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PRELIMINARY DRAFT ENVIRONMENTAL IMPACT STATEMENT

PEASE AIR FORCE BASE CLOSURE

Prepared by

UNITED STATES ARMY CORPS OF ENGINEERS
OMAHA DISTRICT

1989

FOR

UNITED STATES AIR FORCE

93

Air Force
Environmental Planning Division
(HQ USAF/CEVP)

Room 5B269
1260 Air Force Pentagon
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16 JUL 93

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PEASE AIR FORCE BASE CLOSURE
ENVIRONMENTAL IMPACT STATEMENT

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CHAPTER 1 DESCRIPTION OF AND NEED FOR PROPOSED ACTION

1.1 INTRODUCTION

A congressionally chartered Commission selected by the Secretary of Defense has proposed closing Pease Air Force Base (AFB), New Hampshire. This proposed action will involve the deactivation of the 509th Bombardment Wing, which presently consists of 21 FB-111 aircraft, 13 KC-135A tanker aircraft, and other operational and support units. The 132d Air Refueling Squadron of the Air National Guard (ANG) that is assigned to Pease AFB and consists of 10 KC-135E aircraft will not be deactivated. It will remain as a stand-alone tenant to the anticipated civilian operation of the airfield. Because of a previously programmed force structure action, the relocation of the 21 FB-111 bomber aircraft at Pease AFB is not considered as a part of the proposed action. The relocation of these aircraft has been assessed in a separate environmental impact document; the cumulative impacts of this action, however, are addressed in this Environmental Impact Statement (EIS).

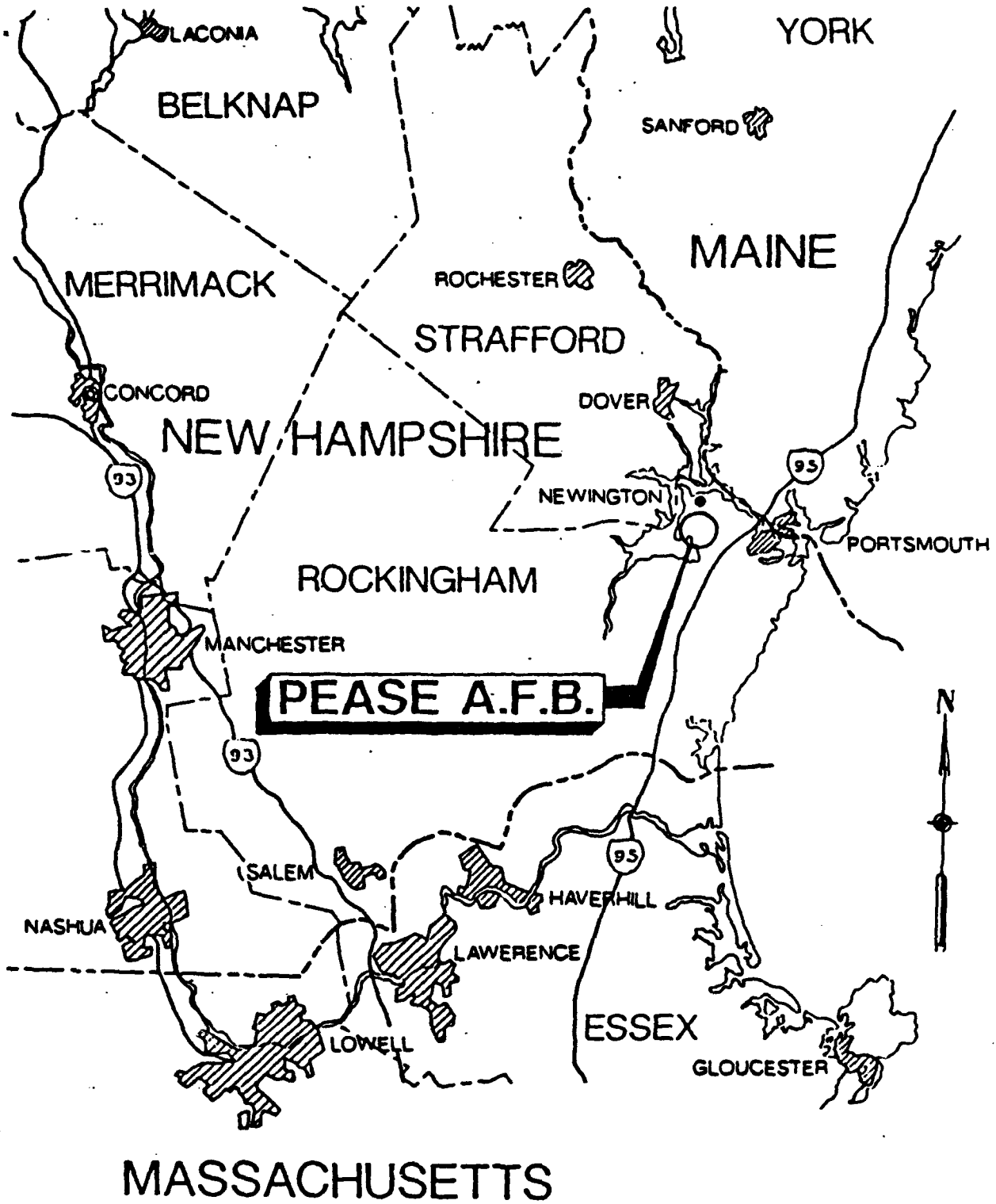
This EIS does not cover the final disposition of all the facilities or the 132d Air Refueling Squadron, which will have to be relocated if local authorities do not elect to operate the facilities as an airport. These actions will be addressed in a subsequent and separate EIS after further planning.

The Commission recommended Pease AFB for closure primarily because of the quality and number of available facilities. The base has a shortage of buildings for operational, training, and maintenance purposes. In addition, the military family housing is inadequate and requires upgrading. There are also deficiencies in the recreational facilities.

The Commission also determined that the military value of Pease AFB, is lower than that of other strategic bomber bases because of the base's low prelaunch survivability from submarine-launched ballistic missiles. The location of Pease AFB provides less warning time for launching aircraft during times of increased tension or international conflict.

1.2 LOCATION OF PROPOSED ACTION

Pease AFB is located in southeast New Hampshire, as shown in figure 1-1, and has become an established segment of the State's coastal commun-



LOCALE MAP

PEASE AFB CLOSURE EIS

Figure 1-1

ity. As shown in figure 1-2, it is bordered on the east by the city of Portsmouth and on the west by the town of Newington. Part of the base adjoins the Great Bay, a significant estuarine resource. Figure 1-3 illustrates general features of the installation itself.

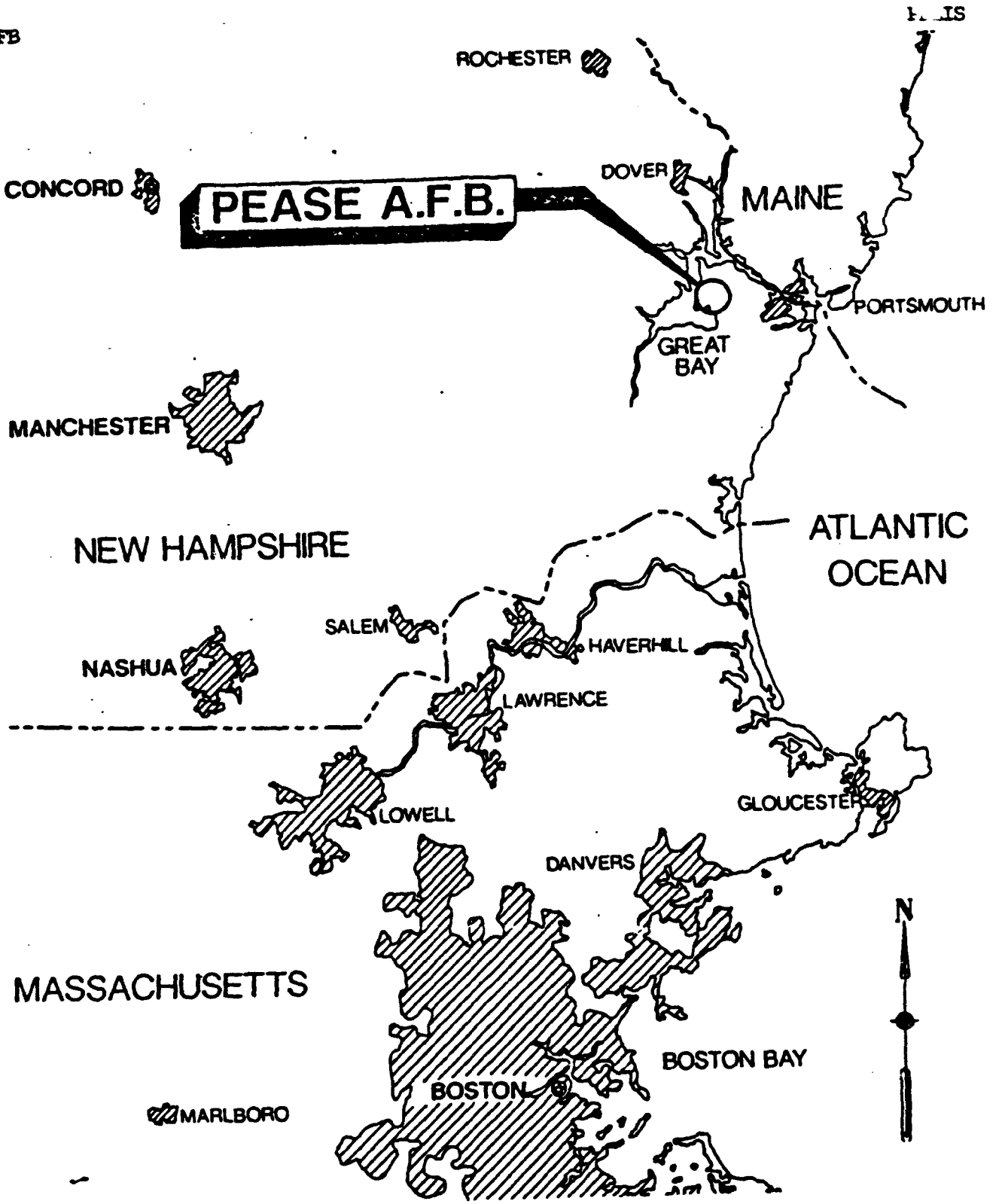
1.3 SCOPING PROCESS AND PREPLANNING ANALYSIS

The scoping process was initiated with the placement of a Notice of Intent to prepare an EIS for the proposed action in the Federal Register on 8 February 1989. The purposes of the scoping process are to publicly determine the scope of issues to be addressed and to identify significant issues related to the proposed action that will be analyzed in depth. The process is used to deemphasize insignificant issues and to narrow the scope of the EIS while identifying the range of impacts to be considered.

The notice invited public comment on both the closure of Pease AFB (for this EIS) and the final disposition of the facilities (for a future EIS). Comments on both actions were also solicited at three scoping meetings, which were held in Portsmouth on 15 February 1989, at Pease AFB on 16 February 1989, and in Newington on 28 March 1989. The comment period for the closure action was open until 11 April 1989.

The following concerns and issues regarding the closing of the base--not the disposal of the facilities--were identified during the scoping comment period. Concerns regarding closure included:

- The extent of ground water contamination and its movement off base;
- The status of current hazardous waste site cleanup and the impacts of closure on that level of cleanup;
- The quality of surface waters, their cleanup, and prevention of their pollution;
- The condition of the tank storage system and the prevention of pollution;
- The prevention of solid waste; asbestos; radiological water; and pesticide, herbicide, polychlorinated biphenyl (PCB), trichloroethane (TCE), and lead pollution;
- The habitat loss to fish and wildlife;

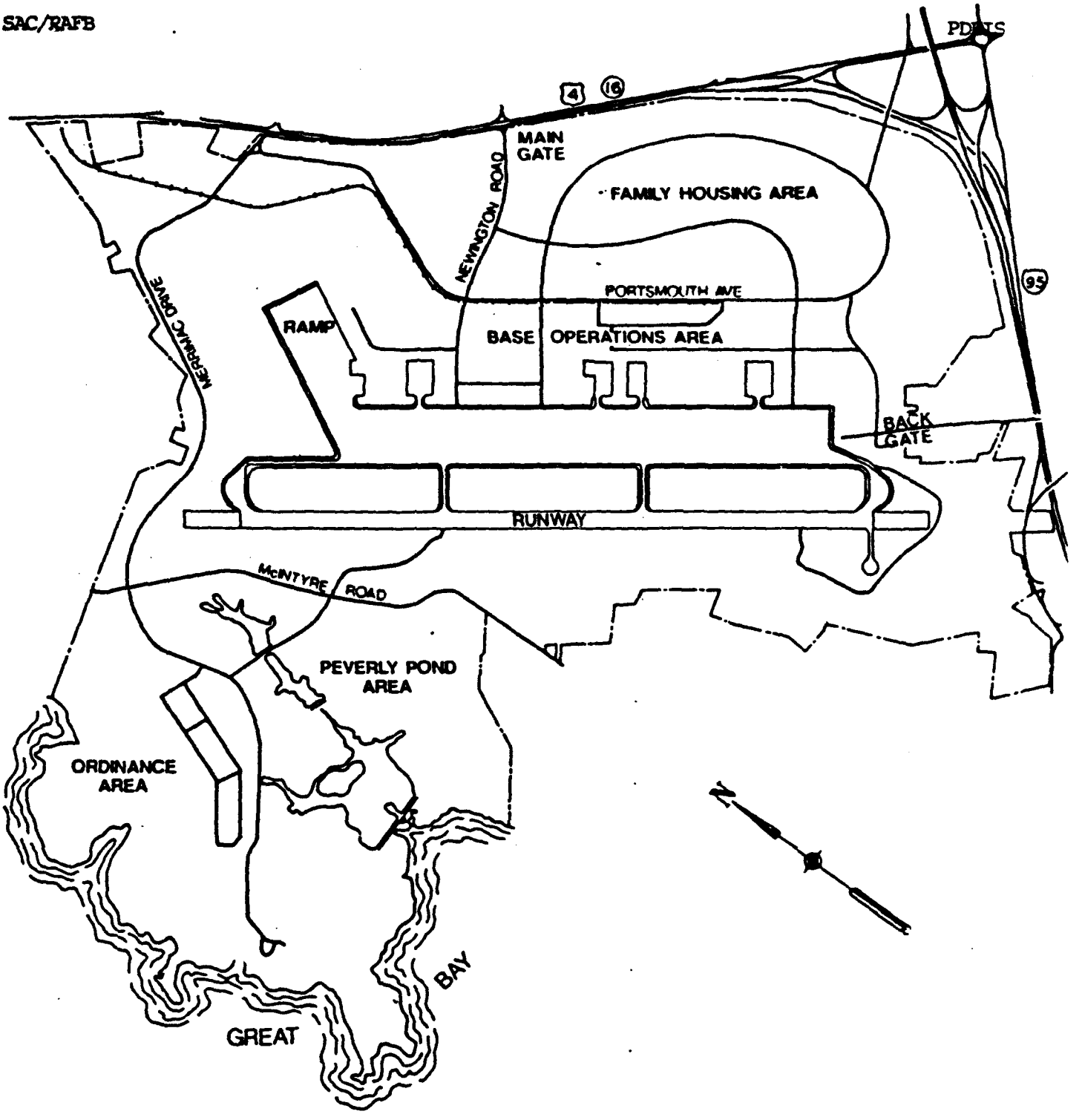


AREA MAP

PEASE AFB CLOSURE EIS

Figure 1-2

6/30/89



INSTALLATION MAP

PEASE AFB CLOSURE EIS

Figure 1-3

- The impacts on historic resources;
- Conformance with environmental statutes;
- The segmentation of action into a closure EIS and a subsequent disposal EIS;
- The loss of nearby medical and other facilities for retired military personnel;
- The loss to communities of an important source of part-time and secondary employees;
- The overall economic impact caused by loss of Federal employment and expenditures in the area;
- The impact on base recreational uses;
- The impact to the Portsmouth school system caused by the loss of students and their Federal impact aid;
- The impact on area housing and the rental market;
- The impact on the overall ability of the area to obtain Federal grants, aid, and assistance;
- The impact on the property tax base of local communities; and
- The impact on municipal services such as the loss of firefighting assistance in the seacoast region.

