 percent when compared to the baseline. Thus, bird-aircraft strikes associated with airfield operations at Dover AFB would be expected to decrease commensurate with the change in airfield operations. Based on the 2003 data in Table 3.1.10-3 and the decrease in airfield operations, it is estimated that 30.0 annual bird-aircraft strikes would occur when applying the reduction in airfield operations. Table 4.4.10-2 lists the monthly bird-aircraft strikes based on the baseline monthly average bird-aircraft strikes per airfield operation and the anticipated monthly operations.

Table 4.4.10-2 Estimated Dover AFB Proposed Action Bird-Aircraft Strikes

Month	Baseline Monthly Average	Estimated Monthly Bird-Aircraft Strikes	Net Change	Percent Change
Jan	0.5	0.4	-0.1	-20%
Feb	1.0	0.7	-0.3	-30%
Mar	2.3	1.7	-0.6	-26%
Apr	1.5	1.1	-0.4	-27%
May	4.5	3.3	-1.2	-27%
Jun	2.3	1.7	-0.6	-26%
Jul	4.8	3.5	-1.3	-27%
Aug	5.3	3.8	-1.5	-28%
Sep	5.5	4.0	-1.5	-27%
Oct	7.3	5.3	-2.0	-27%
Nov	3.5	2.5	-1.0	-29%
Dec	2.7	2.0	-0.7	-26%
Total	41.2	30.0	-11.2	-27%

Dover AFB aircrews flew no MTR operations under the baseline condition and the baseline bird-aircraft strike data for the operations that occurred on the routes proposed for use by Dover AFB are not available. Thus, there is no statistical data for use in estimating bird-aircraft strikes for the Dover AFB Proposed Action MTR operations. Based on an estimated average of 45 minutes of flying time for each route flown, Dover AFB C-17 aircrews would fly a combined 596 hours annually on all the MTRs. Using this estimate of flying time and the Air Force-wide rate of 0.0052 strikes per flying hour, it is anticipated that about three bird-aircraft strikes would occur annually from Dover AFB C-17 MTR operations.

The number of bird-aircraft strikes described in the previous paragraphs could fluctuate as a result of the cyclical patterns of bird populations. Historically, 1/2 of 1 percent of all reported bird-aircraft strikes involving Air Force aircraft resulted in a serious mishap. Therefore, it is unlikely that any of these bird-aircraft strike incidents would result in an aircraft accident, involve injury either to aircrews or to the public, or damage to property (other than the aircraft).

4.4.10.5 Mitigation

No significant airspace and airfield operations, MTR operations, aircraft safety, or BASH impacts would be anticipated. Thus, no mitigation would be required.

4.4.10.6 Cumulative Impacts

None of the other actions anticipated at Dover AFB include aircraft basing or airfield operations changes. Therefore, no cumulative airspace and airfield operations impacts would be anticipated.

4.4.11 Environmental Management

4.4.11.1 Dover AFB

Pollution Prevention

The Proposed Action would result in construction of new facilities and the introduction of C-17 aircraft at Dover AFB. The activities associated with the action would be accomplished under existing Air Force and Base directives, as well as innovative pollution prevention technologies, to achieve the P2 goals of minimizing or eliminating the use of hazardous materials, reducing the volume of hazardous waste and the release of pollution into the environment, and conserving energy.

Asbestos and Lead-based Paint

It is possible that asbestos and LBP could be encountered in older buildings that would be demolished. The demolition contractor would be responsible for all ACM and LBP removal. Friable ACM would be removed by a licensed asbestos abatement contractor using glove-bag techniques just prior to actual demolition of the building. If this procedure is used, asbestos-containing areas would not require polyethylene containment and negative pressure. Non-friable ACM could be disposed as solid waste along with other construction debris as long as the landfill is permitted to accept non-friable ACM. Non-friable asbestos will be moistened just prior to removal to minimize airborne fibers. Debris mixed with ACM debris must be kept wet and must be sent to an asbestos-approved landfill. Removal of LBP would comply with 29 CFR 1910. The proposed facilities would be constructed or renovated without any ACM and LBP. Buildings or structures proposed for demolition would be evaluated by the Dover AFB Bioenvironmental Engineering to determine if an asbestos survey would be required. In addition, the Base Environmental Flight would coordinate any LBP investigation and actions.

Environmental Restoration Program

The Life Support Facility project, which includes demolition of existing facilities and construction of a new building, would occur near ERP site OT51. It is anticipated that demolition and construction activities would occur at depths above the contaminated groundwater associated with the site. Groundwater elevation for the site ranges from about 12 to 15 feet below the ground surface. Thus, it is unlikely groundwater would be encountered. No ground disturbing activities would occur from the project that would alter the doors on Building 715, a hangar that is adjacent to site OT50. Thus, the project would not affect the groundwater associated with the site.

Facilities design and construction would be coordinated with the Base Environmental Flight and Bioenvironmental Engineering to ensure that construction would avoid interference with ongoing investigation and remediation work and would not worsen the condition of, or impair the ability to remediate any site. Before construction activities begin, the contractor would be required to coordinate with the Base Environmental Flight and Bioenvironmental Engineering to prepare a work plan and health and safety plan in case

contamination is encountered during excavation activities. The work plan and health and safety plan would address measures for using field instruments capable of detecting contaminants at harmful levels. Soil gas associated with groundwater contamination could enter the building at levels that could present a long-term health risk. For this reason, buildings to be constructed over any contaminated groundwater plumes would be designed to include a subterranean vapor barrier, closed barrier seams, and a passive vent system.

4.4.11.2 Mitigation

No significant pollution prevention, asbestos and LBP management, or ERP impacts would be anticipated. For this reason, no mitigation measures would be required.

4.4.11.3 Cumulative Impacts

The construction contractor for other projects would be required to comply with the regulatory requirements and best management practices identified for the Dover AFB Proposed Action. Although some of the other actions are adjacent to Proposed Action project sites, use of the regulatory requirements and best management practices identified for the Proposed Action would minimize the potential for cumulative impacts. When completed, activities at the other facilities would be managed in accordance with applicable environmental plans and policies. No cumulative pollution prevention, asbestos and LBP management, or ERP impacts would be anticipated.

4.5 MCGUIRE AFB ALTERNATIVE ACTION

4.5.1 Introduction

Basing 12 additional C-17 aircraft at McGuire AFB would enhance the capability of the Air Force to meet the national military strategy by modernizing strategic and tactical airlift aircraft on the east coast. The McGuire AFB mission of providing airlift of troops, equipment, and passengers would be expanded with the additional C-17 aircraft.

4.5.2 Air Quality

4.5.2.1 McGuire AFB

Under the McGuire AFB Alternative Action, 12 additional C-17 aircraft would be assigned to McGuire AFB, increasing the total number of C-17s to 24 aircraft. Ten construction projects would be accomplished. There would be no change in the number of KC-10, KC-135, or transient aircraft operations at McGuire AFB when compared to the baseline condition. Aircraft maintenance activities would occur at McGuire AFB, and MTR operations would occur on the 16 MTRs. Portions of seven of the MTRs occur in AQCR 45, the AQCR in which McGuire AFB is located.

The methodologies used to estimate emissions from construction projects, airfield and MTR operations, and aircraft maintenance activities for the Dover AFB Proposed Action were used to determine emissions for the McGuire AFB Alternative Action in AQCR 45. Table 4.5.2-1 lists the emissions anticipated from the McGuire AFB Alternative Action and compares the emissions to the baseline AQCR 45 emissions inventory.

Table 4.5.2-1 McGuire AFB Alternative Action Emissions in AQCR 45

Criteria Air Pollutant	CO (tpy)	VOC (tpy)	NOx (tpy)	SOx (tpy)	PM10 (tpy)
AQCR 45 CY99 Emissions Inventory	50,300.000	45,780.000	89,880.000	101,050.000	12,600.000
Construction Emissions					
Construction Emissions[a]	5.640	1.280	14.060	1.520	3.450
Construction Emissions as Percent of AQCR Emissions	0.0112%	0.0028%	0.0156%	0.0015%	0.0274%
Aircraft Emissions					
AGE Operation	4.989	1.401	17.552	1.991	1.129
Airfield Operations	1,572.000	1,095.000	939.000	0.000	214.000
Aircraft Trim/Power Checks	17.000	8.000	83.000	0.000	13.000
SR-800 Operations	0.020	0.010	1.550	0.000	0.120
SR-801 Operations	0.010	0.010	1.070	0.000	0.080
SR-805 Operations	0.020	0.010	1.590	0.000	0.120
SR-844 Operations	0.000	0.000	0.310	0.000	0.020
SR-845 Operations	0.010	0.010	0.810	0.000	0.060
SR-846 Operations	0.020	0.010	1.440	0.000	0.110
VR-1709 Operations	0.150	0.090	12.800	0.000	0.980
Annual Aircraft Emissions	1,594.219	1,104.541	1,059.112	1.991	229.619
Annual Aircraft Emissions as Percent of AQCR Emissions	3.17%	2.41%	1.18%	0.00%	0.18%

(a) CY 07 used for the extreme condition construction emissions.

Note: VOC is not an air pollutant criterion. However, VOC is reported because, as an O_3 precursor, it is a controlled pollutant. Emissions listed for an MTR are those that would occur from operations on that portion of the MTR within the AQCR. Emissions for the remainder of the MTR are listed in Table 4.5.2-4.

The construction emissions presented in Table 4.5.2-1 include the estimated annual emissions from construction equipment exhaust associated with the McGuire AFB Alternative Action. The 10 projects would be accomplished over an approximate 4-year period. Therefore, the year with the greatest construction equipment emissions (CY07) was used to present the extreme condition for emissions analysis. As with fugitive dust emissions, combustion emissions would produce slightly elevated air pollutant concentrations. However, the effects would be temporary, fall off rapidly with distance from the proposed construction site, and would not result in any long-term impacts.

AGE and airfield operations, as well as aircraft trim/power checks and MTR operations within AQCR 45 where McGuire AFB is located, would generate emissions on a recurring basis. Table 4.5.2-1 lists the annual emissions from these operations for the McGuire AFB Alternative Action in AQCR 45. As indicated in the table, the greatest volume of emissions for any of the criteria pollutants from recurring aircraft operations would be 1,594.219 tpy for CO, which equates to 3.17 percent of the AQCR emissions inventory for that pollutant.

A CAA General Conformity Applicability Analysis for the McGuire AFB Alternative Action was prepared in August 2004 (USAF 2004b). Table 4.5.2-2 summarizes the net change in emissions associated with the McGuire AFB Alternative Action, and Table 4.5.2-3 compares the change in emissions for regional significance and *de minimis* purposes.

Table 4.5.2-2 Net Change in Emissions from McGuire AFB Alternative Action Activities in AQCR 45

Category	Pollutants Emitted (tons/year)				
	CO	NO_X	VOC	SO_X	PM_{10}
Net Change in Airfield Operations Emissions	+786.000	+469.000	+547.000	0.000	+107.000
Net Change in AGE Operation Emissions	+0.512	+1.804	+0.144	+0.205	+0.116
Net Change in Trim/Power Check Emissions	0.000	+18.000	0.000	0.000	+6.000
Net Change in Construction Emissions	+5.640	+14.060	+1.280	+1.520	+3.450
Net Change in Military Training Route Operation Emissions	+0.110	+9.770	+0.070	0.000	+0.760
Net Change in Emissions for the Alternative Action	+792.262	**+512.634**	**+548.494**	+1.725	+117.326

Note: Bold indicates the pollutant is nonattainment within AQCR 45.

Source USAF 2004b.

Table 4.5.2-3 Regional Significance Analysis and Comparison to Conformity *de minimis* Thresholds for AQCR 45 for the McGuire AFB Alternative Action

Category	Pollutants Emitted (tons/year)				
	CO	NO_X	VOC	SO_X	PM_{10}
Emissions Inventory	50,300	89,880	45,780	101,050	12,600
Net Change in Emissions	+792.262	**+512.634**	**+548.494**	+1.725	+117.326
Percent Change Compared to Emissions Inventory	+1.58%	+0.57%	+1.20%	+0.00	+0.93%
Regionally Significant? (>10%)	NA	**No**	**No**	NA	NA
de minimis Threshold (tpy)	NA	100	50	NA	NA
Exceed *de minimis* Threshold?	NA	**Yes**	**Yes**	NA	NA
SIP Budgets (tpy)	NA	1,084	1,198	NA	NA
Exceed SIP Budgets?	NA	**No**	**No**	NA	NA

NA not applicable. De minimis does not apply since AQCR 45 is in attainment for pollutant.

Source USAF 2004b.

The CAA General Conformity Applicability Analysis for the McGuire AFB Alternative Action concluded that, although the McGuire AFB Alternative Action would occur within an air basin designated as nonattainment for O_3, the net change in emissions for NO_x and VOC (the pollutants of concern), as well as other criteria pollutants, would be less than 10 percent of the emissions inventory, and the federal action would not be considered regionally significant (see Table 4.5.2-3). The net change in NO_x and VOC emissions (*i.e.*, 512.634 and 548.494 tpy, respectively) would exceed *de minimis* thresholds of 100 tpy for NO_x and 50 tpy for VOC. However, the increase in emissions for NO_x and VOC would be accounted for in

the most recent SIP (*i.e.*, 1,084 and 1,198 tpy, respectively), which demonstrates conformity. The analysis determined that the McGuire AFB Alternative Action positively conforms to the applicable SIP for AQCR 45. The McGuire AFB Alternative Action has been demonstrated by USEPA standards not to cause or contribute to new violations of any national ambient air quality standard in the affected area, nor increase the frequency or severity of an existing violation. Implementation of the McGuire AFB Alternative Action would not delay timely attainment of the O_3 standards in the air basin, and the federal action is in compliance or consistent with all relevant requirements and milestones contained in the applicable SIP. This conclusion of positive General Conformity Determination for the federal action planned for McGuire AFB fulfills the Air Force's obligation and responsibility under 40 CFR Part 93, Subpart B.

The USEPA has established new NAAQS for fine particles less than 2.5 microns in aerodynamic diameter ($PM_{2.5}$). The CY99 AQCR 45 emissions inventory is the most recent and complete inventory made available to the public. This inventory, however, was completed prior to enforcement of the $PM_{2.5}$ NAAQS, and $PM_{2.5}$ emissions are not included in the emissions summaries. For this reason, it is assumed that $PM_{2.5}$ emissions would be the same as the PM_{10} emissions for all analyses in this EA.

In summary, emissions from the construction activities would be temporary and would be eliminated upon completion of the activities, and would not be regionally significant. Emissions from aircraft, AGE, and MTR operations, as well as aircraft trim/power checks, would not be considered regionally significant. Although the emissions exceed *de minimis* thresholds, the increase in emissions would be accommodated by the most recent SIP. A Conformity Determination would not be required.

4.5.2.2 Military Training Routes

McGuire AFB C-17 aircrews would accomplish operations on MTRs in Delaware, Kentucky, Maryland, North Carolina, New Jersey, New York, Pennsylvania, South Carolina, Tennessee, Virginia, Vermont, and West Virginia. Table 4.5.2-4 lists the estimated emissions for C-17 operations on the McGuire AFB Alternative Action MTRs within the respective AQCR and compares the emissions to the AQCR emissions inventory. As indicated in the table, many MTRs occur in more than one AQCR due to the length and location of the route. Portions of the MTRs that occur within AQCR 45 are included in the analyses for McGuire AFB in Subchapter 4.5.2.1. Table E-3 in Appendix E details the emissions from the McGuire AFB Alternative Action MTR operations on the portion of each route that occurs within the respective AQCR.

Table 4.5.2-4 McGuire AFB Alternative Action Military Training Routes Emissions

Criteria Pollutant	CO (tpy)	VOC (tpy)	NO_X (tpy)	SO_X (tpy)	PM_{10} (tpy)
AQCR 46					
CY99 Emissions Inventory	430	2,730	6,900	28,770	670
Total MTR Operations	0.21	0.12	17.33	0.00	1.33
MTR Emissions as Percent of AQCR Emissions	0.0483%	0.0044%	0.2512%	0.0000%	0.1991%
AQCR 47					
CY99 Emissions Inventory	2,880	**1,100**	**47,970**	111,340	2,150
Total MTR Operations	0.01	0.00	0.46	0.00	0.04
MTR Emissions as Percent of AQCR Emissions	0.0002%	0.0003%	0.0010%	0.0000%	0.0017%
AQCR 114					
CY99 Emissions Inventory	876	**1,047**	**1,795**	4,839	528
Total MTR Operations	0.19	0.11	16.17	0.00	1.24
MTR Emissions as Percent of AQCR Emissions	0.0221%	0.0108%	0.9007%	0.0000%	0.2356%
AQCR 116					
CY99 Emissions Inventory	800	**170**	**22,720**	76,970	1,480
Total MTR Operations	0.03	0.02	2.40	0.00	0.18
MTR Emissions as Percent of AQCR Emissions	0.0036%	0.0099%	0.0106%	0.0000%	0.0125%
AQCR 150					
CY99 Emissions Inventory	1,450	**680**	**10,000**	19,660	1,290
Total MTR Operations	0.63	0.37	52.59	0.00	4.05
MTR Emissions as Percent of AQCR Emissions	0.0435%	0.0541%	0.5259%	0.0000%	0.3137%
AQCR 151					
CY99 Emissions Inventory	23,420	**9,360**	**33,600**	**84,680**	7,440
Total MTR Operations	0.31	0.18	25.86	0.00	1.99
MTR Emissions as Percent of AQCR Emissions	0.0013%	0.0019%	0.0769%	0.0000%	0.0267%
AQCR 158					
CY99 Emissions Inventory	5,260	15,810	10,700	12,820	7,010
Total MTR Operations	0.80	0.47	67.01	0.00	5.16
MTR Emissions as Percent of AQCR Emissions	0.0153%	0.0030%	0.6263%	0.0000%	0.0736%
AQCR 159					
CY99 Emissions Inventory	16,874	**1,682**	**5,539**	9,474	3,747
Total MTR Operations	0.82	0.48	68.71	0.00	5.29
MTR Emissions as Percent of AQCR Emissions	0.0049%	0.0286%	1.2404%	0.0000%	0.1411%

Table 4.5.2-4 McGuire AFB Alternative Action Military Training Routes Emissions
(…continued)

Criteria Pollutant	CO (tpy)	VOC (tpy)	NO_X (tpy)	SO_X (tpy)	PM_{10} (tpy)
AQCR 160					
CY99 Emissions Inventory	4,340	7,950	19,210	84,960	6,830
Total MTR Operations	0.00	0.00	0.02	0.00	0.00
MTR Emissions as Percent of AQCR Emissions	0.0000%	0.0000%	0.0001%	0.0000%	0.0000%
AQCR 164					
CY99 Emissions Inventory	2,190	1,460	15,410	74,160	2,800
Total MTR Operations	0.25	0.15	20.98	0.00	1.61
MTR Emissions as Percent of AQCR Emissions	0.0115%	0.0101%	0.1362%	0.0000%	0.0577%
AQCR 166					
CY99 Emissions Inventory	13,090	9,250	64,550	154,370	9,620
Total MTR Operations	0.01	0.01	0.82	0.00	0.06
MTR Emissions as Percent of AQCR Emissions	0.0001%	0.0001%	0.0013%	0.0000%	0.0007%
AQCR 168					
CY99 Emissions Inventory	5,139	2,659	4,654	4,534	1,174
Total MTR Operations	0.00	0.00	0.11	0.00	0.01
MTR Emissions as Percent of AQCR Emissions	0.0000%	0.0000%	0.0024%	0.0000%	0.0007%
AQCR 178					
CY99 Emissions Inventory	125,380	**10,350**	**47,890**	159,000	6,440
Total MTR Operations	0.67	0.39	85.33	0.00	6.57
MTR Emissions as Percent of AQCR Emissions	0.0005%	0.0038%	0.1782%	0.0000%	0.1020%
AQCR 195					
CY99 Emissions Inventory	12,610	**5,680**	**34,930**	169,280	5,340
Total MTR Operations	1.02	0.60	85.33	0.00	6.57
MTR Emissions as Percent of AQCR Emissions	0.0081%	0.0105%	0.2443%	0.0000%	0.1230%
AQCR 196					
CY99 Emissions Inventory	6,810	**9,300**	**29,260**	90,430	5,400
Total MTR Operations	0.47	0.28	39.52	0.00	3.04
MTR Emissions as Percent of AQCR Emissions	0.0070%	0.0030%	0.1351%	0.0000%	0.0563%
AQCR 197					
CY99 Emissions Inventory	52,000	8,000	163,000	**611,000**	17,000
Total MTR Operations	0.02	0.01	1.67	0.00	0.13
MTR Emissions as Percent of AQCR Emissions	0.0000%	0.0001%	0.0010%	0.0000%	0.0008%

Table 4.5.2-4 McGuire AFB Alternative Action Military Training Routes Emissions *(…continued)*

Criteria Pollutant	CO (tpy)	VOC (tpy)	NO_X (tpy)	SO_X (tpy)	PM_{10} (tpy)
AQCR 221					
CY99 Emissions Inventory	1,181	1,444	631	1,124	367
Total MTR Operations	0.09	0.05	7.61	0.00	0.59
MTR Emissions as Percent of AQCR Emissions	0.0077%	0.0037%	1.2056%	0.0000%	0.1595%
AQCR 222					
CY99 Emissions Inventory	15,770	13,710	26,240	9,100	3,000
Total MTR Operations	0.01	0.00	0.63	0.00	0.05
MTR Emissions as Percent of AQCR Emissions	0.0000%	0.0000%	0.0024%	0.0000%	0.0016%
AQCR 223					
CY99 Emissions Inventory	32,747	6,198	32,073	89,014	3,573
Total MTR Operations	0.01	0.00	0.46	0.00	0.04
MTR Emissions as Percent of AQCR Emissions	0.0000%	0.0001%	0.0014%	0.0000%	0.0010%
AQCR 224					
CY99 Emissions Inventory	6,344	2,262	14,702	17,908	1,754
Total MTR Operations	0.17	0.10	13.86	0.00	1.07
MTR Emissions as Percent of AQCR Emissions	0.0026%	0.0043%	0.0943%	0.0000%	0.0608%
AQCR 225					
CY99 Emissions Inventory	10,884	12,260	38,993	77,589	3,506
Total MTR Operations	0.05	0.03	4.57	0.00	0.35
MTR Emissions as Percent of AQCR Emissions	0.0005%	0.0003%	0.0117%	0.0000%	0.0100%
AQCR 226					
CY99 Emissions Inventory	8,890	9,850	24,250	42,420	3,770
Total MTR Operations	0.06	0.03	4.92	0.00	0.38
AQCR 231					
CY99 Emissions Inventory	606	1,615	3,144	340	1,165
Total MTR Operations	0.05	0.03	4.53	0.00	0.35
MTR Emissions as Percent of AQCR Emissions	0.0090%	0.0020%	0.1441%	0.0000%	0.0299%

Note: VOC is not an air pollutant criterion. However, VOC is reported because, as an O_3 precursor, it is a controlled pollutant. ***Bold*** *type indicates pollutants that are nonattainment. Data are reflected as tpy.*

As indicated in Table 4.5.2-4, AQCRs 46, 47, 114, 116, 150, 151, 159, 178, 195, 196, and 197 are nonattainment. Based on the emissions calculations summarized in Table 4.5.2-4, the net change in emissions for any of the criteria pollutants in any of these 11 AQCRs would not exceed *de minimis* and would be less than 10 percent of the particular emissions inventory, and the action would not be considered regionally significant. The McGuire AFB Alternative Action has been demonstrated by USEPA standards not to cause or contribute to new violations of any national ambient air quality standard in the affected area, nor increase the frequency or severity of an existing violation. Implementation of the

McGuire AFB Alternative Action would not delay timely attainment of the air quality standards in the AQCR, and the federal action is in compliance or consistent with all relevant requirements and milestones contained in the applicable SIP.

Review of the data in Table 4.5.2-4 for AQCRs 158, 160, 164, 166, 168, 221, 222, 223, 224, 225, 226, and 231, all of which are in attainment, indicates that the greatest increase in emissions from MTR operations would be NO_X (67.01 tpy) from recurring aircraft operations in AQCR 158, which equates to 0.6263 percent of the NO_X emissions within the AQCR. Emissions in each of these air basins fall below the 10 percent level that would be considered regionally significant by the USEPA if the region were nonattainment for any of the criteria pollutants as stated in 40 CFR 51, Subpart W, Section 852. However, AQCRs 158, 160, 164, 166, 168, 221, 222, 223, 224, 225, 226, and 231 are in attainment. Therefore, the air emissions impacts from the activities associated with the McGuire AFB Alternative Action in these AQCRs would not be considered significant and a Conformity Determination would not be required.

4.5.2.3 Mitigation

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

4.5.2.4 Cumulative Impacts

Numerous construction projects would be accomplished under the other actions announced for McGuire AFB. The methodologies for calculating emissions for the Dover AFB Proposed Action were used to estimate emissions for the cumulative condition at McGuire AFB. Cumulative condition construction projects would occur over an approximate 7-year period. Therefore, the year with the greatest construction equipment emissions (CY07) was used to present the extreme condition for emissions analysis. Table 4.5.2-5 summarizes the emissions from the other actions as well as the McGuire AFB Alternative Action and compares the emissions to the baseline AQCR emissions inventory.

Table 4.5.2-5 McGuire AFB Alternative Action Cumulative Condition Emissions

Criteria Air Pollutant	CO (tpy)	VOC (tpy)	NOx (tpy)	SOx (tpy)	PM10 (tpy)
AQCR 45 CY99 Emissions Inventory	50,300.00	45,780.00	89,880	101,050.00	12,600.00
Extreme Condition Construction Emissions[(a)]	22.450	3.900	42.020	4.560	13.100
Annual Emissions from Alternative Action Aircraft Operations	1,594.219	1,104.541	1,059.112	1.991	229.619
Cumulative Condition Emissions	1,616.669	1,108.441	1,102.132	6.551	249.719
Cumulative Condition Emissions as Percent of AQCR Emissions	3.21%	2.42%	1.23%	0.00%	1.93%

(a) CY07 used for the extreme condition construction emissions. Data include the combined emissions from the McGuire AFB Alternative Action and the other actions.

Note: VOC is not an air pollutant criterion. However, VOC is reported because, as an O_3 precursor, it is a controlled pollutant.

Review of data in Table 4.5.2-5 indicates that the greatest emissions for any of the criteria pollutants would be 1,616.669 tons of CO from McGuire AFB Alternative Action cumulative condition activities would equate to 3.21 percent of the emissions inventory. If the McGuire AFB Alternative Action were selected as the basing alternative, the emissions from the planned construction projects would exceed McGuire AFB's emission budget for NO_x and McGuire AFB would contact the NJDEP concerning the assessment of actual emissions versus budgeted emissions.

The CAA General Conformity Applicability Analysis for the McGuire AFB Alternative Action prepared in August 2004 also included the cumulative condition (USAF 2004a). Table 4.5.2-6 summarizes the net change in emissions associated with the McGuire AFB Alternative Action cumulative condition, and Table 4.5.2-7 compares the change in emissions for regional significance and *de minimis* purposes.

Table 4.5.2-6 Net Change in Emissions from Aircraft Operations Activities in AQCR 45, McGuire AFB Alternative Action Cumulative Condition

Category	Pollutants Emitted (tons/year)				
	CO	NO_X	VOC	SO_X	PM_{10}
Net Change Aircraft Operations Emissions	+786.622	**+498.574**	**+547.214**	+0.205	+113.776
Net Change in Construction Emissions	+22.450	+42.020	+3.900	+4.560	+13.100
Net Change in Cumulative Condition Emissions	+809.072	**+540.594**	**+551.114**	+4.765	+126.876

Note: Bold indicates the pollutant is nonattainment within AQCR 45.

Source USAF 2004b.

Table 4.5.2-7 Regional Significance Analysis and Comparison to Conformity *de minimis* Thresholds for AQCR 45 for the McGuire AFB Alternative Action Cumulative Condition

Category	Pollutants Emitted (tons/year)				
	CO	NO_X	VOC	SO_X	PM_{10}
Emissions Inventory	50,300	89,880	45,780	101,050	12,600
Net Change in Emissions	+809.072	**+540.594**	**+551.114**	+4.765	+126.876
Percent Change Compared to Emissions Inventory	+1.61%	+0.60%	+1.20%	+0.01	+0.98%
Regionally Significant? (>10%)	NA	**No**	**No**	NA	NA
de minimis Threshold (tpy)	NA	100	50	NA	NA
Exceed *de minimis* Threshold?	NA	**Yes**	**Yes**	NA	NA
SIP Budgets (tpy)	NA	1,084	1,198	NA	NA
Exceed SIP Budgets?	NA	**No**	**No**	NA	NA

NA not applicable. De minimis does not apply since AQCR 45 is in attainment for pollutant.

Source USAF 2004b.

The CAA General Conformity Applicability Analysis prepared for the McGuire AFB Alternative Action also included emissions from the other actions. Based on the emissions calculations summarized in Table 4.5.2-7, the analysis concluded that, although the McGuire

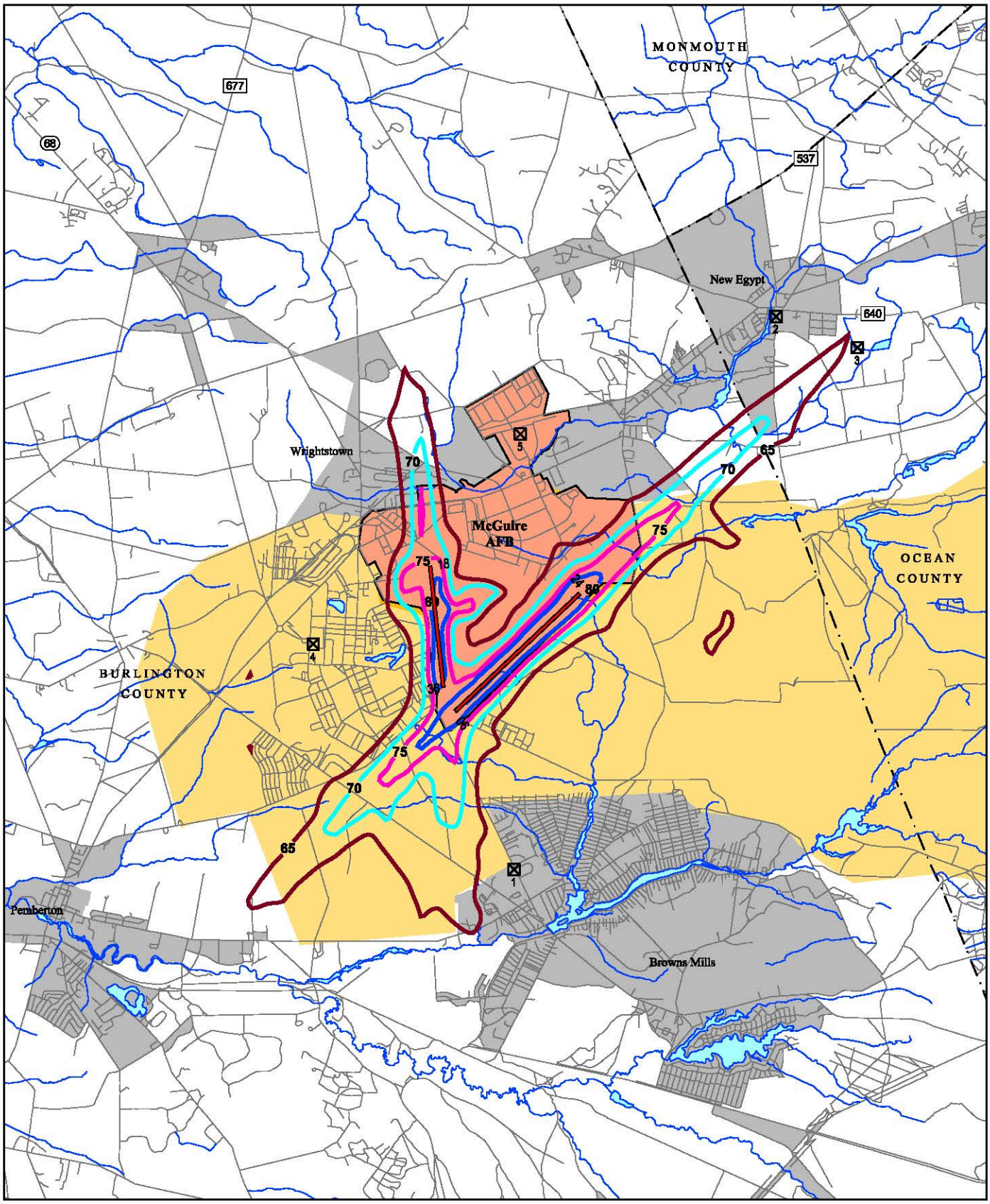
AFB Alternative Action cumulative condition would occur within an air basin designated as moderate nonattainment for O_3, the net increase in emissions for O_3 as well as the other criteria pollutants would be less than 10 percent of the emissions inventory and the action would not be considered regionally significant. The net change in emissions would exceed the *de minimis* thresholds; however, the amount of the increase in emissions is accounted for in the most recent SIP, which demonstrates conformity. The analysis determined that the McGuire AFB Alternative Action cumulative condition positively conforms to the applicable SIP for AQCR 45. The McGuire AFB Alternative Action cumulative condition has been demonstrated by USEPA standards not to cause or contribute to new violations of any national ambient air quality standard in the affected area, nor increase the frequency or severity of an existing violation. The McGuire AFB Alternative Action cumulative condition would not delay timely attainment of the O_3 standards in the air basin, and the action is in compliance or consistent with all relevant requirements and milestones contained in the applicable SIP. This conclusion of positive General Conformity Determination for the federal action planned for McGuire AFB fulfills the Air Force's obligation and responsibility under 40 CFR Part 93, Subpart B.

4.5.3 Noise

4.5.3.1 McGuire AFB

Figure 4.5.3-1 depicts the noise exposure area form aircraft operations after the additional 12 C-17s would be based at McGuire AFB, increasing the total number of C-17s to 24 aircraft. There would be no change in the number of KC-10 and KC-135E aircraft. Figure 4.5.3-2 compares the McGuire AFB Alternative Action contours with the baseline. There would be no change to the baseline condition aircraft ground tracks under the McGuire AFB Alternative Action (see Figure 3.2.3-1). The aircraft operations modeled include transient aircraft operations as well as the anticipated C-17, KC-10, and KC-135E operations.

Table 4.5.3-1 compares the DNL changes from the baseline for the McGuire AFB Alternative Action at the analysis points. There would be no change to the aircraft types or aircraft flight tracks and profiles from the baseline condition. Therefore, the SEL would not change from the baseline condition. Table 4.5.3-2 compares the on-Base land area and population exposed to noise of DNL 65 dBA and greater, as well as the potentially highly annoyed, for the McGuire AFB Alternative Action with the baseline condition. Table 4.5.3-3 compares the information for the off-Base land area exposed to aircraft noise. Data from these tables are used for analysis in the day-night sound analysis section.



McGuire Air Force Base

LEGEND

- 65 dBA Contour
- 70 dBA Contour
- 75 dBA Contour
- 80 dBA Contour
- Runway
- Roadway
- Analysis Point
- McGuire AFB
- Fort Dix
- Urban Area

N

0 8,000

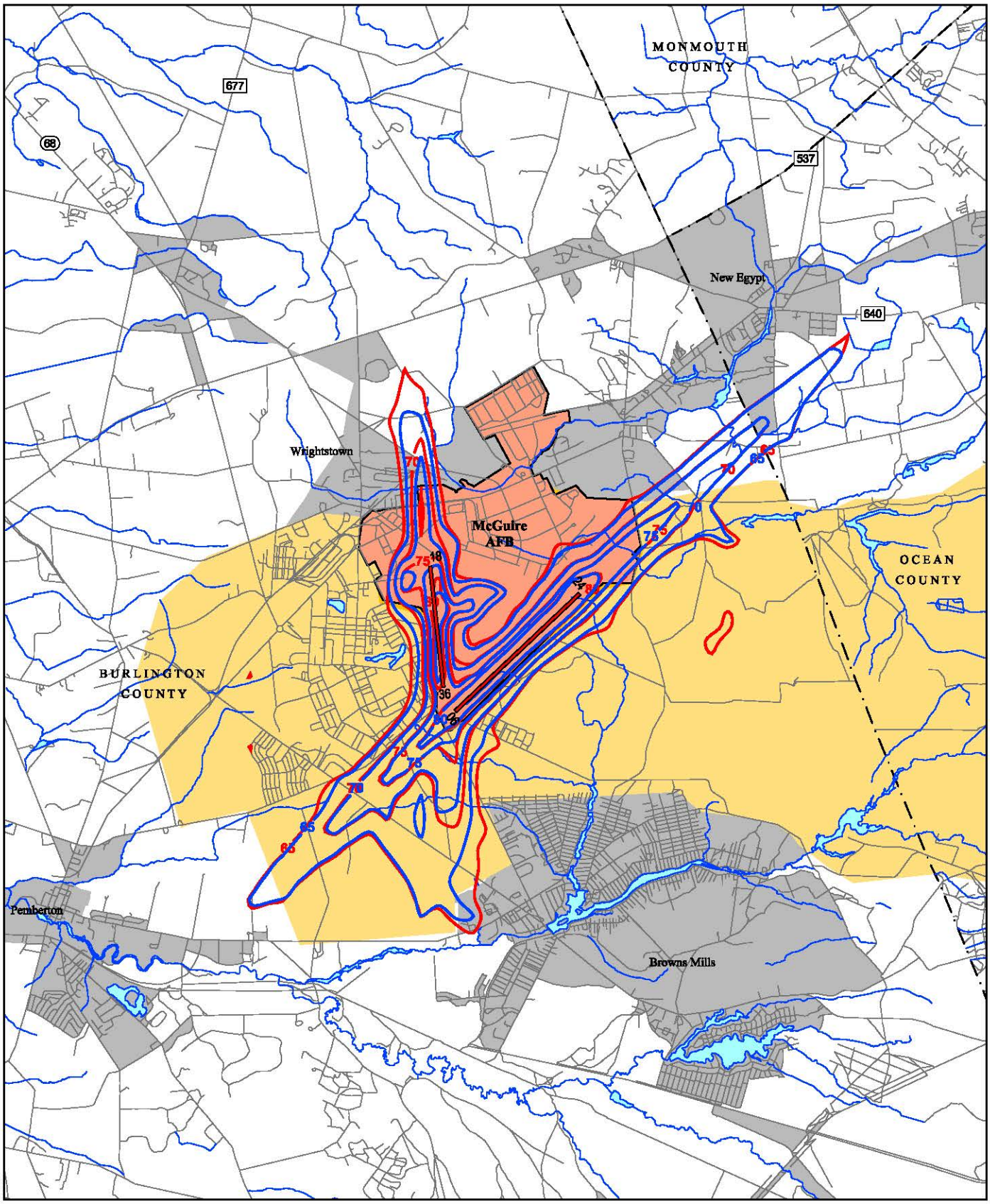
Feet

Alternative Action Noise Contours, McGuire AFB

Figure 4.5.3-1

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McGuire Air Force Base
LEGEND

- Baseline Noise Contour
- Alternative Action Noise Contour
- Runway
- Roadway
- McGuire AFB
- Fort Dix
- Urban Area

N

0 8,000
Feet

Comparison of Baseline and McGuire AFB Alternative Action Noise Contours
Figure 4.5.3-2

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Table 4.5.3-1 Comparison of DNL from Proposed Airfield Operations at Analysis Points with Baseline, McGuire AFB Alternative Action

Number	Description	DNL (dBA)		
		BL	Alt	Chg
1	Residence	59	61	+2
2	New Egypt	58	59	+1
3	Farm House	64	64	0
4	Fort Dix Cantonment	54	58	+4
5	McGuire AFB Family Housing	52	54	+2

Note: BL=baseline. Alt=alternative. Chg=change. There would be no change to the aircraft types or flight tracks and profiles these aircraft would fly. See Table 3.2.3-1 for SEL. The analysis point number and description correspond to the point as reflected on the noise contour and aircraft ground track figures. There may be minor differences when comparing the DNL for a point from the table to the DNL for the point as depicted on the noise contour figure. This difference is a result of small misalignments during the process of printing the noise contours on top of the background map.

Table 4.5.3-2 Summary of Land Area and Population Exposed to, and Population Potentially Highly Annoyed by DNL 65 dBA and Greater, McGuire AFB Alternative Action

	DNL Interval (dBA)				
Category	**65-70**	**70-75**	**75-80**	**80+**	**Total**
Acres					
Baseline Acres	2,727	1,350	618	345	5,040
Proposed Action	3,211	1,465	714	416	5,806
Change	+484	+115	+96	+71	+766
Percent Change	+18%	+9%	+16%	+21%	+15%
Population					
Baseline Population	1,017	342	75	0	1,434
Proposed Action	1,512	392	146	0	2,050
Change	+495	+50	+72	0	+617
Percent Change	+49%	+15%	+96%	0%	+43%
Population Highly Annoyed					
Baseline Population	224	126	40	0	390
Proposed Action	333	145	79	0	557
Change	109	19	39	0	167
Percent Change	+49%	+15%	+98%	0%	+43%

Note: People highly annoyed determined by multiplying the total number of people in the noise zone times the higher percent number for the interval in Table 3.1.3-4.

Table 4.5.3-3 Anticipated McGuire AFB Alternative Action Military Training Route Operations

Route	C-17 Operations		Other Aircraft Operations		Total Operations	
	Annual	Monthly	Annual	Monthly	Annual	Monthly
IR-714	25	2.08	8	0.67	33	3.47
IR-720	25	2.08	2	0.16	27	2.24
IR-801	160	13.33	203	16.92	363	30.25
VR-704	36	3.00	52	4.32	88	7.32
VR-705	274	22.83	206	17.16	480	39.99
VR-707	274	22.83	60	5.00	334	27.83
VR-725	36	3.00	90	7.50	126	10.50
VR-1709	274	3.00	1,690	140.85	1,964	143.85
VR-1711	36	3.00	41	3.42	77	6.42
VR-1712	36	3.00	67	5.57	103	8.57
SR-800	36	3.00	0	0.00	36	3.00
SR-801	36	3.00	480	40.00	84	43.00
SR-805	36	3.00	0	0.00	36	3.00
SR-844	36	3.00	0	0.00	36	3.00
SR-845	36	3.00	0	0.00	36	3.00
SR-846	274	22.83	120	10.00	394	32.83

Single Event Sound Analysis, McGuire AFB

Sound Exposure Level

A total of five representative analysis points were selected under the traffic patterns and around the airfield to calculate the SEL due to aircraft overflight. The noise contour and aircraft ground track figures show the locations of the analysis points.

C-17 aircraft operate at McGuire AFB under the baseline condition. Although there would be additional C-17 operations at the Base under the McGuire AFB Alternative Action, there would be no change in the aircraft ground tracks or flight profiles for the aircraft. Likewise, there would be no change in the other types of aircraft that operate at the Base. There would be no change in the SEL listed in Table 3.2.3-2 since SEL is related to the single event on a flight track.

Sleep Disturbance

The introductory sleep disturbance and background information for the Dover AFB Proposed Action in Subchapter 4.4.3.1 applies to McGuire AFB. Individuals in residences in the area around the Base would continue to be exposed to indoor SEL of 60 to 80 dBA during normal sleep periods (10:00 p.m. to 7:00 a.m.). There would be 617 additional persons exposed to DNL 65 dBA and greater as a result of the McGuire AFB Alternative Action. Assuming the number of sleep awakenings would be proportional to the increase in exposed population, it is anticipated there would be the potential for an additional 62 persons who

could be awakened when comparing the McGuire AFB Alternative Action to the baseline condition.

Effects of Noise on Structures

The maximum sound pressure produced by C-17 aircraft at McGuire AFB would be 112 dBA at 100 feet from the aircraft. At a distance of 1,000 feet, the C-17 aircraft generates a maximum sound pressure of 91 dBA. The maximum sound pressure is the highest instantaneous sound pressure during a single noise event no matter how long the sound may persist. Maximum sound pressure is different than SEL, which is the A-weighted sound level integrated over the duration of the noise event and adjusted to a length of 1 second. Therefore, no damage to structures in the area surrounding McGuire AFB would be anticipated because the sound pressure produced by the aircraft would not exceed the level at which structural damage could occur.

Construction Noise

The primary source of noise from the facilities would be the equipment involved in construction activities. Construction noise would be intermittent and short-term in duration. Typical noise levels from heavy equipment range from 75 to 89 dBA at 50 feet from the source. See Table 4.4.3-3 for a list of construction equipment and associated noise levels. The construction noise assumptions and analysis for the Dover AFB Proposed Action applies to the McGuire AFB Alternative Action.

Day-Night Sound Analysis, McGuire AFB

Overall, the McGuire AFB Alternative Action noise contours would retain the same basic shape as the baseline contours (see Figure 4.5.3-2), with the number of acres in the DNL 65 dBA and greater exposure area increasing by 15 percent. The primary areas of increase are at the outer ends of the DNL 65 dBA contour along the extended Runway 18/36 centerline.

As indicated in Table 4.5.3-1, the DNL would increase by as much as 4 dBA at 4 of the analysis points and remain the same at one point. Assuming the analysis points are representative of points within the area around the airfield and based on the fact that the DNL would increase by 4 dBA at one point, it is anticipated that the DNL would not increase at any point within the noise exposure area by more than 4 dBA.

While no persons would be exposed to DNL 80+ dBA (see Table 4.4.3-2), there would an additional 495 (49 percent increase), 50 (15 percent increase), and 72 (96 percent increase) persons, respectively, in the DNL 65-70, 70-75, and 75-80 dBA noise zones. The total number of people exposed to DNL 65-dBA and greater would increase by 617 persons (43 percent). These 617 additional persons would equate to 0.9 percent of the estimated 68,862 persons (based on 2000 census data) who live within the airfield airspace environment. This approximate 5-mile radius area includes the airspace allocated to the air traffic control tower and is the area in which closed patterns and maneuvering for takeoffs and landings is accomplished. The density of residences in the newly exposed area would be

consistent with adjacent residential areas exposed to aircraft noise under the baseline condition. The overall number of persons who would be highly annoyed by noise exposure would increase by 167 people (43 percent).

The background information concerning speech disruption for the Dover AFB Proposed Action applies to the alternative. Assuming the number of conversations is proportional to the increase in exposed population and the increase in airfield operations, it is anticipated there would be a corresponding increase in the potential for speech disruption for the 72 additional persons exposed to DNL 75 dBA and greater (see Table 4.5.3-2). These 72 persons would equate to 0.1 percent of the estimated 68,862 persons who live within the airfield airspace environment.

The hearing loss and nonauditory health effects information for the Dover AFB Proposed Action apply to the alternative. Noise-induced hearing loss would not be anticipated from airfield operations associated with the McGuire AFB Alternative Action and nonauditory health effects cannot be analyzed.

In summary, there would be an increase in speech disruption from aircraft overflight and there should be no noise-induced hearing loss impacts. The overall effect of the McGuire AFB Alternative Action would be a 43 percent increase in the number of people exposed to DNL 65 dBA and greater.

4.5.3.2 Military Training Routes

Annually, 1,580 sorties (131.65 monthly) would be accomplished by the 24 C-17 aircraft assigned to McGuire AFB. The sorties by other aircraft types would remain at the baseline levels.

Table 4.5.3-4 compares the L_{dnmr} for the C-17 and other aircraft operations that would occur on the specific routes from the baseline condition. As indicated in the table, the L_{dnmr} ranges from a low of 43 dBA to a high of 62 dBA. As indicated in Table 4.5.3-4, the L_{dnmr} would equal or exceed 55 dBA on four routes. Although the L_{dnmr} would increase minimally (*i.e.*, 2 dBA on one route and 1 dBA on the other) on two of these four routes, it would remain the same as the existing condition on the other two routes. There is no reason to expect that the general population would be at risk from any of the effects of noise for sound levels at and below L_{dnmr} 55 dBA (USEPA 1974). Additionally, the L_{dnmr} 62 dBA anticipated for VR-1709 would not exceed the HUD, FAA, and Air Force noise level (*i.e.*, L_{dnmr} 65 dBA) at which residential and other noise-sensitive land uses would be unacceptable. The L_{dnmr} would be a maximum of 5 dBA greater than the values stated in Table 4.5.3-4 at the points at which the MTRs intersect or when there are common route segments. Thus, the maximum L_{dnmr} for any route is about 67 dBA.

Table 4.5.3-4 Comparison of Aircraft Noise Levels as a Function of Distance from Aircraft Ground Track Centerline, McGuire AFB Alternative Action

Route	L_{dnmr} (dBA)				L_{dnmr} (dBA)		
	Baseline	Alt	Chg.	Route	Baseline	Alt	Chg.
IR-714	49	49	0	VR-1711	54	54	0
IR-720	45	47	+2	VR-1712	51	51	0
IR-801	54	54	0	SR-800	40	43	+3
VR-704	57	57	0	SR-801	45	46	+1
VR-705	57	57	0	SR-805	40	43	+3
VR-707	57	58	+1	SR-844	40	43	+3
VR-725	45	47	+2	SR-845	40	43	+3
VR-1709	62	62	0	SR-846	50	53	+3

Note: L_{dnmr} is represented for 300 feet AGL. Alt=alternative action. Chg=change from baseline.

The information and analysis concerning hearing loss, speech interference, SEL levels, and structural damage presented for the Dover AFB Proposed Action apply to the McGuire AFB Alternative Action.

4.5.3.3 Mitigation

No significant noise impacts would occur from the McGuire AFB Alternative Action. Therefore, no mitigation would be required.

4.5.3.4 Cumulative Impacts

None of the other actions have aircraft operations associated with them. Therefore, there would be no cumulative noise impacts associated with aircraft noise.

Under the cumulative condition, other facilities would be constructed at McGuire AFB. As depicted in Figures 2.4.3-1 and 2.6.2-1, the distance between one of the other action construction sites and a McGuire AFB Alternative Action site could be as close as 100 feet. For analysis purposes, it is assumed the noisiest piece of construction equipment (89 dB scraper which produces 85 dB at 100 feet from the noise source) is being operated simultaneously at each site and the distance to a receptor is 100 feet from each construction site. If the intensity of a sound is doubled, the sound level increases by 3 dBA, regardless of the initial sound level. Thus, the combined noise from equipment operation at the receptor would be 88 dB. As with the McGuire AFB Alternative Action, construction noise would be temporary and occur only during the hours that construction, demolition, or renovation activity would occur and would cease when the project is completed.

4.5.4 Hazardous Waste, Hazardous Materials, and Stored Fuels

4.5.4.1 McGuire AFB

Hazardous Waste

The discussion and analysis for construction activities under the Dover AFB Proposed Action apply to the McGuire AFB Alternative Action.

