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EPA/ROD/R01-94/093
December 1994

EPA Superfund Record of Decision:

Pease Air Force Base, Site 8, NH 9/30/1994

Record of Decision
for Site 8
Pease Air Force Base, New Hampshire

September 1994

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Record of Decision
for Site 8

Pease Air Force Base, NH

September 1994

Prepared for:

Headquarters Air Force Base Conversion Agency (HQ AFBCA)
The Pentagon, Washington, DC 20330

Air Force Center for Environmental Excellence
Base Closure Division (AFCEE/ESB)
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RECORD OF DECISION
SITE 8

Table of Contents

RECORD OF DECISION
SITE 8

Table of Contents
(Continued)

RECORD OF DECISION
SITE 8

List of Tables

RECORD OF DECISION
SITE 8

List of Tables
(Continued)

List of Tables
(Continued)

RECORD OF DECISION
SITE 8

List of Figures

List of Figures
(Continued)

DECLARATION

SITE NAME AND LOCATION

Pease Air Force Base (Pease AFB), Site 8, New Hampshire

STATEMENT OF BASIS AND PURPOSE

This decision document presents a selected remedial action designed to protect human and ecological receptors at Site 8, Pease AFB, New Hampshire. This document was developed in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (42 USC Subsection 9601 et seq.), as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986, and the National Contingency Plan (NCP) (40 CFR Part 300). Through this document, the Air Force plans to remedy the threat to human health, welfare, or the environment posed by contamination at Site 8. This decision is based on the Administrative Record for the site. The Administrative Record for the site is located at the Information Repository in Building 43 at Pease International Tradeport (formerly Pease AFB). The Administrative Record Index as it applies to Site 8 is provided in Appendix D.

The State of New Hampshire Department of Environmental Services (NHDES) concurs with the selected remedy.

ASSESSMENT OF THE SITE

Actual or threatened releases of hazardous substances from Site 8, if not addressed by implementing the response action selected in the Record of Decision (ROD), may present an imminent and substantial endangerment to public health, welfare, or the environment.

DESCRIPTION OF THE SELECTED REMEDY

This action addresses the principal threat posed by Site 8, preventing endangerment of public health, welfare, or the environment by implementation of this ROD through remediation of the soil and groundwater, and, consequently, minimizing the leaching potential of soil contaminants.

The selected remedy includes in situ soil vapor extraction (SVE) treatment of source area soil contaminated above cleanup goals. Extracted soil vapor will be treated for removal of volatile organic compounds (VOCs). The remedy also will involve the construction of an asphaltic concrete cap to minimize rainfall and snowmelt infiltration into the area of SVE treatment. The cap will help to minimize the moisture content of the soil to be treated by SVE. One component of the alternative involves recovery and off-base disposal of free-phase product floating on the water table in the source area. A groundwater recovery system will be designed to capture dissolved-phase contamination in overburden groundwater that exceeds cleanup goals and to prevent continued migration of contaminated groundwater to the bedrock groundwater. An on-site groundwater treatment plant (GWTP) will be constructed for long-term treatment of recovered groundwater.

STATUTORY DETERMINATION

The selected remedy is protective of human health and the environment, complies with federal and state requirements that are legally applicable or relevant and appropriate to the remedial action, and is cost effective. The remedy uses permanent solutions and alternative treatment technologies to the maximum extent practicable. The determination will reflect the requirement of CERCLA 120(b)(i) that states "Remedial actions, in which treatment that permanently and significantly reduces the volume, toxicity, or mobility of hazardous substances, pollutants, or contaminants is a principal element, are to be preferred over remedial alternatives not involving such treatment." A review will be conducted by the Air Force, the U.S. Environmental Protection Agency (EPA), and NHDES no less than every

5 years after completion of remediation to ensure that the remedy provides adequate protection to human health and the environment.

The foregoing represents the selection of a remedial action by the Air Force and EPA Region I, with the concurrence of NHDES.

Concur and recommended for immediate implementation:

U.S. Air Force

By: ______________________ Date: September 20, 1994

Alan K. Olsen
Director, Air Force Base Conversion Agency

U.S. Environmental Protection Agency

By: ______________________ Date: 9/20/94

John P. Devillars
Regional Administrator

RECORD OF DECISION SUMMARY

I. SITE NAME, LOCATION, AND DESCRIPTION

Pease Air Force Base (AFB), located in Portsmouth, New Hampshire, is included on the federal National Priorities List (NPL). Based on Remedial Investigations and Feasibility Studies (RI/FSs) conducted at a number of areas at Pease AFB, several areas containing groundwater were identified that require remedial action to address sources of contamination to the environment. This Record of Decision (ROD) addresses contamination at one of the areas, referred to as Site 8 (Fire Department Training Area 2) (FDTA-2). Site 8 is located in the northern portion of Pease AFB in the area designated as Zone 5.

Pease AFB is located in the Towns of Newington and Greenland and in the City of Portsmouth, located in Rockingham County, New Hampshire. As shown in Figure 1, Pease AFB is located on a peninsula in southeastern New Hampshire. The peninsula is bounded on the west and southwest by Great Bay, on the northwest by Little Bay, and on the north and northeast by the Piscataqua River. The City of Portsmouth is located east and southeast of the base. Pease AFB occupies 4,365 acres and is located approximately in the center of the peninsula.

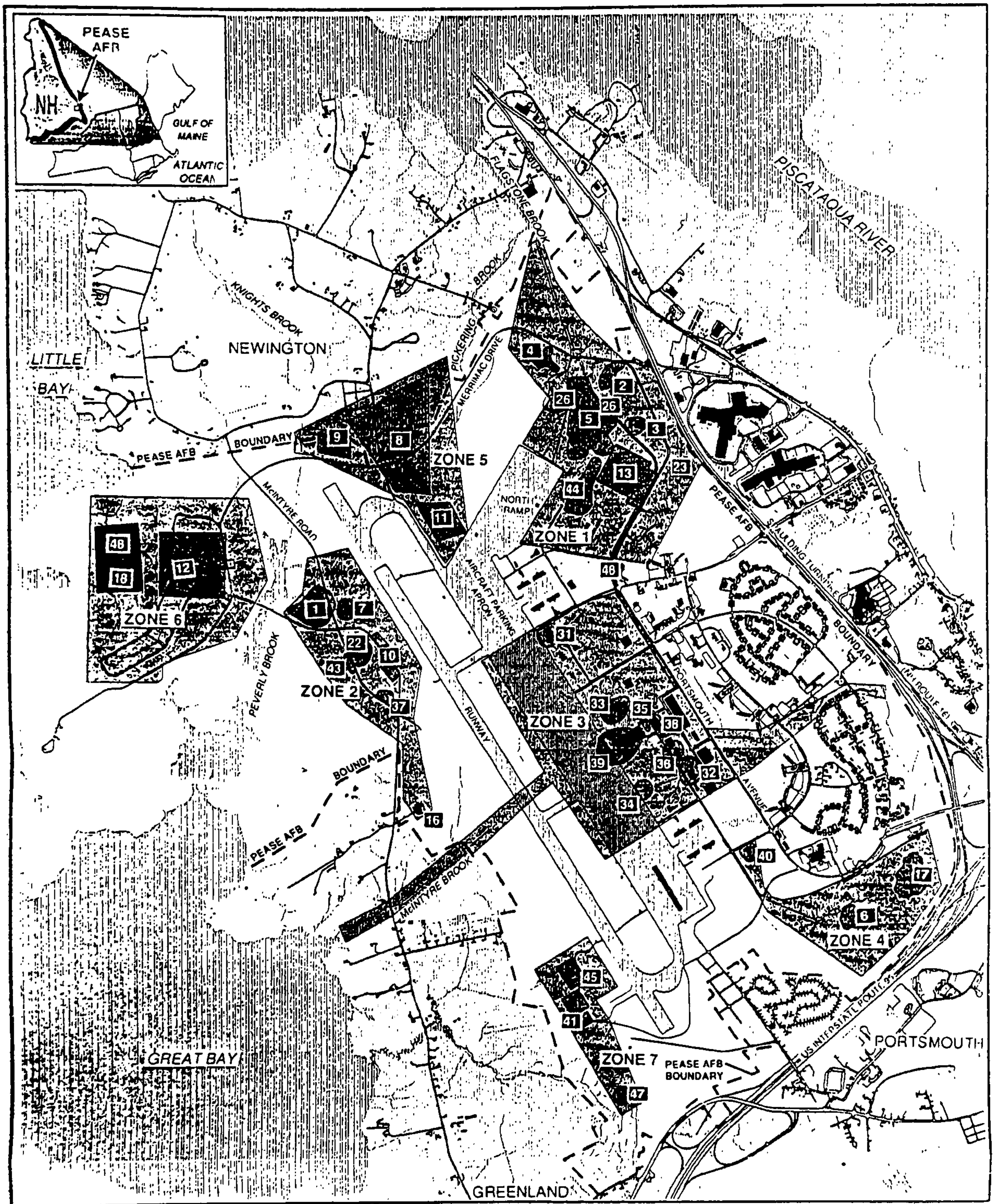
At the beginning of World War II, the U.S. Navy used an airport located at the present Pease AFB. The Air Force assumed control of the site in 1951, and construction of the existing facility was completed in 1956. During its history, Pease AFB has been the home of the 100th and 509th Bombardment Wings whose mission was to maintain a combat-ready force capable of long-range bombardment operations. The New Hampshire Air National Guard (NHANG) relocated the 157th Military Airlift Group from Grenier Field in Manchester, New Hampshire, to Pease AFB in 1966. The mission of the group was changed in 1975, when it was designated as the 157th Air Refueling Group. Over time, various quantities of fuels, oils, solvents, lubricants, and protective coatings were used at the base for routine maintenance operations, and releases of contaminants into the environment occurred as a result of usage and disposal of these and other materials.

In December 1988, Pease AFB was selected as one of 86 military installations to be closed by the Secretary of Defense's Commission on Base Realignment and Closure. The base was closed as an active military reservation on 31 March 1991. NHANG remains at the airfield and uses some of the existing facilities. The remainder of the reservation has been divided among the Department of the Interior, the State of New Hampshire's Pease Development Authority (PDA), and the Air Force. PDA now operates the runway and flightline areas as a commercial airport.

There are approximately 3,700 dwellings within a 1-mile radius of Pease AFB. Based on water usage surveys conducted in 1988 and 1992 and on available U.S. Geological Survey (USGS) and New Hampshire Department of Environmental Services (NHDES) information, it was determined that a number of these dwellings have wells and/or springs located on their associated properties. The Town of Newington, in particular, has a large number of private wells. The majority of Portsmouth residences surveyed are serviced by town water only. A compilation of area springs and wells for Pease AFB, based on information available to date, is presented in the Pease AFB Off-Base Well Inventory Letter Report (G-599) contained in Appendix G of the Draft Final Zone 5 RI Report (G-635).

Surface drainageways at Pease AFB flow radially away from the center of the peninsula, into Great Bay toward the west, Little Bay to the northwest and north, and the Piscataqua River to the east. Little Bay flows into the Piscataqua River at the northern end of the peninsula. Great Bay, Little Bay, and the Piscataqua River are all tidally influenced. Consequently, these water bodies are subject to semidiurnal water level fluctuations.

Land use in the vicinity of Site 8 varies. Site 8 is surrounded by the Field Maintenance Squadron Equipment Cleaning Area (FMS, Site 11) to the southeast, Construction Rubble Dump 1 (CRD-1, Site 9) to the northwest, the Town of Newington to the north, and Taxiway D to the south (see Figure 1). Undeveloped forested land is located along the



LISTING OF CURRENT IRP SITES

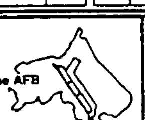
SITE NO	SITE NAME - (ABBREVIATION)		ZONE
1	Landfill 1	(LF-1)	2
2	Landfill 2	(LF-2)	1
3	Landfill 3	(LF 3)	1
4	Landfill 4	(LF-4)	1
5	Landfill 5	(LF 5)	1
6	Landfill 6	(LF-6)	4
7	Fire Department Training Area 1	(FDTA 1)	2
8	Fire Department Training Area 2	(FDTA 2)	5
9	Construction Rubble Dump 1	(CRD 1)	5
10	Leaded Fuel Tank Sludge Disposal Area	(LFTS)	2
11	FMS Equipment Cleaning Site	(FMS)	5
12	Munitions Maintenance Area	(MMA)	6
13	Bulk Fuel Storage Area	(BFSA)	1
16	Building 410 PCB Spill		2
17	Construction Rubble Dump 2	(CRD 2)	4
18	Munitions Residue Burial Area	(MRBA)	6
22	Burn Area 1	(BA-1)	2
23	Pauls Brook		1
26	Flagstone Brook/Railway Ditch		1
31	Building 244		3
32	Building 113		3
33	Building 229		3
34	Building 222 Jet Engine Test Cell	(JETC)	3
35	Building 226		3
36	Building 119		3
37	Burn Area 2	(BA 2)	2
38	Building 120		3
39	Building 227		3
40	Auto Hobby Shop	(AHS)	4
41	Golf Course Maintenance Area	(GCMA)	7
43	McIntyre Road Drum Disposal Area	(MRDDA)	2
44	Paint Can Disposal Area	(PCDA)	4
45	Old Jet Engine Test Stand	(OJETS)	7
46	RR Tracks Herbicides	(RRTH)	1
47	Golf Course Pesticide Area (Mixing/Storage)	(GCPA)	7
48	EOD Burn Detonation Area		6

NORTH

0 500 1000 2000 4000

SCALE IN FEET

Base Map Source:
Detail area of photogrammetric compilation of
PAFB from aerial photography dated 11.23.87



LEGEND:

Areal extent of IRP Zone

48 IRP Site

Site 8 (FTDA-2)
Stage 3, Record of Decision
Pease Air Force Base, New Hampshire

FIGURE 1
GENERAL LOCATION MAP

eastern Site 8 boundary, which includes the Newington Town Forest (which is listed on the National Register of Historic Places). Pickering Brook, which flows off base in a north-northeasterly direction, also is located in the forested land.

Pease AFB officially closed on 31 March 1991. Land uses at the base since closure include industrial, commercial, and military. Figure 2a presents the general vicinity land use map for the Zone 5 area of Pease AFB. The locations of off-base features in the vicinity of Site 8 also are shown in Figures 2a and 2b. Off-base land use is primarily residential, although the Newington Town Forest is located immediately north of the base boundary. The Newington Town Forest, established in 1640 by early settlers, is believed to be the oldest community forest in the United States. This property, totaling 112 acres, was community owned in full from 1710 until 1919, when 5 acres were sold to the church to build a new parsonage. During this communal period, a portion of the property was cleared for pasture and the remainder was held as a source of timber for construction, as a resource for financing public buildings, and as fuel for fires for less fortunate individuals. Approximately 90% of the original property was acquired by the Air Force in 1952. Subsequently, 30 acres were cleared for the runway and 69 acres remained in a natural state and were managed as a forest area by the Air Force. Figure 2b shows the location of the Newington Town Forest area in relation to the boundaries of Pease AFB. The Newington Town Garage is located on the western side of Nimble Hill Road and also is immediately north of the base boundary. Commercial and residential areas are located off base along Spaulding Turnpike, approximately 1,000 feet northeast of the Pease AFB eastern boundary, and Interstate I-95, which is located along the southeastern base boundary. The largest commercial complex is a shopping mall located on the eastern side of Spaulding Turnpike. Other nonresidential land uses in the vicinity of Site 8 include a cemetery on Nimble Hill Road and an abandoned transfer station located on Little Bay Road.

Pickering Brook is the primary surface water pathway that carries runoff away from the Site 8 area toward the Piscataqua River (see Figure 3). The headwaters of Pickering Brook are located in an extensive, forested wetlands area. Pickering Brook flows off base approximately 1,500 feet downstream and then joins Flagstone Brook to flow into the

Piscataqua River. Before Pickering Brook reaches Flagstone Brook, it joins other small tributaries that flow from properties along Fox Point Road, which is northeast of Site 8. In addition to Pickering Brook, several wetlands areas exist in the vicinity of Site 8. The wetlands northeast of Site 8, identified as Wetlands XII, are relatively extensive. East of Merrimac Drive, at the headwaters of Pickering Brook, Wetlands XIII surrounds the brook. Wetlands XIII is immediately adjacent to Flagstone Brook, and a portion of it flows into Flagstone Brook near its conjunction with Merrimac Drive. It is not known whether Site 8 is within a 100-year floodplain because floodplain location maps are not available for Pease AFB.

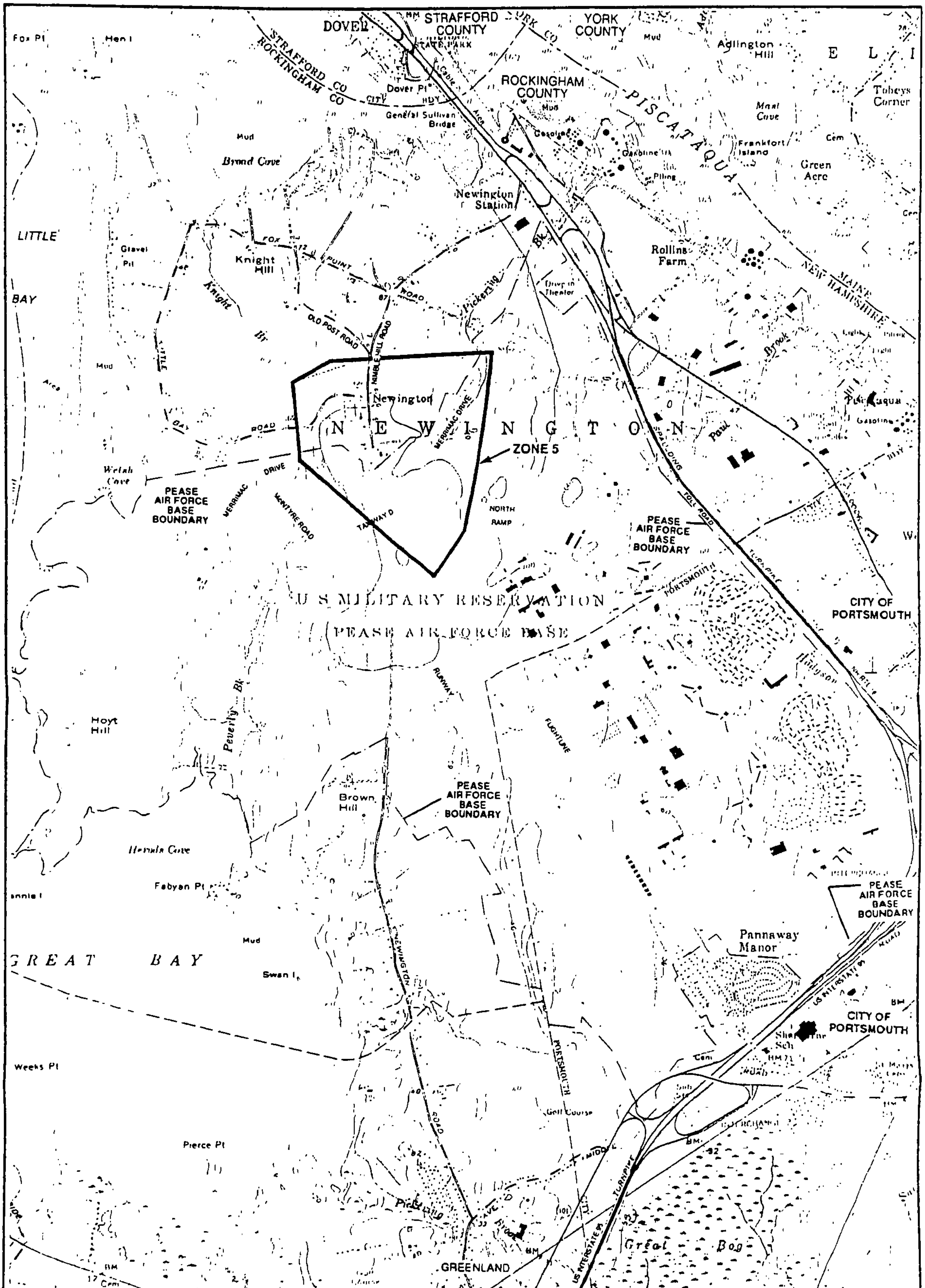
Site 8 slopes toward the north from a high of approximately 117 feet above mean sea level (ft MSL) in the southeast to approximately 50 ft MSL to the north-northeast. Less than 10 feet of relief exists across the former burn areas. A bedrock outcrop exists in the southeastern part of the site area. A more complete description of the site is presented in the Draft Final Site 8 RI Report (G-577).

II. SITE HISTORY AND ENFORCEMENT ACTIVITIES

A. Site Use and Response History

Records indicate that Site 8 was active as a fire training area from 1961 to 1988. The majority of the fire training exercises were performed in a large circular pit area located in the southeastern portion of the site. Small and large aircraft crash fires were simulated using approximately 200 and 500 to 1,000 gallons of JP-4 fuel, respectively.

Fire training exercises were conducted approximately two to four times per month. Exercises were curtailed during the winter months because of adverse weather conditions. Prior to 1971, mixed waste oils, solvents, and fuels were collected from drums and bowers located across the base and transported to Site 8 as the main method of disposal. The pit area was first presaturated with water, and then the waste oils, solvents, and fuel were poured on top of the water and onto mock aircraft. The mixture was allowed to burn for 1 to 2 minutes and was extinguished using an aqueous film-forming foam. Sometime in the



NORTH

500 0 500 1000 2000

SCALE IN FEET

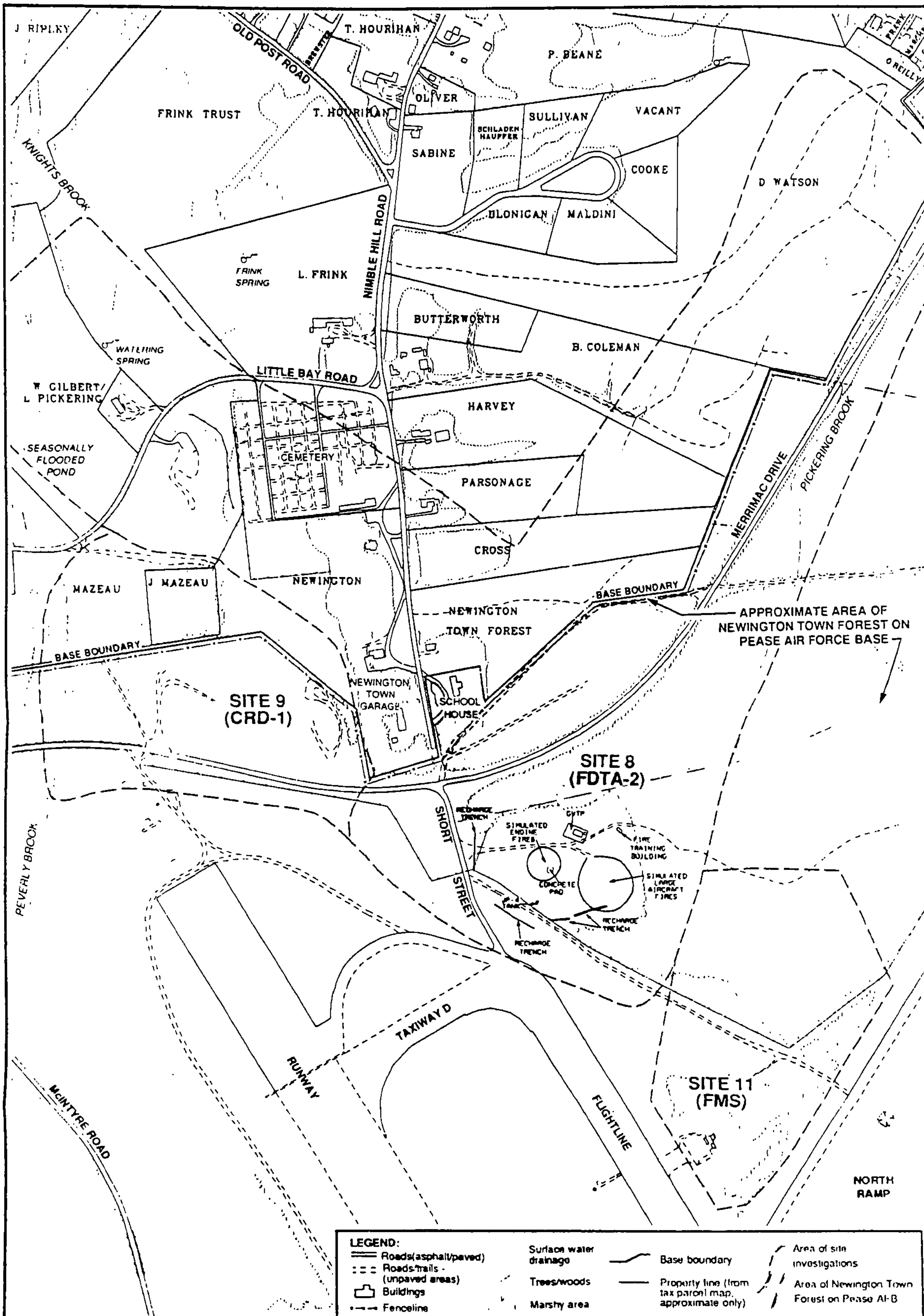
Base Map Source: From USGS 7.5 min series (1:24,000), Portsmouth, NH - ME Quadrangle, dated 1956, PR 1980

Pease AFB

NOTES:

Site 8 (FTDA-2)
Stage 3, Record of Decision
Pease Air Force Base, New Hampshire

FIGURE 2A
GENERAL VICINITY LAND USE MAP



NORTH

SCALE IN FEET

Base Map Source:
Detail area of photogrammetric compilation of PAFB from aerial photography dated 11/23/87

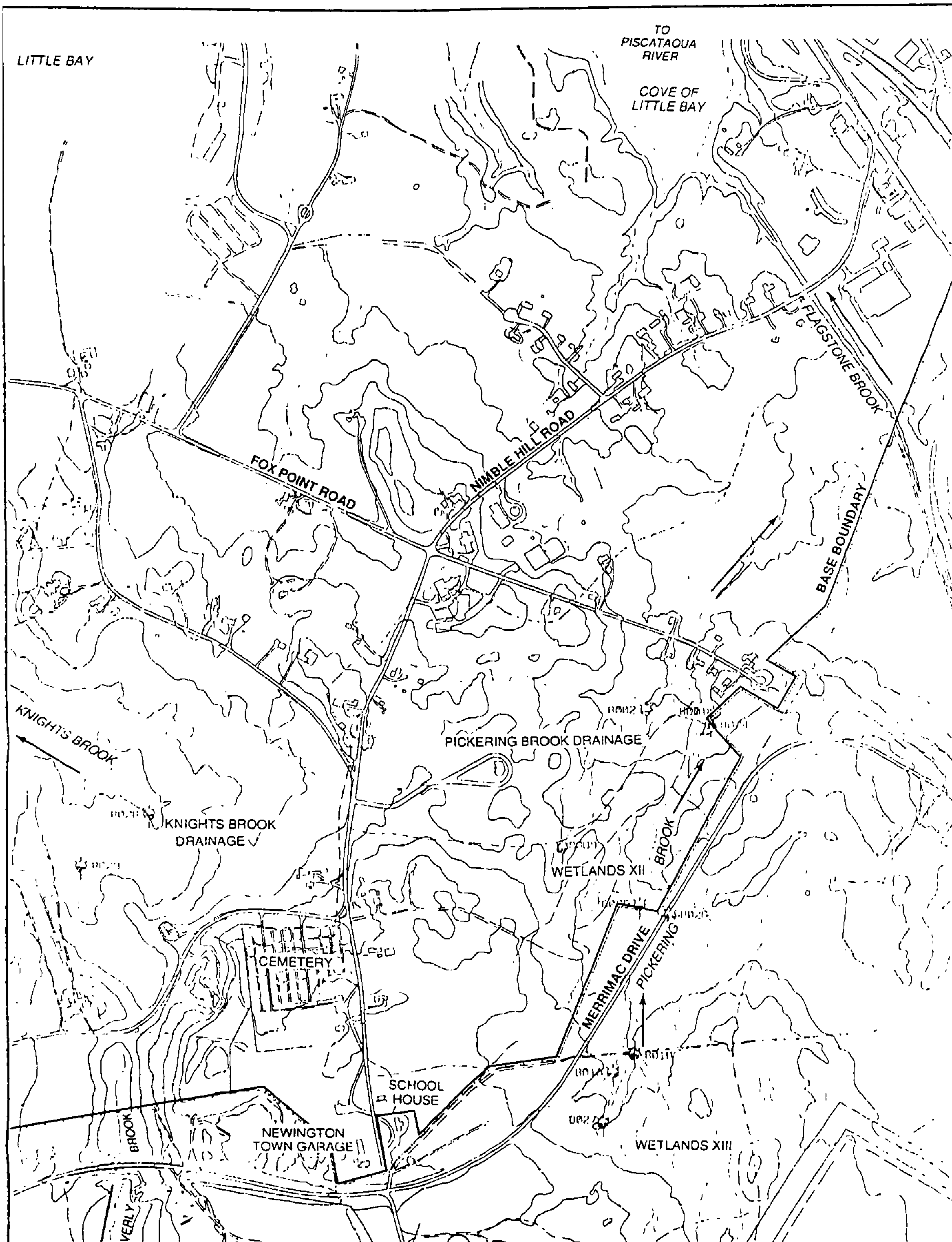
Pease AFB

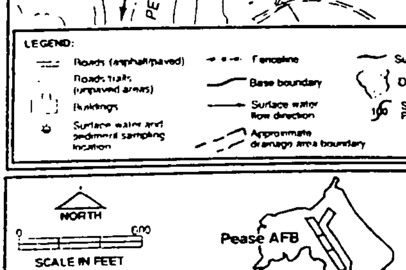
Map Area

NOTE:

Site 8 (FTDA-2)
Stage 3, Record of Decision
Pease Air Force Base, New Hampshire

FIGURE 2B
SITE LOCATION





Base Map Source:
Detail area of photogrammetric compilation of PAFB from aerial photography dated 11/23/87

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Site 8 (FDTA-2)
Stage 3, Record of Decision
Pease Air Force Base, New Hampshire

FIGURE 3
SURFACE WATER AND SEDIMENT SAMPLING LOCATIONS

mid-1970s, the practice of mixing waste oils and solvents with fuel for training fires ceased, and only JP-4 fuel was used. The exact date on which this change occurred is unknown, but was most likely after the pit was refurbished in 1974.

