DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 436TH AIRLIFT WING (AMC)

MEMORANDUM FOR 436 CES/CEV

FROM: 436 MSG/CC

SUBJECT: Finding of No Significant Impact (FONSI)-Upgrade Runway 14/32 by constructing 25 foot shoulders.

Introduction
The 436th Airlift Wing (436 AW) of the United States Air Force (USAF) has proposed to upgrade Runway 14/32 at Dover Air Force Base (AFB), Delaware. Dover AFB proposes to construct 25 foot shoulders on Runway 14/32 to improve efficiency and safety of airfield operations and meet USAF runway standards. The Proposed Action and the No Action Alternative were assessed in the attached Environmental Assessment (EA). Dover AFB is a USAF base under the Air Mobility Command (AMC) and is headquarters to the 436 AW. The 436 AW provides support for Dover AFB, including financial, personnel, housing, maintenance, legal, recreational, medical, fire protection, base security, and chaplain services.

Purpose Of And Need For The Proposed Action
The purpose of the Proposed Action is to upgrade the existing runway to meet USAF standards and support the efficiency and safety of missions at Dover AFB, Delaware. Runway 14/32 is 150 feet in width and does not possess 25 foot shoulders as required by Unified Facilities Criteria (UFC) 3-260-01. The proposed construction and repair is needed to meet the standards of UFC 3-260-01 and to improve airfield operations and safety at Dover AFB.

Description Of The Proposed Action
This project entails constructing 25 foot wide runway shoulders on Runway 14/32, realigning the runway edge lights, and moving other runway infrastructure as necessary. Under the Proposed Action, 25 foot runway shoulders would be constructed on both sides of Runway 14/32 comprising a total length of 17, 940 feet and a total area of 448,500 square feet of pavement. Construction is expected to take place over eight phases. The length of time that construction would continue would be dependent upon funding. After construction is complete, the runway pavement would meet the criteria specified under UFC 3-260-01.

No Action Alternative
Under the No Action Alternative, the 25 foot shoulders would not be constructed along Runway 14/32. The airfield pavement would not meet the criteria specified under UFC 3-260-01. There would be no change from the existing conditions at the installation. This alternative would not address the safety requirements of the AMC and Dover AFB.

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Environmental Impacts Of The Proposed Action
Analysis of the Proposed Action indicates that the affected environment would not be significantly impacted by proceeding with the proposed construction activities.

Public Review And Interagency Coordination
An environmental assessment, which is attached, was drafted and demonstrates that there are no significant environmental impacts from the proposed action. An environmental assessment was available for public review and comment from 16 November through 29 November 2003. No comments were received.

Findings
Finding of No Significant Impact. After review of the EA prepared in accordance with the requirements of the National Environmental Policy Act (NEPA), the Council on Environmental Quality (CEQ) regulations, and Environmental Impact Analysis Process (EIAP), 32 Code of Federal Regulations 989, as amended, I have determined that the Proposed Action would not have a significant impact on the quality of the human or natural environment and, therefore, an Environmental Impact Statement (EIS) does not need to be prepared. This decision has been made after taking into account all submitted information, and considering a full range of practical alternatives that would meet project requirements and are within the legal authority of the USAF.

Charles P. Smiley

CHARLES P. SMILEY, Colonel, USAF
Commander, 436th Mission Support Group

Attachments:
1. AF Form 813
2. Environmental Assessment

ENVIRONMENTAL ASSESSMENT OF RUNWAY UPGRADES AT DOVER AIR FORCE BASE, DELAWARE

DECEMBER 2003

ABBREVIATIONS AND ACRONYMS

°F	Degrees Fahrenheit
436 AW	436th Airlift Wing
436 CES/CEV	436th Civil Engineering Squadron, Environmental Flight
ACM	Asbestos Containing Material
AFB	Air Force Base
AFI	Air Force Instruction
AFOSH	Air Force Occupational and Environmental Safety, Fire Protection, and Health
AFPD	Air Force Policy Directive
AFM	Air Force Manual
AMC	Air Mobility Command
AQCR	Air Quality Control Region
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
CO	Carbon Monoxide
CRM	Cultural Resources Manager
CRMP	Cultural Resources Management Plan
CWA	Clean Water Act
CY	Calendar Year
DERP	Defense Environmental Restoration Program
DNHI	Delaware Natural Heritage Inventory
DNREC	Delaware Department of Natural Resources and Environmental Control
DOD	Department of Defense
DSWA	Delaware Solid Waste Authority
EA	Environmental Assessment
ECP	Entry Control Point
EIAP	Environmental Impact Analysis Process
EIS	Environmental Impact Statement
EO	Executive Order
ERP	Environmental Restoration Program
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FFA	Federal Facilities Agreement
FIP	Federal Implementation Plan
FONSI	Finding of No Significant Impact
HAP	Hazardous Air Pollutant
HSWA	Hazardous and Solid Waste Amendments
IAP	Initial Accumulation Point
JP-8	jet propellant-8
kV	kilovolts
LBP	Lead Based Paint
MFH	Military Family Housing
mg/m^3	milligrams per cubic meter
MSL	mean sea level
MSW	Municipal Solid Waste
MVA	megavolt ampere
NAAQS	National Ambient Air Quality Standards
NCP	National Contingency Plan
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxide(s)
NPDES	National Pollution Discharge Elimination System
NPL	National Priority List
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
O_3	Ozone
P.L.	Public Law
Pb	Lead
PM_{10}	Particulate Matter ≤ 10 microns in diameter
$PM_{2.5}$	Particulate Matter ≤ 2.5 microns in diameter
POL	Petroleum, Oil, and Lubricants
ppm	parts per million
PSD	Prevention of Significant Deterioration
QD	safe-quantity distance
RAPCON	RADAR Approach Control
RCRA	Resource Conservation and Recovery Act
SARA	Superfund Amendment and Reauthorization Act
SCS	Soil Conservation Service
SHPO	State Historic Preservation Office
SIP	State Implementation Plan
SO_2	Sulfur Dioxide
SR	State Route
TCP	Traditional Cultural Properties
tpy	tons per year
TSCA	Toxic Substances Control Act
TSP	Total Suspended Particulate
U.S.	United States
U.S.C.	United States Code
USACE	U.S. Army Corps of Engineers
USAF	United States Air Force
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
UST	Underground Storage Tank
VAQs	Visiting Airmen's Quarters
VOC	Volatile Organic Compound
$\mu g/m^3$	micrograms per cubic meter

ENVIRONMENTAL ASSESSMENT OF RUNWAY UPGRADES AT DOVER AIR FORCE BASE, DELAWARE

436th Airlift Wing
436th Civil Engineering Squadron/Environmental Flight
600 Chevron Avenue
Dover Air Force Base, Delaware 19902-5600

DECEMBER 2003

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ENVIRONMENTAL ASSESSMENT OF RUNWAY UPGRADES AT DOVER AIR FORCE BASE, DELAWARE

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1. Purpose of and Need for the Proposed Action

1.1 Background

Dover Air Force Base (AFB) is a United States Air Force (USAF) base under the Air Mobility Command (AMC). The 436th Airlift Wing (436 AW) is the active duty wing and senior military organization at Dover AFB. The 436 AW provides command and staff supervision, along with support functions, for assigned airlift aircraft providing worldwide movement of outsized cargo and personnel on scheduled, special assignment, exercise, and contingency airlift missions. The 436 AW consists of the operations, logistics, support, and medical groups, in addition to 12 divisions and two detachments. Dover AFB employs a total of over 8,000 military, civilian, and reserve personnel.

The 436 AW is proposing the construction of 25-ft wide shoulders along the length of Runway 14/32 so that the runway meets Unified Facility Criteria 3-260-01 standards. These upgrades would support the efficiency and safety of Dover AFB missions.

The Environmental Assessment (EA) analyzes 436 AW's Proposed Action and the No Action Alternative. If the analyses presented in the EA indicate that implementation of the Proposed Action would not result in significant environmental impacts, a Finding of No Significant Impact (FONSI) would be prepared. A FONSI briefly presents why a Proposed Action would not have a significant effect on the human environment and why an Environmental Impact Statement (EIS) is unnecessary. If significant environmental issues result that cannot be mitigated to insignificance, an EIS will be required, or the Proposed Action would be abandoned and no action would be taken.

Based on the analysis in the EA, the USAF, as the decision-maker, will decide whether there are significant adverse environmental impacts associated with the runway upgrades. Based on the review of the analysis, the USAF will either prepare a FONSI or recommend the analysis proceed to an EIS.

1.2 Purpose of the Proposed Action

The purpose of the Proposed Action is to upgrade the existing 14/32 runway to meet UFC 3-260-01 standards and support the efficiency and safety of missions at Dover AFB, Delaware.

1.3 Need for the Proposed Action

Runway 14/32 is 150 ft in width and does not possess the 25-ft wide shoulders required by UFC 3-260-01. The proposed construction and repair activities are needed to meet UFC 3-260-01 standards and to improve airfields operations and safety at Dover AFB.

1.4 Location

Dover AFB is located partially within the corporate limits of the City of Dover and unincorporated areas of Kent County, Delaware (see Figure 1-1). The base occupies approximately 3,300 acres with an additional 589 acres under grants or easement and another 11 acres that are managed under lease agreements. Principal routes that define the base boundary include South Little Creek Road, State Route (SR)-9, and U.S. Route 113/SR-1 (DAFB 2001).

Dover AFB has two active airfields. The north-south airfield at Dover AFB divides the main installation into two primary sections. Open space, recreational areas, and limited amounts of industrial uses are located east of the airfield. The land uses west of the airfield and east of U.S. Route 113 are industrial, airfield operations, administrative, community, medical and some unaccompanied personnel housing. Eagle Heights military family house (MFH), temporary lodging quarters, a golf course, and additional unaccompanied personnel housing are located west of U.S. Route 113 and east of St. Jones River. Eagle Meadows MFH (approximately 76 acres) is located 3.5 miles west of the main gate (west of the St. Jones River) along SR-26 and SR-362 near the town of Lebanon (DAFB 2001).

1.5 Summary of Key Environmental Compliance Requirements

1.5.1 National Environmental Policy Act

The National Environmental Policy Act, commonly known as NEPA, is a Federal statute requiring the identification and analysis of potential environmental impacts of proposed Federal actions before those actions are taken. NEPA established the Council on Environmental Quality (CEQ) that is charged with the development of implementing regulations and ensuring agency compliance with NEPA. CEQ regulations mandate that all Federal agencies use a systematic interdisciplinary approach to environmental planning and the evaluation of actions that may affect the environment. This process evaluates potential environmental consequences associated with a proposed action and considers alternative courses of action. The intent of NEPA is to protect, restore, or enhance the environment through well-informed Federal decisions.

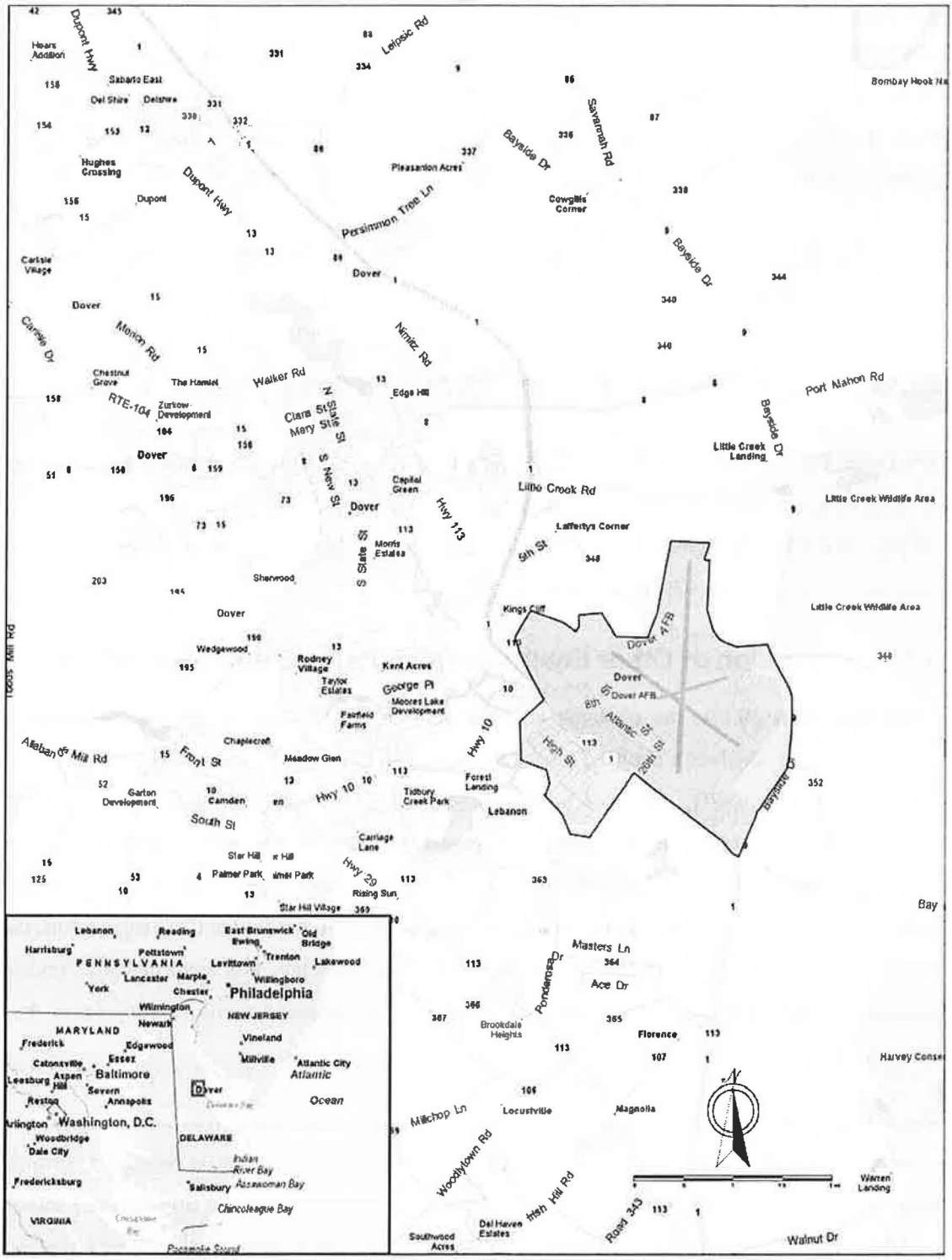

Figure 1-1. Dover AFB and Surrounding Area

The process for implementing NEPA is codified in Title 40 Code of Federal Regulations (CFR) 1500-1508, *Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act.* The CEQ was established under NEPA to implement and oversee Federal policy in this process. CEQ regulations specify the following must be accomplished when preparing an EA.

- Briefly provide evidence and analysis for determining whether to prepare an EIS or a FONSI
- Aid in an agency's compliance with NEPA when an EIS is unnecessary
- Facilitate preparation of an EIS when one is necessary

Air Force Policy Directive (AFPD) 32-70, *Environmental Quality*, states that the USAF will comply with applicable Federal, state, and local environmental laws and regulations, including NEPA. The USAF's implementing regulation for NEPA is *The Environmental Impact Analysis Process (EIAP)*, 32 CFR 989, as amended.