It is not anticipated that any new hazardous waste streams would occur with implementation of the McGuire AFB Alternative Action because the Base currently operates C-17 aircraft. However, it is possible the volume of hazardous waste could increase by as much as 21 percent due to the additional 12 C-17 aircraft. McGuire AFB would continue to be a large-quantity hazardous waste generator. The existing hazardous waste management processes and procedures should accommodate the waste generated under the McGuire AFB Alternative Action. However, it may be necessary to increase waste storage capacity. If needed, McGuire AFB would revise its existing *Hazardous Waste Management Plan* to incorporate activities of the McGuire AFB Alternative Action.

Hazardous Materials

The discussion and analysis for construction activities under the Dover AFB Proposed Action apply to the McGuire AFB Alternative Action.

It is not anticipated that any new hazardous materials would be needed with implementation of the McGuire AFB Alternative Action because the Base currently operates C-17 aircraft. However, it is likely that hazardous materials procurement could increase by 21 percent due to the additional 12 C-17 aircraft. The existing hazardous materials handling processes and procedures could accommodate the activities associated with C-17 operation and maintenance.

Stored Fuels

Petroleum products that would be used under the McGuire AFB Alternative Action are similar in nature to those used by the current aircraft activities. Fueling and lubrication of equipment would be conducted in a manner that affords maximum protection against spills. The number of airfield operations by based C-17, KC-10, and KC-135 aircraft at McGuire AFB would increase by about 17 percent. Assuming there is a relationship between airfield operations (which equates to flying time) and fuel use, it is anticipated that the amount of fuel needed for operations could increase as much as 17 percent. Fuel consumption could increase from the 77,327,566 gallons of jet fuel used in 2003 to 90,473,252 gallons annually. This could require an increase in pipeline delivery frequencies. The existing fuels storage and handling processes and procedures could accommodate the activities associated with the additional C-17 operation and maintenance.

4.5.4.2 Mitigation

No significant hazardous materials, hazardous, or stored fuels impacts would be anticipated. Therefore, no mitigation would be required.

4.5.4.3 Cumulative Impacts

The construction contractor for other projects at the Base would comply with applicable regulatory guidance as described for the McGuire AFB Alternative Action. Hazardous materials would be procured and used for operations at some of the other action facilities after construction is completed. Likewise, hazardous waste could be generated at the other action facilities. However, it is not anticipated that any hazardous materials not currently used at facilities would be used at the new facilities nor would any new waste streams be generated. The existing hazardous materials and waste management procedures would accommodate the cumulative condition construction and facility operation. No significant cumulative hazardous waste, hazardous materials, and stored fuels impacts would be anticipated.

4.5.5 Water Resources

4.5.5.1 McGuire AFB

Surface Water

It is unlikely that South Run would be degraded from runoff from construction areas due to the distance from the individual project sites (*i.e.*, about 500 feet to the site nearest the stream). Additionally, the Base's diversion pond and sluice gate on South Run would protect the water from spills that might occur. The construction contractor would prepare a SWPPP and utilize erosion control measures to prevent sediment, nutrients, and pollutants from entering South Run.

Groundwater

Although there would be an increase in personnel assigned to McGuire AFB as a result of the Alternative Action, the additional groundwater that would be withdrawn from the aquifer would not cause the Base to exceed its permitted pumping amount. Facility design and construction activities would be coordinated with the Base Environmental Flight and Bioenvironmental Engineering to ensure that construction would not worsen the quality of groundwater any site, if encountered. In the event groundwater is encountered during construction, the construction contractor would temporarily suspend work and notify the Base Environmental Flight.

4.5.5.2 Mitigation

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

4.5.5.3 Cumulative Impacts

As with the McGuire AFB Alternative Action, the construction contractor for other projects would be required to comply with applicable regulatory requirements to protect water resources. When completed, activities at the other facilities would be managed in accordance with the SWPPP for McGuire AFB. No additional personnel would be added to the Base under the other actions. Thus, the additional ground water withdrawn from the aquifer would not cause the Base to exceed its permitted pumping amount. The McGuire AFB Alternative Action would not contribute cumulative impacts to surface water or groundwater.

4.5.6 Biological Resources

4.5.6.1 McGuire AFB

Vegetation and Wildlife

The construction, demolition, and renovation activities would occur within developed, maintained areas with highly modified and disturbed landscape that is now either paved or has lawns and landscaping. There would be no disturbance of high quality and/or native vegetation within either the project or adjacent areas. The McGuire AFB Alternative Action would not result in any adverse effects to vegetation and wildlife at the Base.

Wetlands

None of the McGuire AFB Alternative Action projects would occur in or within 300 feet of a wetlands.

Threatened, Endangered, and Rare Species

None of the McGuire AFB Alternative Action projects would occur within the sensitive habitat area of airfield triangle, the area in which the five state-listed rare species have been observed.

4.5.6.2 Military Training Routes

The McGuire AFB Alternative Action would use the 16 of the 22 Dover AFB Proposed Action MTRs and the same type of aircraft would be flown under each action. The types and levels of C-17 operations on MTRs under the McGuire AFB Alternative Action would be identical to the Dover AFB Proposed Action. The greatest daily use for any of the MTRs by McGuire AFB Alternative Action C-17s would be 0.76 sorties per day based on seven days of flying per week (see Table 2.4.3-2). Thus, the routes would be flown infrequently. The discussion and analysis for the Dover AFB Proposed Action apply to this alternative. No significant adverse effects would be anticipated.

4.5.6.3 Mitigation

No adverse effects were identified for biological resources. Therefore, no mitigation measures would be required.

4.5.6.4 Cumulative Impacts

As with the McGuire AFB Alternative Action, many of the other projects considered for cumulative impact purposes would occur within developed, maintained areas with highly modified and disturbed landscape that is now either paved or has lawns and landscaping. There would be no cumulative disturbance of high quality and/or native vegetation within either the project or adjacent areas due to the alternative and other projects.

Although there would be no cumulative impacts due to the proximity of McGuire AFB Alternative Action projects and other action projects, three of the other projects (numbers 5, 13, and 14 on Figure 2.6.2-1) would occur in or adjacent to the sensitive habitat area for the five state-listed rare species and would be adjacent to a wetland (see Figure 3.2.6-1). As policy, the Air Force would provide the same protection to the state-listed species that is given to USFWS-listed species. McGuire AFB would consult with the State of New Jersey and the Pinelands Commission should the project occur within 300 feet of a wetland.

4.5.7 Socioeconomic Resources

4.5.7.1 McGuire AFB

Population

When compared to the Burlington County population of 423,394 in 2000, the McGuire AFB Alternative Action would result in an increase in the local and regional population of 1,500 (0.003 percent) due to the net gain of 631 military and civilian positions. This anticipated population gain includes military personnel and family members directly impacted, and a portion of civilian personnel anticipated to relocate to the area.

Housing

It is anticipated that approximately 602 housing units would be required to accommodate the increase of military and civilian personnel. Approximately 90 percent of this housing would be required by military personnel and family members. The 602 housing units equate to 0.01 percent of the 61,311 units in Burlington County. Based on the current on- and off-Base distribution of housing occupied by military personnel, approximately 70 percent of these units would consist of off-Base housing and 30 percent on-Base housing. Pemberton Township, New Hanover Township, North Hanover Township, and Springfield Township would be expected to experience the most housing demand as a result of this activity. According to the Burlington County MLS, there were 659 homes listed for sale in the $50,000-$200,000 price range in April 2004. Thus, the existing inventory of the housing

supply in Burlington County is low when compared to the additional housing demand under this alternative action.

Education

The net gain of the military and civilian population expected from the McGuire AFB Alternative Action would result in an increase in local school district enrollments. Assuming a factor of 0.75 school age children per military household, there would be an enrollment increase of approximately 430 military dependent children in addition to 20-25 children from the affected civilian households who are assumed to relocate to the area. The 2002-2003 total enrollment in the four most affected school districts was approximately 8,500 students. Thus, the additional anticipated enrollment resulting from this alternative would result in an overall increase of approximately 5 percent. Based on current on- and off-Base military residency distribution, it is expected that a minimum of 130 of these new students would attend on-Base schools operated by the North Hanover Township School District. This additional enrollment would represent an approximate 10 percent or greater increase over the 2002-2003 district enrollment for on-Base schools.

Economy

Direct and indirect short-term beneficial economic impacts would be realized by the regional and local economy during the construction phase of the McGuire AFB Alternative Action, while long-term beneficial economic impacts would be expected after construction is completed. Employment generated by construction activities would result in wages paid and expenditures for local and regional services and supplies. In addition, the increase of 631 military and civilian employees as a result of the McGuire AFB Alternative Action would result in an increase in wages paid, business sales, and income to the local and regional economy.

The estimated construction cost (capital costs) for project implementation and annual average income for construction laborers were the inputs used in the execution of the EIFS construction model. The estimated construction cost is approximately $16.1 million over a 4.5-year period. The ROI is considered to be Burlington County.

Since the economic projections generated by the EIFS model are on an annual basis, the primary model input for construction costs ($16.1 million) was pro-rated over an estimated 4.5-year construction period. As indicated in Table 4.5.7-1, the direct annual regional economic impacts of project construction over this 4.5-year period consist of $2,650,463 in business volume (sales); 38 jobs in the construction, retail trade, services, and industrial sectors; and, $1,633,667 in direct personal income. The latter value represents earnings of employees in the construction, retail, wholesale and service establishments who are initially or directly affected by the construction activity. The increase in business volume reflects increases in the sales of goods, services, and supplies associated with project construction activity.

Table 4.5.7-1 Economic Impact Forecast System, McGuire AFB Alternative Action

	Direct Impacts	Indirect Impacts	Total
Construction			
Sales (Business) Volume	$2,650,463	$5,778,010	$8,428,473
Income	$1,633,667	$697,714	$2,331,380
Employment	38	15	53
Operations			
Sales (Business) Volume	$12,092,690	$26,362,050	$38,454,740
Income	$24,169,890	$3,183,304	$27,353,190
Employment	663	69	732

Source: EIFS Model, U.S. Army Construction Engineering Research Laboratories

Table 4.5.7-1 also portrays the indirect annual regional impacts on secondary sales, employment, and income generated by the employment and business activity directly associated with project construction. The direct increase in sales and employment generates secondary sales of $5,778,010; creates an additional 15 jobs indirectly in the retail trade, services, and industry sectors; and results in an additional $697,714 in indirect income. Income is indirectly impacted as a result of the indirect increase in sales and employment resulting from the initial economic impacts.

Long-term beneficial economic benefits of the McGuire AFB Alternative Action would be realized as a result of the increase of 631 military and civilian employees during operations. The primary inputs for the EIFS operations model are an increase in estimated annual operating expenditures ($1,000,000); estimated increase of military and civilian employees (631); and annual average incomes of $37,900 and $40,255, respectively, for military and civilian employees being displaced.

As indicated in Table 4.5.7-1, the direct annual regional economic impacts as a result of an increase of 631 employees consist of an increase to the regional economy of $12,092,690 in business volume (sales); 663 jobs in the government, retail trade, services and industrial sectors; and $24,169,890 in direct personal income. The latter represents the earnings of employees in the retail, wholesale and service establishments that are initially or directly affected by the net gain of military and civilian employees. The increase in business volume reflects increases in the sales of goods, services, and supplies to the military and civilian personnel associated with project operations.

Table 4.5.7-1 also portrays the indirect annual regional impacts on secondary sales, employment, and income generated by the employment and business activity directly associated with operations. The indirect increase in sales and employment generates increases in secondary sales of $26,362,050; the gain of an additional 69 jobs indirectly in the retail trade, services, and industry sectors; and a gain of an additional $3,183,304 in indirect income. Income is indirectly impacted as a result of the increase in sales and employment resulting from the initial economic impacts.

The EIFS model assessment of the regional economic impacts of project construction and operations of the McGuire AFB Alternative Action reveals that the RTVs for each of the four variables were less than the regional RTVs. For this reason, short-term project construction and long-term increase in military and civilian personnel associated with the McGuire AFB

Alternative Action would not be expected to result in significant annual regional economic impacts.

4.5.7.2 Mitigation

No significant population, housing, education, or economic impacts would be anticipated. Therefore, no mitigation would be required.

4.5.7.3 Cumulative Impacts

There would be an increase of 631 military and civilian personnel authorizations under the McGuire AFB Alternative Action. Additionally, 18 facilities projects would be constructed under the other actions during the same period as the 10 Alternative Action projects. Table 4.5.7-2 presents cumulative impacts to population, housing, and education, and Table 4.5.7-3 summarizes the economic impacts of the cumulative condition.

Table 4.5.7-2 Cumulative Population, Housing, and Education Impacts, McGuire AFB Alternative Action

Category	Proposed Action	Other Actions	Cumulative Condition	Percent Change
Population (persons)	1,500	-	1,500	0.003 percent of Burlington County population
Housing (units)	602	-	602	0.01 percent of Burlington County housing units
Education (students)	450	-	450	0.05 percent in student enrollment

Table 4.5.7-3 Cumulative Economic Impacts, McGuire AFB Alternative Action

	Direct Impacts	Indirect Impacts	Total
Construction			
Sales (Business) Volume			
Other Actions	$8,160,112	$17,789,040	$25,949,152
Proposed Action	$2,650,463	$5,778,010	$8,428,473
Cumulative Impact	$10,810,575	$23,567,050	$34,377,625
Income			
Other Actions	$4,375,334	$2,148,085	6,523,419
Proposed Action	$1,633,667	$697,714	$2,331,380
Cumulative Impact	$6,009,001	$2,845,799	$8,854,799
Employment			
Other Actions	101	47	148
Proposed Action	38	15	53
Cumulative Impact	139	62	201
Operations			
Sales (Business) Volume			
Other Actions	-	-	-
Proposed Action	$12,092,690	$26,362,050	$38,454,740
Cumulative Impact	$12,092,690	$26,362,050	$38,454,740
Income			
Other Actions	-	-	-
Proposed Action	$24,169,890	$3,183,304	$27,353,190
Cumulative Impact	$24,169,890	$3,183,304	$27,353,190
Employment			
Other Actions	-	-	-
Proposed Action	663	69	732
Cumulative Impact	663	69	732

As indicated in Table 4.5.7-2, population within Burlington County would increase by 1,500 persons, 602 additional housing units would be needed, and an additional 450 students would attend the affected school districts. The greatest increase for any of these categories for the Proposed Action cumulative condition when compared to the baseline condition would be the 0.05 percent increase in student enrollment.

With respect to the EIFS model assessment of the economic impacts of construction and increase of 631 operations-related military and civilian personnel, the RTVs for each of the four variables (population, sales volume, income, and employment) were found to be less than the regional RTVs. For this reason, short-term project construction and the long-term increase in military and civilian personnel associated with the McGuire AFB Alternative

Action cumulative condition would not be expected to result in significant annual regional economic impacts.

4.5.8 Cultural Resources

4.5.8.1 McGuire AFB

Archaeological Resources

No NRHP-eligible archaeological resources are located within or adjacent to the ROI for McGuire AFB. The Alternative Action would not result in effects to archaeological resources at McGuire AFB.

Historical Resources

Under the McGuire AFB Alternative Action, two buildings (2251 and 2306) are scheduled for demolition and one building (3210) would undergo an addition. None of these buildings have been identified as potentially NRHP-eligible. No NRHP-eligible historical resources are located within the ROI for McGuire AFB. The McGuire AFB Alternative Action would not result in adverse effects on historical resources.

Native American Interests

A list of federally recognized and state-recognized Native American tribes and groups identified at the time of preparation of this document is provided in Table G-1 in Appendix G. The Air Force consulted with these entities pursuant to 36 CFR 800.2 (Appendix G). Responses to consultation were resolved by the Air Force's answer.

4.5.8.2 Military Training Routes

The MTRs that would be used by the McGuire AFB Alternative Action would be the same as those identified for the Dover AFB Proposed Action. Therefore, the discussion and analysis for Native American interests in Subchapter 4.4.7.2 for the Dover AFB Proposed Action applies to the McGuire AFB Alternative Action.

4.5.8.3 Mitigation

No significant effects to archaeological and historical resources have been identified. Therefore, no mitigation measures would be required.

4.5.8.4 Cumulative Impacts

The relationship between McGuire AFB Alternative Action sites and sites for other actions would be considered for mitigation and consultation with SHPO to reveal cumulative effects should an other action project include an eligible facility. The consultation documentation and process with Native American interests for the McGuire AFB Alternative

Action would include the other action sites. When combining the other actions with the McGuire AFB Alternative Action through the consultation process, no cumulative adverse cultural resources effects, including visual, would be anticipated under the cumulative condition.

4.5.9 Land Use

4.5.9.1 McGuire AFB

On-Base land use conflicts would not be expected under the McGuire AFB Alternative Action. Most land uses would be compatible with the general character of established and planned Base land use patterns. The facility construction anticipated under the alternative action would be consistent with existing and future land use plans and programs identified in the McGuire AFB General Plan. Facility construction and alteration activities may have a temporary minor constraint on existing operations and land uses; however, after construction, these facilities would not be expected to impact any adjacent land use.

The McGuire AFB Alternative Action would slightly increase noise contours when compared to baseline conditions. Although the slight additional noise exposure would occur to the north, south, and east of the Base, the only additional incompatible uses would occur on an extremely small portion of residential land use areas to the south. The slight increase in noise contours would expose approximately 8 acres of additional off-Base residential land uses to DNL 65-70 dBA. Although residences are not recommended in this noise zone unless attenuation materials are installed (see Table 3.1.8-1), the number of additionally exposed residences in the DNL 65-70 dBA noise zone would be small when compared to baseline. Additionally, the condition (*i.e.*, additional residences in the DNL 65-70 dBA noise zone) would be consistent with existing land use in the area because other residences occur in these noise zones under the baseline condition. Therefore, the additional noise exposure from the alternative action would not be inconsistent with local land use plans. Although additional residences would be exposed to DNL 65 dBA and greater and this increase would be incompatible according to Air Force AICUZ guidance, the small amount of increase would not require the Air Force to update its current AICUZ Study according to AICUZ program guidance. All existing off-Base land uses in the northern CZ and many within the APZs, with the exception of vacant land, are incompatible with AICUZ recommendations. There would be no change to the dimensions of current CZs or APZs at McGuire AFB and, therefore, no additional areas would be impacted by AICUZ requirements when compared to baseline conditions. No additional significant land use incompatibilities would be anticipated under the McGuire AFB Alternative Action.

4.5.9.2 Military Training Routes

Lands below the MTRs were reviewed to determine if increased aircraft noise or additional MTR operations would affect land uses. Sensitive land uses (*e.g.*, wildlife management areas, parks, residential) would be exposed to increased noise levels between L_{dnmr} 43 and 62 dBA. The maximum increase on any route would be L_{dnmr} 3 dBA on five

routes. There would be no increase in noise on the route that had the highest noise under the baseline (VR-1709, L_{dnmr} 62 dBA). These resultant noise levels would be below the DNL noise/land use compatibility guidelines synopsized in Table 3.1.8-1. There are numerous recreational/wilderness areas below the MTRs (see Subchapter 3.1.8) where visitors may be annoyed by aircraft overflight. However, based on the sensitive land uses, exposed noise levels and consideration of the noise and overflight studies described in Subchapter 3.1.3, no significant impacts to sensitive land uses would be anticipated due to the slight increase in noise levels or additional overflights from the proposed operations. No impacts to land ownership or the existing function of the sensitive land uses would occur.

4.5.9.3 Mitigation

No significant land use impacts would occur as a result of the McGuire AFB Alternative Action. Therefore, no mitigative actions would be required. The local planning agencies could use the noise contours for future land use planning and zoning.

4.5.9.4 Cumulative Impacts

Under the cumulative condition, other facilities would be constructed on McGuire AFB and some would be in the general area associated with C-17 basing activities. As with the McGuire AFB Alternative Action facilities, the other facility actions would be compatible with the McGuire AFB General Plan. Thus, the facility construction anticipated under the cumulative condition would be consistent with existing and future land use plans and programs identified in the General Plan.

4.5.10 Infrastructure and Utilities

4.5.10.1 McGuire AFB

Water Supply

Under the McGuire AFB Alternative Action, there would be a net increase of 631 Air Force active duty, reserve, and civilian personnel, increasing the Base workforce to 12,957 persons. The average daily per capita consumption for FY03 was approximately 85.57 gal/day. Assuming the same consumption rate, there would be a net increase of about 53,995 gallons of water per day used as a result of the McGuire AFB Alternative Action. This additional water for personnel represents a 5.12 percent increase when compared to the baseline personnel use. The resultant daily use for the Base would be 1.105 mgd. McGuire AFB Alternative Action water consumption would be about 89 percent of the permitted use, which equates to an approximate 4 percent increase when compared to the baseline condition.

In addition to personal use, up to 0.0035 mgd of water per acre may be applied for dust control during demolition, construction, and renovation. This water would be supplied by the water system at McGuire AFB. It is estimated that dust control water application would occur approximately 115 days per year and that approximately 5 acres would be disturbed

during the duration of the project. About 0.07 mgd of water would be applied for dust control 115 days per year. Use of 0.02 mgd of water for dust control equates to 1.4 percent of the permitted amount. Use of water for dust suppression would end when demolition and construction activities are completed.

Wastewater Treatment

Under the McGuire AFB Alternative Action, there would be a net increase of 631 Air Force active duty, reserve, and civilian personnel, increasing the Base workforce to 12,957 persons. The average per capita generation of wastewater for FY03 was about 48.33 gal/day. Assuming the same generation rate, there would be a net increase of about 595,716 gallons of wastewater produced per day as a result of the McGuire AFB Alternative Action. The average daily wastewater treated at the WWTP would be 1.53 mgd (33.26 percent of capacity), or about 0.65 percent more than the baseline condition.

Storm Water Management

All proposed demolition and construction activities would occur within the existing boundaries of the Base. The amount of impervious cover at McGuire AFB is approximately 2,146 acres (93,479,760 square feet). The amount of impervious cover would increase by 286,296 square feet (7 acres), which represents about 0.31 percent increase over baseline conditions. Therefore, the amount of storm water runoff should not increase significantly above the existing conditions. Curbs and gutters installed during any street and off-street parking construction would be connected to the existing storm water system. If required, a new storm water system or connections would be designed and constructed to comply with current regulations and to accommodate any storm water flow increases. Since the amount of disturbed area is greater than 1 acre, a storm water permit for construction activities would be required. The SWPPP discussion and erosion control techniques for the Dover AFB Proposed Action apply to the McGuire AFB Alternative Action.

Energy

As a result of the McGuire AFB Alternative Action, there would be a net increase of 286,266 square feet of climate-controlled space, and daily electricity and natural gas use would increase by 9,161 kWH (286,266 square feet x 0.032 kWH per square foot) and 52,387 ccf (286,266 square feet x 0.183 ccf per square foot), respectively. The net increases represent 4.14 and 4.10 percent, respectively, of the baseline electricity and natural gas consumption. The energy system capacities are adequate to handle the increases as a result of the proposed new buildings.

Solid Waste Management

Under the McGuire AFB Alternative Action, there would be an estimated 631 additional personnel working on Base. Thus, approximately 1,929 additional pounds per day (0.96 tpd) of solid waste would be generated by all activities based on an average daily generation of 3.04 pounds per person.

Based on the generation assumptions for the Dover AFB Proposed Action and estimations for the alternative, 351,929 square feet of new facilities would be constructed and 65,663 square feet would be demolished. Based on these data, it is estimated that 3,724 tons of demolition and construction debris would be generated by the McGuire AFB Alternative Action.

As mentioned in Section 3.2.10.5, the Burlington County Resource Recovery Complex has a remaining projected life expectancy of 20 years, with an average disposal rate of 274 tpd. Based on an average disposal of 365 days per year (*i.e.*, 7 days per week) for 20 years, there would be 7,300 days when construction and demolition debris would be disposed in the landfill. Thus, the total remaining capacity of the landfill is estimated at 2,000,200 tons. The projected disposal from the project (3,724 tons) equates to about 0.19 percent of the total remaining capacity. This condition is conservative and reflects that all waste would be disposed in a 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 that would be recycled cannot be estimated at this time and this analysis assessed the most conservative condition.

Transportation Systems

There would be a temporary increase in construction-related traffic associated with the construction activities. It is anticipated construction-related traffic would be localized to the specific construction project area as well as the route between the project site and the Base gates. Construction-related traffic would be temporary, lasting as long as the project activity in that area. The net increase of 631 Air Force active duty, reserve, and civilian personnel (5 percent when compared to the baseline 12,326 personnel) would result in a slight increase in weekday on-Base roadway volumes and vehicular traffic at Base gates.

4.5.10.2 Mitigation

No significant impacts would be anticipated as a result of the McGuire AFB Alternative Action. Therefore, no mitigation would be required.

4.5.10.3 Cumulative Impacts

Water Supply

There would be no changes in personnel associated with the other actions. Therefore, there would be no water consumption cumulative impacts.

As with the McGuire AFB Alternative Action, water would be applied for dust control for the other actions. It is estimated approximately 22 acres would be disturbed as a result of the other actions. Based on the acres and application data used for the McGuire AFB Alternative Action, about 0.08 mgd of water would be applied for dust control for the other actions. The cumulative condition use of 0.10 mgd of water for dust control equates to about

7.7 percent of system capacity. Use of water for dust suppression would end when demolition and construction activities are completed.

Wastewater Treatment

There would be no changes in the number of personnel at the Base under the other actions. Therefore, there would be no wastewater cumulative impacts.

Storm Water Management

The amount of impervious cover associated with the other actions would increase by 975,433 square feet (22 acres). Thus, when combining the area associated with the alternative action with the other actions, there would be a net increase of 1,261,729 square feet (29 acres) under the cumulative condition, which equates to a 1.35 percent increase when compared to the baseline condition. Discussion of the SWPPP and erosion control techniques for the Dover AFB Proposed Action apply to the McGuire AFB Alternative Action cumulative condition.

Energy

As a result of the other actions, an there would be a net increase of 370,800 square feet of climate-controlled space. Daily electricity and natural gas use would increase by 11,866 kWH (370,800 square feet x 0.032 kWH per square foot) and 67,856 ccf (370,800 square feet x 0.183 ccf per square foot), respectively. When combining the daily consumption of the other action with the McGuire AFB Alternative Action daily consumption, daily electricity and natural gas use would be 21,027 kWH and 120,243 ccf, respectively. The consumption would represent daily increases of 9.50 and 9.41 percent, respectively, for electricity and natural gas under the McGuire AFB Alternative Action cumulative condition. The energy system capacities are adequate to handle the increases as a result of the proposed new buildings.

Solid Waste Management

Under the McGuire AFB Alternative Action cumulative condition, there would be an estimated 631 additional personnel working on Base. Thus, approximately 1,929 additional pounds per day of solid waste would be generated by all activities based on an average daily generation of 3.04 pounds per person.

Based on the information in Section 2.6.2, a total of about 661,425 square feet of facility space would be constructed, 290,625 square feet of space would be demolished, and 604,633 square feet of additional area would be paved under other actions. Based on the solid waste generation assumptions for the Dover AFB Proposed Action, it is estimated 14,994 tons of debris would be generated by the other actions.

The life expectancy and disposal information used for the McGuire AFB Alternative Action analysis apply to the cumulative condition. The projected disposal from the Alternative Action cumulative condition (3,724 plus 14,994 equals 18,718 tons) equates to

0.94 percent of the total remaining capacity. The recycling discussion for the McGuire AFB Alternative Action applies to the cumulative condition.

Transportation

Construction projects associated with the other actions would increase project-related traffic as described for the McGuire AFB Alternative Action. Since some of the other actions are in the same area as the Alternative Action construction activities, there could be a slight cumulative increase in traffic. As with the Alternative Action, construction-related traffic would be temporary, lasting as long as the project activity in that area. As reflected in Subchapter 2.6.2, there would be no personnel changes associated with the other actions. Thus, there would be a net increase of 631 personnel under the McGuire AFB Alternative Action cumulative condition, or a 5 percent decrease when compared to the baseline. The McGuire AFB Alternative Action cumulative condition would result in a slight increase in weekday on-Base roadway volumes and vehicular traffic at Base gates.

4.5.11 Airspace and Airfield Operations

4.5.11.1 McGuire AFB

Airspace Operations

The C-17 sortie aircraft operations and airspace requirements associated with the McGuire AFB Alternative Action would be consistent with the baseline operations. The existing air traffic control procedures and airspace infrastructure surrounding McGuire AFB have the capacity to accommodate the additional daily C-17 operations. The low altitude federal airways and MTRs that transit the airspace would not be impacted, nor would they affect the increased level of operations in the airspace.

Airfield Operations

Under the McGuire AFB Alternative Action, average daily airfield operations at McGuire AFB would increase by 80.12 operations from 228.52 to 308.64 operations (see Tables 2.4.1-2 and 2.4.3-1, respectively), a 35 percent increase. The airfield has the capacity to accommodate this increased level of operations. The existing aircraft ground tracks, pattern altitudes, and instrument approach procedures, as well as the air traffic control procedures, would support the additional C-17 operations at the Base. No additional flight tracks or air traffic control procedures would be necessary for the additional C-17 aircraft at McGuire AFB.

4.5.11.2 Military Training Routes

Under the McGuire AFB Alternative Action, individual route use by McGuire AFB C-17s would range from as few as 2.08 monthly operations on Irs-714 and 720 to as many as 22.83 monthly operations on VRs-705 and 707 and SR-846 (see Table 2.4.3-2). Route use by all aircraft types would range from as few as 2.24 monthly operations on IR-720 to as many

as 143.85 monthly operations on VR-1709 (see Table 4.5.3-3). None of the 16 MTRs would require modification to support C-17 operations. Thus, there would be no need to change to the specific data for any route in Appendix B.

The airspace management and procedures discussion and analysis for the Dover AFB Proposed Action apply to the alternative action. In summary, each MTR has the capacity to accommodate the additional operations associated with the alternative action, and the structure for each route can support C-17 operations.

4.5.11.3 Aircraft Safety

The aircraft size and flight characteristics of the aircraft based at McGuire AFB (C-17, KC-10, and KC-135) under the Alternative Action are identical or very similar to the aircraft that would be based at Dover AFB under the Proposed Action. Therefore, the discussion and analysis for the Dover AFB Proposed Action apply to the McGuire AFB Alternative Action. The probability is low that an aircraft involved in an accident at or around the McGuire AFB airfield or on a MTR (C-17 only) would strike a person or structure on the ground.

4.5.11.4 Bird-Aircraft Strike Hazard

The bird-aircraft strike assessment factors for the Dover AFB Proposed Action in Subchapter 4.3.10.4 apply to the McGuire AFB Alternative Action. Likewise, the bird-aircraft strike fluctuation and bird-aircraft strikes-serious mishap information for the Dover AFB Proposed Action apply.

Overall, it is estimated the total airfield operations for McGuire AFB's three aircraft types (C-17, KC-10, and KC-135) would increase under the McGuire AFB Alternative Action by about 36 percent when compared to the baseline. Thus, bird-aircraft strikes associated with airfield operations at McGuire AFB would be expected to increase commensurate with the change in airfield operations. Based on the 2003 data in Table 3.2.11-3 and the increase in airfield operations, it is estimated that 108.0 annual bird-aircraft strikes would occur when applying the increase in airfield operations. Table 4.5.11-1 lists the monthly bird-aircraft strikes based on the baseline monthly average bird-aircraft strikes per airfield operation and the anticipated monthly operations.

Table 4.5.11-1 Estimated McGuire AFB Alternative Action Bird-Aircraft Strikes

Month	Baseline Monthly Average	Estimated Monthly Bird-Aircraft Strikes	Net Change	Percent Change
Jan	0.5	0.7	+0.2	+40%
Feb	1.4	1.9	+0.5	+36%
Mar	2.5	3.4	+0.9	+36%
Apr	6.4	8.7	+2.3	+36%

Table 4.5.11-1 Estimated McGuire AFB Alternative Action Bird-Aircraft Strikes (*…continued*)

Month	Baseline Monthly Average	Estimated Monthly Bird-Aircraft Strikes	Net Change	Percent Change
May	10.3	14.1	+3.8	+37%
Jun	3.6	4.9	+1.3	+36%
Jul	7.3	10.0	+2.7	+37%
Aug	11.9	16.2	+4.3	+36%
Sep	13.3	18.1	+4.8	+36%
Oct	14.9	20.3	+5.4	+36%
Nov	5.5	7.5	+2.0	+36%
Dec	1.6	2.2	+0.6	+38%
Total	79.2	108.0	+28.8	+36%

Based on an estimated average of 45 minutes of flying time for each route flown, McGuire AFB C-17 aircrews would fly a combined 1,185 hours annually on all the MTRs. Using this estimate of flying time and the Air Force-wide rate of 0.0052 strikes per flying hour, it is anticipated that about six bird-aircraft strikes would occur annually from Dover AFB C-17 MTR operations, or an increase of about three strikes when compared to the baseline condition.

It is unlikely that any of these bird-aircraft strike incidents would result in an aircraft accident, involve injury either to aircrews or to the public, or damage to property (other than the aircraft).

4.5.11.5 Mitigation

No significant airspace and airfield operations, aircraft safety, or BASH impacts would be anticipated. Thus, no mitigation would be required.

4.5.11.6 Cumulative Impacts

None of the other actions anticipated at McGuire AFB involve aircraft operations. Therefore, no cumulative impacts would be anticipated.

4.5.12 Environmental Management

4.5.12.1 McGuire AFB

Pollution Prevention

The McGuire AFB Alternative Action would result in construction of new facilities and the introduction of 12 additional C-17 aircraft at the Base. The activities associated with the action would be accomplished under existing Air Force and Base directives, as well as

innovative pollution prevention technologies, to achieve the P2 goals of minimizing or eliminating the use of hazardous materials, reducing the volume of hazardous waste and the release of pollution into the environment, and conserving energy.

Asbestos and Lead-based Paint

It is possible that asbestos and LBP could be encountered in older buildings that would be demolished. The demolition contractor would be responsible for ACM and LBP removal. The procedures identified for ACM and LBP abatement for the Dover AFB Proposed Action would be used for the McGuire AFB Alternative Action. The proposed facilities would be constructed or renovated without any ACM and LBP.

Environmental Restoration Program

The McGuire AFB Alternative Action would require construction activities at various locations on the Base. Proposed construction of the two-bay C-17 hangar, the addition to the aerospace ground equipment facility, and the four C-17 parking spots would occur adjacent to an ERP sites ST-22 and SS-30. It is possible that ground water could be encountered during construction since the water occurs at depths of two to four feet below the ground surface. The facility design, construction, coordination, and health and safety discussion for the Dover AFB Proposed Action apply.

4.5.12.2 Mitigation

No significant pollution prevention, asbestos and LBP management, or ERP impacts would be anticipated. For this reason, no mitigation measures would be required.

4.5.12.3 Cumulative Impacts

The construction contractor for other projects would be required to comply with the regulatory requirements and best management practices identified for the McGuire AFB Alternative Action. Although some of the other actions are adjacent to Alternative Action project sites, use of the regulatory requirements and best management practices identified for the Alternative Action would minimize the potential for cumulative impacts. When completed, activities at the other facilities would be managed in accordance with applicable environmental plans and policies. No cumulative pollution prevention, asbestos and LBP management, or ERP impacts would be anticipated.

4.6 CHARLESTON AFB ALTERNATIVE ACTION

4.6.1 Introduction

Basing 12 additional C-17 aircraft at Charleston AFB would enhance the capability of the Air Force to meet the national military strategy by modernizing strategic and tactical airlift aircraft on the east coast. The Charleston AFB mission of providing airlift of troops, equipment, and passengers would be expanded with the additional C-17 aircraft.

4.6.2 Air Quality

4.6.2.1 Charleston AFB

Under the Charleston AFB Alternative Action, 12 additional C-17 aircraft would be assigned to Charleston AFB, increasing the total number of C-17s to 60 aircraft. Seven construction projects would be accomplished. Aircraft maintenance activities would occur at the Base and MTR operations would occur on the 17 MTRs. Portions of six of the MTRs occur in AQCR 199, the AQCR in which Charleston AFB is located.

The methodologies used to estimate emissions from construction projects, airfield and MTR operations, and aircraft maintenance activities for the Dover AFB Proposed Action were used to determine the emissions for the Charleston AFB Alternative Action in AQCR 199. Table 4.6.2-1 lists the emissions anticipated from the Charleston AFB Alternative Action and compares the emissions to the baseline AQCR emissions inventory.

The construction emissions presented in Table 4.6.2-1 include the estimated annual emissions from construction equipment exhaust associated with the Charleston AFB Alternative Action. The seven projects would be accomplished over an approximate 4-year period. Therefore, the year with the greatest construction equipment emissions (CY07) was used to present the extreme condition for emissions analysis. As with fugitive dust emissions, combustion emissions would produce slightly elevated air pollutant concentrations. However, the effects would be temporary, fall off rapidly with distance from the proposed construction site, and would not result in any long-term impacts.

AGE and airfield operations, as well as aircraft trim/power checks and MTR operations within the AQCR in which Charleston AFB is located, would generate emissions on a recurring basis. Table 4.6.2-1 lists the annual emissions from these operations for the Charleston AFB Alternative Action. As indicated in the table, the greatest volume of emissions for any of the criteria pollutants from recurring aircraft operations would be 725.034 tpy for NO_X, which equates to 1.78 percent of the AQCR emissions inventory for that pollutant.

Table 4.6.2-1 Charleston AFB Alternative Action Emissions in AQCR 199

Criteria Air Pollutant	CO (tpy)	VOC (tpy)	NOx (tpy)	SOx (tpy)	PM10 (tpy)
AQCR 199 CY99 Emissions Inventory	22,210.000	4,830.000	40,750.000	80,080.000	3,500.000
Construction Emissions					
Construction Emissions[a]	97.010	5.390	18.980	2.290	158.660
Construction Emissions as Percent of AQCR Emissions	0.4368%	0.1116%	0.0466%	0.0029%	4.5331%
Aircraft Emissions					
AGE Operation	3.930	1.103	13.824	1.569	0.890
Airfield Operations	114.000	15.000	600.000	0.000	150.000
Aircraft Trim/Power Checks	7.000	1.000	98.000	0.000	16.000
IR-036 Operations	0.010	0.010	1.240	0.000	0.100
SR-166 Operations	0.060	0.040	5.310	0.000	0.410
VR-088 Operations	0.000	0.000	0.000	0.000	0.000
VR-097 Operations	0.000	0.000	0.000	0.000	0.000
VR-1041 Operations	0.080	0.050	6.600	0.000	0.510
VR-1059 Operations	0.000	0.000	0.060	0.000	0.000
Annual Aircraft Emissions	125.080	17.283	725.034	1.569	167.910
Aircraft Emissions as Percent of AQCR Emissions	0.56%	0.36%	1.78%	0.00%	4.80%

(a) CY 07 used for the extreme condition construction emissions.

Note: VOC is not an air pollutant criterion. However, VOC is reported because, as an O_3 precursor, it is a controlled pollutant. Emissions listed for an MTR are those that would occur from operations on that portion of the MTR within the AQCR. Emissions for the remainder of the MTR are listed in Table 4.6.2-3.

The construction emissions presented in Table 4.6.2-1 include combustive emissions from construction equipment operation and fugitive dust emissions. The emissions would produce slightly elevated air pollutant concentrations that would be temporary, fall off rapidly with distance from the proposed construction site, and would not result in long-term impacts.

Airfield operations would generate emissions on a recurring basis. Review of data in Table 4.6.2-1 indicates the greatest aircraft operation emissions would be 167.91 tpy of PM_{10}, which equates to 4.8 percent of the PM_{10} emissions in the AQCR. Emissions in the AQCR fall below the 10 percent level that would be considered regionally significant by the USEPA if the region were nonattainment for any of the pollutants as stated in 40 CFR 51, Subpart W, Section 852. However, the AQCR is in attainment and the General Conformity Rule is not applicable.

The USEPA has promulgated new NAAQS for fine particles less than 2.5 microns in aerodynamic diameter ($PM_{2.5}$). The CY99 AQCR 199 emissions inventory is the most recent and complete inventory made available to the public. This inventory, however, was completed prior to the enforcement of the $PM_{2.5}$ NAAQS, and $PM_{2.5}$ emissions are not included in the emissions summaries. For this reason, it was assumed that $PM_{2.5}$ emissions would be the same as the PM_{10} emissions for all analyses in this EA.

In summary, emissions from the construction activities would be temporary and would be eliminated upon completion of the activities, and would not be regionally significant.

Emissions from aircraft, AGE, and MTR operations, and aircraft trim/power checks, would not be considered regionally significant and the General Conformity Rule is not applicable.

4.6.2.2 North Field

Under the Charleston AFB Alternative Action, the number of airfield operations at North Field would increase due to the addition of 12 C-17 aircraft that would be assigned to Charleston AFB Base, increasing the total number of C-17s to 60 aircraft at the Base. No construction or aircraft maintenance activities would occur at North Field as a result of the Charleston AFB Alternative Action.

The methodologies used to estimate emissions from airfield and MTR operations for the Dover AFB Proposed Action were used to determine the emissions within AQCR 53 under the Charleston AFB Alternative Action at North Field. Table 4.6.2-2 lists the emissions anticipated from the Charleston AFB Alternative Action at North Field and compares the emissions to the baseline AQCR emissions inventory. Portions of seven of the MTRs occur in AQCR 53, the AQCR in which North Field is located.

Table 4.6.2-2 Alternative Action Emissions in AQCR 53, North Field, Charleston AFB Alternative Action

Criteria Air Pollutant	CO (tpy)	VOC (tpy)	NOx (tpy)	SOx (tpy)	PM_{10} (tpy)
AQCR 53 CY99 Emissions Inventory	11,317.00	4,388.00	24,382.00	43,158.00	8,255.00
Airfield Operations	211.00	29.00	1,295.00	0.00	318.00
IR-035	0.02	0.01	1.86	0.00	0.14
IR-036	0.02	0.01	1.53	0.00	0.12
IR-074	0.00	0.00	0.08	0.00	0.01
SR-166	0.29	0.17	24.59	0.00	1.89
VR-088	0.01	0.01	0.88	0.00	0.07
VR-097	0.00	0.00	0.27	0.00	0.02
VR-1059	0.00	0.00	0.25	0.00	0.02
Annual Aircraft Emissions	211.34	29.20	1,324.46	0.00	320.27
Annual Aircraft Emissions as Percent of AQCR Emissions	1.87%	0.67%	5.43%	0.00%	3.88%

Note: VOC is not an air pollutant criterion. However, VOC is reported because, as an O_3 precursor, it is a controlled pollutant. Emissions listed for an MTR are those that would occur from operations on that portion of the MTR within the AQCR. Emissions for the remainder of the MTR are listed in Table 4.6.2-3.

Airfield operations would generate emissions on a recurring basis. Review of data in Table 4.6.2-1 indicates the greatest aircraft operation emissions would be 1,324.46 tpy of NO_X, which equates to 5.43 percent of the PM_{10} emissions in the AQCR. Emissions in the AQCR fall below the 10 percent level that would be considered regionally significant by the USEPA if the region were nonattainment for any of the pollutants as stated in 40 CFR 51, Subpart W, Section 852. However, the AQCR is in attainment and the General Conformity Rule is not applicable.

4.6.2.3 Military Training Routes

Charleston AFB C-17 aircrews would accomplish operations on MTRs in Alabama, Florida, Georgia, North Carolina, South Carolina, Tennessee, and Virginia. Table 4.6.2-3 lists the estimated emissions for C-17 operations on the Charleston AFB Alternative Action MTRs within the respective AQCR and compares the emissions to the AQCR emissions inventory. The same MTR may be included in more than one AQCR due to the length of the routes. Portions of the MTRs that occur within AQCRs 199 and 53 are included in the analyses for Charleston AFB and North Field, respectively. Table E-5 in Appendix E details the emissions from the Charleston AFB Alternative Action MTR operations on the portion of each route that occurs within the respective AQCR.

Table 4.6.2-3 Charleston AFB Alternative Action Emissions, Military Training Routes

Criteria Pollutant	CO (tpy)	VOC (tpy)	NO_X (tpy)	SO_X (tpy)	PM_{10} (tpy)
AQCR 2					
CY99 Emissions Inventory	18,732	7,650	10,387	13,806	4,993
Total MTR Operations	0.17	0.10	14.57	0.00	1.12
MTR Emissions as Percent of AQCR Emissions	0.0009%	0.0013%	0.1403%	0.0000%	0.0225%
AQCR 3					
CY99 Emissions Inventory	5,650	5,300	17,190	21,710	3,780
Total MTR Operations	0.01	0.00	0.64	0.00	0.05
MTR Emissions as Percent of AQCR Emissions	0.0001%	0.0001%	0.0037%	0.0000%	0.0013%
AQCR 7					
CY99 Emissions Inventory	15,204	21,234	61,015	128,139	5,572
Total MTR Operations	0.82	0.48	68.38	0.00	5.26
MTR Emissions as Percent of AQCR Emissions	0.0054%	0.0023%	0.1121%	0.0000%	0.0944%
AQCR 49					
CY99 Emissions Inventory	79,410	12,280	95,348	148,015	16,263
Total MTR Operations	0.00	0.00	0.13	0.00	0.01
MTR Emissions as Percent of AQCR Emissions	0.0000%	0.0000%	0.0001%	0.0000%	0.0001%
AQCR 54					
CY99 Emissions Inventory	16,561	4,141	85,894	189,940	15,190
Total MTR Operations	0.00	0.00	0.12	0.00	0.01
MTR Emissions as Percent of AQCR Emissions	0.0000%	0.0000%	0.0001%	0.0000%	0.0001%
AQCR 55					
CY99 Emissions Inventory	13,883	**7,761**	**63,422**	186,332	6,948
Total MTR Operations	0.00	0.00	0.37	0.00	0.03
MTR Emissions as Percent of AQCR Emissions	0.0000%	0.0000%	0.0006%	0.0000%	0.0004%
AQCR 57					
CY99 Emissions Inventory	2,118	2,639	2,998	293	595
Total MTR Operations	0.00	0.00	0.36	0.00	0.03
MTR Emissions as Percent of AQCR Emissions	0.0002%	0.0001%	0.0119%	0.0000%	0.0046%

Table 4.6.2-3 Charleston AFB Alternative Action Emissions, Military Training Routes (*…continued*)

Criteria Pollutant	CO (tpy)	VOC (tpy)	NO_X (tpy)	SO_X (tpy)	PM_{10} (tpy)
AQCR 58					
CY99 Emissions Inventory	40,140	8,020	23,580	37,040	11,620
Total MTR Operations	0.03	0.02	2.47	0.00	0.19
MTR Emissions as Percent of AQCR Emissions	0.0001%	0.0002%	0.0105%	0.0000%	0.0016%
AQCR 136					
CY99 Emissions Inventory	7,570	23,250	85,470	97,560	4,310
Total MTR Operations	0.03	0.01	2.11	0.00	0.16
MTR Emissions as Percent of AQCR Emissions	0.0003%	0.0001%	0.0025%	0.0000%	0.0038%
AQCR 165					
CY99 Emissions Inventory	5,678	18,320	38,184	101,117	8,022
Total MTR Operations	0.24	0.14	20.14	0.00	1.55
MTR Emissions as Percent of AQCR Emissions	0.0043%	0.0008%	0.0527%	0.0000%	0.0193%
AQCR 166					
CY99 Emissions Inventory	13,090	9,250	64,550	154,370	9,620
Total MTR Operations	0.04	0.03	3.75	0.00	0.29
MTR Emissions as Percent of AQCR Emissions	0.0003%	0.0003%	0.0058%	0.0000%	0.0030%
AQCR 167					
CY99 Emissions Inventory	11,216	18,042	34,610	74,945	5,415
Total MTR Operations	0.00	0.00	0.39	0.00	0.03
MTR Emissions as Percent of AQCR Emissions	0.0000%	0.0000%	0.0011%	0.0000%	0.0006%
AQCR 168					
CY99 Emissions Inventory	5,139	2,659	4,654	4,534	1,174
Total MTR Operations	0.06	0.04	5.08	0.00	0.39
MTR Emissions as Percent of AQCR Emissions	0.0012%	0.0013%	0.1092%	0.0000%	0.0333%
AQCR 169					
CY99 Emissions Inventory	1,340	5,070	7,880	10,940	1,680
Total MTR Operations	0.13	0.08	11.22	0.00	0.86
MTR Emissions as Percent of AQCR Emissions	0.0100%	0.0015%	0.1423%	0.0000%	0.0514%

Table 4.6.2-3 Charleston AFB Alternative Action Emissions, Military Training Routes (*…continued*)

Criteria Pollutant	CO (tpy)	VOC (tpy)	NO_X (tpy)	SO_X (tpy)	PM_{10} (tpy)
AQCR 170					
CY99 Emissions Inventory	29,900	9,070	26,000	56,170	5,050
Total MTR Operations	0.51	0.30	42.37	0.00	3.26
MTR Emissions as Percent of AQCR Emissions	0.0017%	0.0033%	0.1630%	0.0000%	0.0646%
AQCR 171					
CY99 Emissions Inventory	3,610	5,620	14,020	34,740	1,100
Total MTR Operations	0.01	0.00	0.51	0.00	0.04
MTR Emissions as Percent of AQCR Emissions	0.0002%	0.0001%	0.0036%	0.0000%	0.0036%
AQCR 198					
CY99 Emissions Inventory	1,030	2,060	1,680	3,050	140
Total MTR Operations	0.23	0.14	19.39	0.00	1.49
MTR Emissions as Percent of AQCR Emissions	0.0226%	0.0066%	1.1540%	0.0000%	1.0656%
AQCR 200					
CY99 Emissions Inventory	4,570	4,600	16,840	58,660	4,160
VR-088	0.00	0.00	0.18	0.00	0.01
Total MTR Operations	0.00	0.00	0.18	0.00	0.01
MTR Emissions as Percent of AQCR Emissions	0.0000%	0.0000%	0.0011%	0.0000%	0.0003%
AQCR 201					
CY99 Emissions Inventory	7,710	3,840	11,940	20,010	1,660
Total MTR Operations	0.02	0.01	1.66	0.00	0.13
MTR Emissions as Percent of AQCR Emissions	0.0003%	0.0003%	0.0139%	0.0000%	0.0077%
AQCR 202					
CY99 Emissions Inventory	2,880	7,080	9,060	11,360	840
Total MTR Operations	0.00	0.00	0.08	0.00	0.01
MTR Emissions as Percent of AQCR Emissions	0.0000%	0.0000%	0.0009%	0.0000%	0.0008%
AQCR 203					
CY99 Emissions Inventory	661	1,025	431	187	356
Total MTR Operations	0.00	0.00	0.40	0.00	0.03
MTR Emissions as Percent of AQCR Emissions	0.0007%	0.0003%	0.0920%	0.0000%	0.0086%

Table 4.6.2-3 Charleston AFB Alternative Action Emissions, Military Training Routes (*…continued*)

Criteria Pollutant	CO (tpy)	VOC (tpy)	NO_X (tpy)	SO_X (tpy)	PM_{10} (tpy)
AQCR 204					
CY99 Emissions Inventory	8,750	1,790	29,500	56,310	1,580
Total MTR Operations	0.26	0.15	21.58	0.00	1.66
MTR Emissions as Percent of AQCR Emissions	0.0030%	0.0084%	0.0732%	0.0000%	0.1051%
AQCR 207					
CY99 Emissions Inventory	126,263	**68,729**	**111,565**	339,923	15,466
Total MTR Operations	0.08	0.05	6.97	0.00	0.54
MTR Emissions as Percent of AQCR Emissions	0.0001%	0.0001%	0.0062%	0.0000%	0.0035%
AQCR 222					
CY99 Emissions Inventory	14,780	11,200	24,760	7,170	2,600
Total MTR Operations	0.01	0.01	1.09	0.00	0.08
MTR Emissions as Percent of AQCR Emissions	0.0001%	0.0001%	0.0044%	0.0000%	0.0032%
AQCR 226					
CY99 Emissions Inventory	3,940	5,650	16,560	30,820	2,340
Total MTR Operations	0.02	0.01	1.55	0.00	0.12
MTR Emissions as Percent of AQCR Emissions	0.0005%	0.0002%	0.0094%	0.0000%	0.0051%

Note: VOC is not an air pollutant criterion. However, VOC is reported because, as an O_3 precursor, it is a controlled pollutant. ***Bold*** *indicates pollutants not in attainment. Data are reflected as tpy.*

As indicated in Table 4.6.2-3, AQCRs 55 and 207 are nonattainment. Based on the emissions calculations summarized in Table 4.6.2-3, the net change in emissions for any of the criteria pollutants in either of these AQCRs would not exceed *de minimis* and would be less than 10 percent of the particular emissions inventory and the action would not be considered regionally significant. The Charleston AFB Alternative Action has been demonstrated by USEPA standards not to cause or contribute to new violations of any national ambient air quality standard in the affected area, nor increase the frequency or severity of an existing violation. Implementation of the Charleston AFB Alternative Action would not delay timely attainment of the air quality standards in the AQCR, and a Conformity Determination would not be required..