Refurbishment of the large circular pit occurred from 1974 to 1975, and consisted of installation of a sprinkler and drain system. An underground sprinkler-type system was installed that allowed JP-4 to be sprayed onto the pit area through an underground fuel line. An 8-inch-diameter drain pipe, approximately 200 feet long, was constructed at the edge of the burn pit. Excess fuels and fire training materials eventually discharged through this pipe into a drainage ditch at the northern end of the site.

In 1983, an Installation Restoration Program (IRP) Phase I Problem Identification/Records Search was conducted at Pease AFB (G-84). The study identified Site 8 as a potential source for the release of contaminants into the environment. In response to this finding, a presurvey was conducted to obtain sufficient information for use in the planning of a more detailed study. The presurvey was completed in 1984. Based on the presurvey, RIs were conducted at Site 8 and 18 other IRP sites at Pease AFB in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended; the NCP; and all relevant EPA guidance, including EPA's guidance for conducting RI/FSs under CERCLA. The investigations were conducted in three stages from 1984 through 1992.

The Stage 1 investigation at Site 8, which began in 1984, was designed to identify potential impacts of previous fire training activities on soil and groundwater quality at the site. The results of those investigations were presented in the IRP Phase II — Confirmation/ Quantification, Stage 1 Final Report for Pease AFB (G-525), submitted in June 1986.

Stage 2 field work at Site 8 was performed from October 1987 through May 1989. The primary purposes of the Stage 2 investigation were to characterize the source areas and to more accurately delineate the extent of groundwater contamination. The Stage 2 field investigations are described in detail in four Interim Technical Reports (ITR Nos. 1 through

4) (G-530; G-531; G-536; G-537) and in the IRP Stage 2 Draft Final Report for Pease Air Force Base (G-533). Soil-gas and soil sampling and aerial photograph review were used to conclude that the former burn areas at Site 8 were potential source areas for volatile organic compounds (VOCs). During fire training exercises, surface runoff had been discharged from the former burn areas to the drainage ditch located north of the former burn areas. Based on this information, the ditch was identified as a secondary contaminant source.

Stage 3 activities at Site 8 were performed from September 1989 through June 1993, and include the Site 8 RI/FS, two interim remedial measures (IRMs), and a pilot-scale soil vapor extraction (SVE) treatability study. Site 8 RI activities included geophysical surveys; test pit investigations; surface and subsurface soil sampling; groundwater, surface water, and sediment sampling; historic aerial photograph reviews; and hydrogeologic testing. Table 1 provides a summary of RI activities performed to date at Site 8. The Draft Final Site 8 RI and FS Reports were submitted in November 1992 and January 1993, respectively.

The first IRM was performed in February and March 1990 and involved the removal of approximately 262 tons of contaminated soil from a drainage ditch located in the northeastern corner of the site. This drainage ditch received surface runoff from the former main burn pit. The purpose of the soil removal IRM was to prevent potential migration of contaminants from the relatively highly contaminated drainage ditch soil to deeper soil and groundwater. The excavated soil was disposed of off base at a licensed treatment/disposal facility.

The second IRM is a pilot groundwater remediation system, which has been in operation since August 1990. The groundwater remediation IRM was designed to initiate control of off-site dissolved VOC migration and to evaluate a pump-and-treat system as a potential source control measure. Data collected during the operation of the groundwater treatment IRM were used in the preparation of the FS Report, and will be used for design of a final remedial action at the site.

The pilot groundwater remediation system consists of extraction wells, a groundwater treatment plant (GWTP), and subsurface recharge trenches. The system recovers a combined 11 gallons per minute (gpm) from two overburden extraction wells (562A and 566), located at the northeastern end of the source area in the dissolved-phase contaminant plume. Two other overburden wells (563 and 564), equipped with product skimmers, pump product directly to the oil/water (o/w) separator in the GWTP.

Unit processes in the GWTP include o/w separation, metals precipitation, flocculation, clarification, bag filtration, air stripping, and liquid-phase carbon adsorption. The effluent from the GWTP consistently meets drinking water standards, the requirements agreed on by NHDES and the Air Force for discharge through subsurface trenches. A detailed explanation of the pilot groundwater remediation system is presented in the IRP Site 8 Groundwater Treatment Plant Report (G-552). To date, the pilot groundwater remediation system has extracted and treated approximately 5.1 million gallons of contaminated groundwater, and has recovered approximately 1,100 gallons of free-phase product from the subsurface at Site 8.

After preparation of the FS, which proposed SVE and other treatment technologies to remediate contaminated soils at Site 8, the Air Force performed a pilot-scale treatability study to evaluate the effectiveness of SVE as part of the remedy selection process. The results of the SVE study demonstrate the effectiveness of SVE as a remedial technology for soil at Site 8, and are detailed in the Site 8 Soil Vapor Extraction Treatability Study Letter Report (G-680). The results of the SVE study will be used to help establish design criteria for a full-scale SVE system at Site 8.

B. Enforcement History

In 1976, the Department of Defense (DOD) devised a comprehensive IRP to assess and control migration of environmental contamination that may have resulted from past operations and disposal practices at DOD facilities. In response to the Resource Conservation and Recovery Act (RCRA) of 1976, and in anticipation of CERCLA, DOD issued a Defense Environmental Quality Program Policy Memorandum, dated June 1980 (DEQPPM 80-6), requiring identification of past hazardous waste disposal sites on DOD agency installations. The program was revised by DEQPPM 81-5 (11 December 1981), which reissued and amplified all previous directives and memoranda on the IRP.

Pease AFB was proposed to be added to the NPL in 1989 and was listed on the NPL in 1990. On 24 April 1991, the Air Force, U.S. Environmental Protection Agency (EPA), and NHDES signed a Federal Facility Agreement (FFA) establishing the protocol and timetable for conducting the RI/FS process at Pease AFB. As part of this timetable, the Air Force, in an effort to streamline activities, designed a basewide strategy plan for conducting an RI/FS. This strategy plan grouped the various sites into seven zones or operable units based on geographic location, potential receptors, and potential future uses. Prior to the inclusion of Pease AFB on the NPL, five sites (including Site 8) were on an accelerated RI/FS approach because of the potential threat they posed to human health and the environment. The Air Force, EPA, and NHDES agreed that the RI/FS Reports for these five sites and the remedial actions would continue on an accelerated schedule. The remaining RI/FS Reports for each zone have been prepared as outlined in the strategy plan.

III. COMMUNITY PARTICIPATION

Throughout the site's recent history, there has been community concern and involvement. EPA, NHDES, and the Air Force have kept the community and other interested parties apprised of site activities through informational meetings, fact sheets, press releases, and public meetings.

In January 1991, the Air Force released a community relations plan that outlined a program to address community concerns and keep citizens informed and involved during remedial activities. This plan was updated and released in summer 1993.

Numerous fact sheets have been released by the Air Force throughout the IRP at Pease AFB. These fact sheets are intended to keep the public and other concerned parties apprised of developments and milestones in the Pease AFB IRP. The fact sheets released to date that concern Site 8 are summarized as follows:

Fact Sheet	Release Date
Pease AFB Installation Restoration Program Update	October 1991
Pease AFB Installation Restoration Program Update	December 1992
Interim Groundwater Treatment — Sites 8, 32/36, and 34	January 1993
Remedial Investigation Results, Site 8	January 1994
Site 8 Proposed Plan	January 1994

In addition to the fact sheets, a number of public meetings have been held concerning the remediation of Site 8. On 14 November 1991, an IRP update public meeting was held, and on 12 January 1993, an IRP public workshop and meeting were conducted to provide the public with information on the status of the IRP at Pease AFB. On 1 March 1994, the Air Force conducted a public hearing and information session on the Site 8 Proposed Plan, during which oral comments on the Proposed Plan were received. A transcript of oral comments received during this meeting and the Air Force's response to comments are included in the attached responsiveness summary (see Appendix C). A full transcript is available in the Administrative Record file at Pease AFB. In addition, a public comment period for the Proposed Plan was conducted between 26 January and 10 March 1994. Responses to written comments received during this period also are included in Appendix C.

An Administrative Record containing documents and correspondence relating to the Pease AFB IRP is maintained at Pease AFB in Building 43. An index of the Administrative Record is maintained at EPA Region I in Boston, Massachusetts, and also is presented, in a condensed form, in Appendix D.

IV. SCOPE AND ROLE OF OPERABLE UNIT OR RESPONSE ACTION

Zone 5 encompasses three sites, including the operable unit for Site 8. The other two sites are Sites 9 and 11. The locations of these sites are shown in Figure 1.

Remediation at a Superfund site typically involves activities to remove or isolate contaminant source materials in conjunction with activities that mitigate migration of contamination through groundwater and/or surface water pathways. This ROD addresses both source control measures and management of migration of contaminated groundwater at Site 8.

In general, the maximum extent of soil contamination is within 500 feet of the former burn areas horizontally and from the surface to approximately 30 feet below ground surface (ft BGS) vertically. The majority of soil contamination consists of aromatic hydrocarbons (AHCs) (e.g., benzene and toluene) and total petroleum hydrocarbons (TPHs).

Groundwater in both the overburden and bedrock water-bearing zones has been impacted by past activities at Site 8. In the overburden, two distinct plumes are present. The first is a plume of free-phase product that is floating on the water table. Observations from soil borings, piezometers, and monitor wells across the site indicate that the free-phase product may exist in multiple, isolated pockets within a narrow band extending from the former burn areas northward to Merrimac Drive. The second plume contains dissolved contaminants (both aromatic and chlorinated VOCs) and extends from the former burn areas to the base boundary, the Newington Town property, and the properties owned by Harvey, Cross, and Coleman. The locations of these properties are shown in Figure 2b. In bedrock, no free-phase product has been detected; however, a plume of dissolved VOC contamination has been detected that originates at Merrimac Drive and extends northwest off base onto the Newington Town property.

There are two surface water bodies in the vicinity of Site 8: Pickering Brook and Knights Brook. Pesticides, polynuclear aromatic hydrocarbons (PAHs), and metals were detected in Pickering Brook. Low levels of VOCs and PAHs also were detected in the sediment samples from Knights Brook.

The selected remedy for Site 8, as described in the Draft Final Site 8 Proposed Plan (G-679), provides for the potential combination of two source area remedial alternatives evaluated in the FS and for management of contaminant migration in the overburden water-bearing zone. The primary source area remedial alternative consists of in situ SVE of source area soil (Alternative SC-3 in the Draft Final Site 8 FS Report) (G-611). The secondary source area action is installation of downgradient groundwater recovery trenches. Also included in this alternative is recovery and off-base disposal of free-phase product, management of dissolved-phase contaminant migration in the overburden water-bearing zone, on-site treatment of recovered groundwater, discharge of treated groundwater to subsurface recharge trenches, and institutional controls. Specifically, the preferred alternative includes the following elements:

- In situ SVE of source area soil with contaminant concentrations that exceed cleanup goals. This includes installing vapor extraction vents and drawing a vacuum on the vents to remove VOCs from the soil. The vapors extracted from the soil will be treated to remove VOCs.

- Construction of an asphaltic concrete cap (blacktop pavement) to minimize rainfall and snowmelt infiltration into the area of SVE treatment. The cap will aid in lowering the water table. The cap will be installed only in the existing clearing at the source area. The area will be limited to ensure minimal disturbance of the Newington Town Forest.

- Construction of groundwater/free-phase product recovery trenches downgradient of the free-phase product plume as a contingency measure. The trenches will be installed only in the unlikely event that free-phase product begins to migrate away from the source area because of operation of the SVE system. The free-phase product will be monitored with monitor wells. If free-phase product is detected in these monitor wells, the recovery trenches will be installed to intercept free-phase product.

- Recovery and off-base disposal of free-phase product floating on the water table in the source area. This will be accomplished by installing wells in the area of free-phase product and removing the product using small-diameter skimmer pumps. The recovered product will be disposed of off base at a licensed treatment/disposal facility.

- Management of migration in the downgradient overburden water-bearing zone. The groundwater recovery system will be designed to capture overburden groundwater that contains dissolved-phase contaminants at concentrations exceeding cleanup goals, and to prevent continued migration of contaminated groundwater to the bedrock water-bearing zone. This system will manage the migration of both organic compounds and metals present at concentrations exceeding the cleanup goals.

- Monitoring the progress of the overburden groundwater recovery system to evaluate its effectiveness in controlling continued migration of contaminants into the bedrock. If it is determined that overburden groundwater extraction alone is not controlling migration of contaminants into the bedrock (i.e., the levels in the bedrock increase or remain the same over time), groundwater extraction also will include active extraction from the bedrock groundwater zone in areas where contamination exists above cleanup goals.

- Construction of a new GWTP for long-term treatment of recovered groundwater. Treated groundwater will be discharged to subsurface recharge trenches.

- Environmental monitoring during remedial operations, including air and personnel monitoring during construction to ensure that worker protection is maintained.

- Long-term environmental monitoring, including groundwater, surface water, and sediment sampling and analysis. This process will be implemented through a groundwater management permit in accordance with NHDES regulation Env-Ws 410.

After preparation of the FS, which proposed SVE and other treatment technologies to remediate contaminated soils at Site 8, the Air Force performed a pilot-scale treatability study to evaluate the effectiveness of SVE as part of the remedy selection process. The results of the SVE study demonstrate that SVE is an effective remedial technology for remediating soil at Site 8.

The remedial action will address the following primary risks and principal threats to human health and the environment posed by contamination at the site:

- Risks posed to human receptors from ingestion of contaminated groundwater that may present a health risk.

- Risks posed to ecological receptors from direct contact with, or ingestion of, surface soil at the site. The results of the ecological risk assessment revealed that contaminants in surface soil at the site posed risks to representative species in excess of the EPA benchmark values; however, the values fall into the range of uncertainty for requiring remedial action.

The results of the risk assessment revealed that exposure to soil, surface water, and sediment does not pose a risk (either carcinogenic or noncarcinogenic) to potential current or future human receptors at the site above the EPA threshold criteria. The results of the ecological risk assessment revealed that contaminants in surface soil at the site posed risks to representative species in excess of EPA benchmark values and are detailed in Subsection VI.B of this report.

V. SUMMARY OF SITE CHARACTERISTICS

Section 1 of the Draft Final Site 8 FS Report (G-611) contains an overview of the Draft Final Site 8 RI Report (G-577). Based on the results of the RI, a working conceptual model was developed that incorporates all available applicable data (from Stages 1, 2, and 3) concerning Site 8 and its vicinity, including geological, hydrological, and analytical data and field measurements and visual observations. The salient points of the model are summarized as follows:

- The two former burn areas are the primary contaminant source areas at Site 8. Soil contamination in these former burn areas primarily consists of TPHs and AHCs. Dioxin was detected in seven surface soil samples.
- A former secondary source area is the drainage ditch that receives runoff from the large former burn area via a drain pipe. Contaminated soil was removed from the drainage ditch.
- Contamination in the soil in the area of the former burn pits is most widespread both at the ground surface and at the water table.
- Free-phase floating product detected in several overburden wells acts as a secondary contaminant source.

- A dominant hydrologic feature of Site 8 is a north-northeast/south-southwest-trending bedrock trough that controls the direction of overburden groundwater flow.

- Unsaturated overburden conditions exist on the western and southeastern limbs of the bedrock trough.

- Overburden groundwater flows along the axis of the bedrock trough and discharges to Pickering Brook to the northeast and to the bedrock along the western limb of the bedrock trough.

- A regional bedrock recharge zone exists east of the former burn areas. Bedrock groundwater flows from approximately east to west across the former burn areas and discharges to the headwaters of Knights Brook.

- The light, nonaqueous-phase liquid (LNAPL) free-phase product is located along the axis of the bedrock trough and acts as a contaminant source.

- Overburden and bedrock groundwater at Site 8 is contaminated with halogenated and aromatic VOCs, SVOCs, metals, and pesticides. The concentrations of several of these substances exceed federal and state standards.

- Overburden groundwater contamination primarily consists of aromatic and halogenated VOCs and is generally confined to the axis of the bedrock trough.

- Bedrock groundwater VOC contamination at concentrations above regulatory criteria is confined to two areas.

- A corridor of the low-permeability Glacial Till (GT) unit that is either thin or, in some areas, absent may have produced a conduit for contaminated overburden groundwater to migrate into bedrock.

- Dissolved organic contaminants are migrating beyond the Site 8 boundary and off-site in groundwater and surface water.

These conceptual results of the RI are discussed in more detail in the subsections that follow.

A. Geology

This subsection provides a brief summary of basewide and site-specific geologic conditions. A more detailed discussion of the geology at Site 8 is presented in the Draft Final Site 8 RI

Report (G-577). Site 8 and its vicinity are underlain by metasedimentary and igneous bedrock that is overlain by up to approximately 70 feet of glacial deposits. Test pit and monitor well drilling logs indicate that the glacial deposits near Site 8 consist primarily of the Upper Sand (US) unit discontinuously underlain by the Marine Clay and Silt (MCS) and/or the GT unit. The US interfingers with the MCS where the MCS is present. The bedrock and overburden units are described in Subsections 1.4.6.1 and 1.4.6.2 of the Draft Final Site 8 FS Report (G-611), respectively.

Bedrock Geology

The bedrock at Pease AFB consists of folded, faulted, and metamorphosed sedimentary and igneous rocks of the Proterozoic to Lower Ordovician age Merrimack Group. The Merrimack Group is Late Proterozoic to Lower Ordovician in age. At Pease AFB, the Merrimack Group includes the Kittery and Eliot Formations (G-417), which consist of shales and sandstones that have been metamorphosed to phyllite and quartzite. The Merrimack Group was deformed, metamorphosed, and intruded by the Exeter diorite and by both felsic and diabase dikes. Continental rifting initiated in Early Triassic time resulted in a northeast-southwest trend of faults, joints, and diabase dike intrusion. Limited tectonic activity has occurred since Mesozoic time in the form of successive crustal depression and rebound resulting from continental glaciation and deglaciation.

Description of Bedrock Units

The bedrock underlying Site 8 primarily consists of metamorphosed sedimentary rocks of the Eliot Formation. The Eliot Formation is described as a variably calcareous, dark gray to dark green quartz-chlorite-sericite phyllite interbedded with sericite-chlorite quartzite. Interbedding is commonly observed on the centimeter scale. Diabase dikes were identified throughout Site 8. The dikes are typically dark green to black, fine- to medium-grained, massive pyroxene-plagioclase diabase with traces of pyrite and magnetite. These dikes are more resistant to weathering than the host metasedimentary rocks and tend to form localized bedrock topographic highs. In addition, the diabase dikes encountered at Pease

AFB contain more magnetite than the surrounding rocks or overburden and, therefore, may represent local electromagnetic anomalies.

Overburden Geology

The generalized stratigraphic sequence of the glacial deposits of coastal New England is (in ascending order): till; stratified drift, including subaqueous outwash; marine clay and silt of the Presumpscot Formation; and subaerial outwash, such as ice-contact deltas and marine washover fans (G-468). Except for the GT unit, all of the glacial units were deposited in a marine environment (G-491; G-493; G-377; G-468).

The glacially derived overburden at Pease AFB is Wisconsinan in age. Based on drilling information, glaciomarine deposits have been divided into four units as follows (from oldest to youngest):

- Glacial Till (GT).
- Lower Sand (LS).
- Marine Clay and Silt (MCS).
- Upper Sand (US).

The overburden at Pease AFB also includes sediment that is Recent in age, such as marsh deposits and manmade fill. Although all four units are present at Site 8, one or more of the units may be absent at any particular location. A more detailed discussion of the overburden lithology is presented in the Draft Final Site 8 RI Report (G-577).

B. Hydrogeology

Groundwater occurs in both the bedrock and the overlying unconsolidated deposits at Pease AFB. In some areas of Pease AFB, the unconsolidated deposits are unsaturated and the water table occurs in the bedrock unit. At other locations, the GT and/or the MCS units may form semiconfining layers and separate the shallow overburden water-bearing zone from either the bedrock or a deeper overburden water-bearing zone. Groundwater at Site

8 was observed in the overburden and in bedrock. To the west and east of Site 8, the overburden is unsaturated. Figure 4 illustrates the boundaries between saturated and unsaturated overburden as measured in January 1992. The extent of unsaturated overburden conditions varies on a seasonal basis. Figure 4 indicates that unsaturated overburden conditions exist east and west of the bedrock trough.

Overburden Hydrogeology

The saturated thickness in the overburden ranges from 0 feet (unsaturated areas) to approximately 49.8 feet (at monitor well 5002). Groundwater elevations in the overburden range from a maximum of 95 ft MSL near the former burn areas to a minimum of 63 ft MSL toward the north, near piezometer 7064. Figure 4 is a contour map of groundwater elevations at Site 8 under static (nonpumping) conditions based on monitor wells screened in the overburden. The figure was prepared from data recorded on 20 January 1992, at which time recovery wells 562A, 563, 564, and 566 had not been operating for 1 week, and water level elevations were the highest recorded over a 12-month period. Water elevations measured from hybrid wells are included in Figure 4 for reference only and were not used in developing the contours. Where appropriate, water elevation data were corrected for the effect of free-phase product.

In the former burn areas, groundwater flows principally from east to west toward the center of the bedrock trough along a horizontal gradient of 0.01 ft/ft. Near the western side of the former burn areas, the groundwater flow direction changes to the north-northwest, and the horizontal gradient decreases to 0.002 ft/ft. Farther to the north, groundwater flow is directed to the northeast, toward Pickering Creek, where the horizontal gradient increases to 0.03 ft/ft.

Groundwater elevations in the overburden were observed to fluctuate 2 to 6 feet seasonally. The highest groundwater elevations typically occurred in the spring and early summer, while the lowest groundwater elevations typically occurred in the late summer and fall.

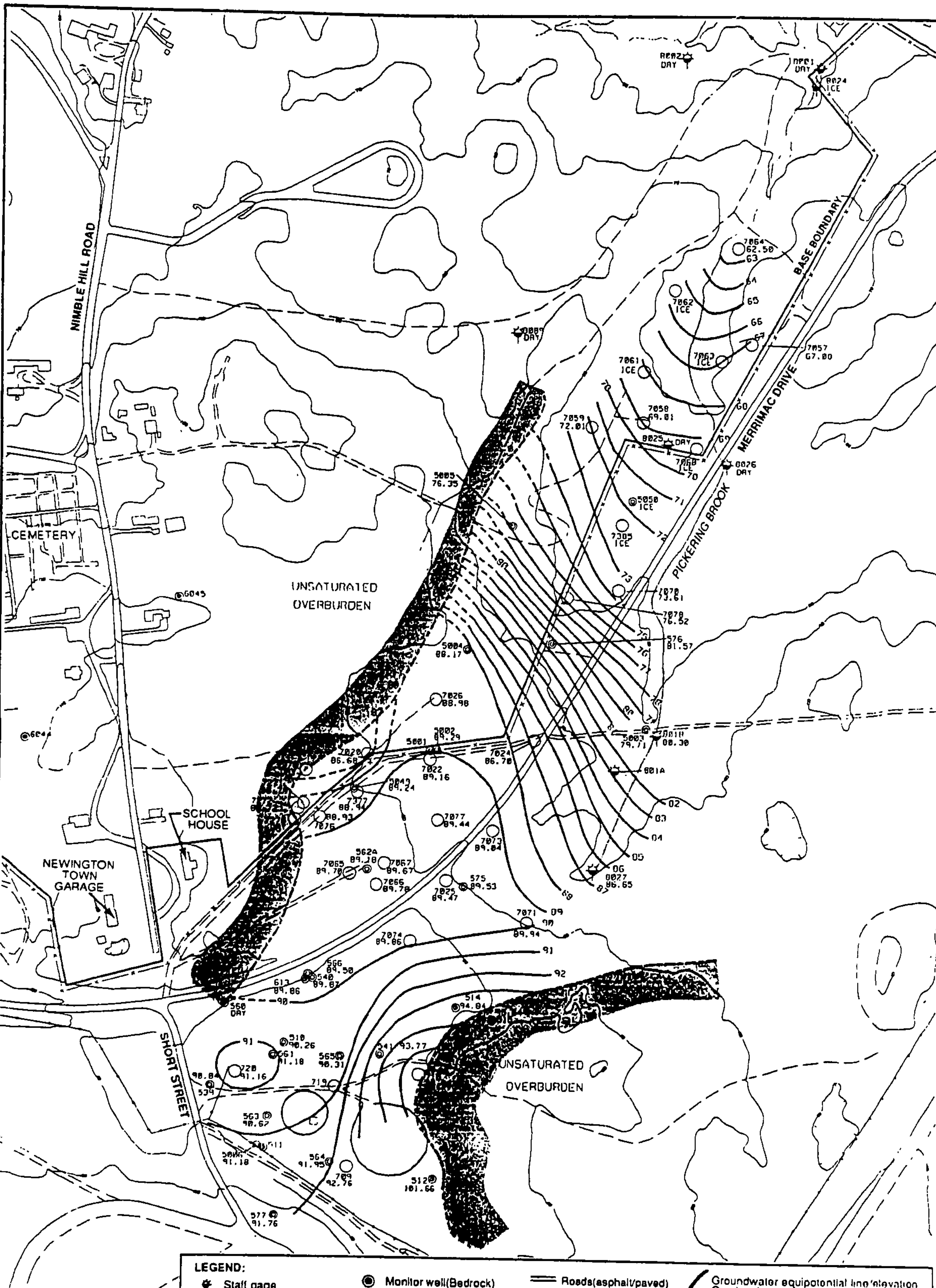
A series of aquifer and laboratory tests was conducted to characterize the hydraulic properties of the overburden at Site 8. The hydraulic testing included slug tests, short-term pumping tests, and long-term pumping tests in the overburden and bedrock. Several split-spoon samples were tested using a flexible-wall permeameter to calculate vertical hydraulic conductivity. Vertical hydraulic conductivities also were calculated from column leach tests, but were considered to be inaccurate because the soil samples used in the test were composited and recompacted, thereby destroying the horizontal structure of the soil. The hydraulic conductivity estimated from the slug and pumping tests ranged from 0.49 to 63.38 ft/day, and the geometric mean was 4.11 ft/day. Based on laboratory analyses of samples collected from the US unit, the vertical hydraulic conductivity estimated from the permeameter tests ranged from 0.005 to 6.2 ft/day, and the geometric mean was 0.27 ft/day.

Two long-term pumping tests were conducted in the overburden at well 562A. During the first test, conducted in July 1991, the discharge rate was 2.5 gpm, and no drawdown was recorded in any of the observation wells. The second test, conducted during September 1993, was performed at pumping rates between 16.5 and 15.8 gpm, resulting in approximately 9 feet of drawdown in well 562A. The average results of the time-drawdown and recovery data analyses yielded an estimated transmissivity of 9,980 ft^2/day and a hydraulic conductivity of approximately 1,275 ft/day.

Bedrock Hydrogeology

The bedrock at Site 8 consists of weathered and/or fractured (shallow) bedrock and competent bedrock. All Site 8 bedrock wells were completed in competent bedrock, with the exception of monitor wells 6021, 6083, and 513, which were constructed as shallow bedrock wells.