1.5.2 Integration of Other Environmental Statutes and Regulations

To comply with NEPA, the planning and decision-making process for actions proposed by Federal agencies involves a study of other relevant environmental statutes and regulations. The NEPA process, however, does not replace procedural or substantive requirements of other environmental statutes and regulations. It addresses them collectively in the form of an EA or EIS, which enables the decision-maker to have a comprehensive view of major environmental issues and requirements associated with the Proposed Action. According to CEQ regulations, the requirements of NEPA must be integrated "with other planning and environmental review procedures required by law or by agency so that all such procedures run concurrently rather than consecutively."

The EA examines potential effects of the Proposed Action and alternatives on eight resource areas including air quality, geological resources, water resources, biological resources, cultural resources, hazardous materials and waste management, infrastructure and utilities, and safety. The following paragraphs present examples of relevant laws, regulations, and other requirements that are often considered as part of the analysis.

Air Quality

The *Clean Air Act* (CAA) establishes Federal policy to protect and enhance the quality of the nation's air resources to protect human health and the environment. The CAA requires that adequate steps be implemented to control the release of air pollutants and prevent significant deterioration in air quality. The 1990 amendments to the CAA require Federal agencies to determine the conformity of proposed actions with respect to State Implementation Plans (SIPs) for attainment of air quality goals.

Water Resources

The *Clean Water Act* (CWA) of 1977 (33 United States Code [U.S.C.] 1344) and the Water Quality Act of 1987, 33 U.S.C. 1251, et seq., as amended) establish Federal policy to restore and maintain the chemical, physical, and biological integrity of the nation's waters, and where attainable, to achieve a level of water quality that provides for the protection and propagation of fish, shellfish, and wildlife, and recreation in and on the water.

Executive Order (EO) 11988, Floodplain Management, requires Federal agencies to take action to reduce the risk of flood damage; minimize the impacts of floods on human safety, health, and welfare; and restore and preserve the natural and beneficial values served by floodplains. Federal agencies are directed to consider the proximity of their actions to or within floodplains. Where information is unavailable, agencies are encouraged to delineate the extent of floodplains at their site.

Biological Resources

The *Endangered Species Act* (ESA) requires Federal agencies that fund, authorize, or implement actions to avoid jeopardizing the continued existence of federally listed threatened or endangered species, or destroying or adversely affecting their critical habitat. Federal agencies must evaluate the effects of their actions through a set of defined procedures, which can include preparation of a Biological Assessment and formal consultation with the U.S. Fish and Wildlife Service (USFWS).

EO 11990, Protection of Wetlands, requires that Federal agencies provide leadership and take actions to minimize or avoid the destruction, loss, or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands.

The CWA, under Section 404, contains provisions for protection of wetlands and establishes a permitting process for activities having potential effects in wetland areas. Wetlands, riverine, and open water systems are considered waters of the United States and, as such, fall under the regulatory jurisdiction of the U.S. Army Corps of Engineers (USACE).

Cultural Resources

The *National Historic Preservation Act of 1966* (NHPA) provides the principal authority used to protect historic properties, establishes the National Register of Historic Places (NRHP), and defines, in Section 106, the requirements for Federal agencies to consider the effect of an action on properties on or eligible for the NRHP.

Protection of Historic and Cultural Properties (36 CFR 800 [1986]) provides an explicit set of procedures for Federal agencies to meet their obligations under the NHPA, including inventorying of resources and consultation with State Historic Preservation Office (SHPO).

The *Archeological Resources Protection Act of 1979* ensures that Federal agencies protect and preserve archeological resources on Federal or Native American lands and establishes a permitting system to allow legitimate scientific study of such resources.

EO 13007, Indian Sacred Sites, requires that, to the extent practicable, Federal agencies accommodate access to and ceremonial use of Indian sacred sites by Indian religious practitioners and avoid adversely affecting the physical integrity of such sacred sites.

EO 13084, Consultation and Coordination with Indian Tribal Governments, requires that each Federal agency shall have an effective process to permit elected officials and other representatives of Indian tribal governments to provide meaningful and timely input in the development of regulatory policies or matters that uniquely affect their communities.

Infrastructure

Infrastructure consists of the systems and physical structures that enable a population in a given area to sustain itself. Consideration of infrastructure is applicable to a proposed action or alternative where there may be an issue with respect to local capacities (e.g., utilities, transportation networks, energy) to provide the required support.

Safety

Air Force Instruction (AFI) 91-301, *Air Force Occupational and Environmental Safety, Fire Protection, and Health (AFOSH) Program*, implements AFPD 91-3, *Occupational Safety and Health*, by outlining the AFOSH Program. The purpose of the AFOSH Program is to minimize loss of USAF resources and to protect USAF personnel from occupational deaths, injuries, or illnesses by managing risks. In conjunction with the USAF Mishap Prevention Program (AFI 91-202), these standards ensure all USAF workplaces meet Federal safety and health requirements. This instruction applies to all USAF activities.

Noise

Federal Aviation Administration (FAA) Part 150, *Airport Noise Compatibility Planning,* provides guidance to measure noise at airports and surrounding areas and determine exposure of individuals to noise that result from the operations of an airport. FAA Part 150 identifies those land uses which are normally compatible with various levels of exposure to noise by individuals. It also provides technical assistance to airport operators, in conjunction with other local, state, and Federal authorities, to prepare and execute appropriate noise compatibility planning and implementation programs (14 CFR 150).

Socioeconomics and Environmental Justice

EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, directs Federal agencies to assess the effects of their actions on minority and low-income populations within their region of influence. Agencies are encouraged to include demographic information related to race and income in their analysis of the environmental and economic effects associated with their actions.

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2. Description of Proposed Action and Alternatives

2.1 Introduction

This section describes the Proposed Action and the No Action Alternative.

2.2 Proposed Action

This project entails constructing 25-ft wide runway shoulders on Runway 14/32, realigning the runway edge lights, and moving other runway infrastructure as necessary. Under the Proposed Action, 25-ft runway shoulders would be constructed on both sides of Runway 14/32 comprising a total length of 17,940 ft and a total area of 448,500 square ft of pavement. Construction is expected to take place over eight phases. The length of time that construction would continue would be dependent upon funding. After construction is complete, the runway pavement would meet the 25-ft runway shoulder criteria specified under UFC 3-260-01. The location of the proposed runway upgrades for each phase in presented in Figure 2-1. The estimated length and area of runway shoulder to be constructed during each phase are presented in Table 2-1.

Table 2-1. Estimated Length and Area of Runway Shoulders Proposed to be Constructed during each at Dover AFB

Phase	Length (feet)	Area (square feet)
1	3,250	81,250
2	2,070	51,750
3	350	8,750
4	3,200	80,000
5	2,900	72,500
6	600	15,000
7	2,310	57,750
8	3,260	81,500
Total	17,940	448,500

2.3 No Action Alternative

Under the No Action Alternative, the 25-ft wide shoulders would not be constructed along the length of Runway 14/32. The airfield pavement would not meet the criteria specified under UFC 3-260-01. There would be no change from the existing conditions at the installation. This alternative would not address the safety requirements of the AMC and Dover AFB.

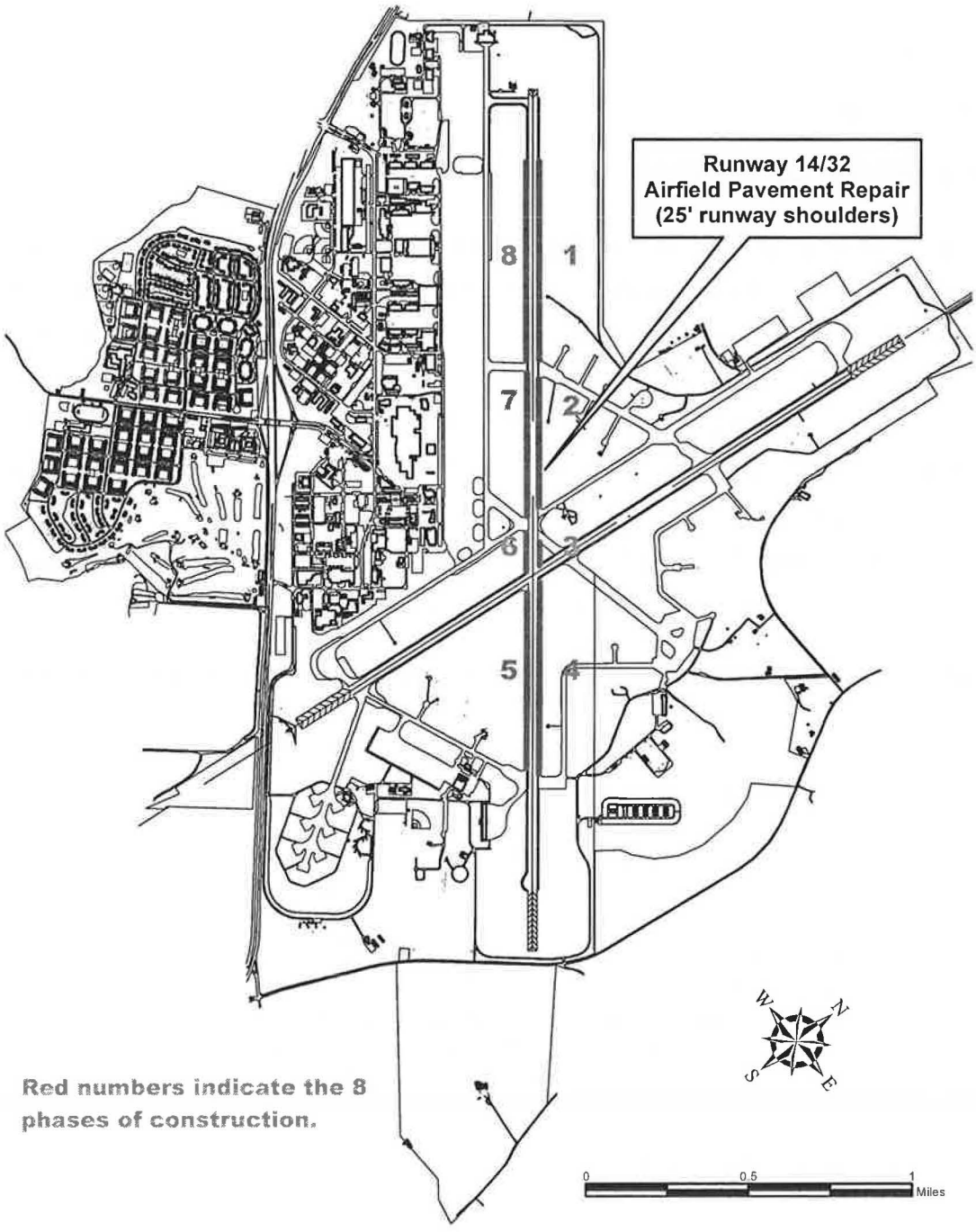

Figure 2-1. Location of Proposed Runway Upgrades at Dover AFB

3. Affected Environment

Section 3.0 describes the environmental and socioeconomic resources and conditions most likely to be affected by the construction activities associated with the Proposed Action. This section provides information to serve as a baseline from which to identify evaluate environmental and socioeconomic changes likely to result from implementation of the Proposed Action. Baseline conditions represent current conditions. The potential environmental and socioeconomic impacts of the Proposed Action and No Action Alternative on the baseline conditions are described in Section 4.0.

In compliance with NEPA, CEQ guidelines, and 32 CFR Part 989, as amended, the description of the affected environment focuses on those resources and conditions potentially subject to impacts. Some environmental resources and conditions that are often analyzed in an EA have been omitted from this analysis. The following details the basis for such exclusions:

- **Land Use.** All activities associated with the Proposed Action would be consistent with present and foreseeable land use patterns at Dover AFB. Implementation of the Proposed Action would not alter the existing land use at Dover AFB. Accordingly, USAF has omitted detailed examination of land use.
- **Noise.** Implementation of the Proposed Action does not involve permanent alterations to aircraft inventories, operations, or missions. No new permanent ground-based heavy equipment operations are included in the Proposed Action. No activity included in the Proposed Action would result in a situation where residences would be impacted by an increase to present ambient noise levels. Furthermore, noise produced by construction activities associated with the Proposed Action would be temporary and would not significantly affect sensitive receptors. Accordingly, USAF has omitted detailed examination of noise.
- **Socioeconomics and Environmental Justice.** The Proposed Action does not involve any activities that would contribute to changes in socioeconomic resources. There would be no change in the number of personnel assigned to Dover AFB, therefore there would be no changes in area population or associated changes in demand for housing and services. Accordingly, the USAF has omitted detailed examination of socioeconomics.

3.1 Air Quality

3.1.1 Definition of Resource

Air quality in a given location is determined by the concentration of various pollutants in the atmosphere. National Ambient Air Quality Standards (NAAQS) are established by the United States Environmental Protection Agency (USEPA) for "criteria pollutants," including ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter equal to or less than 10 microns in diameter (PM_{10}), particulate matter equal to or less than 2.5 microns in diameter ($PM_{2.5}$), and lead (Pb). NAAQS represent maximum levels of background pollution in the ambient air that are considered safe, with an adequate margin of safety to protect public health and welfare (see Table 3-1).

Table 3-1. National Ambient Air Quality Standards

Pollutant	Standard Value		Standard Type
Carbon Monoxide (CO)			
8-hour Average	9 ppm[2]	(10 mg/m^3)[3,4]	Primary
1-hour Average	35 ppm	(40 mg/m^3)[3]	Primary
Nitrogen Dioxide (NO_2)			
Annual Arithmetic Mean	0.053 ppm	(100 µg/m^3)[3,5]	Primary & Secondary
Ozone (O_3)			
1-hour Average[1]	0.12 ppm	(235 µg/m^3)[3]	Primary & Secondary
8-hour Average	0.08 ppm	(157 µg/m^3)[3]	Primary & Secondary
Lead (Pb)			
Quarterly Average		1.5 µg/m^3	Primary & Secondary
Particulate ≤ 10 micrometers (PM_{10})			
Annual Arithmetic Mean		50 µg/m^3	Primary & Secondary
24-hour Average		150 µg/m^3	Primary & Secondary
Particulate ≤ 2.5 micrometers ($PM_{2.5}$)			
Annual Arithmetic Mean		15 µg/m^3	Primary & Secondary
24-hour Average		65 µg/m^3	Primary & Secondary
Sulfur Dioxide (SO_2)			
Annual Arithmetic Mean	0.03 ppm	(80 µg/m^3)[3]	Primary
24-hour Average	0.14 ppm	(365 µg/m^3)[3]	Primary
3-hour Average	0.50 ppm	(1300 µg/m^3)[3]	Secondary

Notes: [1]The ozone 1-hour standard applies only to areas that were designated non-attainment when the ozone 8-hour standard was adopted in Ju

[2] ppm – parts per million

[3] Parenthetical value is an approximately equivalent concentration.