A list of the concerns and issues regarding impacts that will be caused by disposal of the facilities was also made from the public input received before 11 April 1989. The following list is presented in this EIS only for the purpose of documentation. The subsequent Pease AFB disposal EIS will address the following disposal concerns and issues:

- The impacts of hazardous waste sites on redevelopment of the base;
- The feasibility of the ground water and Peverly Brook to serve as a public water supply;
- The impacts to fish and wildlife habitat, especially endangered species, caused by reuse of the base;

- The preservation of significant natural areas;
- The historic resource impacts caused by reuse of the base;
- The air, water, soil, and noise pollution associated with reuse;
- The conformance of reuse with local land use plans and regulations;
- The consideration of the Federal Aviation Administration (FAA) as a cooperating agency in preparation of the EIS;
- The alternative reuse considerations should include a cargo airport, a passenger airport, or no airport at all;
- The consideration of constraints on reuse as a commercial airport, such as development costs, noise, competition, and future expansion;
- Market and other effects of disposal of over 1,200 housing units;
- The use of base housing to meet the homeless housing needs of nearby communities;
- The potential for recreational development;
- The cost and responsibility of bringing the base infrastructure up to a level necessary to facilitate reuse; and
- Consideration of the ownership of base schools by the city of Portsmouth.

1.4 RELEVANT FEDERAL, STATE, AND LOCAL STATUTES, REGULATIONS, OR GUIDELINES

Federal, State, and local statutes, regulations, or guidelines that are relevant to the proposed action are listed below. A brief discussion of the relevance of each follows:

1.4.1 General Environmental Policy

National Environmental Policy Act (NEPA). Public Law 91-190 requires that all Federal agencies prepare an environmental assessment and/or an EIS to ascertain the environmental effects of proposed Federal actions

that may significantly affect the environment. The Council on Environmental Quality (CEQ), created by this act, promulgated Regulations for Implementing the Procedural Provisions of NEPA. The CEQ Regulations were used in the preparation of this EIS.

Air Force Regulation 19-2. This regulation gives specific procedural requirements for Air Force implementation of NEPA. It was used together with the CEQ Regulations in the preparation of this EIS.

1.4.2 Land Use

Executive Order 12372 - Intergovernmental Review of Federal Programs. This order directs Federal agencies to make efforts to accommodate state and local elected officials' concerns regarding Federal development. It requires that agencies consult with and solicit comments from state and local officials whose jurisdictions would be affected by Federal action.

New Hampshire House Bill 750. This bill, which was passed by the State House of Representatives and by the State Senate, was signed into law by Governor Judd Gregg in March 1989. This bill established the Pease AFB Redevelopment Commission for the purpose of monitoring and studying the proposed closing of the base. The Commission is also charged with the responsibility of developing a reuse plan for the facility.

1.4.3 Public Health and Safety

Executive Order 12088 - Federal Compliance With Pollution Control Standards. This order directs that Federal agencies consult with state and local agencies concerning the best techniques and methods available for the prevention, control, and abatement of environmental pollution. A Federal agency must comply with state and local laws and rules concerning air pollution, water pollution, hazardous materials, and hazardous substances. This compliance must be accomplished to the same extent as for any private party.

Resource Conservation and Recovery Act. This act contains provisions for the safe treatment and disposal of wastes and is the basic law for regulation of hazardous waste management practices. Under this act, the Environmental Protection Agency (EPA) defines which wastes are hazardous and sets standards for treatment, storage, and disposal. The act also specifies regulation of underground storage tanks.

State Radioactive Waste Disposal Regulations. These regulations prescribe methods for proper disposal of radioactive material.

State Records Involving Radioactive Material Regulations. These regulations prescribe that discontinuance or curtailment of activities does not relieve the licensee from retaining records, unless the State accepts the records at the licensee's request.

State Disposal of Pesticide and Pesticide Containers Regulations. These regulations prescribe methods for proper disposal of pesticides and pesticide containers.

State Underground Storage Tanks Closure and Reuse Regulations. These regulations prescribe standards applicable to the closure and reuse of underground storage tank facilities.

1.4.4 Air Quality

Clean Air Act. This act legislates that air quality standards set by Federal, state, and county regulatory agencies establish maximum allowable emission rates and pollutant concentrations for sources of air pollution on Federal and private property. Also regulated under this law is the proper removal and safe disposal of asbestos from buildings other than schools.

State Permit Regulations For The Operation Of Sources Of Air Pollution. These regulations require written consent for the transfer of permits.

1.4.5 Noise

Noise Control Act. This act establishes the policy to promote an environment free from noise harmful to health or welfare. Under this act, EPA developed noise criteria for the public health effects of different types and amounts of noise.

1.4.6 Water Quality

Clean Water Act. Under this act, EPA was required to establish Federal limits on the amount of specific pollutants that could be released by municipal and industrial facilities. These limitations are written into permits issued to all dischargers.

State Surface Water Quality Standards Regulations. These regulations establish three classes of surface waters. Each class is assigned certain uses and water quality standards.

Safe Drinking Water Act. This act establishes the amount of concentrated contaminants allowable in public drinking water.

State Protection of Groundwaters Regulations. These regulations prohibit the degradation of ground water beyond the owner's property.

State Drinking Water Quality Regulations. These regulations list maximum contaminant levels for chemicals that are in the public water systems.

1.4.7 Biological Resources

Endangered Species Act. This act requires Federal agencies to determine the effects of their actions on endangered species and their critical habitats.

Fish and Wildlife Coordination Act. This act requires consultation with the U.S. Fish and Wildlife Service to consider fish and wildlife resources in determining agency actions.

State Endangered and Threatened Species Regulations. These regulations prohibit harming any listed species which may occur in the area.

1.4.8 Cultural Resources

National Historic Preservation Act. This act outlines agency responsibilities involving substantial alteration or demolition of historic properties. It affords the Advisory Council on Historic Preservation an opportunity to comment and requires consultation with the State Historic Preservation Officer.

CHAPTER 2 ALTERNATIVES CONSIDERED INCLUDING THE PROPOSED ACTION

2.1 INTRODUCTION

No alternatives to closure of Pease AFB exist as a result of the legislation associated with the proposed action. The Base Closure Act, Public Law 100-526, specifically states that the Secretary of Defense in applying the provisions of NEPA shall not have to consider the need for closing, the need for transferring functions to another military installation, or alternative military installations to those selected.

2.2 DETAILED DESCRIPTION OF PROPOSED ACTION

The proposed action will involve the deactivation of the 509th Bombardment Wing, 509th Air Refueling Squadron consisting of 13 KC-135A tanker aircraft, and other operational and support units. The KC-135 squadron will be relocated to five bases in the last half of Fiscal Year 1990: two aircraft to Carswell AFB, Texas; one aircraft to Eaker AFB, Arizona; six aircraft to Fairchild AFB, Washington; two aircraft to Plattsburgh AFB, New York; and two aircraft to Wurtsmith AFB, Michigan.

The redistribution of the KC-135 squadron and other operational and support units will involve 1,788 military personnel and 325 civilians. The redistribution of personnel will occur as outlined in table 2-1. At the end of the fourth quarter of Fiscal Year 1994, a base operating support of 50 civilian employees will remain.

Table 2-1
Timing of Redistribution of Personnel

Fiscal Year	Fiscal Quarter	Military	Civilian
1991	1st	930	192
1991	2nd/3rd	279	33
1991 thru 1994	4th	579	100
Totals		1,788	325

The 509th Bombardment Wing will be inactivated on 30 September 1990. On 1 October 1990, the 509th Combat Support Group (CSG) will become the host unit to complete the base closure plan. The 509th Strategic Hospital will be inactivated on 31 March 1991. Effective 30 June 1991, the 509th CSG inactivates and a detachment from Plattsburgh AFB, New York, will

activate and maintain Air Force property until disposed of by the General Services Administration.

The 3911th Air Base Squadron will be activated 1 October 1990 and assume caretaker responsibility. This squadron will remain at Pease AFB to provide for the care and custody of all excess real and related personal property until transfer or disposal actions by the General Services Administration are completed. During caretaker status, a safety monitor who will report any mishaps will be designated.

The 132nd Air Refueling Squadron of the Air National Guard (ANG) will remain at Pease AFB as a stand alone tenant to the anticipated civilian operation of the airfield. The current strength of the ANG unit of 267 military and 4 State employee positions will be increased to 325 military and 12 State employee positions during the conversion to a stand alone unit.

As a result of the Pease AFB closure, approximately 4,300 acres of Federal property will be available for disposal, less the property required to support the ANG unit within its cantonment area. Operation and maintenance of the physical plant will continue to some degree until all occupants have left and the properties have been completely transferred. Support to the ANG will continue for its operational needs during the potential transition. The unit will continue its existing flying mission with its 10 KC-135E aircraft. The ANG will require additional military construction, operations and maintenance, fire protection, equipment, and personnel resources. It will also require Buildings 16, 144, 145, 245, 249, 251, and 259. Building 21 will be released for disposal.

Activities for the purpose of environmental restoration, including reducing, removing, and recycling hazardous wastes and removing unsafe buildings and debris may be carried out in closing the installation. These activities will be subject to the availability of funds authorized for and appropriated to the Department of Defense (DOD), and the actual availability of these funds in the base closure account. The DOD has not yet finalized formal rules to access the account for funds in Fiscal Years 1990 and 1991.

The Bioenvironmental Engineering staff necessary to ensure that regulatory requirements are met for any asbestos removal or contaminant cleanup prior to complete turnover will be maintained. All permitted radioactive materials will be submitted in accordance with Air Force regulations. The Strategic Air Command retains responsibility and will continue cleanup and monitoring actions of the current Installation

Restoration Program (IRP), an environmental contamination control program, at Pease AFB until completed and all sites are cleared or neutralized. All IRP decision documents will be coordinated with the regulatory community.

Economic adjustment assistance to communities located near Pease AFB has been initiated by the Office of Economic Adjustment (OEA). Economic adjustment is a process by which organization, planning, and resources are joined to maintain or restore community stability. In the Pease AFB area, initial organization for planning purposes has occurred. The Pease AFB Redevelopment Commission was established and funded by the New Hampshire legislature during its 1989 session expressly to monitor and study base closure and to formulate a comprehensive plan for conversion and redevelopment of the base. The OEA will coordinate with this commission in providing economic adjustment assistance to the area. However, such assistance will be subject to the availability of funds in the base closure account.

2.2.1 Minor Construction Activities

Several minor construction activities will occur regarding the transition of the ANG unit into a stand alone unit. Two existing masonry buildings in the cantonment area will be altered with interior partitions into an alert crew facility and communications facility for the unit's KC-135E alert mission. An electronic security system and perimeter fencing of the cantonment area will be installed. A masonry gate house will be constructed. Aircraft ramp lighting for the alert aircraft parking area will be upgraded. Another building within the cantonment area will be altered with interior partitions into a dining hall. These construction activities are estimated to cost $3,580,000.

An existing JP-7 bulk jet fuel storage tank within the cantonment area will also be altered with environmental controls, new transfer piping, hydrant system connection, truck fill stand, pump house, pavement, and fencing. This alteration is required to support the flying and training operations of the ANG unit and is estimated to cost $1,600,000.

CHAPTER 3 AFFECTED ENVIRONMENT

3.1 INTRODUCTION

This chapter succinctly describes the environment of the area to be affected by closure of Pease AFB. Only specific and relevant subjects are discussed. The depth of presentation is relative to the importance of the issue or impact, and not availability of information. The subsequent sections are within a framework of general topic areas, with only those environmental attributes which will be potentially affected by closure addressed.

Within the general topic area of hazardous materials and solid wastes, a discussion of the following potential sources of soil pollution have been included: base tank storage system and its condition, hazardous waste storage, pesticide and herbicide usage, radioactive materials, lead-based paints, asbestos, and solid wastes. The section is concluded with a discussion of the status of the the Installation Restoration Program being conducted at Pease AFB. This program is for the purpose of assessing and controlling environmental contamination.

Water supply and treatment are discussed within the general topic area of ground water. The surface waters discussion also discusses wastewaters.

3.2 GENERAL DESCRIPTION OF THE INSTALLATION AREA

3.2.1. Topography

The topography of Pease AFB is gently rolling coastal terrain. The prevalent feature is a ridge extending in a northwest direction on which the runway is located. The ridge is 60 to 100 feet in elevation and approximately one-half mile wide. The base has a total area of 4,250 acres, with over one-half of the lands in a forested condition.

3.2.2. Climate

The climate of the New Hampshire seacoast area is moderate, with four distinct seasons. Temperature extremes average from a high of 95 degrees F. to a low of -4 degrees F., with an average mean temperature of 50 degrees F. There are an average of 185 frost-free days from April to October. Average rainfall is 50 inches and average annual snowfall is 62 inches.

3.3 SOILS

Pease AFB is predominantly underlain by glacial till, marine clays, and kame plain deposits having a wide range of water-bearing potential. These deposits are underlain by metasedimentary bedrock moderately to highly fractured in the upper zones. The permeable kame plain deposits and the upper fractured zones of bedrock are the two principal receptors and migration pathways at sites where contamination is found.

Much of the soils on the base are glacial till on the higher elevations and an intermixture of glacial outwash and marine soils on the lower elevations. In places there is a gradual transition from gravelly sands to impermeable clay. There are also several areas of poorly drained wetland soils. A soil map of the base was evaluated in 1984 by the Soil Conservation Service to determine the base acres of prime farmland. The evaluation determined there are 208 acres of prime farmland soils, with most of them wooded and unavailable for farming. They are located in the Peverly Pond area.

The prime farmland soils are Charlton loam or Melrose fine sand loam soils. Charlton soils consist of deep, well-drained soils on uplands. Typically these soils have a dark brown fine sandy loam surface layer 6 inches thick. The subsoil is from 6 to 26 inches thick and is a lighter fine sandy loam. The substratum is from 26 to 60 inches thick and is a gravelly fine sandy loam. The Melrose soils are also a fine sandy loam soil.

3.4 HAZARDOUS MATERIALS AND SOLID WASTES

3.4.1. Underground and Aboveground Tank Storage

Records exist on 155 underground storage tanks that are used or have been used at Pease AFB. Tank sizes range from 250 to 50,000 gallons. Tank ages range from 1 to 33 years with 109 tanks in the 30-33 age bracket, 21 tanks in the 11-29 age bracket, and 25 tanks in the 1-10 age bracket. Related tank piping systems are the same age as the tank and of the same material.

Most tanks are steel and are used for storing jet fuel, fuel oil, diesel fuel, gasoline, deicing fluid, and used oil. Of the steel tanks, 85 are currently in use, 20 are empty, 6 have been filled with sand, 5 have been removed, and 22 have been treated with a caustic solution that enables quick dewatering and placement back into service.

Fifteen recorded tanks are fiber reinforced plastic and are all in use storing mostly gasoline, but also diesel fuel, jet fuel, and waste jet fuel. Two recorded tanks are concrete and were used to store waste TCE. One has been removed and the other has been filled with sand, but will be removed this year.

Underground tank removal, overfill protection, and other work scheduled to be performed prior to and during closure are identified in table 3.4.1-1. Two of the tanks listed in the table store used oil, three store jet fuel, and the remainder store fuel oil, diesel oil, or gasoline. This proposed work is subject to State of New Hampshire approval and appropriate funding.

Table 3.4.1-1
Planned Underground Storage Tank Work

Fiscal Year	Number of Tanks	Work To Be Performed
1989	13	Remove
1990	7	Replace above ground
1990	22	Install overfill protection
1990	94	Internal and subsurface monitoring
1991	22	Remove

A bulk fuel storage area exists on base which contains three large aboveground tanks used to store jet fuel. Tank 1 contains JP-7 fuel and is fully epoxy coated. Tanks 2 and 3 contain JP-4 fuel. Tank 2 is to be inspected in the near future. Tank 3 was inspected in September, 1988 and its floor was found to contain numerous pits to within 1/16 inch of penetrating the floor. These pits were temporarily patched with an epoxy compound. The floor was also found to be buckled in many areas due to the perimeter of the tank settling into the ground. Both Tanks 2 and 3 are considered to be in need of major repairs; namely, floor replacement and concrete ring wall construction. Throughout its history, a number of fuel spills have occurred at the bulk fuel storage area.

Spills occur elsewhere on base also. In 1983, for example, 277 spills occurred. The majority of all fuel spills occurred on the flightline parking apron and involved less than 5 gallons of fuel. The environmental impact of all 277 spills was considered insignificant due to quick cleanup responses.