Bedrock integrity influences the permeability of the bedrock. Factors used to describe bedrock integrity include chemical and physical weathering and fracture density. Weathering and shallow fracturing are limited in areal extent across Site 8, and, as a result, the shallow bedrock is likely less important as a discrete hydrogeologic unit at Site 8 than



NORTH

SCALE IN FEET

Base Map Source: Base map of photogrammetric compilation of PAFB from aerial photography dated 11/23/87

Pease AFB

Map Area

NOTE

Site 8 (FTDA-2)
Stage 3, Record of Decision
Pease Air Force Base, New Hampshire

FIGURE 4
GROUNDWATER ELEVATIONS IN THE OVERBURDEN - 20 JANUARY 1992

elsewhere at Pease AFB. For example, weathered bedrock was observed in only 12 of 38 rock cores collected from Site 8, and shallow fracturing was observed in only 6 of 38 cores from Site 8.

Competent bedrock in the vicinity of the site has negligible primary (intergranular) porosity; thus, movement of groundwater in the competent bedrock is directly related to the bedrock structural fabric (i.e., bedding plane separations, foliation patterns, and fracture and joint sets). Lithologic heterogeneities in the bedrock (e.g., diabase dikes) may influence groundwater flow locally, but are expected to have little influence on regional bedrock groundwater flow.

Groundwater elevations in the bedrock at Site 8 typically range from 95 ft MSL near FDTA-2 to 86 ft MSL west of FDTA-2, near monitor wells 620 and 637. Figure 1.4-12 of the Draft Final Site 8 FS Report (G-611) is a potentiometric elevation contour map based on measurements in bedrock wells collected on 20 January 1992. In the bedrock, groundwater flows toward the west and northwest across the site. Horizontal gradients range from 0.008 ft/ft across Site 8 to 0.03 ft/ft northwest of Site 8 toward CRD-1 (Site 9).

Similar to overburden groundwater, groundwater elevations in the bedrock fluctuate 2 to 4 feet seasonally. The highest groundwater elevations typically occur in the spring and early summer, while the lowest elevations occur in late summer and fall.

The hydraulic properties of the bedrock water-bearing zone at Site 8 were estimated using slug test data collected from well 513, the results of three short-term pumping tests, and the results of the long-term (48-hour) pumping test at well 622. Appendix I of the Draft Final Site 8 FS Report (G-611) contains the results of the long-term pumping test performed at bedrock well 622. The hydraulic conductivity of the competent bedrock reported from the slug tests and short-term pumping tests ranged from 0.02 to 0.30 ft/day, and the geometric mean was 0.13 ft/day. However, data collected from the long-term pumping test at well 622 indicated that the mean hydraulic conductivity of the competent bedrock is approximately 4 ft/day. The results of the long-term pumping test are considered to be more representative of actual site conditions since studies have indicated that the larger the scale (i.e., the longer the duration) of a pumping test, the greater the permeability measured (G-93). The higher hydraulic conductivity value estimated from the long-term pumping test is attributed to the interception of more fractures during longer term tests. The effective porosity of the competent bedrock is estimated at 0.001 based on the results of the long-term pumping test at well 622.

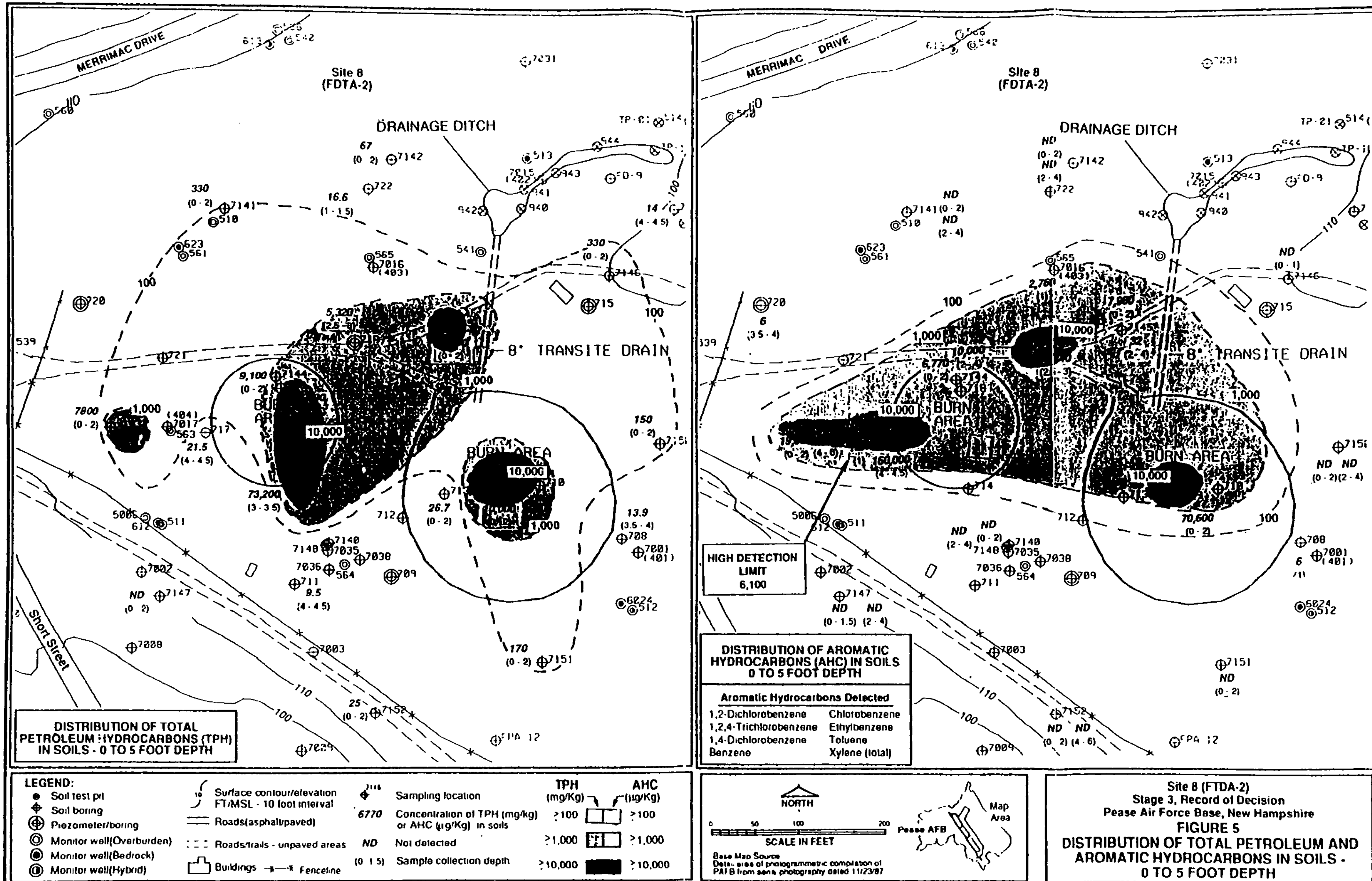
Groundwater seepage rates were estimated for the bedrock water-bearing zone based on the range of horizontal hydraulic gradient values (0.008 to 0.03 ft/ft), a hydraulic conductivity value of 4 ft/day, and a range of effective porosity of 0.01 to 0.001. Using Darcy's equation and these input values, the estimated bedrock groundwater seepage rates at Site 8 range from 3.2 to 120 ft/day.

C. Distribution of Contaminants

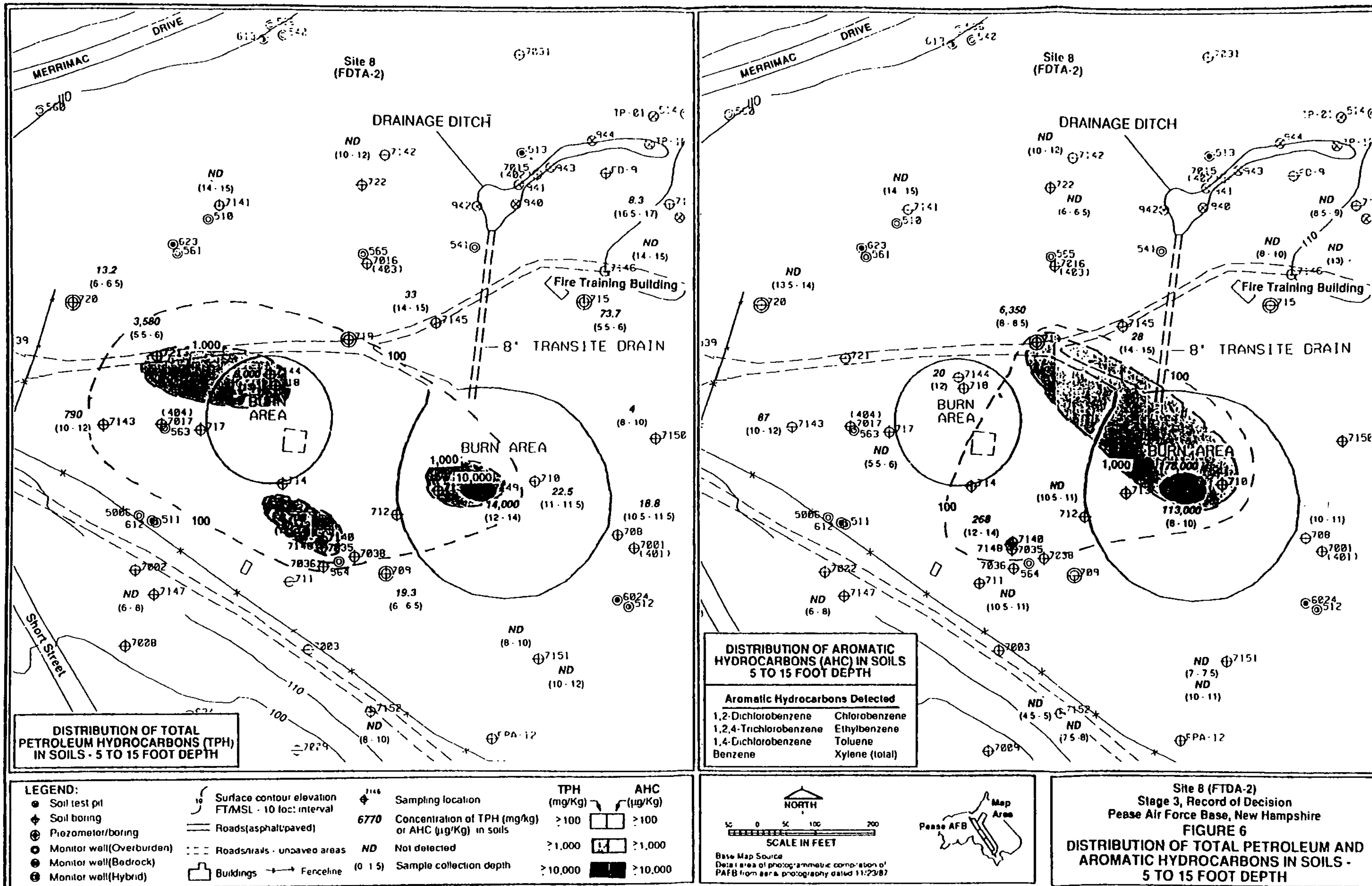
Soil Quality

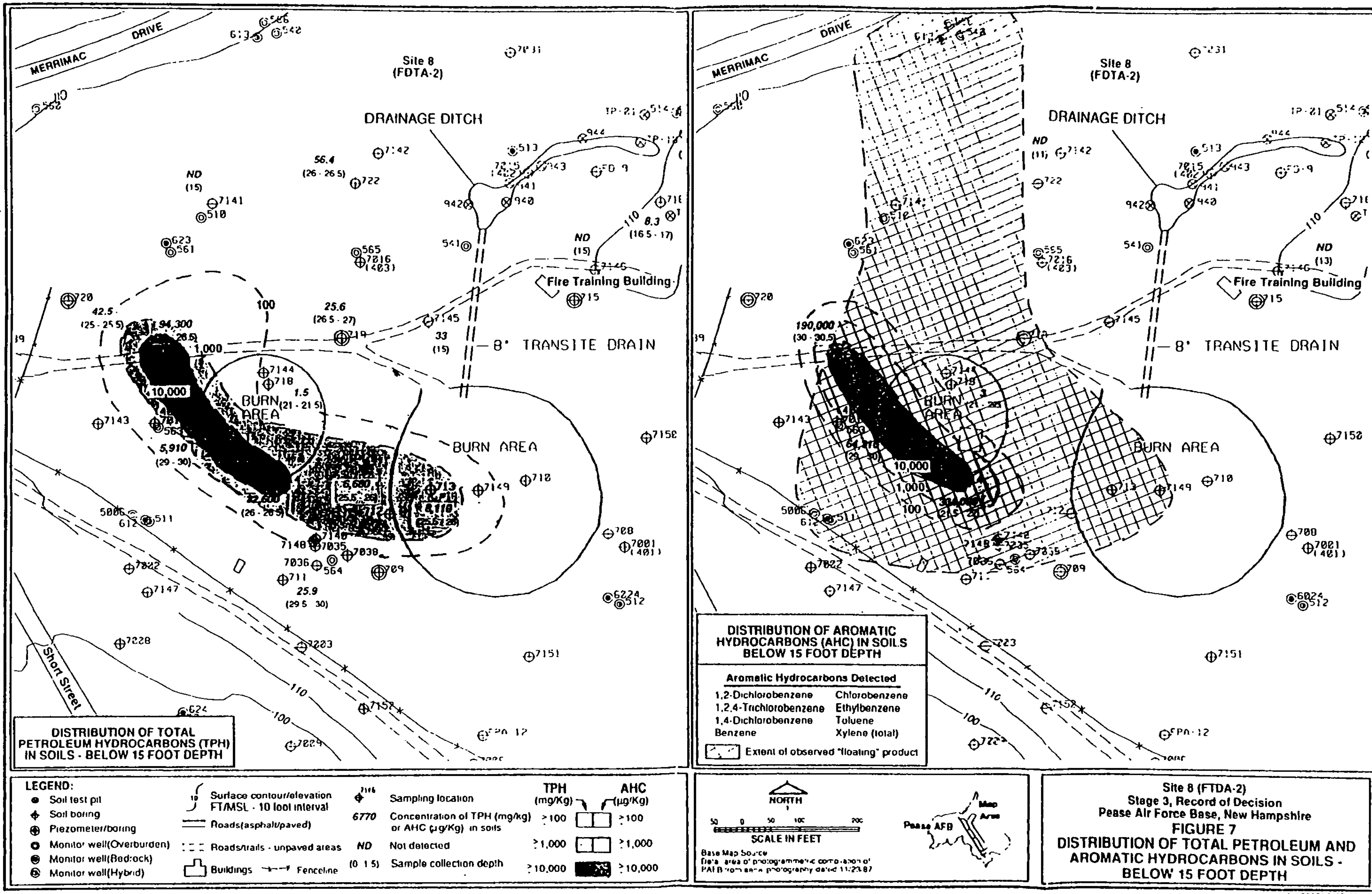
The maximum concentrations of organic compounds and metals detected in Site 8 soil south of Merrimac Drive are presented in Tables 2 and 3, respectively. In general, soil contamination is confined laterally to within 500 feet of the former burn areas and is vertically confined by the water table, which fluctuates to create a smear zone of contaminants in the soil. Soil contamination probably also exists as residual saturation in pore spaces where free-phase product has migrated through the vadose zone. The analytical results from soil boring logs and the mobile laboratory indicate that, north of Merrimac Drive, soil contamination associated with Site 8 activities is limited to the water table and capillary fringe (see Appendix B of the Draft Final Site 8 RI Report)(G-577).

Soil contamination at Site 8 primarily consists of AHCs and TPHs. The lateral and vertical extents of AHCs and TPHs beneath the three source areas are shown in a series of contour maps (Figures 5 through 7) that represent the area from the ground surface to approximately 30 ft BGS. The highest concentrations of TPHs and AHCs in the shallow soil (0 to 5 ft BGS) were detected in the center of the two former burn areas, with some



Site 8 (FTDA-2)
Stage 3, Record of Decision
Pease Air Force Base, New Hampshire
FIGURE 5
DISTRIBUTION OF TOTAL PETROLEUM AND AROMATIC HYDROCARBONS IN SOILS - 0 TO 5 FOOT DEPTH


MERRIMAC DRIVE
Site 8 (FDTA-2)
DRAINAGE DITCH
Fire Training Building
8' TRANSITE DRAIN
BURN AREA
BURN AREA
Short Street
DISTRIBUTION OF TOTAL PETROLEUM HYDROCARBONS (TPH) IN SOILS - 5 TO 15 FOOT DEPTH
DISTRIBUTION OF AROMATIC HYDROCARBONS (AHC) IN SOILS 5 TO 15 FOOT DEPTH
Aromatic Hydrocarbons Detected
1,2-Dichlorobenzene
1,2,4-Trichlorobenzene
1,4-Dichlorobenzene
Benzene
Chlorobenzene
Ethylbenzene
Toluene
Xylene (total)
LEGEND:
Soil test pit
Soil boring
Piezometer/boring
Monitor well(Overburden)
Monitor well(Bedrock)
Monitor well(Hybrid)
Surface contour elevation FT/MSL - 10 foot interval
Roads(asphalt/paved)
Roads/trails - unpaved areas
Buildings
Fenceline
Sampling location
6770 Concentration of TPH (mg/kg) or AHC (µg/Kg) in soils
ND Not detected
(0 1 5) Sample collection depth
TPH (mg/Kg)
AHC (µg/Kg)
>100
>1,000
>10,000
NORTH
SCALE IN FEET
Base Map Source
Detail area of photogrammetric compilation of PAFB from aerial photography dated 11/23/87
Pease AFB
Map Area
Site 8 (FTDA-2)
Stage 3, Record of Decision
Pease Air Force Base, New Hampshire
FIGURE 6
DISTRIBUTION OF TOTAL PETROLEUM AND AROMATIC HYDROCARBONS IN SOILS - 5 TO 15 FOOT DEPTH



Site 8 (FTDA-2)
Stage 3, Record of Decision
Pease Air Force Base, New Hampshire
FIGURE 7
DISTRIBUTION OF TOTAL PETROLEUM AND AROMATIC HYDROCARBONS IN SOILS - BELOW 15 FOOT DEPTH

contamination extending away from the former burn areas toward the north. During the field investigation, free-phase product was observed in wells 510, 540, 563, 564, and 5006 (see Figure 7), and soil contamination (TPHs and AHCs) probably exists at depths below 15 ft BGS, near the water table. Thus, although soil analytical results are not available for depths greater than 15 ft BGS for the northern portion of the free-phase product area, deeper soil contamination (AHCs and TPHs) is assumed to be associated with the free-phase product observed near the water table.

Benzene, toluene, ethylbenzene, and xylenes (BTEX) and chlorinated benzenes [1,2- and 1,4-dichlorobenzene (-DCB), chlorobenzene, and 1,2,4-trichlorobenzene] were the AHCs detected in soil at Site 8. BTEX compounds are significant components of JP-4 fuel. The highest concentrations of toluene and xylenes in soil (128 and 210 mg/kg, respectively) were detected at the water table beneath the smaller of the two former burn areas (see Table 2). The AHCs detected, with the exception of the chlorinated benzenes, have densities less than water, and a separate LNAPL has formed on the water table surface. Because LNAPLs migrate in the groundwater flow direction, soil contamination in the unsaturated zone near the water table (capillary zone) also would be expected to exist in the downgradient direction.

Halogenated hydrocarbons (HHCs) were detected less frequently than AHCs at Site 8 and were confined to soil samples collected west and south of the smaller former burn area and east of the larger former burn area. The HHCs present in Site 8 soil include 1,2-dichloroethene (1,2-DCE), 1,2-dichloroethane (1,2-DCA), tetrachloroethene (PCE), 1,1,2,2-tetrachloroethane (PCA), trichloroethene (TCE), and 1,1,1-trichloroethane (1,1,1-TCA). The highest concentrations of TCE and PCA (5 and 2.5 mg/kg, respectively) were detected to the west of the smaller former burn area. The highest concentration of PCA was detected near the ground surface (4 to 4.5 ft BGS), and the highest concentration of TCE was detected at the water table (30 to 30.5 ft BGS); otherwise, the levels of PCA and TCE were below 0.02 mg/kg. The highest concentration of PCE (0.018 mg/kg) was detected, along with 0.418 mg/kg of 1,1,1-TCA, in the 20 to 22 ft BGS sample from boring 7751 to the west of the cemetery. With the exception of PCA, all HHCs detected in Site 8 soil also were detected in Site 8 groundwater.

Oxygenated hydrocarbons (OHCs) were detected north of the two former burn areas, in the smaller former burn area, and southwest of the larger former burn area. The OHCs detected in Site 8 soil include isophorone, vinyl acetate, 4-methyl-2-pentanone, diethyl ether, acetone, and 2-butanone. The highest concentration of OHCs (34,000 μg/kg of 4-methyl-2-pentanone) was detected in boring 714 at 7 ft BGS. None of these compounds were detected in Site 8 groundwater.

The distribution of PAHs at Site 8 appears to be limited to the former burn areas; however, some PAHs were detected from 0 to 2 ft BGS south and west of the former burn areas. Naphthalene and 2-methylnaphthalene were the most commonly detected PAHs in Site 8 soil. Phenanthrene, pyrene, and chrysene also were detected at several locations. In general, PAHs were detected in the former burn areas, to depths of 26.5 ft BGS, near the water table. PAHs are known components of JP-4, and the occurrence of PAHs correlated strongly with the occurrence of elevated levels (>100 mg/kg) of TPHs in Site 8 soil. Naphthalene is the most mobile of the PAHs detected at Site 8, and is the most likely PAH to migrate to the groundwater. Naphthalene and 2-methylnaphthalene were the PAHs detected in groundwater at the highest concentrations.

Site 8 soil was originally sampled for total dioxins. Dioxins were generally detected in the upper 2 feet of soil in and around the former burn areas. In September 1992, Site 8 soil was resampled for specific dioxin compounds to depths of 16 ft BGS. Dioxins were detected in and around the former burn areas in the upper 2 feet of soil only. The highest concentration of dioxins [4.94 nanograms/gram (ng/g)] was detected in boring 7555. The term dioxin refers to related compounds known as chlorinated dibenzo-p-dioxins and chlorinated dibenzofurans. Dioxins occur as contaminants in several herbicides, such as 2,4,5-T and Silvex, and may result from the burning of chlorinated phenols, chlorinated benzenes, and PCBs (G-357). Herbicides were not detected in Site 8 soil (four samples), and the polychlorinated biphenyl (PCB) Aroclor-1260 was detected only in one soil sample

(08-7144-B013) at Site 8. Chlorinated benzenes were detected in Site 8 soil; however, they were detected outside of the former burn areas (borings 7145, 7148, 7015, and 7016).

The pesticides detected in Site 8 soil were DDT and its degradation products DDD and DDE, alpha- and gamma-chlordane, lindane (gamma-BHC), dieldrin, and heptachlor epoxide. Pesticides were detected at depths to 15 ft BGS, although most detections occurred in the shallow (0 to 2 ft BGS) soil. Lindane, DDD, DDE, and DDT were detected in groundwater at Site 8.

Sodium and trace amounts of antimony, arsenic, cadmium, chromium, copper, lead, magnesium, manganese, mercury, molybdenum, nickel, thallium, and zinc were detected at levels exceeding the background concentrations for soil established from background soil boring samples at Pease AFB (see Table 3). The distribution of these metals across Site 8 is shown in Figure 8. Arsenic, cadmium, chromium, lead, mercury, molybdenum, and nickel are possible constituents present in fuel oil that may have been disposed of at Site 8 prior to 1971. Nickel is a common additive in JP-4 (G-357). Most of the metals present at concentrations that exceed background levels were detected within 150 feet of the former burn areas. Mercury and molybdenum were detected at concentrations exceeding background levels in borings 7146 and 7147, which are located outside the former burn areas, along unpaved roads. Cadmium and total chromium also were present at concentrations exceeding background levels in boring 7146. The metals detected at concentrations exceeding background levels in the vicinity of the smaller former burn area were located in the upper 6 feet of soil. East of the larger former burn area, metals were detected at concentrations exceeding background levels to depths of 11.5 ft BGS. Of those metals present at concentrations exceeding background levels in Site 8 soil, arsenic, lead, and nickel also were present in groundwater at concentrations exceeding Maximum Contaminant Levels (MCLs).

Groundwater Quality

Overburden/Hybrid Groundwater Quality

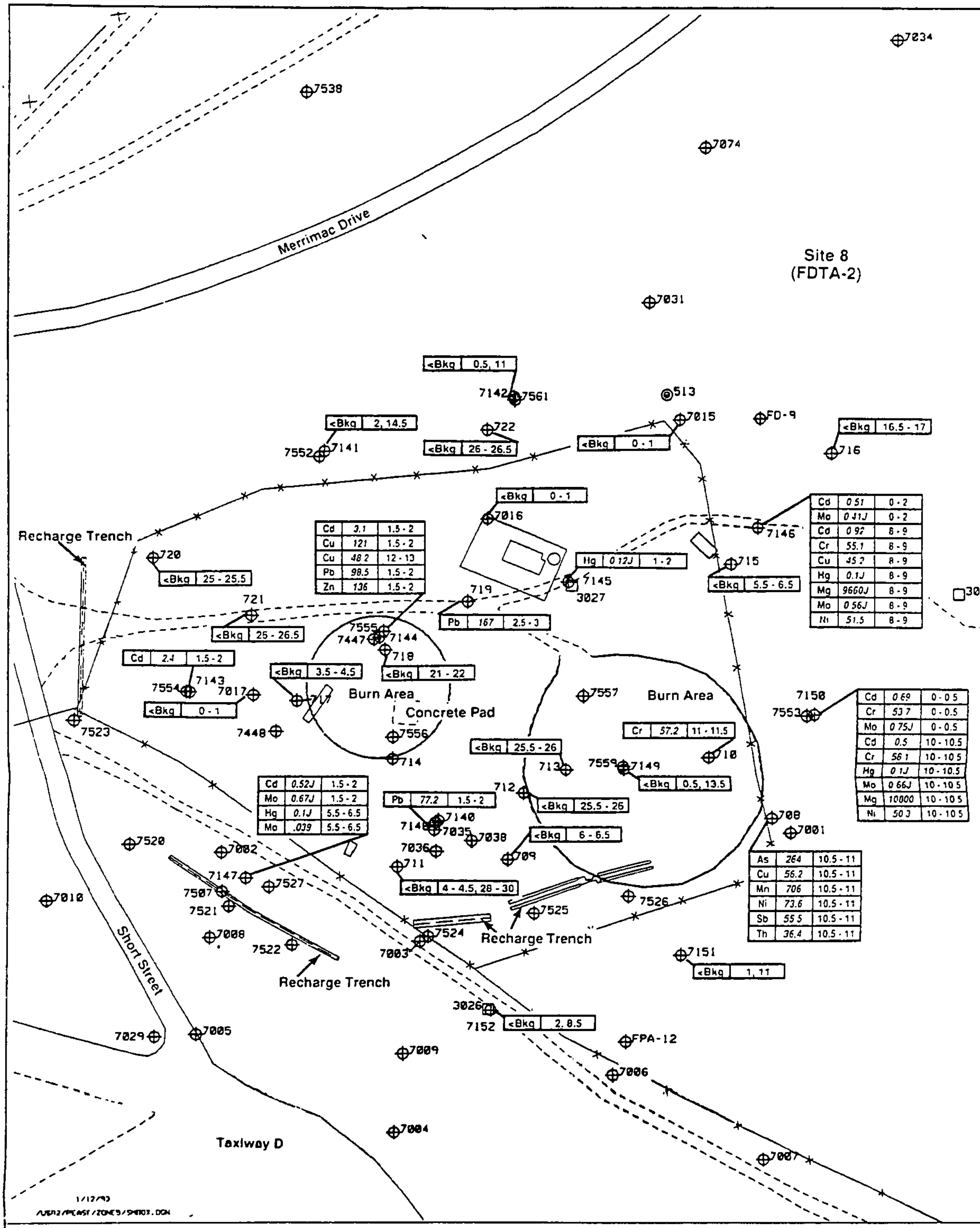
A total of 22 overburden wells and five hybrid wells were sampled at various frequencies throughout the characterization of overburden/hybrid groundwater contamination at Site 8. It should be noted that well 613 was originally constructed as a hybrid well. Well 613 was reconstructed in February 1992 as a bedrock well and was renamed well 613A. Well 613A has been sampled only once (March 1992), and the results of the analysis are discussed herein under bedrock groundwater quality and are presented in Subsection 1.5.3.2 of the Draft Final Site 8 FS Report (G-611). Piezometers 7751, 7752, and 7786 were installed to determine off-site groundwater quality at the locations of bedrock wells 6043, 6045, and 6046, respectively. The three piezometers are discussed in this subsection under dissolved-phase well groundwater.

In general, VOCs are more widespread and were detected at greater concentrations in overburden groundwater than in bedrock groundwater. Both free-phase product and dissolved-phase contamination are observed in the overburden groundwater at Site 8. Free-phase product was not observed downgradient of well 566; the dissolved-phase contaminant plume (primarily VOCs) extends off base at concentrations below MCLs (see Figure 9). The following discussion of wells containing free-phase product is divided into a discussion of product occurrence and a discussion of the chemical analyses of groundwater in these free-phase product-containing wells.