[4] mg/m3 – milligrams per cubic meter

[5] µg/m3 – micrograms per cubic meter

The CAA places most of the responsibility to achieve compliance with the NAAQS on the individual states and/or local agencies that have been delegated CAA authority by USEPA. This is achieved through a SIP, which is required under the CAA. The SIP is a compilation of goals, strategies, schedules, permitting programs, and enforcement actions that lead the state into compliance with all NAAQS. Any changes to the compliance schedule or plan must be incorporated into the SIP and approved by USEPA. Areas not in compliance with a standard can be declared "non-attainment areas" by USEPA or the appropriate state or local agency. Based on the severity of an area's non-attainment (i.e., number of times that ambient air quality exceeds the NAAQS), USEPA also categorizes non-attainment areas (e.g., marginal, serious, severe, extreme). Areas designated by USEPA as being in non-attainment for one or more of the seven NAAQS may petition USEPA for re-designation as a maintenance area if they are able to demonstrate they have met the national standard for the three years preceding the re-designation request. At the time the state petitions USEPA for re-designation, it must also submit a revision of its SIP to provide for the maintenance of the applicable NAAQS for at least 10 years after re-designation ("maintenance plan") pursuant to CAA Section 175(A).

Under the General Conformity Rule, the CAA prohibits Federal agencies from performing projects that do not conform to a USEPA-approved SIP. In 1993, USEPA developed final rules for how Federal agencies must determine air quality conformity prior to implementing a proposed Federal action. Under these rules, certain actions are exempted from conformity determinations, while others are assumed to be in conformity if total project emissions are below *de minimis* levels established under 40 CFR Part 93.153. Total project emissions include both direct and indirect emissions caused by the Federal action.

The CAA and the CAA Amendments of 1990 also require states to permit "major" stationary sources. A major stationary source is a facility (i.e., plant, base, or activity) that emits more than 100 tons annually of any one criteria air pollutant, 10 tons per year (tpy) of a single hazardous air pollutant (HAP), or 25 tpy of any combination of HAPs. There are 188 listed HAPs regulated under the CAA. The purpose of the permitting rule is to establish regulatory control over large facilities or processes that routinely emit significant amounts of pollutants activities and to assess and monitor their impact upon local and regional air quality.

3.1.2 Existing Conditions

Climate. Dover AFB has a humid continental climate. The Atlantic Ocean and the Delaware and Chesapeake Bays influence the region's climate and well-defined seasons. Prevailing winds are from the west/northwest most of the year. Easterly summer winds off the ocean tend to raise temperature in the area. The latter part of July is the warmest part of the year with maximum afternoon temperatures averaging 85 °F. Temperatures of 90 °F and above occur on an average of 19 days a year. Late January/early February represent the coldest part of the year when early morning temperatures average 27 °F (DAFB 2001).

Mean annual precipitation recorded in the area of Dover AFB is 42.7 inches. Precipitation is well distributed throughout the year. Approximately 20 inches of rain fall during the growing season. However, the uneven distribution of summer showers results in occasional dry periods, making crop irrigation necessary. The region's frost-free growing season extends about 163 days, from late April to the end of September. The annual snowfall period at Dover AFB is between October and April. Snowfall during this period at Dover AFB averages 17.1 inches per year (DAFB 2001).

Thunderstorms occur an average of 34 days per year. The majority of these storms occur during the summer. Tropical storms or hurricanes occasionally impact the Dover AFB area between August and October (DAFB 2001).

The average annual wind speed is about 6 knots; however, winds upward of 50 knots may accompany severe thunderstorms (DAFB 2001).

Regional Air Quality. The USEPA classifies the air quality in an air quality control region (AQCR) or in sub-areas of an AQCR according to whether the concentration of criteria pollutants in ambient air exceeds the primary or secondary NAAQS. All areas within each AQCR are therefore designated as either "attainment," "non-attainment," or "unclassified" for each of the six criteria pollutants. Attainment means that the air quality within an AQCR is better than the NAAQS, non-attainment indicates that air quality exceeds NAAQS, and an unclassifiable air quality designation by USEPA means that there is not enough information to appropriately classify an AQCR, so the area is considered attainment.

The General Conformity Rule requires that any Federal action meet the requirements of a SIP or Federal Implementation Plan (FIP). More specifically, CAA Conformity is assured when a Federal action *does not*:

- Cause a new violation of a NAAQS
- Contribute to an increase in the frequency or severity of violations of NAAQS
- Delay the timely attainment of any NAAQS, interim progress milestones, or other milestones toward achieving compliance with the NAAQS

The conformity rule applies only to actions in non-attainment or maintenance areas and considers both direct and indirect emissions. The rule applies only to Federal actions that are considered "regionally significant" or where the total emissions from the action meet or exceed the *de minimis* thresholds. An action is regionally significant when the total non-attainment pollutant emissions exceed 10 percent of the AQCR's total emissions inventory for that non-attainment pollutant. If a Federal action meets the *de minimis* threshold requirements and is not considered regionally significant, then a full Conformity Determination is not required.

Dover AFB. Dover AFB is located in southern Kent County, Delaware. Kent County is located in the Philadelphia-Wilmington-Trenton District of the USEPA Region III AQCR No. 45. The District has been designated by the USEPA as a "severe" non-attainment area for O_3, like much of the Mid-Atlantic coastal area and the Northeast, running from Richmond, Virginia to Maine. Kent County is in attainment for the other five priority air pollutants: CO, Pb, particulate matter (PM_{10} and $PM_{2.5}$), NO_2, and SO_2. Volatile organic compounds (VOC) and nitrogen oxides (NO_x) are precursors for ozone and are the emissions of concern under the SIP in an area of severe non-attainment for O_3, such as Kent County (436 SPTG/CEV 2001).

Two sources of emissions serve as the baseline for Kent County and Dover AFB. Kent County emissions (in tons per day for the peak ozone season) are found in the *Base Year Ozone State Implementation Plan (SIP) Emissions Inventory.* Dover AFB emissions inventories are calculated annually. These inventories of emission sources and associated estimates of pollutant quantities generated serve as a baseline to track and plan future changes in base pollutant emission quantities (436 SPTG/CEV 2001).

The estimated emissions (tons per day for 1990 peak ozone season) for Kent County are: 65.233 tons per day of VOC and 25.843 tons per day NO_x (436 SPTG/CEV 2001). The estimated 2000

emissions (436 SPTG/CEV 2001) in tons per year (tpy) from Dover AFB were 3.15 tpy of PM_{10}, 19.43 tpy of CO, 78.85 tpy of NO_x (which includes NO_2), 34.13 tpy SO_2, 25.53 tpy of VOCs, and 6.27 tpy of HAP. Not included in the Dover AFB figures are VOCs and NO_x from commuter traffic at Dover AFB, estimated at 36.83 tpy and 24.01 tpy, respectively (436 SPTG/CEV 2001).

Dover AFB received a Title V air permit from the State of Delaware on July 4, 2001. The Title V permit includes sources such as the central heat plant, other boilers, emergency generators, solvent cleaners, stage I and II vapor recovery systems, among other items. Although the Title V permit is active, Dover AFB still maintains other air permits as required by the State of Delaware's air regulations (DAFB 2001).

The major sources of air emissions at Dover AFB are VOCs. VOC emissions associated with aircraft and vehicle maintenance and repair are the most significant HAP sources on Dover AFB. These emission sources primarily include the storage and handling of jet propellant-8 (JP-8), gasoline, and diesel fuels. Secondary emission sources include solvent use, paints, thinners, and coatings. Jet engine test cells, reciprocating engines, and electric generators are additional air pollutant sources (DAFB 2001).

3.2 Geological Resources

3.2.1 Definition of Resource

An area's geological resources typically consist of surface and subsurface materials and their inherent properties. Principal factors influencing the ability of geological resources to support structural development are seismic properties (i.e., potential for subsurface shifting, faulting, or crustal disturbance), soil stability, and topography.

The term soil generally refers to unconsolidated materials overlying bedrock or other parent material. Soils play a critical role in both the natural and human environment. Soil depth, structure, elasticity, strength, shrink-swell potential, and erodibility determine a soil's ability to support man-made structures and facilities. Soils typically are described in terms of their series or association, slope, physical characteristics, and relative compatibility or constraints in regard to particular construction activities and types of land use.

Topography is defined as the relative position and elevations of the natural and/or man-made features of an area that describe the configuration of its surface. An area's topography is influenced by many factors, including human activity, seismic activity of the underlying

geological material, climatic conditions, and erosion. Information about an area's topography typically encompasses surface elevations, slope, physiographic features (i.e., mountains, ravines, or depressions), and their influence on human activities.

3.2.2 Existing Conditions

Physiography. Dover AFB is located entirely within the Atlantic Coastal Plain Physiographic province which consists of a wide, wedge-shaped belt of Cretaceous to Recent layered sedimentary deposits of sand, gravel silt, clay limestone, chalk, and marl dipping to the southeast (DAFB 2001).

Topography. The local relief at Dover AFB is typically associated with stream channel development and/or erosion. Surface elevations range from a low of approximately 10 feet above mean sea level (MSL) along the banks of the St. Jones River to approximately 30 feet above MSL in the northwest portion of the base, in the vicinity of Buildings 919 and 946. The Dover AFB airfield elevation is approximately 30 feet above MSL (DAFB 2001).

Geology. From youngest to oldest, the near-surface stratigraphic units underlying Dover AFB are Recent sediments deposited by local rivers, the Pleistocene Columbia Formation, the Miocene Chesapeake Group (which contains only the Calvert Formation in this area), and the Eocene Piney Point Formation (DAFB 2001).

Soils. According to Dover AFB's General Plan (undated), the U.S. Department of Agriculture's (USDA), Soil Conservation Service (SCS) (renamed Natural Resources Conservation Service [NRCS]) 1971 Kent County Soil Survey does not identify specific soil types located on Dover AFB. However, the soil survey does provide descriptions of the three soil associations that are found on Dover AFB, namely, the Sassafras/Fallsington, Othello-Metapeake-Mattapex, and Tidal Marsh associations (DAFB undated).

Because of a history of extensive construction-related soil disturbances on much of Dover AFB, the exact nature of existing soil types on many parts of the base is not known and would likely be characterized as "Urban Complex." The Sassafras/Fallsington Association comprises approximately 50 percent of Dover AFB in the main base area. The Othello-Metapeake-Mattapex Association comprises approximately 40 percent of the base and lies mainly in the northeastern portion of the base. The Tidal Marsh Association is found on the floodplain of the St. Jones River along the southern base boundary and in the tidal flat where the Port Mahon

Petroleum, Oil, and Lubricants (POL) Annex is located. Approximately 10 percent of Dover AFB is covered by this association (DAFB 2001).

3.3 Water Resources

3.3.1 Definition of Resource

Water resources include surface water, groundwater, and floodplains. Evaluation identifies the quantity and quality of the resource and its demand for potable, irrigation, and industrial purposes.

Surface water resources consist of lakes, rivers, and streams. Surface water is important for its contributions to the economic, ecological, recreational, and human health of a community or locale. Stormwater flows, which may be exacerbated by high proportions of impervious surfaces associated with buildings, roads, and parking lots, are important to management of surface water. Stormwater also is important to surface water quality because of its potential to introduce sediments and other contaminants into lakes, rivers, and streams.

Groundwater consists of subsurface hydrologic resources. It is an essential resource often used for potable water consumption, agricultural irrigation, and industrial applications. Groundwater typically may be described in terms of its depth from the surface, aquifer or well capacity, water quality, surrounding geologic composition, and recharge rate.

Floodplains are areas of low-level ground present along a river or stream channel. Such lands may be subject to periodic or infrequent inundation due to rain or melting snow. Risk of flooding typically hinges on local topography, the frequency of precipitation events, and the size of the watershed above the floodplain. Flood potential is evaluated by the Federal Emergency Management Agency, which evaluates the floodplain for 100- and 500-year flood events. Federal, state, and local regulations often limit floodplain development to passive uses such as recreational and preservation activities in order to reduce the risks to human health and safety.

3.3.2 Existing Conditions

Surface Water. Storm water runoff is discharged into the Dover AFB drainage network, which is comprised of a series of inlets, manholes, pipes, culverts, and ditches. Runoff is transmitted to natural low-lying areas that surround Dover AFB. Water leaves the base at several key locations. Base property situated near both Atlantic Street and Taxiway E drains to the Morgan and Pipe

Elm Branches of the Little River. A small area on the east side of the base, in the vicinity of the ammunition storage area, drains to the Lewis Ditch. The remainder of the base drains to an unnamed stream that crosses the golf course, ultimately discharging to the St. Jones River. All of the surface streams eventually drain to the Delaware Bay (DAFB 2001).

Dover AFB is divided into nine drainage sub-basins based on topography and the storm water collection system: Morgan Branch, Pipe Elm Branch, Pipe Elm Branch North, Lewis Ditch, Sand Ditch, Dickinson Ditch, Radio Tower Ditch, St. Jones River, and St. Jones River West.

The Morgan Branch Drainage Area drains 96 acres into Morgan Branch. Approximately, 25 percent of this drainage area is covered by buildings, parking areas, and the northwest-southeast runway. Nearly 75 percent is frequently maintained grass intermixed with low seral stage.

The Pipe Elm Branch Drainage Area drains about 1,394 acres into Pipe Elm Branch. Approximately 75 percent of this drainage area is impervious. The north-south runway divides this drainage area into two halves. Drainage on the west side flows east before entering ditches leading to Pipe Elm Branch. East side drainage flows directly into Pipe Elm Branch. About 168 acres drain from the Pipe Elm Branch North Drainage Area. Fifty percent of this drainage area is covered by the north-south runway and the other 50 percent by intermixed grasses.

The Lewis Ditch, Sand Ditch, Dickinson Ditch, and Radio Tower Ditch Drainage Areas drain 481 acres with between 50 and 80 percent of these drainage areas being pervious.

The St. Jones River and St. Jones River West Drainage Areas receive drainage from 907 acres including base buildings, parking areas, and the golf course. Approximately 75 percent of the St. Jones River Drainage Area is impervious, while the majority of the western drainage area is covered by residential landscape (DAFB 2001).

Groundwater. Water for domestic and other purposes in the vicinity of Dover AFB is derived entirely through groundwater withdrawals from underlying aquifers. Water-bearing units of particular importance at Dover AFB include the Columbia Aquifer of the upper Chesapeake Group, the Frederica Aquifer of the upper Chesapeake Group, the Cheswold Aquifer of the lower Chesapeake Group, and the Piney Point Aquifer of the Piney Point Formation (DAFB 2001). Water supply of the base is drawn from the Cheswold and Piney Point Aquifers. Currently, groundwater contamination at Dover AFB is confined to the Columbia Aquifer, which is not used for drinking water (DAFB undated).

Floodplains. There are areas of Dover AFB that lie within the 100-year floodplain. These areas are located on the golf course along the unnamed drainage into the St. Jones River and immediately along the river where it borders Dover AFB (DAFB undated).

3.4 Biological Resources

3.4.1 Definition of the Resource

Biological resources include native or naturalized plants and animals and the habitats (i.e., wetlands, forests, and grasslands) in which they exist. Sensitive and protected biological resources include plant and animal species listed as threatened or endangered by USFWS.