3.4.2 Hazardous Materials and Hazardous Wastes Storage

Hazardous materials are stored throughout the industrial area of Pease AFB. A listing of hazardous wastes that have been stored in several buildings on base is presented in table 3.4.2-1. Included in the listing

Table 3.4.2-1
Hazardous Wastes That Have Been Stored at Pease AFB

Building	Hazardous Waste
5	Aminopyridine
6	Developer, Solvent
70	Jet fuel absorption pillows
86	Mercury
93	Trichlorethene, Phenol USP acid, Benzoin tincture, Solvents, Formaldehyde, Sodium azide, Mercury, Ethylene oxide
119	Carbon remover, Seduum hydroxide waste
120	Developer, Paint, Paint Thinner
122	Paint, Waste oil, Methylene chloride, Primer adhesive, Sulfuric acid
122-1	Sealants, Adhesives, Trichlorethane, Dichloromethane, Dye
122-2	Paint waste
130	Thinner paint, Waste thinner
141	Diazinon, Chlordane
149	Lithium battery, Ethylene oxide aerosol, Waste diesel fuel, Waste paint lead, Paint oil base, Cleaner, Lubricant, 2,4-Dichlorophendxyacetic
151	Contaminated soil and debris, PCB transformers, Rodenticide bait, Usei oil and solvent, Paint remover
160	Jet fuel sludge/water
214	PCB debris, Joint sealer
226	Methyl ethyl ketone, Paint remover
227	Waste cadmium
251	Isopropyl alcohol
253	Ammcitra
259	Paint aerosol, Leak detection aerosol
262	Paints, Paint remover, sealants
266	Methyl ethyl ketone spill residue
466	Xylene, Toluene, Paint Thinner

Table 3.4.2-1 (Cont'd)
Hazardous Wastes That Have Been Stored at Pease AFB

Building	Hazardous Waste
PB122	Solvents, Batteries, Sealants, Paints, Grease, Lubricants, Adhesives, Waste mercury
PH#3	Waste jet fuel sludge
CESST	Jet fuel sludge water, alodine/eoxidine, sulfuric acid
DEMUE	PCB transformers

are the buildings that were used for storage. Most of these wastes have been disposed of and had been assigned an EPA waste code. The current main hazardous materials storage facility is building 122. Some hazardous wastes are occasionally located on barren soil, upgradient from storm drains, or in close proximity of floor drains. The current PCB storage area, Pumphouse 2, does not meet EPA standards in that there is no secondary containment.

The disposal of hazardous wastes is through waste brokers. The ultimate disposition of the wastes, and their proper management, are not known.

3.4.3 Pesticide and Herbicide Usage

The use of chemical toxicants for the control of nuisance wildlife species on Pease AFB has been, since at least 1984, in accordance with Federal and State laws and regulations. Pesticides are occasionally used to control mosquitoes, cockroaches, blow flies, wasps, bees, ants, fleas, and rats. The pesticides recently used were diazinon, abate, ectiban, baygon, malathion, onatorgin, and organophosphates. Most usage has been less than 10 pounds per application.

Herbicides are infrequently used. Fungicides have been used on the golf course. In the past, some have been mixed and rinsed from application machinery over a storm drain. However, no Federal or State pesticide or herbicide regulatory limits have been found to be exceeded in any ground water or surface water.

3.4.4 Radioactive Materials

Currently there are two sources of permitted radioactive material on Pease AFB. These sources are governed by an Air Force Radioisotope Com-

mittee permit. One source maintains a supply of Cesium-137 and Plutonium-239 for calibration of radiac equipment. The other source contains 400 millicury tritium for use as light sources in an FB-111 flight simulator. The simulator is currently undergoing modification which will delete the need for the tritium.

Other sources of radioactive material, not under permit, exist on base. These sources include radioactive luminous dial watches and compasses, and luminous dials on aircraft in the air park.

3.4.5 Lead-based Paints

Lead-based paints are still being utilized on base for aircraft and vehicle painting. The percentage of lead content in most paints used is less than 10 percent.

It is highly likely that lead-based paint has been used in many of the buildings on Pease AFB because of their age and the number of coats of paint. Actual surveys for lead content in paint were conducted in the base housing in the early 1980s. These surveys found that a majority of the housing contained lead-based paint.

3.4.6 Asbestos

A building survey for asbestos is currently ongoing. To date, approximately 25 percent of the base buildings have been surveyed. In dormitories surveyed, asbestos occurs in wall board and floor tile. In other buildings surveyed the majority of the asbestos occurs in wall board and floor tile; but it also occurs in smaller quantities in pipe insulation, ceiling tile, wall tile, air cells, fume hoods, soffits, and siding. All of the buildings surveyed and found to contain asbestos were constructed in the 1955-57 time period, except for the bowling alley which was constructed in 1962.

Asbestos has been removed from all or parts of several buildings including the nursery school, officer's club, NCO club, people center, education center, chapel 2, and several dormitories. Pipe insulation containing asbestos in the mechanical rooms of 51 buildings has also been removed.

3.4.7 Solid Wastes Disposal

Solid waste material other than hazardous materials, liquid industrial waste, white goods, and tree stumps is generated on base in a

quantity of approximately 362 tons per month. It is disposed of through various service contracts. Approximately 332 tons per month are disposed of at the Maine Energy Recovery Company incinerator in Biddeford, Maine. Approximately 30 tons per month are disposed of at various landfills in the local area.

Medical wastes are generated on base in a quantity of approximately 215 pounds per day. They are disposed of by incineration.

Sludge created by the base wastewater treatment plant has been placed, since 1987, in an area behind the firing range building B146, mixed with other organic material such as wood chips and leaves, and then used as loam material where needed on base. From 1982 to 1987, the sludge was burned in the Refuse to Energy Plant operated by the city of Portsmouth. Prior to that it was placed behind buildings B96 or B146 or mixed with loam and spread throughout the industrial area or used on tees and greens on the base golf course.

Sludge created by base oil/water separators are considered hazardous wastes and are disposed of accordingly.

3.4.8 Installation Restoration Program

In 1976, the Department of Defense (DOD) devised a comprehensive Installation Restoration Program (IRP) for the purpose of assessing and controlling migration of environmental contamination that may have resulted from past operations and disposal practices on DOD facilities. This action was in response to the Resource Conservation and Recovery Act of 1976 (RCRA) and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or Superfund).

The IRP was developed as a four-phase program as follows:

Phase I - Problem Identification/Records Search
Phase II - Problem Confirmation and Quantification
Phase III - Technology Base Development
Phase IV - Corrective Action

The objectives of Phase I are to identify and, on the basis of oral and available written information, assess past disposal sites. The assessment considers whether or not each site may pose a hazard to human health or the environment as a result of direct contact, contaminant migration, or contaminant persistence. Phase I was conducted at Pease AFB in 1983. Eighteen sites were identified and 16 were recommended for Phase II. A PCB spill site and a munitions residual burial site were not recom-

mended for further study because cleanup of contamination at the PCB spill site had already been accomplished, and only inert materials were reportedly disposed of at the munitions site.

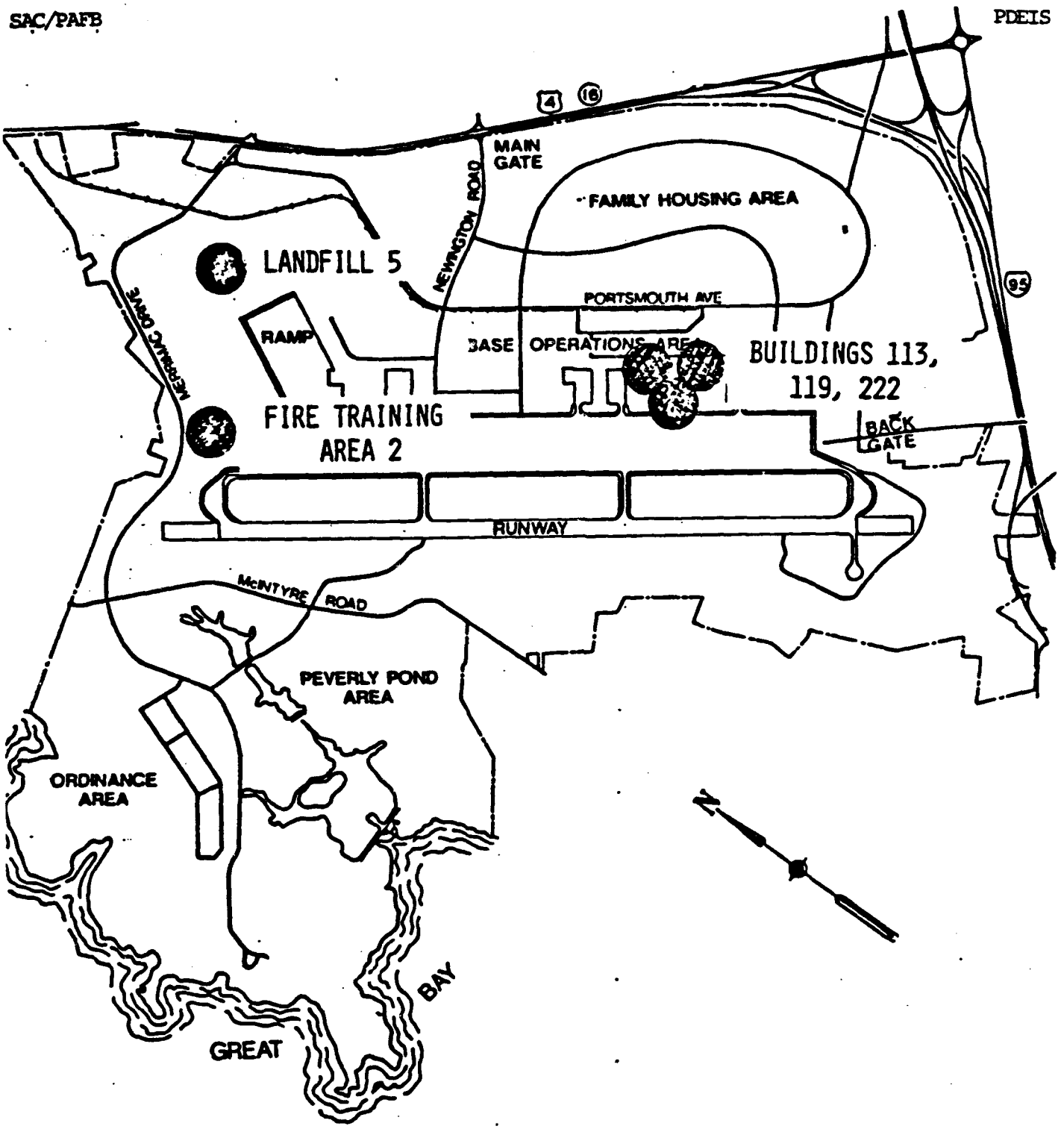
The objectives of Phase II are to investigate the most likely pathways for contamination from a site and to confirm the presence or absence of contamination along those pathways. If contamination is confirmed, the magnitude and extent of it is explored. The results are then quantitatively evaluated.

Phase II was initiated at Pease AFB in 1984. As this phase got underway, four additional sites were added to the study for a total of 20 sites. In 1987, it was concluded that 7 of the sites required no further action, including remedial action; and 13 of the sites required additional investigation to quantify or further assess the extent of current or future contamination. From these additional investigations, it was concluded in May 1989 that five sites potentially represent a threat to human health and/or the environment and require fast-tracked remedial action. The five sites are listed and described in table 3.4.7-1. Their locations are shown in figure 3-1.

Landfill 5 is 23 acres in size. Test pits excavated at the site encountered from 1 to 10 feet of refuse. Buried drums mixed with construction rubble are present in an area of up to 1 acre.

Table 3.4.7-1
IRP Threatening Contaminated Sites

Site Location	Site Description
Landfill 5	Former municipal-type landfill containing some construction and industrial-type wastes
Fire Department Training Area 2	Current fire training area
Building 222	Spill area associated with jet engine test cell
Building 113	Former waste TCE storage tank site
Building 119	Drum storage and spill area associated with jet engine maintenance



INSTALLATION MAP

PEASE AFB CLOSURE EIS

FIGURE 3-1. Contaminated Sites

Ground water beneath the landfill occurs primarily in bedrock at shallow depths, and secondarily within the overburden materials and refuse. Arsenic and benzene have been found in this ground water to exceed the EPA maximum contaminant level (MCL). Monitor wells have identified three contaminant plumes. Drum removal has been identified as an interim remedial measure.

The fire training area is 10 acres in size. It was used until 1971 for the disposal of waste fuels, oils, and solvents. Since 1971, JP-4 jet fuel has been used in the area for fire training exercises. Use of the area has been temporarily discontinued. Bedrock beneath the site ranges between 0 and greater than 40 feet and indications are that the bedrock may be a significant groundwater flow unit. Arsenic, iron, manganese, TCE, trans-1,2-dichloroehtene, benzene, toluene, xylenes, 1,4-dichlorobenzene, phenols, and lindane have been found in the ground water to exceed the EPA MCL. Contaminat plumes have been detected, and it is likely that they migrate north toward, and possibly across, the base boundary. Because downgradient monitoring points are limited, the extent of the plumes in both bedrock and overburden have not been determined. Interim remedial measures include ground water extraction, treatment, and recharge and contaminated drainage ditch sediment/soil removal for off-site disposal.

Building 222 is a Jet Engine Test Cell. The area of concern is the drainage ditch east of the building. Petroleum hydrocarbons were detected in soil samples that exceeded background concentrations. Ground water was encountered at the site at depths from 2 feet to 9 feet. Benzene, ethylbenzene, xylenes, napthalene, 2-methylnaphthalene, and total petroleum hydrocarbons have been found in the ground water to exceed the EPA MCL. A contaminant plume has been identified in bedrock. Further investigations of the extent of contamination have been determined necessary.

Building 113 is the Munitions Maintenance Squadron building. The area of concern is the former underground waste TCE storage tank area next to the building. Nearby is Building 119, the Jet Engine Maintenance Building. The soil in the drum storage area behind the building is visibly stained. It has been reported the TCE-contaminated wastewater was piped in the past to the former industrial wastewater treatment plant and that a spill may also have occurred from a line break somewhere between. Waste is now drummed and stored behind the building to await contractor removal. Bedrock beneath the area ranges from 23 to 45 feet in depth. TCE and vinyl chloride have been found in the ground water to exceed the EPA MCL. Contaminant plumes of TCE and vinyl chloride have been interpreted to occur in the vicinity.

Much more detailed discussions of the five threatening sites can be found in the May 1989 publication by Roy F. Weston, Inc. prepared for the USAF Strategic Air Command entitled "Installation Restoration Program, Phase II - Confirmation/Quantification, Stage 3 Work Plan for Pease AFB, New Hampshire." Still further detailed information can be found in the references cited in that document, all of which can be reviewed at Pease AFB.

The current status of the IRP at Pease is the implementation of further investigations of the five threatening sites. These further studies will include implementation of interim remedial measures, evaluation of the extent of off-site contamination, human health risk and environmental impact assessments, and development of alternatives for long-term remediation. This Phase II, Stage 3 work is proposed to be completed by May 1991.

3.5 AIR QUALITY

The largest air pollutant source for the base is KC-135 and FB-111 aircraft flying operations accounting for 13 percent of the particulates, 38 percent of the suffer oxides, 63 percent of the carbon monoxide, 2β percent of the nitrogen oxides, and 62 percent of the hydrocarbons emitted on base. Motor vehicles on the base are also a significant source of carbon monoxide emissions.

Reasonable estimates of annual mass emissions of pollutants generated from the base were calculated using 1987 data. The results of these calculations are presented in table 3.5-1. The calculations were made by multiplying a usage factor, such as the amount of fuel consumed, by appropriate emission factors. Emission factors were obtained from the Air Force OEHL Report, Manual Calculation Methods for Air Pollution. These results cannot be directly correlated to health standards, as they do not involve any actual air quality measurements or modeling.

Table 3.5-1
Annual Mass Emissions of Air Pollutants
(Tons)

Pollution Source	Particulates	Sulfur Oxides	Carbon Monoxide	Hydro-carbons	Nitrogen Oxides
Fire Fighting	6	--	27	15	--
Heating Oil	5	5	16	6	74
Surface Coating	-	--	--	51	--
AGE	8	1	48	8	107
Fuel Evaporation	-	--	--	96	--
Aircraft Opns	21	21	888	694	127
Motor Vehicles	5	2	195	33	30
	45	29	1,174	903	338

Devices on Pease AFB that are governed by a permit from the State of New Hampshire Air Resources Commission are two combustion central heat plant boiler units, and two jet fuel storage tanks. There have been no past malfunctions with these devices which resulted in emissions greater than those stipulated in the permits. The base has also been permitted in the past to destroy, by open burning, outdated explosives on a twice per month basis.

3.6 GROUND WATERS

Ground water typically occurs 5 to 25 feet below ground surface on Pease AFB. The principal overburden aquifers on the base are the Upper Sand and Lower Sand deposits, which merge in the center of the base under the flightline to form a 40- to 60-foot thick section of saturated, permeable sand. This is the aquifer supplying the principal base supply wells. In general, there is thought to be some degree of hydraulic connection between units and all are susceptible to water quality impacts from contamination originating on or near ground surface.

The water supply for Pease AFB is supplied by three major wells located on base: Haven, Smith, and Harrison; and three smaller wells which service remote sites. The main wells have pumping capacities of 740, 420, and 225 gallons per minute. There is no surface supply avail-

able. The well system was in existence when the base was built, as it served the City of Portsmouth. Demand currently runs one-third of the supply.