Free-Phase Product Well Groundwater Quality

Free-phase product is present at the water table in the vicinity of the former burn areas. Although the area of free-phase product is relatively limited in extent (see Figure 9), the product acts as a continuing source of dissolved-phase groundwater contamination.

Measurable amounts of free-phase product (LNAPLs) have been observed in three overburden groundwater recovery wells (563, 564, and 566) and in three overburden



LEGEND:

⊕	Soil Boring	- - -	Roads/trails (unpaved areas)
⌐¬	Surface Soil Samples	⌂	Buildings
═══	Roads (asphalt paved)	—x—x—	Fenceline

Pb | 64.3 | 2 — Metal detected; Concentration of metals in soils (mg/Kg); Sample collection depth (feet) below ground surface

<Bkg | 5 — Sample analyzed for metals; all detected concentrations below background; Sample collection depth

Metals Detected

As - Arsenic		Mo - Molybdenum	
Cd - Cadmium		Ni - Nickel	
Cr - Chromium		Pb - Lead	
Cu - Copper		Sb - Antimony	
Hg - Mercury		Th - Thallium	
Mg - Magnesium		Zn - Zinc	
Mn - Mangenese			

NORTH

0 100

SCALE IN FEET

Base Map Source:
Digital data of photogrammetric compilation of PAFB from aerial photography dated 11 23 87

Pease AFB

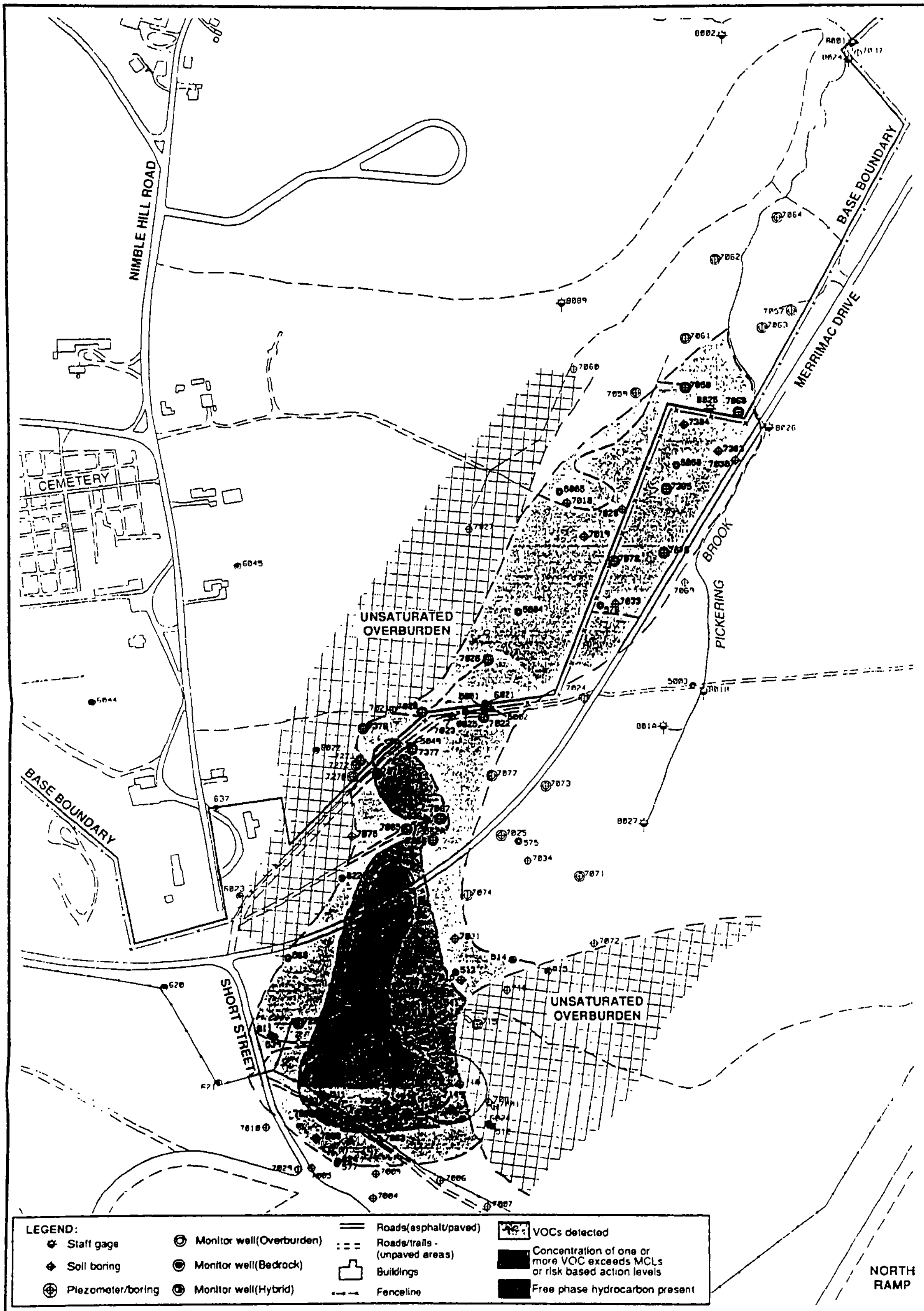
NOTE:

Background levels were obtained from "The Tolerance Limits for Background Soils at Pease AFB", Letter Report, dated 17 April, 1992

94P-1993 4/7/94

Site 8
Stage 3, Record of Decision
Pease Air Force Base, New Hampshire

FIGURE 8
DISTRIBUTION OF METALS ABOVE BACKGROUND LEVELS IN SOILS - SITE 8



NORTH

SCALE IN FEET

Pease AFB

Map Area

NOTE

Site 8 (FTDA-2)
Stage 3, Record of Decision
Pease Air Force Base, New Hampshire

FIGURE 9
EXTENT OF TOTAL VOCs IN OVERBURDEN GROUNDWATER

groundwater monitor wells at Site 8 (510, 540, and 5006) (see Figure 9). Free-phase product has not been observed in overburden recovery well 562A, located downgradient of the free-phase product wells. Measured product thicknesses ranged from 0 feet to a maximum of 10.95 feet measured in well 563 during March 1991. The product layer thickness in each well varies as a function of a number of factors, including pumping rates, pumping frequency, quantity and efficiency of product removal by the recovery wells, groundwater elevation, and amount of rainfall. Further, a discrepancy typically exists between the apparent measured thickness and the actual product thickness in the subsurface (G-112). The apparent thickness reflects the thickness of the capillary fringe in addition to the true product thickness. The weight of the product depresses the water level in the well, increasing the apparent product thickness even more. The ratio of apparent product thickness to true product thickness typically ranges from 2 to 4, and may be as high as 10 (G-112).

Samples of product have been collected from the o/w separator at the Site 8 pilot GWTP and directly from well 563, and the samples were analyzed. The results of these analyses are summarized in the Draft Final Site 8 RI Report (G-577). The detected compounds include those expected for waste fuel and JP-4 product (i.e., BTEX, PCE, TCE, and PAHs); pesticides; Aroclor-1260; and dioxins.

In general, groundwater samples from wells that contain free-phase product contain dissolved-phase contaminants similar to those contaminants found in the product. Tables 4, 5, and 6 summarize the highest observed concentrations of each contaminant detected in groundwater from overburden wells that contain free-phase product. As shown, of the AHCs detected, benzene, ethylbenzene, and toluene all exceeded the referenced guideline concentrations (state or federal MCLs) in monitor well 563. The detected HHCs that exceeded guideline concentrations and are not considered to be common laboratory contaminants were 1,2-DCA, cis-1,2-DCE, trans-1,2-DCE, TCE, 1,2-dibromoethane, and vinyl chloride. The SVOCs fluorene and bis(2-ethylhexyl) phthalate exceeded guideline concentration levels at monitor well 563. The pesticides gamma-BHC and heptachlor were detected at concentrations that exceed guidelines in groundwater at monitor well 510.

Heptachlor epoxide and gamma-chlordane also were detected in well 510 at concentrations equal to the guideline concentrations. The dissolved metals detected above background levels (G-609) were arsenic, cobalt, iron, lead, manganese, nickel, potassium, silicon, silver, and sodium. Total metals whose concentrations exceeded background values and referenced guidelines were arsenic, cobalt, lead, potassium, and sodium.

The HHCs that have been consistently detected in groundwater samples from wells containing free-phase product were TCE, cis-1,2-DCE, 1,2-DCA, and 1,1,1-TCA. Those compounds only occasionally detected included 1,1-DCA, 1,1-DCE, trans-1,2-DCE, PCE, and vinyl chloride.

The AHCs that have been consistently detected in groundwater samples from wells containing free-phase product include benzene, toluene, ethylbenzene, and xylenes. The PAHs detected were generally naphthalene or 2-methylnaphthalene. Pesticides (i.e.. DDD, DDT, DDE, and gamma-BHC) were detected in all groundwater samples from wells that contain free-phase product, except those from well 5006. A more detailed discussion of free-phase product well groundwater quality is presented in the Draft Final Site 8 RI Report (G-577).

Well 566 was sampled for dioxins/furans in November 1992. No dioxins/furans were detected. A groundwater sample collected in November 1992 from well 566 was analyzed for 1,2-dibromoethane. This compound was not detected.

Dissolved-Phase Contaminant Well Groundwater Quality

The dissolved-phase contamination observed in overburden and hybrid well groundwater samples includes VOCs, SVOCs, and pesticides. Tables 7, 8, and 9 summarize the highest observed concentrations of each contaminant detected in groundwater samples from overburden and hybrid wells that contained only dissolved-phase contamination. As shown, of the AHCs detected in groundwater, the only contaminant concentrations detected above MCLs was for benzene in monitor well 511. Benzene also was detected at concentrations above MCLs in recovery well 562A. The HHCs whose concentrations in groundwater samples equalled or exceeded guidelines were 1,2-DCA, cis-1,2-DCE, and TCE. Total metals in groundwater that exceeded the maximum background concentrations established for Pease AFB and federal regulatory values were arsenic, barium, beryllium, cadmium, chromium, and nickel. The total lead concentration in groundwater exceeded the MCL, but was below the maximum background concentration.

Figure 10 illustrates the distribution of these compounds. The distribution of HHCs in overburden groundwater appears to be well-defined if groundwater analytical data from wells containing free-phase product are included in the analysis. There appear to be two areas of HHC concentrations in the overburden at Site 8: a northern and a southern area. The southern area is bounded on the north by wells 541 and 561, and the northern area is limited to wells in the bedrock trough (north of well 510). None of the dissolved-phase groundwater contamination in the southern area exceeds MCLs. In the northern area, MCL exceedances were noted only at well 562A. HHCs were not detected in off-site piezometers 7751, 7752, and 7786. The distribution of AHCs in overburden wells is not as well-defined as that of the HHCs. Groundwater samples from all overburden wells, except wells 514, 541, 561, and 5002, with dissolved-phase contamination indicated the presence of BTEX compounds (see Figure 11). Benzene has not been detected in wells 541 and 561. Benzene and 1,2-dichlorobenzene have been detected in well 5002. Only sec-butylbenzene has been detected in well 514 (see Figure 11). Benzene concentrations that exceed MCLs have been detected in wells 511 and 562A. AHCs were not detected in off-site piezometers 7751, 7752, and 7786.

Groundwater samples collected from seven overburden wells (565, 539, 562A, 5049, 561, 577, and 541) and one hybrid well (511) contained detectable concentrations of SVOCs. The groundwater sample collected from well 5049 contained concentrations of bis(2-ethylhexyl) phthalate (a common laboratory contaminant) above the MCL. SVOCs were not detected in off-site piezometers 7751, 7752, and 7786.

Pesticides have been detected on-site in wells 5003 and 539. However, the most recent groundwater sampling event showed no evidence of pesticides in the overburden groundwater. A groundwater sample collected in September 1992 was analyzed for dioxins/furans. Octachlorinated dibenzo-p-dioxin (OCDD) was detected at a concentration of 59 picograms/liter (pg/L) in a sample collected from well 565. Groundwater samples also were collected in November 1992 from wells 5002 and 562A and were analyzed for dibromoethane (EDB). This compound was not detected.

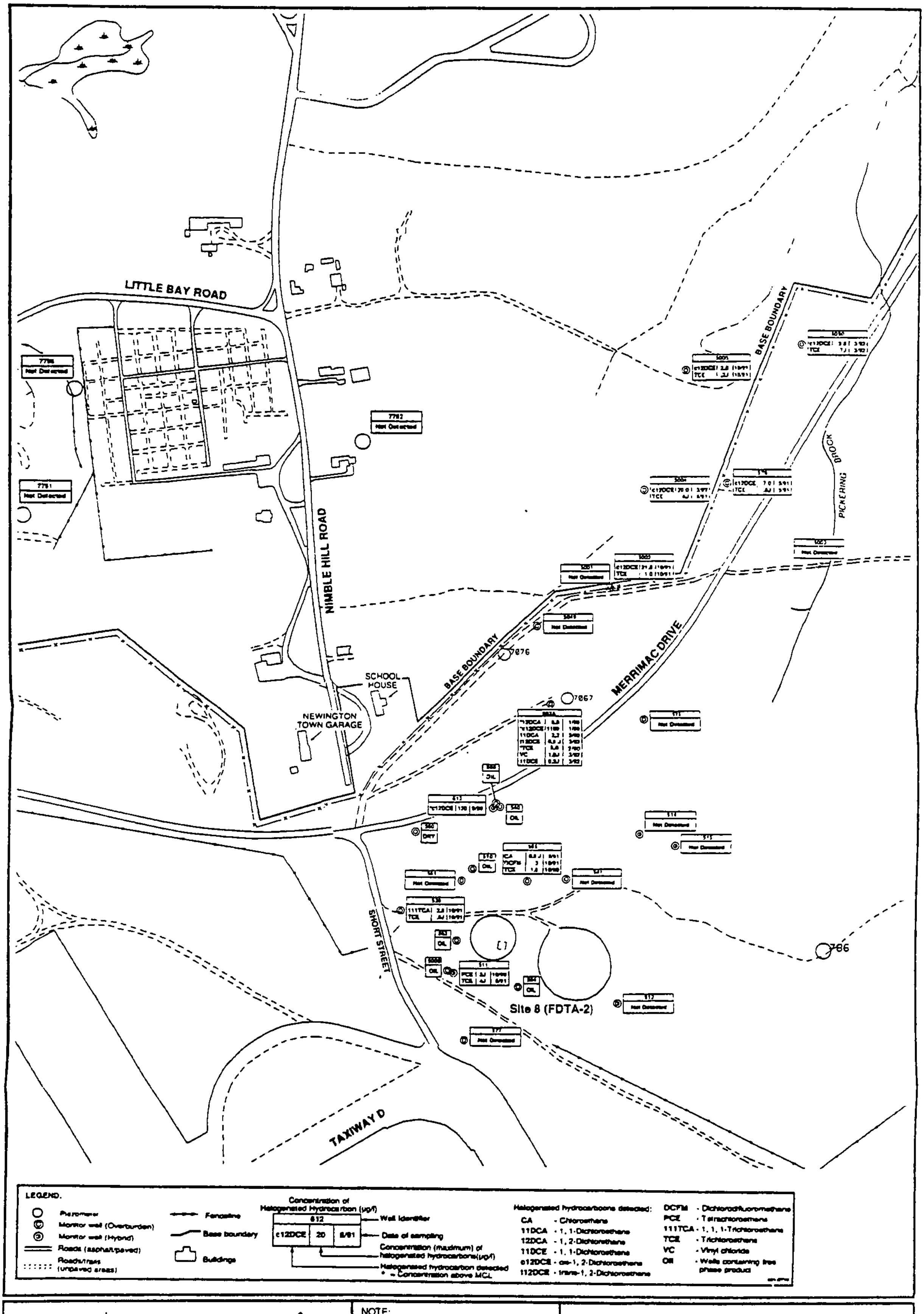
A number of groundwater samples collected from overburden wells contained dissolved metals concentrations that exceeded proposed soluble metals maximum background concentrations (G-609). The dissolved metals detected at concentrations exceeding proposed background levels were arsenic, calcium, cobalt, iron, manganese, potassium, sodium, vanadium, and thallium. Table 8 summarizes the dissolved portion of metals in groundwater. Total metals whose concentrations exceeded established maximum background levels and MCLs were arsenic, barium, beryllium, cadmium, chromium, and nickel. The total lead concentration in groundwater exceeded the MCL, but was below the maximum background concentration.

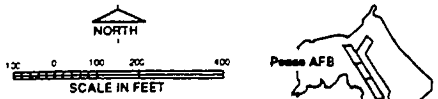
A more detailed description of dissolved-phase contaminants in groundwater is presented in the Draft Final Site 8 RI Report (G-577).

Bedrock Groundwater Quality

Organic groundwater contamination in the bedrock is generally limited to relatively low concentrations of VOCs. Both HHCs and AHCs have been detected on- and off-site. The highest detected concentrations of benzene, cis-1,2-DCE, and bis(2-ethylhexyl) phthalate exceeded their respective referenced guidelines in at least one well.

The highest concentrations of HHCs in groundwater samples from bedrock wells were detected in wells located downgradient of the former burn areas, where the overlying GT unit is absent (see Figure 12 of this report and Figure 1.4-10 of the Draft Final Site 8 FS



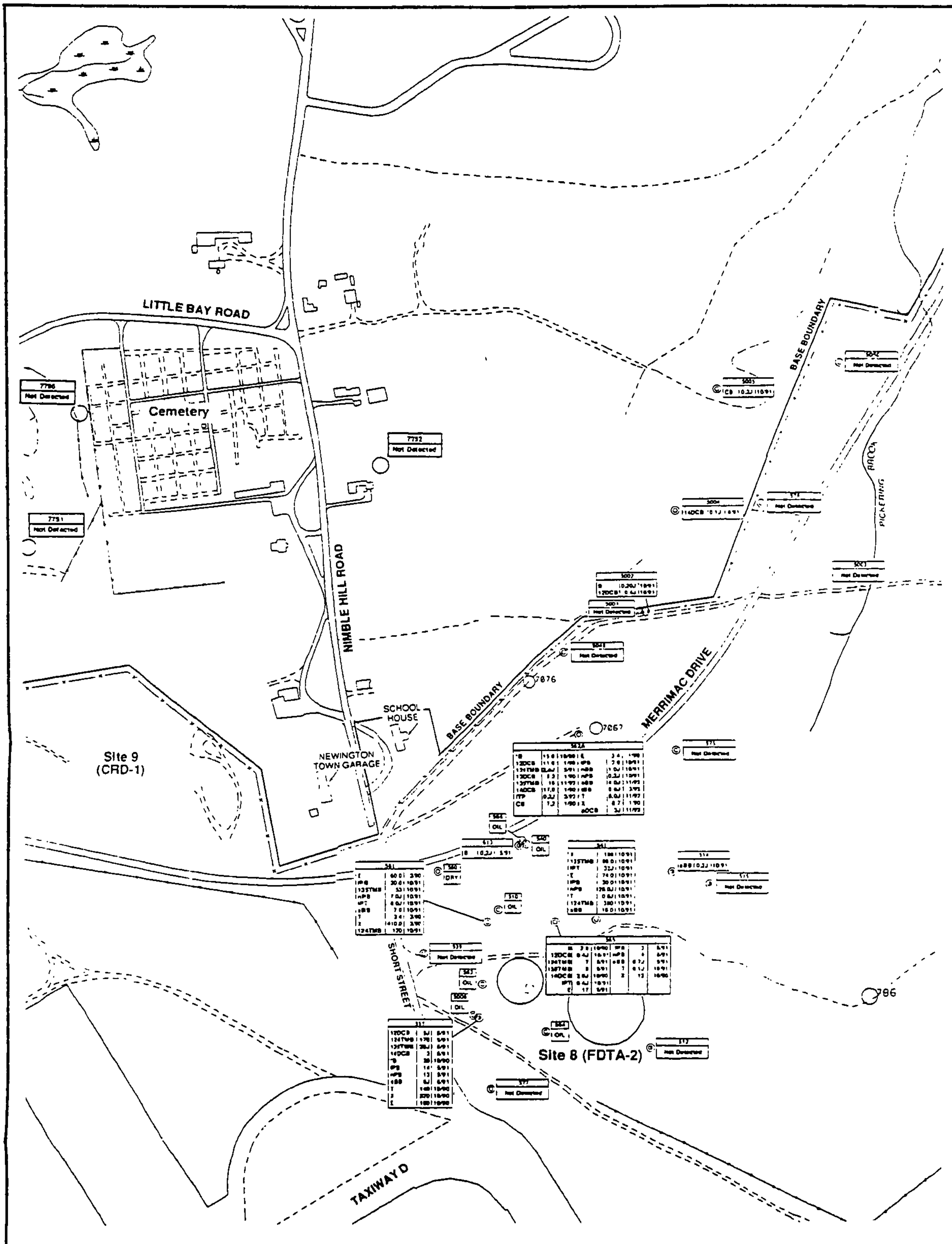


Base Map Source
Detail area of photogrammetric compilation of PAFB from aerial photography dated 11/23/87

NOTE:

Site 8 (FTDA-2)
Stage 3, Record of Decision
Pease Air Force Base, New Hampshire
FIGURE 10
MAXIMUM CONCENTRATIONS OF HALOGENATED ALIPHATIC HYDROCARBONS(HHC) IN OVERBURDEN AND HYBRID WELLS

58RODF10 4/94



LEGEND:

- Piezometer
- Monitor well (Overburden)
- Monitor well (Hybrid)
- Roads (asphalt paved)
- Roads/trails (unpaved areas)
- Fenceline
- Base boundary
- Buildings
- Marsh area

Concentration of Aromatic Hydrocarbon (µg/l)

6025		
12DCB	0.5J	10/91

- Well Identifier
- Date of sampling
- Concentration (maximum) of halogenated hydrocarbons(µg/l)
- Aromatic hydrocarbon detected
- * = Concentration above MCL

Aromatic hydrocarboons detected:

B	- Benzene	pDCB	- p-Dichlorobenzene	T	- Toluene
nBB	- n-Butylbenzene	13DCB	- 1, 3-Dichlorobenzene	124TMB	- 1, 2, 4 Trimethylbenzene
sBB	- sec-Butylbenzene	14DCB	- 1, 4-Dichlorobenzene	135TMB	- 1, 3, 5-Trimethylbenzene
tBB	- tert-Butylbenzene	E	- Ethylbenzene	X	- Xylenes (total)
CB	- Chlorobenzene	IPB	- 4-Isopropylbenzene	Oil	- Wells containing free phase product
12DCB	- 1, 2-Dichlorobenzene	IPT	- 4-Isopropyltoluene		
		nPB	- n-Propylbenzene		

NORTH

100 0 100 200 400

SCALE IN FEET

Base Map Source:
Detail area of photogrammetric compilation of PAFB from aerial photography dated 11/23/87

Pease AFB

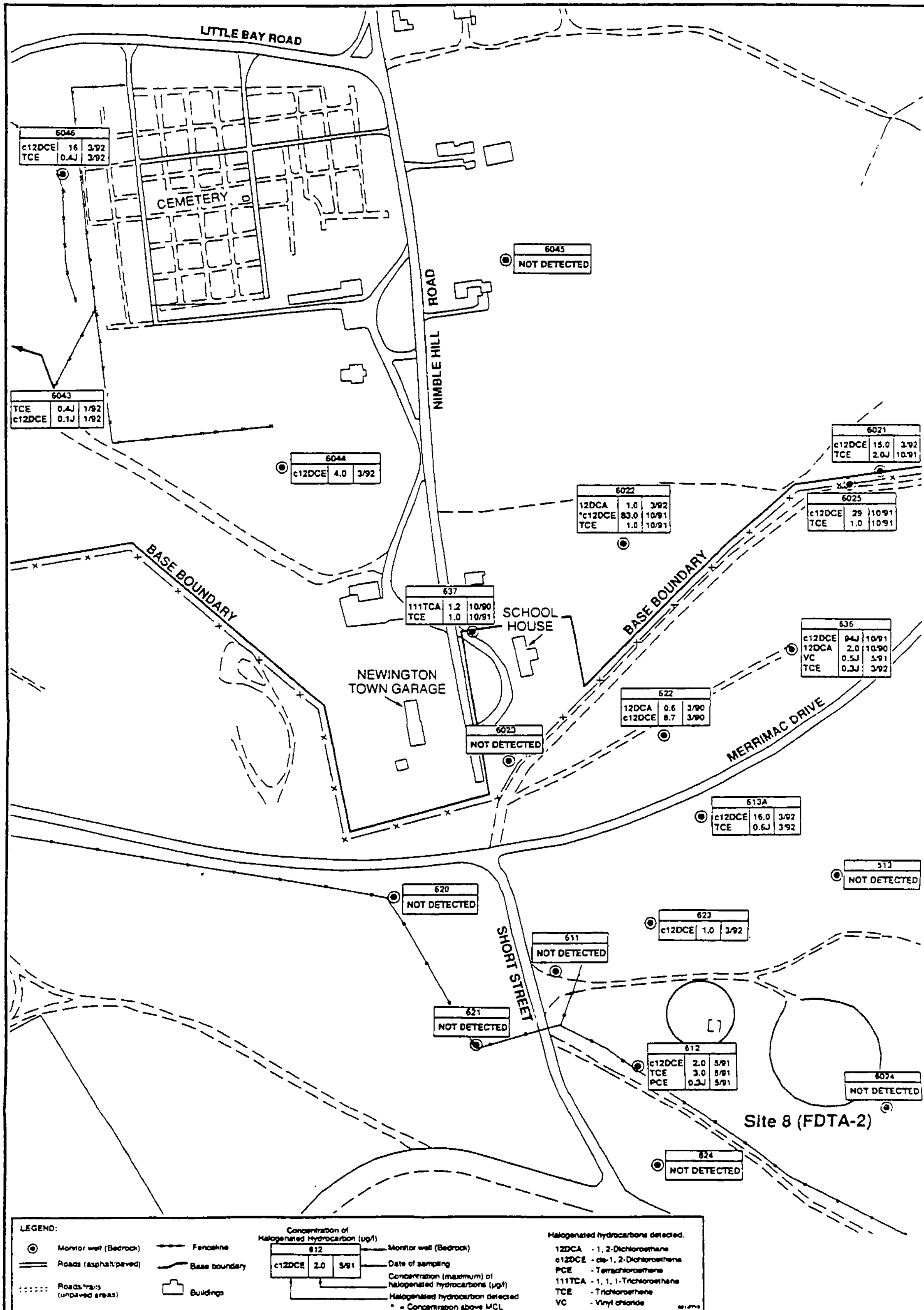
NOTE:

Site 8 (FTDA-2)
Stage 3, Record of Decision
Pease Air Force Base, New Hampshire

FIGURE 11

MAXIMUM CONCENTRATIONS OF AROMATIC HYDROCARBONS(AHC) IN OVERBURDEN AND HYBRID WELLS

S8RODF10 4/94



NORTH

0 300
SCALE IN FEET

Base Map Source
Detail area of photogrammetric compilation of PAFB from aerial photography dated 11/23/87

Pease AFB

NOTE:

Site 8 (FTDA-2)
Stage 3, Record of Decision
Pease Air Force Base, New Hampshire

FIGURE 12
MAXIMUM CONCENTRATIONS OF HALOGENTATED ALIPHATIC HYDROCARBONS(HHC) IN BEDROCK WELLS

S8RODF10-4/94

Report) (G-611). Groundwater samples from 11 bedrock wells (612, 613A, 622, 623, 636, 637, 6021, 6022, 6025, 6044, and 6046) contained detectable concentrations of HHCs. Figure 12 illustrates the distribution of these compounds and suggests the presence of two areas of contaminant concentrations: a south- and a northwest-trending area. The southern area is limited in extent and centered around well 612 (near the former burn area). HHC concentrations that exceed MCLs have not been detected in the southern area. Well 612 is the only location where PCE has been detected in bedrock groundwater. The northwest-trending area extends from well 613A (along Merrimac Drive) toward well 6046 (near the cemetery). Cis-1,2-DCE was present at concentrations exceeding its MCL in samples collected from wells 636 and 6022 and from samples collected from bedrock well 622 during the pumping test. Bedrock well 622 was resampled in June 1993, under pumping test conditions, to clarify significant inconsistencies in the laboratory analytical results [see Appendix I of the Draft Final Site FS Report (G-611)]. The results of the June 1993 sampling round indicate that the maximum concentration of cis-1,2-DCE was 28 $\mu g/L$, which is below the MCL of 70 $\mu g/L$.

Groundwater samples from 13 bedrock wells (513, 611, 612, 613A, 621, 622, 623, 636, 637, 6021, 6022, 6023, and 6025) contained detectable concentrations of AHCs. The distribution of the AHCs is discussed in the Draft Final Site 8 FS Report (G-611). The presence of various BTEX compounds in groundwater shows a pattern that may be explained by the different rates of migration of the various BTEX compounds from a source located at or near the former burn areas [see Table 1.6-1 of the Draft Final Site 8 FS Report (G-611) and Subsection 5.1 of the Draft Final Site 8 RI Report (G-577)]. Benzene concentrations exceeding the MCL were detected in wells 612, 622, and 636.