Under the ESA, an "endangered species" is defined as any species in danger of extinction throughout all or a significant portion of its range. A "threatened species" is defined as any species likely to become an endangered species in the foreseeable future.

The USFWS also maintains a list of species considered as candidates for possible listing under the ESA. Although candidate species receive no statutory protection under the ESA, the USFWS has attempted to advise government agencies, industry, and the public that these species are at risk and may warrant protection under the ESA in the future.

Wetlands are important natural systems and habitats because of the diverse biologic and hydrologic functions they perform. These functions include water quality improvement, groundwater recharge and discharge, pollution mitigation, nutrient cycling, wildlife habitat and unique flora and fauna niche provisions, storm water attenuation and storage, sediment detention, and erosion protection. Wetlands are protected as a subset of the "waters of the United States" under the CWA. The term "waters of the United States" has a broad meaning under the CWA and incorporates deep-water aquatic habitats and special aquatic habitats (including wetlands). The USACE defines wetlands as "those areas that are inundated or saturated with ground or surface water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted to life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas" (33 CFR Part 328).

It is important to distinguish between wetland "functions" and the societal or economic "values" associated with these functions. Wetland functions are the natural properties and actions performed by various wetland ecosystems, while wetland values are expressed in terms of the

relative economic and/or intrinsic worth of the functions as perceived by society. For example, stormwater storage is a typical function noted in many wetland systems. The volume of storage available in the wetland and the ability of the wetland to slow or detain storm water flows are the measurable or estimable metrics that allow for the quantification of the storm water storage function. The fact that wetlands frequently store storm water and slow runoff is of importance to society because these functions can have the effect of lessening the severity and duration of downstream flooding. Hence, the value of storm water storage to society is expressed as the lessening of flood severity or the alteration of flooding and flood flows.

The *1987 Corps of Engineers Wetlands Delineation Manual* outlines the protocols and procedures for wetlands identification and delineation. The protocols presented in the *1987 Corps of Engineers Wetlands Delineation Manual* require the presence of three basic parameters to field identify and delineate wetlands: predominance (more than 50 percent) of hydrophytic vegetation (plant species that commonly occur in wetlands); presence of hydric soils (soils developed under reducing conditions); and evidence of wetlands hydrology (the inundation or saturation by surface or groundwater periodically to support hydrophytic vegetation and develop hydric soils). In undisturbed field conditions, all three of these diagnostic criteria must be present to fulfill wetland classification criteria. The *1987 Corps of Engineers Wetlands Delineation Manual* further describes protocols to be used in the delineation of wetlands in disturbed areas (USACE 1987).

3.4.2 Existing Conditions

Vegetation. Historic agricultural practices, vegetation management, and development have altered the vegetation at the base. At present, the vast majority of grounds at Dover AFB are intensively maintained, resulting in landscaped property and a predominance of short turf grasses. Approximately 130 acres of native woodland and wetland remain, with the rest being semi-improved and improved lawns, open fields, and impervious surfaces. A biological inventory of Dover AFB was conducted by the Delaware Natural Heritage Inventory (DNHI) (DAFB undated). DNHI identified several areas on base that continue to support native vegetation, though some have been disturbed or degraded to various degrees. The highest quality natural areas include the salt marsh and palustrine forested wetlands associated with the St. Jones River, and upland terrestrial forested areas of limited extent situated near MFH and the golf course, and on the eastern side of the base (DAFB undated).

Dover AFB is within the Oak-Pine Forest Region, Atlantic Slope Section. The original forests in this region were dominated in upland areas by canopy species such as loblolly pine, scrub pine, tulip tree, American beech, a number of hickory species, and several species of oaks. Poorly drained and lowland areas were dominated by species such as sweetgum, willow oak, pin oak, red maple, and sour gum. Isolated areas of permanent inundation were often dominated by pure stands of Atlantic white cedar or bald cypress (DAFB undated).

Prior to establishment of the base, much of the forest had been cleared for agriculture, with limited areas of woodland remaining. It is likely that remnant woodlands underwent some form of logging. Original stand timber may exist east of the hazardous cargo storage area (DAFB undated).

Wetlands. The initial jurisdictional wetland survey of Dover AFB was performed in conjunction with an Ecological Risk Assessment Phase I Site Characterization in 1992. This survey was performed at only three locations on the base—areas within and immediately adjacent to Pipe Elm Branch in the northeastern portion of the base, around Environmental Restoration Program (ERP) site LF-13 (rubble fill) east of the airfield, and adjacent to the golf course and the St. Jones River. Several additional wetland areas were observed as part of the DNHI survey in 1991 and 1992. However, these areas were not delineated; they were identified mainly as general locations where certain obligate or facultative wetland plants occurred along with other vegetation (DAFB undated).

An additional base-wide delineation survey was performed in 1998 which included a background evaluation of soils, vegetation, hydrology, land use history, and an on-site wetland survey using methodology described in the *USACE Wetland Delineation Manual* (USACE 1987). A total of 74.11 acres of regulated waters were delineated.

Threatened and Endangered Species. The upland sandpiper (*Bartramia longicauda*) is a state endangered species that has been identified at Dover AFB. The northern harrier (*Circus cyaneus*) and the short-eared owl (*Asio flammeus*) are state endangered species for breeding only and have also been identified at Dover AFB.

Species of state concern that have been identified at Dover AFB are the eastern meadowlark (*Sturnella magna*), bobolink (*Dolichonyx oryzivorous*), fourspine stickleback (*Apeltes quadratus*), mud sunfish (*Acantharcus pomotis*), green frog-fruit (*Phyla lanceolata*), and hysop-leaf hedge-nettle (*Stachys hyssopifolia*). The American redstart (*Setophaga ruticilla*), broad-

winged hawk (*Buteo platypterus*), cliff swallow (*Petrochelidon pyrrhonota*), bank swallow (*Riparia riparia*), black vulture (*Coragyps atratus*), great blue heron (*Ardea herodias*), American kestrel (*Falco sparverius*), black and white warbler (*Mniotilta varia*), common moorhen (*Gallinula chloropus*), and grasshopper sparrow (*Ammodramus savannarum*) are state concern species for breeding only that have been identified at Dover AFB.

Several other plants, including the yellow passionflower (*Passiflora lutea*), tickseed sunflower (*Bidens coronata),* and tiny-headed goldenrod (*Euthamia microcephala)* are rare state plant species identified during the 1993 study by DNHI (DNHI 1993).

3.5 Cultural Resources

3.5.1 Definition of the Resource

Cultural resources may 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. Under 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. In order to be determined a "historic property," the resource must meet one or more of the criteria established by the National Park Service, and outlined in 36 CFR 60.4, that make the resource eligible for inclusion in the NRHP.

Cultural resources are defined in the NHPA as prehistoric and historic sites, structures, districts, or any other physical evidence of human activity considered important to a culture, a subculture, or a community for scientific, traditional, religious, or any other reason. Depending on their condition and historic use, such resources may provide insight into living conditions of previous existing civilizations, and/or may retain cultural and religious significance to modern groups.

Typically, cultural resources are subdivided into archaeological resources (prehistoric or historic sites where human activity has left physical evidence of that activity but no above-ground structures remain standing) or architectural resources (buildings or other structures or groups of structures that are of historic or aesthetic significance). Archaeological resources comprise areas where human activity has measurably altered the earth or intact deposits of physical remains are found (i.e., prehistoric or historic habitation remains).

Architectural resources include standing buildings, bridges, dams, and other structures of historic or aesthetic significance. Generally, architectural resources must be more than 50 years old to be considered potentially eligible for nomination to the NRHP, as stated in National Register Bulletin 15. More recent structures, such as Cold War-era resources, may warrant protection if they are associated with exceptionally significant events or persons, represent remains that are so fragile that examples of any kind are extremely rare, or they have the potential to gain significance in the future, as stated in National Register Bulletin 22.

Traditional Cultural Properties (TCPs) or sacred sites can include archaeological resources, structures, neighborhoods, prominent topographic features, habitats, or areas where particular plants, animals, or minerals exist that Native Americans or other cultural groups consider to be essential for the preservation of traditional cultural practices, as stated in National Register Bulletin 38.

Cultural resources management at USAF installations is established in AFI 32-7065, *Cultural Resources Management.* The AFI details the compliance requirements for protecting cultural resources including the preparation of a Cultural Resources Management Plan (CRMP). The CRMP must include an inventory and evaluation of all known cultural resources; identification of the likely presence of other significant cultural resources; description of installation strategies for maintaining cultural resources and complying with related resource statutes, regulations, policies, and procedures; standard operating procedures and action plans that include budget, staffing and scheduling activities; clear identification and resolution of the mission impact on cultural resources; and conformance with local, state, and Federal preservation programs. In accordance with AFI 32-7065, Dover AFB developed the *Dover Air Force Base Cultural Resource Management Plan* (DAFB 2000a).

3.5.2 Existing Conditions

Cultural resources at Dover AFB are managed in accordance with applicable environmental laws including AFI 32-7064, *Cultural Resources Management*; 32 CFR Part 989; the NHPA of 1966, as amended, and its implementing regulations 36 CFR Part 800; EO 11593, *Protection and Enhancement of the Cultural Environment,* of 1971; NEPA of 1969, as amended, and its implementing regulation 42 U.S.C.; the *Archaeological and Historic Preservation Act of 1974* (Public Law [P.L.] 93-291); the *American Indian Religious Freedom Act of 1978* (P.L. 95-341);

the *Archaeological Resources Protection Act of 1979* (P.L. 96-95); and the *Native American Graves Protection and Repatriation Act of 1990* (P.L. 101-601).

The individual responsible for the management of cultural resources on a day-to-day basis is the base Cultural Resources Manager (CRM). This individual is assigned to the 436th Civil Engineering Squadron, Environmental Flight (436 CES/CEV). Civil Engineering personnel evaluate proposed projects for their potential impact as part of the environmental review process. In the event that unanticipated human remains or archaeological materials are found during a project, work in the area of the find would stop, and the individual responsible for implementing the work (e.g., the non-commissioned officer in charge or the job foreman) would notify the CRM immediately. Various cultural resources studies have been conducted on Dover AFB in compliance with Section 106 and Section 110 of the NHPA (DAFB 2000a).

Archaeological Resources. In fulfillment of its requirements under Section 110 of the NHPA, Dover AFB has surveyed or assessed all of its property for archaeological resources (DAFB 2000b). Surveys have recorded eleven archaeological sites. Seven of these are potentially eligible for the NRHP, three are not eligible for the NRHP, and the eligibility of the one is unknown. Ten areas on Dover AFB have been identified where undiscovered archaeological resources may be anticipated. Any ground disturbing activities in these ten locations, or in the vicinity of potentially NRHP eligible sites will be reviewed by the SHPO before work begins (DAFB 2000a).

No American Indian graves or other culturally sensitive areas have been identified on Dover AFB.

Historical Resources. Dover AFB has completed its identification requirements under Section 110 of the NHPA of 1966, as amended. Dover AFB has inventoried all of its buildings. Hangar 1301 is listed in the NRHP. The Strategic Air Command alert facility (Building 1303), was declared eligible for listing on the NRHP with concurrence of the SHPO, as recommended by the *Inventory of Cold War Properties* (Weitz 1996).

3.6 Hazardous Materials and Wastes

3.6.1 Definition of Resource

Hazardous material is defined by the *Comprehensive Environmental Response, Compensation, and Liability Act* (CERCLA), as amended by the *Superfund Amendments and Reauthorization*

Act (SARA), and the *Toxic Substances Control Act* (TSCA), as any substance with physical properties of ignitability, corrosivity, reactivity, or toxicity that may cause an increase in mortality, a serious irreversible illness, incapacitating reversible illness, or pose a substantial threat to human health or the environment. Hazardous waste is defined by the *Resource Conservation and Recovery Act* (RCRA), which was amended by the *Hazardous and Solid Waste Amendments* (HSWA), as any solid, liquid, contained gaseous, or semisolid waste, or any combination of wastes that poses a substantial present or potential hazard to human health or the environment.

Evaluation of hazardous materials and wastes focuses on underground storage tanks and aboveground storage tanks and the storage, transport, and use of pesticides and herbicides, fuels, and POL. Evaluation may also extend to generation, storage, transportation, and disposal of hazardous wastes when such activity occurs at or near the project site of a proposed action. In addition to being a threat to humans, the improper release of hazardous materials and wastes can threaten the health and well being of wildlife species, botanical habitats, soil systems, and water resources. In the event of release of hazardous materials or wastes, the extent of contamination varies based on the type of soil, topography, and water resources.

Special hazards are those substances that may pose a risk to human health but are not regulated as contaminants under the hazardous waste statutes. Special hazards include asbestos and lead-based paint. The presence of special hazards or controls over them may affect, or be affected by, a proposed action. Information on special hazards describing their locations, quantities, and condition assists in determining the significance of a proposed action.

To protect habitats and people from inadvertent and potentially harmful releases of hazardous substances, DOD has dictated that all facilities develop and implement Hazardous Material Emergency Planning and Response Plans or Spill Prevention, Control, and Countermeasure Plans. Also, DOD has developed the ERP, intended to facilitate thorough investigation and cleanup of contaminated sites located on military installations. These plans and programs, in addition to established legislation (i.e., CERCLA and RCRA) effectively form the "safety net" intended to protect the ecosystems on which most living organisms depend.

AFPD 32-70, *Environmental Quality*, establishes the policy that the Air Force is committed to environmentally-sound practices:

- Cleaning up environmental damage resulting from its past activities

- Meeting all environmental standards applicable to its present operations
- Planning its future activities to minimize environmental impacts
- Managing responsibly the irreplaceable natural and cultural resources it holds in public trust, and
- Eliminating pollution from its activities wherever possible.

AFPD 32-70 and the AFI 32-7000 series incorporate the requirements of all Federal regulations, other AFIs, and DOD Directives for the management of hazardous materials, hazardous wastes and special hazards.

Environmental Restoration Program. The ERP is a subcomponent of the Defense Environmental Restoration Program (DERP) that became law under SARA. The ERP requires each DOD installation to identify, investigate, and cleanup hazardous waste disposal or release sites. The ERP provides a uniform, thorough methodology to evaluate past disposal sites to control the migration of contaminants, to minimize potential hazards to human health and the environment, and to clean up the environment. Description of ERP activities provides a useful gauge of the condition of the soils, water resources, and other resources that may be affected by contaminants. It also aids in the identification of properties and their usefulness for given purposes.

3.6.2 Existing Conditions

The generating location and the 436 CES/CEV are responsible for overseeing hazardous material and waste management for the installation. In conformance with the policies established by AFPD 32-70, the 436 CES/CEV has developed plans to manage hazardous materials, hazardous wastes, and special hazards on the base.

Hazardous Materials. AFI 32-7086, *Hazardous Materials Management*, establishes procedures and standards that govern management of hazardous materials throughout the USAF. It applies to all USAF personnel who authorize, procure, issue, use, or dispose of hazardous materials, and to those who mange, monitor, or track any of those activities. The 436 AW manages hazardous materials in accordance with AFI 32-7086.