Review of data in Table 4.6.2-3 for AQCRs 2, 3, 7, 49, 53, 54, 57, 58, 136, 165, 166, 167, 168, 169, 170, 171, 198, 199, 200, 201, 202, 203, 204, 222, and 226, all of which are in attainment, indicates that the greatest increase in emissions from MTR operations would be NO_X (68.38 tpy) from recurring aircraft operations in AQCR 7, which equates to 0.1121 percent of the NO_X emissions within the AQCR. Emissions in each of these air basins fall below the 10 percent level that would be considered regionally significant by the USEPA if the region were nonattainment for any of the criteria pollutants as stated in 40 CFR 51,

Subpart W, Section 852. However, AQCRs 2, 3, 7, 49, 53, 54, 57, 58, 136, 165, 166, 167, 168, 169, 170, 171, 198, 199, 200, 201, 202, 203, 204, 222, and 226 are in attainment. Therefore, the air emission impacts from the activities associated with the Charleston AFB Alternative Action in these AQCRs would not be considered significant and the General Conformity Rule is not applicable.

4.6.2.4 Mitigation

No significant air quality impacts would be anticipated. No mitigation would be necessary.

4.6.2.5 Cumulative Impacts

Numerous construction projects would be accomplished under other actions announced for Charleston AFB. The methodologies for calculating emissions for the Dover AFB Proposed Action were used for the cumulative condition at Charleston AFB. Cumulative condition construction projects would occur over an approximate 7-year period. Therefore, the year with the greatest construction equipment emissions (CY11) was used to present the extreme condition for emissions analysis. Table 4.6.2-8 summarizes the emissions from the other actions as well as the Charleston AFB Alternative Action and compares the emissions to the baseline AQCR emissions inventory. None of the other actions includes aircraft operations. Therefore, the Charleston AFB Alternative Action cumulative condition analysis is limited to construction emissions.

Table 4.6.2-8 Charleston AFB Alternative Action Cumulative Condition Emissions

Criteria Air Pollutant	CO (tpy)	VOC (tpy)	NOx (tpy)	SOx (tpy)	PM10 (tpy)
AQCR 199 CY99 Emissions Inventory	22,120.00	4,830.00	40,750.00	80,080.00	3,500.00
Extreme Condition Construction Emissions[(a)]	101.63	6.37	29.94	3.48	160.99
Construction Emissions as Percent of AQCR Emissions	0.4594%	0.1319%	0.0735%	0.0043%	4.5997%

(a) CY11 used for the extreme condition construction emissions.

Note VOC is not an air pollutant criterion. However, VOC is reported because, as an O_3 precursor, it is a controlled pollutant.

Review of data in Table 4.6.2-8 indicates that the 101.63 tons of CO from the Charleston AFB Alternative Action cumulative condition activities would equate to 0.4594 percent of the emissions inventory.

Based on the emissions calculations summarized in Table 4.6.2-8, the analysis concluded that the Charleston AFB Alternative Action cumulative condition would occur within an air basin designated as attainment for all criteria pollutants. The net increase in emissions for all criteria pollutants would be less than 10 percent of the emissions inventory, and the action would not be considered regionally significant. The analysis determined that the Charleston AFB Alternative Action cumulative condition positively conforms to the applicable SIP for

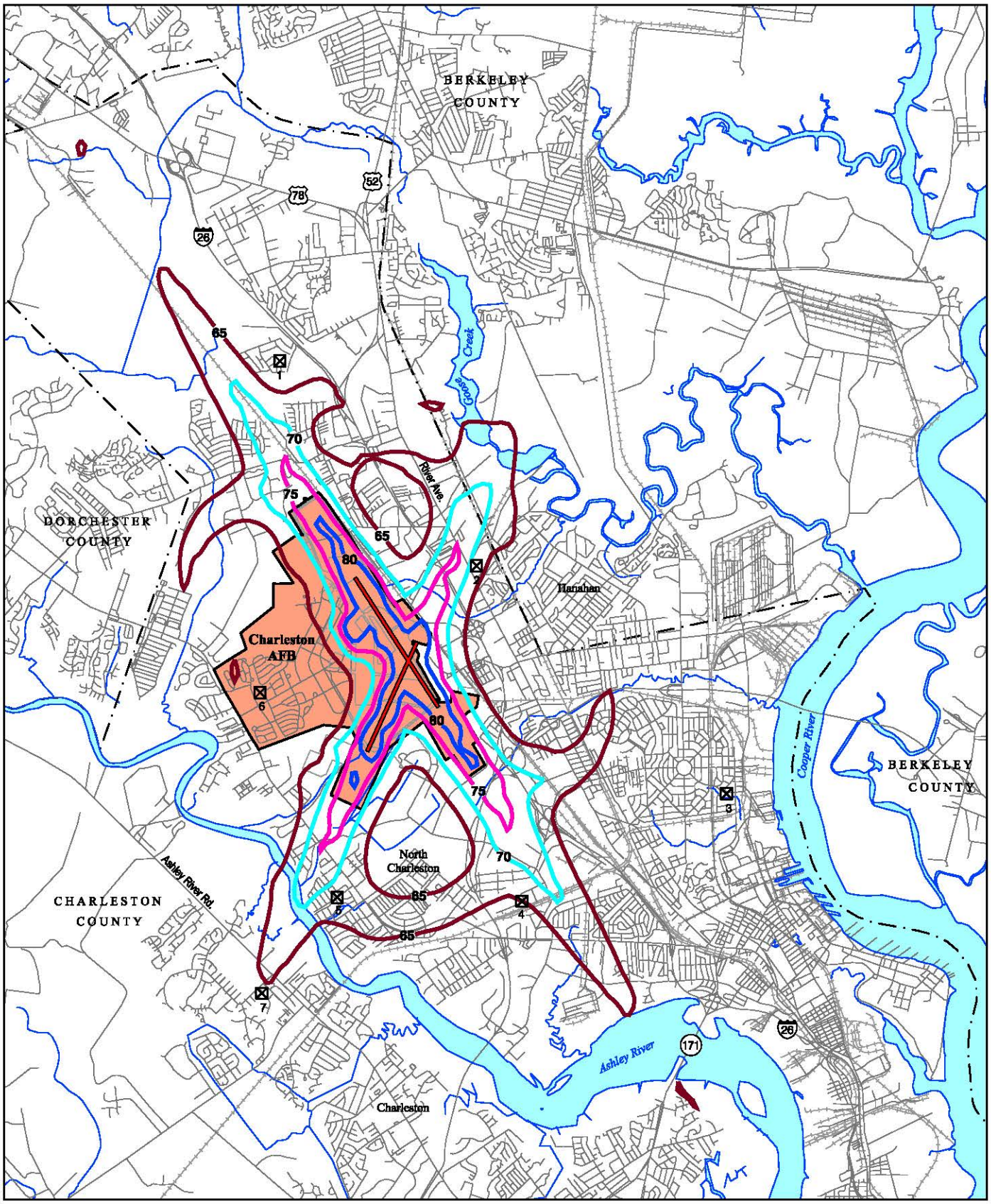
AQCR 199. The Charleston AFB Alternative Action cumulative condition has been demonstrated by USEPA standards not to cause or contribute to new violations of any national ambient air quality standard in the affected area, nor increase the frequency or severity of an existing violation. The Charleston AFB Alternative Action cumulative condition would not delay timely attainment in the air basin, and the action is in compliance or consistent with all relevant requirements and milestones contained in the applicable SIP. This conclusion of positive General Conformity Determination for the federal action planned for Charleston AFB fulfills the Air Force's obligation and responsibility under 40 CFR Part 93, Subpart B.

4.6.3 Noise

4.6.3.1 Charleston AFB

Figure 4.6.3-1 depicts the noise exposure area from aircraft operations after an additional 12 C-17s would be based at Charleston AFB, increasing the total number of C-17s to 60 aircraft. Figure 4.6.3-2 compares the Charleston AFB Alternative Action contours with the baseline. There would be no change to the baseline condition aircraft ground tracks under the Charleston AFB Alternative Action (see Figure 3.3.3-1). The aircraft operations modeled include transient aircraft operations as well as the anticipated C-17 operations.

Table 4.6.3-1 compares the DNL changes from the baseline for the Charleston AFB Alternative Action at the analysis points. There would be no change to the aircraft types or aircraft flight tracks and profiles from the baseline condition. Therefore, the SEL would not change from the baseline condition (see Table 3.3.3-1). Table 4.6.3-2 compares the land area and population exposed to noise of DNL 65 dBA and greater, as well as the potentially highly annoyed, for the Charleston AFB Alternative Action with the baseline condition. There would be an overall five percent increase in the number of people exposed to DNL 65 dBA and greater. Data from these tables are used for analysis in the day-night sound analysis section.



Charleston Air Force Base

LEGEND

- 65 dBA Contour
- 70 dBA Contour
- 75 dBA Contour
- 80 dBA Contour
- Runway
- Roadway
- Analysis Point
- Charleston AFB

N

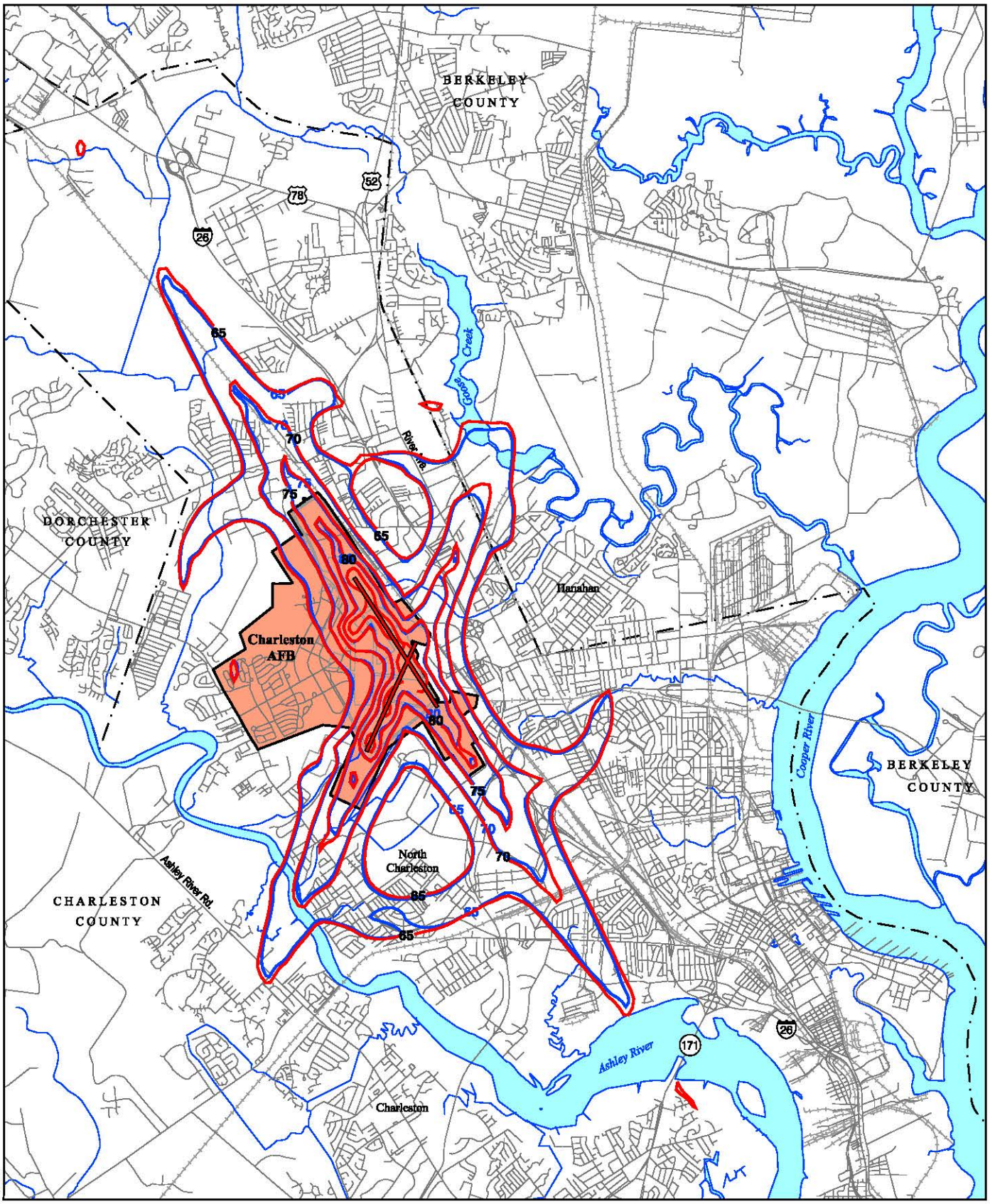
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Charleston AFB Alternative Action Noise Contours

Figure 4.6.3-1

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Charleston Air Force Base

LEGEND

- Baseline Noise Contour
- Alternative Action Noise Contour
- Runway
- Roadway
- Charleston AFB

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Comparison of Baseline and Charleston AFB Alternative Action Noise Contours

Figure 4.6.3-2

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Table 4.6.3-1 Comparison of DNL from Proposed Airfield Operations at Analysis Points with Baseline, Charleston AFB Alternative Action

Number	Description	DNL (dBA)		
		BL	Alt	Chg
1	High School	63	63	0
2	Post Office	67	68	+1
3	Park Circle	51	52	+1
4	Coliseum	65	65	0
5	School	66	67	+1
6	Charleston AFB Housing	58	59	+1
7	Residences	63	64	+1

Note: BL=baseline. Alt=alternative. Chg=change. There would be no change to the aircraft types or flight tracks and profiles these aircraft would fly. See Table 3.3.3-1 for SEL. The analysis point number and description correspond to the point as reflected on the noise contour and aircraft ground track figures. There may be minor differences when comparing the DNL for a point from the table to the DNL for the point as depicted on the noise contour figure. This difference is a result of small misalignments during the process of printing the noise contours on top of the background map.

Table 4.6.3-2 Summary of Land Area and Population Exposed to, and Population Potentially Highly Annoyed by DNL 65 dBA and Greater, Charleston AFB Alternative Action

Category	DNL Interval (dBA)				
	65-70	70-75	75-80	80+	Total
Acres					
Baseline Acres	4,927	1,837	876	590	8,230
Alternative Action	5,310	1,998	947	652	8,907
Change	+383	+161	+71	+62	+677
Percent Change	+8%	+9%	+8%	+11%	+8%
Population					
Baseline Population	5,191	2,201	52	0	7,444
Alternative Action	5,154	2,563	77	1	7,795
Change	-37	+362	+25	+1	+351
Percent Change	-1%	+16%	+49%	--%	+5%
Population Highly Annoyed					
Baseline Population	1,142	814	28	0	1,984
Alternative Action	1,134	648	42	1	2,125
Change	-8	+134	+14	+1	+141
Percent Change	-1%	+16%	+50%	--%	+7%

Note: People highly annoyed determined by multiplying the total number of people in the noise zone times the higher percent number for the interval in Table 3.1.3-4.

Single Event Sound Analysis, Charleston AFB

Sound Exposure Level

A total of seven representative analysis points were selected under the traffic patterns and around the airfield to calculate the SEL due to aircraft overflight. The noise contour and aircraft ground track figures show the locations of the analysis points.

C-17 aircraft operate at Charleston AFB under the baseline condition. Although there would be additional C-17 operations at the Base under the Charleston AFB Alternative Action, there would be no change in the aircraft ground tracks or flight profiles for the aircraft. Likewise, there would be no change in the other types of aircraft that operate at the Base. There would be no change in the SEL listed in Table 3.2.3-2 since SEL is related to the single event on a flight track.

Sleep Disturbance

The introductory sleep disturbance and background information for Dover AFB in Subchapter 4.4.3.2 applies to Charleston AFB. Individuals in residences in the area around the Base would continue to be exposed to indoor SEL of 60 to 80 dBA during normal sleep periods (10:00 p.m. to 7:00 a.m.). There would be 351 additional persons exposed to DNL 65 dBA and greater as a result of the Charleston AFB Alternative Action. Assuming the number of sleep awakenings would be proportional to the increase in exposed population, it is anticipated there would be the potential for an additional 35 persons who could be awakened when comparing the Charleston AFB Alternative Action to the baseline condition.

Effects of Noise on Structures

The maximum sound pressure produced by C-17 aircraft at Charleston AFB would be 112 dBA at 100 feet from the aircraft. At a distance of 1,000 feet, the C-17 aircraft generates a maximum sound pressure of 91 dBA. The maximum sound pressure is the highest instantaneous sound pressure during a single noise event no matter how long the sound may persist. Maximum sound pressure is different than SEL, which is the A-weighted sound level integrated over the duration of the noise event and adjusted to a length of 1 second. Therefore, no damage to structures in the area surrounding Charleston AFB would be anticipated because the sound pressure produced by the aircraft would not exceed the level at which structural damage could occur.

Construction Noise

The primary source of noise from the facilities would be the equipment involved in construction activities. Construction noise would be intermittent and short-term in duration. Typical noise levels from heavy equipment range from 75 to 89 dBA at 50 feet from the source. See Table 4.4.3-3 for a list of construction equipment and associated noise levels. The construction noise assumptions and analysis for the Dover AFB Proposed Action applies to the Charleston AFB Alternative Action.

Day-Night Sound Analysis, Charleston AFB

Overall, the Charleston AFB Alternative Action noise contours would retain the same basic shape as the baseline contours (see Figure 4.6.3-2), with the number of acres in the DNL 65 dBA and greater exposure area increasing by 8 percent. There would be no areas in which there would be a significant change in noise exposure.

As indicated in Table 4.6.3-1, the DNL would 1 dBA at 5 of the analysis points and remain the same at two points. Assuming the analysis points are representative of points within the area around the airfield and based on the fact that the DNL would increase by 1 dBA, it is anticipated that the DNL would not increase at any point within the noise exposure area around the airfield by more than 1 dBA.

Although the number of persons exposed to DNL 65-70 dBA would decrease by 37 people (1 percent), there would be an increase in the number of persons exposed to DNL 70 dBA and greater (see Table 4.7.3-1). The greatest increase would be in the DNL 70-75 zone (362 persons or 16 percent increase). One additional person would be exposed to DNL 80+ dBA. The density of residences in the newly exposed area would be consistent with adjacent residential areas exposed to aircraft noise under the baseline condition. The total number of people exposed to DNL 65-dBA and greater would increase by 351 persons (5 percent). The overall number of persons who would be highly annoyed by noise exposure would increase by 141 people (7 percent increase).

The background information concerning speech disruption for the Dover AFB Proposed Action applies to the alternative. Assuming the number of conversations is proportional to the increase in exposed population and the increase in airfield operations, it is anticipated there would be a corresponding increase in the potential for speech disruption.

The hearing loss and nonauditory health effects information for the Dover AFB Proposed Action apply to the alternative. Noise-induced hearing loss would not be anticipated from airfield operations associated with the Charleston AFB Alternative Action and nonauditory health effects cannot be analyzed.

The background information about classroom disruption for the Dover AFB Proposed Action applies to the alternative. Under the Charleston AFB Alternative Action, the outdoor DNL at the schools identified for analysis (*i.e.*, analysis points 1 and 5) would remain the same as the baseline condition at point 1 (*i.e.*, 63 dBA) and increase by 1 dBA to 67 dBA at point 5. The C-17 outdoor SEL would be 91 and 106 dBA, respectively. Indoor noise levels are generally 20 dBA lower than outdoor noise levels because building structures attenuate the outdoor noise levels. There would be no change to the flight tracks when comparing the Charleston AFB Alternative Action to the baseline condition. Thus, the interior noise levels in the schools would continue to be approximately 71 and 86 dBA, respectively. The noise level at the point 5 school would continue to be 11 dBA above the level (*i.e.*, 75 dBA) at which a marked increase in pauses and masking would occur and at which teaching would be impaired as a result of disruption of speech communication.

In summary, there would be a reduction in speech disruption from aircraft overflight and there should be no noise-induced hearing loss impacts. Although there could be classroom disruption at the schools, there would be no change from the baseline condition. The overall effect of the Charleston AFB Alternative Action would be a 5 percent increase in the number of people exposed to DNL 65 dBA and greater.

4.6.3.2 North Field

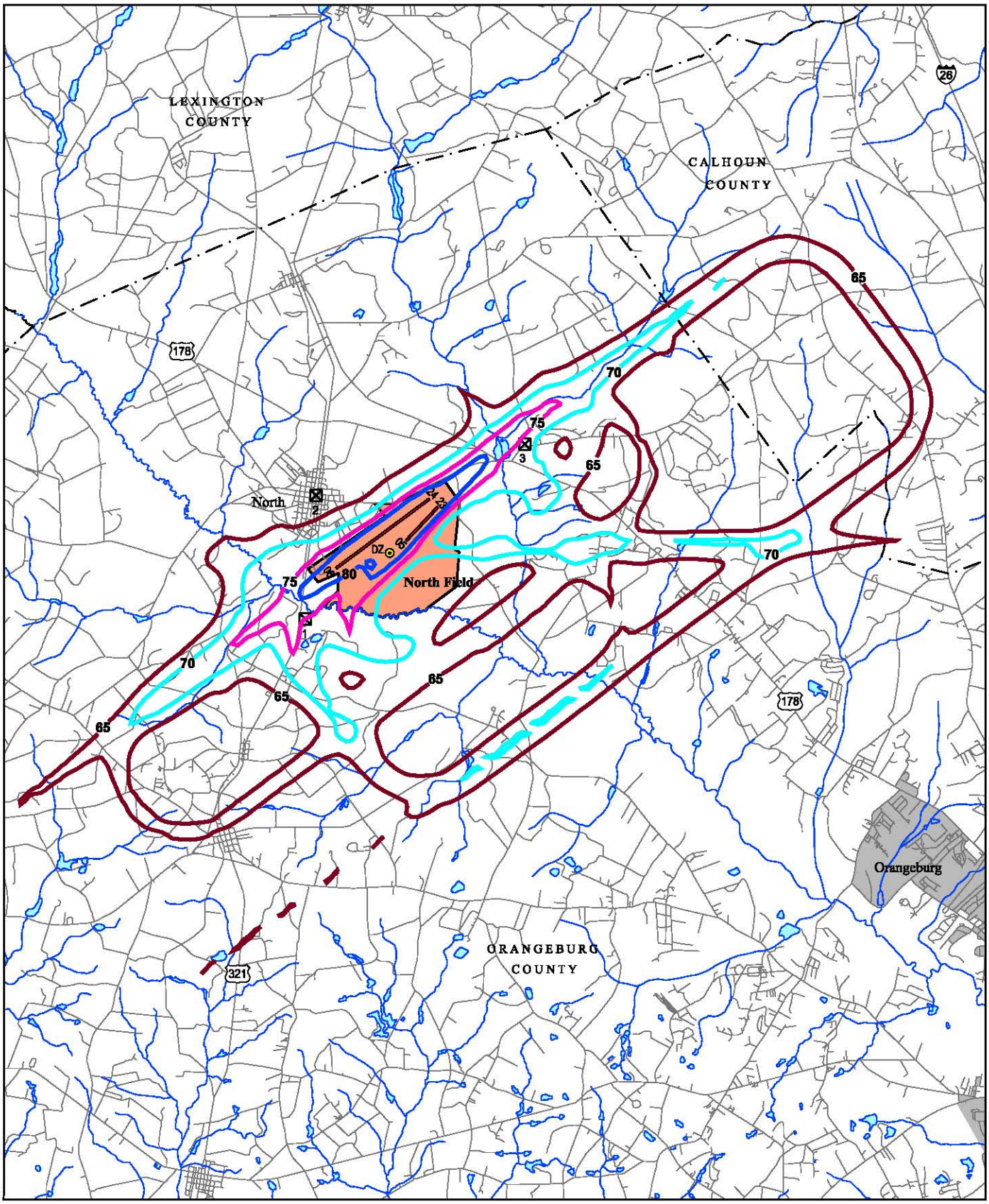
Figure 4.6.3-3 depicts the noise exposure area from aircraft operations at North Field after the additional 12 C-17s would be based at Charleston AFB, increasing the total number of C-17s to 60 aircraft. Figure 4.6.3-4 compares the Charleston AFB Alternative Action contours for North Field with the baseline. There would be no change to the baseline condition aircraft ground tracks for the Charleston AFB Alternative Action at North Field (see Figure 3.3.3-3).

Table 4.6.3-3 compares the DNL changes from the baseline for the Alternative Action at North Field at the analysis points. There would be no change to the aircraft types or aircraft flight tracks and profiles from the baseline condition. Therefore, the SEL would not change from the baseline condition (see Table 3.3.3-4). Table 4.6.3-4 compares the land area and population exposed to noise of DNL 65 dBA and greater, as well as potentially highly annoyed, for the Charleston AFB Alternative Action at North Field with the baseline condition. There would be an overall 15 percent increase in the number of persons exposed to DNL 65 dBA and greater. Data in these tables are used for noise analysis in the day-night sound analysis section.

Table 4.6.3-3 Comparison of DNL from Proposed Airfield Operations at Analysis Points with Baseline, North Field, Charleston AFB Alternative Action

Number	Description	DNL (dBA)		
		BL	Alt	Chg
1	Subdivision	75	75	0
2	Residences	63	63	0
3	Church	72	74	+2

Note: BL=baseline. Alt=alternative. Chg=change. There would be no change to the aircraft types or flight tracks and profiles these aircraft would fly. See Table 3.3.3-4 for SEL. The analysis point number and description correspond to the point as reflected on the noise contour and aircraft ground track figures. There may be minor differences when comparing the DNL for a point from the table to the DNL for the point as depicted on the noise contour figure. This difference is a result of small misalignments during the process of printing the noise contours on top of the background map.

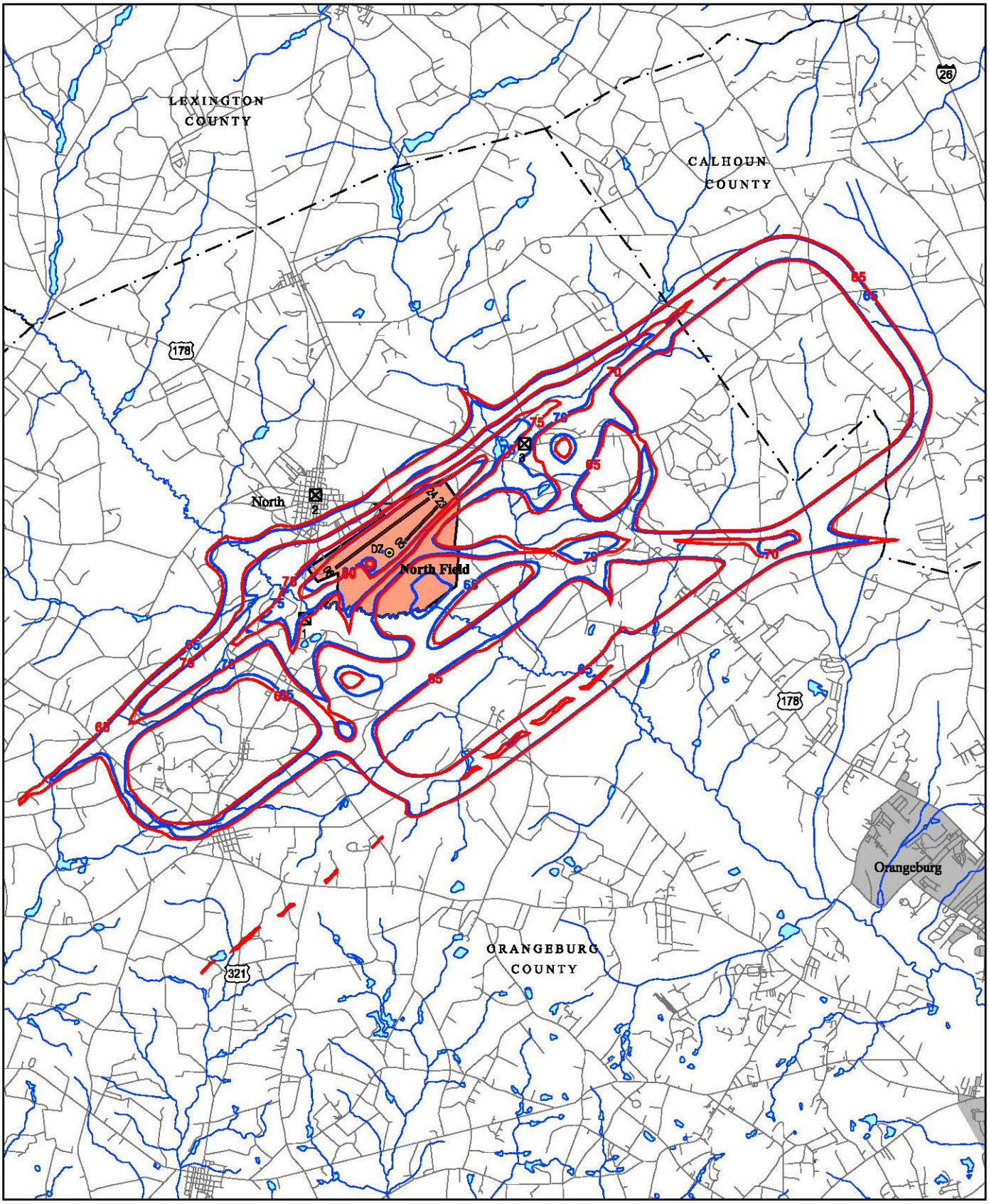


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Charleston AFB Alternative Action Noise Contours, North Field

Figure 4.6.3-3

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North Field
LEGEND

- Baseline Noise Contour
- Alternative Action Noise Contour
- Runway
- Roadway
- North Field
- Urban Area
- Analysis Point
- Drop Zone

N

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Feet

Comparison of Baseline and Charleston AFB Alternative Action Noise Contours, North Field
Figure 4.6.3-4

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Table 4.6.3-4 Summary of Land Area and Population Exposed to, and Population Potentially Highly Annoyed by DNL 65 dBA and Greater, North Field, Charleston AFB Alternative Action

Category	DNL Interval (dBA)				
	65-70	70-75	75-80	80+	Total
Acres					
Baseline Acres	14,693	4,267	1,142	959	21,061
Alternative Action	15,697	4,949	1,386	1,064	23,096
Change	+1,004	+682	+244	+105	+2,035
Percent Change	+7%	+16%	+21%	+11%	+10%
Population					
Baseline Population	862	233	32	7	1,134
Alternative Action	979	279	40	9	1,307
Change	+117	+46	+8	+2	+173
Percent Change	+14%	+20%	+25%	+29%	+15%
Population Highly Annoyed					
Baseline Population	190	86	17	4	297
Alternative Action	215	103	22	5	345
Change	+25	+17	+5	+1	+48
Percent Change	+13%	+20%	+29%	+25%	+16%

Note: People highly annoyed determined by multiplying the total number of people in the noise zone times the higher percent number for the interval in Table 3.1.3-4.

Single Event Sound Analysis, North Field

Sound Exposure Level

A total of three representative analysis points were selected under the traffic patterns and around the airfield to calculate the SEL due to aircraft overflight. The noise contour and aircraft ground track figures show the locations of the analysis points.

C-17 aircraft operate at North Field under the baseline condition. Although there would be additional C-7 operations at the airport under the Charleston AFB Alternative Action, there would be no change in the aircraft ground tracks or flight profiles for the aircraft. Likewise, there would be no change in the other types of aircraft that operate at the airport. Thus, there would be no change in the SEL listed in Table 3.2.3-3 since SEL is related to the single event on a flight track.

Sleep Disturbance

The introductory sleep disturbance and background information for Dover AFB in Subchapter 4.4.3.2 applies to North Field. Individuals in residences in the area around the airfield would continue to be exposed to indoor SEL of 60 to 80 dBA during normal sleep

periods (10:00 p.m. to 7:00 a.m.). There would be 173 additional persons exposed to DNL 65 dBA and greater as a result of the Charleston AFB Alternative Action at North Field . Assuming the number of sleep awakenings would be proportional to the increase in exposed population, it is anticipated there would be the potential for an additional 17 persons who could be awakened when comparing the Charleston AFB Alternative Action at North Field to the baseline condition.

Effects of Noise on Structures

The maximum sound pressure produced by C-17 aircraft at North Field would be 112 dBA at 100 feet from the aircraft. At a distance of 1,000 feet, the C-17 aircraft generates a maximum sound pressure of 91 dBA. The maximum sound pressure is the highest instantaneous sound pressure during a single noise event no matter how long the sound may persist. Maximum sound pressure is different than SEL, which is the A-weighted sound level integrated over the duration of the noise event and adjusted to a length of 1 second. Therefore, no damage to structures in the area surrounding North Field would be anticipated because the sound pressure produced by the aircraft would not exceed the level at which structural damage could occur.

Day-Night Sound Analysis, North Field

Overall, the Charleston AFB Alternative Action at North Field noise contours would retain the same basic shape as the baseline contours (see Figure 4.6.3-4), with the number of acres in the DNL 65 dBA and greater exposure area increasing by 10 percent. There would be no areas in which there would be a significant change in noise exposure.

As indicated in Table 4.6.3-3, the DNL would increase by 2 dBA at analysis point 3 and remain the same at the other two points. Assuming the analysis points are representative of points within the area around the airfield and based on the fact that the DNL would increase by 2 dBA at one point, it is anticipated that the DNL would not increase at any point within the noise exposure area around the airfield by more than 2 dBA.

As indicated in Table 4.6.3-4, the number of persons exposed to aircraft noise would increase in each of the four noise exposure zones, with the greatest increase occurring in the DNL 65-70 dBA zone (117 persons). The total number of people exposed to DNL 65-dBA and greater would increase by 173 persons (15 percent). The density of residences in the newly exposed area would be consistent with adjacent residential areas exposed to aircraft noise under the baseline condition. The overall number of persons who would be highly annoyed by noise exposure would increase by 48 people (16 percent).

The background information concerning speech disruption for the Dover AFB Proposed Action applies to the Charleston AFB Alternative Action at North Field. Assuming the number of conversations is proportional to the increase in exposed population and the increase in airfield operations, it is anticipated there would be a corresponding increase in the potential for speech disruption.

The hearing loss and nonauditory health effects information for the Dover AFB Proposed Action apply to the alternative at North Field. Noise-induced hearing loss would not be anticipated from airfield operations associated with the Charleston AFB Alternative Action at North Field and nonauditory health effects cannot be analyzed.

In summary, there would be an increase in speech disruption from aircraft overflight and there should be no noise-induced hearing loss impacts. The overall effect of the Charleston AFB Alternative Action at North Field would be a 15 percent increase in the number of people exposed to DNL 65 dBA and greater.

4.6.3.3 Military Training Routes

Annually, 859 C-17 sorties (64.22 monthly) would be accomplished by the 60 aircraft proposed for Charleston AFB. The sorties by other aircraft types would remain at the baseline levels (see Table 3.3.3-6). Table 4.6.3-5 compares the L_{dnmr} for the C-17 and other aircraft operations that would occur on the specific routes from the baseline condition. As indicated in the table, the L_{dnmr} ranges from a low of 24 dBA to a high of 67 dBA. As indicated in Table 4.6.3-5, the L_{dnmr} would exceed 55 dBA on eight routes. However, the L_{dnmr} would remain the same as the existing condition on each of the eight routes. There is no reason to expect that the general population would be at risk from any of the effects of noise for sound levels at and below L_{dnmr} 55 dBA (USEPA 1974). The L_{dnmr} 67 dBA anticipated for VR-087 would continue to slightly exceed the HUD, FAA, and Air Force noise level (*i.e.*, L_{dnmr} 65 dBA) at which residential and other noise-sensitive land uses would be unacceptable. The averaged noise analysis for the airfield operations section would apply to the MTR. The L_{dnmr} would be a maximum of 5 dBA greater than the values stated in Table 4.6.3-5 at the points at which the MTRs intersect or when there are common route segments. Thus, the maximum L_{dnmr} for any route would be about 72 dBA.

Table 4.6.3-5 Comparison of Aircraft Noise Levels as a Function of Distance from Aircraft Ground Track Centerline, Charleston AFB Alternative Action

Route	L_{dnmr} (dBA)				L_{dnmr} (dBA)		
	Baseline	Alt	Chg.	Route	Baseline	Alt	Chg.
IR-002	50	50	0	VR-086	58	58	0
IR-012	41	42	+1	VR-087	67	67	0
IR-035	49	49	0	VR-088	65	65	0
IR-036	35	36	+1	VR-097	58	58	0
IR-074	26	26	0	VR-1041	53	53	0
IR-089	24	24	0	VR-1056	50	50	0
IR-721	58	58	0	VR-1059	60	60	0
IR-726	61	61	0	SR-166	53	54	+1
IR-743	53	53	0	--	--	--	--

Note: L_{dnmr} is represented for 300 feet AGL. Alt=alternative action. Chg=Change from baseline.

The information and analysis concerning hearing loss, speech interference, SEL levels, and structural damage presented for the Dover AFB Proposed Action apply to the Charleston AFB Alternative Action.

4.6.3.4 Mitigation

No significant noise impacts would occur from the Charleston AFB Alternative Action. Therefore, no mitigation would be required.

4.6.3.5 Cumulative Impacts

None of the other actions have aircraft operations associated with them. Therefore, there would be no cumulative noise impacts associated with aircraft noise.

Under the cumulative condition, other facilities would be constructed at Charleston AFB. As depicted in Figures 2.4.3-1 and 2.6.3-1, the distance between one of the other action construction sites and a Charleston AFB Alternative Action site could be as close as 100 feet. For analysis purposes, it is assumed the noisiest piece of construction equipment (89 dB scraper which produces 85 dB at 100 feet from the noise source) is being operated simultaneously at each site and the distance to a receptor is 100 feet from each construction site. If the intensity of a sound is doubled, the sound level increases by 3 dB, regardless of the initial sound level. Thus, the combined noise from equipment operation at the receptor would be 88 dB. Construction noise would be temporary and occur only during the hours that construction, demolition, or renovation activity would occur and would cease when the project is completed.

4.6.4 Hazardous Waste, Hazardous Materials, and Stored Fuels

4.6.4.1 Charleston AFB

Hazardous Waste

The discussion and analysis for construction activities under the Dover AFB Proposed Action apply to the Charleston AFB Alternative Action.

It is not anticipated that any new hazardous waste streams would occur with implementation of the Charleston AFB Alternative Action because the Base currently operates C-17 aircraft. However, it is possible the volume of hazardous waste could increase by 25 percent due to the additional 12 C-17 aircraft. Charleston AFB would continue to be a large-quantity hazardous waste generator. The existing hazardous waste management processes and procedures should accommodate the waste generated under the Charleston AFB Alternative Action. However, it may be necessary to increase waste storage capacity. If needed, Charleston AFB would revise its existing *Hazardous Waste Management Plan* to incorporate activities of the Alternative Action.

Hazardous Materials

The discussion and analysis for construction activities under the Dover AFB Proposed Action apply to the Charleston AFB Alternative Action.

It is not anticipated that any new hazardous materials would be needed with implementation of the Charleston AFB Alternative Action because the Base currently operates C-17 aircraft. However, it is likely the hazardous materials procurement could increase by 25 percent due to the additional 12 C-17 aircraft. It is anticipated the existing hazardous materials handling processes and procedures would be able to accommodate the activities associated with C-17 operation and maintenance.

Stored Fuels

Petroleum products that would be used under the Charleston AFB Alternative Action are similar in nature to those used by the current aircraft activities. Fueling and lubrication of equipment would be conducted in a manner that affords maximum protection against spills. The number of airfield operations by based C-17 aircraft at Charleston AFB would increase by about 25 percent. Assuming there is a relationship between airfield operations (which equates to flying time) and fuel use, it is anticipated that the amount of fuel needed for operations could increase as much as 25 percent. Fuel consumption could increase from the 118,000,000 gallons of jet fuel used in 2003 to 147,500,000 gallons annually. This could require an increase in pipeline delivery frequencies. It is anticipated the existing fuels storage and handling processes and procedures would be able to accommodate the activities associated with C-17 operation and maintenance.

4.6.4.2 Mitigation

No significant hazardous materials, hazardous, or stored fuels impacts would be anticipated. Therefore, no mitigation would be required.

4.6.4.3 Cumulative Impacts

The construction contractor for other projects at the Base would comply with applicable regulatory guidance as described for the Charleston AFB Alternative Action. Hazardous materials would be procured and used for operations at some of the other action facilities after construction is completed. Likewise, hazardous waste could be generated at the other action facilities. However, it is not anticipated that any hazardous materials not currently used at facilities would be used at the new facilities nor would any new waste streams be generated. The existing hazardous materials and waste management procedures would accommodate the cumulative condition construction and facility operation. No significant cumulative hazardous waste, hazardous materials, and stored fuels impacts would be anticipated.

4.6.5 Biological Resources

4.6.5.1 Charleston AFB

As discussed in Subchapter 1.4.2.4, no adverse effects would be anticipated to biological resources at Charleston AFB.

4.6.5.2 Military Training Routes

The types of C-17 operations on MTRs under the Charleston AFB Alternative Action would be the same as the Dover AFB Proposed Action. The greatest daily use for any of the MTRs by Charleston AFB Alternative Action C-17s would be 1.18 sorties per day based on seven days of flying per week (see Table 2.4.4-3). Thus, the routes would be flown infrequently. The discussion and analysis for the Dover AFB Proposed Action apply to this alternative. No significant biological adverse effects would be anticipated.

4.6.5.3 Mitigation

No significant adverse effects were identified for biological resources. Therefore, no mitigation measures would be required.

4.6.5.4 Cumulative Impacts

Charleston AFB is a managed landscape; mowing, disking, building construction and urban-like improvements would be expected to continue into the foreseeable future, with or without the Charleston AFB Alternative Action. Natural species diversity and continuity and connectivity of habitats would be expected to decline over the long term. Some species would thrive while others would be displaced and exotic species would most likely continue to increase and displace native species and communities. The Charleston AFB Alternative Action cumulative condition biological resources effects would not be considered significant.

4.6.6 Socioeconomic Resources

4.6.6.1 Charleston AFB

Population

When compared to the Charleston-North Charleston MSA population of 549,033 in 2000, the Charleston AFB Alternative Action would result in an increase in the local and regional population of 1,500 (0.002 percent) due to the net gain of 631 military and civilian positions. This anticipated population increase includes military personnel and family members directly impacted, and a portion of civilian personnel anticipated to relocate within the area.

Housing

It is anticipated that approximately 602 housing units would be required to accommodate the increase of military and civilian personnel. Approximately 90 percent of this housing demand would be required by military personnel and family members. The 602 housing units equate to 0.002 percent of the 232,985 housing units available in the Charleston-North Charleston MSA. Based on the current on- and off-Base distribution of housing occupied by military personnel, approximately 65 percent of these units would consist of off-Base housing and 35 percent on-Base housing. Charleston and Berkeley Counties would be expected to experience the most housing demand as a result of this activity. According to the Charleston

MLS, there were 1,594 single-family houses listed for sale in the $55,000-$155,000 price range in April 2004. Thus, the current supply of single-family dwellings in addition to available rental apartments on the market should accommodate the additional housing demand under the Charleston AFB Alternative Action.

Education

The net gain of the military and civilian population expected from the Charleston AFB Alternative Action would result in an increase in local school district enrollments. Assuming a factor of 0.75 school age children per military household, there would be an enrollment increase of approximately 430 military dependent children in addition to 20-25 children from the affected civilian households who are assumed to relocate to the area. It is anticipated that the majority of the enrollment increase associated with this activity would occur in the Charleston County and Berkeley County School Districts. The combined 2002-2003 enrollment for these two school districts would exceed 68,000 students. The additional anticipated enrollment resulting from this alternative action would result in an overall enrollment increase of less than 1 percent in these two districts. Based on the current policy of on-Base students attending certain designated schools in the Charleston County School District, the anticipated additional enrollment in these schools from on-Base military personnel would result in approximately 150 additional students, or an increase of 4 percent above current enrollment levels.

Economy

Direct and indirect short-term beneficial economic impacts would be realized by the regional and local economy during the construction phase of the Charleston AFB Alternative Action, while long-term beneficial economic impacts would result after construction is completed. Employment generated by construction activities would result in wages paid, and expenditures for local and regional services and supplies. In addition, the increase of 631 military and civilian employees as a result of the Charleston AFB Alternative Action would result in an increase in wages paid, retail sales, and income to the local and regional economy.

The estimated construction cost (capital costs) for project implementation and annual average income for construction laborers were the inputs used in the execution of the EIFS construction model. The estimated construction cost is approximately $124.1 million over a 4.5-year period. The ROI is considered to be Berkeley, Charleston, and Dorchester Counties.

Since the economic projections generated by the EIFS model are on an annual basis, the primary model input for construction costs ($124.1 million) was pro-rated over an estimated 4.5-year construction period. As indicated in Table 4.6.6-1, the direct annual regional economic impacts of project construction over this 4.5-year period consist of increases of $20,591,070 in business volume (sales); 443 jobs in the construction, retail trade, services, and industrial sectors; and $13,382,470 in direct personal income. The latter value represents earnings of employees in the retail, wholesale, and service establishments who are initially or directly affected by the construction activity. The increase in business volume reflects

increases in the sales of goods, services, and supplies associated with project construction activity.

Table 4.6.6-1 EIFS Annual Economic Impacts, Charleston AFB Alternative Action

	Direct Impacts	Indirect Impacts	Total
Construction			
Sales (Business) Volume	$20,591,070	$49,830,380	$70,421,460
Income	$13,382,470	$ 9,977,134	$23,359,600
Employment	443	265	707
Operations			
Sales (Business) Volume	$11,861,000	$28,703,620	$40,564,620
Income	$24,249,360	$ 5,747,094	$29,996,450
Employment	694	153	847

Source: EIFS Model, U.S. Army Construction Engineering Research Laboratories

Table 4.6.6-1 also portrays the indirect annual regional impacts on secondary sales, employment, and income generated by the employment and business activities directly associated with project construction. The direct increase in sales and employment generates secondary sales of $49,830,380; creates an additional 265 jobs indirectly in the retail trade, services, and industry sectors; and results in an additional $9,977,134 in indirect income. Income is indirectly impacted as a result of the indirect increase in sales and employment resulting from the initial economic impacts.

Long-term economic benefits of the Charleston AFB Alternative Action would be realized as a result of the gain of 631 military and civilian employees during operations. The primary inputs for the EIFS operations model are an increase in estimated annual operating expenditures ($1,000,000); estimated gain of military and civilian employees (631); and annual average incomes of $37,900 and $40,255, respectively, for the addition of military and civilian employees.

As indicated in Table 4.6.6-1, the direct annual regional economic impacts as a result of an increase of 631 military and civilian employees consist of a gain to the regional economy of $11,861,000 in business volume (sales); 694 jobs in the government, retail trade, services, and industrial sectors; and $24,249,360 in direct personal income. The latter represents the earnings of employees in the retail, wholesale, and service establishments who are initially or directly affected by the net gain of military and civilian employees. The increase in business volume reflects increases in the sales of goods, services, and supplies to the military and civilian personnel associated with project operations.

Table 4.6.6-1 also portrays the indirect annual regional impacts on secondary sales, employment and income generated by the employment and business activities directly associated with operations. The indirect increase in sales and employment generates increases in secondary sales of $28,703,620; the gain of an additional 153 jobs indirectly in the retail trade, services, and industry sectors; and a gain of an additional $5,747,094 in indirect income. Income is indirectly impacted as a result of the increase in sales and employment resulting from the initial economic impacts.

The EIFS model assessment of the regional economic impacts of project construction, and operations of the Charleston AFB Alternative Action reveals that the RTVs for each of the four variables were less than the regional RTVs. For this reason, short-term project construction and the long-term increase in military and civilian personnel associated with the Charleston AFB Alternative Action would not be expected to result in significant annual regional economic impacts.

4.6.6.2 Mitigation

No significant population, housing, education, or economic impacts would be anticipated. Therefore, no mitigation would be required.

4.6.6.3 Cumulative Impacts

There would be an increase of 631 military and civilian personnel authorizations under the Charleston AFB Alternative Action. Additionally, seven facilities projects would be constructed under the other actions during the same period as the seven Alternative Action projects. Table 4.6.6-2 presents cumulative impacts to population, housing, and education, and Table 4.6.6-3 summarizes the economic impacts of the cumulative condition.