Low concentrations of SVOCs have been detected in bedrock groundwater samples collected both on- and off-site. The highest concentrations of SVOCs were detected in groundwater samples collected from well 6024. Pesticides were not detected in groundwater samples collected from any bedrock wells.

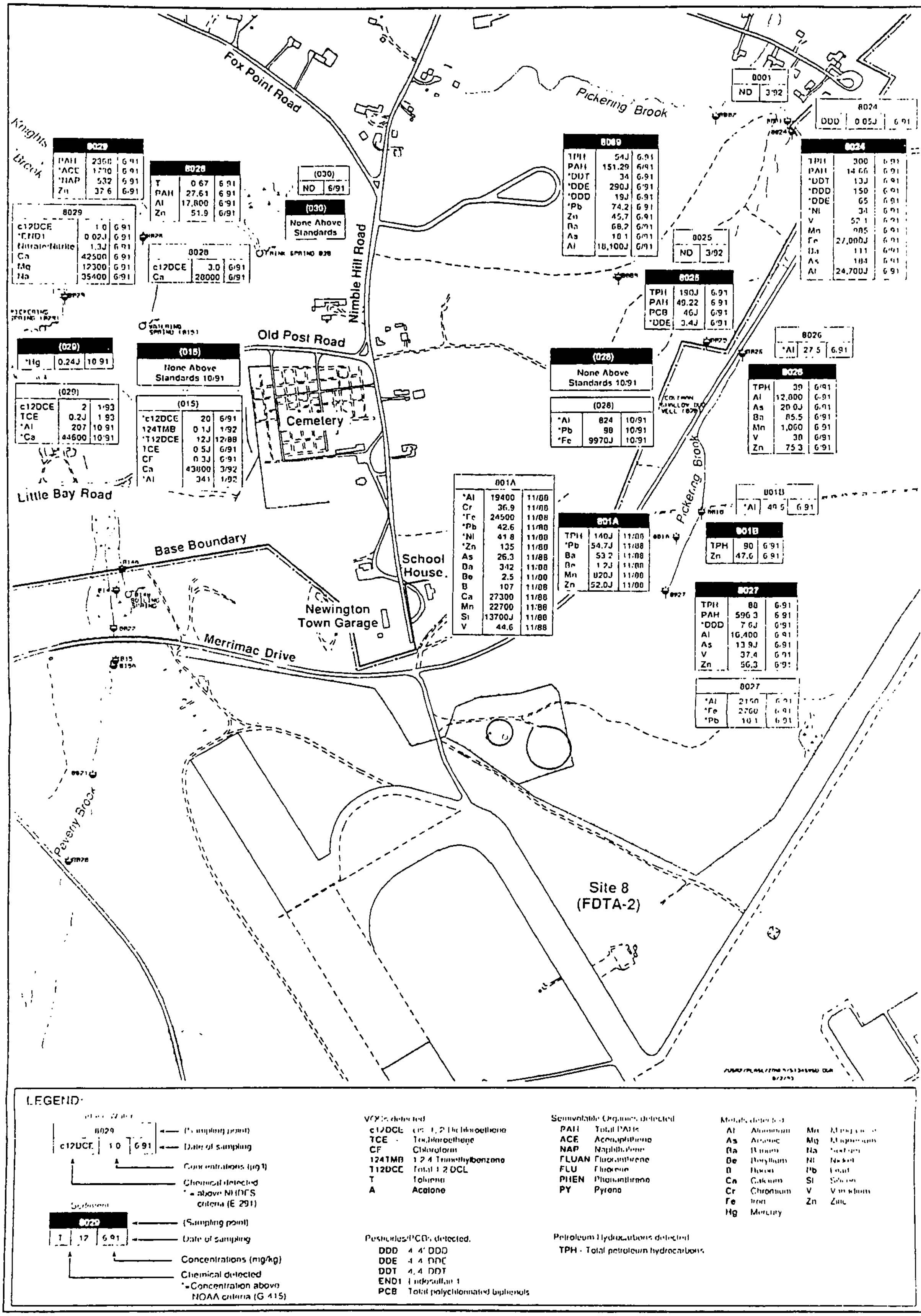
Well 613A was sampled for dioxins/furans in September 1992. None of these compounds were detected. The dissolved metals whose concentrations exceeded background levels were iron, lead, potassium, sodium, and vanadium. The total metals whose concentrations exceeded background levels were iron, potassium, and sodium.

Surface Water and Sediment

Pickering Brook

Pickering Brook is a relatively narrow stream that originates on base but flows off base in a northeasterly direction. Several small tributaries enter Pickering Brook before it discharges to Flagstone Brook. Overburden groundwater from the Site 8 area is believed to discharge to Pickering Brook. In addition, sediment from the on-site drainage ditch may have discharged to Pickering Brook, especially during heavy rainfall events. Surface water and sediment samples were collected at seven stations in the Pickering Brook drainage from 1988 through 1992. These stations are shown in Figure 13. Sediment samples were analyzed for TPHs, organic compounds, total organic carbon (TOC), and metals. Surface water samples were analyzed for organic compounds, ammonia as nitrogen, hardness, and inorganic compounds.

The analytical results indicate the presence of PAHs, pesticides, TPHs, and metals in four sediment samples collected along Pickering Brook (locations 8024, 8025, 8027, and 8089). The pesticide DDT and its metabolites DDD and DDE were detected at concentrations exceeding the National Oceanic and Atmospheric Administration (NOAA) Biological Effects Range — Low (ER—L) (G-415). Total PAH concentrations ranged from approximately 596 $\mu g/kg$ (mostly naphthalene) at location 8027 (the farthest upstream location) to 15 $\mu g/kg$ at location 8024 (the farthest downstream location) (see Figure 13). Concentrations of TPHs greater than 100 mg/kg were detected (using Method E418.1) at three sediment sampling locations (801A, 8024, and 8025). The metals detected in sediment samples at or above their respective ER—L values were lead (locations 801A and 8089) and nickel (location 8024).



NORTH

0 500

SCALE IN FEET

Pease AFB

LEGEND:

- Surface water and sediment sampling
- Spring location
- Roads (asphalt/paved)
- Roads/trails (unpaved areas)
- Shallow Hand Dug Well
- Location
- Base boundary
- Buildings
- Marshy area

Site 8
Stage 3, Record of Decision
Pease Air Force Base, New Hampshire

FIGURE 13
SURFACE WATER AND SEDIMENT QUALITY

The inorganic compounds detected in Pickering Brook surface water samples that exceeded the NHDES Freshwater Chronic Criteria (G-403) were aluminum (locations 801A, 801B, 8026, and 8027), iron (locations 801A and 8027), lead (locations 801A and 8027), nickel (location 801A), and zinc (location 801A). The exceedances for lead, nickel, and zinc were based on a hardness of 20 mg/L $CaCO_3$. The highest concentrations of metals were found in the upper portion of the drainage area (see Figure 13).

Knights Brook

Knights Brook is located northwest of Site 8, entirely outside the Pease AFB boundary. It originates as several small springs that merge and flow north to Little Bay. The results of spring water quality sampling are presented in Subsection 1.5.4.3 of the Draft Final Site 8 FS Report (G-611). Surface water and sediment samples were collected at two locations (8028 and 8029) in the Knights Brook drainage area during June 1991 (see Figure 13). The analytical results showed the presence of VOCs (toluene) and PAHs in both sediment sampling locations in Knights Brook. TPHs also were detected at location 8028. Toluene was not detected in upgradient bedrock wells, and PAHs are relatively immobile in groundwater and are generally transported short distances via overland flow. Metals were not detected above ER—L values.

The organic contaminants detected in surface water samples from Knights Brook were predominantly pesticides and VOCs. Both contaminant types were detected at sampling location 8029. The VOC cis-1,2-DCE detected at location 8029 also was detected at location 8028. Cis-1,2-DCE is a degradation product produced by the dehalogenation of TCE, and is generally more mobile than TCE. It is suspected that the presence of cis-1,2-DCE and TCE in surface water samples collected from Knights Brook may be attributable to Site 8 activities because these contaminants were detected in upgradient Site 8 bedrock wells. However, pesticides were not detected in upgradient bedrock wells. Metals were not detected above NHDES Freshwater Chronic Criteria.

Springs and Shallow-Dug Wells

Sediment samples were collected from Watering Spring, Pickering Spring, and the Coleman shallow dug well (see Figure 13). Two VOCs [toluene (60 $\mu g/kg$) and 4-methyl-2-pentanone (MIBK) (2 J $\mu g/kg$)] were detected in the sediment sample collected from Pickering Spring (see Subsection 1.5.4.2 of the Draft Final Site 8 FS Report) (G-611). The MIBK is most likely due to laboratory contamination. Mercury also was detected in one of the two sediment samples collected from Pickering Spring, but it is not present in upgradient wells.

Water samples were collected from Watering Spring, Pickering Spring, Frink Spring, and six off-site shallow dug wells. VOCs were not detected in these water samples, except as follows.

The VOC cis-1,2-DCE was detected in water samples from Pickering Spring collected in 1988, 1989, 1991, and 1992. Cis-1,2-DCE was not detected in the water sample collected in 1990. In addition, TCE was detected below the laboratory quantification limit in the water samples collected during May and June 1991 and January 1992. Cis-1,2-DCE also has been detected in water samples from Watering Spring. Also, toluene and 4-isopropyltoluene have been detected in water samples from the Coleman shallow dug well (see Subsection 5.3 of the Draft Final Site 8 RI Report) (G-577). The inorganic compounds detected in water from one or more sampling locations whose concentrations exceed the NHDES Freshwater Chronic Criteria were aluminum, iron, lead, and zinc (see Figure 13). Of these inorganic compounds, the criteria for lead and zinc were based on a hardness of 20 mg/L $CaCO_3$.

VI. SUMMARY OF SITE RISKS

A risk assessment was performed to estimate the probability and magnitude of potential adverse human health and environmental effects from exposure to contaminants associated with the site. The risk assessment followed a four-step process:

1. Data evaluation and contaminant identification, which identified those chemicals that, given the specifics of the site, were of significant potential concern.

2. Exposure assessment, which identified actual or potential exposure pathways, characterized the potentially exposed populations, and determined the extent of possible exposure.

3. Toxicity assessment, which considered the types and magnitude of adverse health effects associated with exposure to the chemicals of concern.

4. Risk characterization, which integrated the first three steps to summarize the potential for cancer and adverse noncancer health effects posed to the evaluated receptors.

The results of the baseline human health and ecological risk assessments for Pease AFB are discussed in the subsections that follow.

A. Human Health Risk Assessment

A number of chemicals of concern (listed in Tables 10 through 16) were selected for evaluation in the human health risk assessment. The potential risks to human health were evaluated separately for each medium, in accordance with guidance from EPA Region I. The media that were considered were soil, groundwater, surface water, and sediment. The soil data were evaluated separately for a *hot spot* (a former burn area) and the remainder of the soil (*main soil*). The groundwater data were assessed separately for the overburden and bedrock water-bearing zones, and for a hot spot in the overburden. The surface water and sediment data for Knights and Pickering Brooks also were evaluated separately.

A most reasonable maximally exposed individual (RME) was selected for each medium based on both current and future land and water uses. The site is currently inactive. Future land use at Site 8 within the base boundaries was assumed to continue as industrial, although future residential development may occur off base. The groundwater is not currently used, but could potentially be used for drinking or other purposes in the future. The surface water might be used for recreational activities, either currently or in the future.

The current and future RMEs that were selected for each medium are presented in Table 17. The exposure routes that were considered are presented by medium in Table 18.

Each RME was evaluated for potential cancer and noncancer health effects. The potential for cancer risk was expressed as the probability of developing cancer over a 70-year lifetime. Maximum cancer risk is usually regulated at hazardous waste sites in the 10^{-6} to 10^{-4} range (i.e., 1-in-1-million to 1-in-10,000). Risks of less than 10^{-6} are not usually of regulatory concern. The potential for noncancer health risks was expressed as a hazard index. A hazard index of greater than 1 is usually considered the benchmark for potential concern.

The total lifetime cancer risks and total hazard indices are presented by medium in Tables 19 through 22. Where applicable, the cancer risks and hazard indices were calculated using three concentrations: the mean, the upper 95% confidence limit of the mean, and the maximum. Chemicals that exceeded a 10^{-6} lifetime cancer risk and/or a hazard index of 1 also are indicated in each table. Table 23 provides a summary of chemicals of concern by medium. For the main soil, the cancer risks ranged from 3×10^{-7} to 9×10^{-5}. Dioxins/furans, PAHs, and/or arsenic contributed most of the risk, posing greater than a 10^{-6} risk at all exposure concentrations for the future scenarios. The cancer risks calculated for dioxins/furans are likely to be overestimates of the upper-bound risk. In the absence of data concerning the presence of the 2,3,7,8- isomers of the penta-, hepta-, and hexa-chlorinated compounds, it was conservatively assumed that these compounds were present entirely as the 2,3,7,8- isomers, the only dioxin/furan isomers that are considered to be potentially carcinogenic. The cancer risks posed by contact with hot spot soil ranged from 1×10^{-8} to 2×10^{-7}. There was no apparent risk of noncancer health effects posed by contact with either main or hot spot soil. The total hazard indices for soil were below 1 at all exposure concentrations.

Cancer risks based on use of the overburden groundwater for domestic purposes ranged from 3×10^{-5} to 4×10^{-5} based on either filtered or unfiltered (total) samples. Benzene, bis(2-ethylhexyl) phthalate, 1,4-DCB, 1,2-DCA, and vinyl chloride each posed greater than a 10^{-6} risk at one or more exposure concentrations. The total hazard indices ranged from

3 to 20 based on either filtered or unfiltered samples. 1,2,4-Trimethylbenzene exceeded a hazard index of 10, and naphthalene and manganese (unfiltered and filtered samples) exceeded a hazard index of 1 at one or more exposure concentrations.

For the bedrock groundwater, cancer risk ranged from 7×10^{-5} to 2×10^{-4} based on filtered samples, and from 3×10^{-4} to 3×10^{-3} based on unfiltered samples. The highest risk was posed by arsenic ($>10^{-4}$ at several exposure concentrations). Benzene, bis(2-ethylhexyl) phthalate, and 1,2-DCA each posed a $>10^{-6}$ risk at one or more exposure concentrations. The total hazard indices ranged from 1 to 5 based on filtered samples, and from 3 to 40 based on unfiltered samples. Based on the data for unfiltered samples, arsenic and lead exceeded a hazard index of 10 at the maximum concentration, and had a hazard index of between 1 and 10 at the other exposure concentrations. Other chemicals that had a hazard index between 1 and 10 based on the unfiltered data were chromium (as chromium VI), manganese, and nickel.

Cancer risks for the hot spot groundwater ranged from 1×10^{-1} to 5×10^{-1} based on either filtered or unfiltered samples. Several chemicals posed a risk of greater than 10^{-4} each at one or more exposure concentrations: benzene, 4,4′-DDD, 4-4′-DDT, 1,2-dibromoethane, TCE, vinyl chloride, and arsenic. Bis(2-ethylhexyl) phthalate, 1,4-dichlorobenzene, and methylene chloride each posed a risk between 10^{-6} and 10^{-4} at all exposure concentrations. The total hazard indices for hot spot groundwater ranged from approximately 200 to 400 based on either filtered or unfiltered samples. Chemicals that exceeded a hazard index of 10 at one or more exposure concentrations were 2-methylnaphthalene, naphthalene, 2-nitroaniline, 1,2,4-trimethylbenzene, and arsenic. A number of other chemicals had hazard indices between 1 and 10.

The cancer risks posed by surface water and sediment contact were minimal for both Knights Brook and Pickering Brook. Cancer risks posed by surface water contact ranged from 5×10^{-8} to 6×10^{-8} for Knights Brook and from 2×10^{-7} to 5×10^{-7} for Pickering Brook. The cancer risks posed by contact with sediment in Knights Brook was approximately 2×10^{-7} at all exposure concentrations. The cancer risks posed by contact with sediment in

Pickering Brook ranged from 2×10^{-7} to 4×10^{-7}. There is no apparent risk of adverse noncancer health effects posed by contact with surface water or sediment in Knights Brook and Pickering Brook. The total hazard indices for surface water and sediment from both Knights Brook and Pickering Brook were below the criterion of concern of 1.

B. Ecological Risk Assessment

The potential risks to ecological receptors were evaluated for all media at Site 8 for which the possibility of exposure exists. The media considered were surface soil (0 to 2 ft BGS), surface water, and sediment. As with the human health risk assessment, soil data were evaluated separately for the former 1-acre burn area (hot spot) and the remaining 3-acre site (main site) soil. The potential for adverse impacts on aquatic life was evaluated separately for the surface water and sediment of Pickering Brook and Knights Brook.

The ecological receptors used to evaluate the potential risks represent species and communities for which the potential of risk seemed most probable and for which adequate data exist to determine the likelihood of impact. The receptors and exposure routes evaluated in the ecological risk assessment are presented in Table 24.

The potential risk posed to ecological receptors (i.e., deer mouse, chipping sparrow, and aquatic communities) was assessed by comparing estimated daily doses or medium-specific concentrations with critical toxicity values (CTVs) or appropriate medium-specific criteria values. Hazard quotients were calculated, by contaminant, for each receptor by dividing the estimated daily intake by the CTV, or, when medium-specific criteria were available, concentrations were compared directly to criteria to determine the corresponding hazard quotient. Hazard quotients were summed across all exposure pathways for each contaminant, by receptor, to develop specific hazard indices.

A hazard index of less than 1 indicates adverse effects are not likely to occur and no action is required. A hazard index of greater than 10 indicates that risks are at a level of concern and action is usually required. A hazard index between 1 and 10 is subject to interpretation based on the toxicity of the chemical and the uncertainty in the calculation. The less toxic the chemical, and the more uncertainty in the risk calculation, the less concern is associated with hazard indices between 1 and 10.

The total hazard indices for all ecological receptors are presented in Tables 25 and 26. The hazard indices for ecological receptors were calculated using two concentrations: mean and maximum, where available. The following paragraphs provide an overview of the findings of the Site 8 ecological risk assessment and highlight contaminants that contributed substantially to the total hazard for each receptor.

The total hazard indices for the deer mouse ranged from 9.2 to 88. The primary contributors to the hazard indices for the main site were lead and dioxins/furans in soil and boron and n-nitrosodiphenylamine in vegetation. The primary chemical of concern at the hot spot was lead in soil and vegetation.

Total hazard indices for the chipping sparrow ranged from 4.8 to 1.6×10^1. For both the main site and hot spot, the consumption of potentially contaminated vegetation was the pathway of greatest concern. The chemicals of concern in surface soil that contributed substantially to the total hazard indices at the main site were copper and xylenes (total). Xylenes (total) was the chemical of greatest concern at the hot spot.

Potential risks to aquatic life inhabiting Pickering Brook and Knights Brook were evaluated by comparing surface water contaminant concentrations to Ambient Water Quality Criteria (AWQC), or to aquatic toxicity data when AWQC were not available. The hazard quotients based on acute and chronic criteria for Pickering Brook and Knights Brook are presented in Tables 27 and 28, respectively.

The potential risks to aquatic, benthic, and epibenthic life inhabiting the sediments of Pickering Brook and Knights Brook were assessed by comparing sediment or interstitial water concentrations to ER—L values or chronic freshwater AWQC. For Pickering Brook, the following chemicals of concern had hazard quotients (HQs) greater than 1 at maximum concentrations: 4,4'-DDE (HQ=150), 4,4'-DDD (HQ=75), 4,4'-DDT (HQ=34), lead (HQ=2.1), mercury (HQ=1.1), and nickel (HQ=1.1). For Knights Brook, the following chemicals of concern had hazard quotients greater than 1 at the maximum concentrations: naphthalene (HQ=1.6), acenaphthene (HQ=12), and mercury (HQ=1.6). The hazard quotients based on comparisons to NOAA ER—L values or chronic AWQC for Pickering Brook and Knights Brook are presented in Tables 29 and 30, respectively. A more detailed discussion of the ecological risk assessment is presented in Section 6 of the Draft Final Site 8 and Zone 5 RI Reports (G-577; G-635).

VII. DEVELOPMENT AND SCREENING OF REMEDIAL ALTERNATIVES

A. Statutory Requirements/Response Objectives

Section 121 of CERCLA establishes several statutory requirements and preferences, including the following: remedial actions must be protective of human health and the environment; remedial actions, when complete, must comply with all federal and more stringent state environmental standards, requirements, criteria, or limitations, unless a waiver is invoked; the remedial action selected must be cost-effective and use permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable; and a preference for remedies in which treatment that permanently and significantly reduces the toxicity, mobility, or volume (TMV) of the hazardous substances is a principal element over remedies not involving such treatment. Remedial alternatives were developed to be consistent with these mandates.

Based on preliminary information relating to types of contaminants, environmental media of concern, and potential exposure pathways, remedial action objectives (RAOs) were developed to aid in the development and screening of alternatives. These RAOs were developed to mitigate existing and future potential threats to human health and the environment via source control and management of migration of groundwater.

The RAOs for Site 8 were identified as follows:

Soil

- Protect ecological receptors from direct contact with, or ingestion of, soil containing contaminants in concentrations that may present an unacceptable risk.

- Prevent leaching of contaminants from soil to groundwater that would result in groundwater contamination that may present a health risk (total carcinogenic risk greater than 10^{-4}, or a hazard index greater than 1).

Groundwater

- Protect human receptors from ingestion of contaminated groundwater that may present a health risk (total carcinogenic risk greater than 10^{-4}, or a hazard index greater than 1).

- Prevent discharge of contaminated groundwater to surface water bodies where it may present increased risks to human health and the environment.

B. Technology and Alternative Development and Screening

CERCLA and the National Contingency Plan (NCP) set forth the process by which remedial actions are evaluated and selected. In accordance with these requirements, a range of alternatives was developed for Site 8.

With respect to source control, the RI/FS developed a range of alternatives in which treatment that reduces the TMV of the hazardous substances is a principal element. This range included an alternative that removes or destroys hazardous substances to the maximum extent feasible, eliminating or minimizing to the degree possible the need for long-term management. This range also included alternatives that treat the principal threats posed by the site but vary in the degree of treatment employed and the quantities and characteristics of the treatment residuals and untreated waste that must be managed; alternatives that involve little or no treatment but provide protection through engineering or institutional controls; and a no-action alternative.

In Section 3 of the Draft Final Site 8 FS Report (G-611), technologies were identified, assessed, and screened based on implementability, effectiveness, and cost. These technologies were placed in the categories identified in Section 300.430(e)(3) of the NCP. Section 4 of the Site 8 Draft Final FS Report (G-611) presents the remedial alternatives developed by combining the technologies. The purpose of the initial screening was to reduce the number of potential remedial actions for further detailed analysis while preserving a range of options. The alternatives retained after the initial screening are evaluated in detail in Section 5 of the Draft Final Site 8 FS Report (G-611).

Eight alternatives were retained for detailed analysis. Table 31 identifies the eight alternatives that were identified through the screening process.

VIII. DESCRIPTION OF REMEDIAL ALTERNATIVES

This subsection describes each alternative evaluated. A detailed tabular assessment of each alternative is presented in Tables 5.2-1 through 5.2-8 of the Draft Final Site 8 FS Report (G-611).

Alternative 1

The no-action/institutional control alternative for Site 8 is limited to the following site access restrictions and institutional controls:

- Placement of a security fence and warning signs around the site.
- Long-term environmental monitoring, including groundwater, surface water, and sediment sampling and analysis.
- Placement of deed restrictions on future land development and use of groundwater at the site. The restrictions would remain in effect for several decades.
- Attachment of easements restricting groundwater use on off-base properties where groundwater contaminants at concentrations exceeding cleanup goals can be traced to the contaminant source area at Site 8. The easements would restrict the use of contaminated groundwater and allow access to properties as necessary for performance of monitoring or remedial actions.

- Extension of a public drinking water system to off-base properties where groundwater contaminants at concentrations exceeding cleanup goals can be traced to the contaminant source area at Site 8. (Note: Monitoring of residential wells, to date, does not indicate the presence of Site 8 contaminants; however, this precaution is considered necessary for this alternative.)

No treatment of soil or groundwater, nor recovery of free-phase product, is involved in this response action. Removal of contaminants would occur only by mechanisms of natural attenuation, such as biodegradation, volatilization, and dilution.

Estimated time for design and construction: 6 months.
Estimated period of operation: 30 years.
Estimated capital cost: $313,000.
Estimated operation and maintenance (O&M) cost (net present worth): $1,113,305.
Estimated total cost (net present worth): $1,340,000.

<u>**Alternative 2**</u>

This alternative would consist of the following components:

- Management of migration in the downgradient overburden and bedrock water-bearing zones. The groundwater recovery system would be designed to prevent continued downgradient migration of dissolved-phase groundwater contamination that exceeds cleanup goals. The combined pumping rate of the overburden and bedrock recovery systems is estimated to exceed 40 gpm.

- Construction and operation of an on-site GWTP to treat groundwater extracted for management of migration. The proposed GWTP was designed to accommodate a maximum flow of 60 gallons per minute (gpm). The treatment processes to be employed in the GWTP are discussed in detail in Section 5 of the Draft Final Site 8 FS Report (G-611). Treated groundwater would be discharged to subsurface recharge trenches. Effluent from the proposed GWTP would comply with the requirements of Env-Ws 410 for a groundwater remediation system. Effluent would be monitored for selected compounds at a frequency agreed to during remedial design.

- Placement of a security fence and warning signs around the source area.

- Placement of institutional controls restricting future land development and use of groundwater.

- Long-term environmental monitoring, including groundwater, surface water, and sediment sampling and analysis.

Estimated time for design and construction: 12 months.
Estimated period of operation: 30 years.
Estimated capital cost: $1,189,500.
Estimated O&M cost (net present worth): $5,445,000.
Estimated total cost (net present worth): $6,635,000.

Alternative 3

This alternative would consist of the following components:

- Construction of a groundwater/free-phase product recovery trench downgradient of the free-phase product plume to minimize off-site migration of contaminated overburden groundwater and free-phase product. It is estimated that the trench would recover a maximum of 2 gpm of groundwater.

- Installation of approximately 40 product recovery wells in areas where the greatest amounts of free-phase product have been detected. It is estimated that dual-phase pumps would be installed in 10 of the wells, and product skimming pumps would be installed in the remaining wells. Based on the rate at which product has been recovered during the IRM, it is estimated that a maximum of 20 gallons per day (gpd) of product would be recovered by the product recovery wells. It is estimated that 0.10 gpm of groundwater would be extracted by each of the dual-phase pumping systems.

- Off-base treatment/disposal of recovered free-phase product.

- Management of migration in the downgradient overburden and bedrock water-bearing zones. The groundwater recovery system would be designed to prevent continued downgradient migration of dissolved-phase groundwater contamination that exceeds cleanup goals.

- Construction and operation of an on-site GWTP to treat groundwater extracted for management of migration. Treated groundwater would be discharged to subsurface recharge trenches.

- Placement of a security fence and warning signs around the source area.

- Placement of institutional controls on future land development and use of groundwater at the site.

- Long-term environmental monitoring, including groundwater, surface water, and sediment sampling and analysis.

Institutional controls and access restrictions, including fencing and deed restrictions, would be implemented as described for Alternative 2. Management of dissolved contaminant migration in downgradient overburden and bedrock groundwater would be implemented as for Alternative 2. Environmental monitoring proposed for this alternative would be implemented as described in Appendix G of the Draft Final Site 8 FS Report (G-611).

Estimated time for design and construction: 8 to 12 months.
Estimated period of operation: 30 years.
Estimated capital cost: $1,830,300.
Estimated O&M cost (net present worth): $6,016,000.
Estimated total cost (net present worth): $7,846,000.

Alternative 4

Alternative 4 includes the following components:

- In situ SVE of source area soil contaminated at concentrations above cleanup goals, and treatment of extracted soil vapor for removal of volatilized organics.

- Construction of an asphaltic concrete cap (blacktop pavement) to minimize rainfall and snowmelt infiltration into the area of SVE treatment. The cap will aid in lowering the water table.

- Construction of groundwater/free-phase product recovery trenches downgradient of the free-phase product plume as a contingency measure. The trenches would only be installed in the unlikely event that free-phase product begins to migrate away from the source area.

- Recovery and off-base disposal of free-phase product floating on the water table in the source area.

- Management of migration in the downgradient overburden water-bearing zone. The groundwater recovery system will be designed to capture dissolved-phase overburden groundwater contaminants whose concentrations exceed cleanup goals, and designed to prevent continued migration of contaminated groundwater to the bedrock water-bearing zone.