Hazardous Wastes. The 436 AW maintains a *Hazardous Waste and Used Petroleum Management Plan* as directed by AFI 32-7042, *Solid and Hazardous Waste Compliance*. The *Hazardous Waste and Used Petroleum Management Plan* provides guidance to Dover AFB

personnel on handling, storage, and disposal of hazardous materials and implements the "pharmacy" system to control hazardous waste (436 AW 2001). Wastes generated at Dover AFB include used antifreeze, contaminated fuels, flammable solvents, waste paint-related materials and other miscellaneous wastes (DAFB undated).

Hazardous waste management activities at Dover AFB are performed by generating location and the 436 CES/CEV. The CEV has designated locations as 90-day accumulation points and initial accumulation points (IAPs). Each organization appoints accumulation point managers and alternate managers to ensure the proper identification, handing storage and recordkeeping for hazardous wastes. Used oil and fuels are accumulated and recycled through the base recycling/resale contract. Wastes are periodically collected and transported from the storage facility by a contractor. Because hazardous wastes must be transferred outside of Building 1306 (a 90 day accumulation point) in an area unprotected from precipitation, the base is required to monitor storm water from this site entering the St. Jones River via Dover AFB Outfall 008 as part of the Dover AFB storm water permit (DAFB undated).

Asbestos. AFI 32-1052, *Facilities Asbestos Management,* provides direction for asbestos management at USAF installations. AFI 32-1052 requires installations to develop an asbestos management plan for the purpose of maintaining a permanent record of the status and condition of asbestos containing material (ACM) in installation facilities, as well as documenting asbestos management efforts. In addition, the instruction requires installations to develop an asbestos-operating plan detailing how the installation accomplishes asbestos-related projects. Asbestos is regulated by USEPA with the authority promulgated under the Occupational Safety and Health Act. Section 112 of the CAA regulates emission of asbestos fibers to ambient air. USEPA policy is to leave asbestos in place if disturbance or removal could pose a health threat.

To fulfill the requirements of AFI 32-1052 Dover AFB has an asbestos management program in place which addresses ACM on the base. The asbestos management plan is based on an asbestos survey of the base that was originally performed in 1988-1989, and revised in 1999. Suspect ACM is addressed on an as-needed basis prior to disturbance of the material. Materials to be disturbed that have been confirmed to contain asbestos are handled by qualified outside contractors (DAFB undated).

Lead Based Paint. The *Residential Lead-Based Paint Hazard Reduction Act of 1992*, Subtitle B, Section 408 (commonly called Title X), passed by Congress on October 28, 1992, regulates the

use and disposal of lead-based paint (LBP) on Federal facilities. Federal agencies are required to comply with applicable Federal, state, and local laws and regulations relating to LBP activities and hazards.

USAF policy and guidance establishes lead-based paint management at USAF facilities (USAF 1993). Additionally, the policy requires each installation to develop and implement a facility management plan for identifying, evaluating, managing, and abating LBP hazards. Dover AFB has in place a LBP management program. As with asbestos, all suspect or confirmed LBP is addressed prior to any activities that may disturb them, such as renovation, construction, demolition, etc. LBP abatement is performed by outside contractors when required (DAFB undated).

Environmental Restoration Program. Some fuels, hazardous materials, and hazardous wastes are stored and handled along the flight line in the northwestern area of the base. Most surface drainage from this portion of the base is to Morgan Branch and Pipe Elm Branch both of which flow into the Little River. Historic hazardous materials and waste handling and disposal in this same area of the base have resulted in contamination within these drainages (DAFB undated).

Dover AFB was placed on the National Priority List (NPL) in March 1989. A Federal Facilities Agreement (FFA) was signed in August 1989 to address the environmental cleanup of hazardous substances, pollutants or contaminants present at Dover AFB. The FFA is pursuant CERCLA, RCRA, EO 12580, DERP, National Contingency Plan (NCP), and applicable State of Delaware Statutes (DAFB undated).

Site inspections conducted in the early 1990s identified, fifty-nine ERP sites at Dover AFB. The principal site types are underground storage tanks, oil-water separators, industrial waste collection drains, fire training areas, landfills, fuel spills, fuel leaks and a fuel hydrant system. Fifty-two of the ERP sites are governed by CERCLA regulations, six sites fall under the State Underground Storage Tank (UST) Program, and one site is governed by RCRA Subtitle C (DAFB undated).

A base-wide remedial investigation conducted in the mid-1990s was approved by the Environmental Protection Agency in 1997. As a result of the remedial investigation, 23 of the 59 sites were shown to require no cleanup action and were categorized as "no further action" sites. The remaining 36 sites were carried forward for further evaluation and cleanup (DAFB undated).

Pollution Prevention. AFI 32-7080, *Pollution Prevention Program*, implements the regulatory mandates in the Emergency Planning and Community Right-to-Know Act; 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*. AFI 32-7080 prescribes the establishment of Pollution Prevention Management Plans. The 436 AW fulfills this requirement with the *Pollution Prevention Management Action Plan*, the *Hazardous Waste and Used Petroleum Management Plan* (436 AW 2001), and the *Solid Waste Management Plan*. These plans ensure that Dover AFB maintains a waste reduction program and meets the requirements of the CWA, the National Pollution Discharge Elimination System (NPDES) permit program and Federal, state and local laws and regulations for spill prevention, control and countermeasures.

3.7 Infrastructure and Utilities

3.7.1 Definition of the Resource

Infrastructure consists of the systems and physical structures that enable a population in a specified area to function. Infrastructure is wholly human-made, with a high correlation between the type and extent of infrastructure and the degree to which an area is characterized as "urban" or developed. The availability of infrastructure and its capacity to support growth are generally regarded as essential to economic growth of an area. The infrastructure information provided below was obtained from the *General Plan Delaware Air Force Base Delaware* (DAFB undated) and provides a brief overview of each infrastructure component and comments on its existing general condition. The infrastructure components to be discussed in this section include transportation systems, utilities (electrical power, natural gas, and water supply), solid waste, and sanitary systems.

Solid waste management primarily concerns itself with the availability of landfills to support a population's residential, commercial, and industrial needs. Alternative means of waste disposal may involve waste-to-energy programs or incineration. In some localities, landfills are designed specifically for, and limited to, disposal of construction and demolition debris. Recycling programs for various waste categories (e.g., glass, metals, and papers) reduce reliance of landfills for disposal.

3.7.2 Existing Conditions

Electrical Power. Power for Dover AFB, including the Eagle Heights MFH community, is supplied by the City of Dover. Two 69 kilovolts (kV), three phase transmission lines provide the source of power.

Solid Waste. Solid waste management at Dover AFB includes the collection and disposal of non-hazardous solid wastes; recycling efforts; and contract disposal of overseas waste, infectious waste, and pathological waste. There are no active landfills on base, and the majority of solid wastes from Dover AFB are transported to the Central Delaware Solid Waste Authority (DSWA) landfill in Sandtown (DAFB undated).

Recycling receptacles owned and maintained by DSWA are at one site on base. DSWA removes recyclables (including magazines) from the base to their own recycling center off base. The basewide recycling program includes aluminum cans, paper, glass, and plastic. Recycling activities at base industrial facilities are conducted by a 436 CES/CEV contractor and include the recycling of scrap metal, cardboard, and scrap wood.

Infectious medical waste is red-bagged or placed in sharps containers, collected by housekeeping staff, and placed in locked storage pending removal by a contractor to a permitted disposal facility (DAFB undated).

Pathological wastes from the mortuary are handled and disposed in a similar manner. All overseas wastes, including infectious and food wastes, are steam-sterilized, bagged, offloaded from aircraft, and refrigerated at the aerial port by Fleet Services personnel. A contractor removes the wastes, which are then disposed of off-base following USDA guidelines (DAFB undated).

Transportation. The Dover AFB roadway system should safely handle and distribute vehicular movements with a minimum amount of congestion and delay. This includes traffic movements on and off of the installation, as well as movement within the installation. Pavement condition should not inhibit these movements (DAFB undated).

Access to the base is currently achieved by two entrance gates, the Main and North gates (Figure 2-1). The North Gate is accessed from Route 10, SR-1 and from US 113. The Main Gate is accessed from SR-1 and from Lebanon Road. Lebanon Road provides direct access from the

Eagle Heights MFH community into the Main Gate by way of an overpass bridging SR-1 (DAFB undated).

A diamond intersection at SR-1 and Lebanon Road provides for all the required turning movements at that intersection from off and on ramps, which enables motorists to access the Main Gate and the Eagle Heights MFH community. The North Gate is accessed directly from Route10, northbound SR-1 and southbound 113. Traffic signals control movements at the North Gate. The Main Gate overpass provides for a grade-separated entrance to the base. Traffic signals provide control of traffic movements at the on and off ramps at this intersection (DAFB undated).

3.8 Safety

3.8.1 Definition of Resource

A safe environment is one in which there is no, or an optimally reduced, potential for death, serious bodily injury, illness, or property damage. Human health and safety addresses: (1) workers' health and safety during construction activities and (2) public safety during construction activities and during subsequent operations of those facilities.

Construction work site safety is largely a matter of adherence to regulatory requirements imposed for the benefit of employees and implementation of operational practices that reduce risks of illness, injury, death, and property damage. The health and safety of onsite military and civilian workers are safeguarded by numerous DOD and USAF regulations designed to comply with standards issued by the Occupational Safety and Health Administration and USEPA. These standards specify the amount and type of training required for industrial workers, the use of protective equipment and clothing, engineering controls, and maximum exposure limits for workplace stressors.

3.8.2 Existing Conditions

All contractors performing construction activities at Dover AFB are responsible for following ground safety regulations and worker compensation programs, and they are required to conduct construction activities in a manner that does not pose any risk to its workers or base personnel. An industrial hygiene program addresses exposure to hazardous materials, use of personal protective equipment, and availability of Material Safety Data Sheets. Industrial hygiene is the responsibility of contractors, as applicable. Contractor responsibilities are to review potentially

hazardous workplace operations; to monitor exposure to workplace chemical (e.g., asbestos, lead, hazardous material), physical (e.g., noise propagation), and biological (e.g., infectious waste) agents; to recommend and evaluate controls (e.g., ventilation, respirators) to ensure personnel are properly protected or unexposed; and to ensure a medical surveillance program is in place to perform occupational health physicals for those workers subject to any accidental chemical exposures.

Explosive safety-quantity distance (QD) zones are designated areas designed to safeguard the base population and civilian community from potential explosions. These clear zones include the area within a safety arc surrounding an explosive storage facility.

The QD zones at Dover AFB encompass explosives storage facilities, hazardous cargo parking, suspect vehicle parking areas, and build-up and pre-load areas.

The QD zones cover a significant portion of the airfield and adjacent lands; existing land uses in the arcs are mission necessary functions generally consisting of industrial and maintenance operations.

Airfield safety clearance. The Air Force has established standards to define imaginary surfaces for navigational airspace surrounding the airfield. These standards identify additional criteria that control development within these areas. Applicable airfield safety clearance criteria are defined in Air Force Manual (AFM) 32-1123, *Airfield and Heliport Planning and Design Criteria.* AFM 32-1123 outlines detailed planning and design criteria and standards for airfields; these criteria and standards include dimensions, clearances, and grades for airfield operational areas including the primary surface, clear zones, accident potential zones, and approach/departure clearance surfaces.

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4. Environmental Consequences

This section of the EA assesses potential environmental consequences associated with the Proposed Action. Potential impacts are addressed in the context of the scope of the Proposed Action as described in Section 2.0 and in consideration of the potentially affected environment as characterized in Section 3.0.

4.1 Air Quality

4.1.1 Significance Criteria

The potential impacts to local and regional air quality conditions near a proposed Federal action are determined based upon the increases in regulated pollutant emissions relative to existing conditions and ambient air quality. Specifically, the impact in NAAQS attainment areas would be considered significant if the net increases in pollutant emissions from the Federal action resulted in one of the following scenarios:

- Cause or contribute to a violation of any national or state ambient air quality standard
- Expose sensitive receptors to substantially increased pollutant concentrations
- Represent an increase of ten percent or more in an affected AQCR emissions inventory

Impacts to air quality in NAAQS non-attainment areas are considered significant if the net changes in project-related pollutant emissions result in one of the following scenarios:

- Cause or contribute to a violation of any national or state ambient air quality standard
- Increase the frequency or severity of a violation of any ambient air quality standard
- Exceed any significance criteria established in a SIP
- Delay 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 the proposed Federal action would result in an increase of a non-attainment or maintenance area's emission inventory by ten percent or more for one or more non-attainment pollutants, or if such emissions exceed *de minimis* threshold levels established in 40 CFR 93.153(b) for individual non-attainment pollutants or for pollutants for which the area has been designated as a non-attainment or maintenance area.

The *de minimis* threshold emission rates were established by the USEPA in the General Conformity Rule in order to focus analysis requirements on Federal actions with the potential to have "significant" air quality impacts. Table 4-1 presents these thresholds, by regulated pollutant. These *de minimis* thresholds are similar, in most cases, to the definitions for major stationary sources of criteria and precursors to criteria pollutants under the CAA's New Source Review (NSR) Program (CAA Title I). As shown in Table 4-1, *de minimis* thresholds vary depending upon the severity of the non-attainment area designation by USEPA.

Table 4-1. General Conformity Rule de minimis Emission Thresholds

Pollutant	Status	Non-Attainment Classification	*de minimis* Threshold (tons/yr)
Ozone (measured as – "precursors": Nitrogen Oxides (NO_x) or Volatile Organic Compounds (VOCs))	Non-attainment	Extreme	10
		Severe	25
		Serious	50
		Moderate/marginal (inside ozone transport region)	50 (VOCs)/100 (NO_x)
		All others	100
	Maintenance	Inside ozone transport region	50 (VOCs)/100 (NO_x)
		Outside ozone transport region	100
Carbon Monoxide (CO)	Non-attainment/ Maintenance	All	100
Particulate Matter <10 microns (PM_{10})	Non-attainment	Serious	70
	Maintenance	Moderate	100
		Not Applicable	100
Sulfur Dioxide (SO_2)	Non-attainment/ maintenance	Not Applicable	100
Nitrogen Dioxide (NO_2)	Non-attainment/ maintenance	Not Applicable	100

Source: 40 CFR 93.153(b)

4.1.2 Environmental Consequences

Since a USEPA-designated non-attainment area is affected by this Proposed Action, the USAF must comply with the Federal General Conformity Rule (40 CFR, Part 93). To do so, an analysis has been completed to ensure that, given the changes in direct and indirect emissions of the O_3 precursors (NO_x and VOCs), PM_{10}, and CO, the Proposed Action would be in conformity with applicable CAA requirements. The Conformity Determination requirements specified in this rule can be avoided if the project-related non-attainment pollutant emission rate increases are below *de minimis* thresholds levels for each pollutant and are not considered regionally significant. For

purposes of determining conformity in this non-attainment area, projected regulated pollutant emissions associated with the Proposed Action were estimated using available construction emissions and other non-permitted emission source information. The emission calculations and *de minimis* threshold comparisons are collectively presented in the Air Conformity Analysis provided in Appendix B.

Construction Activities. The Proposed Action consists of eight phases and includes constructing 25-foot wide runway shoulders on each side of Runway 14/32. A description of each phase of construction is provided in Section 2.2.