The water treatment plant is designed for chlorination and fluorination, and also for trichloroethylene (TCE) treatment through aeration and carbon filtration. In 1977, TCE was detected in the three main wells. The highest level was 391 parts per billion (ppb) in Haven well. During the next year, the two wells with the highest concentrations were temporarily shut down until the level of TCE was consistently lower than 280 ppb as limited by the Surgeon General. In 1983, the highest level of TCE found in the three main wells was 10 ppb at Haven well.

During the beginning of Phase II of the IRP, TCE was found on two occasions in the Haven well at levels of 3.5 and 7.2 micrograms/liter (ug/l). These levels are below the New Hampshire MCL of 75 ug/l, but the higher level exceeded the EPA proposed MCL of 5 ug/l. The declining trend in TCE concentrations indicate that the contamination problem has been lessened by natural processes or by cessation of the contributing sources. Existing TCE levels in the base water supply are considered to be such that TCE treatment is not required. It is noted that as presently constructed, however, the carbon column portion of the facility does not function properly.

Phenols and selected metals have been found to exceed EPA maximum concentration levels at localized ground water sampling locations. Iron is commonly and naturally present in the surface and ground waters, and has been detected in excess of the 0.3 mg/l New Hampshire Drinking Water Standard in 17 ground water monitoring well samples. The standard is based on aesthetic values. Arsenic has been detected in excess of the State standard in 3 monitoring wells.

All required lead sampling of the raw water sources has been below the detection limit. The base drinking water supply system consists of copper piping; however, there is potential for lead to be present in the drinking water because of the lead content of solder used in the piping system and the age of the piping system. Some water fountains on base may have been manufactured by companies that used lead-lined tanks in the coolers. High use fountains were specifically tested in the past and found to have no detectable levels.

3.7 SURFACE WATERS

Pease AFB lies within the Piscataqua River basin. The river drains over 1,000 square miles of southern Maine and southeastern New Hampshire.

The river is a 13-mile tidal bay and discharges to the Atlantic Ocean. Great and Little Bays, located west and north of the base, comprise a tidal estuary and cover 10 square miles.

Surface drainage from the base is radial. Stormwater runoff is collected in an extensive system of catch basins and is directed through subsurface drains to various receiving streams and ditches which ultimately discharge to either Little Bay, Great Bay, or the Piscataqua River.

Flagstone Brook flows in a northerly direction from the north end of the aircraft parking apron at the confluence of two storm drains. It continues north, beneath Merrimac road, through a series of oil/water separators, and eventually discharges into Little Bay. Pauls Brook drains the bulk fuel storage area and flows northeasterly to discharge into the Piscataqua River.

Hodgson Brook drains much of the eastern portion of the base and flows southeasterly, beneath Interstate 95 and discharges to the Piscataqua River via North Mill Pond in Portsmouth. Newfields Ditch, which is culverted through part of its length, receives overland flow as well as storm runoff from numerous drains in the industrial shop area and through the base housing area. It flows to the east and joins Hodgson Brook just outside the base boundary. Grafton Ditch receives storm runoff from the southeastern section of the industrial shop and housing areas. It flows toward the southeast and also joins Hodgson Brook just outside the base boundary.

McIntyre Brook receives runoff from most of the runway and aircraft parking apron areas. A portion of the runoff is routed through an oil/water separator before flowing into McIntyre Brook. The brook exits the base to the west and flows to Great Bay.

Peverly Brook receives runoff from 0.1 miles of wooded area. Water level in Bass Pond, located on the lowermost reach of both Peverly Brook and an adjacent unnamed brook, is maintained predominantly from the outlet of Lower Peverly Pond, although springs and surface runoff from the Ordnance Area contribute to some extent.

3.7.1 Wastewaters

The Pease AFB wastewater treatment plant for base sanitary and industrial wastewaters is a secondary treatment facility which utilizes two high rate trickling filters to treat a design flow of 1.2 million gallons per day. The effluent from the plant is discharged into the Piscataqua River, which is a Class B receiving water according to the New

Hampshire Water Supply and Pollution Control Commission classification system. Problems have occurred in the past in meeting effluent guidelines during heavy rains, at which time excess flow was directly bypassed into the river.

Drainage from the flightline passes through an open air oil separator before leaving the base. Six fuel/oil separators are located at industrial facilities. A series of weirs has been installed in the four base streams to aid in any spill cleanup. The streams discharge into the Great Bay or the Piscataqua River. The quality of these discharges is controlled by permits, which limit the amount of oils, greases, and surfactants.

New Hampshire classifies its surface waterways according to potential uses based on water quality. The tidal areas of the Piscataqua River and the Bays and the streams feeding them are classified as Class B, meaning they are suitable for bathing, recreation, fish habitat, and public water supply after adequate treatment. Discharge of untreated sewage or wastes to Class B waters is prohibited.

Water quality in the tributary rivers feeding the Great Bay has reportedly been degraded due to ongoing industrial and municipal discharges upstream from the area of Pease AFB, and, in general, does not meet requirements for Class B. Water in the tidal reaches is brackish and is, therefore, not considered as potable water supply. However, estuaries are highly productive areas for development of aquatic communities, and food chains in these communities are potentially sensitive to man-made contaminants.

There has been no known base attributed contaminants that would cause contamination of human food sources in Great Bay. The base has been in compliance with its discharge permits and there are no known sources of contamination.

IRP investigations have found that sediments from Newfields and Grafton Ditches contained elevated TOX and lead levels and produced an oily sheen on the water when disturbed during sampling. The surface water samples from the same area indicated no contamination problems, and it is likely that contaminants are confined to sediments.

3.8 PLANT AND WETLAND RESOURCES

Pease AFB is within the eastern deciduous forest province of the United States. Plant communities on base are indicative of the pine/northern hardwood ecosystem. The forest resources of Pease AFB are

substantial. More than one half of the base lands, approximately 2,600 acres, are forested; and stands of commercial timber species comprise more than 25 percent of the total base acreage. Much of the forest land lies on flat terrain underlain with poorly drained soils. Water is close to the surface more than 6 months of the year, which is a major limiting factor in the operability of the forest.

3.8.1 Plant Resources

Existing forested stands have evolved from a mixture of old farm woodlots, abandoned fields and pastures, and wetlands unsuited for agriculture. The stands are mostly even-aged and range from seedling/sapling size to overmature, large sawtimber. The wettest sites are dominated by red maple and its associated species. Better drained soils support red oak and other mixed upland species. White pine is found in mixture with both of the above types and also forms pure, even-aged stands on its own. The bulk of the large sawtimber is of poor form and low quality.

Interspersed with the commercial forest land are areas in an old field successional stage. Typical trees occurring in these areas are mixtures of juniper, redcedar, aspen, gray birch, black cherry, sumac and other pioneer species. Nearly 1,000 acres of base lands contain abandoned field and grassland habitat. There is one 20-acre field suitable and available for cropland management. This area is being used for the production of hay.

Reforestation was performed on 29 acres in 1972 using red pine and white spruce, but the plantings are still too young to contribute volume or value except as Christmas trees. In 1973, hybrid white pine seedlings were planted on 38 leased acres by the University of New Hampshire for genetic research. Growth rate, disease, and other factors are recorded each year. Approximately 30 acres of the plantings have been determined not to be worthy of future study due to high mortality.

There has been a great amount of selective thinning of damaged or inferior hardwoods over the past several years, primarily for firewood. The base firewood cutting program is a popular one as many homes subsidize heating costs by burning wood.

Several individual trees on base are of exceptional size. A pignut hickory was found to have dimensions that would classify it to be a State champion. A white oak and common sassafras are county champions.

3.8.2 Wetland Resources

A wetlands and soils map was developed by the Soil Conservation Service for the base in 1982. Approximately 300 acres were designated as wetlands, and were defined as having poorly drained or very poorly drained soils. The freshwater wetlands are significant in that they act as ground water recharge areas returning fresh water to the underground aquifer under the base. The coastal wetlands along Great Bay contribute to the delicate balance of the entire estuarine system. The mudflats off of the southern portion of the base are some of the most productive oyster beds in the bay. With a special license, base residents enjoy shellfishing for clams and oysters.

In cooperation with the State of New Hampshire, the National Oceanic and Atmospheric Administration is currently proposing the designation of the Great Bay area as a National Estuarine Research Reserve. The proposed reserve boundary includes 300 acres of Pease AFB consisting of primarily woodland shoreline area. The State of New Hampshire, Department of Fish and Game will administer the reserve upon designation. In developing a management plan for the reserve, the state has entered into a Memorandum of Understanding with Pease AFB for access onto the base for research and education activities.

3.9 FISH AND WILDLIFE RESOURCES

Of the more than 4,300 acres of land of Pease AFB, some 2,600 acres are utilized for fish and wildlife management. While hunting and fishing are the most popular uses of the fish and wildlife resources, many people also enjoy hiking, bird watching, nature study, and camping on base. The lands support a wide variety of habitat types which support a diverse community of wildlife. There are 6.5 miles of saltwater shoreline and 57 acres of freshwater ponds for fishing.

3.9.1 Fishery Resources

There are no streams of any fishery significance on Pease AFB. However, there are three freshwater ponds, totaling 57 surface acres, located on the base. These are Upper Peverly Pond (8 acres), Lower Peverly Pond (5 acres), and Bass Pond (44 acres). All three ponds contain warmwater fish species such as largemouth bass, yellow perch, and chain pickerel. Catchable brook and rainbow trout are stocked with Federal hatchery fish each spring to provide an early season fishery. The ponds are open to fishing to active and retired military personnel, permanent employed civilian personnel, and Portsmouth Naval Shipyard personnel.

Bass Pond was constructed in 1963 when an area of the Great Bay marsh was diked to prevent tidal flooding for mosquito control. The dike was later increased in height to support a largemouth bass population. The pond provides excellent opportunities for catching largemouth bass in the 5 to 10 pound weight class.

Weed growth and algal blooms in Bass Pond are a recurring problem. Also the overflow weir gate that controls the level of the pond is structurally damaged and plugged as a result of beavers. Installation of a new gate, dredging, and construction of a fish ladder for migration of alewife forage fish from Great Bay have been identified as needed fish habitat improvement projects.

Upper and Lower Peverly Ponds provide good fishing for warmwater species during the summer, and for trout during the spring and fall. Both ponds have been stocked with catchable brook and rainbow trout since 1956 and have been on the New Hampshire list of trout ponds. The dam separating the ponds needs structural repairs, both to the spillway and embankment. Maintaining a high water level has caused the access road guardrails to fall over and the pavement to ravel.

3.9.2 Wildlife Resources

Important wildlife species occurring in the mixed forest habitat on base are deer and gray squirrels. The current deer population size is 12 to 15, and has been as high as 16 to 25 in the past. Because of past and potential deer conflicts with aircraft, the species has only been managed for status quo. The habitat condition for deer is good as the forest lands are largely immature hardwoods interspersed with open areas and old farmland. The habitat condition for gray squirrels is also good, and the trend is upward as trees become older and greater amounts of mast become available and the number of dens sites increases.

Important wildlife species occurring in the abandoned field and grassland habitat on base are cottontail rabbit, woodcock, bobwhite quail, and pheasant. Although there are abundant areas of old fields on base which offer good habitat for rabbits, the trend is downward as tall shrubs and tree species continue to invade field areas. An effort has been made to slow down plant succession by mowing in an attempt to retain a good proportion of grasslands, shrublands, and woodlands. These efforts also aid in maintaining the upland game bird habitat and species. As there is no significant natural reproduction of pheasants, a popular species, they are stocked by the Sportsman's Club at the base.

The tidal coastline and ponds on base offer good resting and feeding habitat for migratory waterfowl. In fact, the U.S. Fish and Wildlife Service believes the preservation of this habitat would constitute a significant contribution to waterfowl conservation efforts in the United States.

A number of wildlife habitat improvements have been implemented by the base over the years, and a number of improvements have been planned. Examples are the construction of wood duck nest boxes, wildlife foodplots, fruit tree pruning, mowing, creation of brush piles, and selective timber harvest that preserves den trees and mast-producing trees. The most important improvement has probably been the mowing to slow down plant succession and maintain habitat and species diversity. A most important planned improvement was to inventory all abandoned fields and develop a 10-year mowing schedule.

3.10 ENDANGERED, THREATENED, AND SENSITIVE SPECIES

Pease AFB provides important habitat for two endangered species: the bald eagle, which is federally and state listed; and the upland sandpiper, which is state listed. Great Bay is New Hampshire's most significant bald eagle wintering area and has supported an average of 10 eagles during the last five winters. The estuary is also an historical bald eagle breeding area and has excellent potential for a breeding pair as regional populations recover. The 3.5 miles of Pease AFB shoreline from Welsh Cove to Fabyan Point constitute a key component of Great Bay's eagle habitat. As the largest stretch of undeveloped shoreline on the Bay, it provides a network of perch trees, a night roost area, and important foraging habitat free of human disturbance and critical to the wintering eagle population.

In 1987, Pease AFB entered into a Wintering Bald Eagle Management Agreement with the USFWS, the NH Fish and Game Department, and the Audubon Society of New Hampshire. Pease AFB primarily agreed to curtail wintertime recreational use and other human activity in the eagle wintering area along much of the base shoreline.

Pease AFB also provides the only currently known nesting population of upland sandpipers in New Hampshire. The sandpiper occurs in managed grassland habitats, and nests in the 800 by 11,320 foot grassland strip between the runway and apron. The species is rare, endangered, or of unknown status throughout New England, and any remaining habitat is considered critical to the regional population.

In 1982, a coastal zone funded study inventoried coastal endangered plants; however, the study did not include Pease AFB property. Based on the Nature Conservancy's knowledge of the biota of the surrounding area,

it is expected that occurrences of other rare animal and plant species and natural communities of statewide and national significance are present at Pease AFB. It is anticipated that an inventory of such resources will be conducted in the near future in preparation of the Pease AFB Disposal EIS.

3.11 VISUAL AND ESTHETIC RESOURCES

The overall appearance and visual quality of the base is esthetically pleasing. The majority of base roads have been completely rebuilt, including new granite curbing. The exterior of all base buildings have been recently repainted. New street trees have been planted along most base streets. Major new building projects, such as the recently completed two-story Civil Engineering complex, have been accomplished with brick to complement some of the original brick buildings on base.

There have been numerous landscape planting projects accomplished at many facilities on base. Noteworthy are the extensive site improvements around five base dormitories. New roadways, parking lots, walkways, lighting, landscape plantings and furniture, benches, and sodding have been recently accomplished to promote a campus atmosphere.

The undeveloped areas on base support numerous recreational activities, especially in the 2,000 acres of forested woodlands. Forestry practices have provided improvements for outdoor recreation, wildlife, and the forest. A series of woodland trails permits many pleasing observations of the landscape. New roads which have been constructed in recent years in conjunction with the firewood cutting program provided a needed link in many areas to complete sections of specific trails. There are 16 miles of designated trails on base.

Along the Great Bay shoreline area of the base there are several scenic overlooks. The Woodman's Point and Thomas Point peninsulas off spectacular views to the bay. Other vantage sites are from the Sportsman Club and the Bass Pond causeway. Each area has its own unique perspective to the Great Bay estuary environment.

3.12 CULTURAL RESOURCES

In order to determine the type and extent of the historic resources located at Pease AFB, the records at the New Hampshire Division of Historical Resources and at Pease AFB, and the book " Newington New Hampshire: A Heritage of Independence Since 1630" by John Rowe, were consulted. Pease was constructed in the early 1950s and there are no earlier military structures on the base. Several houses from the late 1940s or early 1950s occur on base by the southeast gate.

The old Newington School, which dates to 1921, was acquired by the base in 1958 due to aircraft noise. The school is a symmetrical split level building, with a slate hip roof. It is constructed of native cobblestone from the stone walls of older Newington farms, and lumber from the town forest. It is part of the Newington Center Historic District, which was included in the National Register of Historic Places (NRHP) in 1987. The base also acquired and cleared a substantial portion of the town forest which has the reputation as being the first in the state. The forest was originally part of the common ground set aside in 1640. Approximately 10 acres still remain on base.

The only other standing historic structures on the base are associated with the Loomis estate and consist of the main house, currently used as a sportsmen s club; a caretaker's house, and a concrete capped well. It is said that the main house was built by Richman S. Margeson toward the end of the last century and then acquired by the Hawkridge family. The main house is a two story wood frame structure with a hip roof with dormers. On the front is a columned porch and a covered drive. On the back is a one and a half story addition with a small one story flat roofed addition on the very end. Based on recent exterior photographs, James L. Garvin, an architectural historian on the staff of the New Hampshire Division of Historical Resources, dated the structures to about 1910. Therefore, it appears that these are the structures built by Margeson.