- Construction of a new GWTP for long-term treatment of recovered groundwater because of an increase in the volume of extracted groundwater. Treated groundwater would be discharged to subsurface recharge trenches.

- Environmental monitoring during remedial operations.

- Perform long-term environmental monitoring, including groundwater, surface water, and sediment sampling and analysis.

Estimated time for design and construction: 18 months.
Estimated period of operation: 30 years.
Estimated capital cost: $7,257,596.
Estimated O&M cost (net present worth): $6,117,375.
Estimated total cost (net present worth): $13,374,971.

<u>Alternative 5</u>

This alternative includes the same source area remedial action as the preferred alternative (Alternative 4), but the management of migration action includes the extraction of overburden and bedrock groundwater rather than overburden groundwater only as for Alternative 4. This alternative would consist of the following components:

- In situ SVE treatment of source area soil contaminated at concentrations above cleanup goals, and treatment of extracted soil vapor for removal of volatilized organics.

- Construction of an asphaltic concrete cap to minimize rainfall and snowmelt infiltration into the area of SVE treatment. The cap would aid in lowering the groundwater table.

- Recovery and off-base disposal of free-phase product floating on the water table in the source area.

- Management of migration in the downgradient overburden and bedrock water-bearing zones. The groundwater recovery system would be designed to prevent continued downgradient migration of dissolved-phase groundwater contamination that exceeds cleanup goals.

- Construction and operation of an on-site GWTP to treat groundwater extracted for management of migration. Treated groundwater would be discharged to subsurface recharge trenches.

- Environmental monitoring during remedial operations.
- Long-term environmental monitoring, including groundwater, surface water, and sediment sampling and analysis.

Institutional controls would be implemented in the same manner as for Alternative 2. Site access restrictions and deed restrictions would remain in-place until sampling and analysis confirmed that remedial actions had eliminated the need for restrictions. Environmental monitoring also would be implemented as described for Alternative 1. Because of the aggressive remedial actions associated with Alternative 5, the duration of environmental monitoring likely would be shorter for Alternative 5 than for Alternative 1.

Estimated time for design and construction: 12 months.
Estimated period of operation: 30 years.
Estimated capital cost: $5,720,000.
Estimated O&M cost (net present worth): $8,169,569.
Estimated total cost (net present worth): $13,890,000.

Alternative 6

This alternative would include the following components:

- Excavation and ex situ, solid-phase biological/vapor extraction treatment of former burn area soil contaminated at concentrations in excess of cleanup goals. An estimated 42,000 yd^3 of former burn area soil are contaminated at concentrations above cleanup goals and thus require treatment. To access and remove all former burn area soil requiring treatment, an estimated 175,000 yd^3 of soil would be excavated. This alternative also would involve treatment of offgas for removal of volatilized organics, and on-site backfilling of treated soil into the former burn area excavation.
- Extraction, treatment, and disposal of groundwater and free-phase product in the bottom of the open excavation for a period of approximately 6 months. A groundwater/product mixture would be pumped from the excavation at a rate of approximately 25 gpm. It is estimated that this pumping rate would lower the water table in the excavation by a maximum of 2 feet.

- In situ SVE treatment of vadose zone soil in the migrating free-phase product zone. Treatment of extracted soil vapor for removal of volatilized organics also would be involved in this alternative.

- Management of migration in the downgradient overburden and bedrock water-bearing zones. The groundwater recovery system would be designed to capture dissolved-phase groundwater contamination that exceeds cleanup goals.

- Construction and operation of an on-site GWTP to treat groundwater extracted as part of the excavation dewatering and management of migration remedial actions. The unit processes are discussed in detail in Section 5 of the Draft Final Site 8 FS Report (G-611). Treated groundwater would be discharged to subsurface recharge trenches.

- Environmental monitoring during remedial operations.

- Long-term environmental monitoring, including groundwater, surface water, and sediment sampling and analysis.

Institutional controls would be implemented in the same manner as for Alternative 2. Site access restrictions and deed restrictions would remain in-place until sampling and analysis confirmed that cleanup goals in restricted media had been attained. Environmental monitoring also would be implemented as described in Appendix G of the Draft Final Site 8 FS Report (G-611). Owing to the remedial actions associated with Alternative 6, the duration of environmental monitoring likely would be considerably shorter for Alternative 6 than for Alternative 1.

Estimated time for design and construction: 12 months.
Estimated period of operation: 30 years.
Estimated capital cost: $18,430,300.
Estimated O&M cost (net present worth): $6,876,000.
Estimated total cost (net present worth): $25,306,000.

Alternative 7

This alternative would include the following components:

- Excavation and on-site thermal desorption of former burn area soil with contaminant concentrations that exceed cleanup goals.

- Excavation and stockpiling of soil not requiring treatment that must be removed to access soil requiring treatment.

- Extraction, treatment, and disposal of ponded groundwater and free-phase product in the bottom of the open excavation for a period of approximately 6 months.

- In situ SVE treatment of vadose zone soil in the migrating free-phase product zone, and treatment of extracted soil vapor for removal of volatilized organics.

- Management of migration in the downgradient overburden and bedrock water-bearing zones. The groundwater recovery system would be designed to capture dissolved-phase groundwater contamination that exceeds cleanup goals.

- Construction and operation of an on-site GWTP to treat groundwater extracted as part of the excavation dewatering and management of migration remedial actions. Treated groundwater would be discharged to subsurface recharge trenches.

- Off-base treatment/disposal of recovered floating product at an approved transport, storage, and disposal (TSD) facility.

- Environmental monitoring during remedial operations.

- Long-term environmental monitoring, including groundwater, surface water, and sediment sampling and analysis.

- Stabilization of treated soil that failed Toxicity Characteristic Leaching Procedure (TCLP) testing for metals.

- Backfilling of treated and stabilized soil into the excavation.

- Backfilling of soil not requiring treatment, whose excavation is incidental to the removal of soil requiring treatment.

This alternative is similar to Alternative 6, with the exception that thermal desorption would be substituted for bioremediation/vapor excavation as the ex situ soil treatment process. Excavation, screening, segregation, and stockpiling of former burn area soil would be implemented as described for Alternative 6, with the following exception. Soil would be removed from the excavation at a rate equal to the rate of soil treatment (i.e., approximately 200 yd^3/day) by the on-site thermal desorption units. This would avoid stockpiling 30,000 to 40,000 yd^3 of contaminated soil awaiting treatment outside of the excavation. Treated soil would be stockpiled until completion of the excavation dewatering remedial action.

Institutional controls would be implemented in the same manner as for Alternative 2. Site access restrictions and deed restrictions would remain in-place until sampling and analysis confirmed that remedial actions had eliminated the need for restrictions. Environmental monitoring also would be implemented as described in Appendix G of the Draft Final Site 8 FS Report (G-611). Because of the remedial actions associated with Alternative 7, the duration of environmental monitoring likely would be considerably shorter for Alternative 7 than for Alternative 1.

Estimated time for design and construction: 18 months.
Estimated period of operation: 30 years.
Estimated capital cost: $27,271,400.
Estimated O&M cost (net present worth): $6,091,000.
Estimated total cost (net present worth): $33,362,000.

Alternative 8

This alternative would include the following components:

- Excavation and on-site thermal desorption of all source area soil with contaminant concentrations that exceed cleanup goals.
- Excavation and stockpiling of soil not requiring treatment that must be removed to access soil requiring treatment.

- Extraction, treatment, and disposal of ponded groundwater and free-phase product ponded in the bottom of the open excavations for a period of approximately 6 months.

- Management of migration in the downgradient overburden and bedrock water-bearing zones. The groundwater recovery system would be designed to capture dissolved-phase groundwater contamination that exceeds cleanup goals.

- Construction and operation of an on-site GWTP to treat groundwater extracted as part of the excavation dewatering and management of migration remedial actions. Treated groundwater would be discharged to subsurface recharge trenches.

- Off-base treatment/disposal of recovered floating product at an approved TSD facility.

- Environmental monitoring during remedial operations.

- Long-term environmental monitoring, including groundwater, surface water, and sediment sampling and analysis.

- Stabilization of treated soil that failed TCLP testing for metals.

- Backfilling of treated and stabilized soil into the excavation.

- Backfilling of soil not requiring treatment, whose excavation is essential to the removal of soil requiring treatment.

- Environmental monitoring and controls during remedial operations.

Alternative 8 is identical to Alternative 7, with the exception that soil in the migrating floating product zone (i.e., product that has migrated downgradient of the former burn areas) would be excavated and treated by thermal desorption rather than treated in situ by SVE.

The excavation and stockpiling of source area soil would be as described for Alternative 6, except that the volume of contaminated soil removed would be 59,000 yd^3 and the excavation would be performed in two stages. The initial stage of excavation would involve the same excavation area volume and procedures as described for Alternative 7. It is estimated that approximately 17,000 yd^3 of contaminated soil would be excavated and treated during the second stage.

Estimated time for design and construction: 30 months.
Estimated period of operation: 30 years.
Estimated capital cost: $35,616,100.
Estimated O&M cost (net present worth): $5,057,000.
Estimated total cost (net present worth): $40,674,000.

IX. SUMMARY OF THE COMPARATIVE ANALYSIS OF REMEDIAL ALTERNATIVES

Section 121(b)(1) of CERCLA presents several factors that must be considered when assessing remedial alternatives. Building on these specific statutory mandates, the NCP has promulgated nine evaluation criteria to be used in assessing individual remedial alternatives. A detailed analysis was performed on the alternatives using the nine evaluation criteria to select a site remedy. A summary of the comparison of each alternative's strengths and weaknesses with respect to the nine evaluation criteria is presented as follows and tabulated in Table 32 in Appendix E. A detailed comparison of alternatives is presented in Section 5 of the Draft Final Site 8 FS Report (G-611).

Threshold Criteria

The two threshold criteria that follow must be met for the remedial alternatives to be eligible for selection in accordance with the NCP:

1. *Overall protection of human health and the environment* addresses whether a remedy provides adequate protection and describes how risks posed through each pathway are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.

2. *Compliance with Applicable or Relevant and Appropriate Requirements* (ARARs) addresses whether a remedy will meet all of the ARARs or other federal and state environmental laws, and/or will provide grounds for invoking a waiver.

Primary Balancing Criteria

The following five criteria are used to compare and evaluate the elements of one alternative to another that meet the threshold criteria:

3. *Long-term effectiveness and permanence* addresses the criteria that are used to assess alternatives for the long-term effectiveness and permanence they afford, along with the degree of certainty that they will prove successful.

4. *Reduction of toxicity, mobility, or volume (TMV) through treatment* addresses the degree to which alternatives employ recycling or treatment that reduces the TMV of contaminants, including how treatment is used to address the principal threats posed by the site.

5. *Short-term effectiveness* addresses the period of time needed to achieve protection and any adverse impacts on human health and the environment that may be posed during the construction and implementation period, until cleanup goals are achieved.

6. *Implementability* addresses the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement a particular option.

7. *Cost* includes estimated capital, operation and maintenance (O&M), and present-worth costs.

Modifying Criteria

The modifying criteria that are used in the final evaluation of remedial alternatives, generally after public comments on the RI and FS Reports and Proposed Plan are received, are as follows:

8. *State acceptance* addresses the state's position and key concerns related to the preferred alternative and other alternatives, and the state's comments on ARARs or the proposed use of waivers.

9. *Community acceptance* addresses the public's general response to the alternatives described in the Proposed Plan and RI and FS Reports.

A detailed tabular assessment of each alternative according to the nine criteria is presented in Tables 5.2-1 through 5.2-8 of the Draft Final Site 8 FS Report (G-611).

Following the detailed analysis of each alternative, a comparative analysis, focusing on the relative performance of each alternative against the nine criteria, was conducted. This comparative analysis is summarized in Table 32.

The following subsections describe the nine criteria, including the two modifying criteria not discussed in the Draft Final Site 8 FS Report (G-611); a brief narrative summary of the alternatives; and the alternatives' strengths and weaknesses according to the detailed and comparative analysis.

A. Overall Protection of Human Health and the Environment

Overall protection of human health and the environment addresses how an alternative as a whole will protect human health and the environment. This includes an assessment of how human health and environmental risks are properly eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.

The preferred alternative (Alternative 4) for remediating contamination at the site is designed to provide overall protection by preventing continued leaching of contaminants from soil containing contaminant concentrations exceeding cleanup goals into the groundwater. This will be accomplished by removing VOCs from soil via SVE and by recovering free-phase product using the skimmer pumps and, potentially, the groundwater recovery trench. Alternative 4 also is designed to prevent further migration of contaminated groundwater via groundwater extraction. All the other alternatives, except the no-action/institutional control alternative (Alternative 1), also are protective of human health and the environment.

B. Compliance with Applicable or Relevant and Appropriate Requirements

Compliance with ARARs addresses whether a remedy complies with all state and federal environmental and public health laws and requirements that apply or are relevant and appropriate to the conditions and cleanup options at a specific site. If an ARAR cannot be met, the reasons must be clearly stated and a waiver may be required.

With the exception of the no-action alternative (Alternative 1), all the other alternatives that received detailed analysis in the FS would meet the ARARs. The no-action alternative would not meet ARARs because it would potentially allow continued migration of contaminants from the highly contaminated source area groundwater and soil away from the site.

C. Long-Term Effectiveness and Permanence

Long-term effectiveness and permanence refers to the ability of an alternative to maintain reliable protection of human health and the environment over time once the cleanup goals have been met.

All the alternatives, except the no-action/institutional control alternative (Alternative 1), would provide long-term effectiveness because they all include removing and/or treating the contamination from source area soil. Alternative 1, the no-action/institutional control alternative, is not considered permanent or effective in the long term.

D. Reduction of Toxicity, Mobility, or Volume of Contaminants Through Treatment

Reduction of TMV of contaminants through treatment includes the three principal measures of the overall performance of an alternative. The 1986 amendments to the Superfund Amendments and Reauthorization Act (SARA) emphasize that, whenever possible, a remedy should be selected that uses a treatment process to permanently reduce the level of toxicity of contaminants at the site, the spread of contaminants away from the source of contamination, and the volume or amount of contamination at the site.

All the source control alternatives, except Alternative 1 (the no-action/institutional control alternative), reduce, to some extent, the TMV of contaminants because they all include either soil treatment and/or groundwater migration control.

E. Short-Term Effectiveness

Short-term effectiveness refers to the likelihood of adverse impacts on human health or the environment that may be posed during the construction and implementation of an alternative until cleanup goals are achieved.

All of the alternatives retained for detailed analysis in the FS would be effective in the short term. Because of the potential for release of contaminants through volatilization during excavation activities, however, special engineering precautions would be taken to minimize the potential for contaminant emissions to ensure short-term protection of workers and nearby residents during cleanup-related construction activities. Because Alternatives 4 and 5 require no large-scale excavations and have less risk of contaminant emissions, these alternatives rated higher than Alternatives 6, 7, and 8, which do include large-scale excavation and handling of highly contaminated soil.

F. Implementability

Implementability refers to the technical and administrative feasibility of an alternative, including the availability of materials and services needed to implement the alternative.

All the alternatives in the detailed analysis are implementable and have been used successfully at other sites. However, potential difficulties in staging soil in the excavation alternatives (Alternatives 6, 7, and 8) could prove to be extremely difficult because of the larger quantities of soil and the limited area available to stage the soil on-site.

G. Cost

The estimated present-worth costs of the alternatives are shown in Table 33.

H. State Acceptance

NHDES has been involved in oversight of the study of Pease AFB since the mid-1980s, as summarized in Section II of this document. The RI was performed with an Air Force lead, with state and EPA oversight in accordance with the FFA. NHDES has reviewed the Draft Final Site 8 Proposed Plan (G-679) and concurs with the selected remedy. A copy of the Declaration of Concurrence is presented as Appendix B.

I. Community Acceptance

The comments received during the public comment period and the public hearing on the Proposed Plan and FS Report are summarized in the Responsiveness Summary (Appendix C). The selected remedy has not been significantly modified from that presented in the Proposed Plan.

X. THE SELECTED REMEDY

The selected remedy (Alternative 4) is comprehensive in that it provides for source control and management of migration, and it also contributes to the overall attainment of Site 8 objectives. The components of this alternative involve:

- In situ SVE treatment of source area soil contaminated at concentrations exceeding cleanup goals, and treatment of extracted soil vapor for removal of volatilized organics.

- Construction of an asphaltic concrete cap to minimize rainfall and snowmelt infiltration into the area of SVE treatment. The cap will help to minimize the moisture content of the soil to be treated by SVE.

- Recovery and off-base disposal of free-phase product floating on the water table in the source area.

- Management of migration in the downgradient overburden water-bearing zone. The groundwater recovery system will be designed to capture dissolved-phase contaminant overburden groundwater that is contaminated above cleanup goals, and to prevent migration of contaminated groundwater to the bedrock water-bearing zone.

- Construction of an on-site GWTP for long-term treatment of recovered groundwater. Treated groundwater will be discharged to subsurface recharge trenches.

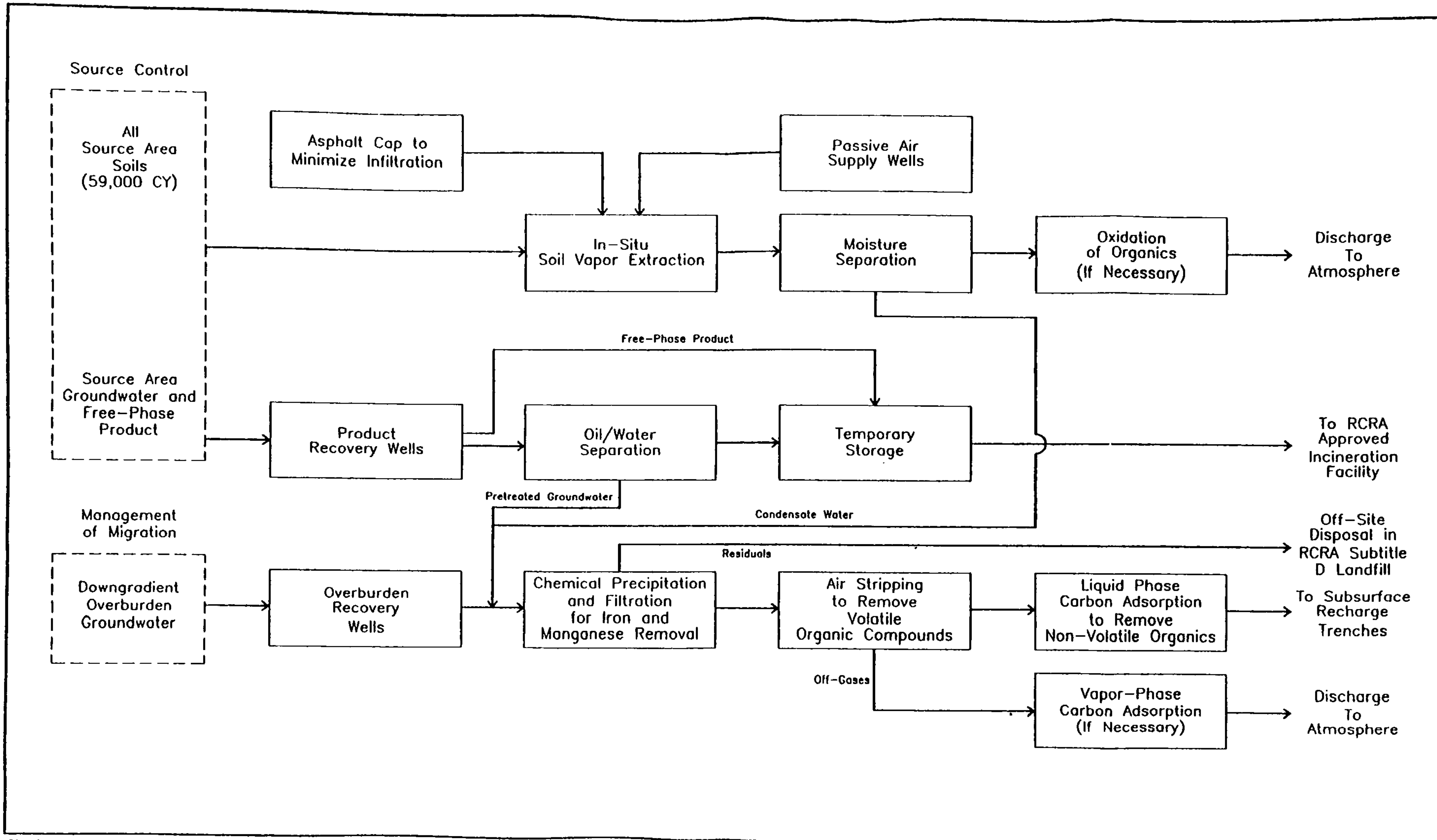
- Environmental monitoring, such as groundwater sampling, groundwater elevation monitoring, surface water (including wetlands) monitoring, and soil contamination monitoring, during remedial operations.

- Long-term environmental monitoring, including groundwater, surface water, and sediment sampling and analysis.

Figure 14 is a schematic diagram of the remedial processes employed in Alternative 4. Institutional controls will be implemented in the same manner as for Alternative 2, as described in the Draft Final Site 8 FS Report (G-611). Site access restrictions and deed restrictions will remain in-place until sampling and analysis confirmed that remedial actions had eliminated the need for restrictions. Environmental monitoring also will be implemented as described in Appendix G of the Draft Final Site 8 FS Report (G-611).

Soil Vapor Extraction of Source Area Soil

SVE will be implemented in Site 8 vadose zone soil that has contaminant concentrations that exceed cleanup goals. Most of the soil contaminated in excess of cleanup goals is in the vicinity of the water table, at approximately 21 to 25 ft BGS, and is contaminated with floating free-phase product, or is smeared with product constituents as a result of seasonal water table fluctuations. Soil cleanup goals also are exceeded in the 0- to 15-ft-BGS zone in areas of Site 8 where contaminants were discharged at the ground surface.



LEGEND:

Site 8 (FDTA-2)
Stage 3, Record of Decision
Pease Air Force Base, New Hampshire

FIGURE 14
REMEDIAL PROCESS FLOW SHEET
ALTERNATIVE 4

SVE removes volatile contaminants from the subsurface by mechanically drawing air through the pore spaces of the vadose zone soil. The increased flow of air through soil pores enhances volatilization of organic compounds and results in movement of organic vapors through the soil to extraction vents. The extraction vents are connected to a vacuum blower system that draws the contaminant-laden airstream to the surface. The airstream is typically treated for removal of contaminants prior to discharge to the atmosphere.

SVE has several advantages over other available technologies for remediation of VOC-contaminated soil:

- SVE is an in situ method that has the potential for treating large volumes of soil at reasonable costs in comparison to other available technologies.
- SVE systems are relatively easy to install and use standard, readily available equipment. This allows for rapid mobilization and implementation of remedial actions.
- SVE systems are generally relatively simple in design.

A pilot-scale SVE treatability study was conducted at Site 8 during April, May, and June 1993. The results of the study indicate that SVE will be effective in remediating vadose zone soil at Site 8 that is contaminated at concentrations that exceed cleanup goals. The objectives of the treatability study included:

- Determination of whether soil deeper than 15 ft BGS has sufficient permeability to allow enhanced movement of contaminant-laden soil vapor to the extraction vents.
- Collection of site-specific data to estimate the rate at which SVE will remove contaminants from the subsurface.
- Determination of the types of organic contaminants that SVE will remove from the subsurface at Site 8.
- Collection of site-specific data necessary to evaluate the implementability and cost of SVE at Site 8.

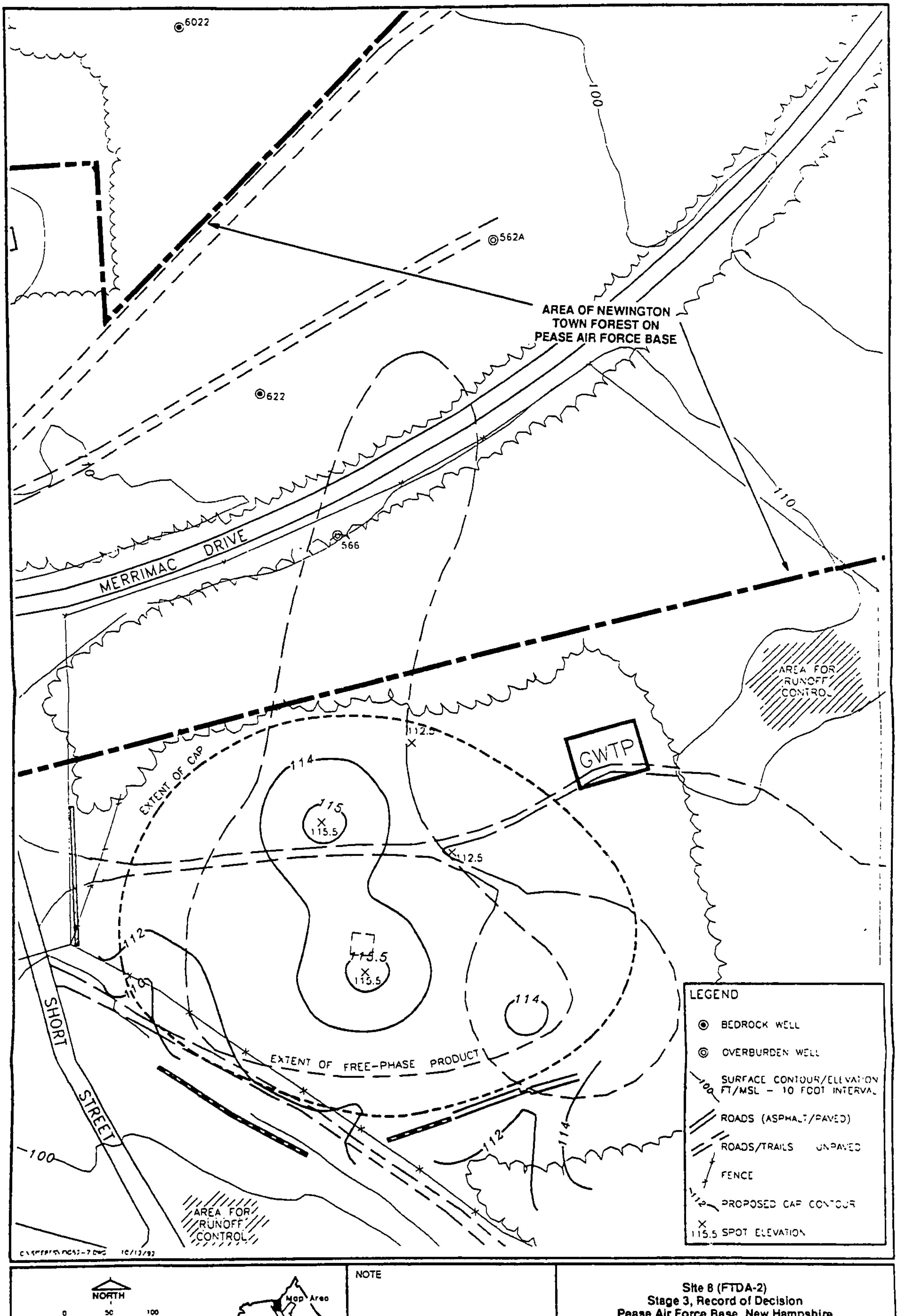
Typical SVE systems consist of an array of vents in the area of the unsaturated (vadose) zone requiring remediation. These vents are manifolded to blowers or vacuum pumps. Valves connected to each pipe provide the flexibility to withdraw air from specific areas or at different air flow rates.

Extracted soil vapors are normally pretreated prior to passing through blower and the emission control systems. Water droplets and particulate matter are removed via gravity by decreasing the velocity of the vapor stream in air/water separators. The vapor exiting the air/water separator passes through a filter, blower or vacuum pump, and an air emissions treatment unit prior to discharge to the atmosphere. The air emissions from the SVE system will be treated to comply with NHDES regulations.

The final design of a full-scale SVE system for Site 8 will be based on the pilot testing conducted at the site. The system will consist of SVE vents; passive air supply vents; and manifold, blower, and air emission control systems.

A low-permeability cap, constructed of asphaltic concrete, will be placed over the area to be treated by SVE, excluding the area within the Newington Town Forest. An evaluation of the capping scenario using a numerical model calibrated to conditions at Site 8 indicates that the cap will result in a lowering of the water table in the soil to be treated by approximately 12 to 18 inches. This will allow the SVE system to provide treatment to soil in the smear zone that would have otherwise been below the water table. The runoff generated by the asphalt cap will be controlled by detention basins, swales, and other surface drainage structures as shown in Figure 15.