Table 4.6.6-2 Cumulative Population, Housing, and Education Impacts, Charleston AFB Alternative Action

Category	Proposed Action	Other Actions	Cumulative Condition	Percent Change
Population (persons)	1,500	-	1,500	0.002 percent of Charleston MSA population
Housing (units)	602	-	602	0.002 percent of Charleston MSA housing units
Education (students)	450	-	450	0.006 percent of Charleston County and Berkeley County School District enrollment

Table 4.6.6-3 Cumulative Economic Impacts, Charleston AFB Alternative Action

	Direct Impacts	Indirect Impacts	Total
Construction			
Sales (Business) Volume			
Other Actions	$647,394	$1,566,695	$2,214,089
Proposed Action	$20,591,070	$49,830,380	$70,421,460
Cumulative Impact	$21,238,464	$51,397,075	$72,635,549
Income			
Other Actions	$379,884	$313,687	$693,571
Proposed Action	$13,382,470	$9,977,134	$23,359,600
Cumulative Impact	$13,762,354	$10,290,821	$24,053,171
Employment			
Other Actions	12	8	20
Proposed Action	443	265	707
Cumulative Impact	455	273	727
Operations			
Sales (Business) Volume			
Other Actions	-	-	-
Proposed Action	$11,861,000	$28,703,620	$40,564,620
Cumulative Impact	$11,861,000	$28,703,620	$40,54,620
Income			
Other Actions	-	-	-
Proposed Action	$24,249,360	$5,747,094	$29,996,450
Cumulative Impact	$24,249,360	$5,747,094	$29,996,450
Employment			
Other Actions	-	-	-
Proposed Action	694	153	847
Cumulative Impact	694	153	847

As indicated in Table 4.6.6-2, population within the Charleston-North Charleston MSA would increase by 1,500 persons, 602 additional housing units would be needed in the MSA, and an additional 450 students would attend the affected school districts. The greatest increase for any of these categories for the Proposed Action cumulative condition when compared to the baseline condition would be 0.006 percent for the number of additional students enrolled in the affected school districts.

With respect to the EIFS model assessment of the economic impacts of Charleston AFB Alternative Action construction cumulative condition, the RTVs for each of the four variables (population, sales volume, income, and employment) were found to be less than the regional RTVs. For this reason, short-term project construction and the long-term increase in military and civilian personnel associated with the Charleston AFB Alternative Action cumulative condition would not be expected to result in significant annual regional economic impacts.

4.6.7 Cultural Resources

Significance criteria for the cultural resources under the Charleston AFB Alternative Action are the same as those stated for the Proposed Action in Subchapter 4.4.7. As mentioned in Subchapter 1.4.2.4, no structures or sites eligible for the NRHP or other formal recognition have been identified at Charleston AFB. Therefore, cultural resources for the Charleston AFB Alternative Action are limited to Native American interests.

Charleston AFB

A list of federally recognized and state-recognized Native American tribes and groups identified at the time of preparation of this document is provided in Table G-2 in Appendix G. The Air Force consulted with these entities pursuant to 36 CFR 800.2 (Appendix G). Responses to consultation were resolved by the Air Force's answer.

Military Training Routes

No adverse effects to archaeological or historic features are anticipated because the maximum sound produced by the C-17 while flying a MTR would not exceed the minimum level of 127 dBA at which damage could be expected.

A list of federally recognized and state-recognized Native American tribes and groups identified at the time of preparation of this document is provided in Table G-2 in Appendix G. The Air Force consulted with these entities pursuant to 36 CFR 800.2 (Appendix G). Responses to consultation were resolved by the Air Force's answer.

4.6.7.1 Mitigation

No Native American resources effects have been identified. Therefore, no mitigation measures would be required.

4.6.7.2 Cumulative Impacts

The consultation documents and process identified for the Charleston AFB Alternative Action also included the other actions. None of the other actions includes use of the MTRs. Therefore, there would be no cumulative impacts.

4.6.8 Land Use

4.6.8.1 Charleston AFB

On-Base land use conflicts would not be expected under the Charleston AFB Alternative Action. Most land uses would be compatible with the general character of established and planned Base land use patterns. The facility construction anticipated under the alternative action would be consistent with existing and future land use plans and programs identified in the Charleston AFB General Plan. Facility construction and alteration activities may have a temporary minor constraint on existing operations and land uses; however, after construction, these facilities would not be expected to impact any adjacent land use.

The Charleston AFB Alternative Action would result in a slight increase in the noise contours when compared to baseline conditions. The contours would expand slightly in all areas surrounding the installation and approximately 50 acres of additional off-Base residential land uses would be exposed to DNL 65-70 dBA. Although residences are not recommended in these noise zones unless attenuation materials are installed (see

Table 3.1.8-1), the number of additionally exposed residences in the DNL 65-70 dBA noise zone would be extremely small when compared to the baseline. Additionally, the condition (*i.e.*, additional residences in the DNL 65-70 dBA noise zone) would be consistent with existing land use in the area because other residences occur in these noise zones under the baseline condition. Therefore, the additional noise exposure from the alternative action would not be inconsistent with local land use plans. Although additional residences would be exposed to DNL 65 dBA and greater and this increase would be incompatible according to Air Force AICUZ guidance, the small amount of increase would not require the Air Force to update its current AICUZ Study according to AICUZ program guidance. Several areas of off-Base land uses in the CZs and many within the APZs are incompatible with AICUZ recommendations. There would be no change to the dimensions of current CZs or APZs at Charleston AFB and, therefore, no additional areas would be impacted by AICUZ requirements when compared to baseline conditions. No additional significant land use incompatibilities would be anticipated under the Charleston AFB Alternative Action.

4.6.8.2 North Field

Implementation of the Charleston AFB Alternative Action would increase noise exposure when compared to baseline conditions at North Field. Land uses adjacent to North Field are predominantly open space and agricultural uses. These land uses are consistent with comprehensive plans for the area, and the slight increase in noise would not impact land uses. Therefore, land use plans for the local community would not be affected.

4.6.8.3 Military Training Routes

Lands below the MTRs were reviewed to determine if increased aircraft noise or additional MTR operations would affect land uses. Sensitive land uses (*e.g.*, wildlife management areas, parks, residential) would be exposed to increased noise levels between L_{dnmr} 24 and 67 dBA. The maximum increase on any route would be L_{dnmr} 1 dBA on three routes. There would be no increase in noise on the route that had the highest noise under the baseline (VR-087, L_{dnmr} 67 dBA). Except for VR-087 (which exceeds the L_{dnmr} 65 dBA noise level at which residential and other noise-sensitive land uses would be unacceptable by 3 dBA), the noise on the other MTRs would be below the DNL noise/land use compatibility guidelines synopsized in Table 3.1.8-1. There are numerous recreational/wilderness areas below the MTRs (see Subchapter 3.3.8) where visitors may be annoyed by aircraft overflight. However, based on the sensitive land uses, exposed noise levels and consideration of the noise and overflight studies described in Subchapter 3.1.3, no significant impacts to sensitive land uses would be anticipated due to the slight increase in noise levels or additional overflights from the proposed operations. No impacts to land ownership or the existing function of the sensitive land uses would occur.

4.6.8.4 Mitigation

No significant land use impacts would occur as a result of the Charleston AFB Alternative Action. Therefore, no mitigative actions would be required. The local planning agencies could use the noise contours for future land use planning and zoning.

4.6.8.5 Cumulative Impacts

Under the cumulative condition, other facilities would be constructed on Charleston AFB and some would be in the general area associated with C-17 basing activities. As with the Charleston AFB Alternative Action facilities, the other facility actions would be compatible with the Charleston AFB General Plan. Thus, the facility construction anticipated under the cumulative condition would be consistent with existing and future land use plans and programs identified in the General Plan.

4.6.9 Infrastructure and Utilities

4.6.9.1 Charleston AFB

Water Supply

Under the Charleston AFB Alternative Action, there would be a net increase of 631 Air Force active duty, reserve, and civilian personnel, increasing the Base workforce to 8,473 persons. The average daily per capita consumption for FY03 was approximately 92.76 gal/day. Assuming the same consumption rate, there would be a net increase of about 58,532 gallons of water per day used as a result of the Charleston AFB Alternative Action. This additional water for personnel represents an 8.05 percent increase when compared to the baseline personnel use. The resultant daily use for the Base would be about 0.787 mgd, which equates to an approximate 8 percent increase when compared to the baseline condition.

In addition to personal use, up to 0.0035 mgd of water per acre may be applied for dust control during demolition, construction, and renovation. This water would be supplied by the Charleston AFB water system. It is estimated dust control water application would occur approximately 115 days per year and that approximately 1 acre would be disturbed during the duration of the project. About 0.0035 mgd of water would be applied for dust control 115 days per year. Use of 0.0035 mgd of water for dust control equates to about 0.481 percent of FY03 daily consumption. Use of water for dust suppression would end when the demolition and construction activities are completed.

Wastewater Treatment

Under the Charleston AFB Alternative Action, there would be a net increase of 631 Air Force active duty, reserve, and civilian personnel, increasing the Base workforce to 8,473 persons. The average per capita generation of wastewater for FY02 was about 124.16 gal/day. Assuming the same generation rate, there would be a net increase of about 78,345 gallons of wastewater produced per day as a result of the Charleston AFB Alternative

Action. The average daily wastewater treated at the WWTP would be 1.054 mgd (48.80 percent of capacity), or about 3.17 percent more than the baseline condition.

Storm Water Management

All proposed demolition and construction activities would occur within the existing boundaries of Charleston AFB. The amount of impervious cover on the Base is approximately 2,146 acres (93,479,760 square feet). The amount of impervious cover would increase by 47,669 square feet (1 acre), which represents about 0.05 percent increase over baseline conditions. Therefore, the amount of storm water runoff should not increase significantly above the existing conditions. Curbs and gutters installed during any street and off-street parking construction would be connected to the existing storm water system. If required, a new storm water system or connections would be designed and constructed to comply with current regulations and to accommodate any storm water flow increases. Since the amount of disturbed area would be greater than 1 acre, a storm water permit for construction activities would be required. Discussion of the SWPPP and erosion control techniques for the Dover AFB Proposed Action apply to the Charleston AFB Alternative Action.

Energy

As a result of the Charleston AFB Alternative Action, there would be a net increase of 27,432 square feet of climate-controlled space. Daily electricity and natural gas use would increase by 1,646 kWH (27,432 square feet x 0.06 kWH per square foot) and 3,740,189 BTU (27,432 square feet x 136.344 BTU per square foot), respectively. The net increases represent 0.62 and 0.63 percent, respectively, of the baseline electricity and natural gas consumption. The energy system capacities are adequate to handle the increases as a result of the proposed new buildings.

Solid Waste Management

Under the Charleston AFB Alternative Action, there would be an estimated 631 additional personnel working on Base. Thus, approximately 1,458 additional pounds per day of solid waste would be generated by all activities based on an average daily generation of 2.28 pounds per person.

Based on the generation assumptions for the Dover AFB Proposed Action and estimations for the Charleston AFB Alternative Action, 113,399 square feet of new facilities would be constructed and 85,967 square feet would be demolished. As stated in Subchapter 2.4.4.2, the concrete and asphalt debris associated with the aircraft parking ramp reconfiguration would be reused and not disposed in a landfill and the surface area associated with that project is not included in the estimations. Based on these data and the assumptions listed above, it is estimated that 4,181 tons of demolition and construction debris would be generated by the Charleston AFB Alternative Action.

As mentioned in Section 3.3.9.5, the Charleston County Incinerator and Bees Ferry Landfill has a remaining projected life expectancy of 9 years, with an average disposal rate of

274 tpd. Based on an average disposal of 365 days per year (*i.e.*, 7 days per week) for 9 years (the more conservative condition), there would be 3,285 days when construction and demolition debris would be disposed in the landfill. Thus, the total remaining capacity of the landfill is estimated at 900,090 tons. The projected disposal from the project (4,181 tons) equates to about 0.46 percent of the total remaining capacity. 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. The exact amount of debris that would be recycled cannot be estimated at this time and this analysis assesses the most conservative condition.

Transportation Systems

There would be a temporary increase in construction-related traffic associated with construction activities. It is anticipated construction-related traffic would be localized to the specific construction project area as well as the route between the project site and the Base gates. The construction-related traffic would be temporary, lasting as long as the project activity in that area. The net increase of 631 Air Force active duty, reserve, and civilian personnel (8 percent when compared to the baseline 7,842 personnel) would result in a slight increase in weekday on-Base roadway volumes and vehicular traffic at Base gates.

4.6.9.2 Mitigation

No significant impacts would be anticipated as a result of the Charleston AFB Alternative Action. Therefore, no mitigation would be required.

4.6.9.3 Cumulative Impacts

Water Supply

There would be no changes in personnel associated with the other actions. Therefore, there would be no water consumption cumulative impacts.

As with the Charleston AFB Alternative Action, water would be applied for dust control for the other actions. It is estimated approximately 6 acres would be disturbed as a result of the other actions. Based on the acres and application data used for the Charleston AFB Alternative Action, about 0.021 mgd of water would be applied for dust control for the other actions. The cumulative condition use of 0.025 mgd of water for dust control equates to about 3.37 percent of FY03 daily use. Use of water for dust suppression would end when the demolition and construction activities are completed.

Wastewater Treatment

There would be no changes in the number of personnel at the Base under the other actions. Therefore, there would be no wastewater cumulative impacts.

Storm Water Management

The amount of impervious cover associated with the other actions would increase by 249,159 square feet (6 acres). Thus, when combining the area associated with the alternative action with the other actions, there would be a net increase of 296,828 square feet (7 acres) under the cumulative condition, which equates to a 0.32 percent increase when compared to the baseline condition. Discussion of the SWPPP and erosion control techniques for the Dover AFB Proposed Action apply to the Charleston AFB Alternative Action cumulative condition.

Energy

As a result of the other actions, an there would be a net increase of 249,159 square feet of climate-controlled space. Daily electricity and natural gas use would increase by 14,950 kWH (249,159 square feet x 0.046 kWH per square foot) and 33,971,335 BTU (249,159 square feet x 0.002 BTU per square foot), respectively. When combining the daily consumption of the other action with the Charleston AFB Alternative Action daily consumption, daily electricity and natural gas use would be 16,596 kWH and 37,711,524 BTU, respectively. The consumption would represent daily increases of 6.28 and 6.31 percent, respectively, for electricity and natural gas under the Charleston AFB Alternative Action cumulative condition. The energy system capacities are adequate to handle the increases as a result of the proposed new buildings.

Solid Waste Management

Under the Charleston AFB Alternative Action cumulative condition, there would be an estimated 631 additional personnel working on Base. Thus, approximately 1,458 additional pounds per day of solid waste would be generated by all activities based on an average daily generation of 2.28 pounds per person.

Based on the information in Section 2.6.3, a total of about 395,250 square feet of facility space would be constructed, 119,000 square feet of space would be demolished, and 40,909 square feet of space would be altered/renovated under other actions. Based on the generation assumptions for the Dover AFB Proposed Action, 8,229 tons of debris would be generated by the other actions.

The life expectancy and disposal information used for the Charleston AFB Alternative Action analysis apply to the cumulative condition. The projected disposal from the Alternative Action cumulative condition (4,181 plus 8,229 equals 12,410 tons) equates to 1.38 percent of the total remaining capacity. The recycling discussion for the Charleston AFB Alternative Action applies to the cumulative condition.

Transportation

Construction projects associated with the other actions would increase project-related traffic as described for the Charleston AFB Alternative Action. Since some of the other actions are in the same area as the Alternative Action construction activities, there could be a

slight cumulative increase in traffic. As with the Charleston AFB Alternative Action, construction-related traffic would be temporary, lasting as long as the project activity in that area. As reflected in Subchapter 2.6.3, there would be no personnel changes associated with the other actions. Thus, there would be a net increase of 631 personnel under the Charleston AFB Alternative Action cumulative condition, or an 8 percent decrease when compared to the baseline. The Charleston AFB Alternative Action cumulative condition would result in a slight increase in weekday on-Base roadway volumes and vehicular traffic at Base gates.

4.6.10 Airspace and Airfield Operations

4.6.10.1 Charleston AFB

Airspace Operations

The C-17 sortie aircraft operations and airspace requirements associated with the Charleston AFB Alternative Action would be consistent with the baseline operations. The existing air traffic control procedures and airspace infrastructure surrounding Charleston AFB have the capacity to accommodate the additional daily C-17 operations. The low altitude federal airways and MTRs that transit the airspace would not be impacted, nor would they affect the increased level of operations in the airspace.

Airfield Operations

Under the Charleston AFB Alternative Action, average daily airfield operations at Charleston AFB would increase by 22.99 operations from 359.61 to 382.60 operations (see Tables 2.4.1-4 and 2.4.4-1, respectively), a 6 percent increase. The airfield has the capacity to accommodate this increased level of operations. The existing aircraft ground tracks, pattern altitudes, and instrument approach procedures, as well as the air traffic control procedures, would support the additional C-17 operations at the Base. No additional flight tracks or air traffic control procedures would be necessary for the additional C-17 aircraft at Charleston AFB.

4.6.10.2 North Field

Airspace Operations

The airspace analysis for Charleston AFB in the preceding subchapter applies to North Field.

Airfield Operations

Under the Charleston AFB Alternative Action, average daily airfield operations at North Field would increase by 53.48 operations from 241.27 to 294.75 operations (see Tables 2.4.1-5 and 2.4.4-2, respectively), a 22 percent increase. The airfield has the capacity to accommodate this increased level of operations. The existing aircraft ground tracks, pattern altitudes, and instrument approach procedures, as well as the air traffic control

procedures, would support the additional C-17 operations at the airfield. No additional flight tracks or air traffic control procedures would be necessary for the additional C-17 aircraft at North Field.

4.6.10.3 Military Training Routes

Under the Charleston AFB Alternative Action, individual route use by Charleston AFB C-17s would range from as few as 0.08 monthly operations on IRs-074 and 089 and VRs-087 and 1059 to as many as 35.33 monthly operations on IR-035 (see Table 2.4.4-3). None of the 17 MTRs would require modification to support C-17 operations. Thus, there would be no need to change to the specific data for any route in Appendix B.

The airspace management and procedures discussion and analysis for the Dover AFB Proposed Action apply to the alternative action. In summary, each MTR has the capacity to accommodate the additional operations associated with the alternative action, and the structure for each route can support C-17 operations.

4.6.10.4 Aircraft Safety

The aircraft size and flight characteristics of the aircraft based at Charleston AFB (C-17) under the alternative action are identical to the aircraft that would be based at Dover AFB under the Proposed Action. Therefore, the discussion and analysis for the Dover AFB Proposed Action apply to the Charleston AFB Alternative Action. The probability is low that an aircraft involved in an accident at or around the Charleston AFB airfield or on a MTR would strike a person or structure on the ground.

4.6.10.5 Bird-Aircraft Strike Hazard

The bird-aircraft strike assessment factors for the Dover AFB Proposed Action in Subchapter 4.4.10.4 apply to the Charleston AFB Alternative Action. Likewise, the bird-aircraft strike fluctuation and bird-aircraft strikes-serious mishap information for the Dover AFB Proposed Action apply.

Overall, it is estimated the total airfield operations for Charleston AFB's C-17s would increase under the Charleston AFB Alternative Action by about 25 percent when compared to the baseline. Thus, bird-aircraft strikes associated with airfield operations at Charleston AFB would be expected to increase commensurate with the change in airfield operations. Based on the 2003 data in Table 3.3.10-3 and the increase in airfield operations, it is estimated that 39.6 annual bird-aircraft strikes would occur when applying the increase in airfield operations. Table 4.6.10-1 lists the monthly bird-aircraft strikes based on the baseline monthly average bird-aircraft strikes per airfield operation and the anticipated monthly operations.

Table 4.6.10-1 Estimated Charleston AFB Alternative Action Bird-Aircraft Strikes

Month	Baseline Monthly Average	Estimated Monthly Bird-Aircraft Strikes	Net Change	Percent Change
Jan	1.0	1.3	+0.3	+30%
Feb	1.3	1.6	+0.3	+23%
Mar	2.2	2.8	+0.6	+27%
Apr	2.7	3.4	+0.7	+26%
May	2.8	3.5	+0.7	+25%
Jun	4.2	5.3	+1.1	+26%
Jul	2.5	3.1	+0.6	+24%
Aug	2.7	3.4	+0.7	+26%
Sep	3.7	4.6	+0.9	+24%
Oct	5.2	6.5	+1.3	+25%
Nov	2.2	2.8	+0.6	+27%
Dec	1.0	1.3	+0.3	+30%
Total	31.5	39.6	+8.1	+26%

Based on an estimated average of 45 minutes of flying time for each route flown, Charleston AFB C-17 aircrews would fly a combined 644 hours annually on all the MTRs. Using this estimate of flying time and the Air Force-wide rate of 0.0052 strikes per flying hour, it is anticipated that about three bird-aircraft strikes would occur annually from Charleston AFB C-17 MTR operations, the same number of strikes when compared to the baseline condition. It is unlikely that any of these bird-aircraft strike incidents would result in an aircraft accident, involve injury either to aircrews or to the public, or damage to property (other than the aircraft).

4.6.10.6 Mitigation

No significant airspace and airfield operations, aircraft safety, or BASH impacts would be anticipated. Thus, no mitigation would be required.

4.6.10.7 Cumulative Impacts

None of the other actions anticipated at Charleston AFB involve aircraft operations. Therefore, no cumulative impacts would be anticipated.

4.6.11 Environmental Management

4.6.11.1 Charleston AFB

Pollution Prevention

The Charleston AFB Alternative Action would result in construction of new facilities and the introduction of 12 additional C-17 aircraft at the Base. The activities associated with the action would be accomplished under existing Air Force and Base directives, as well as innovative pollution prevention technologies, to achieve the P2 goals of minimizing or

eliminating the use of hazardous materials, reducing the volume of hazardous waste and the release of pollution into the environment, and conserving energy.

Asbestos and Lead-based Paint

It is possible that asbestos and LBP could be encountered in older buildings that would be demolished. The demolition contractor would be responsible for ACM and LBP removal. The procedures identified for ACM and LBP abatement for the Dover AFB Proposed Action would be used for the Charleston AFB Alternative Action. The proposed facilities would be constructed or renovated without any ACM and LBP.

Environmental Restoration Program

The Charleston AFB Alternative Action would require construction activities at various locations on the Base. Proposed construction of the two squadron operations/aircraft maintenance facilities would occur adjacent to an ERP site. It is possible that ground water could be encountered during construction since the water occurs at depths of six feet below the ground surface. The facility design, construction, coordination, and health and safety discussion for the Dover AFB Proposed Action apply.

Coastal Zone Consistency

Charleston AFB would seek a Finding of Consistency from the SCDHEC, Office of OCRM, before proceeding with the Alternative Action.

4.6.11.2 Mitigation

No significant pollution prevention, asbestos and LBP management, or ERP impacts would be anticipated. For this reason, no mitigation measures would be required.

4.6.11.3 Cumulative Impacts

The construction contractor for other projects would be required to comply with the regulatory requirements and best management practices identified for the Charleston AFB Alternative Action. Although some of the other actions are adjacent to Alternative Action project sites, use of the regulatory requirements and best management practices identified for the Charleston AFB Alternative Action would minimize the potential for cumulative impacts. When completed, activities at the other facilities would be managed in accordance with applicable environmental plans and policies. No cumulative pollution prevention, asbestos and LBP management, or ERP impacts would be anticipated.

4.7 DOVER AFB ALTERNATIVE ACTION

4.7.1 Introduction

Basing 24 C 17 aircraft at Dover AFB and transferring 32 C 5 aircraft to ARC installations would enhance the capability of the Air Force to meet the national military strategy by modernizing strategic and tactical airlift aircraft on the east coast. The Dover AFB mission of providing rapid global mobility through airlift would be improved with the larger complement of C-17 aircraft.

4.7.2 Air Quality

4.7.2.1 Dover AFB

Under the Dover AFB Alternative Action, 24 total C-17 aircraft would be based at Dover AFB, and all C-5s would be relocated to other installations. Seven construction projects would be accomplished. Aircraft maintenance activities would occur at the Base and MTR operations would occur on the 22 MTRs. Portions of five of the MTRs occur in AQCR 46, the AQCR in which Dover AFB is located.

The methodologies used to estimate emissions from construction projects, airfield, and MTR operations, and aircraft maintenance activities for the Dover AFB Proposed Action were used to determine the emissions for the Dover AFB Alternative Action. Table 4.7.2-1 lists the emissions anticipated from the Dover AFB Alternative Action in AQCR 46 and compares the emissions to the baseline AQCR emissions inventory.

Table 4.7.2-1 Dover AFB Alternative Action Emissions in AQCR 46

Criteria Air Pollutant	CO (tpy)	VOC (tpy)	NO_X (tpy)	SO_X (tpy)	PM_{10} (tpy)
AQCR 46 CY 99 Emissions Inventory	430.000	2,730.000	6,900.000	28,770.000	670.000
Construction Emissions					
Construction Emissions[(a)]	9.690	1.120	7.500	0.830	12.120
Construction Emissions as Percent of AQCR Emissions	2.25%	0.04%	0.11%	0.00%	1.81%
Aircraft Emissions					
AGE Operation	1.118	0.314	3.932	0.446	0.254
Airfield Operations	51.000	8.000	278.000	0.000	69.000
Aircraft Trim/Power Checks	3.000	1.000	37.000	0.000	4.000
SR-800 Operations	0.000	0.000	0.170	0.000	0.010
SR-801 Operations	0.010	0.010	1.240	0.000	0.100
SR-844 Operations	0.000	0.000	0.090	0.000	0.010
SR-845 Operations	0.020	0.010	1.520	0.000	0.120
VR-1709 Operations	0.150	0.090	12.920	0.000	0.990
Annual Aircraft Emissions	55.298	9.424	334.872	0.446	74.484
Annual Aircraft Emissions as Percent of AQCR Emissions	12.86%	0.35%	4.85%	0.00%	11.18%

(a) CY07 used for the extreme condition construction emissions.

Note: VOC is not an air pollutant criterion. However, VOC is reported because, as an O_3 precursor, it is a controlled pollutant. $PM_{2.5}$ is included for information only. Emissions listed for an MTR are those that would occur from operations on that portion of the MTR within the AQCR. Emissions for the remainder of the MTR are listed in Table 4.7.2-3.

The construction emissions presented in Table 4.7.2-1 include the estimated annual emissions from construction equipment exhaust associated with the Dover AFB Alternative Action. The seven projects would be accomplished over an approximate 4-year period. Therefore, the year with the greatest construction equipment emissions (CY07) was used to present the extreme condition for emissions analysis. As with fugitive dust emissions, combustion emissions would produce slightly elevated air pollutant concentrations. However, the effects would be temporary, fall off rapidly with distance from the proposed construction site, and would not result in any long-term impacts.

AGE and airfield operations, as well as aircraft trim/power checks and MTR operations within the AQCR in which Dover AFB is located, would generate emissions on a recurring basis. Table 4.7.2-1 lists the annual emissions from these operations for the Dover AFB Alternative Action condition. As indicated in the table, the greatest volume of emissions for any of the criteria pollutants from recurring aircraft operations would be 334.872 tpy for NO_X, which equates to 4.85 percent of the AQCR emissions inventory for that pollutant.

A Clean Air Act General Conformity Applicability Analysis for the Dover AFB Alternative Action was prepared in August 2004 (USAF 2004c). Table 4.7.2-2 summarizes the net change in emissions associated with the Dover AFB Alternative Action in AQCR, and Table 4.7.2-3 compares the change in emissions for regional significance and *de minimis* purposes.

Table 4.7.2-2 Net Change in Emissions from Dover AFB Alternative Action Activities in AQCR 46

Category	Pollutants Emitted (tons/year)				
	CO	NO_X	VOC	SO_X	PM_{10}
Net Change in Airfield Operations Emissions	-82.000	-1,048.000	-40.000	0.000	+8.00
Net Change in AGE Operation Emissions	-0.005	-0.017	-0.001	-0.002	0.000
Net Change in Trim/Power Check Emissions	-8.000	-54.000	-2.000	0.000	0.000
Net Change in Construction Emissions	+9.690	+1.120	+7.500	+0.830	+12.120
Net Change in Military Training Route Operation Emissions	+0.190	+15.950	+0.110	0.000	+1.230
Net Change in Emissions for the Alternative Action	-80.125	**-1,084.950**	**-34.391**	+0.828	+21.350

Note: Bold indicates the pollutant is nonattainment within the AQCR.

Source USAF 2004c.

Table 4.7.2-3 Regional Significance Analysis and Comparison to Conformity *de minimis* Thresholds for AQCR 46 for the Dover AFB Alternative Action

Category	Pollutants Emitted (tons/year)				
	CO	NO_X	VOC	SO_X	PM_{10}
Emissions Inventory	430.000	6,900.000	2,730.000	28,770.000	670.000
Net Change in Emissions	-80.125	**-1,084.950**	**-34.391**	+0.828	+21.350
Percent Change Compared to Emissions Inventory	-18.63%	**-15.72%**	**-1.26%**	+0.00%	+3.19%
Regionally Significant? (>10%)	NA	**No**	**No**	NA	NA
de minimis Threshold	NA	100	50	NA	NA
Exceed *de minimis* Threshold?	NA	**No**	**No**	NA	NA

NA not applicable. De minimis does not apply since the AQCR is in attainment for pollutant.

Source USAF 2004c.

The CAA General Conformity Applicability Analysis for the Dover AFB Alternative Action concluded that, although the Dover AFB Alternative Action would occur within an air basin designated as moderate nonattainment for O_3, the net change in emissions for O_3 as well as other criteria pollutants would be less than 10 percent of the emissions inventory and the action would not be considered regionally significant. Additionally, the net change in emissions would not exceed *de minimis* thresholds. The analysis determined that the Dover AFB Alternative Action positively conforms to the applicable SIP for AQCR 46. The Dover AFB Alternative Action has been demonstrated by USEPA standards not to cause or contribute to new violations of any national ambient air quality standard in the affected area, nor increase the frequency or severity of an existing violation. Implementation of the Dover AFB Alternative Action would not delay timely attainment of the ozone standards in the air basin, and the action is in compliance or consistent with all relevant requirements and milestones contained in the applicable SIP. This conclusion of positive General Conformity Determination for the federal action planned for Dover AFB fulfills the Air Force's obligation and responsibility under 40 CFR Part 93, Subpart B.

The USEPA has implemented new NAAQS for fine particles less than 2.5 microns in aerodynamic diameter ($PM_{2.5}$). The CY99 AQCR 45 emissions inventory is the most recent and complete inventory made available to the public. This inventory, however, was completed prior to enforcement of the $PM_{2.5}$ NAAQS, and $PM_{2.5}$ emissions are not included in the emissions summaries. For this reason, it was assumed that $PM_{2.5}$ emissions would be the same as the PM_{10} emissions for all analyses in this EA.

In summary, emissions from construction activities would be temporary and would be eliminated upon completion of the activities, and would not be regionally significant. Emissions from aircraft, AGE, and MTR operations, as well as aircraft trim/power checks, would not exceed *de minimis* thresholds, nor would they be considered regionally significant. A Conformity Determination would not be required.

4.7.2.2 Military Training Routes

Dover AFB C-17 aircrews would accomplish operations on MTRs in Delaware, Kentucky, Maryland, North Carolina, New Jersey, New York, Pennsylvania, South Carolina, Tennessee, Virginia, Vermont, and West Virginia. Table 4.7.2-4 lists the estimated emissions for C-17 operations on the Dover AFB Alternative Action MTRs within the respective AQCR and compares the emissions to the AQCR emissions inventory. As indicated in the table, many MTRs occur in more than one AQCR due to the length and location of the route. Portions of the MTRs that occur within AQCR 46 are included in the analyses for Dover AFB. Table E-6 in Appendix E details the emissions from the Dover AFB Alternative Action MTR operations on the portion of each route that occurs within the respective AQCR.

Table 4.7.2-4 Dover AFB Alternative Action Emissions, Military Training Routes

Criteria Pollutant	CO (tpy)	VOC (tpy)	NO_X (tpy)	SO_X (tpy)	PM_{10} (tpy)
AQCR 45					
CY99 Emissions Inventory	50,300	**45,780**	**89,880**	101,050	12,600
Total MTR Operations	0.36	0.21	29.73	0.00	2.29
MTR Emissions as Percent of AQCR Emissions	0.0007%	0.0005%	0.0331%	0.0000%	0.0182%
AQCR 47					
CY99 Emissions Inventory	2,880	**1,100**	**47,970**	111,340	2,150
Total MTR Operations	0.01	0.01	0.89	0.00	0.07
MTR Emissions as Percent of AQCR Emissions	0.0004%	0.0006%	0.0019%	0.0000%	0.0032%
AQCR 101					
CY99 Emissions Inventory	1,104	808	3,535	666	2,597
Total MTR Operations	0.02	0.01	1.68	0.00	0.13
MTR Emissions as Percent of AQCR Emissions	0.0018%	0.0015%	0.0476%	0.0000%	0.0050%
AQCR 103					
CY99 Emissions Inventory	21,483	**8,277**	**239,223**	516,624	7,947
Total MTR Operations	0.01	0.01	1.08	0.00	0.08
MTR Emissions as Percent of AQCR Emissions	0.0001%	0.0001%	0.0005%	0.0000%	0.0010%
AQCR 113					
CY99 Emissions Inventory	160	1,286	8,401	21,971	1,486
Total MTR Operations	0.03	0.02	2.65	0.00	0.20
MTR Emissions as Percent of AQCR Emissions	0.0198%	0.0014%	0.0315%	0.0000%	0.0137%

Table 4.7.2-4 Dover AFB Alternative Action Emissions, Military Training Routes (*…continued*)

Criteria Pollutant	CO (tpy)	VOC (tpy)	NO_X (tpy)	SO_X (tpy)	PM_{10} (tpy)
AQCR 114					
CY99 Emissions Inventory	876	**1,047**	**1,795**	4,839	528
Total MTR Operations	0.32	0.19	26.66	0.00	2.05
MTR Emissions as Percent of AQCR Emissions	0.0365%	0.0178%	1.4853%	0.0000%	0.3886%
AQCR 116					
CY99 Emissions Inventory	800	**170**	**22,720**	76,970	1,480
Total MTR Operations	0.06	0.03	4.61	0.00	0.36
MTR Emissions as Percent of AQCR Emissions	0.0069%	0.0190%	0.0203%	0.0000%	0.0240%
AQCR 136					
CY99 Emissions Inventory	7,570	23,250	85,470	97,560	4,310
Total MTR Operations	0.06	0.04	5.33	0.00	0.41
MTR Emissions as Percent of AQCR Emissions	0.0008%	0.0002%	0.0062%	0.0000%	0.0095%
AQCR 150					
CY99 Emissions Inventory	1,450	**680**	**10,000**	19,660	1,290
Total MTR Operations	0.95	0.56	79.46	0.00	6.11
MTR Emissions as Percent of AQCR Emissions	0.0657%	0.0817%	0.7946%	0.0000%	0.4740%
AQCR 151					
CY99 Emissions Inventory	23,420	**9,360**	**33,600**	**84,680**	7,440
Total MTR Operations	0.53	0.31	44.08	0.00	3.39
MTR Emissions as Percent of AQCR Emissions	0.0023%	0.0033%	0.1312%	0.0000%	0.0456%
AQCR 158					
CY99 Emissions Inventory	5,260	15,810	10,700	12,820	7,010
Total MTR Operations	1.04	0.61	86.83	0.00	6.68
MTR Emissions as Percent of AQCR Emissions	0.0198%	0.0038%	0.8115%	0.0000%	0.0953%
AQCR 159					
CY99 Emissions Inventory	16,874	**1,682**	**5,539**	9,474	3,747
Total MTR Operations	1.17	0.68	97.62	0.00	7.51
MTR Emissions as Percent of AQCR Emissions	0.0069%	0.0406%	1.7625%	0.0000%	0.2005%
AQCR 160					
CY99 Emissions Inventory	4,340	7,950	19,210	84,960	6,830
Total MTR Operations	0.00	0.00	0.03	0.00	0.00
MTR Emissions as Percent of AQCR Emissions	0.0000%	0.0000%	0.0001%	0.0000%	0.0000%

Table 4.7.2-4 Dover AFB Alternative Action Emissions, Military Training Routes (*…continued*)

Criteria Pollutant	CO (tpy)	VOC (tpy)	NO_X (tpy)	SO_X (tpy)	PM_{10} (tpy)
AQCR 164					
CY99 Emissions Inventory	2,190	1,460	15,410	74,160	2,800
Total MTR Operations	0.34	0.20	28.72	0.00	2.21
MTR Emissions as Percent of AQCR Emissions	0.0157%	0.0138%	0.1863%	0.0000%	0.0789%
AQCR 165					
CY99 Emissions Inventory	5,680	18,320	38,180	101,110	8,030
Total MTR Operations	0.53	0.31	44.38	0.00	3.42
MTR Emissions as Percent of AQCR Emissions	0.0094%	0.0017%	0.1162%	0.0000%	0.0425%
AQCR 166					
CY99 Emissions Inventory	13,090	9,250	64,550	154,370	9,620
Total MTR Operations	0.01	0.00	0.52	0.00	0.04
MTR Emissions as Percent of AQCR Emissions	0.0000%	0.0000%	0.0008%	0.0000%	0.0004%
AQCR 167					
CY99 Emissions Inventory	20,990	18,580	35,020	77,680	5,550
Total MTR Operations	0.01	0.00	0.59	0.00	0.05
MTR Emissions as Percent of AQCR Emissions	0.0000%	0.0000%	0.0017%	0.0000%	0.0008%
AQCR 168					
CY99 Emissions Inventory	5,139	2,659	4,654	4,534	1,174
Total MTR Operations	0.00	0.00	0.07	0.00	0.01
MTR Emissions as Percent of AQCR Emissions	0.0000%	0.0000%	0.0015%	0.0000%	0.0005%
AQCR 169					
CY99 Emissions Inventory	1,340	5,070	7,880	10,940	1,680
Total MTR Operations	0.04	0.02	3.40	0.00	0.26
MTR Emissions as Percent of AQCR Emissions	0.0030%	0.0005%	0.0432%	0.0000%	0.0156%
AQCR 171					
CY99 Emissions Inventory	3,610	5,620	14,020	34,740	1,100
Total MTR Operations	0.01	0.00	0.62	0.00	0.05
MTR Emissions as Percent of AQCR Emissions	0.0002%	0.0001%	0.0044%	0.0000%	0.0043%
AQCR 178					
CY99 Emissions Inventory	125,380	**10,350**	**47,890**	159,000	6,440
Total MTR Operations	0.92	0.54	76.88	0.00	5.92
MTR Emissions as Percent of AQCR Emissions	0.0007%	0.0052%	0.1605%	0.0000%	0.0919%

Table 4.7.2-4 Dover AFB Alternative Action Emissions, Military Training Routes (*…continued*)

Criteria Pollutant	CO (tpy)	VOC (tpy)	NO_X (tpy)	SO_X (tpy)	PM_{10} (tpy)
AQCR 195					
CY99 Emissions Inventory	12,610	**5,680**	**34,930**	169,280	5,340
Total MTR Operations	1.40	0.82	116.92	0.00	9.00
MTR Emissions as Percent of AQCR Emissions	0.0111%	0.0144%	0.3347%	0.0000%	0.1685%
AQCR 196					
CY99 Emissions Inventory	6,810	**9,300**	**29,260**	90,430	5,400
Total MTR Operations	0.65	0.38	54.15	0.00	4.17
MTR Emissions as Percent of AQCR Emissions	0.0095%	0.0041%	0.1851%	0.0000%	0.0772%
AQCR 197					
CY99 Emissions Inventory	52,000	8,000	163,000	**611,000**	17,000
Total MTR Operations	0.03	0.02	2.31	0.00	0.18
MTR Emissions as Percent of AQCR Emissions	0.0001%	0.0002%	0.0014%	0.0000%	0.0010%
AQCR 201					
CY99 Emissions Inventory	7,710	3,840	11,940	20,010	1,660
Total MTR Operations	0.02	0.01	1.44	0.00	0.11
MTR Emissions as Percent of AQCR Emissions	0.0002%	0.0003%	0.0120%	0.0000%	0.0067%
AQCR 207					
CY99 Emissions Inventory	25,863	**71,029**	**111,615**	339,973	15,656
Total MTR Operations	0.18	0.10	14.76	0.00	1.14
MTR Emissions as Percent of AQCR Emissions	0.0007%	0.0001%	0.0132%	0.0000%	0.0073%
AQCR 221					
CY99 Emissions Inventory	1,181	1,444	631	1,124	367
Total MTR Operations	0.12	0.07	9.79	0.00	0.75
MTR Emissions as Percent of AQCR Emissions	0.0099%	0.0047%	1.5522%	0.0000%	0.2054%
AQCR 222					
CY99 Emissions Inventory	15,770	13,710	26,240	9,100	3,000
Total MTR Operations	0.08	0.05	6.99	0.00	0.54
MTR Emissions as Percent of AQCR Emissions	0.0005%	0.0004%	0.0266%	0.0000%	0.0179%
AQCR 223					
CY99 Emissions Inventory	32,747	6,198	32,073	89,014	3,573
Total MTR Operations	0.00	0.00	0.29	0.00	0.02
MTR Emissions as Percent of AQCR Emissions	0.0000%	0.0000%	0.0009%	0.0000%	0.0006%

Table 4.7.2-4 Dover AFB Alternative Action Emissions, Military Training Routes (*…continued*)

Criteria Pollutant	CO (tpy)	VOC (tpy)	NO_X (tpy)	SO_X (tpy)	PM_{10} (tpy)
AQCR 224					
CY99 Emissions Inventory	6,344	2,262	14,702	17,908	1,754
Total MTR Operations	0.26	0.15	21.38	0.00	1.65
MTR Emissions as Percent of AQCR Emissions	0.0040%	0.0066%	0.1454%	0.0000%	0.0938%
AQCR 225					
CY99 Emissions Inventory	10,884	12,260	38,993	77,589	3,506
Total MTR Operations	0.04	0.02	2.93	0.00	0.23
MTR Emissions as Percent of AQCR Emissions	0.0003%	0.0002%	0.0075%	0.0000%	0.0064%
AQCR 226					
CY99 Emissions Inventory	8,890	9,850	24,250	42,420	3,770
Total MTR Operations	0.21	0.12	17.35	0.00	1.33
MTR Emissions as Percent of AQCR Emissions	0.0023%	0.0012%	0.0715%	0.0000%	0.0354%
AQCR 231					
CY99 Emissions Inventory	606	1,615	3,144	340	1,165
Total MTR Operations	0.16	0.09	13.37	0.00	1.03
MTR Emissions as Percent of AQCR Emissions	0.0265%	0.0058%	0.4252%	0.0000%	0.0883%
AQCR 232					
CY99 Emissions Inventory	2,352	1,170	6,065	42	1,090
Total MTR Operations	0.04	0.02	3.03	0.00	0.23
MTR Emissions as Percent of AQCR Emissions	0.0015%	0.0018%	0.0500%	0.0000%	0.0214%
AQCR 234					
CY99 Emissions Inventory	4,000	4,000	77,000	129,000	1,000
Total MTR Operations	0.02	0.01	1.60	0.00	0.12
MTR Emissions as Percent of AQCR Emissions	0.0005%	0.0003%	0.0021%	0.0000%	0.0123%
AQCR 235					
CY99 Emissions Inventory	4,120	960	76,240	129,530	1,870
Total MTR Operations	0.03	0.02	2.27	0.00	0.17
MTR Emissions as Percent of AQCR Emissions	0.0007%	0.0017%	0.0030%	0.0000%	0.0094%
AQCR 236					
CY99 Emissions Inventory	936	881	4,005	321	1,632
Total MTR Operations	0.05	0.03	4.04	0.00	0.31
MTR Emissions as Percent of AQCR Emissions	0.0052%	0.0032%	0.1008%	0.0000%	0.0190%

Note: VOC is not an air pollutant criterion. However, VOC is reported because, as an O_3 precursor, it is a controlled pollutant. ***Bold*** *type indicates pollutants that are nonattainment. Data are reflected as tpy.*

As indicated in Table 4.7.2-4, AQCRs 45, 47, 103, 114, 116, 150, 151, 159, 178, 195, 196, 197, and 207 are nonattainment for one or more criteria pollutants. Based on the emissions calculations summarized in Table 4.7.2-4, the net change in emissions for any of the criteria pollutants in any of these 13 AQCRs would not exceed *de minimis* and would be less than 10 percent of the particular emissions inventory and the action would not be considered regionally significant. The Dover AFB Alternative Action has been demonstrated by USEPA standards not to cause or contribute to new violations of any national ambient air quality standard in the affected area, nor increase the frequency or severity of an existing violation. Implementation of the Dover AFB Alternative Action would not delay timely attainment of the air quality standards in the AQCR, and the action is in compliance or consistent with all relevant requirements and milestones contained in the applicable SIP.

Review of data in Table 4.7.2-4 for AQCRs 101, 113, 136, 158, 160, 164, 165, 166, 167, 168, 169, 171, 201, 221, 222, 223, 224, 225, 226, 231, 232, 234, 235 and 236, all of which are in attainment, indicates that the greatest increase in emissions from MTR operations would be NO_X (86.83 tpy) from recurring aircraft operations in AQCR 158, which equates to 0.8115 percent of the NO_X emissions within the AQCR. Emissions in each of these air basins fall below the 10 percent level that would be considered regionally significant by the USEPA if the region were nonattainment for any of the criteria pollutants as stated in 40 CFR 51, Subpart W, Section 852. However, AQCRs 101, 113, 136, 158, 160, 164, 165, 166, 167, 168, 169, 171, 201, 221, 222, 223, 224, 225, 226, 231, 232, 234, 235 and 236 are in attainment. Therefore, the air emission impacts from activities associated with the Dover AFB Alternative Action in these AQCRs would not be considered significant, and a Conformity Determination would not be required.

4.7.2.3 Mitigation

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

4.7.2.4 Cumulative Impacts

Numerous construction projects would be accomplished under the other actions announced for Dover AFB. The methodologies for calculating emissions for the Dover AFB Proposed Action were used to estimate emissions for the cumulative condition at Dover AFB. Cumulative condition construction projects would occur over an approximate 7-year period. Therefore, the year with the greatest construction equipment emissions (CY10) was used to present the extreme condition for emissions analysis. Table 4.7.2-5 summarizes emissions from the other actions as well as the Dover AFB Alternative Action and compares the emissions to the baseline AQCR emissions inventory.

Table 4.7.2-5 Dover AFB Alternative Action Cumulative Condition Emissions

Criteria Air Pollutant	CO (tpy)	VOC (tpy)	NOx (tpy)	SOx (tpy)	PM10 (tpy)
AQCR 46 CY99 Emissions Inventory	430.00	2,730.00	6,900.00	28,770.00	670.00
Extreme Condition Construction Emissions[(a)]	30.42	21.35	99.30	10.72	41.72
Annual Emissions from Alternative Action Aircraft Operations	55.298	9.424	334.872	0.446	74.484
Cumulative Condition Emissions	85.718	30.774	434.172	11.166	116.204
Cumulative Condition Emissions as Percent of AQCR Emissions	19.93%	1.13%	6.29%	0.039%	17.34%

(a) CY10 used for the extreme condition construction emissions. Data include the combined emissions from the Dover AFB Proposed Action and the other actions.

Note: VOC is not an air pollutant criterion. However, VOC is reported because, as an O_3 precursor, it is a controlled pollutant.

Review of data in Table 4.7.2-5 indicates that the 434.172 tons of NO_X from Dover AFB Alternative Action cumulative condition activities would equate to 6.29 percent of the emissions inventory. However, the 85.178 tons of CO emissions constitute the greatest percent of baseline emissions inventory at 19.93 percent.

The CAA General Conformity Applicability Analysis for the Dover AFB Alternative Action prepared in August 2004 also included the cumulative condition (USAF 2004a). Table 4.7.2-6 summarizes the net change in emissions associated with the Dover AFB Alternative Action cumulative condition, and Table 4.7.2-7 compares the change in emissions for regional significance and *de minimis* purposes.

Table 4.7.2-6 Net Change in Emissions from Aircraft Operations Activities in AQCR 46, Dover AFB Alternative Action Cumulative Condition

Category	Pollutants Emitted (tons/year)				
	CO	NO_X	VOC	SO_X	PM_{10}
Net Change Aircraft Operations Emissions	-45.619	**-887.467**	**-0.809**	-0.002	+9.23
Net Change in Construction Emissions	+30.420	**+99.300**	**+21.350**	+10.720	+41.720
Net Change in Cumulative Condition Emissions	-28.975	**-986.767**	**+20.541**	+10.718	+50.950

Note: Bold indicates the pollutant is nonattainment within AQCR 46.

Source USAF 2004c.

Table 4.7.2-7 Regional Significance Analysis and Comparison to Conformity *de minimis* Thresholds for AQCR 46 for the Dover AFB Alternative Action Cumulative Condition

Category	Pollutants Emitted (tons/year)				
	CO	NO_X	VOC	SO_X	PM_{10}
Emissions Inventory	430.000	6,900.000	2,730.000	28,770.000	670.000
Net Change in Emissions	-28.975	**-986.767**	**+20.541**	+10.718	+50.950
Percent Change Compared to Emissions Inventory	-13.81%	**-14.30%**	**-0.75%**	+0.04%	+7.60%
Regionally Significant? (>10%)	NA	**No**	**No**	NA	NA
de minimis Threshold (tpy)	NA	100	50	NA	NA
Exceed *de minimis* Threshold?	NA	**No**	**No**	NA	NA

NA not applicable. De minimis does not apply since AQCR 46 is in attainment for pollutant.

Source USAF 2004c.

The CAA General Conformity Applicability Analysis prepared for the Alternative Action at Dover AFB also included emissions from the other actions. Based on the emissions calculations summarized in Table 4.7.2-7, the analysis concluded that, although the Alternative Action cumulative condition would occur within an air basin designated as moderate nonattainment for O_3, the net increase in emissions for NO_X and VOC, as well as the other criteria pollutants, would be less than 10 percent of the emissions inventory, and the action would not be considered regionally significant. Additionally, the net change in emissions would not exceed the *de minimis* thresholds. The analysis determined that the Alternative Action cumulative condition positively conforms to the applicable SIP for AQCR 46. The Alternative Action cumulative condition has been demonstrated by USEPA standards not to cause or contribute to new violations of any national ambient air quality standard in the affected area, nor increase the frequency or severity of an existing violation. The Alternative Action cumulative condition would not delay timely attainment of the ozone standards in the air basin, and the action is in compliance or consistent with all relevant requirements and milestones contained in the applicable SIP. This conclusion of positive General Conformity Determination for the federal action planned for Dover AFB fulfills the Air Force's obligation and responsibility under 40 CFR Part 93, Subpart B.