If the interior of the main house is well preserved, it may have some architectural significance. It may also have some significance as an example of the construction of estates along the shores of Great and Little Bays during the late 1800s and early 1900s. The caretaker's house is similar to mail-order buildings, and based only on the photographs, is assumed to be the same age as the main house. Together these structures have the potential to be eligible for inclusion on the NRHP.

Pease AFB has never been surveyed for historic or prehistoric archeological resources. A ferry landing and two houses are identified on an 1805 map as being within the current boundary of the base. Furber Point is named for the operators of the ferry who owned the land as early as 1652. It is stated that the Gerrish Furber house, built in 1794, was destroyed when land for Pease was acquired. Approximately two dozen structures are identified on an 1851 map. In the late 1800s, water from Peverly Brook was pumped to Portsmouth for use in the Frank Jones Brewery.

It has also been reported that there were numerous brickyards in the area, including one at Welsh Cove just north of the base. Brick fragments have been reported on the base just south of the cove and may be related

to either another brickyard or an early structure. The area was first settled by Europeans in the early 1600s, so it is possible that there are significant historic remains on the base.

No prehistoric sites have been reported within the base boundary. However, with fresh water springs and the resources of Great Bay available, the area was undoubtedly inhabited. A Middle Archaic site from about 6000-4000 B.C. has been recorded north of the base along the Little Bay coast. Across Furber Strait, refuse from prehistoric use of shellfish has been recorded. One of these sites contained Woodland pottery from 1000 B.C.-A.D. 1600. Another of these sites was located 30 to 40 centimeters below the surface of the ground. The sites in this area are small and difficult to locate, but they provide important information about prehistoric subsistence and settlement patterns. Also, early settlers traded with and were attacked by Indians; so there is a long history of occupation in the area.

3.13 SOCIOECONOMIC SETTING

3.13.1 Impact Area

The operation of Pease AFB affects the economy and socioeconomic factors in nearby communities, including the adjacent communities of Portsmouth, New Hampshire and the town of Newington, New Hampshire, and in a three-county area. The larger economic impact area includes Rockingham and Strafford Counties in New Hampshire and York County in Maine. This area is somewhat larger than the Portsmouth-Dover-Rochester New England Metropolitan Statistical Area (NEMSA) which is the labor market area and includes portions of these three counties. The PDR-NEMSA was first designated as an MSA in 1980 and had an estimated population of 215,290 person in 1988 compared to a population of 487,927 for the three-county area as a whole the same year (Donnelly Demographics). The entire three-county impact area encompasses 2,077 square miles and is within approximately 40 miles or slightly less than a one-hour commuting distance of Pease AFB. The operation of the base effects this area through purchases of local goods and services made directly by the base and through purchases of goods, services and housing made by military and civilian base employees.

3.13.2 Area Economy

Employment and Income. The area economy has experienced strong growth during recent years. As shown on table 3.13.2-1 total employ-

ment for the three-county area increased from 122,569 to 189,184 employees between 1977 and 1986. This increase of 66,638 jobs reflects an annual growth rate of 5.0 percent.

Table 3.13.2-1
Employment Growth in the Impact Area
1977 to 1986

Industry	1977 Employment	1986 Employment	Growth Employment	Growth Percent
Farm Workers (BEA 1977)	2,293	2,384	92	4
Ag Services, Forestry, Fishing & Other	265	639	374	141
Mining (Approximate)	33	60	27	82
Contract Construction	4,509	10,302	5,793	128
Manufacturing	32,468	39,252	6,789	21
Transportation & other Public Utilities	2,940	7,295	4,355	148
Wholesale Trade	3,652	7,094	3,442	94
Retail Trade	22,550	40,167	17,617	78
Finance, Insurance, and Real Estate	3,495	8,788	5,292	151
Services	15,139	31,325	16,186	107
Government (BEA 1977)	35,201	41,877	6,676	119
TOTAL	122,546	189,184	66,638	54

Source: National Planning Data Corporation, Enhanced Business Patterns, 1986 derived from Bureau of the Census County Business Patterns 1986.

Area economy growth has been strong in all important sectors. However, retail trade and services accounted for slightly more than one-half of the total job development. Very strong growth was also experienced in contract construction, manufacturing, transportation and utilities, wholesale trade, finance, insurance and real estate, and government. The remaining three sectors of farm workers, agricultural services, forestry, fishing and other, and mining contributed slightly to overall growth and accounted for less than 1.0 percent of the increased number of jobs.

The impact area has experienced very low unemployment rates during recent years. In 1986 the annual average unemployment rate was 3.5 percent. This level dropped to 3.1 during 1987 and averaged 3.0 percent during the first half of 1988. The lowest level recently recorded was 2.1 percent for June 1988. Income for major industrial classifications

in the area total over $3,243,000,000 in 1986. As shown in table 3.13.2-2, manufacturing was the largest single contributor to the area economy with an income of $877,242,000. The next highest contributor was government with a total income of $776,871,000. Together these two sectors comprise slightly over 50 percent of the area's income. As with

Table 3.13.2-2
Impact Area Income by Industry - 1986
($1,000)

Industry	Income
Farm Workers (BEA)	17,926
Ag Services, Forestry, Fishing & Other	8,975
Mining	1,431
Contract Construction	209,505
Manufacturing	877,242
Transportation & Other Public Utilities	183,653
Wholesale Trade	165,076
Retail Trade	429,558
Finance, Insurance, and Real Estate	165,449
Services	448,832
Government (BEA)	776,871
TOTAL	$3,243,013

Source: National Planning Data Corporation, Enhancement Business Patterns, 1986 derived from Bureau of the Census County Business Patterns 1986.

employment, farm workers, agricultural services, forestry, fishing and other, and mining contribute the least to the economy comprising $28,332,000 of income and less than 1 percent of the area's total income.

Part-time Employment. Neither the State of New Hampshire or the State of Maine report part-time employment statistics on a regional or county basis. Information is available for 1987 on a statewide basis from both states. Statewide full and part-time labor force and unemployment rates for various sex and age grouping for both states are presented in table 3.13.2-3.

These figures only include part-time workers seeking part-time employment. Full-time workers reduced to part-time status are not included. Part-time labor force and unemployment forces for the three-county impact area can be estimated using statewide employment data and

Table 3.13.2-3
Full and Part-Time Labor Force and
Unemployment Rates for New Hampshire and Maine
Civilian Labor Force
(Labor force figures in 1,000)

Category	New Hampshire				Maine			
	Full-time		Part-time		Full-time		Part-time	
	Labor Force (1,000)	Unemployment Rate	Labor Force (1,000)	Unemployment Rate	Labor Force (1,000)	Unemployment Rate	Labor Force (1,000)	Unemployment Rate
Total, 16-yr. and over	499	2.2	89	4.4	486	4.1	100	5.9
Men	302	2.3	21	5.2	296	3.6	27	6.5
Women	197	2.0	68	4.2	191	4.9	72	5.7
Total, 16-19 years	19	4.9	22	6.6	18	9.2	21	6.7

Source: Geographic Profile of Employment and Unemployment, 1987, U.S. Department of Labor, Bureau of Labor Statistics.

impact area population projections. A weighted average of the two states' unemployment figures are used based on the population of the impact area residing in each state to estimate local part-time unemployment. This approach is supported by an estimated full-time unemployment rate for the area of 2.8 percent compared to a rate of 3.1 actually experienced in 1989. Estimates of part-time labor force and unemployment rate for the impact area are presented in table 3.13.2-4. As shown on the table, there are an estimated 2,000 unemployed workers seeking part-time employment.

Table 3.13.2-4
1987 Estimated Part-Time Labor Force and
Unemployment Rate Economic Impact Area
(Labor Force Figure in 1,000)

Category	Estimated Labor Force (1,000)	Estimated Unemployment Rate	Estimated Unemployed Labor Force (1,000)
Total part-time	41	4.9	2.0
Part-time men	10	5.6	0.6
Part-time women	31	4.7	1.4
Total 16-19 years	10	6.6	0.7

3.13.3 Population

Population Growth. Population growth has occurred in the three-county area during recent years and is projected to continue. As shown on table 3.13.3-1 the area experienced an average population growth of 2.6 percent between 1970 and 1980, 2.0 percent between 1980 and 1988 and is projected to grow at an annual rate of 1.6 percent through 1993. Rockingham County in which Pease AFB is located has the highest population and has experienced the most rapid growth rate. Between 1970 and 1988 the population of Rockingham County has grown by 89,928 persons which constitutes 54 percent of the total population growth in the three-county region. Rockingham County is projected to continue leading the area's growth through 1993.

Population Characteristics. The population of the three-county area is predominantly white, with nearly 99 percent identified as being in that racial group in 1988. The remaining 1 percent is composed of Black, Hispanic, and other races. The population is mobile. Approximately 8 percent of the 1986 population resulted from net migration in the preceding 6 years. Net migration only includes the difference between the

Table 3.13.3.-1
Population Growth and Projected Growth
in the Economic Impact Area, 1970-1993

County	1970 [1]	1980 [2]	Percent Growth 1970-1980	1988 [3]	Percent Growth 1980-1988	1993 [3]	Percent Growth 1988-1993
Rockinhan, NH	138,951	190,345	3.2	228,879	2.3	249,900	1.8
Strafford, NH	70,431	85,408	1.9	95,741	1.4	100,890	1.6
York, ME	111,576	139,666	2.3	163,307	2.0	176,925	1.6
Total 3-County Area	320,958	415,419	2.6	487,927	2.0	527,715	1.6

[1] U.S. Bureau of the Census, Census of Population, 1970.

[2] U.S. Bureau of the Census, Census of Population, 1980.

[3] Donnelley Demographis 8/88

number of people who move into an area and the number who move out. The total proportion of persons moving to the area during this period would be greater than 8 percent to the extent additional immigrants would be required to offset out migrants. This net migration is largely responsible for the rapid growth rate in the region. Between 1980 and 1986, 65 percent of the region's growth was caused by net migration with the remander being the result of natural increase.

3.14 HOUSEHOLD CHARACTERISTICS AND TRENDS

The number of households in the three-county area has grown steadily along with the population during recent years. Growth is projected to continue through 1993. As shown in table 3.14.1-1, the number of occupied housing units in the area has increased from 144,703 in 1980 to 179,430 in 1988.

3.14.1 Household Size

Household size has decreased slightly in recent years in line with a national trend toward a small number of persons per household. Since 1980 the number of persons per household has decreased from 2.8 to 2.7 persons, a reduction of approximately 4 percent. A similar decrease is projected through 1993, with the size being forecasted to drop to 2.6 persons per household.

3.14.2 Household Income.

Household income has grown in the area since 1980 in both dollar value and real terms. As shown on table 3.14.1-1 household income increased from $19,205 in 1980 to an estimated $34,721 in 1988, an increase of 81 percent. When values are adjusted for inflation, the increase is still estimated to be 31 percent. By 1993, household income is projected to be $44,330. This is 28 percent higher than estimated income in 1988 and reflects an increase in purchasing power of 8 percent when inflation is considered.

3.14.3 Housing Cost.

The three-county area is adjacent to the Boston-Lawrence, MA-NH Consolidated Metropolitan Statistical Area on the south and is influenced economically by this area. A large portion of the three-county impact area, including Portsmouth and Newington, New Hampshire, is within commuting distance to Boston, Massachusetts. For this reason, housing costs in the impact area are influenced by economic growth and housing

Table 3.14.1-1
Household Characteristics
Economic Impact Area

	1980 Census	1988 Estimate	Percent Change 1980-1988	1998 Projection	Percent Projected Change 1988-1989
Total Population	415,419	487,927	17	527,715	8
Total Households	144,703	179,430	24	199,250	11
Household Population	403,682	476,190	18	515,978	8
Average Household Size	2.8	2.7	4	2.6	4
Average H'hold Income	$19,205	$34,721	81	$44,330 1/	28
Average H'hold Income (1980 dollars)	$19,205	$25,185	31	$27,321	8

1/ Adjustment factor based on CPI change 1982-1987.

costs in the Boston Metropolitan area. In 1987 the Boston metropolitan area was identified as having the highest median purchase price of existing one-family houses of any metropolitan area in the continental United States. The median purchase price of an existing single-family house at that time was reported to be approximately $186,000. This reflects an increase of 164 percent since 1980. Rental costs have increased almost as much for a gain of 162 percent between 1980 and 1987. Average and medium home values and monthly rent for rental units in the three-county area are presented on table 3.14.3-1. Housing costs for 1987 are estimated based on the price index for housing and rental unit price increases reported in the Boston area. Although a difference between changes occurring in the Boston area and those in the impact area, especially the northernmost part, are probable, this adjustment should be sufficient to provide an indication of price changes in the impact area since 1980. Because of this difference, counties are presented on an individual basis. The Boston area price change index is likely to be most appropriate for Rockingham County. Figures presented on the table are only approximations of 1987 housing costs. Limited information available on cities in Strafford County show these 1987 averages were exceeded in some instances in 1986. A housing study done by the Strafford Regional Planning Commission for Strafford County showed the average purchase price of housing already exceeded the $77,300 average presented on the table for 1987 in 7 of the 16 communities considered by the study in 1986. In two of the communities, Dover and Duram, housing cost averaged $111,572 and $122,331, respectively, in 1986.

3.14.4 Vacancy Rates

The three-county area has a diverse housing supply. In addition to owner occupied, renter occupied, and vacant housing units, there are also a large number of seasonal housing units. In 1980, the Bureau of Census reported that of the 149,239 year-around housing units in the three county area, 1,439 were vacant and for sale and 3,097 were vacant and for rent. Of the total, 46,485 were rental units with 43,388 occupied and 3,097 available for rent. The vacancy rate for rental units was 7 percent in 1980. Although more recent data is not available for the three county impact area, it is believed the current housing market is much tighter than that reflected by a 7-percent vacancy rate. The number of vacant housing units for sale compared to the total in 1980 was only 1 percent of the total year-around housing. This figure does not reflect occupied houses which were also for sale.

Table 3.14.3-1
Housing Cost
1980-1987

County	Median Home Value		Average Home Value		Median Monthly Rent		Average Monthly Rent	
	1980	1987	1980	1987	1980	1987	1980	1987
Rockingham	$56,594	$92,800	$58,504	$95,900	$237	$384	$237	$384
Strafford	$43,631	$71,600	$47,104	$77,300	$200	$324	$197	$319
York	$42,823	$70,200	$47,140	$77,300	$174	$282	$178	$288

Note: 1987 housing and rental cost estimates based on price index for Boston metro area.

Source: U.S. Bureau of the Census, Census of Housing, 1980.

3.15 GOVERNMENT SERVICES AND FINANCE

Local governmental services in the three county area are primarily provided by town and city governments. Services provided at this level include police and fire protection, parks and recreation, community development, sewage treatment and disposal, libraries, local streets and highways and local public schools. In 1982 local governments in the three county area spent $323,900,000 on direct general expenditures (U.S. Department of Commerce, Bureau of the Census, 1982 Census of Government). The largest single expenditure, constituting 50 percent of the total was for local education. The second largest expenditure was 7 percent of the total and was for local streets and highways. Police and fire protection were 5 and 4 percent of the general total expenditure, respectively. Local government revenues totaled $329,145,000 for the three-county area in 1982 (U.S. Department of Commerce, Bureau of the Census, 1982 Census of Government). The largest single contributor to revenues was local property tax which provided 61 percent of the total. Local government charges and miscellaneous general revenues contribute an additional 11 percent and state and Federal Government contribute 19 and 5 percent of the total, respectively. The remaining 4 percent of local revenues comes from utility fees.

Two local government services would be directly impacted by the closure of Pease AFB. These are education services provided by the Portsmouth school system and rescue and fire protection which are provided by communities in the seacoast area.

3.15.1 Education

Portsmouth School System. The Portsmouth school system is a component of Portsmouth, New Hampshire, city government. The school system provided public education for grade school, junior high, and high school students residing within the city. Education is also provided, under special agreements with other school systems, for students not residing within the district. High school is provided in this manner to surrounding systems who do not have high schools and education is provided for grades 7 through 12 for the town of Newington. The Portsmouth school system is paid tuition for students attending Portsmouth's schools who live outside of the city. Base housing at Pease AFB is located entirely within the city boundaries of the City of Portsmouth and all students living on the base are eligible to attend the city school system as residents.

Enrollment Trends. School system involvement in Portsmouth has declined steadily in recent years. As shown on table 3.15.1-1 enrollment has dropped from 5,589 students in the 1978-79 school year to an estimated 3,984 students in 1988-89. The average annual decline during this period was 161 students. The average annual percent of total enrollment lost was 2.8 percent. Total loss for the period was 1,605 students constituting 28.7 percent of the original enrollment. There is no reason to believe this trend will not continue.