Operational monitoring of the SVE system will include monthly sampling and analysis of vapor extracted from the subsurface by the SVE system. The relative concentration of VOCs in the vapor will be measured with a photoionization detector (e.g., HNu) or flame ionization detector (e.g., OVA) and recorded. If the concentration of VOCs in the vapor decreases to nondetectable levels, or if the concentration stabilizes at a low concentration, soil samples in the contaminated areas will be collected and analyzed for VOCs. If the soil



Base Map Source
Detail area of photogrammetric compilation of PAFB from aerial photography dated 11/23/87

NOTE

Site 8 (FTDA-2)
Stage 3, Record of Decision
Pease Air Force Base, New Hampshire

FIGURE 15
SVE LOW PERMEABILITY CAP DRAINAGE PLAN

sample analytical results indicate that cleanup goals have been achieved, the source control remedial action to address soil contamination will be considered complete. If VOC concentrations in the soil are not below cleanup goals, additional remedial actions or modification of the SVE system to enhance treatment will be considered. It is expected that the soil cleanup goals will be achieved within 5 years based on the estimated mass of contamination and the estimated vapor extraction rates.

<u>**Recovery and Off-Base Disposal of Free-Phase Product**</u>

Recovery of free-phase product from source area wells will be implemented in a similar manner as for Alternative 3, as described in the Draft Final Site 8 FS Report (G-611). Passive air supply vents screened through a product layer and the water table will be used as wells for product extraction. Product would be recovered from all passive vents with floating product layers thick enough for skimming or dual-phase pumping. Criteria for use of dual-phase or skimmer pumps will be the same as discussed for Alternative 3, as described in the Draft Final Site 8 FS Report (G-611). Oil/water separation, on-site product storage, and off-base product disposal will be implemented as discussed previously for Alternative 3. Groundwater/floating free-phase product recovery trenches may be installed downgradient of the free-phase product plume as a contingency measure. The trenches would only be installed in the unlikely event that free-phase product begins to migrate away from the source area as a result of operation of the SVE system. The free-phase product will be monitored with monitor wells. If free-phase product is seen in these monitor wells, the recovery trenches will be installed to intercept floating product.

<u>**Management of Migration in the Downgradient Overburden Water-Bearing Zone**</u>

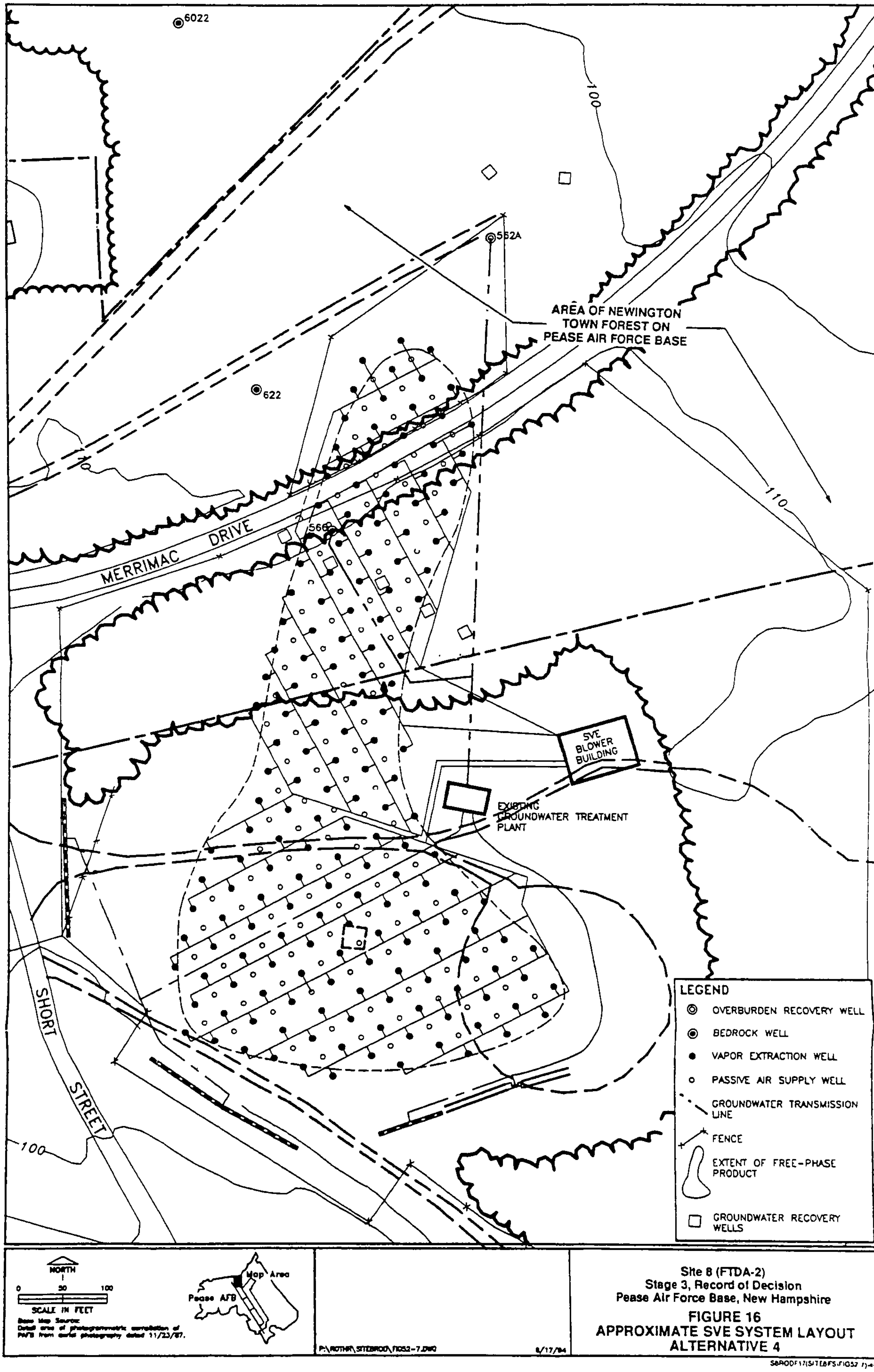
The management of migration component of this alternative will involve the collection of overburden groundwater outside the source area that contains contaminant concentrations that exceed cleanup goals. Groundwater extraction and subsequent treatment will effectively minimize further migration of the dissolved-phase contaminant plume in the downgradient overburden water-bearing zone. The overburden wells that will be used for extraction will be in the vicinity of wells 562A and 566. The locations of these wells are shown in Figure 16.

The design of the management of migration groundwater extraction system will be prepared using a three-dimensional groundwater flow model incorporating data from the Draft Final Site 8 RI Report (G-577) and performance data from the on-site GWTP.

The overburden recovery wells are located upgradient of the zone where contaminated overburden groundwater appears to migrate to the bedrock water-bearing zone. [The hydrologic connection between the overburden and bedrock water-bearing zones at Site 8 is discussed in Subsection 1.6.2.2 of the Draft Final Site 8 FS Report (G-611)]. As a result, the management of migration groundwater recovery system for this alternative will be designed to prevent migration of contaminated groundwater to the bedrock water-bearing zone. Following implementation of this alternative, and the subsequent elimination of the source of dissolved-phase contaminant migration to the bedrock water-bearing zone, contaminants present in excess of cleanup goals in the bedrock water-bearing zone will attenuate naturally. The Air Force will verify through the submittal of periodic data evaluations and 5-year reviews to EPA and NHDES that the cleanup of the overburden and bedrock zones is progressing. If the data indicate that the cleanup of the bedrock zone is not progressing, then the Air Force will implement a bedrock groundwater recovery system.

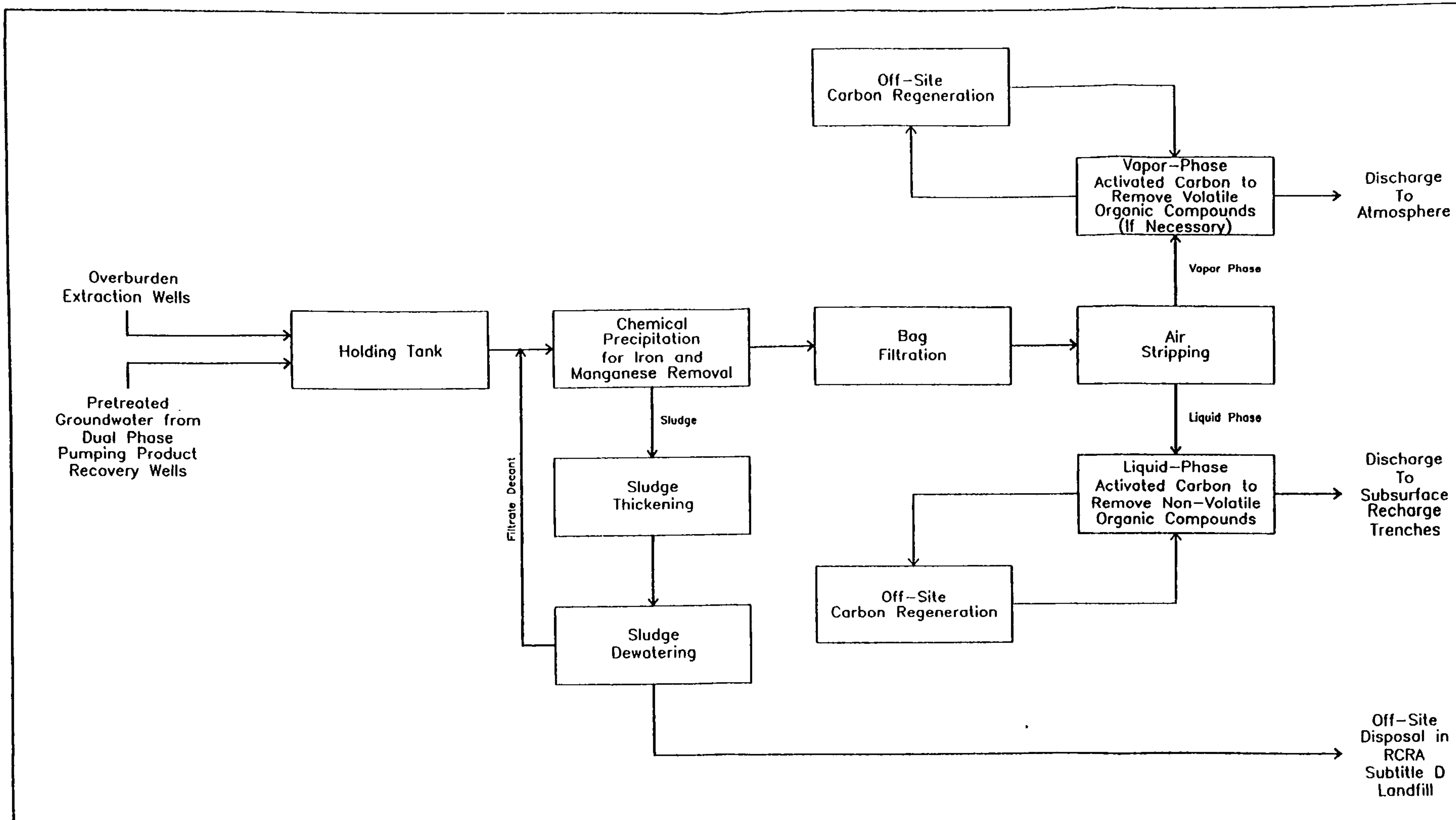
Groundwater Treatment

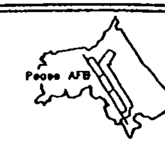
Groundwater will be treated by a new GWTP to be constructed at Site 8. Wherever possible, the new GWTP will use equipment from the pilot GWTP. The treatment processes employed at the GWTP will be chemical precipitation, filtration, air stripping, and activated carbon adsorption. A schematic diagram of the GWTP is presented in Figure 17. Dissolved-phase contaminants designated for remedial action at Site 8 consist of VOCs, SVOCs, metals, and pesticides.



Site 8 (FTDA-2)
Stage 3, Record of Decision
Pease Air Force Base, New Hampshire

FIGURE 16
APPROXIMATE SVE SYSTEM LAYOUT
ALTERNATIVE 4





Site 8 (FDTA-2)
Stage 3, Record of Decision
Pease Air Force Base, New Hampshire

FIGURE 17
GROUNDWATER TREATMENT PLANT SCHEMATIC - ALTERNATIVE 4

8/17/94

GWTP Metals Removal

Metals removal from the GWTP influent is required to prevent fouling of the GWTP air stripping and carbon adsorption units. Iron and manganese concentrations of less than 1 and 0.5 mg/L, respectively, are required for optimal operating conditions. Chemical precipitation and coagulation followed by filtration will continue to be used for metals removal prior to air stripping.

Sludge will be pumped from the bottom of the clarifier to a holding tank for thickening. Supernatant from the thickener will be routed to the influent holding tank for reprocessing. Thickened sludge will be dewatered in a filter press. The sludge will typically consist of iron and manganese hydroxides and is expected to pass TCLP testing; however, dewatered sludge would be analyzed for hazardous levels of inorganics and organics as specified by RCRA. Sludge will be disposed of off base in accordance with federal and state regulations. Clarifier effluent will be routed through filters for removal of suspended solids that do not settle in the clarifier.

These unit processes will reduce metals concentrations in the extracted groundwater to meet discharge criteria. Some organics also may be removed during chemical precipitation and filtration.

GWTP Organics Removal

Organics will be removed from the GWTP process water stream via air stripping and activated carbon adsorption. Air stripping is a relatively inexpensive, yet effective, means of removing VOCs from the aqueous phase. The air stripping unit will consist of a column containing plastic packing media or will consist of a stack of aerated trays. The air stripper is expected to remove 97% to greater than 99% of VOCs from the contaminated groundwater. Pease AFB has approval from the NHDES Division of Air Resources to emit VOCs from the existing Site 8 pilot GWTP air stripper without treatment. Based on conversations with NHDES, it is assumed that for long-term operation of the GWTP, air stripper emissions will not require treatment prior to discharge to the atmosphere and will still comply with federal and state ARARs. However, final determination on the need for air emissions control will be made by NHDES during remedial design.

Liquid-phase activated carbon adsorption will continue to be employed for removal of trace levels of contaminants not removed from the groundwater by air stripping. Carbon adsorption is effective for removal of a wide variety of contaminants, including volatile and nonvolatile organic compounds, such as chlorinated hydrocarbons, AHCs, PAHs, base-neutral acid-extractable compounds (BNAs), pesticides, and PCBs, all of which may be present in the GWTP process water.

For the conceptual GWTP design included in the FS, the option of replacing the existing organics removal processes (i.e., air stripping and carbon adsorption) with ultraviolet (UV)/chemical oxidation was investigated. Based on the analysis presented in Appendix J of the Draft Final Site 8 FS Report (G-611), treatment by air stripping and carbon adsorption will be more cost effective than UV/chemical oxidation. Groundwater treatment options will be re-evaluated in greater detail during the remedial design phase of this project. The technologies that best meet the GWTP design criteria (including contaminant removal rates, reliability of available equipment, and cost effectiveness) will be selected.

GWTP Effluent Disposal

During operation of the SVE system, most of the GWTP effluent will not be discharged to the four existing recharge trenches located to the south and west of the source area. Instead, most of the treated effluent will be discharged to recharge trenches located farther to the west or to the north of the site. This process will avoid raising the water table in the source area and, thus, will maximize the volume of soil exposed to treatment by SVE. Discharge of a limited volume of effluent to the trenches located to the south of the site will be continued to maintain a hydraulic barrier, blocking southward migration of contamination. On-site groundwater level monitoring during operation of the SVE system will be used to determine the optimum distribution of GWTP effluent.

Effluent from the GWTP will comply with NHDES standards for reinjection to the ground. Effluent will be monitored periodically to ensure compliance with these standards.

A. Methodology for Cleanup Level Determination

Cleanup levels have been selected for each medium of concern at Site 8. Cleanup levels have been established for chemicals of concern identified in the risk assessment section of the Draft Final Site 8 RI Report (G-577) and for contaminants detected at levels exceeding ARARs, risk-based concentrations, or leaching-based concentrations.

The approach used to determine risk-based concentrations is consistent with the approach used to evaluate both human health and ecological risks in the risk assessment section of the Draft Final Site 8 RI Report (G-577). This approach is presented in the Protocols for Generation of Baseline Risk Assessments for Pease Air Force Base (G-568).

Risk-based concentrations were derived for the chemicals of concern in soil and groundwater based on the RME (current or future) for the medium. The chemicals of concern include those substances that were identified as chemicals of concern in the risk assessment section of the Draft Final Site 8 RI Report (G-577). In addition, risk-based concentrations were derived for a few chemicals that were not selected as chemicals of concern in the risk assessment, but whose maximum reported concentration exceeded one or more ARAR.

Risk-based concentrations were derived for each noncarcinogenic chemical in a medium based on a goal of a hazard index of 1. For each carcinogenic chemical, the concentrations were derived based on a goal of 10^{-6} (1-in-1 million) lifetime cancer risk, with the following exceptions. Some chemicals, although categorized by EPA as carcinogens, are not considered to be carcinogenic through all exposure routes. For example, several metals, including cadmium, chromium VI, and nickel, are not classified as carcinogens through the oral exposure route. Therefore, in deriving risk-based concentrations for a given medium, if a carcinogenic chemical was not considered to be carcinogenic through the applicable exposure routes, the risk-based concentration for the chemical was based on a hazard index of 1 (i.e., noncarcinogenic risk).

Ecological risk-based concentrations were calculated for chemicals of concern in surface soil (0 to 2 ft BGS) at Site 8. These concentrations were based on the maximally exposed ecological receptor to ensure that the concentrations are protective of all other receptors that can be evaluated. Ecological risk-based concentrations for surface water and sediment were evaluated using AWQC and NOAA ER-L values, respectively.

Cleanup levels were selected after comparing maximum contaminant concentrations detected for each chemical of concern in each medium with appropriate chemical-specific ARARs, human health risk-based concentrations, and, if applicable, ecological risk-based concentrations.

In general, where ARARs were available and deemed appropriate, the ARARs were selected as cleanup levels. Where ARARs were not available, or if the basis on which the ARAR was established was not consistent with Site 8 exposure scenarios, a risk-based concentration was selected as the cleanup goal. When ARARs were selected as the cleanup goal, a human health risk was calculated for the ARAR concentration. Cleanup levels were not established for chemicals detected at maximum concentrations that were lower than appropriate ARARs or risk-based concentrations.

Cleanup levels for the various contaminated media at Site 8 are summarized in the subsections that follow.

B. Soil Cleanup Goals

Cleanup goals for soil at Site 8 were determined based on an evaluation of:

- The results of the human health risk assessment of source area soil to a maximum depth of 15 ft BGS.

- The results of the ecological risk assessment of source area soil at a depth of 0 to 2 ft BGS.

- The leaching potential of organic soil contaminants as determined by application of the Summers Model.

- The leaching potential of inorganic contaminants as inferred from a qualitative review of the distribution of inorganic contaminants in soil and groundwater at Site 8.

- Available soil ARARs.

The results of the human health risk assessment indicated that for both current and future use soil exposure scenarios, total lifetime cancer risks did not exceed EPA's acceptable range of 10^{-6} to 10^{-4}, and total hazard indices did not exceed EPA's action level of 1. Therefore, reduction of human health risks resulting from the soil exposure pathway was not considered an RAO.

The results of the ecological risk assessment for surface soil (0 to 2 ft BGS) at Site 8 indicated that the average cumulative hazard index for the deer mouse was 4.18×10^1, with the majority of the hazard index attributable to lead. The ecological risk assessment revealed that site soil contaminants posed ecological risks exceeding EPA benchmark values. The majority of the potential risk (90%) is attributable to lead exposure to the deer mouse. One of the key assumptions used throughout the calculation of risks was the assumption that the deer mouse is continuously exposed to the maximum concentration observed at the site. However, lead concentrations at Site 8 slightly exceeded the background lead concentration (65 mg/kg) for only two of 12 samples. It is more realistic to examine potential exposure based on average lead concentrations in soil. The average lead concentration in Site 8 soil was well below background lead concentrations. As indicated in the previous discussion, and coupled with more realistic assumptions used in the calculation of potential ecological risk, remediation of surface soils to background levels at Site 8 to reduce ecological risk is not warranted.

The potential for soil contaminants to leach to groundwater resulting in groundwater contaminant concentrations that exceed cleanup goals is the predominant factor driving cleanup of Site 8 soil. Since human health and ecological risks from site soil are minimal, reducing the leaching of contaminants to groundwater, thereby reducing the human health risks resulting from the groundwater exposure pathway, represents the most significant RAO for site soil.

The leaching potential of organic contaminants was evaluated quantitatively using the Summers Model, as described in Subsection 2.5 of the Draft Final Site 8 FS Report (G-611). Because the leaching of inorganic contaminants is more complex than the leaching of organic contaminants owing to speciation, pH sensitivity, and oxidation/reduction potential, the leaching potential of inorganic contaminants was qualitatively evaluated by examining the distribution of inorganic contaminants in both soil and groundwater at Site 8.

Based on a qualitative evaluation of the distribution of metals in soil and groundwater, there does not appear to be a correlation between site-related soil contamination and metals concentrations in groundwater that exceed MCLs. Table 34 provides a summary of data and criteria used for this qualitative evaluation. Possible exceptions are lead and arsenic, which have been detected at concentrations that exceed MCLs in Site 8 monitor wells that contain free-phase product. These high concentrations of lead are likely a result of dissolution of this metal from the free-phase product rather than leaching from soil. The presence of high concentrations of arsenic in groundwater is likely indicative of the reducing conditions of the groundwater at Site 8. Biological activity has depleted oxygen levels in the groundwater, resulting in the reduction of metal oxides of iron, manganese, and arsenic in the naturally occurring soil to metal species that are more soluble and more mobile in groundwater.

Soil ARARs that may be relevant to Site 8 soil include RCRA Corrective Action Levels and the State of New Hampshire Interim Policy for the Management of Soils Contaminated from Spills/Releases of Virgin Petroleum Products.

The RCRA Corrective Action Levels were developed based on human health risks resulting from ingestion of soil in a residential exposure scenario. Because the exposure scenario for Site 8 involves incidental ingestion of, and dermal contact with, contaminated soil in an industrial exposure scenario, the RCRA levels are not consistent with the Site 8 exposure scenarios. Therefore, more emphasis has been placed on the results of the human health risk assessment at Site 8 than on a comparison of site soil concentrations with the RCRA Corrective Action Levels.

The New Hampshire Interim Policy for Spills/Releases of Virgin Petroleum Products provides a cleanup goal of 1.0 mg/kg for total BTEX. However, it does not address waste oils or solvents, which are also present at Site 8. The cleanup goals presented in this policy were developed using a generalized leaching model assuming subsurface conditions considered typical in the State of New Hampshire.

Table 35 provides a comparison of maximum detected concentrations of organics in soil with ARARs and target levels based on leaching potential. The list of chemicals provided in this table includes the organic chemicals that have been selected as soil chemicals of concern and/or contaminants that were detected in both soil and groundwater. Cleanup goals for organics in soil were established if the maximum concentration detected in Site 8 soil exceeded either the State of New Hampshire ARAR for BTEX or the target levels based on leaching potential for all other organic contaminants.

The RCRA Corrective Action Levels were not selected as cleanup goals because the Site 8 exposure scenarios are not consistent with the exposure scenario used to establish the RCRA levels.

The human health risk assessment prepared for soil at Site 8 evaluated data from the soil interval of 0 to 15 ft BGS. Human receptors were assumed not to come into contact with soil at depths greater than 15 ft BGS. However, three remedial alternatives include excavation and remediation of soil below 15 ft BGS to address the leaching potential of soil contaminants. After treatment, this soil may be replaced on-site at depths of less than 15 ft BGS. To ensure that the cleanup goals for organic contaminants based on leaching potential are also protective of human health, the cancer risks and hazard indices for these concentrations at the 0 to 15 ft BGS interval were calculated and are presented in Table 35.

The methodology for calculation of these risks and hazard indices is presented in Appendix L of the Draft Final Site 8 FS Report (G-611).

Because a risk assessment was not performed for soil deeper than 15 ft BGS, and because cleanup goals were not established for inorganics based on leaching potential, a list of inorganic cleanup goals based on human health risks has been developed for soil at depths greater than 15 ft BGS. These cleanup goals are intended for implementation only on soil that would be excavated from depths greater than 15 ft BGS and replaced in the excavation at depths of less than 15 ft BGS after treatment. These concentrations were based on a lifetime cancer risk of 10^{-6} and a hazard index of 1 for each individual contaminant. The methodology for calculation of these concentrations is presented in Subsection 2.3 of the Draft Final Site 8 FS Report (G-611).

Although ecological risks were not considered severe enough to warrant remediation, ecological risk-based concentrations for soil were calculated and presented in Subsection 2.4 of the Draft Final Site 8 FS Report (G-611). These concentrations are based on a hazard index of 10 for ecological receptors. Although they were not used to establish soil cleanup goals, the ecological risk-based concentrations for soil contaminants provided in Table 2.4-1 of the Draft Final Site 8 FS Report (G-611) would be considered if soil from depths greater than 2 ft BGS are excavated for treatment. Soil with contaminant concentrations greater than the ecological risk-based concentrations would not be placed in the 0 to 2 ft BGS depth interval. A summary of the cleanup goals established for soil at Site 8 is presented in Table 35.

C. Sediment Cleanup Goals

The human health risk assessment for sediment in Knights and Pickering Brooks indicated that the total lifetime cancer risks did not exceed 10^{-6} and the total hazard indices did not exceed 0.01. Both the human health cancer risks and hazard indices are, therefore, below EPA action levels.

The ecological risk assessment indicated a cumulative mean hazard index of 91 for Pickering Brook and 10 for Knights Brook. The contaminants that contributed 93% of the hazard index for Pickering Brook sediments were the pesticides DDD, DDE, and DDT. Of this 93%, only one sampling station (8024) contributed the greatest amount to the cumulative hazard index. The majority (75%) of the cumulative mean hazard index for Knights Brook was contributed by acenaphthene and mercury. Mercury and acenaphthene were detected in only one of the Knights Brook sediment sampling locations. Therefore, based on the frequency of detections of pesticides in Pickering Brook and mercury and acenaphthene in Knights Brook, potential risks posed to ecological receptors from sediment do not warrant remediation.

Based on the preceding information, RAOs for Site 8 do not include reducing risks resulting from the sediment exposure pathway. Therefore, cleanup goals for sediment are not necessary and have not been established.

D. Surface Water Cleanup Goals

The human health and ecological risk assessments for surface water in Knights and Pickering Brooks did not reveal exposures that resulted in unacceptable risks to human or ecological receptors. Total lifetime cancer risks for human receptors did not exceed 10^{-6}, and total hazard indices did not exceed 10^{-2}. Both the human health cancer risks and hazard indices are, therefore, below EPA action levels. The cumulative chronic hazard index for average contaminant concentrations in Pickering Brook was 65.9, with 78% attributable to aluminum. Iron contributed 12.2% and lead contributed 10% to the average hazard index. The major contributor to ecological risk to surface water (i.e., aluminum) was detected at only one surface water sampling location (8027) in exceedance of chronic Ambient Water Quality Criteria. In addition, lead was detected in only one surface water sampling location (8027). A cumulative chronic hazard index for average contaminant concentrations was calculated to be 2.81 for Knights Brook. However, this hazard index was based on contaminant concentrations detected in various springs in the vicinity of Knights Brook but not found in Knights Brook itself. Aluminum, which was detected above chronic Ambient

Water Quality Criteria in only two springs, contributed 65% to the cumulative hazard index. Issues identified in the preceding discussion indicate that surface water exceedances in Pickering and Knights Brooks are not extensive and do not warrant remediation. The Air Force will monitor surface water quality in Pickering and Knights Brooks as part of the remedial action for Site 8. The remedial action for Site 8 also will comply with NHDES groundwater regulation Env-Ws 410.03c.

In summary, none of the surface water results evaluated for Site 8 showed unacceptable risks or were above background concentrations. As a result, cleanup goals were not established for surface water.

E. Groundwater Cleanup Goals

The methodology used to select cleanup goals for groundwater contamination was essentially the same as that used to select groundwater target levels for input into the leaching model (see Subsection 2.5 of the Draft Final Site 8 FS Report) (G-611). However, the list of groundwater contaminants that were evaluated for establishment of groundwater cleanup goals was limited to groundwater chemicals of concern plus groundwater contaminants that exceed MCLs. Tables 36 and 37 present the maximum detected concentrations of contaminants in Site 8 groundwater, ARARs, risk-based concentrations, the basis for selecting the cleanup goals, and the cleanup goals established for each contaminant. Table 37 also includes the background concentrations for soluble metals. These background concentrations were established as groundwater cleanup goals when they were greater than ARARs or risk-based concentrations. Table 38 presents the risks to human health presented by the groundwater exposure scenarios, as presented in Subsection 2.3 of the Draft Final Site 8 FS Report (G-611), for groundwater containing a contaminant at a concentration equivalent to the ARARs presented in Tables 36 and 37. Tables 36 and 37 also provide a summary of the cleanup goals selected for groundwater.

XI. STATUTORY DETERMINATION

The remedial action selected for implementation at Site 8 is consistent with CERCLA and the NCP. The selected remedy is protective of human health and the environment, attains ARARs, and is cost effective. The selected remedy also satisfies the statutory preference for treatment that permanently and significantly reduces the TMV of hazardous substances as a principal element. Additionally, the selected remedy uses alternative treatment technologies or resource recovery technologies to the maximum extent practicable.