4.7.3 Noise

4.7.3.1 Dover AFB

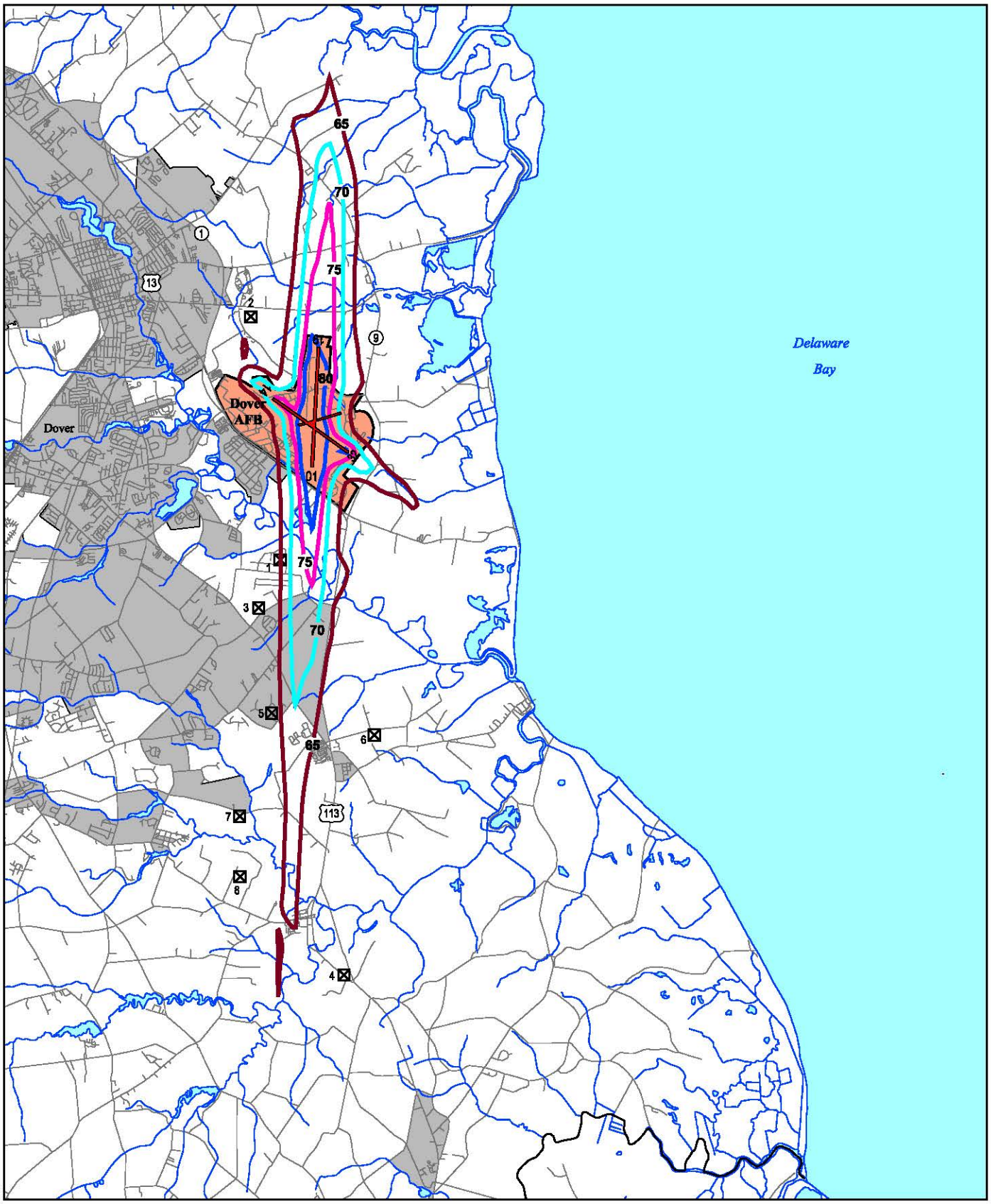
Figure 4.7.3-1 depicts the noise exposure area from the aircraft operations condition at the Base associated with 24 C-17 aircraft based at Dover AFB. Figure 4.7.3-2 compares the Dover AFB Alternative Action and baseline noise contours. The aircraft operations modeled include transient aircraft operations as well as the anticipated C-17 operations. All C-5s would be relocated to another installation.

Table 4.7.3-1 compares the baseline and Dover AFB Alternative Action DNL at the analysis points. The aircraft ground tracks for the Dover AFB Alternative Action would be the same as those for the Dover AFB Proposed Action. Therefore, the C-17 SEL for the alternative would be the same as those for the Dover AFB Proposed Action (see Table 4.4.3-1). Table 4.7.3-2 compares the land area and population exposed to noise of DNL 65 dBA and greater, as well as the population potentially highly annoyed, for the Dover AFB Alternative Action with the baseline condition. There would be an overall 88 percent decrease in the number of people exposed to DNL 65 dBA and greater. Data from these tables are used in the single event and day-night sound analysis sections.

Table 4.7.3-1 Comparison of DNL from Proposed Airfield Operations at Analysis Points with Baseline, Dover AFB Alternative Action

		DNL (dBA)		
Number	**Description**	**BL**	**Alt**	**Chg**
1	Golf Course	67	65	-2
2	Hospital	72	59	-13
3	High School	61	61	0
4	School	61	59	-2
5	Residences	64	64	0
6	Residences	57	56	0
7	Residences	57	57	0
8	Residences	59	59	0

Note: BL=baseline. Alt=Alternative. Chg=change. The analysis point number and description correspond to the point as reflected on the noise contour and aircraft ground track figures. There may be minor differences when comparing the DNL for a point from the table to the DNL for the point as depicted on the noise contour figure. This difference is a result of small misalignments during the process of printing the noise contours on top of the background map.



Dover Air Force Base

LEGEND

- 65 dBA Contour
- 70 dBA Contour
- 75 dBA Contour
- 80 dBA Contour
- Runway
- Roadway
- Analysis Point
- Dover AFB
- Urban Area

N

0 12,000

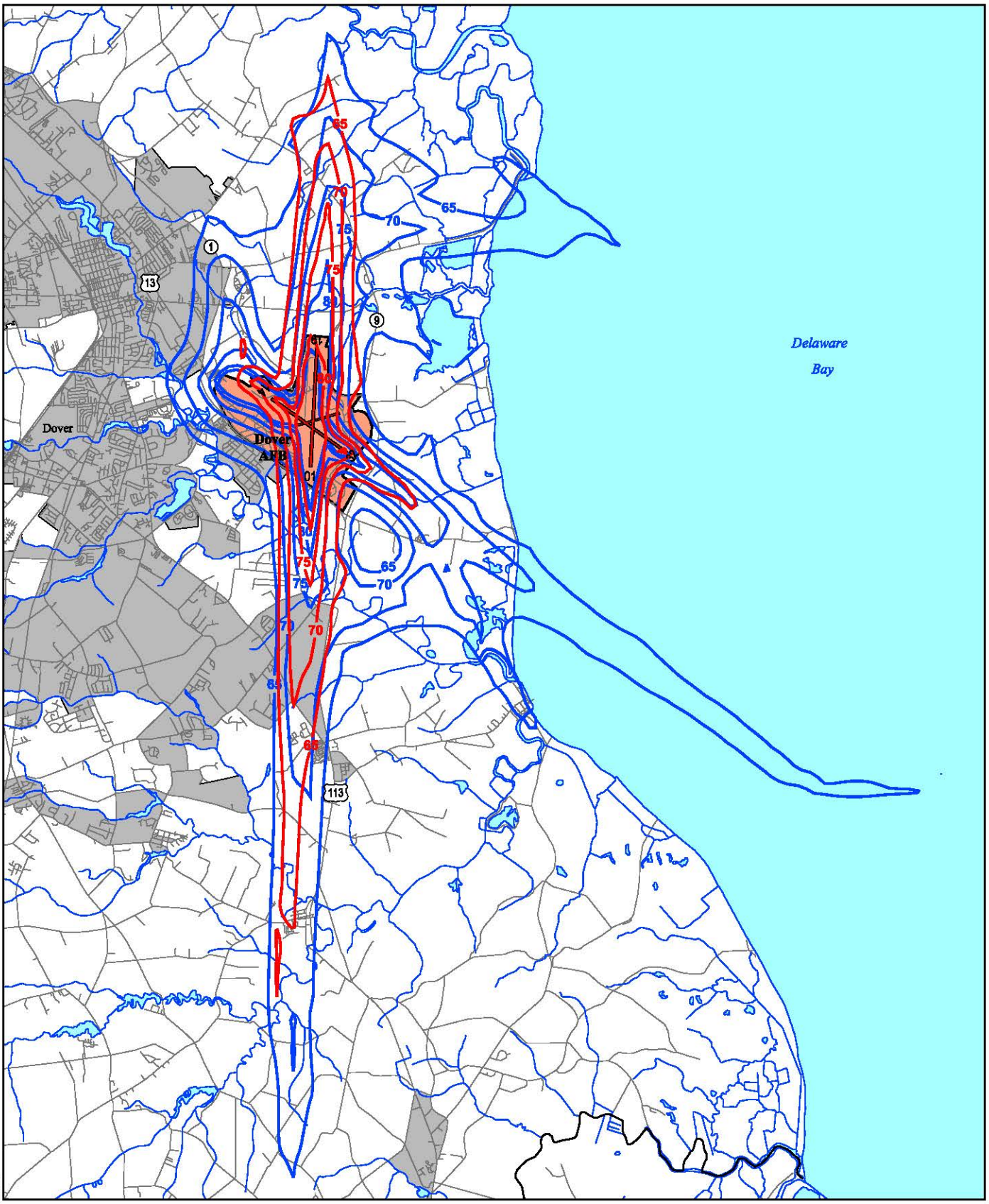
Feet

743528 EC17-DOV-AANC.DWG

Dover AFB Alternative Action Noise Contours

Figure 4.7.3-1

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Dover Air Force Base

LEGEND

- Baseline Noise Contour
- Alternative Action Noise Contour
- Runway
- Roadway
- Dover AFB
- Urban Area

N

0 12,000

Feet

Comparison of Baseline and Dover AFB Alternative Action and Proposed Action Noise Contours

Figure 4.7.3-2

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Table 4.7.3-2 Summary of Land Area and Population Exposed to, and Population Potentially Highly Annoyed, by DNL 65 dBA and Greater, Dover AFB Alternative Action

	DNL Interval (dBA)				
Category	**65-70**	**70-75**	**75-80**	**80+**	**Total**
Acres					
Baseline Acres	15,233	6,256	2,527	2,228	26,244
Proposed Action	4,045	2,097	1,114	610	7,866
Change	-11,188	-4,159	-1,413	-1,618	-18,378
Percent Change	-73%	-66%	-56%	-73%	-70%
Population					
Baseline Population	5,308	2,137	201	192	7,839
Proposed Action	781	154	17	0	952
Change	-4,527	-1,984	-184	-192	-6,887
Percent Change	-85%	-93%	-91%	-100%	-88%
Population Highly Annoyed					
Baseline Population	1,168	791	109	117	2,185
Proposed Action	172	57	9	0	238
Change	-996	-734	-100	-117	-1,947
Percent Change	-85%	-93%	-92%	-100%	-89%

Note: People highly annoyed determined by multiplying the total number of people in the noise zone times the higher percent number for the interval in Table 3.1.3-4.

Single Event Noise Analysis

Sound Exposure Level

Each aircraft overflight near an analysis point yields a single-event noise level, presented as SEL. A total of eight representative analysis points were selected under the traffic patterns and around the airfield to calculate the SEL from aircraft overflight. The noise contour and aircraft ground track figures show the locations of the analysis points. The C-17 flight tracks and profiles for the alternative would be the same as the Dover AFB Proposed Action. Therefore, the SEL data in Table 4.4.3-1 and the Dover AFB Proposed Action discussion and analysis apply to the Dover AFB Alternative Action.

Sleep Disturbance

The introductory sleep disturbance and background information for Dover AFB in Subchapter 4.4.3.1 applies to the Dover AFB Alternative Action. Individuals in residences in the area around the Base would continue to be exposed to indoor SEL of 60 to 80 dBA during normal sleep periods (10:00 p.m. to 7:00 a.m.). There would be 6,887 fewer persons exposed to DNL 65 dBA and greater as a result of the Dover AFB Alternative Action. Assuming the number of sleep awakenings would be proportional to the decrease in exposed population, it is anticipated there would be the potential for 689 fewer persons who could be awakened when comparing the Dover AFB Alternative Action to the baseline condition.

Effects of Noise on Structures

The aircraft ground tracks at Dover AFB under the alternative would be the same as that for the Dover AFB Proposed Action. Therefore, the discussion and analysis for the Dover AFB Proposed Action in Subchapter 4.4.3.1 apply to the alternative. However, the C-5 discussion would not apply since no C-5 aircraft would be assigned to the Base.

Construction Noise

The construction noise discussion and analysis for the Dover AFB Proposed Action apply to the alternative at the Base.

Day-Night Noise Analysis, Dover AFB

Overall, the Dover AFB Alternative Action noise contours would change in both shape and area of coverage when compared to the baseline (see Figure 4.7.3-2), with the number of acres in the DNL 65 dBA and greater exposure area decreasing by 70 percent. The primary areas of decrease are to the northeast and southeast where the noise contours would not extend as far outward. The area of coverage also decreases to the northwest and at the end of the contour to the south

As indicated in Table 4.7.3-1, the DNL would decrease by as much as 13 dBA at one of the analysis points, decrease by 2 dBA at two points, and remain the same at the other five points. Assuming the analysis points are representative of points within the area around the airfield and based on the fact that the DNL would remain the same or decrease at each of the eight points, it is anticipated that the DNL would not increase at any point within the noise exposure area.

The number of persons in all four noise zones would decrease, with the greatest percent of decrease (100 percent) occurring in the DNL 80+ dBA noise zone (see Table 4.7.3-2). The total number of people exposed to DNL 65-dBA and greater would decrease by 6,887 persons (88 percent). The overall number of persons who would be highly annoyed by noise exposure would decrease by 1,947 people (89 percent).

The background information concerning speech disruption for the Dover AFB Proposed Action applies to the alternative. Assuming the number of conversations is proportional to the decrease in exposed population and the reduction in airfield operations, it is anticipated there would be a corresponding decrease in the potential for speech disruption.

The hearing loss and nonauditory health effects information for the Dover AFB Proposed Action apply to the alternative. Noise-induced hearing loss would not be anticipated from airfield operations associated with the Dover AFB Alternative Action and nonauditory health effects cannot be analyzed.

The background information about classroom disruption for the Dover AFB Proposed Action applies to the alternative. Under the Dover AFB Alternative Action, the outdoor DNL at the schools identified for analysis (*i.e.*, analysis points 3 and 4) would remain the same as

the baseline condition at point 3 (*i.e.*, 61 dBA) and decrease by 2 dBA to 59 dBA at point 4. The C-17 outdoor SEL would be 85 and 91 dBA, respectively. Indoor noise levels are generally 20 dBA lower than outdoor noise levels because building structures attenuate the outdoor noise levels. Thus, the interior noise levels in the schools would be approximately 65 and 71 dBA, respectively. Both these noise levels are below the levels (*i.e.*, 75 dBA) at which a marked increase in pauses and masking would occur and at which teaching would be impaired as a result of disruption of speech communication.

In summary, there would be a reduction in speech disruption from aircraft overflight and there should be no noise-induced hearing loss impacts. Classroom disruption would remain at approximately the baseline condition. The overall effect of the Dover AFB Alternative Action would be an 88 percent decrease in the number of people exposed to DNL 65 dBA and greater.

4.7.3.2 Military Training Routes

Annually, a combined 1,590 C-17 sorties (132.54 monthly) would be accomplished by the 24 aircraft proposed for Dover AFB. The sorties by other aircraft types would remain at the baseline levels (see Table 3.1.3-7). Table 4.7.3-3 lists the annual and monthly operations anticipated for the 22 MTRs under the Dover AFB Alternative Action.

Table 4.7.3-3 Anticipated Dover AFB Alternative Action Military Training Route Operations

Route	C-17 Operations				Other Aircraft		Total	
	Dover AFB		McGuire AFB					
	Annual	Monthly	Annual	Monthly	Annual	Monthly	Annual	Monthly
IR-714	16	1.33	0	0.00	8	0.67	24	2.00
IR-720	16	1.33	0	0.00	2	0.16	18	1.49
IR-721	32	2.67	0	0.00	39	3.25	71	5.92
IR-726	32	2.67	0	0.00	103	8.58	135	11.25
IR-743	32	2.67	0	0.00	34	2.84	66	5.51
IR-760	32	2.67	0	0.00	0	0.00	32	2.67
IR-761	32	2.67	0	0.00	0	0.00	32	2.67
IR-762	32	2.67	0	0.00	1	0.08	33	2.75
IR-801	126	10.50	80	6.67	203	16.92	329	27.42
VR-704	32	2.67	18	1.50	52	4.32	84	6.99
VR-705	238	19.83	137	11.42	206	17.16	444	36.99
VR-707	238	19.83	137	11.42	60	5.00	298	24.83
VR-725	32	2.67	18	1.50	90	7.50	122	10.17
VR-1709	238	19.83	137	11.42	1,690	140.85	1,928	160.68
VR-1711	32	2.67	18	1.50	41	3.42	73	6.09
VR-1712	32	2.67	18	1.50	67	5.57	99	8.24
SR-800	32	2.67	18	1.50	0	0.00	32	2.67
SR-801	32	2.67	18	1.50	480	40.00	512	42.67
SR-805	32	2.67	18	1.50	0	0.00	32	2.67
SR-844	32	2.67	18	1.50	0	0.00	32	2.67
SR-845	32	2.67	18	1.50	0	0.00	32	2.67
SR-846	238	19.83	137	11.42	120	10.00	358	29.83

Note: Monthly operations rounded to the nearest whole number. See Table 3.1.3-7 for the other aircraft types.

Table 4.7.3-4 compares the L_{dnmr} for the C-17 and other aircraft operations that would occur on the specific routes from the baseline condition. As indicated in the table, the L_{dnmr} ranges from a low of 43 dBA to a high of 62 dBA. As indicated in Table 4.7.3-4, the L_{dnmr} would equal or exceed 55 dBA on eight routes. Although the L_{dnmr} would increase minimally (*i.e.*, 2 dBA on one route and 1 dBA on three routes) on four of these eight routes, it would remain the same as the existing condition on the other four routes. There is no reason to expect the general population to be at risk from any of the effects of noise for sound levels at and below L_{dnmr} 55 dBA (USEPA 1974). Additionally, the L_{dnmr} 62 dBA anticipated for VR-201 would not exceed the HUD, FAA, and Air Force noise level (*i.e.*, L_{dnmr} 65 dBA) at which residential and other noise-sensitive land uses would be unacceptable. The L_{dnmr} would be a maximum of 5 dBA greater than the values stated in Table 4.7.3-4 at the points at which the MTRs intersect or when there are common route segments. Thus, the maximum L_{dnmr} for any route could be about 67 dBA.

Table 4.7.3-4 Comparison of Aircraft Noise Levels as a Function of Distance from Aircraft Ground Track Centerline, Dover AFB Alternative Action

	L_{dnmr} (dBA)				L_{dnmr} (dBA)		
Route	**Baseline**	**Alt**	**Chg.**	**Route**	**Baseline**	**Alt**	**Chg.**
IR-714	49	49	0	VR-707	57	58	+1
IR-720	45	46	+1	VR-725	45	48	+3
IR-721	56	56	0	VR-1709	62	62	0
IR-726	61	61	0	VR-1711	54	55	+2
IR-743	53	54	+1	VR-1712	51	52	+1
IR-760	--	43	--	SR-800	40	45	+5
IR-761	--	43	--	SR-801	45	48	+3
IR-762	23	43	+20	SR-805	40	45	+5
IR-801	54	55	+1	SR-844	40	45	+5
VR-704	57	58	+1	SR-845	40	45	+5
VR-705	57	57	0	SR-846	50	54	+4

Note: L_{dnmr} is represented for 300 feet AGL. Alt=alternative action. Chg=change from baseline. No baseline L_{dnmr} listed for IRs 760 and 761 because routes were not flown.

The information and analysis concerning hearing loss, speech interference, SEL levels, and structural damage presented for the Dover AFB Proposed Action apply to the Dover AFB Alternative Action.

4.7.3.3 Mitigation

No noise impacts were identified. Therefore, no mitigation would be required.

4.7.3.4 Cumulative Impacts

None of the other actions have aircraft operations associated with them. Therefore, there would be no cumulative noise impacts associated with aircraft noise.

The other actions for the Dover AFB Alternative Action cumulative condition would be the same as those for the Dover AFB Proposed Action cumulative condition. Therefore, the

discussion and analysis in Subchapter 4.4.3.4 apply to the Dover AFB Alternative Action cumulative condition.

4.7.4 Hazardous Waste, Hazardous Materials, and Stored Fuels

4.7.4.1 Dover AFB

Hazardous Waste

The discussion and analysis for construction activities under the Dover AFB Proposed Action apply to the Dover AFB Alternative Action.

Since the overall number of aircraft assigned to Dover AFB would decrease by eight, and because the C-17 and C-5 are similar aircraft (*i.e.*, both four-engine transport), it is anticipated the volume of hazardous waste generated under the Proposed Action would decrease by about 25 percent when compared to the baseline. Additional storage capacity should not be needed and the Base would continue to be a large quantity generator. If needed, Dover AFB would revise its existing *Hazardous Waste, Universal Waste, and Used Petroleum Management Plan* to incorporate the activities of the Proposed Action. The plan would be revised to reflect any additional procedures necessary to achieve and maintain regulatory compliance regarding accumulation, transportation, and disposal of hazardous waste.

Hazardous Materials

The discussion and analysis for construction activities under the Dover AFB Proposed Action apply to the Dover AFB Alternative Action.

Since the overall number of aircraft assigned to Dover AFB would decrease by eight aircraft and because the maintenance activities for C-17 and C-5 are similar, it is anticipated that no new hazardous material types would be needed and that hazardous material procurement could decrease by 25 percent. The existing hazardous materials handling processes and procedures could accommodate the activities associated with C-17 operation and maintenance.

Stored Fuels

Petroleum products that would be used under the Dover AFB Alternative Action are similar in nature to those used by the current aircraft activities at Dover AFB. Fueling and lubrication of equipment would be conducted in a manner that affords maximum protection against spills. The number of airfield operations by based C-17s at Dover AFB would decrease by about 55 percent. Assuming there is a relationship between airfield operations (which equates to flying time) and fuel use, it is anticipated the amount of fuel needed for operations could decrease as much as 55 percent. Fuel consumption could decrease from the 77,062,897 gallons of jet fuel used in 2003 to 34,678,304 gallons annually. The existing fuels storage and handling processes and procedures could accommodate the activities associated with C-17 operation and maintenance.

4.7.4.2 Mitigation

No significant hazardous materials, hazardous waste, or stored fuels impacts would be anticipated. Therefore, no mitigation would be required.

4.7.4.3 Cumulative Impacts

The construction contractor for other projects at Dover AFB would comply with applicable regulatory guidance as described for the Dover AFB Alternative Action. Hazardous materials would be procured and used for operations at some of the other action facilities after construction is completed. Likewise, hazardous waste could be generated at the other action facilities. However, it is not anticipated that any hazardous materials not currently used at facilities would be used at the new facilities nor would any new waste streams be generated. The existing hazardous materials and waste management procedures would accommodate the cumulative condition construction and facility operation. No significant cumulative hazardous waste, hazardous materials, and stored fuels impacts would be anticipated.

4.7.5 Biological Resources

4.7.5.1 Dover AFB

Vegetation and Wildlife

The construction, demolition, and renovation activities would occur within developed, maintained areas with highly modified and disturbed landscape that is now either paved or has lawns and landscaping. There would be no disturbance of high quality and/or native vegetation outside either the project or immediately adjacent areas. The Dover AFB Alternative Action would not result in any adverse effects to vegetation and wildlife at the Base.

Threatened, Endangered, and Rare Species

As mentioned in Subchapter 3.1.5.1, no threatened, endangered, or rare species occur within the project areas associated with the Dover AFB Alternative Action.

4.7.5.2 Military Training Routes

The types of C-17 operations on MTRs under the Dover AFB Alternative Action would be the same as the Dover AFB Proposed Action. The greatest daily use for any of the MTRs by Dover AFB Alternative Action C-17s would be 0.66 sorties per day based on 7 days of flying per week (see Table 2.4.5-2). Thus, the routes would be flown infrequently. The discussion and analysis for the Dover AFB Proposed Action apply to this alternative. No significant adverse effects would be anticipated.

4.7.5.3 Mitigation

No significant adverse biological effects were identified. No mitigation would be required.

4.7.5.4 Cumulative Impacts

Dover AFB is a managed landscape; mowing, disking, building construction and urban-like improvements would be expected to continue into the foreseeable future, with or without the Dover AFB Alternative Action. Natural species diversity and continuity and connectivity of habitats would be expected to decline over the long term. Some species would thrive while others would be displaced and exotic species would most likely continue to increase and displace native species and communities. The Dover AFB Alternative Action cumulative condition biological resources impacts would not be considered significant.

4.7.6 Socioeconomic Resources

4.7.6.1 Dover AFB

Population

When compared to the Kent County population of 126,697 persons in 2000, the Dover AFB Alternative Action would result in a decrease in the local and regional population of 727 (0.006 percent) due to the net loss of 322 military and civilian positions. This anticipated population loss includes military personnel and family members directly impacted, as well as a portion of civilian personnel anticipated to relocate outside the area.

Housing

It is anticipated that approximately 350 housing units would become vacant due to the loss of military and civilian personnel, with the majority being housing occupied by military personnel and family members. The 350 housing units equate to 0.007 percent of the 50,481 housing units in Kent County. Based on the current on- and off-Base distribution of military personnel occupied housing in addition to off-Base civilian personnel, approximately 65 percent of these units would consist of off-Base housing. The Cities of Dover and Milford, and the Town of Smyrna would be expected to experience the most housing vacancies based on the present distribution of off-Base military residency.

Education

The net loss of the military and civilian population expected from the Dover AFB Alternative Action would result in a decrease in local school district enrollments. Assuming a factor of 0.75 school age children per military household, there would be an enrollment decrease of approximately 220 military dependent children in addition to a small number of children from affected civilian households who are assumed to relocate. It is anticipated that the 0.032 percent decrease in school enrollments would occur primarily within the Caesar

Rodney School District based on the current enrollment distribution of military dependent children.

Economy

Direct and indirect short-term beneficial economic impacts would be realized by the regional and local economy during the construction phase of the Dover AFB Alternative Action, while adverse long-term economic impacts would be expected to result after construction is completed. Employment generated by construction activities would result in wages paid, and expenditures for local and regional services and supplies. However, the loss of military and civilian employees as a result of subsequent loss of 322 personnel authorizations under the Dover AFB Alternative Action would result in a loss in wages paid, business sales and income to the local and regional economy.

The estimated construction cost (capital costs) for project implementation and annual average income for construction laborers were the inputs used in the execution of the EIFS construction model. The estimated construction cost is approximately $75.7 million over a 4.5-year period. The ROI is considered to be Kent County.

Since the economic projections generated by the EIFS model are on an annual basis, the primary model input for construction costs ($75.7 million) was pro-rated over an estimated 4.5-year construction period. As indicated in Table 4.7.6-1, the direct annual regional economic impacts of project construction over this 4.5-year period consist of increases of $11,391,700 in business volume (sales); 304 jobs in the construction, retail trade, services and industrial sectors; and, $7,966,312 in direct personal income. The latter value represents the earnings of employees in the construction, retail, wholesale and service establishments that are initially or directly affected by the construction activity. The increase in business volume reflects increases in the sales of goods, services and supplies associated with project construction activity.

Table 4.7.6-1 EIFS Annual Economic Impacts, Dover AFB Alternative Action

	Direct Impacts	Indirect Impacts	Total
Construction			
Sales (Business) Volume	$11,391,700	$16,631,890	$28,023,590
Income	$7,966,312	$3,442,819	$11,409,130
Employment	304	89	393
Operations			
Sales (Business) Volume	-$5,439,724	-$7,941,998	-$13,381,720
Income	-$12,274,450	-$1,644,003	-$13,918,450
Employment	-351	-42	-393

Source: U.S. Army Construction Engineering Research Laboratory 1999

Table 4.7.6-1 also portrays the indirect annual regional impacts on secondary sales, employment and income generated by the employment and business activity directly associated with project construction. The direct increase in sales and employment generates secondary sales of $16,631,890; creates an additional 89 jobs indirectly in the retail trade,

services, and industry sectors; and results in an additional $3,442,819 in indirect income. Income is indirectly impacted as a result of the indirect increase in sales and employment resulting from the initial economic impacts.

Long-term adverse economic impacts of the Dover AFB Alternative Action would be realized as a result of the loss of 322 military and civilian employees during operations. The primary inputs for the EIFS operations model are estimated loss of military and civilian employees (322) and annual average incomes of $37,900 and $40,255, respectively, for military and civilian employees being displaced.

As indicated in Table 4.7.6-1, the direct annual regional economic impacts as a result of a decrease of 322 employees consist of a loss to the regional economy of $5,439,724 in business volume (sales); 351 jobs in the government, retail trade, services, and industrial sectors; and $12,274,450 in direct personal income. The latter represents earnings of employees in the retail, wholesale, and service establishments who are initially or directly affected by the net loss of military and civilian employees. The decrease in business volume reflects decreases in the sales of goods, services, and supplies to the military and civilian personnel associated with project operations.

Table 4.7.6-1 also portrays the indirect annual regional impacts on secondary sales, employment, and income generated by the employment and business activities directly associated with operations. The indirect decrease in sales and employment generates losses in secondary sales of $7,941,998; the loss of an additional 42 jobs indirectly in the retail trade, services, and industry sectors; and loss of an additional $1,644,003 in indirect income. Income is indirectly impacted as a result of the decrease in sales and employment resulting from the initial economic impacts.

The EIFS model assessment of the regional economic impacts of project construction and operations of the Dover AFB Alternative Action reveals that the RTVs for each of the four variables were less than the regional RTVs. For this reason, short-term project construction and the long-term decrease in military and civilian personnel associated with the Dover AFB Alternative Action would not be expected to result in significant annual regional economic impacts.

4.7.6.2 Mitigation

No significant population, housing, education, or economic impacts would be anticipated. Therefore, no mitigation would be required.

4.7.6.3 Cumulative Impacts

There would be an increase of 206 personnel authorizations at Dover AFB under other actions, and a decrease of 161 personnel as a result of the Proposed Action. Additionally, 18 facilities projects would be constructed under other actions during the same period as the 16 Proposed Action projects. Table 4.7.6-2 presents cumulative impacts to population,

housing, and education, and Table 4.7.6-3 summarizes the economic impacts of the cumulative condition.

There would be a decrease of 322 personnel authorizations under the Dover AFB Alternative Action. The same number of facilities projects to be constructed under other actions and under the Proposed Action projects would be constructed under the Dover AFB Alternative Action. Table 4.7.6-2 presents cumulative impacts to population, housing, and education, and Table 4.7.6-3 summarizes the economic impacts of the cumulative condition.

Table 4.7.6-2 Cumulative Population, Housing, and Education Impacts, Dover AFB Alternative Action

Category	Proposed Action	Other Actions	Cumulative Condition	Percent Change
Population (persons)	-727	-	-727	.002 percent of Dover County population
Housing (units)	-350	-	-350	.007 percent of Burlington County housing units
Education (students)	-220	-	-220	.033 percent of Caesar Rodney students

Table 4.7.6-3 Cumulative Economic Impacts, Dover AFB Alternative Action

	Direct Impacts	Indirect Impacts	Total
Construction			
Sales (Business) Volume			
Other Actions	$43,603,060	$63,660,460	$107,263,520
Proposed Action	$11,391,700	$16,631,890	$28,023,590
Cumulative Impact	$54,994,760	$80,292,350	$135,287,110
Income			
Other Actions	$27,281,440	$13,177,790	$40,459,230
Proposed Action	$7,966,312	$3,3442,819	$11,409,130
Cumulative Impact	$35,247,752	$16,620,609	$51,868,360
Employment			
Other Actions	1,023	339	1,362
Proposed Action	304	89	393
Cumulative Impact	1,327	428	1,755
Operations			
Sales (Business) Volume			
Other Actions	-	-	-
Proposed Action	-$5,439,724	-$7,941,998	-$13,381,720
Cumulative Impact	-$5,439,724	-$7,941,998	-$13,381,720
Income			
Other Actions	-	-	-
Proposed Action	-$12,274,450	-$1,644,003	-$13,918,450
Cumulative Impact	-$12,274,450	-$1,644,003	-$13,918,450
Employment			
Other Actions	-	-	-
Proposed Action	-351	-42	-393
Cumulative Impact	-351	-42	-393

As indicated in Table 4.7.6-2, population within Kent County would decrease by 727, 350 housing units would be vacated, and there would be a decrease of 220 students in school enrollment. The greatest decrease for any of these categories for the Dover AFB Alternative Action cumulative condition when compared to the baseline condition would be the .033 percent decrease in school enrollment.

With respect to the EIFS model assessment of the economic impacts of construction and a decrease of 322 operations-related personnel, the RTVs for each of the four variables (population, sales volume, income, employment) were found to be less than regional RTVs. For this reason, short-term project construction and the long-term increase in military and civilian personnel associated with the Dover AFB Alternative Action cumulative condition would not be expected to result in significant annual regional economic impacts.

4.7.7 Cultural Resources

4.7.7.1 Dover AFB

Archaeological Resources

No NRHP-eligible archaeological resources are located within or adjacent to the ROI at Dover AFB. The Dover AFB Alternative Action would not result in any adverse effects to archaeological resources at the Base.

Historical Resources

The areas that would be affected by the Dover AFB Alternative Action would be identical to the areas identified for the Dover AFB Proposed Action. Therefore, the discussion and analysis in Subchapter 4.4.7.1 apply to the Dover AFB Alternative Action.

Native American Interests

No traditional cultural properties or other Native American interests have been identified within or immediately adjacent to the ROI for Dover AFB. A list of federally recognized and state-recognized Native American tribes and groups identified at the time of preparation of this document is presented in Table G-1 in Appendix G. The Air Force consulted with these entities pursuant to 36 CFR 800.2 (Appendix G). Responses to consultation were resolved by the Air Force's answer.

4.7.7.2 Military Training Routes

The MTRs that would be flown under the Dover AFB Alternative Action would be identical to the Dover AFB Proposed Action. Therefore, the areas that would be affected by the Dover AFB Alternative Action would be the same as the areas identified for the Dover AFB Proposed Action. The discussion and analysis in Subchapter 4.4.7.2 applies to the Dover AFB Alternative Action.

4.7.7.3 Mitigation

No significant archaeological and historical resources or Native American effects have been identified. Therefore, no mitigation measures would be required.

4.7.7.4 Cumulative Impacts

The relationship between Dover AFB Alternative Action sites and sites for other actions would be considered for mitigation and consultation with SHPO to reveal cumulative effects should an other action project include an eligible facility. The consultation documentation and process with Native American interests for the Dover AFB Alternative Action would include the other action sites. When combining the other actions with the Dover AFB Alternative Action through the consultation process, no cumulative adverse cultural resources effects, including visual, would be anticipated under the cumulative condition.

4.7.8 Land Use

4.7.8.1 Dover AFB

On-Base land use conflicts would not be expected under the Dover AFB Alternative Action. Most land uses would be compatible with the general character of existing and planned Base land use patterns. The Dover AFB General Plan incorporated mission beddown scenarios such as the alternative for the future land use and future development components of the General Plan. Thus, facility construction anticipated under the C-17 beddown would be consistent with existing and future land use plans and programs identified in the General Plan. Facility construction and alteration activities may have a temporary minor constraint on existing operations and land uses; however, after construction, these facilities would not be expected to impact any adjacent land use.

The Dover AFB Alternative Action would decrease the noise contours when compared to baseline conditions, and no additional areas would be exposed to higher noise levels. The landfill located in the southwest APZ I would continue to be incompatible with AICUZ recommendations. There would be no change to the dimensions of the CZs or APZs at Dover AFB. No additional land use incompatibilities would be anticipated under the Dover AFB Alternative Action.

4.7.8.2 Military Training Routes

Lands below the MTRs were reviewed to determine if increased aircraft noise or additional MTR operations would affect land uses. Sensitive land uses (*e.g.*, wildlife management areas, parks, residential) would be exposed to increased noise levels between L_{dnmr} 43 and 62 dBA. The maximum increase on any route would be L_{dnmr} 20 dBA (IR-762). However, the resultant noise level on that route would be L_{dnmr} 43 dBA. There would be no increase in noise on the route that had the highest noise under the baseline (VR-1709, L_{dnmr} 62 dBA). These resultant noise levels would be below the DNL noise/land use compatibility guidelines synopsized in Table 3.1.8-1. There are numerous recreational/wilderness areas below the MTRs (see Subchapter 3.1.8) where visitors may be annoyed by aircraft overflight. However, based on the sensitive land uses, exposed noise levels and consideration of the noise and overflight studies described in Subchapter 3.1.3, no significant impacts to sensitive land uses would be anticipated due to the slight increase in noise levels or additional

overflights from the proposed operations. No impacts to land ownership or the existing function of the sensitive land uses would occur.

4.7.8.3 Mitigation

No significant land use impacts would occur as a result of the Dover AFB Alternative Action. Therefore, no mitigative actions would be required. The local planning agencies could use the noise contours for future land use planning and zoning.

4.7.8.4 Cumulative Impacts

Under the cumulative condition, other facilities would be constructed on Dover AFB and some would be in the general area associated with C-17 basing activities. As with the Dover AFB Alternative Action facilities, the other facility actions would be compatible with the Dover AFB General Plan. Thus, the facility construction anticipated under the cumulative condition would be consistent with existing and future land use plans and programs identified in the General Plan.

4.7.9 Infrastructure and Utilities

4.7.9.1 Dover AFB

Water Supply

Under the Dover AFB Alternative Action, there would be a net loss of 322 Air Force active duty, reserve, and civilian personnel, decreasing the Base workforce to 7,508 persons. The average daily per capita consumption for CY02 was approximately 108.42 gal/day. Assuming the same consumption rate, there would be a net reduction of about 34,911 gallons of water per day used as a result of the Dover AFB Alternative Action. This represents a 4.11 percent reduction when compared to the baseline condition. The resultant maximum daily demand would be about 2.86 mgd. Dover AFB Alternative Action water consumption would be about 94 percent of system capacity, which equates to an approximate 1 percent reduction when compared to the baseline condition.

In addition to personal use, up to 0.0035 mgd of water per acre may be applied for dust control during demolition, construction, and renovation. This water would be supplied by the Dover AFB water system. It is estimated that dust control water application would occur approximately 115 days per year and that approximately 19 acres would be disturbed during the duration of the project. About 0.07 mgd of water would be applied for dust control 115 days per year. Use of 0.07 mgd of water for dust control equates to about 2.2 percent of system capacity. Use of water for dust suppression would end when the demolition and construction activities are completed.

Wastewater Treatment

Under the Dover AFB Alternative Action, there would be a net loss of 322 Air Force active duty, reserve, and civilian personnel, decreasing the Base workforce to 7,508 persons. The average per capita generation of wastewater for FY02 was about 101.81 gal/day. Assuming the same generation rate, there would be a net reduction of about 32,783 gallons of wastewater produced per day as a result of the Dover AFB Alternative Action. The average daily wastewater treated at the WWTP would be 10.97 mgd (73.13 percent of capacity), or about 0.20 percent less than the baseline condition.

Storm Water Management

All proposed demolition and construction activities would occur within the existing boundaries of Dover AFB. The amount of impervious cover on the Base is approximately 2,146 acres (93,479,760 square feet). The amount of impervious cover would increase by 830,874 square feet (19 acres), which represents about 0.89 percent increase over baseline conditions. Therefore, the amount of storm water runoff should not increase significantly above the existing conditions. Curbs and gutters installed during any street and off-street parking construction would be connected to the existing storm water system. If required, a new storm water system or connections would be designed and constructed to comply with current regulations and to accommodate any storm water flow increases. Since the amount of disturbed area would be greater than 5,000 square feet, a storm water permit for construction activities would be required. Discussion of the SWPPP and erosion control techniques for the Dover AFB Proposed Action apply to the Dover AFB Alternative Action.

Energy

As a result of the Dover AFB Alternative Action, there would be a net increase of 60,874 square feet of climate controlled space and daily electricity and natural gas use would increase by 2,800 kWH (60,874 square feet x 0.046 kWH per square foot) and 122 ccf (60,874 square feet x 0.002 ccf per square foot), respectively. The net increases represent 1.68 and 1.42 percent, respectively, of the baseline electricity and natural gas consumption. The energy system capacities are adequate to handle the increases as a result of the proposed new buildings.

Solid Waste Management

Under the Dover AFB Alternative Action, there would be an estimated 322 fewer personnel working on Base. Thus, approximately 352 fewer pounds per day of solid waste would be generated by all activities based on an average daily generation of 1.04 pounds per person.

Based on the assumptions for the Dover AFB Proposed Action and estimations for the alternative, 587,893 square feet of new facilities would be constructed, 10,000 square feet of space would be renovated/altered, and 3,330,400 square feet of additional area would be paved. Based on these data and the assumptions listed above, it is estimated that 2,117 tons

of demolition and construction debris would be generated by the Dover AFB Alternative Action.

As mentioned in Section 3.1.9.5, the Delaware Solid Waste Authority Landfill has a remaining projected life expectancy of 9 years, with an average disposal rate of 27 tons per day. Based on an average disposal of 365 days per year (*i.e.*, 7 days per week) for 9 years (the more conservative condition), there would be 5,475 days when construction and demolition debris would be disposed in the landfill. Thus, the total remaining capacity of the landfill is estimated at 147,825 tons. The projected disposal from the project (2,117 tons) equates to about 1.43 percent of the total remaining capacity. 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. The exact amount of debris that would be recycled cannot be estimated at this time and this analysis assessed the most conservative condition.

Transportation Systems

There would be a temporary increase in construction-related traffic associated with the construction activities. It is anticipated construction-related traffic would be localized to the specific construction project area as well as the route between the project site and the Base gates. The construction-related traffic would be temporary, lasting as long as the project activity in that area. The net loss of 322 Air Force active duty, reserve, and civilian personnel (4 percent when compared to the baseline 7,830 personnel) would result in a slight decrease in weekday on-Base roadway volumes and vehicular traffic at Base gates.

4.7.9.2 Mitigation

No significant impacts would be anticipated as a result of the Dover Alternative Action. Therefore, no mitigation would be required.

4.7.9.3 Cumulative Impacts

Water Supply

There would be no changes in personnel associated with the other actions. Therefore, there would be no water consumption cumulative impacts.

As with the Dover AFB Alternative Action, water would be applied for dust control for the other actions. It is estimated approximately 12 acres would be disturbed as a result of the other actions. Based on the acres and application data used for the Dover AFB Alternative Action, about 0.04 mgd of water would be applied for dust control for the other actions. The cumulative condition use of 0.11 mgd of water for dust control equates to about 3.6 percent of system capacity. Use of water for dust suppression would end when the demolition and construction activities are completed.

Wastewater Treatment

There would be no changes in the number of personnel at the Base under the other actions. Therefore, there would be no wastewater cumulative impacts.

Storm Water Management

The amount of impervious cover associated with the other actions would increase by 1,934,193 square feet (44 acres). Thus, when combining the area associated with the alternative action with the other actions, there would be a net increase of 2,765,067 square feet (31 acres) under the cumulative condition, which equates to a 2.96 percent increase when compared to the baseline condition. Discussion of the SWPPP and erosion control techniques for the Dover AFB Proposed Action apply to the Dover AFB Alternative Action cumulative condition.

Energy

As a result of the other actions, there would be a net increase of 1,184,193 square feet of climate-controlled space. Daily electricity and natural gas use would increase by 54,473 kWH (1,184,193 square feet x 0.046 kWH per square foot) and 2,368 ccf (1,184,193 square feet x 0.002 ccf per square foot), respectively. When combining daily consumption of the other action with the Dover AFB Alternative Action daily consumption, daily electricity and natural gas use would be 57,273 kWH and 2,490 ccf, respectively. The consumption would represent daily increases of 34.37 and 28.97 percent, respectively, for electricity and natural gas under the Dover AFB Alternative Action cumulative condition. The energy system capacities are adequate to handle the increases as a result of the proposed new buildings.

Solid Waste Management

Under the Dover AFB Proposed Action cumulative condition, there would be an estimated 322 fewer personnel working on Base. Thus, approximately 352 fewer pounds per day of solid waste would be generated by all activities based on an average daily generation of 1.04 pounds per person.

As stated in Subchapter 2.6.4, the cumulative condition for the Dover AFB Alternative Action would be the same as the Dover AFB Proposed Action. Based on the generation assumptions for the Dover AFB Proposed Action, it is estimated 3,321 tons of debris would be generated by the other actions.

The life expectancy and disposal information used for the Dover AFB Proposed Action analysis apply to the cumulative condition. The projected disposal from the Dover AFB Alternative Action cumulative condition (2,117 plus 3,321 equals 5,438 tons) equates to 3.68 percent of the total remaining capacity. The recycling discussion for the Dover AFB Proposed Action applies to the cumulative condition.

Transportation

Construction projects associated with the other actions would increase project-related traffic as described for the Dover AFB Alternative Action. Since some of the other actions are in the same area as the Alternative Action construction activities, there could be a slight cumulative increase in traffic. As with the Dover AFB Alternative Action, construction-related traffic would be temporary, lasting as long as the project activity in that area. As reflected in Subchapter 2.6.4, there would be no personnel changes associated with the other actions. Thus, there would be a net loss of 322 personnel under the Dover AFB Alternative Action cumulative condition, or a 4 percent decrease when compared to the baseline. The Dover AFB Alternative Action cumulative condition would result in a slight decrease in weekday on-Base roadway volumes and vehicular traffic at Base gates.

4.7.10 Airspace and Airfield Operations

4.7.10.1 Dover AFB

Airspace Operations

Given the size and operating similarities (airspeed, flight profiles) of the C-17 and C-5 aircraft, the type of sortie aircraft operations and airspace requirements associated with the Dover AFB Alternative Action would be consistent with the baseline operations. The existing air traffic control procedures and airspace infrastructure surrounding Dover AFB have the capacity to accommodate the anticipated C-17 operations. The low altitude federal airways and MTRs that transit the airspace would not be impacted, nor would they affect, operations in the airspace.

Airfield Operations

Under the Dover AFB Alternative Action, average daily airfield operations at the Base would decrease by 93.47 operations from 239.25 to 145.78 operations (see Tables 2.4.1-1 and 2.4.5-1, respectively), a 39 percent decrease. The only difference between the airfield operations anticipated with the Dover AFB Alternative Action and the Dover AFB Proposed Action is that there would be no C-5 operations under the alternative. Therefore, the Dover AFB Proposed Action discussion and analysis in Subchapter 4.4.10.1 apply to the Dover AFB Alternative Action. The airfield has the capacity to accommodate the reduced anticipated level of operations as well as the C-17 tactical events that would be accomplished at the airfield.

4.7.10.2 Military Training Routes

Under the Dover AFB Alternative Action, individual route use by Dover AFB C-17s would range from as few as 1.33 monthly operations on IRs-714 and 720 to as many as 19.83 monthly operations on VRs-705 and 707 and SR-846 (see Table 2.4.3-2). Route use by all aircraft types would range from as few as 1.49 monthly operations on IR-720 to as many as 160.68 monthly operations on VR-1709 (see Table 4.7.3-3). None of the 22 MTRs would

require modification to support C-17 operations. Thus, there would be no need to change to the specific data for any route in Appendix B.

The airspace management and procedures discussion and analysis for the Dover AFB Proposed Action apply to the alternative action. In summary, each MTR has the capacity to accommodate the additional operations associated with the alternative action, and the structure for each route can support C-17 operations.

4.7.10.3 Aircraft Safety

The aircraft size and flight characteristics of the aircraft based at Dover AFB (C-17) under the alternative action are identical to the aircraft that would be based at Dover AFB under the Proposed Action. Therefore, the discussion and analysis for the Dover AFB Proposed Action apply to the Dover AFB Alternative Action. The probability is low that an aircraft involved in an accident at or around the Dover AFB airfield or on a MTR (C-17 only) would strike a person or structure on the ground.

4.7.10.4 Bird-Aircraft Strike Hazard

The bird-aircraft strike assessment factors for the Dover AFB Proposed Action in Subchapter 4.4.10.4 apply to the Dover AFB Alternative Action. Likewise, the bird-aircraft strike fluctuation and bird-aircraft strikes-serious mishap information for the Dover AFB Proposed Action apply.

Overall, it is estimated the total airfield operations for Dover AFB's C-17s would decrease under the Dover AFB Alternative Action by about 45 percent when compared to the baseline. Thus, bird-aircraft strikes associated with airfield operations at Dover AFB would be expected to decrease commensurate with the change in airfield operations. Based on the 2003 data in Table 3.1.10-3 and the decrease in airfield operations, it is estimated that 18.6 annual bird-aircraft strikes would occur when applying the decrease in airfield operations. Table 4.7.10-1 lists the monthly bird-aircraft strikes based on the baseline monthly average bird-aircraft strikes per airfield operation and the anticipated monthly operations.

Table 4.7.10-1 Estimated Dover AFB Alternative Action Bird-Aircraft Strikes

Month	Baseline Monthly Average	Estimated Monthly Bird-Aircraft Strikes	Net Change	Percent Change
Jan	0.5	0.2	-0.3	-60%
Feb	1.0	0.5	-0.5	-50%
Mar	2.3	1.0	-1.3	-57%
Apr	1.5	0.7	-0.8	-53%
May	4.5	2.0	-2.5	-56%
Jun	2.3	1.0	-1.3	-57%

Table 4.7.10-1 Estimated Dover AFB Alternative Action Bird-Aircraft Strikes (*…continued*)

Month	Baseline Monthly Average	Estimated Monthly Bird-Aircraft Strikes	Net Change	Percent Change
Jul	4.8	2.2	-2.6	-54%
Aug	5.3	2.4	-2.9	-55%
Sep	5.5	2.5	-3.0	-55%
Oct	7.3	3.3	-4.0	-55%
Nov	3.5	1.6	-1.9	-54%
Dec	2.7	1.2	-1.5	-56%
Total	41.2	18.6	-22.6	55%

Dover AFB aircrews flew no MTR operations under the baseline condition and the baseline bird-aircraft strike data for the operations that occurred on the routes proposed for use by Dover AFB are not available. Thus, there is no statistical data for use in estimating bird-aircraft strikes for the Dover AFB Alternative Action MTR operations. Based on an estimated average of 45 minutes of flying time for each route flown, Dover AFB C-17 aircrews would fly a combined 1,192 hours annually on all the MTRs. Using this estimate of flying time and the Air Force-wide rate of 0.0052 strikes per flying hour, it is anticipated that about six bird-aircraft strikes would occur annually from Dover AFB C-17 MTR operations. It is unlikely that any of these bird-aircraft strike incidents would result in an aircraft accident, involve injury either to aircrews or to the public, or damage to property (other than the aircraft).

4.7.10.5 Mitigation

No significant airspace and airfield operations, MTR operations, aircraft safety, or BASH impacts would be anticipated. Thus, no mitigation would be required.

4.7.10.6 Cumulative Impacts

None of the other actions anticipated at Dover AFB include aircraft basing or airfield operations changes. Therefore, no cumulative airspace and airfield operations impacts would be anticipated.