School Budget. The school department of the City of Portsmouth was budgeted $18,945,500 for operation during the 1988-89 school year. As shown on table 3.15.1-2 approximately $4,251,750 of this amount was provided by school revenues and the remaining $14,693,750 was provided by the city from property taxes. School revenues included several sources of funds which could be impacted by reductions in enrollment. The most important of these sources being approximately $2,500,000 in Federal impact aid. Federal impact aid is given to the school system by the Department of Education to partially offset the cost of educating students who are attending school in the area due to the operation of a military installation. Such assistance is needed because these installations are not subject to local property taxes, the major source of school funding.

Table 3.15.1-1
Portsmouth School System Enrollment Change
1978-1989

School Year	Total Enrollment [1]	Enrollment Change	Percent Loss
1978-79	5,589	NA	NA
1979-80	5,267	-322	-5.8
1980-81	5,166	-101	-1.9
1981-82	4,864	-302	-5.8
1982-83	4,622	-242	-5.0
1983-84	4,383	-239	-5.2
1984-85	4,343	-40	-0.9

Table 3.15.1-1
Portsmouth School System Enrollment Change
1978-1989

School Year	Total Enrollment [1]	Enrollment Change	Percent Less
1985-86	4,405	62	1.4
1986-87	4,259	-146	-3.3
1987-88	4,118	-141	-3.3
1988-89	3,984	-134	-3.3
Average loss 1978-89	NA	-161	-2.8
Total loss 1978-89	NA	-1,605	-28.7

1/ Enrollment as of 1 October of each year.

Source: Portsmouth School Department, letter from W. Peter Torrey, 28 April 1989.

Table 3.15.1-2
Portsmouth School Department
Revenue Sources

	1988/89	Percent Total Budget
School Revenues		
Federal Impact Aid	$2,500,000	13.2
Drivers Education	19,250	0.1
Pupil Activities	75,000	0.4
Tuition	1,650,000	8.7
Rentals	7,500	> 0.1
City Taxes	14,693,750	79.0
Total Budget	$18,945,500	101.4 1/

1/ Error in total due to rounding.

School revenues would be diminished by the removal of students due to the closure of Pease AFB. Specific sources which would be effected include Federal impact aid, drivers education funds provided by the State of New Hampshire and the student fees for student activities.

School Budget Cycle. The school's budget is a line item in the city budget. The budget is finalized in the summer preceding the school year. Approximately 80 percent of the school's budget is composed of contract obligations for teachers and other services. These contracts are binding and cannot be unilaterally changed by the school department. The determination on the number of students eligible for school impact aid is made in October after the school budget for that year is final.

School Buildings. Two schools, Brackett and Jones Elementary Schools, which are used by the Portsmouth school system are located on Pease AFB. These buildings are owned by the U.S. Department of Education. Only one of the schools is fully utilized. Brackett Elementary School had 669 students during the 1988-89 school year. These included students in grades kindergarten through sixth. Jones Elementary School was only partially utilized. It was used for an early childhood learning program and accommodated 44 students. The Jones Elementary School building is also used by the Air Force.

3.15.2 Fire Fighting and Rescue Assistance

The base provided back-up fire fighting and rescue assistance to surrounding communities. Base assistance is especially valuable in fighting gasoline or other types of fuel fires. The base has aqueous film foam capability used in fighting these types of fires and is the only department in the area able to control and extinguish incidents involving large quantities of flammable liquids. The base rescue crew has provided emergency medical services and vehicle extraction services to most surrounding communities. The department has also responded to several hazardous materials incidents within the area.

3.16 SERVICES FOR RETIRED MILITARY PERSONNEL

Retired military personnel in the vicinity have base privileges. These include base exchange privileges, commissary privileges, medical treatment on a space available basis and access to recreation facilities. In 1988 there were 14,278 military and Coast Guard retirees in an area composed of parts of three states who would be likely to use one or more of the facilities at Pease AFB. This area includes southern Maine, northeastern Massachusetts and most of the state of New Hampshire.

3.17 OUTDOOR RECREATION

A wide selection of outdoor recreation activities are provided at Pease AFB for those who have approved access to the recreation facilities. Recreation activities at the base include camping, swimming,

picnicking, hiking, golfing, hunting, fishing, boating, cross-country skiing, and snowmobiling. Important base recreation facilities include Peverly Pond and the associated recreation area, Bass Pond, Woodman's Point, Sportsmen's Club, the golf course, and various ORV, hiking and nature trails. Peverly Pond is the most utilized recreation facility and provides opportunities for swimming, picnicking, camping, and fishing. Fishing and hunting activities are popular, with approximately 800 permits sold annually. Both activities are enhanced through management of wildlife. Peverly Pond has been stocked in recent years with 6,000 trout by the U.S. Fish and Wildlife Service. The Sportsmen's Club stocks appropriate wildlife areas with pheasants.

3.17.1 Recreation Use

Recreation activity on the base for the years 1981 and 1982 are presented in table 3.17.1-1. The average activity for both years and the percentage average of the total are also shown. The most popular activity listed on the table is picnicking, which on the average accounted for 51 percent of the total activity. Water sports is second with 19 percent, followed by fishing with 12 percent and camping with 7 percent. All four of these activities can be pursued at the Peverly Pond recreation area, which is the most popular recreation site on base. Together these four activities account for 89 percent of the total. Hunting, primarily a fall sport, and winter sports account for the remaining 11 percent of outdoor recreation.

3.17.2 Recreation Accesses

Access to recreation facilities is limited because of base security requirements. The general public is not allowed on base for recreational purposes. Group B base personnel and guests and retired military personnel are permitted use of the base facilities.

3.18 NOISE

Although improvements have been made in recent years, modern jet aircraft still generates a considerable amount of noise. This high level of noise is a problem to nearby land uses which are incompatible with airport operation. Because noise levels are partially a function of distance the problem is primarily one of incompatible land use development adjacent to and in the approaches of an airport. Noise problems are also dependant

Table 3.17.1-1
Outdoor Recreation Activity
Pease AFB, 1981 and 1982

Recreation Activity	Visitor Days FY 81	FY 82	Two Year Average	Percent of Total
Hunting	875	825	850	7
Fishing	1,510	1,400	1,455	12
Camping	832	900	866	7
Picnicking	7,180	5,300	6,240	51
Winter Sports	510	475	493	4
Water Sports	2,100	2,450	2,275	19
Total	13,007	11,350	12,179	100

Source: Outdoor Recreation Plan, Pease AFB, New Hampshire. 1983, 509 CSG/DEEV.

on the frequency and time of flights with frequent flights and night flights increasing the problem. There have been problems at Peasw AFB despite efforts on the part of the Air Force to minimize noise levels and conflicts and on the part of local governments to consider noise zones in land use plans.

3.18.1 Flying Operations

Pease AFB currently has a mission as a combat-ready force of FB-111A fighter bomber aircraft and KC-135 tanker aircraft. Training flights are conducted at the Air Base utilizing T-37 jet aircraft. The base also hosts the New Hampshire Air National Guard operating KC-135 tankers. The southeast approach zone for the base lies under commercial airways between Portland, Maine, and Boston, Massachusetts, and approximately 75 percent of flying operations take place north and west of the airport. The type and number of aircraft operating at Pease and the number of daily takeoffs are presented in table 3.18.1-1.

As shown in the table, most activity, 52 percent, is due to operations of the FB-111A fighter bombers. These aircraft are required to takeoff with full after burner operation which limits the level of noise reduction available through changed operating procedures. Tanker aircraft constitute 22 percent of operations. These aircraft currently utilize reduced power settings for takeoffs. The level of power reduction is

limited by aircraft weight. The quiter T-37 trainer aircraft constitutes 26 percent of all takeoffs. A study completed in 1987 by the Air

Table 3.18.1-1
Daily Aircraft Operation - Pease AFB

Type of Aircraft	Number of Daily Takeoffs	Percentage of Total Takeoffs	Number of Assigned Aircraft
FB-111	38	52	25
KC-135	16	22	21
T-37	19	26	3
Total	73	100	49

Source: Air Installation Compatible Use Zones (AICUZ), Pease Air Force Base, New Hampshire, prepared by the U.S. Air Force, February 1987

Force on air installation compatible use zones which considered noise in the evaluation concluded that drastic changes to the existing procedures would be required before existing noise levels could be reduced further.

3.18.2 Noise Levels

Noise contours are developed using the day-night average sound level (Ldn) methodology. This method assesses the amount of exposure to aircraft noise. The Ldn values used for land use compatibility planning purposes are 65, 70, 75, and 80. Examples of land uses compatible with an Ldn of 85 to 80 include heavy manufacturing and wholesale commercial which are not people intensive. Agricultural activities such as row crop production are also compatible at this level. Commercial and retail trade and personnel business services are compatible between 80 and 70 Ldn but sound reduction should be included in building construction. No special considerations are suggested for these uses below 70 Ldn. Public service and residential land uses are compatible with Ldn below 65.

3.18.3 Noise Conflicts

Existing Conditions. Land uses considered incompatible or highly discouraged from noise zones resulting from the operation of Pease AFB exist in the New Hampshire communities of Portsmouth, Newington, Greenland, Rye, Dover, Duram, and Madbury. These discouraged uses include residential, business, commercial and industrial.

Future Conditions. Future land use conditions are reflected by community plans and land use regulations, especially zoning ordinances. The previously listed community zoning regulations include developments similar to those already existing in the noise zones. Future development can be made more compatible with high Ldn levels by including noise reduction methods in construction. Such noise reduction is encouraged for impacted areas which are developed because no alternative site exists.

3.18.4 Force Realignment/Base Closure

Closure of Pease AFB will be accomplished in two steps. Both will effect noise levels. First, the FB-111A fighter bombers and Air Force KC-135 tankers will be transferred to other bases. The transfer of both groups of aircraft is scheduled to be completed by the end of 1990. Second, the base will be effectively closed and converted to caretaker status by June 1991. In that status the NHANG KC-135 tankers will still operate but Air Force flying activity at the base will be virtually stopped. Currently, the NHANG tankers account for approximately 47 percent of the KC-135 activity at Pease AFB. Together realignment of the FB-111A's and the KC-135 will result in a reduction of takeoffs of approximately 62 percent.

CHAPTER 4 ENVIRONMENTAL CONSEQUENCES

4.1 INTRODUCTION

This chapter provides a discussion of the effects of implementation of closure on each aspect of the environment described in Chapter 3. Effects may be either direct, indirect, or cumulative. Direct effects occur at the same time and place as the action. Indirect effects occur later in time or are farther removed in distance, but are still reasonably foreseeable. A cumulative effect is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency undertakes such other action.

NEPA requires a discussion of the significance of effects. Significance varies with the setting of a proposed action. For instance, in the case of a site-specific action, significance would usually depend upon the effects in the locale rather than in the world as a whole. Both short-term and long-term effects are relevant. Significance also requires consideration of intensity, such as the degree to which the action affects public health, endangered species, or an ecologically critical area. Significance cannot be avoided by terming an action temporary or breaking it down into small component parts.

This chapter also discusses mitigation of adverse effects. Mitigation includes minimizing the impact, restoring the affected environment, reducing or eliminating of the impact over time, compensating by providing substitute resources, or avoiding the impact altogether.

4.2 SOIL RESOURCES

One closure activity would impact prime farmland soils. The activity is the destruction by open burning of outdated explosives. This activity would take place in an area that has been used for this purpose in the past, and the area contains several acres of prime farmland soils. Residual materials would be inert, which would render this impact insignificant.

The scheduled underground tank removal, overfill protection, and other tank work described in Chapter 3 may or may not occur, dependent upon funding. Fuel operations will be maintained until the Air National Guard (ANG) unit has completed alteration of the existing fuels storage

system to meet its needs. This work will cause temporary, localized disturbances to soils. Disturbed areas will be revegetated to prevent soil loss.

Ultimately, during caretaker status, all underground storage tanks not being used by the ANG unit and bulk fuel storage tanks 2 and 3 will be drained to avoid any indirect, later-in-time adverse impact on soils. Removal of deteriorated tanks will be negotiated during the development of reuse plans.

As stated in Chapter 3, accidental spills of fuels and other hazardous materials occur on the base. In 1983, for example, 277 spills occurred. The number of spills on Pease AFB lands will be significantly reduced upon closure, resulting in a significant benefit to the soil resources.

In accordance with all applicable regulations, all hazardous materials on base including herbicides and pesticides will be shipped and used elsewhere, sold as excess, or disposed of as hazardous waste. All hazardous wastes will be collected in accordance with all applicable regulations and disposed of through waste brokers. Their place of ultimate disposal will be determined, and inspections will be made of the ultimate disposal practices and sites. The ultimate disposal at a site will contribute to that site's long-term nonuse for other purposes, an unavoidable significant and adverse cumulative impact.

Upon removal of hazardous materials and wastes, storage facilities will be cleaned as necessary. Solutions used in the cleaning will be treated as hazardous waste during and after the cleaning. Any contaminated equipment will also be cleaned or properly disposed of if necessary.

Radioactive materials used for calibration of radar equipment will be submitted into the Air Force supply system, and then used by another agency. Radioactive luminous dial watches and compasses will also be submitted into the supply system if they are still serviceable. Otherwise, they will be shipped as waste to Kelly AFB, Texas. The disposition of the luminous dials on the aircraft in the air park is unknown at this time because the disposition of the aircraft is unknown at this time.

With closure of the base, the approximately 30 tons per month of solid wastes that are disposed of at various landfills in the local area will essentially cease. A slight increase will occur during closure from

discards because of the closure and several building alterations by the ANG unit, but no major demolition of buildings is planned. A small amount of waste will be generated during the caretaker status prior to disposal of the property. These wastes will be managed by the caretaker unit. The overall reduction of solid wastes to local landfills will prolong the use of the landfills by other entities in the community, which can be considered a significant beneficial impact.

4.2.1 Interim Remediation of Contaminated Sites

Interim remedial measures planned for the Installation Restoration program (IRP) threatening contaminated sites that are related to soils are as follows. These measures are not considered as activities of closure; rather, they are considered to be activities of the Air Force's. The discussion in this EIS is in response to great public interest.

The buried drums from Landfill 5 will be excavated, categorized, and containerized for offsite disposal. During excavation activities, stained soils will be separated, and stockpiled, on and covered with polyethylene sheeting. The interim remedial plan is not intended to remediate soils. At the conclusion of excavation, the site will be enclosed with cyclone fencing to limit access until final remediation. Staging areas will level and line with polyethylene sheeting. The storage facility for the drums will be a pole barn structure without walls but with a concrete block dike surrounded by hurricane fencing.

Soil in a drainage ditch at the Fire Training Area 2 contaminated with petroleum hydrocarbons will be excavated to a maximum depth of 2 feet, loaded into transport vehicles, and hauled to an approved disposal site. Regrading to prevent surface ponding will also be performed. This same interim remedial action will be performed in the portion of Newfields Ditch west of Dover Avenue, which has been contaminated with petroleum hydrocarbons from Building 222, a Jet Engine Test Cell. It will also be performed in conjunction with the excavation of an overflow pipe that had been connected to the underground waste TCE storage tank next to Building 113. These three excavations will involve a maximum of 1,375 tons of soil.

These interim remedial measures will contain and isolate the most contaminated known soils on Pease AFB land, which is considered to be a significant beneficial effect on the soil resources of Pease AFB lands. However, their ultimate disposal at a site will contribute to that site's long-term nonuse for other purposes, an unavoidable significant and adverse cumulative effect.

4.3 AIR RESOURCES

Closure of Pease AFB will result in a significant reduction in the annual mass emissions of the five air pollutants described in Chapter 3. It will also result in a presumably insignificant reduction in the emissions of the Maine Energy Recovery Company incinerator in which 332 tons per month of solid wastes from the base are disposed. Also, emissions from the incineration of a small amount of medical wastes on base would cease. Emissions will still occur from the ANG unit operations. This reduced air pollution, by itself, is considered to be a beneficial and insignificant effect. However, in the context of cumulative impacts, it can be considered a beneficial and significant effect.

Elevated ground-level ozone concentrations are reported to be an occasional problem in the area when prevailing winds are from the direction of Boston. The ozone is formed by photochemical reactions between directly emitted nitrogen oxides and reactive organic gases formed from combustion of fuels and from evaporation of organic solvents. Elevated ozone concentrations result in reduced lung function, particularly during vigorous physical activity. This health problem is particularly acute in children.

As stated in Chapter 3, a building survey for asbestos is currently 25 percent complete. It is planned to complete the survey prior to the disposal of the property. Any easily accessible and friable asbestos discovered during the survey will be properly removed and treated as hazardous waste. The removal of such asbestos will have a significant beneficial impact on air pollution and public health. Nonfriable and difficult to access asbestos, as well as lead-based painted surfaces, will not be disturbed and left in place. Such action will not cause any significant health hazard to the public.