The construction projects would generate TSP and PM_{10} emissions as fugitive dust from ground disturbing activities (e.g., grading, demolition, soil piles, etc.) and combustion of fuels in construction equipment. Fugitive dust emissions would be greatest during the initial site preparation activities and would vary from day-to-day depending on the construction phase, level of activity, and prevailing weather conditions. The quantity of uncontrolled fugitive dust emissions from a construction site is proportional to the area of land being worked and the level of construction activity.

Fugitive dust emissions for various construction activities were calculated using emission factors and assumptions published in USEPA's AP-42 Section 11.9 dated July 1998 and Section 13.2 dated September 1998. These estimates assume that 230 working days are available per year for construction (accounting for weekends, weather, and holidays). Using Climate Prediction Center information for the State of Delaware the average soil percent moisture was estimated to be an average of 85 percent (CPC NOAA 2003). Wind speed of greater then 12 mph is recorded 31.5 percent of the time during ozone season (April 1-October 31), which is based on average wind rose data and measured speed for Philadelphia-Wilmington-Trenton District of the USEPA Region III AQCR No. 45 (USEPA 2003).

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

Information on the affected project site area to be disturbed in Section 2.2 was used to estimate fugitive dust and all other criteria pollutant emissions. For the purposes of this analysis it was assumed that all eight phases would occur in CY 2004. The construction emissions presented in Table 4-2 include the estimated annual construction PM_{10} emissions associated with the Proposed Action at Dover AFB. These emissions would produce slightly elevated short-term PM_{10} ambient air concentrations. However, the effects would be temporary, and would fall off rapidly with distance from the proposed construction site.

Table 4-2. Annual Construction Emissions from the Proposed Action at Dover AFB, DE

	Proposed Construction Emissions Estimates				
Calendar Year	**NO_x[1] (tpy)**	**VOC[1] tpy)**	**CO (tpy)**	**SO_x (tpy)**	**PM_{10} (tpy)**
2004	1.89	0.61	0.41	0.13	13.12

Note: [1] Denotes non-attainment pollutant in Philadelphia-Wilmington-Trenton District of the USEPA Region III AQCR No. 45.
[2] For the purposes of this analysis it was assumed that all eight phases would occur in CY 2004.

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 methodologies for construction and experience with similar types of construction projects. Combustion by-product emissions from construction equipment exhausts were estimated using USEPA's AP-42 emissions factors for heavy-duty diesel-powered construction equipment.

The construction emissions presented in Table 4-2 include the estimated annual emissions from construction equipment exhaust associated with the Proposed Action. As with fugitive dust emissions, combustion emissions would produce slightly elevated air pollutant concentrations. Early stages of construction projects involve greater use of heavy diesel equipment and earthmoving, resulting in higher NO_x and PM_{10} emissions. Later stages of construction projects involve greater use of light gasoline equipment and surface coating, resulting in more CO and VOC emissions. 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.

As mentioned earlier, Philadelphia-Wilmington-Trenton District of the USEPA Region III AQCR No. 45 is currently classified as being severe "non-attainment" for O_3 and is in attainment for all other criteria pollutants. As shown in Table 4-2, the Proposed Action would generate

emissions well below conformity *de minimis* limits as specified in 40 CFR 93.153. Because the emissions generated would be below *de minimis* levels, it is reasonable to assume that the temporary construction emissions caused by the Proposed Action would not cause a violation of the NAAQS. Therefore, no significant impact on regional or local air quality would result from implementation of the Proposed Action. Appendix B details the emission factors, calculations, and estimates of construction-related emissions for the Proposed Action.

According to 40 CFR 81 no Class I areas are located in the State of Delaware or in the vicinity of Dover AFB. Therefore, Federal PSD regulations would not apply to the Proposed Action.

Local and regional pollutant impacts resulting from direct and indirect emissions from stationary emission sources under the Proposed Action are addressed through Federal and state permitting program requirements under NSR regulations (40 CFR 51 and 52). As noted previously, Dover AFB has appropriate permits in place and has met all applicable permitting requirements and conditions for specific stationary devices.

4.2 Geological Resources

4.2.1 Evaluation Criteria

Protection of unique geological features, minimization of soil erosion, and the siting of facilities in relation to potential geologic hazards are considered when evaluating potential impacts of a proposed action on geological resources. Generally, impacts can be avoided or minimized if proper construction techniques, erosion control measures, and structural engineering design are incorporated into project development.

Analysis of potential impacts on geological resources typically includes the following evaluation tools:

- Identification and description of resources that could potentially be affected
- Examination of a proposed action and the potential effects this action may have on the resource
- Assessment of the significance of potential impacts
- Provision of mitigation measures in the event that potentially significant impacts are identified

4.2.2 Potential Impacts

Under the Proposed Action, construction activities, such as grading, excavation, and re-contouring of the soil, would result in soil disturbance. Implementation of best management practices during construction would limit potential impacts resulting from construction activities. Fugitive dust from construction-activities would be minimized by watering and soil stockpiling, thereby reducing to negligible levels the total amount of soil exposed. Standard erosion control means (silt fencing, sediment traps, application of water sprays, and re-vegetation at disturbed areas) would also reduce potential impacts related to those characteristics. Additionally, prior to construction, a Delaware Department of Natural Resources and Environmental Control (DNREC) sediment and erosion control general permit would be required. Therefore, impacts on soils at the installation would not be significant.

The Proposed Action would not cause or create significant changes to the topography of the Dover AFB area. The proposed construction is in a previously disturbed area. Therefore, no significant impact on regional or local topography or physiographic features would result from implementation of the Proposed Action.

4.3 Water Resources

4.3.1 Evaluation Criteria

Significance criteria for water resources impacts are based on water availability, quality, and use; existence of floodplains; and associated regulations. A potential impact on water resources would be significant if it were to reduce water availability to existing users or interfere with the supply; create or contribute to overdraft of groundwater basins or exceed safe annual yield of water supply sources; adversely affect water quality or endanger public health by creating or worsening adverse health hazard conditions; threaten or damage unique hydrologic characteristics; or violate established laws or regulations that have been adopted to protect or manage water resources of an area. The impact of flood hazards on a proposed action is significant if such an action is proposed in an area with a high probability of flooding.

4.3.2 Potential Impacts

Implementation of the Proposed Action is expected to have no significant adverse effects on water quality. Adherence to proper engineering practices and applicable codes and ordinances would reduce storm water runoff-related impacts to a level of insignificance. Erosion and

sediment controls would be in place during construction to reduce and control siltation or erosion impacts to areas outside of the construction site. Prior to construction, a DNREC sediment and erosion control general permit would be required. Furthermore, the proposed construction activity would not occur within the 100-year floodplain. As a result, the Proposed Action would not affect the 100-year floodplain.

The activities associated with the Proposed Action would not affect groundwater quality.

4.4 Biological Resources

4.4.1 Evaluation Criteria

Determination of significance potential impact on biological resources is based on the importance (i.e., legal, commercial, recreational, ecological, or scientific) of the resource; the percentage of the resource that would be affected relative to its occurrence in the region; the sensitivity of the resource to proposed activities; and the duration of ecological ramifications. Impacts on biological resources are significant if species or habitats of high concern are adversely affected over relatively large areas, or if disturbances cause reductions in population size or impact the distribution of a species of high concern.

The significance of impacts on wetland resources is proportional to the functions and values of the wetland complex. Wetlands function as habitat for plant and wildlife populations, including threatened and endangered species that depend on wetlands for their survival. Wetlands are valuable to the public for flood mitigation, storm water runoff abatement, aquifer recharge, water-quality improvement, and aesthetics. On a global scale, wetlands are significant factors in the nitrogen, sulfur, methane, and carbon dioxide cycles. These parameters vary from year to year or from season to season. Quantification of wetlands functions and values, therefore, is based on the ecological quality of the site as compared with similar sites, and the comparison of the economic value of the habitat with the economic value of the proposed activity that would modify it. A significant adverse impact on wetlands would occur should either the major function or value of the wetland be significantly altered.

4.4.2 Environmental Consequences

Vegetation. The Proposed Action would occur in areas of Dover AFB that are improved. The proposed demolition would not disturb any native vegetation. Mature trees and shrubbery would be located and identified prior to construction. Measures would be taken to avoid impacts to

mature trees and shrubs of importance. Therefore, the Proposed Action would not adversely impact native vegetation on Dover AFB.

Wetlands. The proposed runway upgrades are more than 100 ft from wetlands (see Figure 4-1). Measures would be taken to avoid any indirect impacts to wetlands. Therefore, the Proposed Action would not result in adverse impacts to wetlands on Dover AFB.

Threatened and Endangered Species. There are no known occurrences of federally listed threatened and endangered species on Dover AFB. Therefore, the Proposed Action is not likely to adversely affect threatened or endangered species on Dover AFB.

The proposed runway upgrades include an area where the upland sandpiper (a state endangered species) has been identified at Dover AFB (see Figure 4-1). The upland sandpiper habitat is comprised of large, flat tracts of land, and is most likely found along taxiways, runways, and open fields. The most important time to look for the upland sandpipers is from May 1 though July 15 (DNHI 1993). If upland sandpipers were identified at the proposed construction site prior to construction of the runways, the DNHI office would be contacted and measures would be taken to avoid impacts to upland sandpiper. Therefore, the Proposed Action would have no effect on state threatened, endangered, or rare species.

4.5 Cultural Resources

4.5.1 Evaluation Criteria

Potential impacts of the Proposed Action are assessed by: (1) identifying the nature and potential significance of cultural resources in potentially affected areas, and (2) identifying activities that could directly or indirectly affect cultural resources classified as historic properties. Historic properties, under 36 CFR 800, are defined as cultural resources included in, or eligible for inclusion in the NRHP. The term "eligible for inclusion" includes both listed and eligible properties, which meet NRHP listing criteria as outlined by 36 CFR 60.4. Therefore, cultural resources not yet evaluated are considered potentially eligible for the NRHP and are afforded the same regulatory consideration as nominated historic properties.

Figure 4-1. Natural Resources Constraints at Dover AFB

4.5.2 Environmental Consequences

The Proposed Action would have no effect on cultural resources at Dover AFB.

Archaeological Resources. The proposed runway upgrades are in previously disturbed areas and are not located near identified archaeological sites or sites requiring further archaeological investigation (DAFB 2000a).

If unanticipated American Indian human remains, funerary objects, sacred objects, or objects of cultural patrimony are found on Dover AFB, the CRM would contact the SHPO to determine the appropriate American Indian groups to consult (DAFB 2000a).

In case of inadvertent discovery of archaeological artifacts during construction, all construction activities would cease, as required by Federal and USAF regulations and 36 CFR 800.13(b). Procedures outlined in Dover AFB's CRMP would be followed. All construction would cease, and the CRM would be notified. Work would not resume until a full archaeological investigation is completed. Therefore, the Proposed Action would have no effect on archaeological resources.

Historical Resources. The proposed runway upgrades are in previously disturbed areas and are not located near historic resources (DAFB 2000a). Therefore, the Proposed Action would have no effect on historic properties.

Pursuant to 800.4(d)(1), Dover AFB determined that the Proposed Action would not affect historic properties.

4.6 Hazardous Materials and Waste

4.6.1 Evaluation Criteria

Numerous local, state, and Federal laws regulate the storage, handling, disposal, and transportation of hazardous material and waste. The primary purpose of these laws is to protect public health and the environment. Potential impacts associated with hazardous material and waste would be significant if the storage, use, transportation, or disposal of these substances were to substantially increase the risk to human health or exposure to the environment.

4.6.2 Environmental Consequences

Hazardous Materials. The Proposed Action would require the use of hazardous materials such as paints, welding gases, solvents, preservatives, and sealants. Contractors would be responsible for the management of hazardous materials. All hazardous materials would be handled in accordance with Federal and state regulations. Therefore, hazardous materials management at Dover AFB would not be impacted by the proposed construction activities.

Hazardous Waste. It is anticipated that the quantity of hazardous wastes generated from proposed construction activities would be negligible. Dover AFB would coordinate with the contractors for the handling and disposal of hazardous wastes generated by the proposed project. Typically, hazardous waste is given a Dover AFB generator number and is disposed directly by the base. All hazardous wastes would be disposed in accordance with Federal and state laws and regulations. Therefore, construction of the proposed facilities would have negligible impacts on Dover AFB hazardous waste management program.

Asbestos and Lead-based Paint. ACM or LBP are not expected to be encountered during the proposed runway upgrades

Environmental Restoration Program. ERP monitoring wells are more than 100 feet from Runway 14/32. Access would be provided to any monitoring wells that fall within the construction site. All efforts would be coordinated with 436 CES/CEV. No other ERP management impacts would be expected.

Pollution Prevention. It is anticipated that the Proposed Action would not impact the pollution prevention program at Dover AFB. Quantities of hazardous material and chemical purchases, off-base transport of hazardous waste, disposal of municipal solid waste (MSW), and energy consumption would remain unchanged under with implementation of the Proposed Action. The Pollution Prevention Program at Dover AFB would accommodate the Proposed Action.

4.7 Infrastructure and Utilities

4.7.1 Evaluation Criteria

Impacts to infrastructure are evaluated on their potential for disruption or improvement of existing levels of service and additional needs for energy and water consumption, wastewater systems, and transportation patterns and circulation. Impacts may arise from physical changes to

circulation, construction activities, introduction of construction-related traffic on local roads or changes in daily or peak-hour traffic volumes, and energy needs created by either direct or indirect workforce and population changes related to base activities.

4.7.2 Environmental Consequences

Electrical Power. The Proposed Action would not result in any changes to Dover AFB electrical power. Therefore, implementation of the Proposed Action at Dover AFB would not impact the electrical power at the base.

Solid Waste. In considering the basis for evaluating the significance of impacts on solid waste, several items are considered. These items include evaluating the degree to which the proposed runway upgrades could affect the existing solid waste management program and capacity of the area landfill.

Solid waste generated from the proposed construction activities would consist of debris. All materials that can be recycled will be sent to the Resource Re-use and Recovery Program building on base. All materials that cannot be recycled will be sent to the Sandtown landfill. The landfill space required at the DSWA landfill in Sandtown, DE or another approved landfill used by the contractor would increase over the next two years (Calendar Year [CY] 2003 to CY 2004). The DSWA landfill has the capacity to handle the additional demolition solid waste stream from the Proposed Action. Therefore, implementation of the Proposed Action at Dover AFB would not impact the solid waste management program at the base or the capacity of the DSWA landfill in Sandtown, DE.

Transportation Systems. The construction activities associated with the Proposed Action would require delivery of materials to and removal of debris from the proposed runway upgrade sites. Traffic associated with the Proposed Action would comprise a small percentage of the total existing traffic over the eight phases of construction and many of the vehicles would be driven to and kept on-site for the duration of construction, resulting in relatively few additional trips. Furthermore, potential increases in traffic volume associated with proposed activity would be temporary. Heavy vehicles are frequently on base roads. Therefore the vehicles necessary for the proposed construction are not expected to have a heavy impact on base roads. All road and lane closures would be coordinated with emergency personnel and would be temporary in nature; therefore, no adverse impacts on transportation systems would be expected.