4.7.11 Environmental Management

4.7.11.1 Dover AFB

As described in Subchapter 2.4.5.2, the seven facility projects associated with the Dover AFB Alternative Action occur at the same location as the seven Dover AFB Proposed Action projects and involve the same types of activities. Therefore, the pollution prevention, asbestos and LBP, and ERP discussion and analyses for the Dover AFB Proposed Action apply to the Dover AFB Alternative Action. As with the Dover AFB Proposed Action, no significant pollution prevention, asbestos and LBP, and ERP impacts would be anticipated under the Dover AFB Alternative Action.

4.7.11.2 Mitigation

No significant pollution prevention, asbestos and LBP management, or ERP impacts would be anticipated. For this reason, no mitigation measures would be required.

4.7.11.3 Cumulative Impacts

The construction contractor for other projects would be required to comply with the regulatory requirements and best management practices identified for the Dover AFB Proposed Action. Although some of the other actions are adjacent to Dover AFB Alternative Action project sites, use of the regulatory requirements and best management practices identified for the Dover AFB Proposed Action would minimize the potential for cumulative impacts. When completed, activities at the other facilities would be managed in accordance with applicable environmental plans and policies. No cumulative pollution prevention, asbestos and LBP management, or ERP impacts would be anticipated.

4.8 LANDING ZONE ALTERNATIVES

As mentioned in Subchapter 1.4.6, three separate levels of LZ operating conditions could occur depending on the total number of C-17 aircraft that would be based in the northeastern United States. However, only the LZ operations condition associated with basing 36 C-17 aircraft is assessed since it would represent the greatest potential for significant environmental effects of the three possible alternatives.

4.8.1 McGuire AFB Landing Zone Alternative

4.8.1.1 Air Quality

The methodologies used to estimate emissions from airfield operations for the Dover AFB Proposed Action were used to determine emissions under the McGuire AFB LZ Alternative.

Table 4.8.1-1 lists emissions anticipated from the McGuire AFB LZ Alternative, which includes the McGuire AFB Alternative Action emissions, and compares total emissions to the baseline AQCR emissions inventory. The CAA General Conformity Applicability Analysis for the McGuire AFB Alternative Action also evaluated the McGuire AFB LZ Alternative (USAF 2004b). Table 4.8.1-2 summarizes the net change in emissions associated with the McGuire AFB LZ Alternative in AQCR 45, and Table 4.8.1-3 compares the change in emissions for regional significance and *de minimis* purposes.

Table 4.8.1-1 McGuire AFB Landing Zone Alternative Emissions in AQCR 45

Criteria Air Pollutant	CO (tpy)	VOC (tpy)	NOx (tpy)	SOx (tpy)	PM10 (tpy)
AQCR 45 CY99 Emissions Inventory	50,300	45,780	89,880	101,050	12,600
Construction Emissions					
Extreme Condition Alternative Action Construction Emissions[a]	5.640	1.280	14.060	1.520	3.450
Landing Zone Construction Emissions	6.730	2.700	0.440	0.31	5.04
Combined Construction Emissions	12.370	3.980	14.500	1.83	8.49
Construction Emissions as Percent of AQCR Emissions	0.02%	0.01%	0.02%	0.00%	0.07%
Aircraft Emissions					
AGE Operation[a]	4.989	1.401	17.552	1.991	1.129
Airfield Operations[a]	1,572.000	1,095.000	939.000	0.000	214.000
Landing Zone Operations	99.680	13.380	611.850	0.000	146.390
Aircraft Trim/Power Checks[a]	17.000	8.000	83.000	0.000	13.000
Annual MTR Operations[a]	0.230	0.140	19.570	0.000	1.490
Annual Aircraft Emissions	1,693.899	1,117.921	1,670.972	1.991	376.009
Annual Aircraft Emissions as Percent of AQCR Emissions	3.37%	2.44%	1.86%	0.00%	2.98%

(a) Estimated emissions from McGuire AFB Alternative Action activities.

Note: VOC is not an air pollutant criterion. However, VOC is reported because, as an O_3 precursor, it is a controlled pollutant.

Table 4.8.1-2 Net Change in Emissions from McGuire AFB Landing Zone Alternative in AQCR 45

Category	Pollutants Emitted (tons/year)				
	CO	NO_X	VOC	SO_X	PM_{10}
Net Change in Airfield Operations Emissions	+786.000	+469.000	+547.000	+0.00	+107.000
Net Change in AGE Operation Emissions	+0.512	+1.804	+0.144	+0.205	+0.116
Net Change in Trim/Power Check Emissions	0.000	+18.000	0.000	0.000	+6.000
Net Change in Construction Emissions	+5.640	+14.060	+1.280	+1.520	+3.450
Net Change in Military Training Route Operation Emissions	+0.110	+9.770	+0.070	0.000	+0.760
Net Change in Landing Zone Operations Emissions	+99.680	+611.850	+13.380	0.000	+146.390
Net Change in LZ Construction Emissions	+6.730	+2.700	+0.440	+0.310	+5.040
Net Change in Emissions for the Landing Zone Alternative	+898.672	**+1,127.184**	**+562.314**	+2.035	+268.756

Note: Bold indicates the pollutant is nonattainment within the AQCR.

Source USAF 2004b.

Table 4.8.1-3 Regional Significance Analysis and Comparison to Conformity *de minimis* Thresholds for AQCR 45 for the McGuire AFB Landing Zone Alternative

Category	Pollutants Emitted (tons/year)				
	CO	NO_X	VOC	SO_X	PM_{10}
Emissions Inventory	50,300	89,880	45,780	101,050	12,600
Net Change in Emissions	+898.672	**+1,127.184**	**+562.314**	+2.035	+268.756
Percent Change Compared to Emissions Inventory	+1.79%	+1.25%	+1.23%	+0.00%	+2.13%
Regionally Significant? (>10%)	NA	**No**	**No**	NA	NA
de minimis Threshold (tpy)	NA	100	50	NA	NA
Exceed *de minimis* Threshold?	NA	**Yes**	**Yes**	NA	NA
SIP Budgets (tpy)	NA	1,084	1,198	NA	NA
Exceed SIP Budgets?	NA	**Yes**	**No**	NA	NA

NA not applicable. De minimis does not apply since the AQCR is in attainment for pollutant.

Source USAF 2004b.

The construction emissions presented in Table 4.8.1-1 include the estimated annual emissions from construction equipment exhaust associated with the McGuire AFB LZ Alternative. Emissions would produce slightly elevated air pollutant concentrations. However, the effects would be temporary, fall off rapidly with distance from the proposed construction site, and would not result in any long-term impacts.

AGE, LZ, and other airfield operations, as well as aircraft trim/power checks and MTR operations within the AQCR in which McGuire AFB is located, would generate emissions on a recurring basis. Table 4.8.1-1 lists the annual emissions from these operations for the McGuire AFB LZ Alternative. As indicated in Table 4.8.1-1, the greatest volume of emissions for any of the criteria pollutants from recurring aircraft operations would be 1,693.899 tpy for CO, which equates to 3.37 percent of the AQCR emissions inventory for that pollutant.

The CAA General Conformity Applicability Analysis for the McGuire AFB Alternative Action also evaluated the McGuire AFB LZ Alternative (USAF 2004b). Specifically, the analysis concluded that, although the alternative would occur within an air basin designated as moderate nonattainment for O_3, the net change in emissions for NO_X and VOC, would be less than 10 percent of the emissions inventory and the action would not be considered regionally significant. However, the net change in emissions would exceed the *de minimis* thresholds of 100 tpy for NO_X and 50 tpy for VOC. Although the New Jersey SIP allows McGuire AFB to emit NO_X and VOC at annual rates greater than *de minimis* thresholds, the annual NO_X emissions from the action would exceed the volume in the SIP. The annual VOC emissions would not exceed the SIP budget for the pollutant. Therefore, the analysis determined that the McGuire AFB LZ Alternative negatively conforms to the applicable SIP for AQCR 45 because the NO_X emissions exceed the budget. The McGuire AFB LZ Alternative has been demonstrated by USEPA standards to cause or contribute to new violations of any national ambient air quality standard in the affected area, and increase the

frequency or severity of an existing violation. Implementation of the McGuire AFB LZ Alternative would delay timely attainment of the O_3 standards in the air basin, and the action would not be in compliance or consistent with all relevant requirements and milestones contained in the applicable SIP. This conclusion of negative General Conformity Determination for the federal action planned for McGuire AFB LZ would not fulfill the Air Force's obligation and responsibility under 40 CFR Part 93, Subpart B.

Mitigation

If selected as the preferred LZ alternative, the Air Force would coordinate with the NJDEP to establish General Conformity budgets that ensure the air emissions from the McGuire AFB LZ Alternative conform to the New Jersey State Implementation Plan for attainment of the Ozone National Ambient Air Quality Standard. It is anticipated the coordination process would be completed before this EA is finalized. With inclusion of the emissions in the budget, the emissions from the McGuire AFB LZ Alternative would positively conform to the applicable SIP.

Cumulative Impacts

Numerous construction projects would be accomplished under the other actions announced for McGuire AFB. The methodologies for calculating emissions for the Dover AFB Proposed Action were used to estimate emissions for the McGuire AFB LZ Alternative cumulative condition. Cumulative condition construction projects would occur over an approximate 7-year period. Therefore, the year with the greatest construction equipment emissions (CY07) was used to present the extreme condition for emissions analysis. Table 4.8.1-4 summarizes emissions from the other actions as well as the McGuire AFB LZ Alternative and compares the emissions to the baseline AQCR emissions inventory.

Table 4.8.1-4 McGuire AFB Landing Zone Alternative Cumulative Condition Emissions

Criteria Air Pollutant	CO (tpy)	VOC (tpy)	NOx (tpy)	SOx (tpy)	PM10 (tpy)
AQCR 45 CY99 Emissions Inventory	50,300.00	45,780.00	89,880	101,050.00	12,600.00
Alternative Action Cumulative Condition Extreme Condition Construction Emissions[(a)]	22.450	3.900	42.020	4.560	13.000
Landing Zone Construction Emissions	6.730	2.700	0.440	0.310	5.040
Total Construction Emissions	29.180	6.600	42.460	4.870	18.040
Annual Emissions from Alternative Action Aircraft Operations	1,594.219	1,104.541	1,059.112	1.991	229.619
Annual Emissions from Landing Zone Alternative Aircraft Operations	99.680	13.380	611.850	0.000	146.390
Total Annual Aircraft Operations Emissions	1,693.899	1,117.921	1,670.962	1.991	376.009
Combined Construction and Aircraft Operations Emissions	1,723.079	1,124.521	1,713.422	6.861	394.149
Cumulative Condition Emissions as Percent of AQCR Emissions	3.43%	2.47%	1.91%	0.00%	3.13%

(a) CY07 used for the extreme condition construction emissions.

Note: VOC is not an air pollutant criterion. However, VOC is reported because, as an O_3 precursor, it is a controlled pollutant.

Review of data in Table 4.8.1-4 indicates that the 1,723.079 tons of CO from McGuire AFB Landing Zone Alternative cumulative condition activities would equate to 3.43 percent of the emissions inventory, constituting the greatest percent of baseline emissions inventory for the criteria pollutants. If McGuire AFB were selected as the basing alternative and the LZ alternative, the emissions from the planned construction projects would exceed McGuire AFB's emission budget for NO_x and McGuire AFB would contact the NJDEP concerning the assessment of actual emissions versus budgeted emissions.

The CAA General Conformity Applicability Analysis for the McGuire AFB Alternative Action also evaluated the McGuire AFB LZ Alternative (USAF 2004b). Table 4.8.1-5 summarizes the net change in emissions associated with the Dover AFB Landing Zone Alternative cumulative condition, and Table 4.8.1-6 compares the change in emissions for regional significance and *de minimis* purposes.

Table 4.8.1-5 Net Change in Emissions from McGuire AFB Landing Zone Alternative Cumulative Condition Activities in AQCR 45

Category	Pollutants Emitted (tons/year)				
	CO	NO_X	VOC	SO_X	PM_{10}
Net Change in Alternative Action Aircraft Operations Emissions	+786.622	**+498.574**	**+547.214**	+0.205	+113.776
Net Change in Landing Zone Alternative Aircraft Operations Emissions	+99.680	**+611.850**	**+13.380**	0.000	+146.390
Net Change in Construction Emissions	+29.180	+44.720	+4.340	+4.870	+18.140
Net Change in Cumulative Condition Emissions	+915.482	**+1,155.144**	**+564.934**	+5.075	+278.306

Note *Bold indicates the pollutant is nonattainment within AQCR 46.*

Source *USAF 2004b.*

Table 4.8.1-6 Regional Significance Analysis and Comparison to Conformity *de minimis* Thresholds for AQCR 45 for the McGuire AFB Landing Zone Alternative Cumulative Condition

Category	Pollutants Emitted (tons/year)				
	CO	NO_X	VOC	SO_X	PM_{10}
Emissions Inventory	50,300	89,880	45,780	101,050	12,600
Net Change in Emissions	+915.482	**+1,155.144**	**+564.934**	+5.075	+278.306
Percent Change Compared to Emissions Inventory	+1.82%	**+1.26%**	**+1.23%**	+0.01	+2.21%
Regionally Significant? (>10%)	NA	**No**	**No**	NA	NA
de minimis Threshold (tpy)	NA	100	50	NA	NA
Exceed *de minimis* Threshold?	NA	**Yes**	**Yes**	NA	NA
SIP Budgets (tpy)	NA	1,084	1,198	NA	NA
Exceed SIP Budgets?	NA	**Yes**	**No**	NA	NA

NA *not applicable. De minimis does not apply since AQCR 45 is in attainment for pollutant.*

Source *USAF 2004b.*

The CAA General Conformity Applicability Analysis for the McGuire AFB Alternative Action also evaluated the McGuire AFB LZ Alternative cumulative condition (USAF 2004b). Specifically, the analysis concluded that, although the cumulative condition would occur within an air basin designated as moderate nonattainment for O_3, the net change in emissions for NO_X and VOC, would be less than 10 percent of the emissions inventory and the action would not be considered regionally significant. However, the net change in emissions would exceed the *de minimis* thresholds of 100 tpy for NO_X and 50 tpy for VOC. Although the New Jersey SIP allows McGuire AFB to emit NO_X and VOC at annual rates greater than *de minimis* thresholds, the NO_X emissions from the action would exceed the volume in the SIP. The annual VOC emissions would not exceed the SIP budget for the pollutant. Therefore, the analysis determined that the McGuire AFB LZ Alternative cumulative condition negatively conforms to the applicable SIP for AQCR 45 because the NO_X emissions exceed the budget. The McGuire AFB LZ Alternative cumulative condition has been demonstrated by USEPA standards to cause or contribute to new violations of any national ambient air quality standard in the affected area, and increase the frequency or severity of an existing violation. Implementation of the McGuire AFB LZ Alternative cumulative condition would delay timely attainment of the O_3 standards in the air basin, and the action would not be in compliance or consistent with all relevant requirements and milestones contained in the applicable SIP. This conclusion of negative General Conformity Determination for the federal action planned for McGuire AFB LZ Alternative cumulative condition would not fulfill the Air Force's obligation and responsibility under 40 CFR Part 93, Subpart B.

4.8.1.2 Noise

The aircraft operations modeled include transient aircraft operations as well as the anticipated C-17 (to include LZ and related operations), KC-10, and KC-135E operations. Figure 4.8.1-1 shows the aircraft ground tracks and Figure 4.8.1-2 depicts the noise exposure area from the aircraft operations condition for the McGuire AFB LZ Alternative. Figure 4.8.1-3 compares the LZ Alternative and baseline noise contours. Table 4.8.1-7 compares the baseline and McGuire Landing Zone Alternative DNL as well as the C-17 SEL. There would be no change to the ground tracks for the KC-10 and KC-135E aircraft. Therefore the baseline SEL for the two aircraft would be the same as the baseline condition (see Table 3.3.3-2). Table 4.8.1-8 compares the land area and population exposed to noise of DNL 65 dBA and greater, as well as the population potentially highly annoyed, for the McGuire AFB Landing Zone Alternative with the baseline condition. There would be an overall 865 percent increase in the number of people exposed to DNL 65 dBA and greater. Data from these tables are used in the single event and day-night sound analysis sections.

Table 4.8.1-7 Comparison of DNL from Proposed Airfield Operations at Analysis Points with Baseline, McGuire AFB Aircraft Landing Zone Alternative

		DNL (dBA)			C-17 SEL (dBA)		
Number	Description	BL	Alt	Chg	BL	Alt	Chg
1	Residence	59	66	+7	98	98	0
2	New Egypt	58	58	0	88	88	0
3	Farm House	64	64	0	96	96	0
4	Fort Dix Cantonment	54	56	+2	97	97	0
5	McGuire AFB Family Housing	52	66	+14	98	98	0

Note: BL=baseline. Alt=alternative. Chg=change. There would be no change to the KC-10 or KC-135E SEL (see Table 3.2.3-2) since there are no changes to the flight tracks or profiles these aircraft would fly. The analysis point number and description correspond to the point as reflected on the noise contour and aircraft ground track figures. There may be minor differences when comparing the DNL for a point from the table to the DNL for the point as depicted on the noise contour figure. This difference is a result of small misalignments during the process of printing the noise contours on top of the background map.

Table 4.8.1-8 Summary of Land Area and Population Exposed to, and Population Potentially Highly Annoyed by DNL 65 dBA and Greater, McGuire AFB Aircraft Landing Zone Alternative

	DNL Interval (dBA)				
Category	65-70	70-75	75-80	80+	Total
Acres					
Baseline Acres	2,727	1,350	618	345	5,040
Landing Zone Alternative	6,986	2,452	1,124	813	11,375
Change	+4,259	+1,102	+506	+468	+6,335
Percent Change	+156%	+82%	+82%	+136%	+126%
Population					
Baseline Population	1,017	342	75	0	1,734
Landing Zone Alternative	10,732	2,567	450	84	13,833
Change	+9,714	+2,225	+375	+84	+12,399
Percent Change	+955%	+651%	+503%	--%	+865%
Population Highly Annoyed					
Baseline Population	224	126	40	0	390
Landing Zone Alternative	2,361	950	243	51	3,605
Change	+2,137	+824	+203	+51	+3,215
Percent Change	+954%	+654%	+508%	--%	+824%

Note: People highly annoyed determined by multiplying the total number of people in the noise zone times the higher percent number for the interval in Table 3.1.3-4.

Single Event Noise Analysis, McGuire AFB Landing Zone Alternative

Sound Exposure Level

A total of five representative analysis points were selected under the traffic patterns and around the airfield to calculate the SEL due to aircraft overflight. The noise contour and aircraft ground track figures show the locations of the analysis points.



McGuire Air Force Base

LEGEND

- Flight Track
- Runway
- Roadway
- Analysis Point
- McGuire AFB
- Fort Dix
- Urban Area

N

0 3

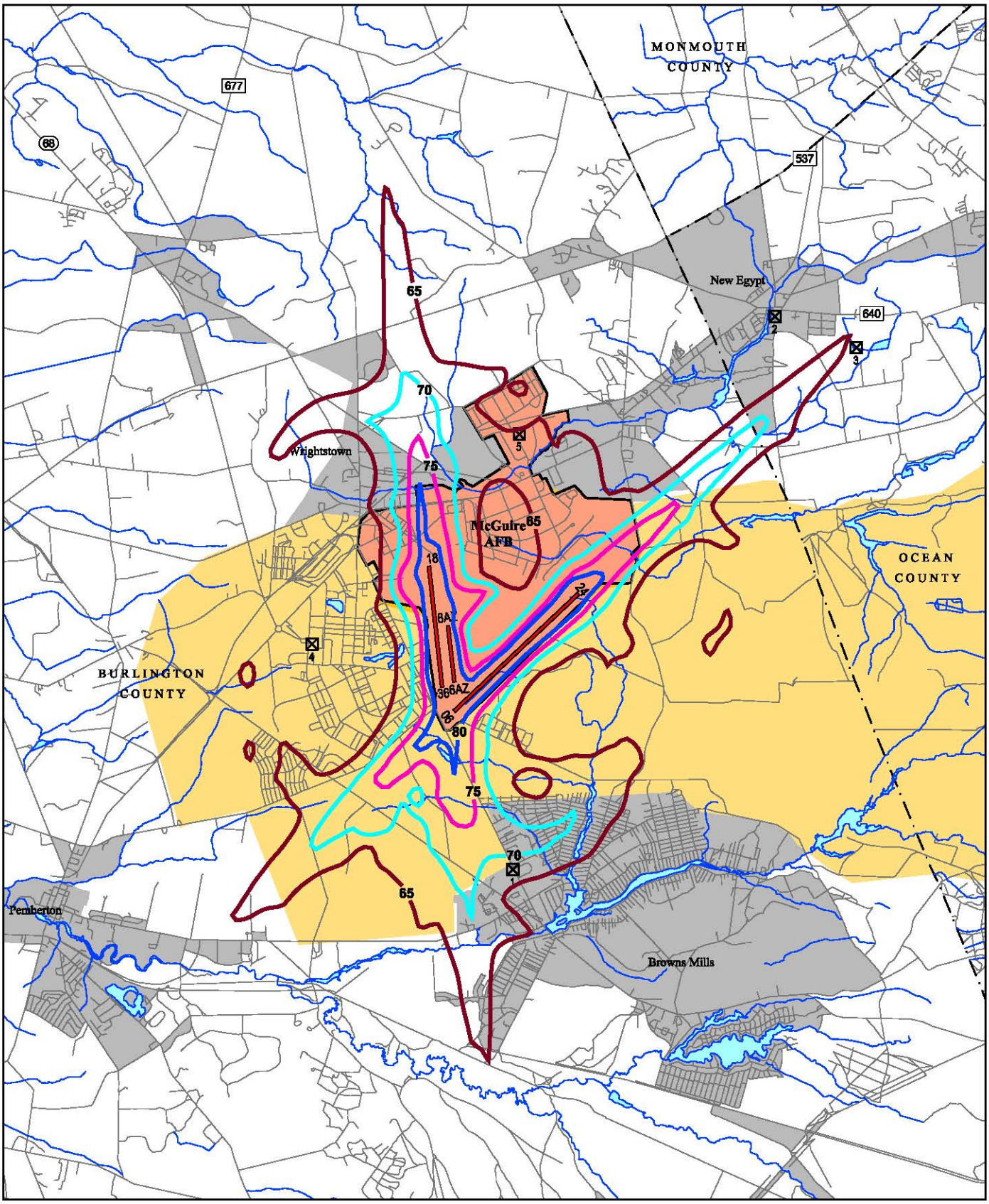
Miles

Aircraft Ground Tracks, McGuire AFB Landing Zone Alternative

Figure 4.8.1-1

743528 EC17-MCG-ALZGT.DWG

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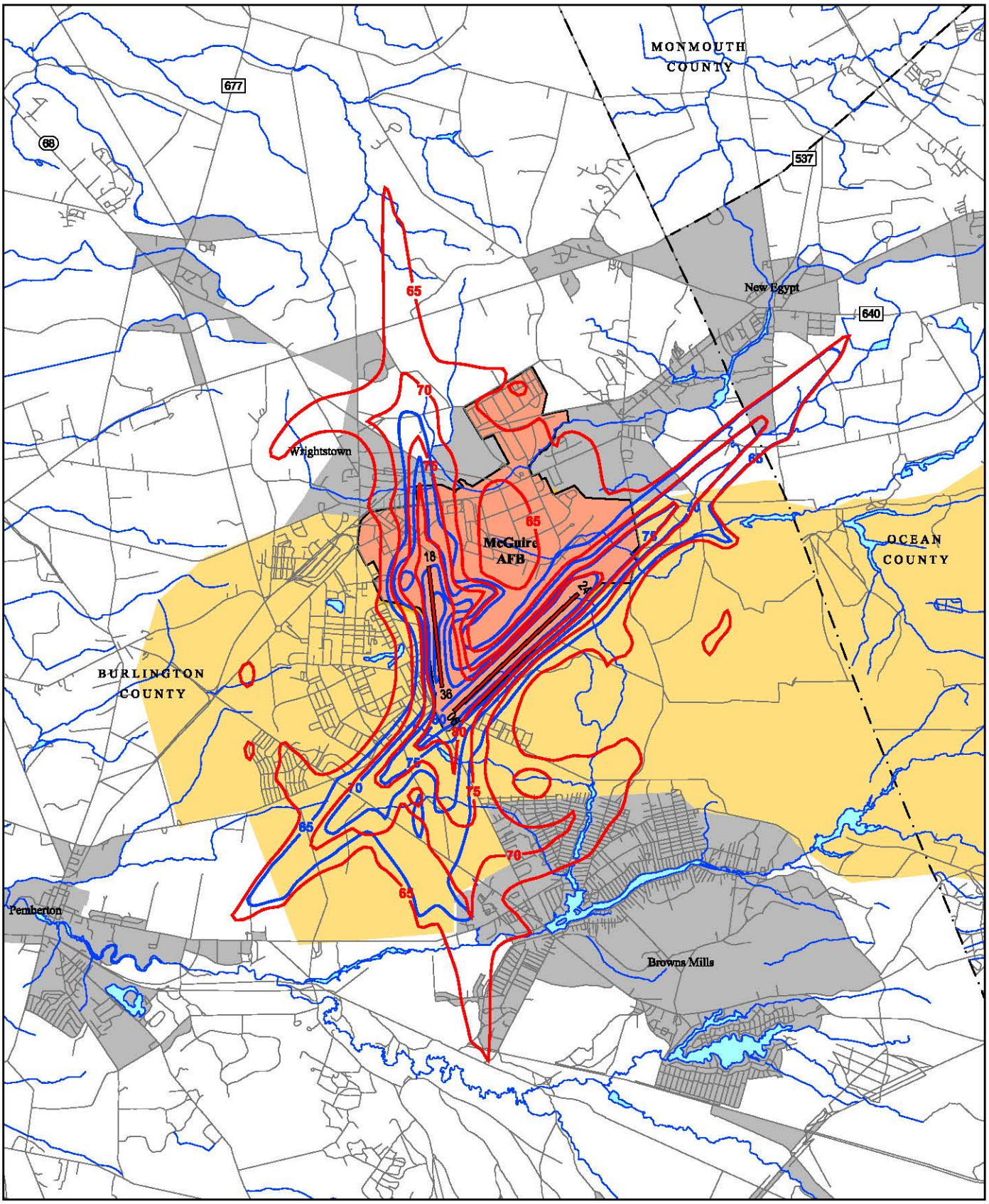


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Noise Contours, McGuire AFB Landing Zone Alternative

Figure 4.8.1-2

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743528 EC17-MCG-COMP2.DWG

McGuire Air Force Base

LEGEND

- Baseline Noise Contour
- LZ Alternative Noise Countour
- Runway
- Roadway
- McGuire AFB
- Fort Dix
- Urban Area

N

0 8,000

Feet

Comparison of Baseline and McGuire AFB Landing Zone Noise Contours

Figure 4.8.1-3

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C-17 aircraft operate at McGuire AFB under the baseline condition. Although there would be additional flight tracks associated with LZ operations at the Base under the McGuire AFB Landing Zone Alternative, the SEL at the selected analysis points would not change when compared to the baseline (see Table 4.8.1-8). Since the five analysis points are representative, it is not anticipated that SEL at other points around McGuire AFB would increase, or if does increase, the amount of increase would be minimal.

Sleep Disturbance

The introductory sleep disturbance and background information for Dover AFB in Subchapter 4.4.3.2 applies to McGuire AFB. Individuals in residences in the area around the Base would continue to be exposed to indoor SEL of 60 to 80 dBA during normal sleep periods (10:00 p.m. to 7:00 a.m.). There would be 12,399 additional persons exposed to DNL 65 dBA and greater as a result of the McGuire AFB Landing Zone Alternative. Assuming the number of sleep awakenings would be proportional to the increase in exposed population, it is anticipated there would be the potential for an additional 1,234 persons who could be awakened when comparing the McGuire AFB Landing Zone Alternative to the baseline condition.

Effects of Noise on Structures

The maximum sound pressure produced by C-17 aircraft at McGuire AFB would be 112 dBA at 100 feet from the aircraft. At a distance of 1,000 feet, the C-17 aircraft generates a maximum sound pressure of 91 dBA. The maximum sound pressure is the highest instantaneous sound pressure during a single noise event no matter how long the sound may persist. Maximum sound pressure is different than SEL, which is the A-weighted sound level integrated over the duration of the noise event and adjusted to a length of 1 second. Therefore, no damage to structures in the area surrounding McGuire AFB would be anticipated because the sound pressure produced by the aircraft would not exceed the level at which structural damage could occur.

Construction Noise

Construction noise during LZ construction would occur on the airfield, would be intermittent, and would be short-term in duration. Typical noise levels from heavy equipment range from 75 to 89 dBA at 50 feet from the source (see Table 4.4.3-3). The construction noise assumptions and analysis for the Dover AFB Proposed Action applies to the McGuire AFB Landing Zone Alternative. It is not anticipated any construction noise impacts would occur due to the distance from the LZ construction site to a receptor.

Day-Night Noise Analysis, McGuire AFB Landing Zone Alternative

Overall, the number of acres in the DNL 65 dBA and greater noise exposure area under the McGuire AFB Landing Zone Alternative would increase by 126 percent (see Figure 4.8.1-3). The areas in which the noise exposure would increase the most are at the northern end of the contour on the extended Runway 18/36 centerline and to the south of the airfield.

As indicated in Table 4.8.1-5, the DNL would increase by as much as 14 dBA at one of the analysis points, 7 dBA at one point, 2 dBA at one point, and remain the same at two points. Although there is an increase of 14 dBA at one point and 7 dBA it another point, the DNL at the points would be 66 dBA, which is 1 dBA above the level at which community noise effects are compared. Both analysis points are along the extended LZ centerline, one to the north and the other to the south. Assuming these two analysis points are representative of points overflown by aircraft operating from the LZ, it is anticipated noise in the areas to the north and south of the LZ could increase by as much as 14 dBA.

There would an additional 9,714 (955 percent), 2,225 (651 percent), 375 (503 percent), and 84 persons, respectively, in the DNL 65-70, 70-75, 75-80, and 80+ dBA noise zones. The total number of people exposed to DNL 65-dBA and greater would increase by 12,399 persons (865 percent). These 12,399 additional persons would equate to 18.0 percent of the estimated 68,862 persons (based on 2000 census data) who live within the airfield airspace environment. This approximate 5-mile radius area includes the airspace allocated to the air traffic control tower and is the area in which closed patterns and maneuvering for takeoffs and landings is accomplished. The density of residences in the newly exposed area would be consistent with adjacent residential areas exposed to aircraft noise under the baseline condition. The overall number of persons who would be highly annoyed by noise exposure would increase by 3,215 people (824 percent).

The background information concerning speech disruption for the Dover AFB Proposed Action applies to the alternative. Assuming the number of conversations is proportional to the increase in exposed population and the increase in airfield operations, it is anticipated there would be a corresponding increase in the potential for speech disruption for the 375 additional persons exposed to DNL 75 dBA and greater (see Table 4.8.1-6). These 375 persons would equate to 0.1 percent of the estimated 68,862 persons who live within the airfield airspace environment.

The hearing loss and nonauditory health effects information for the Dover AFB Proposed Action apply to the alternative. Noise-induced hearing loss would not be anticipated from airfield operations associated with the McGuire AFB Landing Zone Alternative and nonauditory health effects cannot be analyzed.

In summary, there would be an increase in speech disruption from aircraft overflight and there should be no noise-induced hearing loss impacts. The overall effect of the McGuire AFB Landing Zone Alternative would be an 865 percent increase in the number of people exposed to DNL 65 dBA and greater. Although the number of additional people that would be exposed to DNL 65 dBA and greater is large, the additionally exposed areas would be adjacent to areas currently exposed to noise at this level.

Mitigation

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

Cumulative Impacts

None of the other actions have aircraft operations associated with them. Therefore, there would be no cumulative noise impacts associated with aircraft noise.

Under the cumulative condition, other facilities would be constructed at McGuire AFB. The distance between one of the other action construction sites and a McGuire AFB LZ Alternative site could be as close as 100 feet. For analysis purposes, it is assumed the noisiest piece of construction equipment (89 dB scraper which produces 85 dB at 100 feet from the noise source) is being operated simultaneously at each site and the distance to a receptor is 100 feet from each construction site. If the intensity of a sound is doubled, the sound level increases by 3 dB, regardless of the initial sound level. Thus, the combined noise from equipment operation at the receptor would be 88 dB. Construction noise would be temporary and occur only during the hours that construction, demolition, or renovation activity would occur and would cease when the project is completed.

4.8.1.3 Water Resources

Surface Water

It is unlikely that surface water features would be degraded from runoff from LZ construction because the construction contractor would prepare a SWPPP and utilize erosion control measures to control storm water flow and to prevent sediment, nutrients, and pollutants from entering surface water.

Groundwater

No personnel would be assigned to McGuire AFB as a result of the McGuire AFB LZ Alternative. Therefore, groundwater withdrawal from the aquifer would remain at approximately the baseline levels and would not cause the Base to exceed its permitted pumping amount. Construction activities would be coordinated with the Base Environmental Flight and Bioenvironmental Engineering to ensure that construction would not worsen the quality of groundwater, if encountered. In the event groundwater is encountered during construction, the construction contractor would temporarily suspend work and notify the Base Environmental Flight.

Mitigation

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

Cumulative Impacts

The construction contractor for other projects would be required to comply with applicable regulatory requirements to protect water resources. When completed, activities at the other facilities would be managed in accordance with the SWPPP for McGuire AFB. No additional personnel would be added to the Base under the other actions or the LZ alternative.

Therefore, groundwater withdrawal from the aquifer would remain at approximately the baseline levels and would not cause the Base to exceed its permitted pumping amount. The McGuire AFB Alternative Action would not contribute cumulative impacts to surface water or groundwater.

4.8.1.4 Biological Resources

Vegetation and Wildlife

Construction of the LZ at McGuire AFB would result in the loss of approximately 9 of the approximate 645 acres in the airfield triangle, an area devoid of trees. Species that could be affected would be grasses, mammals, and birds that nest on or close to the ground. Although habitat would be lost, the amount is small (1.4 percent) when compared to the total area in the airfield triangle. The loss of about 9 acres would not adversely affect the species that occur in the triangle area.

Threatened, Endangered, and Rare Species

As stated in Subchapter 3.2.6.1, three species of state-listed rare breeding birds and two plant species were observed in the surveys in the maintained grassland community within the airfield triangle. The LZ would be constructed within the triangle. Although AFI 32-7064 does not require consideration of state-listed species in land use planning, in keeping with past practices, McGuire AFB would consult with the state on an informal basis to avoid an adverse effect to any of the five species that might be encountered during LZ construction.

Wetlands

The LZ could be constructed in a wetland when comparing the estimated location for the LZ (see Figure 2.5.6-1) and the location of wetlands at McGuire AFB (see Figure 3.2.6-1). McGuire AFB would consult with the State of New Jersey and the Pinelands Commission to coordinate construction within a wetland. Federal law recognizes wetlands and other waters of the United States as valuable natural resources. These laws strongly discourage activities within federal jurisdiction that alter aquatic habitats. Alteration of wetlands as part of the LZ construction would be considered a potentially adverse impact. Work within the wetlands would require a Section 404/401 permit from the USACE. Construction would be conducted in accordance with permit conditions.

Mitigation

No significant biological effects would be anticipated. Therefore, no mitigation would be required.

Cumulative Impacts

The distance between the LZ and the McGuire AFB Alternative Action projects and all but two of the other action projects would be such that no cumulative significant biological impacts would occur. The LZ project would occur adjacent to Runway 18/36, which has two

projects listed under the other actions (numbers 5 and 14 on Figure 2.6.2-1). The construction activities of all three projects would be considered during planning. AS policy, the Air Force would provided the same protection to the state-listed species that is given to the USFWS-listed species. McGuire AFB would consult with the State of New Jersey concerning the species and the state and the Pinelands Commission should the projects occur within 300 feet of a wetland.

4.8.1.5 Cultural Resources

Archaeological Resources

The LZ would be built on a portion of the airfield previously disturbed during construction of the airfield. The discussion and analysis for the McGuire AFB Alternative Action in Subchapter 4.5.8.1 applies to the McGuire AFB LZ Alternative.

Historical Resources

The LZ would be built on a portion of the airfield previously disturbed during construction of the airfield. The discussion and analysis for the McGuire AFB Alternative Action in Subchapter 4.5.8.1 applies to the McGuire AFB LZ Alternative.

Native American Interests

The LZ would be built on the McGuire AFB airfield. Therefore, the discussion and analysis in Subchapter 4.5.8.1 applies to the McGuire AFB LZ Alternative.

Mitigation

No significant cultural resource effects would be anticipated. Therefore, no mitigation would be required.

Cumulative Impacts

When combining the other actions with the McGuire AFB LZ Alternative, no cumulative adverse cultural resources effects, including visual, would be anticipated under the cumulative condition.

4.8.1.6 Land Use

The LZ would be constructed on a site within the airfield and direct mission land use category and would be consistent with existing and future land use plans and programs identified in the McGuire AFB General Plan.

The expanded noise contours would expose approximately 5,361 acres of additional off-Base public and residential land uses to DNL 65-75 dBA. Although public buildings and private residences are not recommended in this noise exposure area unless attenuation materials are installed (see Table 3.1.8-1), based on the current land uses, exposed noise

levels, and consideration of the noise and overflight studies described in Subchapter 3.1.3, no significant impacts to land uses would occur because of the increased noise levels from the proposed operations. Additionally, the condition (*i.e.*, additional residences in the DNL 65-70 dBA noise zone) would be consistent with existing land use in the area because other residences occur in these noise zones under the baseline condition. Therefore, the additional noise exposure from the McGuire AFB Landing Zone Alternative would not be inconsistent with local land use plans. No impacts to land ownership or the existing function of the land uses would occur.

The precise location for the LZ is unknown; however, it is anticipated it would be sited reasonably close to the depiction in Figure 2.5.1-1. An airfield obstruction survey would be accomplished as part of the LZ engineering process prior to the initiation of construction activity to ensure the LZ exclusion area, CZ, and approach-departure clearance surface criteria mentioned in Subchapter 2.5 are met. Likewise, the McGuire AFB AICUZ Study would be updated to reflect the CZs and APZs for the LZ as well as any incompatible land uses resulting from the establishment of the two imaginary surfaces at each end of the LZ and noise exposure zone. As depicted on Figure 2.5.1-2, the CZ and APZ at the north end of the LZ would fall on the McGuire AFB airfield. The entire CZ and nearly all of the APZ at the southern end of the LZ also would be on the McGuire AFB airfield. The small portion that would not be on the airfield would occur on an open area of Fort Dix. No significant land use incompatibilities would be anticipated from the establishment of CZs and APZs for the LZ. However, the McGuire AFB AICUZ Study would need to be updated to reflect the CZs and APZs for the LZ resulting from the establishment of the two imaginary surfaces at each end of the LZ as well as the changes in noise exposure.

Mitigation

No significant land use impacts would occur as a result of the McGuire AFB Landing Zone Alternative. Therefore, no mitigative actions would be required. The local planning agencies could use the noise contours for future land use planning and zoning.

Cumulative Impacts

Under the cumulative condition, other facilities would be constructed on McGuire AFB and some would be in the general area associated with LZ activities. The other facility actions would be compatible with the McGuire AFB General Plan. Thus, the facility construction anticipated under the cumulative condition would be consistent with existing and future land use plans and programs identified in the General Plan.

4.8.1.7 Airspace and Airfield Operations

Airspace Operations

The C-17 sortie aircraft operations and airspace requirements associated with the McGuire AFB LZ Alternative would be consistent with the baseline operations. The existing air traffic control procedures and airspace infrastructure surrounding McGuire AFB have the capacity to accommodate the additional daily C-17 operations. The low altitude federal

airways and MTRs that transit the airspace would not be impacted, nor would they affect the increased level of operations in the airspace.

Airfield Operations

Under the McGuire AFB LZ Alternative, average daily airfield operations at McGuire AFB would increase by 191.35 operations from 228.52 to 419.87 operations (see Tables 2.4.1-2 and 2.5.1-1, respectively), an 84 percent increase. C-17 aircrews would accomplish tactical events such as arrivals and departures at the LZ in which the aircraft may spiral up to about 5,000 feet AGL during a departure or down from that altitude on an arrival to a landing. The air traffic control tower and McGuire AFB RAPCON would establish procedures for these tactical events since they start in one airspace unit (*i.e.*, either tower or RAPCON) and end in the other (*i.e.*, either tower or RAPCON). The volume of traffic in the airspaces in which the tactical arrivals and departures would be accomplished would not preclude establishment of the procedures to allow execution of the events. Thus, the airspace has the capacity to accommodate the additional air traffic control procedures needed for the combination of the C-17 LZ operations and the airfield operations associated with the McGuire AFB Alternative Action. The airfield has the capacity to accommodate the anticipated type and level of operations.

Aircraft Safety

The aircraft size and flight characteristics of the aircraft based at McGuire AFB (C-17, KC-10, and KC-135) under the Alternative Action plus the C-17s associated with LZ operations are identical or very similar to the aircraft that would be based at Dover AFB under the Proposed Action. Therefore, the discussion and analysis for the Dover AFB Proposed Action apply to the McGuire AFB LZ Alternative. The probability is low that an aircraft involved in an accident at or around the McGuire AFB airfield would strike a person or structure on the ground.

Bird-Aircraft Strike Hazard

The bird-aircraft strike assessment factors for the Dover AFB Proposed Action in Subchapter 4.3.10.4 apply to the McGuire AFB LZ Alternative. Likewise, the bird-aircraft strike fluctuation and bird-aircraft strikes-serious mishap information for the Dover AFB Proposed Action apply.

Overall, it is estimated the total airfield operations for McGuire AFB's three aircraft types (C-17, KC-10, and KC-135) plus the C-17 LZ operations would increase under the McGuire AFB LZ Alternative Action by about 112 percent when compared to the baseline. Thus, bird-aircraft strikes associated with airfield operations at McGuire AFB would be expected to increase commensurate with the change in airfield operations. Based on the 2003 data in Table 3.2.11-3 and the increase in airfield operations, it is estimated that 167.5 annual bird-aircraft strikes would occur when applying the increase in airfield operations. Table 4.8.1-7 lists the monthly bird-aircraft strikes based on the baseline monthly average bird-aircraft strikes per airfield operation and the anticipated monthly operations. It is unlikely that any of these bird-aircraft strike incidents would result in an aircraft accident,

involve injury either to aircrews or to the public, or damage to property (other than the aircraft).

Table 4.8.1-9 Estimated McGuire AFB Landing Zone Alternative Bird-Aircraft Strikes

Month	Baseline Monthly Average	Estimated Monthly Bird-Aircraft Strikes	Net Change	Percent Change
Jan	0.5	1.1	+0.6	+120%
Feb	1.4	3.0	+1.6	+114%
Mar	2.5	5.3	+2.8	+112%
Apr	6.4	13.5	+7.1	+111%
May	10.3	21.8	+11.5	+112%
Jun	3.6	7.6	+4.0	+111%
Jul	7.3	15.4	+8.1	+111%
Aug	11.9	25.2	+13.3	+112%
Sep	13.3	28.1	+14.8	+111%
Oct	14.9	31.5	+16.6	+111%
Nov	5.5	11.6	+6.1	+111%
Dec	1.6	3.4	+1.8	+113%
Total	79.2	167.5	+88.3	+111%

Mitigation

No significant airspace and airfield operations, safety, or BASH impacts would be anticipated. Therefore no mitigation would be necessary.

Cumulative Impacts

None of the other actions anticipated at McGuire AFB include aircraft basing or airfield operations changes. Therefore, no cumulative airspace and airfield operations impacts would be anticipated.

4.8.1.8 Environmental Management

Pollution Prevention

The McGuire AFB Landing Zone Alternative would result in construction of a LZ in the southwest corner of the airfield at the Base. The activities associated with the action would be accomplished under existing Air Force and Base directives, as well as innovative pollution prevention technologies, to achieve the P2 goals of minimizing or eliminating the use of hazardous materials, reducing the volume of hazardous waste and the release of pollution into the environment, and conserving energy.

Environmental Restoration Program

As mentioned in Subchapter 3.2.12.3, there are no ERP sites at or near the proposed location for the LZ.

Mitigation

No significant pollution prevention or ERP impacts would be anticipated. For this reason, no mitigation measures would be required.

Cumulative Impacts

The construction contractor for other projects would be required to comply with the regulatory requirements and best management practices identified for the McGuire AFB Alternative Action. Although some of the other actions are adjacent to the LZ project site, use of the regulatory requirements and best management practices identified for the McGuire AFB Alternative Action would minimize the potential for cumulative impacts. No cumulative pollution prevention or ERP impacts would be anticipated.

4.8.2 Dover AFB Landing Zone Alternative

4.8.2.1 Air Quality

The methodologies used to estimate emissions from airfield operations for the Dover AFB Proposed Action were used to determine the emissions under the Dover AFB LZ Alternative.

Table 4.8.2-1 lists the emissions anticipated from the Dover AFB LZ Alternative, which includes the Dover AFB Proposed Action emissions, and compares the total emissions to the baseline AQCR emissions inventory. The CAA General Conformity Applicability Analysis for the Dover AFB Proposed Action also evaluated the Dover AFB LZ Alternative (USAF 2004a). Table 4.8.2-2 summarizes the net change in emissions associated with the Dover AFB LZ Alternative in AQCR 46, and Table 4.8.2-3 compares the change in emissions for regional significance and *de minimis* purposes.

Table 4.8.2-1 Dover AFB Landing Zone Alternative Emissions in AQCR 46

Criteria Air Pollutant	CO (tpy)	VOC (tpy)	NOx (tpy)	SOx (tpy)	PM10 (tpy)
AQCR 46 CY99 Emissions Inventory	430.000	2,730.000	6,900.000	28,770.000	670.000
Construction Emissions					
Extreme Condition Proposed Action Construction Emissions[a]	9.540	1.090	7.140	0.790	12.040
Landing Zone Construction Emissions	6.730	0.440	2.7000	0.310	5.040
Combined Construction Emissions	16.270	1.530	9.840	1.100	17.080
Construction Emissions as Percent of AQCR Emissions	3.7837%	0.0561%	0.1426%	0.0038%	2.5493%
Aircraft Emissions					
AGE Operation[a]	1.404	0.394	4.937	0.560	0.318
Airfield Operations[a]	91.000	27.000	802.000	0.000	65.000
Landing Zone Operations	99.700	13.380	611.840	0.000	146.400
Aircraft Trim/Power Checks[a]	7.000	3.000	67.000	0.000	4.000

Criteria Air Pollutant	CO (tpy)	VOC (tpy)	NOx (tpy)	SOx (tpy)	PM10 (tpy)
Annual MTR Operations[a]	0.100	0.060	7.970	0.000	0.620
Annual Aircraft Emissions	199.204	43.834	1,493.747	0.560	216.338
Annual Aircraft Emissions as Percent of AQCR Emissions	46.33%	1.61%	21.65%	0.00%	32.29%

(a) Estimated emissions from Dover AFB Proposed Action activities.

Note: VOC is not an air pollutant criterion. However, VOC is reported because, as an O_3 precursor, it is a controlled pollutant.

Table 4.8.2-2 Net Change in Emissions from Dover AFB Landing Zone Alternative Activities in AQCR 46

Category	Pollutants Emitted (tons/year)				
	CO	NO_X	VOC	SO_X	PM_{10}
Net Change in Airfield Operations Emissions	-42.000	-524.000	-21.000	0.000	+4.000
Net Change in AGE Operation Emissions	+0.281	+0.988	+0.079	+0.112	+0.064
Net Change in Trim/Power Check Emissions	-4.000	-24.000	0.000	0.000	0.000
Net Change in Construction Emissions	+9.540	+7.140	+1.090	+0.790	+12.040
Net Change in Military Training Route Operation Emissions	+0.100	+7.970	+0.060	0.000	+0.620
Net Change in Landing Zone Operations Emissions	+99.700	+611.840	+13.380	0.000	+146.400
Net Change in LZ Construction Emissions	+6.730	+2.700	+0.440	+0.310	+5.040
Net Change in Emissions for the Landing Zone Alternative	+70.261	**+82.638**	**-5.951**	+1.212	+168.164

Note: Bold indicates the pollutant is nonattainment within the AQCR.

Source USAF 2004a.

Table 4.8.2-3 Regional Significance Analysis and Comparison to Conformity *de minimis* Thresholds for AQCR 46 for the Dover AFB Landing Zone Alternative

Category	Pollutants Emitted (tons/year)				
	CO	NO_X	VOC	SO_X	PM_{10}
Emissions Inventory	430.000	6,900.000	2,730.000	28,770.000	670.000
Net Change in Emissions	+70.261	**+82.638**	**-5.951**	+1.212	+168.164
Percent Change Compared to Emissions Inventory	+16.34%	+1.20%	-0.22%	0.00%	+25.10%
Regionally Significant? (>10%)	NA	**No**	**No**	NA	NA
de minimis Threshold (tpy)	NA	100	50	NA	NA
Exceed *de minimis* Threshold?	NA	**No**	**No**	NA	NA

NA not applicable. De minimis does not apply since the AQCR is in attainment for pollutant.

Source USAF 2004a.

Construction emissions presented in Table 4.8.2-1 include the estimated annual emissions from construction equipment exhaust associated with the Dover AFB LZ Alternative. Emissions would produce slightly elevated air pollutant concentrations. However, the effects would be temporary, fall off rapidly with distance from the proposed construction site, and would not result in any long-term impacts.

AGE, LZ, and other airfield operations, as well as aircraft trim/power checks and MTR operations within the AQCR in which Dover AFB is located, would generate emissions on a recurring basis. Table 4.8.2-1 lists the annual emissions from these operations for the Dover AFB LZ Alternative. As indicated in the table, the greatest volume of emissions for any of the criteria pollutants from recurring aircraft operations would be 1,493.747 tpy for NO_X, which equates to 21.65 percent of the AQCR emissions inventory for that pollutant.

The CAA General Conformity Applicability Analysis for the Dover AFB Proposed Action concluded that, although the Dover AFB Proposed Action with the LZ Alternative would occur within an air basin designated as moderate nonattainment for O_3, the net change in emissions for NO_x and VOC (the pollutants of concern), as well as other criteria pollutants, would be less than 10 percent of the emissions inventory and the action would not be considered regionally significant (see Table 4.8.2-3). Additionally, the net change in emissions would not exceed the *de minimis* thresholds. The analysis determined that the Dover AFB Proposed Action with LZ Alternative positively conforms to the applicable SIP for AQCR 46. The Dover AFB Proposed Action with the LZ Alternative has been demonstrated by USEPA standards not to cause or contribute to new violations of any national ambient air quality standard in the affected area, nor increase the frequency or severity of an existing violation. Implementation of the Dover AFB Proposed Action with the LZ Alternative would not delay timely attainment of the O_3 standards in the air basin, and the action is in compliance or consistent with all relevant requirements and milestones contained in the applicable SIP. This conclusion of positive General Conformity Determination for the federal action planned for Dover AFB fulfills the Air Force's obligation and responsibility under 40 CFR Part 93, Subpart B.