The open burning of any outdated explosives will be done under permit. This activity would be expected to cause only temporary and insignificant emissions of air pollutants.

4.4 GROUND WATER RESOURCES

The closure activities discussed in the soil resources section to prevent soil pollution will also prevent ground water pollution. Upon the removal of the hazardous materials and wastes on base, the potential for future pollution of ground water will be significantly reduced.

The severely contaminated soil cleanup activities will also prevent ground water pollution. Further, interim remedial measures planned for the IRP threatening contaminated sites that are specifically related to ground water resources are as follows. It should be noted that these interim actions are not expected to meet the long-term cleanup goals for a site.

In the fire training area, up to four wells will be selected for ground water extraction. The water will be delivered to a pilot treatment system involving the following five processes: gravity oil/water separation, oxidation, filtration, air stripping, and carbon adsorption. The water will then be discharged, in accordance with a ground water discharge permit, to a ground water recharge trench system consisting of perforated plastic pipe drains. This pilot system will be performed for a period of 1 year.

A similar 1-year pilot treatment system involving five wells will be performed in the area of Buildings 113, 119, and 222. The processes of filtration, air stripping, and carbon adsorption will be used. The treated water will then be discharged, in accordance with an NPDES permit into Newfields Ditch or to a nearby sanitary sewer.

Risk assessments of the five sites will be performed within the next 3 years to determine whether actual or potential harm to public health or welfare and the environment is posed. The risk assessments will consist of five components: contamination assessment, environmental fate and transport assessment, exposure assessment, toxicity assessment, and risk characterization.

Of specific concern during the EIS scoping process was the movement of contaminants off base upon closure that would be caused by the reduced use of the base water supply wells. The environmental fate and transport assessment will enable this concern to be addressed. It will describe the potential for offsite migration, provide estimates of the direction of movement, and include information of factors that may significantly affect the fate and transport of contaminants released from a site.

The exposure assessment will identify the potential or actual routes of exposure, characterize the population exposed, and determine the extent of exposure. The toxicity assessment will identify the toxicological properties of the contaminants. The risk characterization

will present a qualitative description of potential adverse effects and an estimate of risk to public health and the environment based on existing guidelines and standards.

Because the effect of the reduced use of base wells on the transport of contaminants is undetermined at this time, an interim mitigation measure to avoid potential effects could be implemented in the event reduced well use needs to occur before the risk assessments are completed. The interim mitigation measure could be an increased use of the wells by the city of Portsmouth to a level comparable to their current use by the base. Currently, water quality in the base wells meet State and Federal drinking water standards, and the base provides supplementary water to the city supply under a cooperative agreement.

4.5 SURFACE WATER RESOURCES

The number of spills of fuels and other hazardous materials on Pease AFB lands will be significantly reduced upon closure. This will result primarily in an insignificant benefit to the surface waters of the area. Assuming some future spills were to be of significant consequence to surface waters, this benefit could be considered significant on occasion.

Problems which have occurred in the past in meeting wastewater treatment plant effluent guidelines during heavy rains, at which time excess flow was directly bypassed into the Piscataqua River, will be reduced because the generation of wastewaters will be reduced upon closure. This reduction will enable some previously bypassed waters to be treated, dependent upon the storm event. This beneficial effect can be considered significant.

Discharges and nonpoint source inputs of contaminants into marine waters have resulted in accumulated and elevated concentrations in the water column, sediments, and living marine resources in all regions of the country, according to the National Oceanic and Atmospheric Administration. However, current indicators of pollution stress at the population, community, and ecosystem levels often cannot adequately distinguish natural variability from pollution effects or determine when observed changes or differences are of concern. In this context of unknown cumulative effects, the reduction of contaminants from spills, surface runoff, and wastewater discharges from Pease AFB upon closure can be considered only potentially significant.

4.6 PLANT AND WETLAND RESOURCES

The loading of equipment and property during closure is expected to cause temporary disturbances to grassed areas adjacent to buildings needed for staging the move. These disturbances are expected to be insignificant.

Mowing activities upon closure and during caretaker status of the property will be reduced to that necessary to maintain an overall neat appearance, as opposed to a well manicured appearance of the base. The mowing of old fields to retard plant succession will only occur in those fields where invasion by woody species, because of their size, warrants it as a last opportunity to mow.

The popular base firewood cutting program will be ended when the Bioenvironmental Engineering work force is reduced. This will result in damaged and inferior hardwoods no longer being thinned, which would not be expected to significantly affect the overall health and vigor of base forest resources. Unlawful cutting during the caretaker status of the base will be prevented by restricting public access.

The minor construction activities that will occur regarding the transition of the ANG unit into a stand alone unit will also cause disturbances to grassed areas. Significantly disturbed areas will be graded and seeded. Several grassed areas will be destroyed from the construction of a fuel truck fill stand, pumphouse, and additional pavement. As these areas are located in the base operations area, their destruction is not considered to be significant.

The perimeter fencing of the ANG cantonment area will traverse primarily grassland along road shoulders. Vegetation disturbances and losses will be minimal and insignificant.

Areas around transformers will continue to be treated with herbicides during the caretaker status of the base. This will be done in order to prevent a potential fire hazard from developing adjacent to the transformers.

The staging and storage areas for the drum removal from Landfill 5 will also destroy primarily grassland in insignificant amounts. The drainage ditch excavations associated with the other IRP sites will cause minor disturbances and losses primarily to grasses and shrubs, and some small trees.

As an IRP activity, wetland assessments will be conducted at Landfill 5 and the spill area associated with the Jet Engine Test Cell, Building 222. These investigations will evaluate the possible impacts of environmental contamination. Surveys of aquatic macroinvertebrates will be conducted along gradients of possible contaminant migration. Survey results will be related to contaminant concentrations in water, soils, and aquatic sediments.

4.7 FISH AND WILDLIFE RESOURCES

The reduced human use of the base freshwater pond fisheries would result in insignificant increases in fish sizes and numbers. The fisheries will continue to be used by ANG, retired military, and Portsmouth Naval Shipyard personnel during the caretaker status of the base.

The needed fish habitat improvement projects described in Chapter 3 will not be implemented because of the closure of the base. Their nonimplementation would not be expected to cause a loss of the fisheries and would not be considered a significant adverse effect.

The grassland losses caused by the minor construction activities will occur in operational areas which are infrequently used by important wildlife species. The reduced manicure-type mowing activities will improve the use of some grassed areas by cottontail rabbits. This will be offset by the reduce mowing of old fields, which will reduce habitat. It will be further offset by the decreased use by rabbits and upland game birds of other grassed areas in which IRP activities will occur. The expected net effect would be an insignificant increase in rabbits and decrease in upland game birds during the caretaker status.

The perimeter fencing for the ANG cantonment area will be either a three-strand barbed wire or cyclone fence. A cyclone fence would significantly affect the movement of deer in and out of the area. This effect could be minimized with small openings which allow passage.

The reduced human use of the base wildlife resources for hunting would result in insignificant increases in wildlife numbers, except for pheasants which would no longer be stocked. Hunting would continue by ANG, retired military, and Portsmouth Naval Shipyard personnel during the caretaker status of the base.

Due to scarcity of data, environmental impact assessments rarely consider noise effects on wildlife. Aircraft noise is known to cause a startled response in wildlife, but the accompanying physiological response has not been well studied. Noise has been shown to affect the reproduction of various groups of animals. Negative reproductive effects of aircraft noise could potentially decrease populations of wildlife species, but few studies have examined the effects of noise on wildlife at the population level. Thus, it is likely that the closure of Pease AFB and the significant reduction in aircraft noise will benefit wildlife, but to an unknown degree.

The reduced air, water, and soil pollution that will result from the closure will also benefit wildlife to an unknown degree. Past accidental spills undoubtedly affected the food chains of some wildlife species. The use of some pesticides may still be necessary during caretaker status, such as for mosquitoes if they become a serious nuisance.

4.8 ENDANGERED, THREATENED, AND SENSITIVE SPECIES

No adverse effects to the endangered bald eagle are expected to occur as a result of closure or IRP activities. The Wintering Bald Eagle Management Agreement will continue to be in affect during the caretaker status of the base property.

Upland sandpipers are also not expected to be adversely affected by closure or IRP activities. The grassland strip between the runway and apron will not be used for the staging of any movement of equipment. The strip will continue to be mowed during caretaker status because the runway will still be used by the ANG. It is assumed that mowing frequency and timing will not change.

Both species would be expected to benefit from reduced noise stress when the aircraft use of the base is reduced. The potential for accidental collision of the two species with aircraft will also be reduced. Because these species are limited in number, these beneficial effects can be considered significant.

Impacts to natural communities located on base that are of statewide or national significance would not be expected to occur even though the locality of these communities are not presently known. This is because the activities that will be causing disturbances will be occurring in areas that have been previously heavily disturbed.

4.9 VISUAL AND ESTHETIC VALUES

Impacts to visual and esthetic resources are not expected to be significant. Even though mowing activities will be reduced, a neat appearance, as opposed to a well manicured appearance, will be maintained on the base property during caretaker status by the caretaker work force. Litter will also be managed to maintain a neat appearance.

Scenic overlook areas will not be disturbed by any closure or IRP activities. It is expected that trails will continue to be used by retired military, ANG, and Portsmouth Naval Shipyard personnel. The trails will be occasionally checked for litter.

Significant deterioration of the outside of buildings is not expected because the exterior of all base buildings have been recently painted. Significant deterioration of streets is also not expected because the majority of the base roads have been completely rebuilt.

Base security will continue until the ANG unit can perform as a stand-alone unit. This security will prevent any vandalism of base property during this period. Upon attainment of stand-alone status, ANG security police will prevent vandalism to the extent possible.

4.10 CULTURAL RESOURCES

One base property, the Newington Stone Schoolhouse, is on the National Register of Historic Places (NRHP) as part of the Newington Center Historic District. This building has been leased to the town of Newington for a period of 50 years. This lease will remain in effect during the caretaker status of the base. Thereby, closure will have no effect on this property.

A State Historic Preservation Office (SHPO) staff architectural historian visited the Loomis house and the caretaker's house in June 1989. Based on that visit, these buildings may/may not be eligible for inclusion on the NRHP. Necessary repairs to prevent deterioration while the base is in caretaker status will be coordinated with the SHPO. Access to the base will continue to be restricted. Under these conditions, closure will have no effect on these structures.

Ground disturbance associated with closure will be restricted to the activities discussed in the soil and ground water resource sections. These actions will be coordinated with the SHPO, and surveys will be conducted as necessary. Other prehistoric and historic archeological

resources which may be present on the base will not be affected by closure.

4.10 EMPLOYMENT

Several environmental resources are effected by both the realignment of aircraft and support personnel and by base closure, with conversion to caretaker status. These resources include employment, the area economy, government finance, housing, recreation and noise. Both actions are evaluated in considering these resources so the combined effect of the actions can be given appropriate consideration. Aspects of employment effected by realignment and base closure are; direct loss of employment due to the elimination of military and civilian jobs; indirect loss of jobs due to the reduction of expenditures in the area economy; and reduction in the area second and part time job labor force.

4.10.1 Direct Employment

As shown on table 4.10.1-1 realignment would directly result in the loss of 1,471 military and 11 civilian jobs at Pease AFB. Most military personnel would be transferred to other installations. Civilian personnel would be given other federal jobs, be retired or terminated.

An additional 1,930 military jobs and 397 civilian jobs would be eliminated at Pease AFB as the result of base closure. A caretaker force of 50 persons would remain following closure. In addition to uniformed and civilian Air Force workers, 86 civilian base exchange and commissary jobs would be lost when these facilities close.

Table 4.10.1-1
Direct Employment Loss

	Realignment	Closure	Combined Loss
Military	1,471	1,930	3,401
Civilian	11	397	408
Base Exchange/Commissary	-0-	86	86
Total	1,482	2,413	3,895

With the retention of 50 caretaker jobs there would be a net direct loss to area employment of 3,845 jobs. Most of these would be military jobs moved to other bases. Although moving military jobs would have an effect on the local economy it would not directly create unemployment because, for the most part, individuals would be trans- ferred along with

the jobs. Only 494 civilian Air Force and base service type jobs would be eliminated. This constitutes less than one percent of the area employment. Adverse effects caused by lost employ- ment would be diminished by; placement of some employees in other Federal jobs, the tight labor market, and the rapid economic growth being experienced in the area. For these reasons adverse effects on unemployed persons should be temporary and the adverse impact to em- ployment, including the combined impact of realignment and base closure are not considered significant.

4.10.2 Indirect Employment

Realignment and base closure would reduce the level of Federal funds directly, through purchases, and indirectly, through payrolls, expended in the Pease AFB impact area. This reduction in expenditures will result in a reduced level of economic activity and ultimately in a lower level of employment than would be experienced without the reduc- tion in Federal expenditures. This loss will adversely effect the local economy and job market. Because of the rapid growth, which has been experienced in recent years and is expected to continue, adverse effects on employment are expected to be short lived. Job losses due to reduce local Federal expenditures should be less than would normally be expected and short lived in the rapidly expanding impact area economy which averaged an increase of approximately 7,400 jobs per year between 1977 and 1986. (Insufficient project description data has been provided to allow the use of an economic impact model to estimate changes in indirect employment.)

4.10.3 Second Job and Part Time Labor Force

The area labor force would be reduced in two ways by realignment and base closure activities. This is because many spouses and depen- dents of uniformed military personnel have full time jobs and many military personnel, spouses, and dependents have second jobs.

Second Jobs. An unknown number of military spouses and dependents have second jobs. The loss of the employees in these jobs due to realignment and base closure will have an effect on the labor force and potentially adverse effect on the employers utilizing this segment of the labor force. The impact on the labor force is not expected to be significant because at the same time the labor force is being reduced other workers will become temporarily unemployed due to reductions in direct and indirect employment. This will also result in little effect on employers, although some retraining may be required. Project

description figures have not been provided on the number of military spouses and dependents holding second jobs, with the military job considered primary.

Part Time Jobs. Many uniformed military personnel assigned to Pease AFB hold part time jobs in addition to their base duties. These individuals provide an important part time labor source to area employers, especially in Portsmouth and Newington. Removal of this labor source will contribute additional pressure to an already tight part time labor market. As shown on table 3.12.2-4 there are an estimated 2,000 persons in the impact area who desire part time employment and do not have it. In light of the size of the economic impact area it is likely that many of these persons do not reside sufficiently close to the Portsmouth-Newington vicinity to replace part time employees from the base. Additional persons will need to be attracted to the part time labor force to fill the gap left by realignment and closure. This will require increased wages for part time employees. This increase will beneficially impact the employees and adversely effect the em- ployers. Neither impact is considered significant. (Estimates of part time labor force reductions due to realignment and closure have not been provided as part of the project description. These estimates are necessary before this section can be completed.)

4.11 GOVERNMENT REVENUES/EXPENDITURES

Local government tax revenues will likely decline as a result of reduced economic activity due to lower Federal expenditures in the local economy following realignment and base closure. Federal impact aid to education, which is designed to partially offset the cost of educating students who live on military bases or whose parents work on military bases, would also be reduced in line with the reduction in students. Additionally, facilities or services provided by the base could be curtailed and would adversely effect the budgets of local governments using the facility or sharing the services. (Insufficient project description has been provided to run an economic impact model to estimate changes in government revenues.)

4.11.1 Education

Portsmouth School System. The Portsmouth public school system will be adversely impacted by both realignment and base closure. Realignment will result in the loss of student enrollment and reduction in the school budget. Base closure will further reduce school system enrollment and budget and will also effect the need for two elementary

schools located on base. As shown on tables 4.11.1-1 and 4.11.1-2 the combined impact of both actions will greatly effect the city's school department. The timing of these actions will be critical to the level of significance associated with these impacts.

. Enrollment - dependents of uniformed military personnel attending the Portsmouth city schools would be moved out of the system as a result of realignment and base closure. Dependent students living on base would be lost to the system inasmuch as base housing would not be occupied. Dependent students living off base would eventually be replaced by new students of families moving into off base housing vacated by military families. Changes in both groups due to realign- ment and closure are presented on table 4.11.1-1. In addition to military dependents, students with one or both parents working on the base would also be effected. Some unknown number of these students would relocate. All would lose their eligibility for Federal impact aid to local education. (Completion awaiting additional project description.)

. Revenue - as shown on table 4.11.1-2 school revenue would be cut by both realignment and base closure. The largest single reduction would be Federal school impact aid, reduced an estimated for realign- ment and for closures with a total estimated reduction of for both actions. These reductions constitute , and percent of the schools 1988-89 budget for realignment, base closure and the combined impact respectively. As shown, additional funds would be lost from state drivers education and student activity charge sources. These are difficult to estimate because they relate to future enrollment, but would clearly worsen realignment and base closure impacts on the school budget.