4.8 Safety

4.8.1 Evaluation Criteria

If implementation of the Proposed Action were to increase substantially risks associated with the safety of Dover AFB personnel, contractors, or the local community, or substantially hinder the ability to respond to an emergency, it would represent a significant impact. Furthermore, if implementation of the Proposed Action would result in incompatible land use with regard to safety criteria (e.g., height restrictions), impacts to safety would be significant. Impacts were assessed based on the potential effects of construction activities and proposed runway upgrades.

4.8.2 Environmental Consequences

Short-term, minor adverse effects would be expected. Implementation of the Proposed Action would slightly increase the short-term risk associated with contractors performing work at Dover AFB during the normal workday because the level of such activity would increase. Contractors would be required to establish and maintain safety programs. Projects associated with the Proposed Action would not pose a safety risk to base personnel or activities at the base. The proposed construction projects would enable 436 AW to meet future mission objectives at the base and conduct or meet mission requirements in a safe operating environment.

The Proposed Action would provide a positive impact to the base. The runway upgrades would improve the safety of airfield operations at Dover AFB. Runway 14/32 would meet the criteria specified under UFC 3-260-01.

4.9 No Action Alternative

Under the No Action Alternative, existing conditions would remain as is and the proposed construction project would not occur. If the No Action Alternative were carried forward, there would be no change in or effects on air quality, geological resources, water resources, biological resources, cultural resources, hazardous materials and waste, or infrastructure and utilities at Dover AFB. However, under the No Action Alternative, Runway 14/32 would remain out of compliance with the 25-ft shoulder requirements specified under UFC 3-260-01. Safety of airfield operations would not be improved at Dover AFB.

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5. Cumulative and Adverse Impacts

Cumulative impacts on environmental resources result from incremental effects of proposed actions, when combined with other past, present, and reasonably foreseeable future projects in the area. Cumulative impacts can result from individually minor, but collectively substantial, actions undertaken over a period of time by various agencies (Federal, state, and local) or individuals. Informed decision-making is served by consideration of cumulative impacts resulting from projects that are proposed, under construction, recently completed, or anticipated to be implemented in the reasonably foreseeable future.

During the timeframe of the Proposed Action, 436 AW would conduct additional construction and demolition activities. Construction and demolition activities that are proposed, under construction, recently completed, or anticipated to be implemented in the reasonably foreseeable future and total square footage for each project (if available) are presented in Table 5-1. Cumulative impacts include an increase in total impervious surface, soil disturbance, hazardous material and wastes, solid waste, and temporary increased air emissions during constructions. No significant impacts to the environment are anticipated from the Proposed Action in conjunction with these projects. However, all projects are necessary to support the efficiency and safety of missions at Dover AFB. Additionally, the projects collectively would not significantly impact the natural or human environment at Dover AFB.

5.1 Unavoidable Adverse Impacts

Unavoidable adverse impacts would result from implementation of the Proposed Action. None of these impacts would be significant.

Geological Resources. Under the Proposed Action, construction activities associated with the proposed demolition projects, such as grading, excavating, and recontouring of the soil, would result in soil disturbance. Implementation of best management practices during construction would limit potential impacts resulting from construction activities. Standard erosion control means would also reduce potential impacts related to these characteristics. Additionally, a DNREC-approved sediment and erosion control plan would be required for the projects. Although unavoidable, impacts on soils at the base are not considered significant.

Hazardous Materials and Waste. The generation of hazardous materials and wastes are unavoidable conditions associated with the Proposed Action. However, the potential for these unavoidable situations would not significantly increase over baseline conditions and, therefore, are not considered significant.

Table 5-1. Dover AFB Construction and Demolition Projects and Total Square Footage

Proposed Building Construction	Total Square Feet
Entry Control (ECP) Upgrades	unknown
Addition to Facility 778	480
New Air Freight Terminal	355,000
Addition to Facility 206	400
Addition to Fire Station[1]	2,500
Addition to Kennel Facility	2,000
Temporary Lodging Facility	23,295
New Youth Center	20,884
New Cryogenics Facility	1,008
Defense Courier Service Facility	3,600
Air Traffic Control Facility including: -Tower -Radar Approach Control (RAPCON)	 4,306 7,998
Liquid Oxygen (LOX) Facility	2,000
Construction of 200 new houses: -152 New Housing units in Eagle Meadows -146 Housing units to be renovated	 unknown unknown
C-17 Beddown -Flight Simulator -Life Support	 13,579 20,638
Proposed Pavement Repair/Construction	**Total Square Feet**
ECP Upgrades	unknown
Perimeter Road	unknown
Proposed Demolition	**Total Square Feet**
Gatehouse 265	81
Visiting Airmen Quarters (Buildings 410 and 411)	20,640
Storage Facility (Building 1305)	2,319

Notes: [1] Currently in progress.

Energy. The use of nonrenewable resources is an unavoidable occurrence, although not considered significant. The Proposed Action would require the use of fossil fuels, a nonrenewable natural resource. Energy supplies, although relatively small, would be committed to the Proposed Action or No Action Alternative.

5.2 Compatibility of the Proposed Action and Alternatives with the Objectives of Federal, Regional, State, and Local Land Use Plans, Polices, and Controls

Impacts as a result of the Proposed Action would occur entirely within the boundaries of Dover AFB. The proposed runway upgrades would not result in any significant or incompatible land use changes on or off base. The proposed projects have been sited according to existing land use zones. Consequently, construction activities would not be in conflict with base land use policies or objectives. The Proposed Action would not conflict with any applicable off-base land use ordinances or designated clear zones.

5.3 Relationship Between Short-term Use and Long-term Productivity

Short-term uses of the biophysical components of man's environment include direct construction-related disturbances and direct impacts associated with an increase in population and activity that occurs over a period of less than five years. Long-term uses of man's environment include those impacts occurring over a period of more than five years, including permanent resource loss.

Several kinds of activities could result in short-term resource uses that compromise long-term productivity. Filling of wetlands or loss of other especially important habitats and consumptive use of high-quality water at nonrenewable rates are examples of actions that affect long-term productivity.

The Proposed Action would not result in an intensification of land use at Dover AFB or in the surrounding area. Development of the Proposed Action would not represent a significant loss of open space. Therefore, it is anticipated that the Proposed Action would not result in any cumulative land use or aesthetic impacts. Long-term productivity of these sites would be increased by the development of the Proposed Action.

5.4 Irreversible and Irretrievable Commitments of Resources

The irreversible environmental changes that would result from implementation of the Proposed Action involve the consumption of material resources, energy resources, land, biological habitat, and human resources. The use of these resources is considered to be permanent.

Irreversible and irretrievable resource commitments are related to the use of nonrenewable resources and the effects that use of these resources will have on future generations. Irreversible effects primarily result from use or destruction of a specific resource that cannot be replaced within a reasonable time frame (e.g., energy and minerals).

Material Resources. Material resources utilized for the Proposed Action include materials including concrete and asphalt (for runway upgrades), and various material supplies (for infrastructure). Most of the materials that would be consumed are not in short supply, would not limit other unrelated construction activities, and would not be considered significant.

Energy Resources. Energy resources utilized for the Proposed Action would be irretrievably lost. These include petroleum-based products (such as gasoline and diesel), natural gas, and electricity. During construction, gasoline and diesel would be used for the operation of construction vehicles. During operation, gasoline would be used for the operation of private and government-owned vehicles. Natural gas and electricity would be used by operational activities. Consumption of these energy resources would not place a significant demand on their availability in the region. Therefore, no significant impacts would be expected.

Biological Habitat. The Proposed Action would result in a minimal loss of vegetation and wildlife habitat on proposed construction sites. Proposed construction is mostly occurring on already disturbed land.

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

6. List of Preparers

This EA has been prepared under the direction of Dover AFB. The individuals who contributed to the preparation of this document are listed below.

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APPENDIX A

AIR CONFORMITY ANALYSIS

Appendix B - Clean Air Act - General Conformity Analysis

Emissions Estimates for EA of Proposed Construction of Runway Shoulders at Dover AFB, DE - Constructio

This workbook contains

Summary (this worksheet) Summarizes total emissions by calendar year.

Combustion (one sheet for each calendar year) Estimates emissions from non-road equipment exhaust as well as painting.

Grading (one sheet for each calendar year) Estimates the number of days of site preparation, to be used for estimating heavy equipment exhaust and earthmoving dust emissions)

Fugitive (one sheet for each calendar year) Estimates fine particulate emissions from earthmoving, vehicle traffic, and windblown dust.

Summary of Construction Emissions

		NOx (ton)	HC (ton)	CO (ton)	SO2 (ton)	PM10 (ton)
CY2004	Combustion	1.89	0.61	0.41	0.13	0.33
	Fugitive Dust					12.79
	TOTAL CY2004	1.89	0.61	0.41	0.13	13.12

Conformity Emission Calculations for EA of Proposed Construction of Runway Shoulders at Dover AFB, DE
Includes:

100% of Construction of Runway Shoulders Along 14/32 448,500 ft2

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

User Inputs:

Total Building Area:	0	ft^2	(None)
Total Paved Area:	448,500	ft^2	(Construction of Runway 14/32 Shoulders)
Total Disturbed Area:	10.3	acres	(Construction of Runway 14/32 Shoulders)
Construction Duration:	1.0	years	(assumed)
Annual Construction Activity:	230	days/yr	(assumed)

Results:[Average per Year Over the Construction Period]

	ROG	NOx	SO2	CO	PM10
Emissions, lbs/day	5.27	16.47	1.10	3.57	2.88
Emissions, tons/yr	0.61	1.89	0.13	0.41	0.33

Calculation of Unmitigated Emissions

Summary of Input Parameters

	ROG	NOx	SO2	CO	PM10
Total new acres disturbed:	10	10	10	10	10
Total new acres paved:	10.30	10.30	10.30	10.30	10.30
Total new building space, ft^2:	0.00	0.00	0.00	0.00	0.00
Total years:	1.00	1.00	1.00	1.00	1.00
Area graded, acres in 1 yr:	10	10	10	10	10
Area paved, acres in 1 yr:	10.30	10.30	10.30	10.30	10.30
Building space, ft^2 in 1 yr:	0.00	0.00	0.00	0.00	0.00

Annual Emissions by Source (lbs/day)

	ROG	NOx	SO2	CO	PM10
Grading Equipment	2.57	16.47	1.10	3.57	2.88
Asphalt Paving	2.70	0.00	0.00	0.00	0.00
Stationary Equipment	0.00	0.00	0.00	0.00	0.00
Mobile Equipment	0.00	0.00	0.00	0.00	0.00
Architectural Coatings (Non-Res)	0.00	0.00	0.00	0.00	0.00
Total Emissions (lbs/day):	**5.27**	**16.47**	**1.10**	**3.57**	**2.88**

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

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

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

Conformity Emission Calculations for EA of Proposed Construction of Runway Shoulders at Dover AFB, DE

Construction (Grading) Schedule

Estimate of time required to grade a specified area.

Input Parameters
Construction area: 10.3 acres/yr (from "Combustion" Worksheet)
Qty Equipment: 1.2 (calculated based on acres disturbed)

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

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

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

Means Line No.	Operation	Description	Output	Units	Acres per equip-day)	equip-days per acre	Acres/yr	Equip-days per year
021 108 0550	Site Clearing	Dozer & rake, medium brush	0.6	acre/day	0.6	1.67	10	17.16
021 144 0300	Stripping	Topsoil & stockpiling, adverse soil	1,650	cu. yd/day	2.05	0.49	10	5.03
022 242 5220	Excavation	Bulk, open site, common earth, 150' hau	800	cu. yd/day	0.99	1.01	5	5.19
022 208 5220	Backfill	Structural, common earth, 150' haul	1,950	cu. yd/day	2.42	0.41	5	2.13
022 226 5020	Compaction	Vibrating roller, 6 " lifts, 3 passes	1,950	cu. yd/day	2.42	0.41	10	4.26
TOTAL								33.77

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

(Equip)(day)/yr: 33.77
Qty Equipment: 1.24
Grading days/yr: 33.77

Round to	34 grading days/yr

Conformity Emission Calculations for EA of Proposed Construction of Runway Shoulders at Dover AFB, DE

Construction Fugitive Dust Emissions

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

User Input Parameters / Assumptions

Acres graded per year:	10.3	acres/yr	(From "Combustion" worksheet)
Grading days/yr:	34	days/yr	(From "Grading" worksheet)
Exposed days/yr:	90	assumed days/yr graded area is exposed	
Grading Hours/day:	8	hr/day	
Soil piles area fraction	0.10	(assumed fraction of site area covered by soil piles)	
Soil percent silt, s:	8.5	%	(mean silt content; expected range: 0.5 to 23, AP-42 Table 13.2.2-1)
Soil percent moisture, M	85	%	http://www.cpc.noaa.gov/products/soilmst/drought_composite.html#CSMRP Soil moisture within Delaware averages between 70 to 100 percent so 85% was used
Annual rainfall days, p	120	days/yr	rainfall exceeds 0.01 inch/day (AP-42 Fig 13.2.2-1)
Wind speed > 12 mph %, I:	31.5	%	Ave. wind speed > 12 mph within Philadelphia-Wilmington-Trenton District http://www.epa.gov/ttn/naaqs/ozone/areas/windr/13739.gif
Fraction of TSP, J:	0.5	(SCAQMD recommendation)	
Mean vehicle speed, S:	5	mi/hr	(On-site)
Dozer path width:	8	ft	
Qty construction vehicles:	1	vehicles	(From "Grading" worksheet)
On-site VMT/vehicle/day:	5	mi/veh/day	(Excluding bulldozer VMT during grading)
PM10 Adjustment Factor k	2.6	lb/VMT	(AP-42 Table 13.2.2-2 9/98 for PM10)
PM10 Adjustment Factor a	0.8	(dimensionless)	(AP-42 Table 13.2.2-2 9/98 for PM10)
PM10 Adjustment Factor b	0.4	(dimensionless)	(AP-42 Table 13.2.2-2 9/98 for PM10)
PM10 Adjustment Factor c	0.3	(dimensionless)	(AP-42 Table 13.2.2-2 9/98 for PM10)
Mean Vehicle Weight W	40	tons	assumed for aggregate trucks

Emissions Due to Soil Disturbance Activities

Operation Parameters (Calculated from User Inputs)

Grading duration per acre	26.4	hr/acre	
Bulldozer mileage per acre	1	VMT/acre	(Miles traveled by bulldozer during grading)
Construction VMT per day	6	VMT/day	
Construction VMT per acre	20.4	VMT/acre	(Travel on unpaved surfaces within site)

Equations Used (Corrected for PM10)

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

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

Calculation of PM10 Emission Factors for Each Operation

Operation	Emission Factor (mass/ unit)	Operation Parameter	Emission Factor (lbs/ acre)
Bulldozing	0.04 lbs/hr	26.4 hr/acre	1.1 lbs/acre
Grading	0.77 lbs/VMT	1 VMT/acre	0.8 lbs/acre
Vehicle Traffic	0.61 lbs/VMT	20.4 VMT/acre	12.4 lbs/acre

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

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

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

Soil Piles EF = 10.5 lbs/day/acre covered by soil piles

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

Soil piles area fraction:	0.10	(Fraction of site area covered by soil piles)
Soil Piles EF =	1.05	lbs/day/acres graded

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

Calculation of Annual PM10 Emissions

Source	Emission Factor	Graded Acres/yr	Exposed days/yr	Emissions lbs/yr	Emissions tons/yr
Bulldozing	1.1 lbs/acre	10.30	NA	11	0.01
Grading	0.8 lbs/acre	10.30	NA	8	0.00
Vehicle Traffic	12.4 lbs/acre	10.30	NA	128	0.06
Erosion of Soil Piles	1.1 lbs/acre/day	10.30	90	973	0.49
Erosion of Graded Surface	26.4 lbs/acre/day	10.30	90	24,464	12.23
TOTAL				25,584	12.79

Soil Disturbance EF: 14.3 lbs/acre
Wind Erosion EF: 27.45 lbs/acre/day

Back calculate to get EF: 73.1 lbs/acre/grading day

MEMORANDUM FOR 436 AW/PA

FROM: 436 CES/CEV

SUBJECT: Public Notice Release

1. Attached is a public notice we will be placing in the Delaware State News. The ad announces a public comment period for a draft environmental assessment associated with the Runway Upgrades on Dover AFB.