Mitigation

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

Cumulative Impacts

Numerous construction projects would be accomplished under other actions announced for Dover AFB. The methodologies for calculating emissions for the Dover AFB Proposed Action were used to estimate emissions for the Dover AFB LZ Alternative cumulative condition. Cumulative condition construction projects would occur over an approximate 7-year period. Therefore, the year with the greatest construction equipment emissions (CY07) was used to present the extreme condition for emissions analysis. Table 4.8.2-4 summarizes emissions from the other actions as well as the Dover AFB Proposed Action Landing Zone Alternative and compares the emissions to the baseline AQCR emissions inventory.

Table 4.8.2-4 Dover AFB Landing Zone Alternative Cumulative Condition Emissions

Criteria Air Pollutant	CO (tpy)	VOC (tpy)	NOx (tpy)	SOx (tpy)	PM10 (tpy)
AQCR 46 CY99 Emissions Inventory	430.000	2,730.000	6,900.000	28,770.000	670.000
Proposed Action Cumulative Condition Extreme Condition Construction Emissions[(a)]	30.42	21.35	99.30	10.72	41.72
Landing Zone Construction Emissions	6.73	0.44	2.70	0.31	5.04
Total Construction Emissions	37.15	21.79	102.00	11.03	46.76
Annual Emissions from Proposed Action Aircraft Operations	99.504	30.454	891.907	0.560	69.938
Annual Emissions from Landing Zone Alternative Aircraft Operations	99.700	13.380	611.840	0.000	146.400
Total Annual Aircraft Operations Emissions	199.204	43.834	1,503.747	0.560	216.338
Combined Construction and Aircraft Operations Emissions	236.354	65.624	1,605.747	11.590	263.098
Cumulative Condition Emissions as Percent of AQCR Emissions	55.00%	2.40%	23.27%	0.00%	39.00%

(a) CY10 used for the extreme condition construction emissions. Data include the combined emissions from the Dover AFB Proposed Action cumulative condition.

Note: VOC is not an air pollutant criterion. However, VOC is reported because, as an O_3 precursor, it is a controlled pollutant.

Review of data in Table 4.8.2-4 indicates that the 1,605.747 tpy of NO_X from Dover AFB LZ Alternative cumulative condition activities would equate to 23.27 percent of the emissions inventory. However, the 236.354 tpy of CO emissions constitute the greatest percent of baseline emissions inventory at 55.00 percent.

The CAA General Conformity Applicability Analysis for the Dover AFB Proposed Action also evaluated the Dover AFB LZ Alternative cumulative condition (USAF 2004a).

Table 4.8.2-5 summarizes the net change in emissions associated with the Dover AFB Landing Zone Alternative cumulative condition, and Table 4.8.2-6 compares the change in emissions for regional significance and *de minimis* purposes.

Table 4.8.2-5 Net Change in Emissions from Aircraft Operations Activities in AQCR 46, Dover AFB Landing Zone Alternative Cumulative Condition

Category	Pollutants Emitted (tons/year)				
	CO	NO_X	VOC	SO_X	PM_{10}
Net Change in Proposed Action Aircraft Operations Emissions	-45.619	**-539.042**	**-20.861**	+0.112	+4.684
Net Change in Landing Zone Alternative Aircraft Operations Emissions	+99.700	**+611.840**	**+13.380**	0.000	+146.400
Net Change in Construction Emissions	+37.15	**+102.00**	**+21.79**	+11.03	+46.76
Net Change in Cumulative Condition Emissions	+91.231	**+174.798**	**+14.309**	+11.142	+197.844

Note: Bold indicates the pollutant is nonattainment within AQCR 46.

Source USAF 2004a.

Table 4.8.2-6 Regional Significance Analysis and Comparison to Conformity *de minimis* Thresholds for AQCR 46 for the Dover AFB Landing Zone Alternative Cumulative Condition

Category	Pollutants Emitted (tons/year)				
	CO	NO_X	VOC	SO_X	PM_{10}
Emissions Inventory	430.000	6,900.000	2,730.000	28,770.000	670.000
Net Change in Emissions	+91.231	**+174.798**	**+14.309**	+11.142	+197.844
Percent Change Compared to Emissions Inventory	+21.22%	**+2.53%**	**-0.52%**	+0.04%	+29.53%
Regionally Significant? (>10%)	NA	**No**	**No**	NA	NA
de minimis Threshold (tpy)	NA	100	50	NA	NA
Exceed *de minimis* Threshold?	NA	**Yes**	**No**	NA	NA

NA not applicable. De minimis does not apply since AQCR 46 is in attainment for pollutant.

Source USAF 2004a.

The CAA General Conformity Applicability Analysis for the Dover AFB Alternative Action also evaluated the Dover AFB LZ Alternative cumulative condition (USAF 2004b). Specifically, the analysis concluded that, although the alternative would occur within an air basin designated as moderate nonattainment for O_3, the net change in emissions for NO_X and VOC would be less than 10 percent of the emissions inventory and the action would not be considered regionally significant. The net change in VOC emissions would not exceed the *de minimis* threshold. However, the net change in NO_X emissions would exceed the *de minimis* thresholds. Therefore, the analysis determined that the Dover AFB LZ Alternative cumulative condition negatively conforms to the applicable SIP for AQCR 46. The Dover AFB LZ Alternative cumulative condition has been demonstrated by USEPA standards to cause or contribute to new violations of any national ambient air quality standard in the

affected area, and increase the frequency or severity of an existing violation. Implementation of the Dover AFB LZ Alternative cumulative condition would delay timely attainment of the O_3 standards in the air basin, and the action would not be in compliance or consistent with all relevant requirements and milestones contained in the applicable SIP. This conclusion of negative General Conformity Determination for the federal action planned for Dover AFB LZ cumulative condition would not fulfill the Air Force's obligation and responsibility under 40 CFR Part 93, Subpart B.

4.8.2.2 Noise

The aircraft operations modeled include transient aircraft operations as well as the anticipated C-17 (to include LZ and related operations) and C-5 operations.

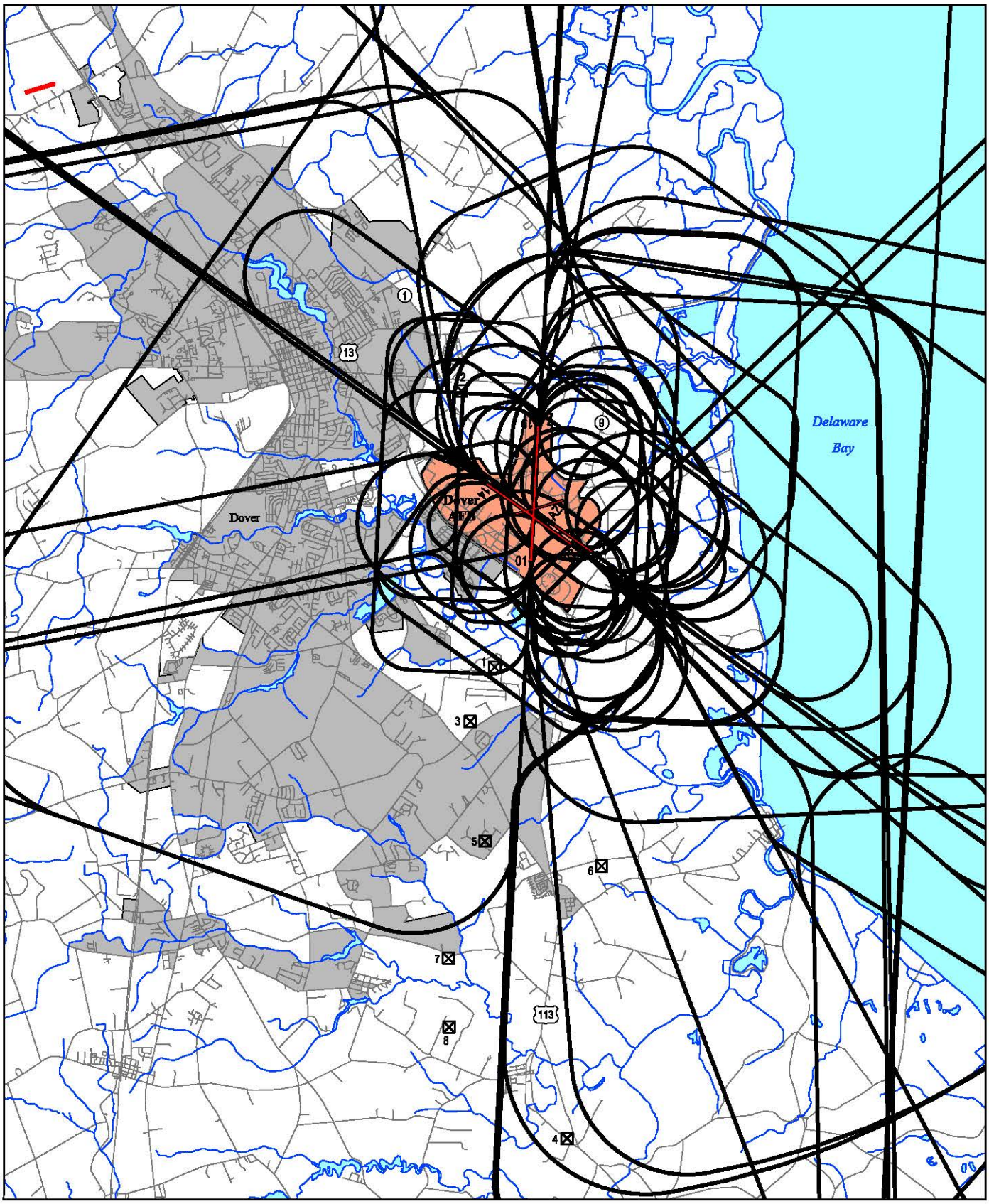
Landing Zone Location A

Figure 4.8.2-1 shows the aircraft ground tracks and Figure 4.8.2-2 depicts the noise exposure area from the aircraft operations condition for the Dover AFB LZ Alternative, Location A. Figure 4.8.2-3 compares the LZ Alternative Location A and baseline noise contours. Table 4.8.2-7 compares the baseline and Dover AFB Landing Zone Alternative Location A DNL and lists the C-17 SEL at the analysis points. There would be no change to the SEL from C-5 operations since the flight tracks used by C-5 aircraft would be the same as the baseline (see Table 3.1.3-2). Table 4.8.2-8 compares the land area and population exposed to noise of DNL 65 dBA and greater, as well as the population potentially highly annoyed, for the Dover AFB Landing Zone Alternative Location A with the baseline condition. There would be an overall 19 percent decrease in the number of people exposed to DNL 65 dBA and greater. Data from these tables are used in the single event and day-night sound analysis sections.

Table 4.8.2-7 Comparison of DNL from Proposed Airfield Operations at Analysis Points with Baseline, Dover AFB Landing Zone Alternative Noise Contours, Location A

		DNL (dBA)			
Number	Description	BL	Loc A	Chg	C-17 SEL (dBA)
1	Golf Course	67	67	0	94
2	Hospital	72	72	0	99
3	High School	61	63	+2	85
4	School	61	61	0	91
5	Residences	64	65	+1	91
6	Residences	57	58	+1	89
7	Residences	57	60	+3	83
8	Residences	59	61	+2	84

Note: BL=baseline. Loc A=Location A. Chg=change. The analysis point number and description correspond to the point as reflected on the noise contour and aircraft ground track figures. There may be minor differences when comparing the DNL for a point from the table to the DNL for the point as depicted on the noise contour figure. This difference is a result of small misalignments during the process of printing the noise contours on top of the background map.



Dover Air Force Base

LEGEND

- Flight Track
- Runway
- Roadway
- Analysis Point
- Dover AFB
- Urban Area

N

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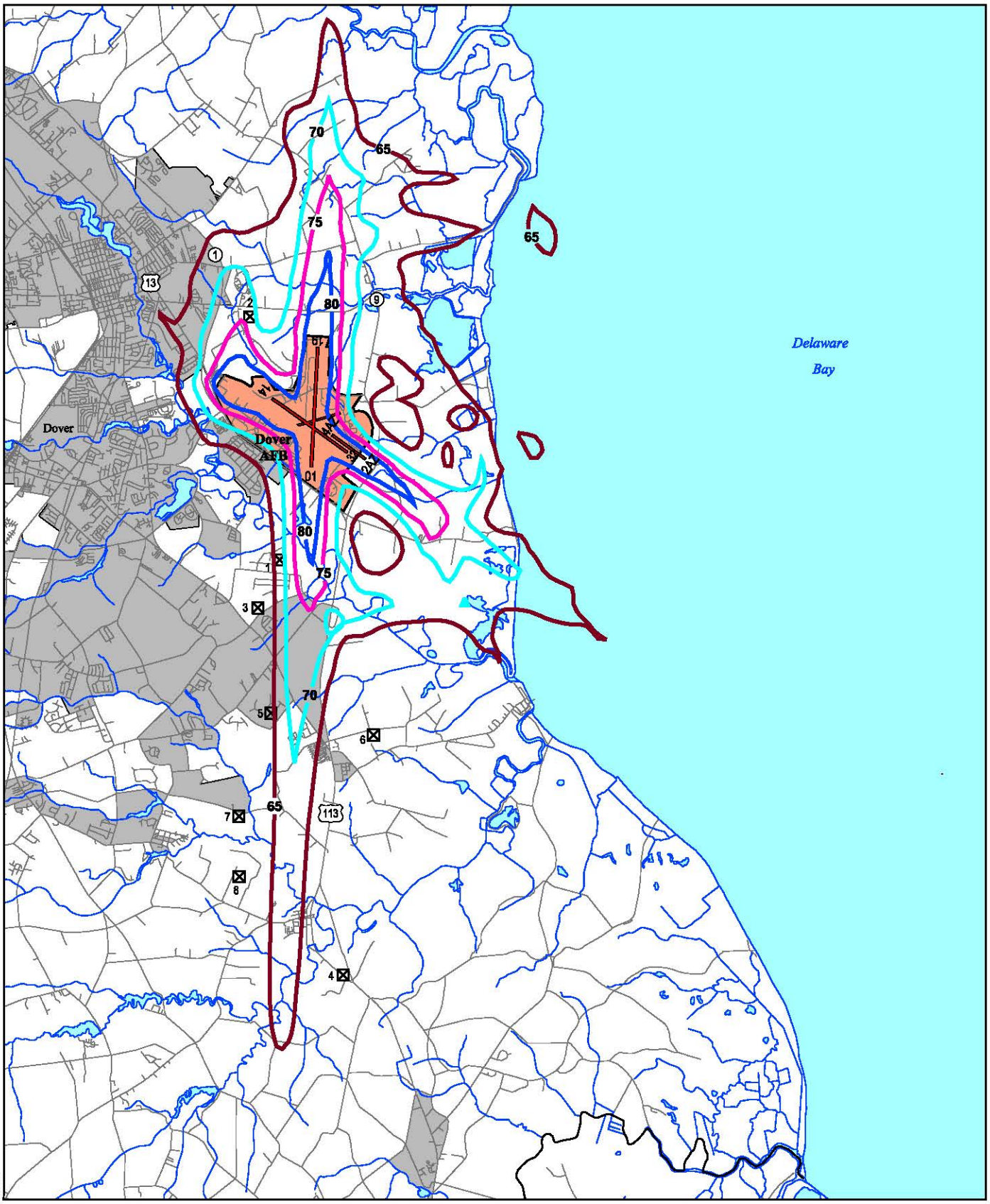
Miles

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Aircraft Ground Tracks, Dover AFB Landing Zone Alternative, Location A

Figure 4.8.2-1

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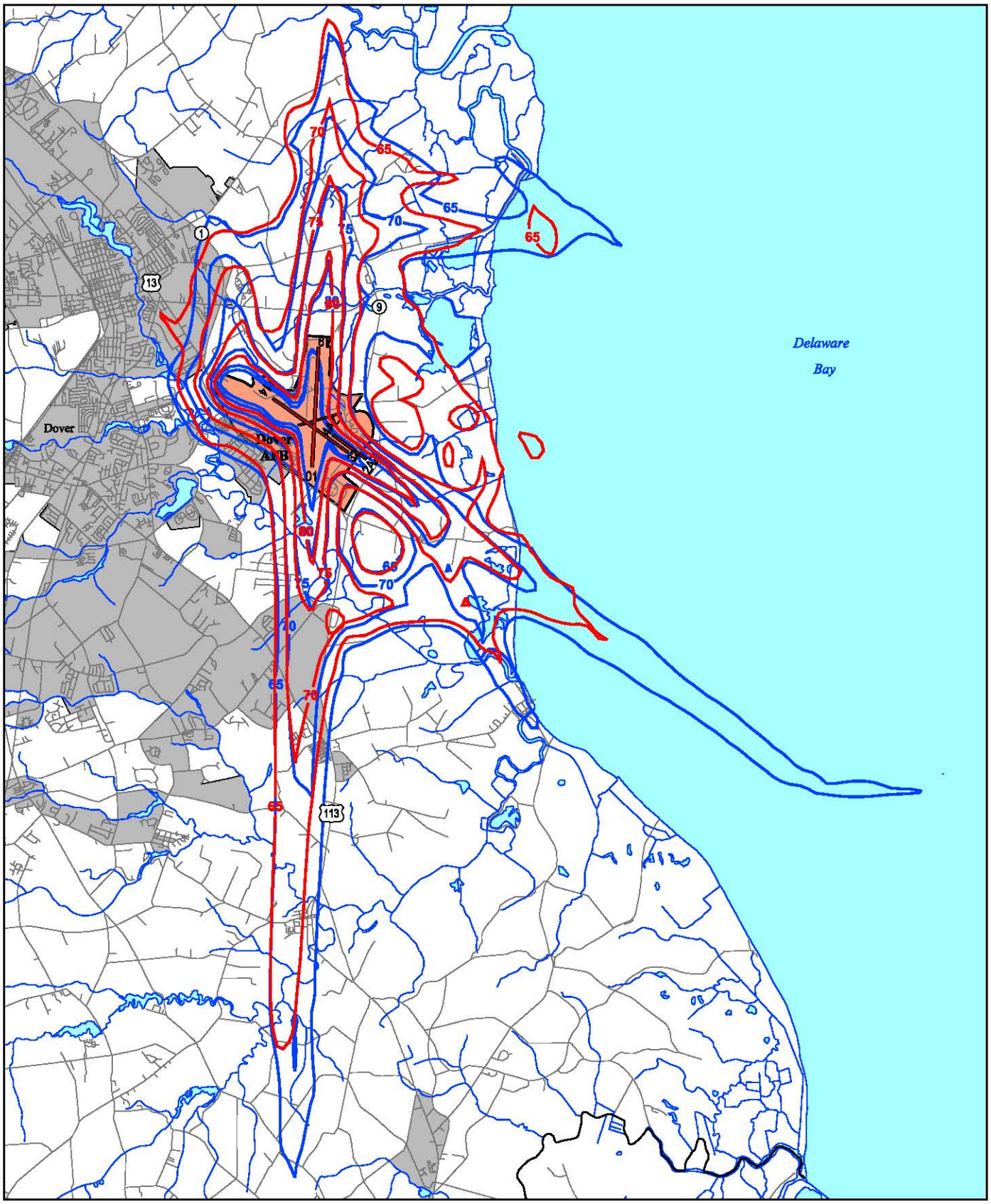


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Noise Contours, Dover AFB Landing Zone Alternative, Location A

Figure 4.8.2-2

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Dover Air Force Base

LEGEND

- Baseline Noise Contour
- LZ Alternative A Noise Countour
- Runway
- Roadway
- Dover AFB
- Urban Area

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Feet

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Comparison of Baseline and Dover AFB Landing Zone Alternative Noise Contours, Location A

Figure 4.8.2-3

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Table 4.8.2-8 Summary of Land Area and Population Exposed to, and Population Potentially Highly Annoyed by DNL 65 dBA and Greater, Dover AFB Landing Zone Alternative Noise Contours, Location A

	DNL Interval (dBA)				
Category	**65-70**	**70-75**	**75-80**	**80+**	**Total**
Acres					
Baseline Acres	15,233	6,256	2,527	2,228	26,244
Landing Zone Alternative	13,069	5,376	2,321	2,142	22,908
Change	-2,164	-880	-206	-86	-3,336
Percent Change	-14%	-14%	-8%	-4%	-13%
Population					
Baseline Population	5,308	2,137	201	192	7,839
Landing Zone Alternative	4,874	1,116	274	81	6,345
Change	-434	-1,022	+73	-111	-1,494
Percent Change	-8%	-48%	+36%	-58%	-19%
Population Highly Annoyed					
Baseline Population	1,168	791	109	117	2,185
Landing Zone Alternative	1,072	413	148	50	1,683
Change	-96	-378	+39	-67	-502
Percent Change	-8%	-48%	+36%	-57%	-23%

Note: People highly annoyed determined by multiplying the total number of people in the noise zone times the higher percent number for the interval in Table 3.1.3-4.

Single Event Noise Analysis, Dover AFB Landing Zone Alternative, Location A

Sound Exposure Level

A total of eight representative analysis points were selected under the traffic patterns and around the airfield to calculate the SEL due to aircraft overflight. The noise contour and aircraft ground track figures show the locations of the analysis points.

Although there would be additional flight tracks associated with LZ operations at the Base under the Dover AFB Landing Zone Location A Alternative, it is anticipated the SEL at other points in the area around the Base would be similar to that for the selected analysis points (see Table 4.8.2-7) because the eight analysis points are representative. However, if the SEL does increase at other points in the area around the Base, the amount of increase would be minimal.

Sleep Disturbance

The introductory sleep disturbance and background information for Dover AFB in Subchapter 4.4.3.2 applies to Dover AFB. Individuals in residences in the area around the Base would continue to be exposed to indoor SEL of 60 to 80 dBA during normal sleep periods (10:00 p.m. to 7:00 a.m.). There would be 1,494 fewer persons exposed to DNL 65 dBA and greater as a result of the Dover AFB Landing Zone Location A Alternative. Assuming the number of sleep awakenings would be proportional to the decrease in exposed population, it is anticipated there would be the potential for 149 fewer persons who could be awakened when comparing the Dover AFB Landing Zone Location A Alternative to the baseline condition.

Effects of Noise on Structures

The maximum sound pressure produced by C-17 aircraft at Dover AFB would be 112 dBA at 100 feet from the aircraft. At a distance of 1,000 feet, the C-17 aircraft generates a maximum sound pressure of 91 dBA. The maximum sound pressure is the highest instantaneous sound pressure during a single noise event no matter how long the sound may persist. Maximum sound pressure is different than SEL, which is the A-weighted sound level integrated over the duration of the noise event and adjusted to a length of 1 second. Therefore, no damage to structures in the area surrounding Dover AFB would be anticipated because the sound pressure produced by the aircraft would not exceed the level at which structural damage could occur. Aircraft would continue to avoid overflying the historical properties just south of the Base.

Construction Noise

Construction noise during LZ construction would occur on the airfield, would be intermittent, and would be short-term in duration. Typical noise levels from heavy equipment range from 75 to 89 dBA at 50 feet from the source (see Table 4.4.3-3). The construction noise assumptions and analysis for the Dover AFB Proposed Action applies to the Dover AFB Landing Zone Location A Alternative. It is not anticipated any construction noise impacts would occur due to the distance from the LZ construction site to a receptor.

Day-Night Noise Analysis, Dover AFB Landing Zone Alternative, Location A

Overall, the Dover AFB Landing Zone Alternative Location A noise contours essentially would retain the same shape as the baseline contours (see Figure 4.8.2-3), with the number of acres in the DNL 65 dBA and greater exposure area decreasing by 13 percent. The primary areas of decrease are to the northeast and southeast where the degree to which the DNL 65 dBA contour extends over the Delaware Bay and to the south where the contour does not extend as far along the extended runway centerline. However, there is an area to the east of the airfield that would be exposed to DNL 65-70 dBA under the alternative that is not exposed to noise at this level under the existing condition.

As indicated in Table 4.8.2-7, the DNL would increase at five of the analysis points and remain the same at 3 points. There would be no change at the one point that exceeds DNL 65 dBA under the baseline. The maximum increase at the five points that would experience an increase would be 3 dBA. One point would increase to DNL 65 dBA, the point at which community noise effects are compared. Assuming the five analysis points are representative of points within the area around the airfield, it is anticipated DNL in the noise exposure area could increase by as much as 3 dBA.

Although there would be an increase of 73 persons (36 percent) in the DNL 75-80 dBA noise zone, the number of persons would decrease in the other three noise zones when compared to the baseline (see Table 4.8.2-8). The total number of people exposed to DNL 65-dBA and greater would decrease by 1,494 persons (19 percent). The overall number of persons who would be highly annoyed by noise exposure would decrease by 502 people (23 percent).

The background information concerning speech disruption for the Dover AFB Proposed Action applies to the alternative. Assuming the number of conversations is proportional to the decrease in exposed population and the reduction in airfield operations, it is anticipated there would be a corresponding decrease in the potential for speech disruption.

The hearing loss and nonauditory health effects information for the Dover AFB Proposed Action apply to the alternative. Noise-induced hearing loss would not be anticipated from airfield operations associated with the Dover AFB Landing Zone Alternative Location A and nonauditory health effects cannot be analyzed.

The background information about classroom disruption for the Dover AFB Proposed Action applies to the alternative. Under the Dover AFB Landing Zone Alternative Location A, the outdoor DNL at the schools identified for analysis (*i.e.*, analysis points 3 and 4) would increase by 2 dBA at point 3 (*i.e.*, 63 dBA) and remain at 61 dBA at point 4. The C-17 outdoor SEL would be 85 and 91 dBA, respectively. Indoor noise levels are generally 20 dBA lower than outdoor noise levels because building structures attenuate the outdoor noise levels. Thus, the interior noise levels in the schools would be approximately 65 and 71 dBA, respectively. Both these noise levels are below the levels (*i.e.*, 75 dBA) at which a marked increase in pauses and masking would occur and at which teaching would be impaired as a result of disruption of speech communication.

In summary, there would be a reduction in speech disruption from aircraft overflight and there should be no noise-induced hearing loss impacts. Classroom disruption would remain at approximately the baseline condition. The overall effect of the Dover AFB Landing Zone Alternative Location A would be a 19 percent decrease in the number of people exposed to DNL 65 dBA and greater.

Landing Zone Alternative Location B

Figure 4.8.2-4 shows the aircraft ground tracks and Figure 4.8.2-5 depicts the noise exposure area from the aircraft operations condition for the Dover AFB LZ Alternative, Location B. Figure 4.8.2-6 compares the LZ Alternative Location B and baseline noise contours. Table 4.8.2-9 compares the baseline and Dover AFB Landing Zone Alternative Location B and lists the C-17 SEL at the analysis points. There would be no change to the SEL from C-5 operations since the flight tracks used by C-5 aircraft would be the same as the baseline (see Table 3.1.3-2). Table 4.8.2-10 compares the land area and population exposed to noise of DNL 65 dBA and greater, as well as the population potentially highly annoyed, for the Dover AFB Landing Zone Alternative Location B with the baseline condition. There would be an overall 22 percent decrease in the number of people exposed to DNL 65 dBA and greater. Data from these tables are used in the single event and day-night sound analysis sections.

Table 4.8.2-9 Comparison of DNL from Proposed Airfield Operations at Analysis Points with Baseline, Dover AFB Landing Zone Alternative, Location B

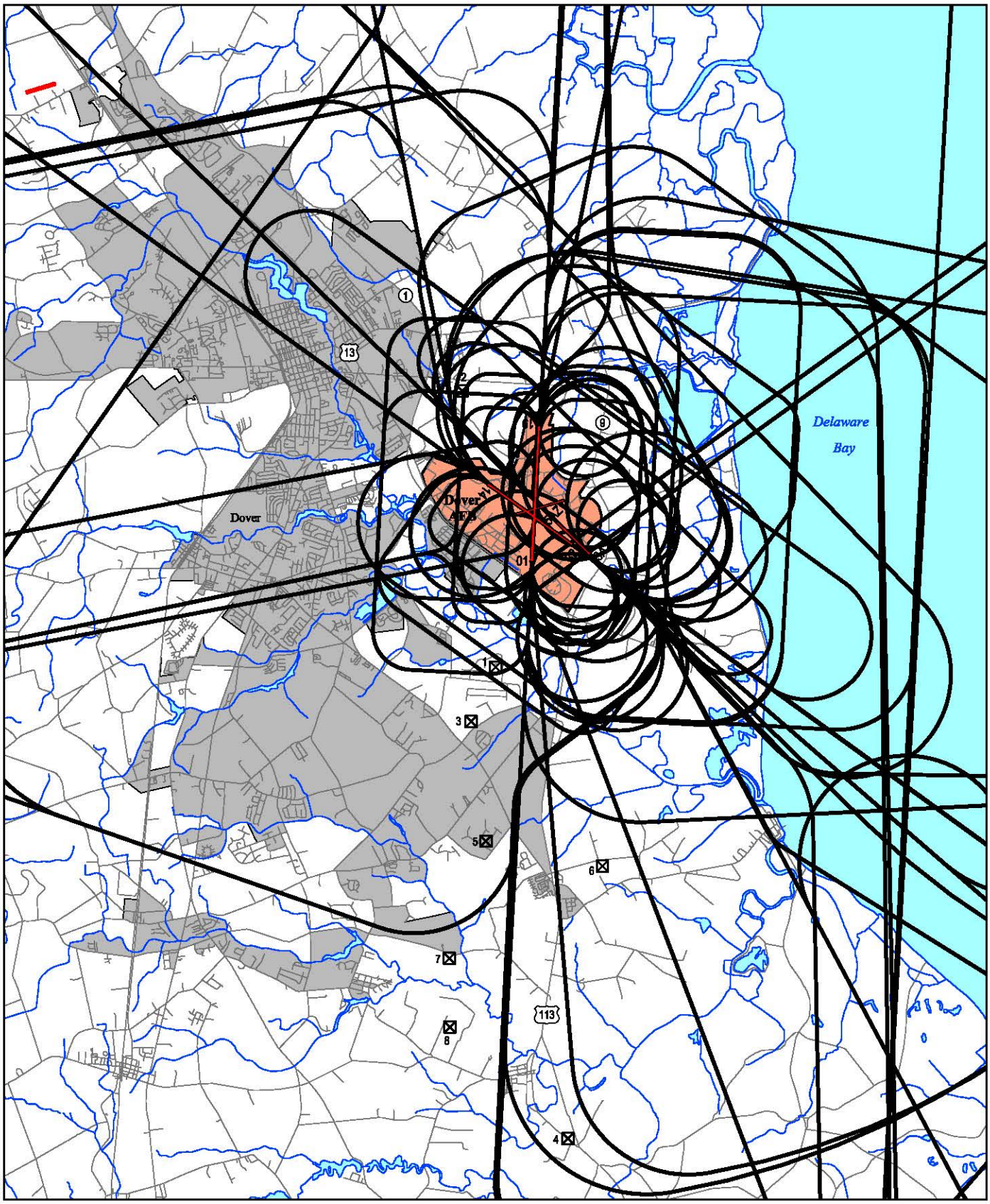
		DNL (dBA)			
Number	**Description**	**BL**	**Loc B**	**Chg**	**C-17 SEL (dBA)**
1	Golf Course	67	67	0	94
2	Hospital	72	72	0	99
3	High School	61	62	+1	85
4	School	61	61	0	91
5	Residences	64	65	+1	91
6	Residences	57	58	+1	89
7	Residences	57	60	+3	83
8	Residences	59	60	+1	84

Note: BL=baseline. Loc B=Location B. Chg=change. The analysis point number and description correspond to the point as reflected on the noise contour and aircraft ground track figures. There may be minor differences when comparing the DNL for a point from the table to the DNL for the point as depicted on the noise contour figure. This difference is a result of small misalignments during the process of printing the noise contours on top of the background map.

Table 4.8.2-10 Summary of Land Area and Population Exposed to, and Population Potentially Highly Annoyed by DNL 65 dBA and Greater, Dover AFB Landing Zone Alternative, Location B

	DNL Interval (dBA)				
Category	**65-70**	**70-75**	**75-80**	**80+**	**Total**
Acres					
Baseline Acres	15,233	6,256	2,527	2,228	26,244
Landing Zone Alternative	12,862	5,314	2,352	2,142	22,670
Change	-2,371	-942	-175	-86	-3,574
Percent Change	-16%	-15%	-7%	-4%	-14%
Population					
Baseline Population	5,308	2,137	201	192	7,839
Landing Zone Alternative	4,643	1,128	285	79	6,134
Change	-666	-1,010	+84	-113	-1,705
Percent Change	-13%	-47%	+42%	-59%	-22%
Population Highly Annoyed					
Baseline Population	1,168	791	109	117	2,185
Landing Zone Alternative	1,021	417	154	48	1,640
Change	-147	-374	+45	-69	-545
Percent Change	-13%	-47%	+41%	-59%	-25%

Note: People highly annoyed determined by multiplying the total number of people in the noise zone times the higher percent number for the interval in Table 3.1.3-4.



Dover Air Force Base

LEGEND

- Flight Track
- Runway
- Roadway
- Analysis Point
- Dover AFB
- Urban Area

N

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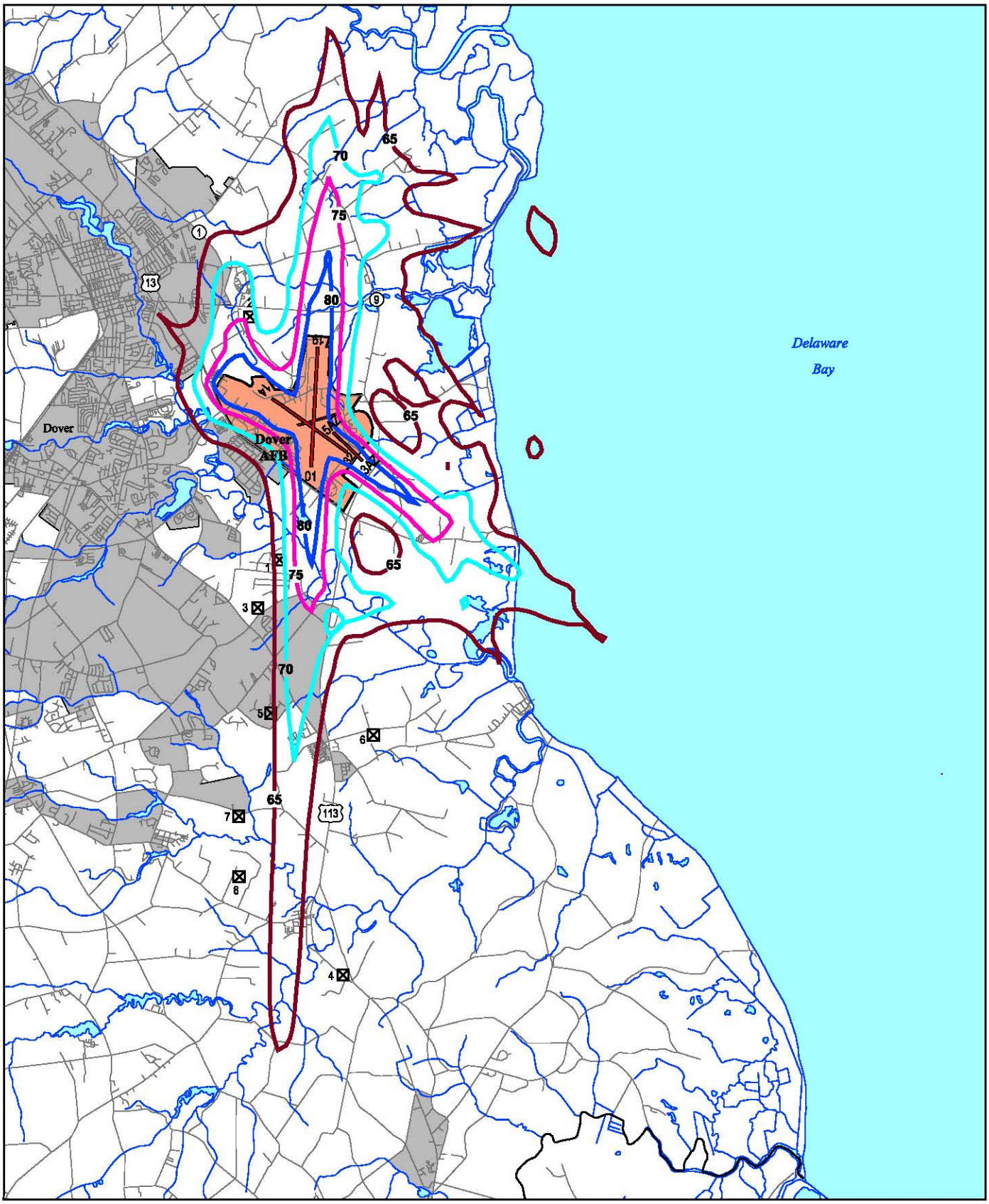
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Aircraft Ground Tracks, Dover AFB Landing Zone Alternative, Location B

Figure 4.8.2-4

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Dover Air Force Base

LEGEND

- 65 dBA Contour
- 70 dBA Contour
- 75 dBA Contour
- 80 dBA Contour
- Runway
- Roadway
- Analysis Point
- Dover AFB
- Urban Area

N

0 12,000

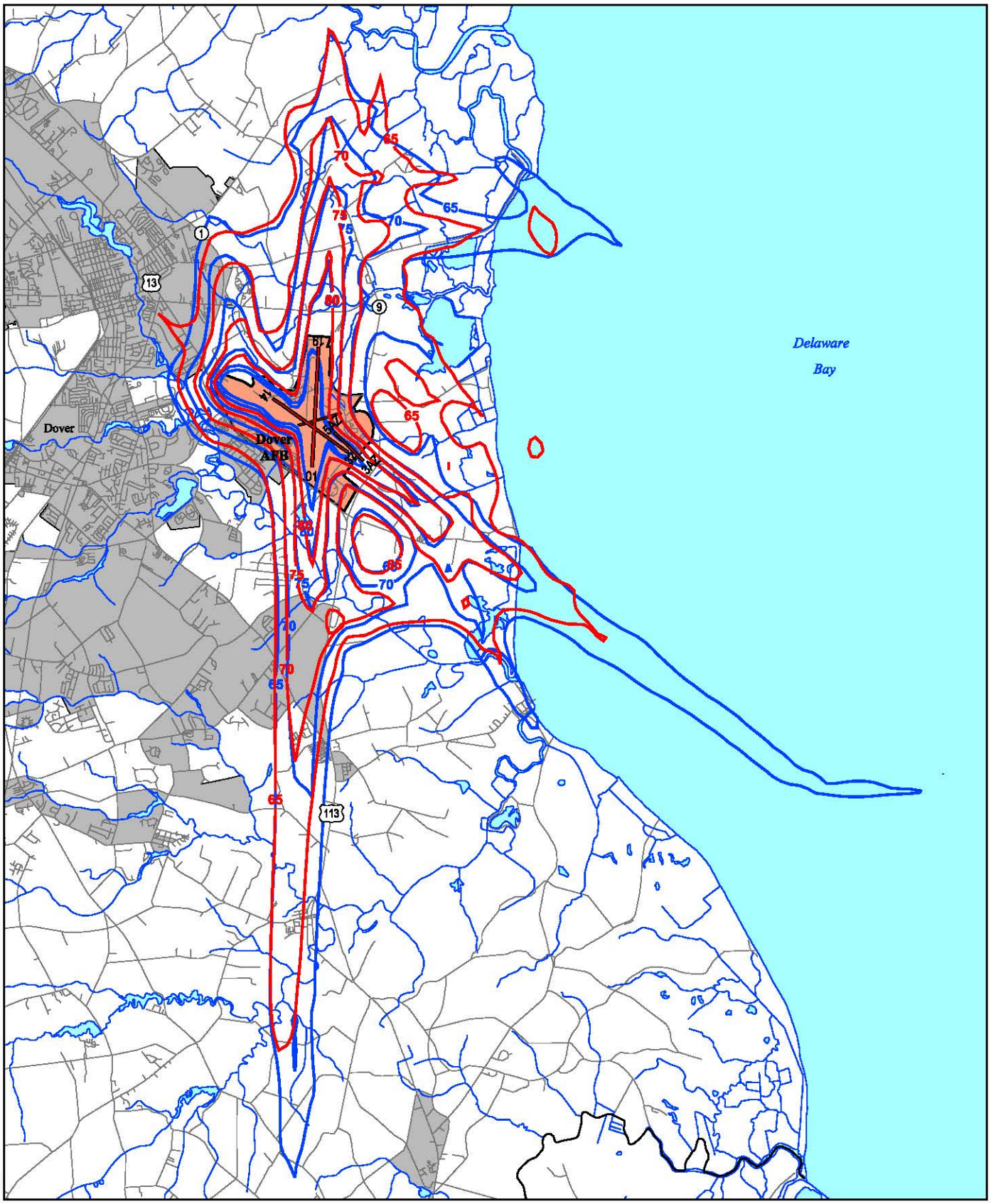
Feet

Noise Contours, Dover AFB Landing Zone Alternative, Location B

Figure 4.8.2-5

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Dover Air Force Base

LEGEND

- Baseline Noise Contour
- LZ Alternative B Noise Countour
- Runway
- Roadway
- Dover AFB
- Urban Area

N

0 12,000

Feet

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Comparison of Baseline and Dover AFB Landing Zone Alternative Noise Contours, Location B

Figure 4.8.2-6

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Single Event Noise Analysis, Dover AFB Landing Zone Alternative, Location B

Sound Exposure Level

A total of eight representative analysis points were selected under the traffic patterns and around the airfield to calculate the SEL due to aircraft overflight. The noise contour and aircraft ground track figures show the locations of the analysis points.

Although there would be additional flight tracks associated with LZ operations at the Base under the Dover AFB Landing Zone Location B Alternative, it is anticipated the SEL at other points in the area around the Base would be similar to that for the selected analysis points (see Table 4.8.2-9) because the eight analysis points are representative. However, if the SEL does increase at other points in the area around the Base, the amount of increase would be minimal.

Sleep Disturbance

The introductory sleep disturbance and background information for Dover AFB in Subchapter 4.4.3.2 applies to Dover AFB. Individuals in residences in the area around the Base would continue to be exposed to indoor SEL of 60 to 80 dBA during normal sleep periods (10:00 p.m. to 7:00 a.m.). There would be 1,705 fewer persons exposed to DNL 65 dBA and greater as a result of the Dover AFB Landing Zone Location B Alternative. Assuming the number of sleep awakenings would be proportional to the decrease in exposed population, it is anticipated there would be the potential for 171 fewer persons who could be awakened when comparing the Dover AFB Landing Zone Location B Alternative to the baseline condition.

Effects of Noise on Structures

The maximum sound pressure produced by C-17 aircraft at Dover AFB would be 112 dBA at 100 feet from the aircraft, the same as for the Dover AFB Landing Zone Alternative, Location A. Therefore, the discussion and analysis for Location A applies to Location B.

Construction Noise

The location for the Dover AFB Landing Zone Alternative, Location B is nearly the same as that for Location A. Therefore, the discussion and analysis for Location A applies to Location B.

Day-Night Noise Analysis, Dover AFB Landing Zone Alternative, Location B

Overall, the Dover AFB Landing Zone Alternative Location B noise contours essentially would retain the same shape as the baseline contours (see Figure 4.8.2-6), with the number of acres in the DNL 65 dBA and greater exposure area decreasing by 14 percent. The primary areas of decrease are to the northeast and southeast where the degree to which the DNL 65 dBA contour extends over the Delaware Bay and to the south where the contour does not

extend as far along the extended runway centerline. However, there is an area to the east of the airfield that would be exposed to DNL 65-70 dBA under the alternative that is not exposed to noise at this level under the existing condition.

As indicated in Table 4.8.2-9, the DNL would increase at five of the analysis points and remain the same at 3 points. There would be no change at the one point that exceeds DNL 65 dBA under the baseline. The maximum increase at the five points that would increase would be 3 dBA. One point would increase to DNL 65 dBA, the point at which community noise effects are compared. Assuming the five analysis points are representative of points within the area around the airfield, it is anticipated DNL in the noise exposure area could increase by as much as 3 dBA.

Although there would be an increase of 84 persons (36 percent) in the DNL 75-80 dBA noise zone, the number of persons would decrease in the other three noise zones when compared to the baseline (see Table 4.8.2-10). The total number of people exposed to DNL 65-dBA and greater would decrease by 1,705 persons (22 percent). The overall number of persons who would be highly annoyed by noise exposure would decrease by 545 people (25 percent).

The background information concerning speech disruption for the Dover AFB Proposed Action applies to the alternative. Assuming the number of conversations is proportional to the decrease in exposed population and the reduction in airfield operations, it is anticipated there would be a corresponding decrease in the potential for speech disruption.

The hearing loss and nonauditory health effects information for the Dover AFB Proposed Action apply to the alternative. Noise-induced hearing loss would not be anticipated from airfield operations associated with the Dover AFB Landing Zone Alternative Location B and nonauditory health effects cannot be analyzed.

The background information about classroom disruption for the Dover AFB Proposed Action applies to the alternative. Under the Dover AFB Landing Zone Alternative Location B, the outdoor DNL at the schools identified for analysis (*i.e.*, analysis points 3 and 4) would increase by 1 dBA at point 3 (*i.e.*, 62 dBA) and remain at 61 dBA at point 4. The C-17 outdoor SEL would be 85 and 91 dBA, respectively. Indoor noise levels are generally 20 dBA lower than outdoor noise levels because building structures attenuate the outdoor noise levels. Thus, the interior noise levels in the schools would be approximately 65 and 71 dBA, respectively. Both these noise levels are below the levels (*i.e.*, 75 dBA) at which a marked increase in pauses and masking would occur and at which teaching would be impaired as a result of disruption of speech communication.

In summary, there would be a reduction in speech disruption from aircraft overflight and there should be no noise-induced hearing loss impacts. Classroom disruption would remain at approximately the baseline condition. The overall effect of the Dover AFB Landing Zone Alternative Location B would be a 22 percent decrease in the number of people exposed to DNL 65 dBA and greater.

Mitigation

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

Cumulative Impacts

None of the other actions have aircraft operations associated with them. Therefore, there would be no cumulative noise impacts associated with aircraft noise.

Under the cumulative condition, other facilities would be constructed at Dover AFB. The distance between one of the other action construction sites and a Dover AFB LZ Alternative site could be as close as 100 feet. For analysis purposes, it is assumed the noisiest piece of construction equipment (89 dB scraper which produces 85 dB at 100 feet from the noise source) is being operated simultaneously at each site and the distance to a receptor is 100 feet from each construction site. If the intensity of a sound is doubled, the sound level increases by 3 dB, regardless of the initial sound level. Thus, the combined noise from equipment operation at the receptor would be 88 dB. Construction noise would be temporary and occur only during the hours that construction, demolition, or renovation activity would occur and would cease when the project is completed.

4.8.2.3 Biological Resources

Vegetation and Wildlife

As mentioned in Subchapter 3.1.5, historic agricultural practices, vegetation management, and development have altered the vegetation at the Base. Additionally, wildlife abundance and diversity are low at Dover AFB. Construction of the LZ at Dover AFB would result in the loss of approximately 9 acres of the airfield, an area devoid of trees. Species that could be affected would be grasses, mammals, and birds that nest on or close to the ground. For these reasons, construction of the LZ would not be expected to significantly adversely affect vegetation and wildlife under the Dover AFB Landing Zone Alternative.

Threatened, Endangered, and Special Status Species

As discussed in Subchapter 3.1.5, upland sandpipers, a state-listed endangered species, have been observed at the proposed LZ location. The loss of habitat likely would reduce the number of nesting birds and therefore, the potential for successful breeding. However, past and current mowing practices to reduce the potential for bird-aircraft strikes also have limited the potential for increasing the numbers of the species. Other areas of the base where the bird has been observed would continue to provide habitat for the species. Thus, while there could be a decrease in upland sandpipers at the base due to the loss of habitat, it is likely that the species would not be eliminated from the Base due to construction of the LZ and that the reduction in numbers of the upland sandpiper would not be significant. Although AFI 32-7064 does not require consideration of state-listed species in land use planning, in keeping with past practices, Dover AFB would consult with the state on an informal basis to

avoid an adverse effect to any of the state-listed species that might be encountered during LZ construction.

Mitigation

No significant adverse biological effects would be anticipated. Therefore, no mitigation would be necessary.

Cumulative Impacts

The distance between the LZ location and the other actions at Dover AFB would preclude the potential for cumulative impacts.

4.8.2.4 Cultural Resources

Archaeological Resources

The LZs would be built on a portion of the airfield previously disturbed during construction of the airfield. The discussion and analysis for the Dover AFB Proposed Action in Subchapter 4.4.8.1 applies to the Dover AFB LZ Alternative.

Historical Resources

The LZs would be built on a portion of the airfield previously disturbed during construction of the airfield. The discussion and analysis for the Dover AFB Proposed Action in Subchapter 4.4.8.1 applies to the Dover AFB LZ Alternative.

Native American Interests

The LZs would be built on the Dover AFB airfield. Therefore, the discussion and analysis in Subchapter 4.4.8.1 applies to the Dover AFB LZ Alternative.

Mitigation

No significant cultural resource effects would be anticipated. Therefore, no mitigation would be required.

Cumulative Impacts

When combining the other actions with the Dover AFB LZ Alternative, no cumulative adverse cultural resources effects, including visual, would be anticipated under the cumulative condition.

4.8.2.5 Land Use

The potential locations for each LZ are in the airfield and direct mission land use category and would be compatible with the future land use proposals addressed in the Dover AFB General Plan.

Approximately 3,044 fewer acres (LZ Location A) or 3,313 fewer acres (LZ Location B) would be exposed to DNL 65-75 dBA, with the primary areas of reduction being over Delaware Bay. Some land east of the airfield not previously exposed to DNL 65-70 dBA would be exposed to noise at this level under both LZ location options. Although residences are not recommended in this noise zone unless attenuation materials are installed (see Table 3.1.8-1), the number of additionally exposed residences in the DNL 65-70 dBA noise zone would be minor when compared to the baseline. Additionally, the condition (*i.e.*, additional residences in the DNL 65-70 dBA noise zone) would be consistent with existing land use in the area because other residences occur in these noise zones under the baseline condition. Therefore, the additional noise exposure from the Dover AFB Landing Zone Alternative would not be inconsistent with local land use plans.