Table 4.11.1-1
Portsmouth School System Enrollment Changes

Dependent Students Effected	Realignment No.	Realignment Percent Enrollment	Base Closure No.	Base Closure Percent Enrollment	Combined Impact No.	Combined Impact Percent Enrollment
On base						
Off base						
	(Insufficient project description provided to complete table)					
Non-military Students Effected						
Total Effected						

Table 4.11.1-2
Portsmouth School System Revenue Impacts

	Realignment		Base Closure		Combined Impact	
	Reduction ($1000)	Percent Budget	Reduction ($1000)	Percent Budget	Reduction ($1000)	Percent Budget
Federal impact aid						
Drivers ed/ student fees						
(Insufficient project description provided to complete table)						
Total						

(Completion of tables and analysis awaiting additional project description.)

. Timing - the timing of realignment and base closure actions are critical to the significance of impacts on the school budget. A decrease in the number of Federal and impact eligible students following finalization of the Portsmouth school department's budget, which is part of the city budget, in July but prior to the official count of Federal aid eligible students taken in October could seriously impact the school budget. Plans call for personnel draw down for realignment and base closure through the July to October period in 1990. Students lost to the system during this period will adversely effect the school budget at a time when the school is less capable of addressing bud- getary changes. The importance of this impact can be diminished through close coordination between the base and school during the school budget development process.

. School Buildings - the combined impact of realignment and base closure will result in the closing and mothballing of Bracket and Jones elementary schools which are located on the base. These schools will be closed simply as a cost-saving measure because there will be insufficient elementary students to justify their combined operation. School closure will occur along with base closure because of reduced enrollment and revenue. The on base community of which these schools are a part will be vacated and closure of these schools is not a significant impact of itself.

4.11.2 Fire Fighting and Rescue Assistance

Base fire fighting and rescue operations would be continued during the caretaker period. Therefore there would be no change to the level of service provided surrounding communities in the past.

4.12 HOUSING

The demand for rented and owner-occupied housing would be diminished by both realignment and base closure actions. On base housing would also be vacated. The magnitude and effects of these changes are discussed below.

4.12.1 Housing Changes

Realignment and base closure activities will cause the transfer of uniformed and some civilian personnel out of the Pease AFB area. The greatest change will be caused by the relocation on uniformed military personnel who, with the exception of dependents and discharged persons staying on in the area, will be wholly removed. Uniformed military personnel who are not housed in dormitory housing on base, are either housed in residential structures on base or own or rent residences off base. The number of persons residing in each class of residence who are effected by realignment and base closure are presented in table 4.12.1-1. As shown on this table a maximum of 1,850 rental units and 220 owner-occupied units would be effected by the combined realignment and base closure actions. An additional 1,209 households would be effected on base.

Table 4.12.1-1
Military Household Relocated

	Realignment		Base Closure		Combined Impact	
	(1) H'hold	(2) Persons	(1) H'hold	(2) Persons	(1) H'hold	(2) Persons
Off Base						
Rental	497	1,175	1,353	2,218	1,850	3,393
Owner occupied	47	171	173	563	220	734
Total off base	544	1,346	1,526	2,781	2,070	4,127
On base	390	1,419	819	2,665	1,209	4,084
Total All Housing	934	2,765	2,345	5,446	3,279	8,211

Table 4-12.1-1 (Cont'd)
Military Household Relocated

(1) Assumes all military personnel living off base are in separate households. Households are estimated to the extent more than one military persons live in the same dwelling.

(2) Figures include military and dependent persons and assume the same number of persons per household for owner-occupied dwellings as for base housing (3.64 person/household for realignment and 3.25 persons/household for closure).

4.12.2 Housing Market Effects

Rental Housing. In 1980 approximately 32 percent of the economic impact area households were rental units. If this proportion holds true for 1988, the approximately 57,400 of the areas' 179,430 housing units are rented property and the remaining 122,030 are owner-occupied. Realignment will result in the vacating of up to 497 units comprising slightly less than 1 percent of the total. Base closure will vacate an additional 1,353 units or 2 percent of the area rental units. The combined action will vacate up to 1,850 or 3 percent of the area's rental units. The reduction in the number of renters caused by the combination of these actions will occur in a period of approximately 1 year. Some of these units will be filled rapidly by area population growth which is projected to be a healthy 1.6 percent annually through 1993. Additionally, the Pease AFB area housing market is effected by growth outside of the area, primarily that occurring in Boston, Massachusetts. This growth has kept the housing market tight in recent years and will continue to influence it in the future. For these reasons the decrease in demand for housing units caused by realignment, base closure, and the combined impact of these separate actions is not considered significant.

Owner-occupied Housing. The combined realignment and base closure actions will effect 220 households currently owning homes in the area. These units constitute less than 0.2 percent of the area's owner-occupied housing units. This is a very small portion of the total number of housing units and is not expected to have a discernible effect on the area housing market.

Base Housing. Under closure conditions base housing will not be utilized by other than caretaker personnel. For this reason no effect on the housing market is anticipated.

4.13 SERVICES FOR MILITARY RETIREES

Military retirees and their dependents are authorized access to many of the services and facilities provided on base for active duty personnel. These include base commissary and exchange privileges, medical treatment, and access to recreational facilities. Because of the advantage of being near a base with a high level of services, many retirees have located in communities near Pease AFB. The commissary, base exchange, hospital, and like facilities will be closed and special access privileges for retirees terminated upon closure of the base and its conversion to caretaker status.

4.13.1 Commissary Privileges

The Pease commissary recorded sales of over $24,000,000 in 1988. According to a survey of commissary users 70 percent of this total, or $15,000,000 was due to purchases made by retired military persons and their dependents. This reflects an average expenditure of approximately $1,000 per retiree for those reported as living in the area services by the base. However, this is an average figure and retirees living close to the base would likely spend more at the commissary while those living at a distance would spend less. The food stuffs and dry goods at the commissary are estimated to be 20 to 35 percent less costly than those available off base. This difference results in an average savings of from $200 to $350 per retiree. Again, the actual savings would depend on commissary use with retirees living closer likely to use it more frequently than those living at a greater dis- tance. There are three alternative bases with commissaries located within a distance of 100 miles from Portsmouth, New Hampshire. These are Hanscom AFB, Bedford, Massachusetts, located 65 miles south of Portsmouth, Fort Devens, near Ayer, Massachusetts, located 83 miles southwest of Portsmouth, and Brunswick NAS, Brunswick, Maine, located 58 miles northeast of Portsmouth. Retirees not living in the city of Portsmouth would be closer to these alternative bases, depending on their place of residence. The closure of Pease AFB commissary would adversely effect retirees and their dependents currently using it. Retirees would have to travel a greater distance to obtain the cost advantage of a commissary or would have to expend additional funds for the same goods locally.

4.13.2 Base Exchange Privileges

The base exchange (BX) provides goods and services like those available in a small regional shopping center, with exception of

groceries which are available at the commissary. At Pease, the BX operates a department store, service station, barber shop, beauty salon, liquor store, theater, optical shop, flower shop, laundry and dry cleaning facilities. Total sales for goods and services for the year of 1988 were at $17,000,000. By management estimates 50 percent or $8,500,000 of these sales are to retired military personnel and their dependents. This reflects an average annual expenditure of approximately $600 per retiree for those reported as living in the area serviced by the base. BX prices for goods and services are 23 and 20 percent of off base retail prices respectively. This difference re- flects an average savings of roughly $130. The actual saving would depend on BX use with close retirees more likely to use it than those residing at a greater distance. Alternative BXs are located at the same bases identified as having commissaries. The closure of the BX would adversely affect retirees and their dependents currently using it. Relatives would have to travel a greater distance to obtain goods and services at BX prices or would have to expend additional funds for the same goods locally.

4.13.3 Medical Services

(Insufficient project description provided to complete this section.)

4.13.4 Recreation Access

Military retirees and their dependents presently have access to base recreational facilities. Closure of the base would preclude the use of these facilities by retirees. This would have an adverse effect on retirees who presently use those facilities. Recreation activities and the volume of recreational use is discussed elsewhere in this report.

4.14 NOISE

Noise levels in adjacent communities and in approaches to Pease AFB will be reduced from those presented in the 1987 AICUZ report for the base under both realignment and base closure conditions. Adverse effects on existing land uses, which are incompatible with high noise levels and recommended restrictions to future land use development due to noise, will also be diminished. The greatest reduction will result from the combined effect of the two actions.

4.14.1 Realignment Noise Reduction

Realignment Condition. For noise analysis purposes, realignment is identified as the removal of all FB-111 and Air Force KC-135 tanker aircraft. Tanker aircraft operations have been reduced by 53 percent to reflect this change and the continued operation and the continued operation of NHANG KC-135s. Baseline conditions are those presented in the 1987 AICUZ report. NHANG tankers have been reclassified as KC-135E from the KC-135As considered in the AICUZ report to reflect the use of the quieter engines. All T-37 training and transient aircraft operations included under the realignment condition.

Noise Reduction. The area with sufficiently high noise level to effect present use or future development will be reduced. Under the realignment condition, the total area within a noise contour of 65 DBL or greater will be reduced by approximately 35 percent. The area of contours having levels of 70 to 85 DBL or greater will be reduced by approximately 40 percent. The distance the noise contours extend from the end of the runway in the approaches will also be diminished somewhat. Land uses effected include residential, industrial, public, and commercial. The reduction in noise levels will have a beneficial impact on effect land use. Not all of the noise reduction is due to reduced activity. Part of the noise reduction benefit is due to the replacement of "A" type aircraft engines on the NHANG KC-135 tankers with the quieter "E" type engines. The impact is not considered significant.

4.14.2 Closure/Combined Noise Reduction Closure/Combined Condition. For noise analysis purposes, the closure condition combines realignment and base closure actions. Changes from the baseline include the actions described for realignment conditions. Additionally T-37 aircraft are removed and transient operations are curtailed. Under this condition only NHANG KC-135E tankers are operated.

Noise Reduction. The area with sufficiently high noise levels to effect present land use or future development will be greatly reduced under this condition. The total area within a contour of GS-DBl or greater will be reduced by approximately 65 percent. The area of contours having levels of from 70 to 85 or greater will be reduced from two thirds to three quarters, with the higher levels projected to having the greatest reduction. The distance the noise contours extend from the end of the runway in the approaches will also diminish. Land uses effected include residential, industrial, public, and commercial. Some incompatible uses are no longer in the noise contours. In other

instances, the noise level is reduced thereby effecting incompatible land use to a lesser degree. Because of the magnitude of the large change in the area of the noise contours and the high level of controversy surrounding past noise problems, the beneficial impact of reduced noise levels is considered significant.

4.15 OUTDOOR RECREATION

Outdoor recreation is a resource effected by both aircraft and support personnel realignment and base closure, with conversion to caretaker status. For this reason both actions are evaluated to provide appropriate consideration for their combined effects.

4.15.1 Realignment/Activity Reduction

The realignment of aircraft and support personnel will result in a reduction in the number of persons eligible to use the base recreation facilities. Approximately 25 percent of the military personnel and dependents at Pease AFB will be relocated as a result of transfers due to realignment by April 1991. This will reduce the use of base outdoor recreation facilities. The loss of outdoor recreation activity is not considered significant because such transfers are a normal adjunct of military life, with reassignments occurring periodically. Additionally, in most instances alternative outdoor recreation opportunities will be provided by the Air Force at the next assignment thereby minimizing the adverse impact to those affected.

Realignment may result in a slight increase in the quality of the recreation experience at base facilities due to a decrease in crowding on peak use days and to the reduction in noise level. This also is considered an insignificant effect.

4.15.2 Base Closure

Following base closure and conversion to caretaker status recreation facilities will not be manned or maintained at a level sufficient to accommodate recreation activities. Outdoor recreation activities including fishing and hunting will cease.

Recreation Facility Loss. Base closure of itself, will not cause the loss of recreational facilities. Some deterioration of facilities may result from the period of non-use and no maintenance which will be experienced during the caretaker status.

Recreation Use. All outdoor recreation activity, as described in Chapter 3, will cease on the base as a result of closure. This will result in a loss of approximately 12,000 visitor days annually, including hunting, fishing, camping, picnicking, winter sports, and water sports. Fishing, picnicking, and water sports account for 82 percent of the loss.

These facilities are not open to the general public. Two primary groups will be effected by the loss of recreation. These are military personnel and their dependents and civilian workers in the area who currently use the base's outdoor recreation facilities, and retired military personnel and their dependents in the area who currently use the base's outdoor recreation facilities. With regards to the first group, with the exception of the magnitude, the adverse effect of lost recreation for closure is like that of realignment. Although the magnitude of the reduction in visitor days is greater, the impact is to persons who for the most part are periodically transferred to other assignments with varying levels of outdoor recreation opportunities. Civilian workers with access to base outdoor recreational facilities are in a similar status inasmuch as their use is job dependent and their access is subject to being eliminated due to transfer, retirement or termination of employment. For these reasons recreation loss to this group is not considered significant.

Persons in the second group have selected the area for retirement from the military and are less mobile than active military personnel. Their reasons for retiring in the Pease AFB vicinity may include, but are probably not largely dependent on access to base outdoor recrea- tional facilities. The elimination of access to those facilities would have an adverse effect on the members of this group currently using them. Inasmuch as their access to the base is directly related to former employment and there is no long term commitment by the Air Force to provide these outdoor recreational opportunities to retirees this adverse effect is not considered a significant loss of recreation.

CHAPTER 5 CONSULTATION AND COORDINATION

5.1 GOVERNMENT AGENCIES AND ORGANIZATIONS

The following government agencies and organizations provided information or were contacted for information during the preparation of the DEIS. The subject matter of the information is also presented in this listing.

5.1.1 Federal Government

USAF, Headquarters - closure policy
USAF, Strategic Air Command - description of action and baseline conditions.
USAF, Pease AFB - description of action and baseline conditions

U.S. Environmental Protection Agency - scoping
U.S. Department of Interior, Fish and Wildlife Service - scoping, Endangered Species Act, effects of aircraft noise on wildlife
U.S. Department of Interior, National Park Service - scoping
U.S. Department of Transportation, Federal Aviation Administration - scoping
U.S. Department of Commerce, National Oceanic and Atmospheric Administration - scoping, Great Bay National Estuarine Research Reserve Management Plan, National Marine Pollution Program
U.S. Department of Agriculture, Soil Conservation Service - soil survey
U.S. Department of Health and Human Services - scoping

5.1.2 State Government

New Hampshire Department of Adminstrative Services - scoping
New Hampshire Attorney General - scoping
New Hampshire Department of Environmental Services - scoping
New Hampshire Air Resources Commission - air quality
New Hampshire State Historic Preservation Office - cultural resources
New Hampshire Department of Employment Security - scoping
New Hampshire State Representatives - scoping
New Hampshire Office of State Planning - Population and housing data and selected planning and zoning regulations
New Hampshire Department of Employment Security - Labor statistics
Maine State Planning Office - scoping
Maine Department of Labor, Bureau of Employment Security - Labor statistics

5.1.3 Local Government

Newington Board of Selectmen - scoping
Newington Zoning Administrator - Town zoning ordinance
Portsmouth Mayor - scoping
Portsmouth Planning Director - scoping
Portsmouth City Manager - scoping
Portsmouth City Councilman - scoping
Pease Redevelopment Commission - scoping

5.2 GROUPS AND ORGANIZATIONS

The following list of interested groups and organizations either participated in the scoping process or otherwise indicated an interest in the proposed action.

Aircraft Owners and Pilots Association
Audubon Society of New Hampshire
Conservation Law Foundation of New England
Great Bay Green Assembly
Nature Conservancy, Eastern Heritage Task Force
Save Pease Committee
Seacoast Military Retirees
Society for the Protection of New Hampshire Forests
Sherburne Civic Association
University of New Hampshire, Progressive Student Network

5.3 PREPARERS

The following is a listing of the preparers of the DEIS. These individuals made a significant contribution to the development, preparation, or drafting of the document.

Name	Discipline/ Expertise	Experience	Role in Preparing EIS
Richard Miner	Sociology, Project Director	15 years, EIS	EIS Reviewer
Robert Nebel	Biology/Ecology, Project Mgmt	10 years, EIS Studies	EIS Manager Environmental Sections

Name	Discipline/ Expertise	Experience	Role in Preparing EIS
Gene Sturm	Urban Planning, Socioeconomic Analysis	7 years, EIS Studies	Socio-economic Sections
Ellen Cummings	Archeologist	16 years, EIS Studies	Historic Resources Sections