2. Request your coordination on this public notice. We plan to place the ad by Friday 14 Nov 03, so the ad will begin running in the paper by the next Sunday. Please acknowledge by indorsing below.

CHARLES C. MIKULA, P.E.
Chief, Environmental Flight

1st Ind, 436 AW/PA

MEMORANDUM FOR 436 CES/CEV

PA has reviewed and coordinated on the attached advertisement announcing a public comment period for the environmental assessment indicated in this correspondence.

JON K. ANDERSON, Lt Col, USAF
Chief, Public Affairs Division

PUBLIC NOTICE

Notice of Availability
Draft Finding of No Significant Impact
for the Environmental Assessment of
Runway Upgrades at Dover Air Force Base, DE

Dover AFB, Delaware – An Environmental Assessment (EA) of runway upgrades at Dover Air Force Base, Delaware has been prepared. The 436th Airlift Wing (436 AW) is proposing to issue a Finding of No Significant Impact (FONSI) based on this EA. The analysis considered potential effects of the Proposed Action and the No Action Alternatives. The results, as found in the EA, show that the Proposed Action would not have an adverse impact on the environment – indicating that a FONSI would be appropriate. An Environmental Impact Statement should not be necessary to implement the proposed action.

Copies of the Draft FONSI and EA showing the analysis are available for review at the Dover AFB within the 436 Civil Engineer Squadron Environmental Office located at 600 Chevron Avenue, Dover AFB, Delaware 19902-5600. Requests to review the Draft FONSI and EA should be directed to Mr. Steven Seip at (302) 677-6839 to arrange for access to Dover AFB.

Public comments on the Draft FONSI and EA will be accepted through December 1, 2003.

FACSIMILE ELECTRO MAIL TRANSMITTAL

(This information collection is not subject to OMB review under PL-96, The Paperwork Reduction Act.)

WARNING!! - DO NOT TRANSMIT CLASSIFIED INFORMATION OVER UNSECURED TELECOMMUNICATIONS SYSTEMS. OFFICIAL DOD TELECOMMUNICATIONS SYSTEMS ARE SUBJECT TO MONITORING AND USE OF DOD TELECOMMUNICATIONS SYSTEMS CONSTITUTES CONSENT TO MONITORING.

SECTION I - TO BE COMPLETED BY ORIGINATOR

CLASSIFICATION	TRANSMISSION	PAGE 1 OF 3 PAGES
☐ FOR OFFICIAL USE ONLY	☒ IMMEDIATE ☐ ROUTINE	

TO *(Office Symbol, Point of Contact, and Address)*	FAX NO. DSN	FAX NO. COMMERCIAL
The Delaware State News Classified Ads Section		302-678-3988
	VOICE NO. DSN	VOICE NO. COMMERCIAL
ELECTRONIC MAIL ADDRESS *(E-Mail)*		

SUBJECT

Placement of Classified Ads for Dover Air Force Base

FROM *(Office Symbol, Point of Contact, and Address)*	FAX NO. DSN	FAX NO. COMMERCIAL
Rayanne Benner 436 CES/CEV 600 Chevron Avenue Dover AFB, DE 19902-5600		302-677-6837
	VOICE NO. DSN	VOICE NO. COMMERCIAL
ELECTRONIC MAIL ADDRESS *(E-Mail)*		302-677-6849

REMARKS

Dover Air Force Base would like to place the attached ads in the Public Notice Section of the Delaware State News classified ads on the following dates:

Sunday, November 16, 2003
Wednesday, November 19, 2003

Please fax me a price quote at (302) 677-6837. I will call and arrange to have a check written and delivered to your office as soon as I receive the quote. If you have any questions, please call me at 302-677-6849.

RELEASER'S SIGNATURE	DATE	TIME

SECTION II - TO BE COMPLETED BY ELECTRO MAIL OPERATOR

DATE TRANSMITTED	TIME TRANSMITTED	TRANSMITTER'S SIGNATURE
DATE ADDRESSEE CONTACTED	TIME ADDRESSEE CONTACTED	CONTACTOR'S SIGNATURE

PUBLIC NOTICE
DOVER AIR FORCE BASE

Dover Air Force Base (DAFB) is providing a public comment period regarding an environmental assessment associated with the construction of a New Cryogenics Facility.

A copy of the environmental assessment is available for review at the Dover Public Library, 45 State Street, Dover, DE 19901. Comments may be submitted in writing no later than November 29, 2003 to Mr. Charles Mikula, 436 CES/CEV, 600 Chevron Avenue, Dover AFB, DE 19902-5600. All comments received prior to November 29, 2003 will be considered in the final decision.

42/947 DSN 11/16,19/03

INDEPENDENT NEWSPAPERS, INC. PROOF

Customer: 436 CES/SEV Contact: FAXED COPY Phone: 3026773350

Ad Number: 427917

Insert Dates: 11/16/2003 11/19/2003

Price: 142.48

Section: CL Class: 5005; PUBLIC NOTICE Size: 2 x 3.44

Printed By: D205 Date: 11/12/2003

Signature of Approval: [signature] Date: 13 NOV 03

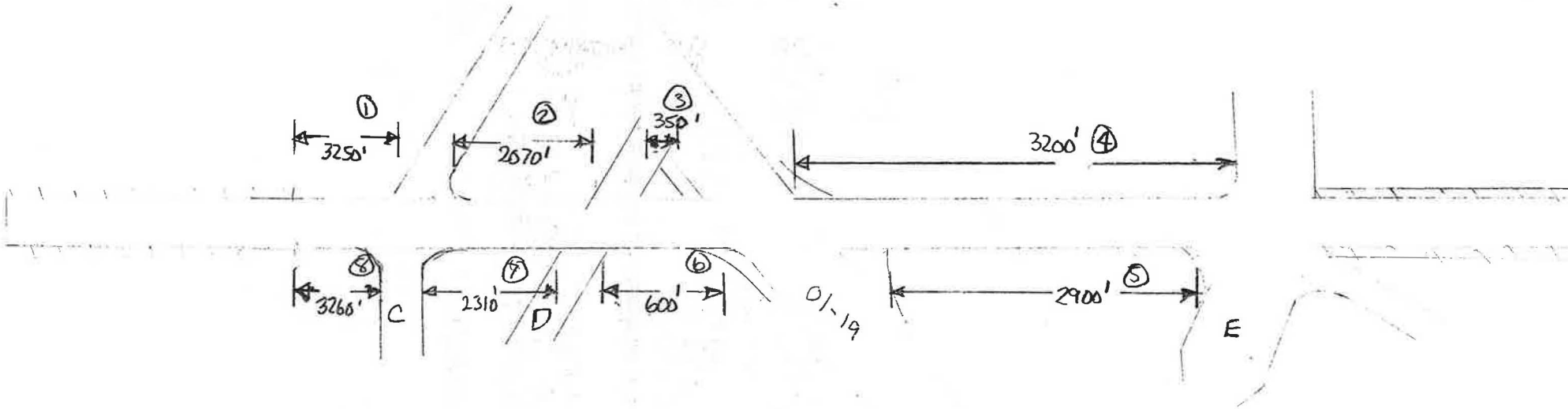
Comment Response Matrix
Preliminary Draft EA, Draft FONSI, Draft NOA, and Draft IICEP Materials
Runway Upgrades at Dover AFB, DE

#	Location			Comment	Reviewer	e^2M's Response
	Page	Line	Section			
1			Public Notice	Remove reference to FONPA. Do we need this large of an advertisement or can we use a legal notice?		Text revised per comment.
2	1-1	27	1.2	Add 14/32 between existing and runway.		Text revised per comment.
3	1-8	9-10	1.5.3	Remove reference to Appendix A. We should not have to the IICEP letter, because 800.3(a)(1) since there is no potential effects on any historic properties.		Text revised per comment.
4	3-21	4-9	3.7.2	Remove the wording from the third sentence of the paragraph to the end of the paragraph. This wording shows our electrical power vulnerability.		Text revised per comment.
5	3-22	15-16	3.7.2	Remove both lines. Security issue.		Text revised per comment.
6	3-23	18-21	3.8.2	Remove the wording from the second sentence to the rest of the paragraph. Security issue.		Text revised per comment.
7	4-3	29	4.1.2	Why do we care about the Sacramento Metropolitan Air Quality Management District?		Text was added to clarify that this is guidance that was used to generate air emissions estimates.
8	4-6	10	4.2.2	A DNREC sediment and erosion control general permit will be required for this project.		Text revised per comment.
9	4-7	3	4.3.2	A DNREC sediment and erosion control general permit will be required for this project.		Text revised per comment.
10	4-7		4.3.2	Forgot to mention anything about the 100-year floodplain.		Text included information on 100-year floodplain.
11	4-10	13	4.5.1	Remove any reference to the IICEP. We should not have to the IICEP letter, because 800.3(a)(1) since there is no potential effects on any historic properties.		Text revised per comment.
12	4-12	22	4.7.2	Lane closures are coordinated with emergency personnel Not transportation.		Text revised per comment.
13	5-2	3	5.1	Table 5-1. Need to remove runwa14/32 footage from the table and add the footage for the demo of VAQ 410, 411, and 1305. In addition, change MFH Privatization Initiative to -- Construction of 200 new houses.		Text revised per comment.

Comment Response Matrix
Preliminary Draft EA, Draft FONSI, Draft NOA, and Draft IICEP Materials
Runway Upgrades at Dover AFB, DE

#	Location			Comment	Reviewer	e^2M's Response
	Page	Line	Section			
Reviewer: Please provide your name, title, commercial phone number, and date of comments • *Example: JD – John Doe, Fire Chief, (123) 456-7890, john.doe@af.mil, 25 July 2003.*						

RUNWAY 04/32
SHOULDERS



Const SHOULDERS 25' WIDE

	SY	CY	TN	LF
	LF	X 25 SF	÷9 SY	EXCAVATION 8.5" CY
1	3250	81,250	9028	2132
2	2070	51,750	5750	1358
-3	350	8750	972	230
4	3200	80000	8889	2099
5	2900	72500	8056	1902
-6	600	15000	1667	394
7	2310	57750	6417	1515
8	3260	81500	9056	2138
TOTALS				11768

	CR 6" CY (crushed rock)	AC 2.5" TON (asphalt + concrete)	STRIPING X3'
1	1505	1287	9750
2	958	820	6210
-3	162	139	1050
4	1482	1267	9600
5	1343	1148	8700
-6	278	238	1800
7	1069	914	6930
8	1509	1290	9780
TOTALS	8306	7103	53,820

EXCAVATION (~~SF~~ $\frac{8.5}{12}$ ÷ 27 = CY)

CR (~~SF~~ $\frac{6}{12}$ ÷ 27 = CY)

AC (SY x 2.5 x .057 = TONS)

or (SY * .1425)

STRIPING (LF x 3')

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 436TH AIRLIFT WING (AMC)

21 May 2003

MEMORANDUM FOR 436 CES/CEV

FROM: 436 AW/JA

SUBJECT: Categorical Exclusion for Project FJXT021007

1. I have reviewed your request to Categorically Exclude (CATEX) project FJXT021007 from the requirement of an Environmental Impact Analysis under the National Environmental Policy Act. Since the proposed project involves disturbing more than 1 acre of land, it cannot satisfy the requirements of AFI 32-7061, paragraph A2.3.14, or any other Air Force approved Exclusion. Additionally, an EA is appropriate for the proposed project under AFI 32-7061, paragraph 3.3.

2. Please contact me at extension 3305 if you have any questions.

GEORGE J. KONOVAL, Capt, USAF
Chief, Environmental Law

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 436TH AIRLIFT WING (AMC)

9 December 2003

MEMORANDUM FOR 436 CES/CEV

FROM: 436 AW/JA

SUBJECT: Environmental Assessment for Construction of ~~a New Cryogenics Facility~~ 25 ft shoulders KS

1. I have reviewed your Environmental Assessment (EA) and Finding of No Significant Impact (FONSI) for the proposed construction of 25 ft shoulders on Runway 14/32. These documents appear to be in substantial compliance with the requirements of 32 CFR §989.14 and §989.15 as implemented by AFI 32-7061, paragraph 3.3 and 3.4. I have made only one minor correction to the FONSI.

2. RECOMMENDATION: I recommend that you publish the EA and FONSI incorporating the proposed change.

3. Please contact me at extension 3308 if you have any questions.

J. SHANE FLANNERY, Capt, USAF
Chief, Environmental Law

1st Ind, 436 AW/SJA

MEMORANDUM FOR 436 CES/CEV

Concur/~~Non-concur~~.

DONNA MARIE VERCHIO, ~~Lt Col, USAF~~
Staff Judge Advocate

STAFF SUMMARY SHEET

	TO	ACTION	SIGNATURE (Surname), GRADE AND DATE		TO	ACTION	SIGNATURE (Surname), GRADE AND DATE
1	AW/JA	Coord		6			
2	MSG/CD	Coord		7			
3	MSG/CC	Sign	Smiley Col (10)	8			
4	CES/CEV	Action		9			
5				10			

SURNAME OF ACTION OFFICER AND GRADE	SYMBOL	PHONE	TYPIST'S INITIALS	SUSPENSE DATE
Mikula, GS-13	CEV	4753	rb	

SUBJECT: Finding of No Significant Impact (FONSI) for the construction of 25 foot shoulders on Runway 14/32.

DATE: 3 Dec 03

SUMMARY

1. A FONSI with an environmental assessment (EA) for the construction of 25 foot shoulder on Runway 14/32 is enclosed at Tab 1. As indicated in the EA there are no significant environmental impacts from the proposed action.

2. RECOMMENDATION: MSG/CC sign the enclosed FONSI at Tab 1.

M. A. PERZA
Deputy Base Civil Engineer

2 Tabs
1. FONSI with an environmental assessment
2. Public Notice for Subject EA