The precise location for the LZ is unknown; however, it is anticipated it would be sited reasonably close to one of the sites depicted in Figure 2.5.2-1. An airfield obstruction survey would be accomplished as part of the LZ engineering process prior to the initiation of construction activity to ensure the LZ lateral exclusion area, CZ, and APZ criteria mentioned in Subchapter 2.5.2 are met. As depicted on Figure 2.5.2-2, the CZ and APZ at the northwest end of the LZ would fall on the Dover AFB airfield. Although the CZ and APZ at the southeastern end of the LZ would occur off-Base, it is estimated that all or nearly all of the surface area associated with the LZ CZ and APZ would fall within the existing CZ and APZs for Runway 32. Thus, only limited additional off-Base land would be affected by the establishment of the CZ and APZ for the LZ. No significant land use incompatibilities would be anticipated from the establishment of CZs and APZs for the LZ. However, the Dover AFB AICUZ Study would need to be updated to reflect the CZs and APZs for the LZ and any incompatible land uses resulting from the establishment of the two imaginary surfaces at each end of the LZ as well as the changes in noise exposure.

Mitigation

No significant land use impacts would occur as a result of the Dover AFB Landing Zone Alternative. Therefore, no mitigative actions would be required. The local planning agencies could use the noise contours for future land use planning and zoning.

Cumulative Impacts

Under the cumulative condition, other facilities would be constructed on Dover AFB and some would be in the general area associated with LZ activities. As with the Proposed Action facilities, the other facility actions would be compatible with the Dover AFB General Plan. Thus, the facility construction anticipated under the cumulative condition would be consistent with existing and future land use plans and programs identified in the General Plan.

4.8.2.6 Airspace and Airfield Operations

Airspace Operations

Given the size and operating similarities (airspeed, flight profiles) of the C-17 and C-5 aircraft, the type of sortie aircraft operations and airspace requirements associated with the Dover AFB LZ Alternative would be consistent with the baseline operations. The existing air traffic control procedures and airspace infrastructure surrounding Dover AFB have the capacity to accommodate the anticipated C-17 operations. The low altitude federal airways and MTRs that transit the airspace would not be impacted, nor would they affect, operations in the airspace.

Airfield Operations

Under the Dover AFB LZ Alternative, average daily airfield operations at Dover AFB would increase by 50.66 operations from 239.25 to 289.91 operations (see Tables 2.4.1-2 and 2.4.6-2, respectively), a 21 percent increase. The C-17 tactical training events conducted under the Dover AFB LZ Alternative would be identical to tactical training events anticipated under the Dover AFB Proposed Action. However, some of the events would be accomplished on the LZ instead of the other two runways. Therefore, the Dover AFB Proposed Action discussion and analysis in Subchapter 4.4.10.1 apply to the Dover AFB LZ Alternative. The airfield has the capacity to accommodate the anticipated level of operations as well as the C-17 tactical events that would be accomplished at the airfield.

Aircraft Safety

The aircraft size and flight characteristics of the aircraft based at Dover AFB (C-17 and C-5) under the Proposed Action plus the C-17s associated with LZ operations are identical to the aircraft that would be based at Dover AFB under the Proposed Action. Therefore, the discussion and analysis for the Dover AFB Proposed Action apply to the Dover AFB LZ Alternative. The probability is low that an aircraft involved in an accident at or around the Dover AFB airfield would strike a person or structure on the ground.

Bird-Aircraft Strike Hazard

The bird-aircraft strike assessment factors for the Dover AFB Proposed Action in Subchapter 4.3.10.4 apply to the Dover AFB LZ Alternative. Likewise, the bird-aircraft strike fluctuation and bird-aircraft strikes-serious mishap information for the Dover AFB Proposed Action apply.

Overall, it is estimated the total airfield operations for Dover AFB's two aircraft types (C-17 and C-5) plus the C-17 LZ operations would increase under the Dover AFB LZ Alternative Action by about 73 percent when compared to the baseline. Thus, bird-aircraft strikes associated with airfield operations at Dover AFB would be expected to increase commensurate with the change in airfield operations. Based on the 2003 data in Table 3.1.10-3 and the increase in airfield operations, it is estimated that 71.4 annual bird-aircraft strikes would occur when applying the increase in airfield operations.

Table 4.8.2-11 lists the monthly bird-aircraft strikes based on the baseline monthly average bird-aircraft strikes per airfield operation and the anticipated monthly operations. It is unlikely that any of these bird-aircraft strike incidents would result in an aircraft accident, involve injury either to aircrews or to the public, or damage to property (other than the aircraft).

Table 4.8.2-11 Estimated Dover AFB Landing Zone Alternative Bird-Aircraft Strikes

Month	Baseline Monthly Average	Estimated Monthly Bird-Aircraft Strikes	Net Change	Percent Change
Jan	0.5	0.9	+0.4	+80%
Feb	1.0	1.7	+0.7	+70%
Mar	2.3	4.0	+1.7	+74%
Apr	1.5	2.6	+1.1	+73%
May	4.5	7.8	+3.3	+73%
Jun	2.3	4.0	+1.7	+74%
Jul	4.8	8.3	+3.5	+73%
Aug	5.3	9.2	+3.9	+74%
Sep	5.5	9.5	+4.0	+73%
Oct	7.3	12.6	+5.3	+73%
Nov	3.5	6.1	+2.6	+74%
Dec	2.7	4.7	+2.0	+74%
Total	41.2	71.4	+30.2	+73%

Mitigation

No significant airspace and airfield operations, safety, or BASH impacts would be anticipated. Therefore no mitigation would be necessary.

Cumulative Impacts

None of the other actions anticipated at Dover AFB include aircraft basing or airfield operations changes. Therefore, no cumulative airspace and airfield operations impacts would be anticipated.

4.8.2.7 Environmental Management

Pollution Prevention

The Dover AFB Landing Zone Alternative would result in construction of a LZ in the eastern area of the airfield. The activities associated with the action would be accomplished under existing Air Force and Base directives, as well as innovative pollution prevention technologies, to achieve the P2 goals of minimizing or eliminating the use of hazardous materials, reducing the volume of hazardous waste and the release of pollution into the environment, and conserving energy.

Environmental Restoration Program

As mentioned in Subchapter 3.1.11.3, there are no ERP sites at or near the proposed location for the LZ.

Mitigation

No significant pollution prevention or ERP impacts would be anticipated. For this reason, no mitigation measures would be required.

Cumulative Impacts

The construction contractor for other projects would be required to comply with the regulatory requirements and best management practices identified for the Dover AFB Proposed Action. Although one of the other actions is adjacent to the LZ project site, use of the regulatory requirements and best management practices identified for the Dover AFB Proposed Action would minimize the potential for cumulative impacts. No cumulative pollution prevention or ERP impacts would be anticipated.

4.8.3 NAES Lakehurst Landing Zone Alternative

4.8.3.1 Air Quality

The methodologies used to estimate emissions from airfield operations for the Dover AFB Proposed Action were used to determine the emissions under the NAES Lakehurst LZ Alternative.

Table 4.8.3-1 lists the emissions anticipated from the NAES Lakehurst LZ Alternative and compares total emissions to the baseline AQCR emissions inventory. Table 4.8.3-2 summarizes the net change in emissions associated with the NAES Lakehurst LZ Alternative in AQCR 150, and Table 4.8.3-3 compares the change in emissions for regional significance and *de minimis* purposes.

Table 4.8.3-1 NAES Lakehurst Landing Zone Alternative Emissions in AQCR 150

Criteria Air Pollutant	CO (tpy)	VOC (tpy)	NOx (tpy)	SOx (tpy)	PM_{10} (tpy)
AQCR 150 CY99 Emissions Inventory	1,450.00	680.00	10,000.00	19,660.00	1,290.00
Construction Emissions					
Landing Zone Construction Emissions	29.33	4.35	50.89	3.25	206.27
Construction Emissions as Percent of AQCR Emissions	2.1228%	0.6397%	0.5089%	0.0165%	15.9999%
Aircraft Emissions					
Landing Zone Operations CY 06	0.00	0.00	0.00	0.00	0.00
Landing Zone Operations CY 07	0.00	0.00	0.00	0.00	0.00
Landing Zone Operations CY 08	66.75	9.00	414.99	0.00	98.94
Landing Zone Operations CY 09	77.87	10.50	484.15	0.00	115.42
Landing Zone Operations CY 10	88.99	12.00	553.31	0.00	131.91
Landing Zone Operations CY 11	100.12	13.50	622.48	0.00	148.40
SR-800	0.04	0.03	3.71	0.00	0.29
SR-801	0.04	0.02	3.27	0.00	0.25
SR-805	0.05	0.03	4.27	0.00	0.33
SR-844	0.05	0.03	4.25	0.00	0.33
SR-845	0.04	0.02	3.18	0.00	0.25
SR-846	0.21	0.12	17.23	0.00	1.33
VR-1709	0.26	0.15	21.86	0.00	1.68
Annual MTR Operations	0.69	0.40	57.77	0.00	4.46
Annual Aircraft Emissions	100.81	13.90	680.25	0.00	152.86
Annual Aircraft Emissions as Percent of AQCR Emissions	6.95%	2.04%	6.80%	0.0000%	11.85%

Note: VOC is not an air pollutant criterion. However, VOC is reported because, as an O_3 precursor, it is a controlled pollutant.

Table 4.8.3-2 Net Change in Emissions from NAES Lakehurst Landing Zone Alternative in AQCR 150

Category	Pollutants Emitted (tons/year)				
	CO	NO_X	VOC	SO_X	PM_{10}
Net Change in Military Training Route Operations Emissions	+0.34	+28.89	+0.21	0.00	+2.24
Net Change in Landing Zone Operations Emissions	+100.12	+622.48	+13.50	0.00	+148.40
Net Change in Landing Zone Construction Emissions	+29.33	+50.89	+4.35	+3.25	+206.27
Net Change in Emissions for the LZ Alternative *	+129.79	**+702.26**	**+18.06**	+3.25	+356.91

Note *Bold indicates the pollutant is nonattainment within the AQCR.*

Source *USAF 2004d.*

Table 4.8.3-3 Regional Significance Analysis and Comparison to Conformity *de minimis* Thresholds for AQCR 150 for the NAES Lakehurst Landing Zone Alternative

Category	Pollutants Emitted (tons/year)				
	CO	NO_X	VOC	SO_X	PM_{10}
Emissions Inventory	1,450.00	10,000.00	680.00	19,660.00	1,290.00
Net Change in Emissions	+129.79	**+702.26**	**+18.06**	+3.25	+356.91
Percent Change Compared to Emissions Inventory	+8.95%	+7.02%	+2.66%	+0.02%	+27.67
Regionally Significant? (>10%)	NA	**No**	**No**	No	NA
de minimis Threshold (tpy)	NA	100	50	NA	NA
Exceed *de minimis* Threshold?	NA	**Yes**	**No**	NA	NA

NA not applicable. De minimis does not apply since the AQCR is in attainment for pollutant.

Source USAF 2004d.

Construction emissions presented in Table 4.8.3-1 include the estimated annual emissions from construction equipment exhaust associated with the NAES Lakehurst LZ Alternative. Emissions would produce slightly elevated air pollutant concentrations. However, the effects would be temporary, fall off rapidly with distance from the proposed construction site, and would not result in any long-term impacts.

Airfield and MTR operations in the AQCR in which the Station is located would generate emissions on a recurring basis. Table 4.8.3-1 lists the annual emissions from these operations for the NAES Lakehurst LZ Alternative. As indicated in the table, the greatest volume of emissions for any of the criteria pollutants from recurring aircraft operations would be 680.25 tpy for NO_X, which equates to 6.80 percent of the AQCR emissions inventory for that pollutant.

The CAA General Conformity Applicability Analysis for the NAES LZ Alternative (USAF 2004c) concluded that, although the alternative would occur within an air basin designated as moderate nonattainment for O_3, the net change in emissions for NO_X and VOC would be less than 10 percent of the emissions inventory, and the action would not be considered regionally significant. While the net change in VOC emissions would not exceed the *de minimis* threshold of 50 tpy, the net change in NO_X emissions would exceed *de minimis* threshold of 100 tpy. Thus, the analysis determined that the NAES Lakehurst LZ Alternative negatively conforms to the applicable SIP for AQCR 150. The NAES Lakehurst LZ Alternative has been demonstrated by USEPA standards to cause or contribute to new violations of any national ambient air quality standard in the affected area, and increases the frequency or severity of an existing violation. Implementation of the NAES Lakehurst LZ Alternative would delay timely attainment of the O_3 standards in the air basin, and the action is not in compliance or consistent with all relevant requirements and milestones contained in the applicable SIP. This conclusion of negative General Conformity Determination for the federal action planned for NAES Lakehurst does not fulfill the Air Force's obligation and responsibility under 40 CFR Part 93, Subpart B.

Mitigation

The Air Force and the Navy consulted with the NJDEP and the USEPA to include the NAES Lakehurst LZ Alternative in the SIP to meet the requirements under the General Conformity Rule. The NJDEP agreed to include the NAES Lakehurst LZ Alternative in the 8-hour Attainment Demonstration SIP, which will be submitted to the USEPA in June 2007. Additionally, the NJDEP agreed to provide NAES Lakehurst with a facility-wide emissions budget for VOC and NO_X emissions in the 8-hour Attainment Demonstration. Appendix C-4 contains the NJDEP letter concerning the consultation. The result of the consultation process is that the Air Force's obligation and responsibility under 40 CFR Part 93, Subpart B is fulfilled and a Conformity Determination would not be required.

4.8.3.2 Noise

The aircraft operations modeled include other aircraft operations as well as the anticipated C-17 operations (see Tables 2.5.3-1 and 3.4.7-1). Figure 4.8.3-1 shows the aircraft ground tracks and Figure 4.8.3-2 depicts the noise exposure area from the aircraft operations condition for the NAES Lakehurst LZ Alternative. Figure 4.8.3-3 compares the LZ Alternative and baseline noise contours. Table 4.8.3-4 compares the baseline and NAES Lakehurst Landing Zone Alternative DNL as well as the SEL for C-17 operations at the airfield. Table 4.8.3-5 compares the land area and population exposed to noise of DNL 65 dBA and greater, as well as the population potentially highly annoyed, for the NAES Lakehurst Landing Zone Alternative with the baseline condition. There would be an overall 605 people exposed to DNL 65 dBA and greater. Data from these tables are used in the single event and day-night sound analysis sections.

Table 4.8.3-4 Comparison of DNL and SEL from Proposed Airfield Operations at Analysis Points with Baseline, NAES Lakehurst Landing Zone Alternative

		DNL (dBA)			C-17 SEL (dBA)		
Number	**Description**	**BL**	**Alt**	**Chg**	**BL**	**Alt**	**Chg**
1	Church	48	62	+14	96	103	+7
2	Church	40	59	+19	87	100	+13
3	Subdivision	39	50	+11	76	76	0
4	Elementary School	37	59	+18	89	89	0
5	Navy Housing	42	62	+18	96	103	+7
6	High School	35	55	+20	85	85	0
7	Vocational School	48	67	+19	102	103	+1
8	On-Station High School	40	50	+10	77	97	+20

Note: BL=baseline. Alt=alternative. Chg=change. The flight tracks and profiles for the other aircraft operating at NAES Lakehurst would not change. Therefore, the SEL data in Table 3.4.3-1 apply to the LZ alternative. The analysis point number and description correspond to the point as reflected on the noise contour and aircraft ground track figures. There may be minor differences when comparing the DNL for a point from the table to the DNL for the point as depicted on the noise contour figure. This difference is a result of small misalignments during the process of printing the noise contours on top of the background map.

Table 4.8.3-5 Summary of Land Area and Population Exposed to, and Population Potentially Highly Annoyed by DNL 65 dBA and Greater, NAES Lakehurst Landing Zone Alternative

	DNL Interval (dBA)				
Category	**65-70**	**70-75**	**75-80**	**80+**	**Total**
Acres					
Baseline Acres	103	12	0	0	115
Landing Zone Alternative	5,348	2,028	598	470	8,444
Change	+5,245	+2,016	+598	+470	+8,329
Percent Change	+5,092%	+16,800%	--	--	+7,243%
Population					
Baseline Population	0	0	0	0	0
Landing Zone Alternative	534	58	13	0	605
Change	+534	+58	+13	+0	+605
Percent Change	--%	--%	--%	--%	--%
Population Highly Annoyed					
Baseline Population	0	0	0	0	0
Landing Zone Alternative	117	21	7	0	145
Change	+117	+21	+7	0	+145
Percent Change	--%	--%	--%	--%	--%

Note: People highly annoyed determined by multiplying the total number of people in the noise zone times the higher percent number for the interval in Table 3.1.3-4.

Single Event Noise Analysis, NAES Lakehurst Landing Zone Alternative

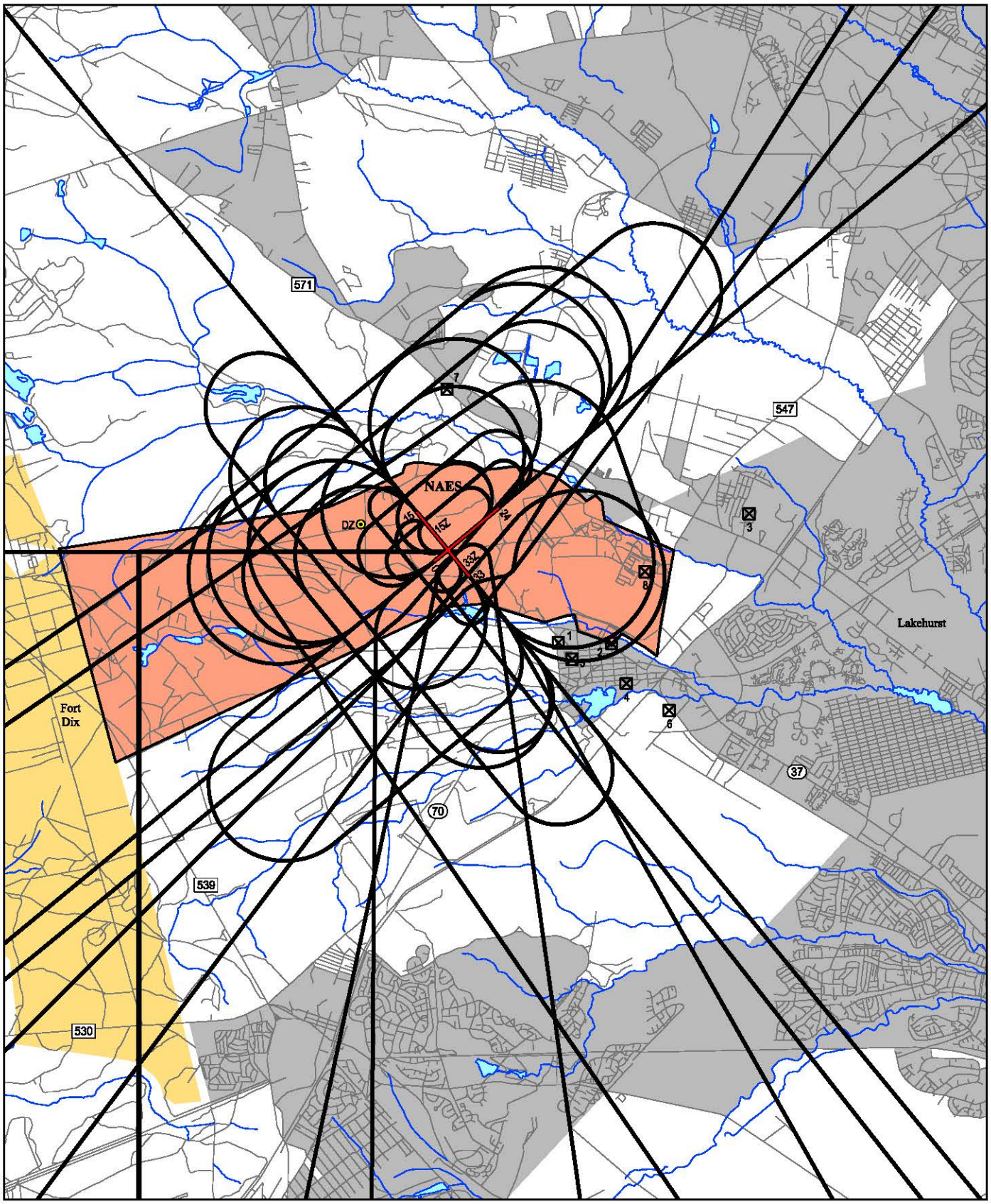
Sound Exposure Level

A total of eight representative analysis points were selected under the traffic patterns and around the airfield to calculate the SEL due to aircraft overflight. The noise contour and aircraft ground track figures show the locations of the analysis points.

As indicated in Table 4.8.3-4, the C -17 SEL would increase at five of the eight analysis points and remain the same at the other three points. Although the DNL would increase by a maximum of 7 dBA at two of the five points, the increase at the fifth point (the on-Station high school) would be 20 dBA. The increases are due to the addition of LZ-related aircraft flight tracks that overfly the analysis points.

Sleep Disturbance

The introductory sleep disturbance and background information for Dover AFB in Subchapter 4.4.3.2 applies to NAES Lakehurst. Individuals in residences in the area around the Station would continue to be exposed to indoor SEL of 60 to 80 dBA during normal sleep periods (10:00 p.m. to 7:00 a.m.). There would be 605 persons exposed to DNL 65 dBA and greater as a result of the NAES Lakehurst Landing Zone Alternative. Assuming the number of sleep awakenings would be proportional to the increase in exposed population, it is anticipated there would be the potential for 61 additional persons who could be awakened when comparing the NAES Lakehurst Landing Zone Alternative to the baseline condition.



NAES Lakehurst
LEGEND

- Flight Track
- Runway
- Roadway
- Analysis Point
- NAES Lakehurst
- Fort Dix
- Urban Area
- Drop Zone

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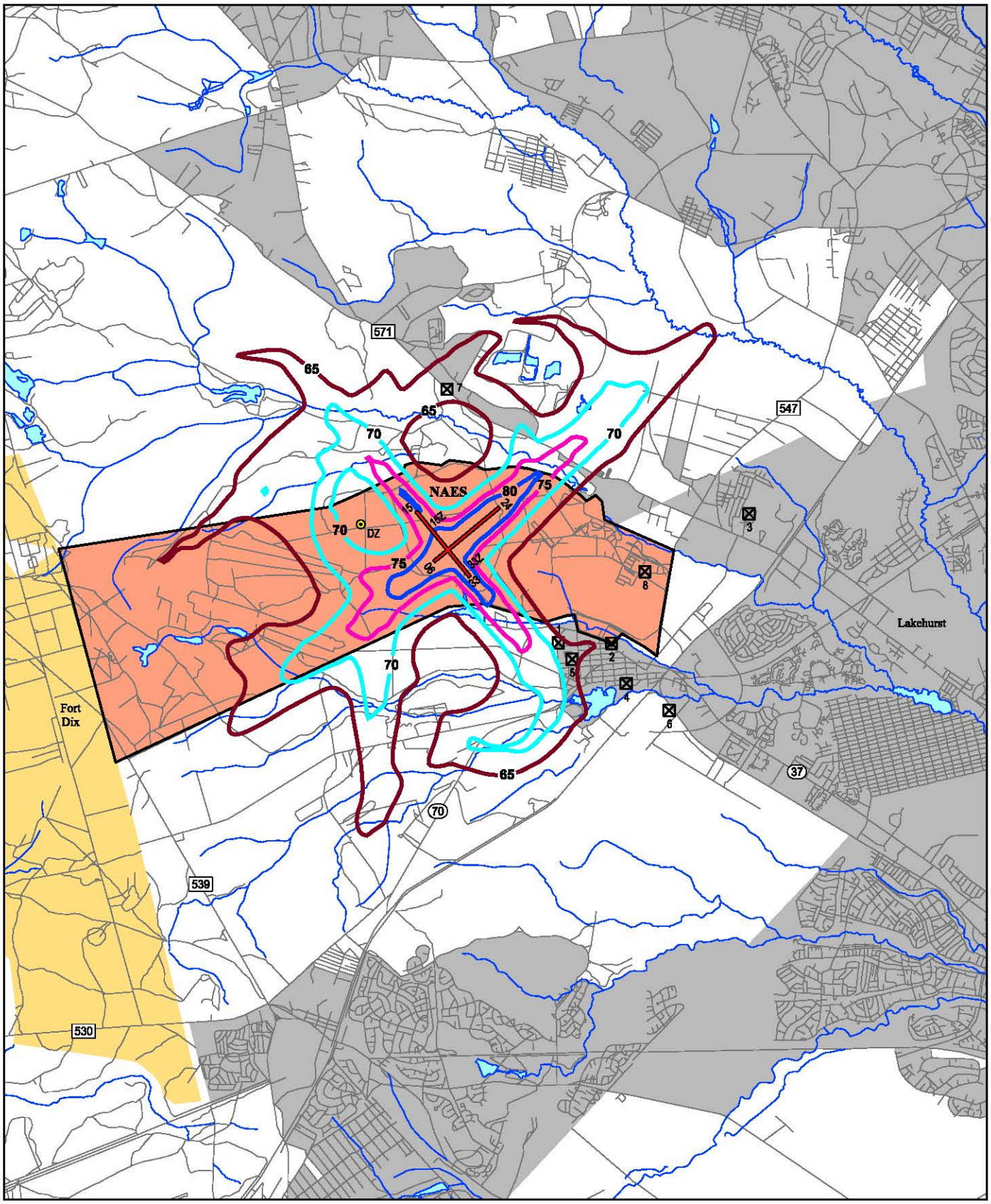
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Aircraft Ground Tracks, NAES Lakehurst Landing Zone Alternative

Figure 4.8.3-1

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NAES Lakehurst
LEGEND

- 65 dBA Contour
- 70 dBA Contour
- 75 dBA Contour
- 80 dBA Contour
- Runway
- Roadway
- Analysis Point
- Drop Zone
- NAES Lakehurst
- Fort Dix
- Urban Area

N

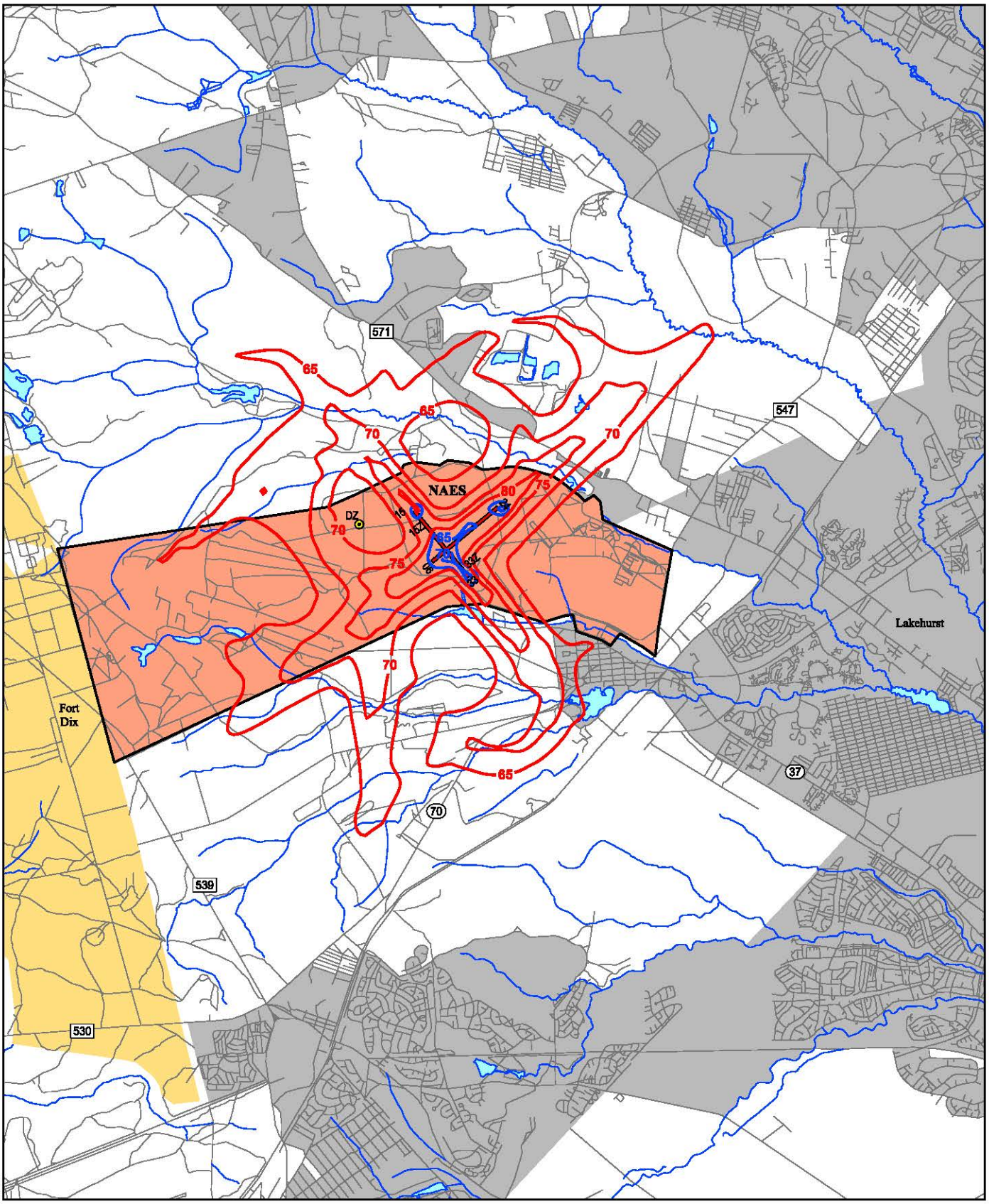
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Noise Contours, NAES Lakehurst Landing Zone Alternative

Figure 4.8.3-2

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NAES Lakehurst
LEGEND

- Baseline Noise Contour
- LZ Option 1 Noise Contour
- Runway
- Roadway
- NAES Lakehurst
- Fort Dix
- Urban Area
- Drop Zone

N
0 8,000
Feet

Comparison of Baseline and NAES Lakehurst Landing Zone Alternative Noise Contours

Figure 4.8.3-3

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Effects of Noise on Structures

The maximum sound pressure produced by C-17 aircraft at NAES Lakehurst would be 112 dBA at 100 feet from the aircraft. At a distance of 1,000 feet, the C-17 aircraft generates a maximum sound pressure of 91 dBA. The maximum sound pressure is the highest instantaneous sound pressure during a single noise event no matter how long the sound may persist. Maximum sound pressure is different than SEL, which is the A-weighted sound level integrated over the duration of the noise event and adjusted to a length of 1 second. Therefore, no damage to structures in the area surrounding NAES Lakehurst would be anticipated because the sound pressure produced by the aircraft would not exceed the level at which structural damage could occur.

Construction Noise

Construction noise during LZ construction would occur on the airfield, would be intermittent, and would be short-term in duration. Typical noise levels from heavy equipment range from 75 to 89 dBA at 50 feet from the source (see Table 4.4.3-3). The construction noise assumptions and analysis for the Dover AFB Proposed Action applies to the NAES Lakehurst Landing Zone Alternative. It is not anticipated any construction noise impacts would occur due to the distance from the LZ construction site to a receptor.

Day-Night Noise Analysis, NAES Lakehurst Landing Zone Alternative

Overall, the NAES Lakehurst Landing Zone Alternative noise contours would increase in all directions from the airfield (see Figure 4.8.3-1), with the number of acres in the DNL 65 dBA and greater exposure area increasing by 7,243 percent. The areas in which the noise exposure extends the farthest from the airfield are to the north, northeast, south, and southwest of the Station (see Figure 4.8.3-1). The exposed area to the north would include the Colliers Mills Wildlife Management Area, while the area south and southwest of the Station would primarily encompass the Manchester Fish and Wildlife Management Area. Except for a strip of urbanized land along Highway 571, most of the additionally exposed area northeast of the Station across the highway is industrial land that includes activities such as gravel mining.

As indicated in Table 4.8.3-4, the DNL would increase at all analysis points, with the greatest increase (20 dBA) occurring at analysis point 6 (high school). Although the DNL would increase at all points, the DNL at the analysis points would exceed 65 dBA at only one point (vocational school). The DNL at the vocational school would be 67 dBA, or 2 dBA greater than the level at which community noise effects are compared.

People would be exposed to aircraft noise in three of the four noise zones (see Table 4.8.3-5), with the DNL 65-70 dBA noise zone containing 534 of the 605 persons exposed to DNL 65-dBA and greater. These 605 persons would equate to 0.6 percent of the estimated 101,777 persons (based on 2000 census data) who live within the airfield airspace environment. This approximate 5-mile radius area includes the airspace allocated to the air traffic control tower and is the area in which closed patterns and maneuvering for takeoffs and

landings is accomplished. The overall number of persons who would be highly annoyed by noise exposure would be 145 people. As indicated in Table 4.8.3-5, no people were exposed to DNL 65 dBA and greater under the baseline.

The background information concerning speech disruption for the Dover AFB Proposed Action applies to the alternative. Assuming the number of conversations is proportional to the increase in exposed population and the increase in airfield operations, it is anticipated there would be a corresponding increase in the potential for speech disruption for the 13 persons exposed to DNL 75 dBA and greater (see Table 4.8.3-5). These 13 persons would equate to 0.01 percent of the estimated 101,777 persons who live within the airfield airspace environment.

The hearing loss and nonauditory health effects information for the Dover AFB Proposed Action apply to the alternative. Noise-induced hearing loss would not be anticipated from airfield operations associated with the NAES Lakehurst Landing Zone Alternative and nonauditory health effects cannot be analyzed.

The background information about classroom disruption for the Dover AFB Proposed Action applies to the alternative. Under the NAES Lakehurst Landing Zone Alternative, the outdoor DNL at the schools identified for analysis (*i.e.*, analysis points 4, 6, 7, and 8) would increase by 18, 20, 19, and 10 dBA, respectively. However, the greatest DNL at any of the schools would be 67 dBA at point 7. The C-17 outdoor SEL at the four points respectively would be 89, 85, 103, and 97 dBA, respectively. Indoor noise levels are generally 20 dBA lower than outdoor noise levels because building structures attenuate the outdoor noise levels. Thus, the interior noise levels in the schools would be approximately 69, 65, 83, and 77 dBA, respectively. The interior noise levels at points 7 and 8 would exceed the 75 dBA level at which a marked increase in pauses and masking would occur and at which teaching would be impaired as a result of disruption of speech communication by 8 and 2 dBA, respectively. However, the change in the potential for teaching impairment resulting from aircraft noise at point 7 would be minimal because the SEL increase would be 1 dBA when compared to the baseline. Although the SEL would increase by 20 dBA at point 8 and be 2 dBA over the impairment threshold, it is anticipated the potential for impairment would be minimal because a 3 dBA change in sound level is just perceptible (Bies and Hansen 1988).

In summary, there would be an increase in speech disruption from aircraft overflight and there should be no noise-induced hearing loss impacts. The potential for classroom disruption at two of the schools would be minimal when compared to the baseline. The overall effect of the NAES Lakehurst Landing Zone Alternative would be 605 people exposed to DNL 65 dBA and greater.

Mitigation

No significant noise impacts would be anticipated. Therefore, no mitigation would be necessary.

4.8.3.3 Biological Resources

Vegetation and Wildlife

Approximately 8 acres of maintained grassland would be permanently lost due to construction of the LZ and associated taxiway. This represents approximately 0.5 percent of the total grassland area at NAES Lakehurst (total grassland area = 1,675 acres). No tree clearing would be required. As stated in Subchapter 2.5, maintained grassland areas temporarily disturbed during construction would be revegetated with native grasses under the supervision of the NAES Lakehurst Natural Resources Manager.

The relatively small loss of habitat would not be expected to adversely effect wildlife populations at the installation. However, construction activities could temporarily disturb wildlife species in the immediate vicinity of the LZ construction. Mobile species such as mammals and birds would likely avoid the area during construction.

Wetlands

As stated in Subchapter 2.5, the construction contractor would prepare and implement a SWPPP in accordance with federal, state, and local guidance prior to initiation of construction activities. No activities would occur in wetlands, state open waters, or wetland transition areas.

Threatened, Endangered, and Rare Species

No federally listed species have been documented at or in the immediate vicinity of the LZ. Furthermore, the project area lacks suitable habitat for the three federally listed species that have been documented at NAES Lakehurst (Knieskern's beaked-rush, bog turtle, and bald eagle). The project area lacks wetland habitats that are inhabited by Knieskern's beaked-rush and the bog turtle. The project area also lacks large bodies of open water that are used by the bald eagle. Therefore, LZ construction activities would have no adverse affect on federally listed species.

The grassland area in which the LZ would be constructed would not provide suitable denning or nesting for the northern pine snake. Although the foraging range of the snake is large, the construction and operation of the LZ would not remove significant foraging area because the LZ would be very close to the existing, paved Runway 06/24.

Human and equipment activity during construction would likely cause birds and pine snakes to avoid the area during construction. Therefore, the potential for direct injury, damage, or death to these species from construction activities is minimal. Following construction, routine maintenance activities, such mowing to meet airfield safety requirements, would not change from current conditions.

Two state listed birds, grasshopper sparrow and upland sandpiper, have been documented within the grasslands associated with the existing runways. These grasslands provide suitable foraging habitat for the two species, as well as other grassland birds. However, nesting

habitat within the runway grasslands is likely limited by the mowing regime that is routinely accomplished before and during the breeding season to discourage nesting.

Approximately 8 acres of grassland habitat (*i.e.*, 0.5 percent of the total grassland habitat at the Station) would be lost due to construction of the LZ and associated taxiway. NAES Lakehurst would create or enhance an equal area of grassland in other areas of the Station to offset the loss of grassland due to construction of the LZ. Therefore, there would be no net loss of habitat. Disturbance to habitat would be temporary, lasting only as long as it takes to establish the grasslands. Establishing habitat in other areas of the Station that would be more distant from the airfield would have a beneficial effect because the increased distance would reduce the potential for bird-aircraft strikes and disturbance from airfield operations. For these reasons, no significant adverse effect would occur with regard to state listed bird habitation.

Mitigation

No significant biological effects would be anticipated. Therefore, no mitigation would be required.

4.8.3.4 Land Use

On-Station land use conflicts would not be expected under the NAES Lakehurst Landing Zone Alternative. Most land uses would be compatible with the general character of established and planned Station land use patterns. The construction anticipated under the NAES Lakehurst Landing Zone Alternative would be consistent with existing and future land use plans and programs identified in the NAES Lakehurst Vision Plan.

The additional off-Station noise exposure would occur to the north, northeast, south, and southwest of the Station (see Figure 4.8.3-3). The exposed area to the north would include the Colliers Mills Wildlife Management Area, while the area south and southwest of the Station would primarily encompass the Manchester Fish and Wildlife Management Area. Except for a strip of urbanized land along Highway 571, most of the additionally exposed area northeast of the Station across the highway is industrial land that includes activities such as gravel mining. Based on the current land uses, exposed noise levels, and consideration of the noise and overflight studies described in Subchapter 3.1.3, no significant impacts to land uses would occur because of the increased noise levels from aircraft operations. No impacts to land ownership or the existing function of the land uses would occur.

As depicted on Figure 2.5.3-2, the two CZs associated with the LZ would occur on the Station. Only the extreme outer portion of the APZ at the northeastern end of the LZ would occur off-Station. All the CZs and APZ land surfaces would occur within the CZs and APZs associated with the existing Runway 06/24. Thus, no land use categories would require changing as a result of establishing the LZ, CZs, and APZs. The NAES Lakehurst AICUZ Study would need to be updated to reflect the CZs and APZs for the LZ and any incompatible land uses resulting from the establishment of the imaginary surfaces at each end of the LZ as well as the changes in noise exposure.

Mitigation

No significant land use impacts would occur as a result of the NAES Lakehurst Landing Zone Alternative. Therefore, no mitigative actions would be required. The local planning agencies could use the noise contours for future land use planning and zoning.

4.8.3.5 Airspace and Airfield Operations

Airspace Operations

The C-17 sortie aircraft operations and airspace requirements associated with the NAES Lakehurst LZ Alternative would be consistent with the C-17, KC-10, and C-130 aircraft that operate in the airspace under the baseline. The existing air traffic control procedures and airspace infrastructure surrounding NAES Lakehurst and McGuire AFB have the capacity to accommodate the additional daily C-17 operations. The low altitude federal airways and MTRs that transit the airspace would not be impacted, nor would they affect the increased level of operations in the airspace.

Airfield Operations

Under the NAES Lakehurst LZ Alternative, average daily airfield operations at the Station would increase by 115.30 operations from 119.35 to 234.65 operations (see Tables 3.4.7-1 and 2.4.6-3, respectively), a 97 percent increase. C-17 aircrews would accomplish tactical events at the LZ such as arrivals and departures in which the aircraft may spiral up to about 5,000 feet AGL during a departure or down from that altitude on an arrival to a landing. The NAES Lakehurst air traffic control tower and McGuire AFB RAPCON would establish procedures for these tactical events since they start in one airspace unit (*i.e.*, either tower or RAPCON) and end in another (*i.e.*, either tower or RAPCON). The volume of traffic in the airspaces in which the tactical arrivals and departures would be accomplished would not preclude establishment of the procedures to allow execution of the events. Thus, the airspace has the capacity to accommodate the additional air traffic control procedures needed for the combination of the C-17 LZ operations and the operations associated with the NAES Lakehurst LZ Alternative. The airfield has the capacity to accommodate the anticipated level and type of operations.

Aircraft Safety

The aircraft size and flight characteristics of the C-17s associated with LZ operations are identical to the aircraft that would be based at McGuire AFB under the Alternative Action. Therefore, the discussion and analysis for the Dover AFB Proposed Action apply to the NAES Lakehurst LZ Alternative. The probability is low that an aircraft involved in an accident at or around the NAES Lakehurst airfield would strike a person or structure on the ground.

Bird-Aircraft Strike Hazard

The bird-aircraft strike assessment factors for the Dover AFB Proposed Action in Subchapter 4.3.10.4 apply to the NAES Lakehurst LZ Alternative. Likewise, the bird-aircraft strike fluctuation and bird-aircraft strikes-serious mishap information for the Dover AFB Proposed Action apply. As reflected in Table 3.4.7-1, only 176 annual C-17 operations occurred at NAES Lakehurst under the baseline. No bird-aircraft strike data are available for C-17 operations at the Station.

Due to the proximity of NAES Lakehurst and McGuire AFB, the similarity of the ecological settings for the two installations, and the similarity in aircraft size and flight characteristics between the C-17s that would conduct LZ operations and the three baseline McGuire AFB aircraft (C-17, KC-10, and KC-135), the McGuire AFB average monthly bird-aircraft strike per airfield operation were used to estimate the number of bird-aircraft strikes that could occur at NAES Lakehurst. Based on the 2003 data in Table 3.2.11-3 and the increase in airfield operations at NAES Lakehurst, it is estimated that 60.7 annual bird-aircraft strikes would occur at the Station. Table 4.8.3-6 lists the estimated bird-aircraft strikes. It is unlikely that any of these bird-aircraft strike incidents would result in an aircraft accident, involve injury either to aircrews or to the public, or damage to property (other than the aircraft).

Table 4.8.3-6 Estimated NAES Lakehurst Landing Zone Alternative Bird-Aircraft Strikes

Month	Estimated Monthly Bird-Aircraft Strikes
Jan	0.4
Feb	1.1
Mar	1.9
Apr	4.9
May	7.9
Jun	2.8
Jul	5.6
Aug	9.1
Sep	10.2
Oct	11.4
Nov	4.2
Dec	1.2
Total	60.7

Mitigation

No significant airspace and airfield operations, safety, or BASH impacts would be anticipated. Therefore no mitigation would be necessary.

4.9 UNAVOIDABLE ADVERSE IMPACTS

Unavoidable adverse impacts would result from implementation of the east coast C-17 basing alternatives and the LZ alternatives.

Air Quality

Emissions of air pollutants associated with facilities construction and aircraft operation are an unavoidable condition, but are not considered significant, and a CAA General Conformity Determination would not be required for the basing alternatives. However, a Conformity Determination would be required for the McGuire AFB and NAES Lakehurst LZ alternatives.

Noise

Noise resulting from anticipated aircraft operations is an unavoidable condition. However, sleep disturbance, annoyance, and speech interference may occur for the Proposed Action, Alternative Actions, and LZ Alternatives. Hearing impairment would not be expected. Noise would not be considered a significant impact.

Environmental Management

The loss of aggregate, which would become inaccessible, would occur as a result of the construction activities. However, due to the potential for reuse of this material on site, the relatively small portion of the resource area affected and the low economic value of aggregate in the areas, this condition would not be considered significant.

Biological Resources

Site grading associated with construction projects would remove minimal vegetation and associated small animal life now occupying or utilizing the few acres affected. All of the affected sites are in the areas of the bases that were previously disturbed and would not presently provide significant habitat for many species. Plants and wildlife would be extirpated from the site, decreasing site floral and faunal diversity. Although unavoidable, this adverse condition would not be considered significant.

Safety

The potential for aircraft mishaps, the potential for accidents or spills at the fuel storage facility, and the generation of hazardous waste are unavoidable conditions associated with the proposed action. However, the potential for these unavoidable situations would not significantly increase over baseline conditions, and therefore would not be considered significant.

Infrastructure and Utilities

The use of nonrenewable resources is an unavoidable occurrence, although not considered significant. The Proposed Action, Alternative Actions, and LZ Alternatives would require use of fossil fuels, a nonrenewable natural resource. Energy supplies, although relatively small, would be committed to the Proposed Action, Alternative Actions, and LZ Alternatives.

4.10 RELATIONSHIP BETWEEN SHORT-TERM USES AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

Neither the Proposed Action nor the Alternative Action or the LZ Alternatives would result in intensification of land use in the area surrounding the respective Base. Development of the Proposed Action, Alternative Action, No Action Alternative, and LZ Alternatives would not represent a significant loss of open space. The sites are designated for aviation uses, and were not planned for use as open space. Therefore, it is not anticipated that the Proposed Action, Alternative Action, No Action Alternative, and LZ Alternatives would result in any cumulative land use or aesthetic impacts. Long-term productivity of the sites would be increased by development of the Proposed Action, the Alternative Actions, or LZ Alternatives.

Irreversible and Irretrievable Commitment of Resources

The irreversible environmental changes that would result from implementation of the Proposed Action, Alternative Actions, or No Action Alternative and LZ Alternatives involve consumption of material resources, energy resources, land, biological habitat, and human resources. The use of these resources is considered to be permanent.

Material Resources

Building materials (for construction of facilities), concrete and asphalt (for facilities, runways, and roads), and various material supplies (for infrastructure) would be used for the Proposed or Alternative Actions and LZ Alternatives. Most of these materials are not in short supply, and are readily available from suppliers in the region. Use of these materials for the proposed action would not limit other unrelated construction activities.

Energy Resources

Energy resources such as petroleum-based products (such as gasoline, jet fuel, and diesel), natural gas, and electricity would be used for the Proposed or Alternative Actions and would be irretrievably lost. Gasoline and diesel would be used for operation of construction vehicles. Jet fuel would be used for aircraft operations and gasoline would be used for vehicle operation. Natural gas and electricity would be used to operate facilities. Consumption of these energy resources would not place a significant demand on their supply systems or within the region.

Land

Implementation of either the Proposed, Alternative Actions, and LZ Alternative would result in construction of new facilities on the respective installation. This land would be lost to other uses during the operational life of the basing and LZ action. The loss of open space is not considered irreversible.

Biological Habitat

The Proposed Action, Alternative Actions, and LZ Alternatives would result in the irreversible destruction or loss of the vegetation and wildlife habitat on proposed construction

sites. Neither action would remove a significant amount of open space or undeveloped land currently functioning as biological habitat.

Human Resources

The use of human resources for construction and operation is considered an irretrievable loss only in that it would preclude the affected personnel from engaging in other work activities. However, the use of human resources for either the Proposed Action, Alternative Actions, or LZ Alternatives represents employment opportunities, and is considered beneficial.

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CHAPTER 5
LIST OF PREPARERS

Name	Degree	Resource	Years of Experience
Auman, Cindy	B.A., International Affairs M.A., Anthropology	Cultural Resources	16
Beisel, Don	B.A., Geography, Education M.A., Geography	Socioeconomic Resources; Environmental Justice	25
Bupp, Susan	B.A., Anthropology M.A., Anthropology	Cultural Resources	27
Crisologo, Rosemarie	B.S., Biological Sciences M.S., Environmental Engineering	Hazardous Waste, Hazardous Materials, and Stored Fuels; Water Resources; Environmental Management	24
Davis, Anthony, P.E.	B.S., Civil Engineering	Infrastructure and Utilities	22
Gaddi, Elvira	B.S., Chemical Engineering M.S., Chemical Engineering	Air Quality	25
Miller, Dorothy	B.S., Mathematics	Aircraft Noise Modeling	29
Roesch, Jim	B.S., Environmental Design B.L.A., Landscape Architecture M.S., Environmental Science	Land Use	9
Schnapp, Angela	B.S., Nuclear Engineering M.S., Environmental Engineering	Air Quality	9
Wallin, John	B.A., Biology M.A., Management	Project Manager; Airspace and Airfield Operations, BASH, and Aircraft Safety; Noise	32
Wooten, R.C., Ph.D.	Ph.D., Ecology and Biology	Technical Manager	34

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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

Castaneda, Frank (HQ AFCEE/ECE)
Kissler, Tracy (HQ AFCEE/ECE)
Lester, Bob (HQ AFCEE/TDI)

Scott Air Force Base, Illinois, Headquarters Air Mobility Command

Allbright, Doug (HQ AMC/A75C)
Krogh, Jim (HQ AMC/A36AA)

Dover Air Force Base, Delaware, 436th Airlift Wing

Benner, Rayanne (436 CES/CEVQ)
Mikula, Charles (436 CES/CEV)
Seip, Steve (436 CES/CEV)

McGuire Air Force Base, New Jersey, 305th Air Mobility Wing

Archer, Chris (305 CES/CEV)
Hasser, Stephanie Lt (305 CES/CEV)
Kidd, Joanna (305 CES/CERR)
McDonald, Kimberlee (305 CES/CEV)
Panebianco, Robert (305 CES/CEV)
Polehmus, Richard Capt (305 AMW/SEF)
Smith, Ryan Lt (305 CES/CEV)

Charleston Air Force Base, South Carolina, 437th Airlift Wing

Bouknight, John (Chief, Maintenance Group Programs and Resources)
Camp, Joe (437 CES/CEV)
Eppley, Joel Capt (437 OSS/OST)
McCadams, Glenn Capt (437 OSS/OST)
Deese, Harold (437 CES/CEV)
Werrell, Bill (437 CES/CECP)

NAES Lakehurst, New Jersey

Blazak, Dennis (Environmental Department, 8.7)
D'Haene, Peggy CDR (LDO/Business Development)
Peterson, Dorothy (Business Development Analyst)
Snider, John Chief (Airfield Manager)

Charleston County, South Carolina

Lawing, Robert (Charleston County Solid Waste)

Delaware Solid Waste Authority Landfill, Sandtown, Delaware

Miller, Logan

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CHAPTER 7
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