A. Protection of Human Health and the Environment

The remedy at the site will permanently reduce the risks posed to human health and the environment by eliminating, reducing, or controlling exposures to human and ecological receptors through treatment and by engineering controls. Specifically, the selected remedy employs in situ SVE of source area soil to remediate soil contaminated above cleanup goals. This will involve extraction of VOCs from the soil. The vapors extracted will be treated for destruction of VOCs. Volatilization of the VOC-contaminated soil also will eliminate the threat of exposure to the most mobile contaminants through direct contact with, or ingestion of, contaminated soil. The current risks associated with ingestion and dermal contact of the soil requiring remediation currently fall within the target range of 10^{-6} to 10^{-4}. Leaching of soil contaminants into the groundwater, however, may result in exceedances of groundwater cleanup goals, which could result in increased risks associated with the groundwater exposure pathways. EPA regulates maximum risk at hazardous waste sites by selecting an acceptable risk level within this range. Treating the soil by in situ SVE will lower the risk to within the range of acceptable exposure levels and also reduce leaching of contaminants into the groundwater to within acceptable levels. By capping the site to minimize infiltration into the area of soil vapor treatment, the risks of exposure through direct contact will be further reduced. The current risks posed by groundwater exceed EPA's target maximum risk range of 10^{-6} to 10^{-4}. By extracting and treating groundwater from the overburden, the risks posed by the groundwater will be gradually reduced to an acceptable level. There are no short-term risks associated with the selected remedy that cannot be readily controlled. In addition, no adverse cross-media impacts are expected from the remedy.

B. Compliance with ARARs

The selected remedy of in situ SVE of source area soil, recovery and off-base disposal of free-phase product, groundwater extraction and on-site treatment and recharge, and institutional controls will attain all of the substantive, nonprocedural requirements of federal and state ARARs. ARARs for the Site 8 selected remedy are presented in Appendix A, which contains a complete list of ARARs, including the regulatory citation, a brief summary of the requirement, and the action to be taken to attain the requirement. Although not ARARs for the purpose of this action, the Air Force will comply with OSHA, the Off-Site Rule, and all state and federal requirements governing management of wastes recovered or generated at the site. In addition, policies, criteria, and guidelines that are *to be considered* (TBC) also will be considered during the implementation of the remedial action. The ARARs are presented as follows:

- Chemical-Specific ARARs.
  - Federal — SDWA, Maximum Contaminant Levels.
  - State — NH Admin. Code Env-Ws 410, Health-Based Groundwater Protection Standards.
- Location-Specific ARARs.
  - National Historic Preservation Act of 1966 [36 CFR Part 800, Sections 106 and 110 (f)].
  - Floodplains Executive Order (EO 11888).
  - Wetlands Executive Order (EO 11990).
  - Federal — CWA404, Section 404(b)(i), Guidelines for Specification of Disposal Sites for Dredged or Fill Material.
  - Federal — 16 USC 661 et. seq., Fish and Wildlife Coordination Act.

- State — RSA 485:A-17, NH Admin. Code Env-Ws 415, Rules Relative to Prevention of Pollution from Dredging, Filing, Mining, Transporting, and Construction.

- State — RSA 482:A, NH Admin. Code Env-Wt 300, 400, and 600, New Hampshire Criteria and Conditions for Fill and Dredging in Wetlands.

- Action-Specific ARARs.

  - Federal RCRA ARARs will be relevant and appropriate and have effect through state hazardous waste requirements, which operate in lieu of direct federal regulations. Appendix A provides a list of these requirements.

  - Federal — RCRA, 40 CFR 264.90 through 264.101 (Subpart F), Releases from Solid Waste Management Units.

  - Federal — HSWA, Amendments to RCRA, 40 CFR Part 268, Land Disposal Restrictions.

  - State — NH Admin. Code Env-Wm 351 through 353, 701 through 705, 707, 708, and 709, Standards for Owners and Operators of Hazardous Waste Facilities.

  - State — NH Admin. Code Env-Wm 702.10 through 702.14, Monitoring of Hazardous Waste Treatment Facilities.

  - State — NH Admin. Code Env-Wm 707.03, Waste Pile Requirements.

  - State — NH Admin. Code Env-Wm 500, Standards for Generators.

  - State — NH Admin. Code Env-Wm 600, Requirements for Hazardous Waste Transporters.

  - State — NH Admin. Code-Wm 507.03 and 603.05, Packaging and Labeling Requirements.

  - State — NH Admin. Code Env-Wm 510, 511, 604, 703, and 513.03, Manifesting Requirements.

  - State — NH Admin. Code Env-Ws 412, Reporting and Remediation of Oil Discharges.

  - Federal — DOT, 49 CFR Parts 107 and 171 through 179, Department of Transportation Regulations for Transport of Hazardous Materials.

- State — NH Admin. Code Saf-C-600, NH Department of Safety Rules for Transport of Hazardous Materials.

- Federal — RCRA 40 CFR Part 264, Subpart AA.

- Federal — RCRA 40 CFR Part 264, Subpart BB.

- Federal — CAA, National Emission Standards for Hazardous Air Pollutants (NESHAP).

- Federal — CAA, 40 CFR 50, National Ambient Air Quality Standards (NAAQS).

- Federal — RCRA, 40 CFR 264.251(j)(Subpart L) and 264.30(j)(Subpart N).

- State — NH Admin. Code Env-A 800, Testing and Monitoring Procedures.

- State — NH Admin. Code Env-1002, Fugitive Dust Control.

- State — NH Admin. Code Env-A 1300, Toxic Air Pollutants.

- State — NH Admin. Code Env-A 300, Ambient Air Quality Standards.

- TBC Criteria.

  - OSWER Directive 9834.11, 13 November 1987.

  - State — NH Admin. Code Env-A 1024, Control of VOC Emissions.

    State — NH Guidance Document Interim Policy for the Management of Soils Contaminated from the Spills/Releases of Virgin Petroleum Products.

The basewide ARARs document (G-614) identifies ARARs for Pease AFB, and Appendix A identifies those ARARs for the selected remedy for Site 8.

C. Cost Effectiveness

The selected remedy is cost effective because it will provide overall effectiveness proportional to its costs, the net present-worth value being $13,374,971. The estimated cost of the selected remedy is an order of magnitude lower than that of Alternative 5, and significantly lower than the excavation alternatives (Alternatives 6 through 8), and yet the selected remedy ensures a much higher degree of certainty that the remedy will be effective in the long run as a result of significant reduction of the toxicity and mobility of the contaminants achieved through in situ SVE of VOCs, recovery and off-base disposal of free-phase product, and groundwater extraction and treatment.

A summary of the costs associated with each remedial alternative is presented as follows. All costs are presented in net present-worth costs.

Remedial Alternative	Capital Cost	30-Year Present-Worth O&M Cost	Present-Worth Cost
1. No Action/Access Restrictions and Institutional Controls (fencing, deed restrictions, monitoring, and extension of public water supply).	$313,000.	$1,113,305.	$1,340,000.
2. Management of Dissolved-Phase Contaminant Migration in the Overburden and Bedrock Water-Bearing Zones, On-Site Treatment of Recovered Groundwater, Discharge of Treated Groundwater to Subsurface Recharge Trenches, and Institutional Controls.	$1,189,500.	$5,445,000.	$6,635,000.
3. Downgradient Groundwater Recovery Trench to Minimize Off-Site Contaminant Migration, Recovery and Off-Site Disposal of Free-Phase Product, Management of Dissolved-Phase Contaminant Migration in the Overburden and Bedrock Water-Bearing Zones, On-Site Treatment of Recovered Groundwater, Discharge of Treated Groundwater to Subsurface Recharge Trenches, and Institutional Controls.	$1,830,300.	$6,016,000.	$7,846,000.
4. In Situ Soil Vapor Extraction of Source Area Soil, Recovery and Off-Site Disposal of Free-Phase Product, Management of Dissolved-Phase Contaminant Migration in the Overburden Water-Bearing Zone, On-Site Treatment of Recovered Groundwater, Discharge of Treated Groundwater to Subsurface Recharge Trenches, and Institutional Controls.	$7,257,596.	$6,117,375.	$13,374,971.
5. In Situ Soil Vapor Extraction of Source Area Soil, Recovery and Off-Site Disposal of Free-Phase Product, Management of Dissolved-Phase Contaminant Migration in Overburden and Bedrock Water-Bearing Zones, On-Site Treatment of Recovered Groundwater, Discharge of Treated Groundwater to Subsurface Recharge Trenches, and Institutional Controls.	$5,720,000.	$8,169,569.	$13,890,000.
6. Excavation and Ex Situ Biological/Vapor Extraction Treatment of Burn Area Soil Contaminated Above Cleanup Goals, Dewatering of Open Excavation, Recovery and Off-Site Disposal of Free-Phase Product, In Situ Soil Vapor Extraction of Migrating Free-Phase Product Area Soil, Management of Dissolved-Phase Contaminant Migration in Overburden and Bedrock Water-Bearing Zones, On-Site Treatment of Recovered Groundwater, Discharge of Treated Groundwater to Subsurface Recharge Trenches, and Institutional Controls.	$18,430,300.	$6,876,000.	$25,306,000.

Remedial Alternative	Capital Cost	30-Year Present-Worth O&M Cost	Present-Worth Cost
7. Excavation and On-Site Thermal Treatment of Burn Area Soil Contaminated Above Cleanup Goals, Dewatering of the Open Excavation, Recovery and Off-Site Disposal of Free-Phase Product, In Situ Soil Vapor Extraction of Migrating Free-Phase Product Area Soil, Management of Dissolved-Phase Contaminant Migration in Overburden and Bedrock Water-Bearing Zones, On-Site Treatment of Recovered Groundwater, Discharge of Treated Groundwater to Subsurface Recharge Trenches, and Institutional Controls.	$27,271,400.	$6,091,000.	$33,362,000.
8. Excavation and On-Site Thermal Treatment of All Soil Contaminated Above Cleanup Goals, Dewatering of the Open Excavation, Recovery and Off-Site Disposal of Free-Phase Product, Management of Dissolved-Phase Contaminant Migration in Overburden and Bedrock Water-Bearing Zones, On-Site Treatment of Recovered Groundwater, Discharge of Treated Groundwater to Subsurface Recharge Trenches, and Institutional Controls.	$35,616,100.	$5,057,000.	$40,674,000.

Of the aforementioned alternatives, seven attain ARARs and are protective: Alternatives 2 through 8. Alternative 4 is the most cost-effective alternative overall, and provides a degree of protectiveness proportional to its cost. A summary of the costs associated with Alternative 4 (in net present-worth costs) is presented as follows:

Component of Remedy	Present-Worth Cost
Source Area Cap	$140,000
Passive Air Supply Vents, SVE Vents, and Manifold System	$2,546,163
LNAPL/Groundwater Recovery System	$285,000
Source Area Groundwater Treatment/LNAPL Storage	$58,835
Management of Migration of Groundwater Recovery System	$21,400
Construction of New GWTP	$2,592,800
Miscellaneous	$1,613,398
O&M	$6,117,375
Total	$13,374,971

D. Use of Permanent Solutions and Alternative Treatment or Resource Recovery Technologies to the Maximum Extent Practicable

EPA and the State of New Hampshire have determined that the selected remedy represents the maximum extent to which permanent solutions and treatment technologies can be used in a cost-effective manner for Site 8. Of those alternatives that are protective of human health and the environment and comply with ARARs, EPA and NHDES have determined that the selected remedy provides the best balance of tradeoffs in terms of long-term effectiveness and permanence, reduction in TMV of contaminants through treatment, short-term effectiveness, implementability, and cost, while considering the statutory preference for treatment as a principal element and considering state and community acceptance.

The selected remedy does offer as relatively high a degree of long-term effectiveness and permanence as do the excavation alternatives, and it will significantly reduce the inherent hazards posed by the contaminated soil through SVE of the VOCs and will reduce the hazards posed by groundwater by extraction and treatment. The hazard posed by the free-phase product would be removed by recovery and off-base disposal of the free-phase product.

The selected remedy treats the principal threats posed by the soil, achieving significant VOCs reductions. The implementability of the selected remedy is comparable to the nontreatment alternatives and significantly better than the excavation options. The selected remedy also is the least costly in situ option and is less expensive than excavation.

The selection of this remedy is consistent with program expectations that indicate that highly toxic and mobile wastes are a priority for treatment and that treatment is often necessary to ensure the long-term effectiveness of a remedy. Since all in situ and excavation treatment options are reasonably comparable with respect to long-term effectiveness and the toxicity and mobility reductions achieved, the major tradeoffs that provide the basis for this selection decision are short-term effectiveness, implementability, and cost. The selected remedy can be implemented more quickly, with less difficulty, and at less cost than the other in situ and excavation treatment alternatives and, therefore, is the most appropriate solution for Site 8.

E. Preference for Treatment as a Principal Element

By treating the VOC-contaminated soil by in situ SVE and pumping and treating contaminated groundwater, the selected remedy addresses the principal threats posed by the site through the use of treatment technologies. VOCs extracted from the soil will be destroyed. Therefore, the statutory preference for remedies that employ treatment as a principal element is satisfied.

XII. DOCUMENTATION OF SIGNIFICANT CHANGES

The Air Force presented a Proposed Plan (Alternative 4) for remediation of Site 8 in January 1994 (G-679). The components of the preferred alternative included:

- In situ SVE of source area soil.
- Construction of a cap.
- Construction of groundwater/free-phase product recovery trenches as a contingency.
- Recovery and off-base disposal of free-phase product.
- Management of migration in overburden groundwater.
- Management of migration in bedrock groundwater as a contingency measure.
- Construction of an on-site GWTP for treatment of recovered groundwater.
- Environmental monitoring during remedial action.
- Long-term monitoring.

There have been no significant changes in the selected alternative since publication of the Draft Final Site 8 FS Report (G-611) and Proposed Plan (G-679).

It should be noted that several regulations have been updated and some are now enforceable, where they were not previously. Regulatory updates, as of the submission of this ROD, have been added to Appendix A. Additionally, it has been determined, as part of the initial design work, that the use or upgrade of the existing GWTP is no longer a viable option.

XIII. STATE ROLE

NHDES, as party to the FFA, has reviewed the various alternatives and has indicated its support for the selected remedy. The State of New Hampshire has reviewed the Draft Final Site 8 RI Report, including the baseline risk assessment, and the Draft Final Site 8 FS Report to determine whether the selected remedy is in compliance with ARARs (G-611; G-577). The State of New Hampshire concurs with the selected remedy for Site 8. A copy of the Declaration of Concurrence is attached as Appendix B.

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LIST OF ACRONYMS

AALs	Ambient Air Limits
AFB	Air Force Base
AFCEE/ERB	Air Force Center for Environmental Excellence/Base Closure Division
AHCs	aromatic hydrocarbons
ARAR	Applicable or Relevant and Appropriate Requirement
AWQC	Ambient Water Quality Criteria
BAT	best available technology
BNAs	base-neutral acid-extractable compounds
BTEX	benzene, toluene, ethylbenzene, and xylenes
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CRD-1	Construction Rubble Dump 1
CTV	critical toxicity value
DCA	dichloroethane
DCE	dichloroethene
DEQPPM	Defense Environmental Quality Program Policy Memorandum
DOD	Department of Defense
EDB	ethylene dibromide
EPA	Environmental Protection Agency
ER—L	Biological Effects Range — Low
FDTA-2	Fire Department Training Area 2
FFA	Federal Facility Agreement
FMS	Field Maintenance Squadron
FS	Feasibility Study
ft MSL	feet above mean sea level
ft BGS	feet below ground surface
GC	gas chromatograph
GMZ	Groundwater Management Zone
gpd	gallons per day
gpm	gallons per minute
GT	Glacial Till
GWTP	groundwater treatment plant
HA	Health Advisory
HQ AFBCA	Headquarters Air Force Base Conversion Agency
IRM	interim remedial measure
IRP	Installation Restoration Program
ITR	Interim Technical Report
LNAPL	light, nonaqueous-phase liquid
LS	Lower Sand
MCL	Maximum Contaminant Level
MCLG	Maximum Contaminant Level Goal
MCS	Marine Clay and Silt
MIBK	4-methyl-2-pentanone
MOA	Memorandum of Agreement
NAAQS	National Ambient Air Quality Standards

LIST OF ACRONYMS
(Continued)

NCP	National Contingency Plan
NESHAP	National Emission Standards for Hazardous Air Pollutants
NHANG	New Hampshire Air National Guard
NHDES	New Hampshire Department of Environmental Services
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
o/w	oil/water
O&M	operation and maintenance
OCDD	octachlorinated dibenzo-p-dioxin
OEHL	Occupational and Environmental Health Laboratory
OHC	oxygenated hydrocarbon
PA	Preliminary Assessment
PAH	polynuclear aromatic hydrocarbon
PCA	tetrachloroethane
PCB	polychlorinated biphenyl
PCE	tetrachloroethene
ppm	parts per million
QAPP	Quality Assurance Project Plan
RAO	remedial action objective
RCRA	Resource Conservation and Recovery Act
RfD	Risk Reference Dose
RI	Remedial Investigation
RI/FSs	Remedial Investigations and Feasibility Studies
RME	most reasonable maximally exposed individual
ROD	Record of Decision
SAP	Sampling and Analysis Plan
SARA	Superfund Amendments and Reauthorization Act
SI	Site Investigation
SVE	soil vapor extraction
TBC	to be considered
TCE	trichloroethene
TCLP	Toxicity Characteristic Leaching Procedure
TMV	toxicity, mobility, or volume
TOC	total organic carbon
TPH	total petroleum hydrocarbon
TSD	transport, storage, and disposal
TSDFs	treatment, storage and disposal facilities
US	Upper Sand
USAFOEHL	U.S. Air Force Occupational and Environmental Health Laboratory
USGS	U.S. Geological Survey
UV	ultraviolet
VOC	volatile organic compound
WESTON®	Roy F. Weston, Inc.

APPENDIX A

ARARS FOR THE PREFERRED ALTERNATIVE

APPENDIX A

ARARs FOR ALTERNATIVE 4: IN SITU SOIL VAPOR EXTRACTION OF SOURCE AREA SOIL, RECOVERY AND OFF-SITE DISPOSAL OF FREE-PHASE PRODUCT, MANAGEMENT OF DISSOLVED-PHASE CONTAMINANT MIGRATION IN THE OVERBURDEN WATER-BEARING ZONE, ON-SITE TREATMENT OF RECOVERED GROUNDWATER, DISCHARGE OF TREATED GROUNDWATER TO SUBSURFACE RECHARGE TRENCHES, AND INSTITUTIONAL CONTROLS SITE 8, PEASE AFB, NH

Medium	Requirement	Requirement Synopsis	Action To Be Taken To Attain Requirements	Status
	<u>CHEMICAL-SPECIFIC</u>			
Groundwater	FEDERAL-SDWA-Maximum Contaminant Levels (MCLs) (40 CFR 141.11-141.16)	MCLs have been promulgated for a number of common organic and inorganic contaminants. These levels regulate the contaminants in public drinking water supplies, but may also be considered relevant and appropriate for groundwater aquifers potentially used for drinking water.	MCLs were considered when selecting groundwater cleanup goals. Free-phase product removal, groundwater extraction and treatment, institutional controls, and Groundwater Management Zone (GMZ) monitoring would be conducted to attain requirements.	Relevant and Appropriate
Groundwater	FEDERAL-SDWA-Maximum Contaminant Level Goals (MCLGs) (40 CFR 141.50-141.51)	Non-zero MCLGs are nonenforceable health-based goals for public water systems. MCLGs are set at levels that would result in no known or expected adverse health effects, with an adequate margin of safety.	Non-zero MCLGs were considered when selecting groundwater cleanup and treatment goals. Free-phase product removal, groundwater extraction and treatment, institutional controls, and GMZ monitoring would be conducted to attain requirements.	Relevant and Appropriate
Groundwater	FEDERAL-EPA Health Advisories (HAs)	HAs are nonenforceable health-based standards established for various exposure durations, i.e., 1-day, 10-day, and lifetime.	HAs were considered when selecting groundwater cleanup goals as presented in Tables 2.6-3 and 2.6-4 of the Draft Final Site 8 FS Report (G-611). Free-phase product removal, groundwater extraction and treatment, institutional controls, and GMZ monitoring would be conducted to attain requirements.	TBC

APPENDIX A

ARARs FOR ALTERNATIVE 4: IN SITU SOIL VAPOR EXTRACTION OF SOURCE AREA SOIL, RECOVERY AND OFF-SITE DISPOSAL OF FREE-PHASE PRODUCT, MANAGEMENT OF DISSOLVED-PHASE CONTAMINANT MIGRATION IN THE OVERBURDEN WATER-BEARING ZONE, ON-SITE TREATMENT OF RECOVERED GROUNDWATER, DISCHARGE OF TREATED GROUNDWATER TO SUBSURFACE RECHARGE TRENCHES, AND INSTITUTIONAL CONTROLS SITE 8, PEASE AFB, NH (Continued)

Medium	Requirement	Requirement Synopsis	Action To Be Taken To Attain Requirements	Status
Groundwater, Soil	FEDERAL-EPA Risk Reference Doses (RfDs)	RfDs are dose levels developed based on the noncarcinogenic effects and are used to develop Hazard Indices. A Hazard Index of less than or equal to 1 is considered acceptable.	EPA RfDs have been used to characterize risks resulting from exposure to contaminants in groundwater because leaching from soil to groundwater may potentially occur. Free-phase product removal, groundwater extraction and treatment, institutional controls, and GMZ monitoring would be conducted to attain requirements.	TBC
Groundwater, Soil	FEDERAL-EPA Carcinogen Assessment Group Potency Factors	Potency Factors are developed by the EPA from Health Effects Assessments or evaluation by the Carcinogenic Assessment Group and are used to develop excess cancer risks. A range of 10^{-4} to 10^{-6} is considered acceptable.	EPA Carcinogenic Potency Factors have been used to compute the individual incremental cancer risk resulting from exposure to site contamination in groundwater and soil.	TBC

APPENDIX A

ARARs FOR ALTERNATIVE 4: IN SITU SOIL VAPOR EXTRACTION OF SOURCE AREA SOIL, RECOVERY AND OFF-SITE DISPOSAL OF FREE-PHASE PRODUCT, MANAGEMENT OF DISSOLVED-PHASE CONTAMINANT MIGRATION IN THE OVERBURDEN WATER-BEARING ZONE, ON-SITE TREATMENT OF RECOVERED GROUNDWATER, DISCHARGE OF TREATED GROUNDWATER TO SUBSURFACE RECHARGE TRENCHES, AND INSTITUTIONAL CONTROLS SITE 8, PEASE AFB, NH (Continued)

Medium	Requirement	Requirement Synopsis	Action To Be Taken To Attain Requirements	Status
Groundwater	STATE-NH Admin. Code, Env-Ws 410.05, Health-Based Groundwater Protection Standards	Allowable limits for contaminants in groundwater are based on New Hampshire Division of Public Health Services health-based standards and federal MCLs, MCLGs, and other relevant standards.	Available MCLs, MCLGs, and other health-based limits have been used, as appropriate, to set cleanup goals for groundwater extracted during remedial activities. Target cleanup goals are presented in the Draft Final Site 8 FS Report (G-611). Free-phase product removal, groundwater extraction and treatment, institutional controls, and GMZ monitoring would be conducted to attain requirements.	Applicable
	<u>**LOCATION-SPECIFIC**</u>			
Historic Places	National Historic Preservation Act of 1966	Requires a federal agency head with jurisdiction over a federal, federally assisted, or federally licensed undertaking to take into account the effects of the agency's undertakings on properties included in, or eligible for, the National Register of Historic Places and, prior to approval of an undertaking, to afford the Advisory Council on Historic Preservation a reasonable opportunity to comment on the undertaking.	A Memorandum of Agreement (MOA) between the Air Force and the New Hampshire State Historic Preservation Officer that covers this issue will be signed.	Applicable

APPENDIX A

ARARs FOR ALTERNATIVE 4: IN SITU SOIL VAPOR EXTRACTION OF SOURCE AREA SOIL, RECOVERY AND OFF-SITE DISPOSAL OF FREE-PHASE PRODUCT, MANAGEMENT OF DISSOLVED-PHASE CONTAMINANT MIGRATION IN THE OVERBURDEN WATER-BEARING ZONE, ON-SITE TREATMENT OF RECOVERED GROUNDWATER, DISCHARGE OF TREATED GROUNDWATER TO SUBSURFACE RECHARGE TRENCHES, AND INSTITUTIONAL CONTROLS SITE 8, PEASE AFB, NH (Continued)

Medium	Requirement	Requirement Synopsis	Action To Be Taken To Attain Requirements	Status
Wetlands	Wetlands Executive Order (EO 11990) 40 CFR Part 6, Appendix A	Under this order, federal agencies are required to minimize the destruction, loss, or degradation of wetlands or beneficial values of wetlands.	The remedial action will address impacts to identified wetlands. Remedial activities will minimize harm to the wetlands to the extent possible. Appropriate federal agencies identified (under this act) will be contacted and allowed to review the proposed work plan prior to remedial activities.	TBC
Wetlands	FEDERAL-CWA 404, Section 404 (b)(i), Guidelines for Specification of Disposal Sites for Dredged or Fill Material (40 CFR 230)	Contains requirements for discharge of dredge or fill material, including that no discharge is permitted if there is a practicable alternative to the proposed discharge that would have a less adverse impact on the aquatic ecosystem, and that no discharge is permitted unless appropriate and practicable steps are taken to minimize potential adverse impacts on the aquatic ecosystem.	No dredging or filling of wetlands will occur under this alternative. Remedial activities will be designed to minimize potential adverse effects on the aquatic ecosystem.	Applicable
Wetlands	FEDERAL-16 USC 661 et. seq., Fish and Wildlife Coordination Act	Requires federal agencies to take into consideration the effect that water-related projects will have on fish and wildlife. Requires consultation with the Fish and Wildlife Service and the state to develop measures to prevent, mitigate, or compensate for project-related losses to fish and wildlife.	Relevant federal and state agencies will be contacted to help analyze effects of the remedial action on wildlife in the wetlands in and around Site 8 and to develop measures to prevent, mitigate, and compensate for adverse impacts.	Applicable

APPENDIX A

ARARs FOR ALTERNATIVE 4: IN SITU SOIL VAPOR EXTRACTION OF SOURCE AREA SOIL, RECOVERY AND OFF-SITE DISPOSAL OF FREE-PHASE PRODUCT, MANAGEMENT OF DISSOLVED-PHASE CONTAMINANT MIGRATION IN THE OVERBURDEN WATER-BEARING ZONE, ON-SITE TREATMENT OF RECOVERED GROUNDWATER, DISCHARGE OF TREATED GROUNDWATER TO SUBSURFACE RECHARGE TRENCHES, AND INSTITUTIONAL CONTROLS SITE 8, PEASE AFB, NH (Continued)

Medium	Requirement	Requirement Synopsis	Action To Be Taken To Attain Requirements	Status
Wetlands, Rivers	STATE-RSA 485:A-17, NH Admin. Code Env-Ws 415, Rules Relative to Prevention of Pollution from Dredging, Filling, Mining, Transporting, and Construction	Establish criteria for conducting any activity in or near state surface waters that significantly alters terrain or may otherwise adversely affect water quality, impede natural runoff, or create unnatural runoff. Activities within the scope of these provisions include excavation, dredging, filling, mining, and grading of topsoil in or near wetland areas.	Source control and management of migration treatment systems will meet substantive requirements of these NHDES rules as applicable to wetlands prior to initiation.	Applicable
Wetlands, Rivers	STATE-RSA 482-A, NH Admin. Code Env-Wt 300, 400, and 600, New Hampshire Criteria and Conditions for Fill and Dredging in Wetlands	Regulate filling and other activities in or adjacent to wetlands, and establish criteria for the protection of wetlands from adverse impacts on fish, wildlife, commerce and public recreation.	Proposed work adjacent to the wetlands will be reviewed by the Wetlands Board and will comply with State Wetlands Protection Requirements.	Applicable
Soil	New Hampshire RSA 217A, Native Plant Protection Act	Prohibits damaging plant species listed as endangered within the state.	Endangered plants are not likely to exist at this location, but care will be taken to identify and protect any before commencement of remediation.	Applicable, if endangered plants are identified
Historic Places	National Historic Prevention Act of 1966 (16 USC 470 et seq.), Protection of Historic Land and Structures; Archeological and Historic Preservation Act of 1974; Historic Sites Building and Antiquities Act	Several statues that govern the preservation of historic, scientific, and archeological sites and resources. Includes action to recover and preserve artifacts, preserve historic properties, and minimize harm to historic landmarks.	Remedial action must be coordinated with preservation agencies and societies to minimize loss of significant scientific, prehistorical, historical, or archeological data.	Applicable

APPENDIX A

ARARs FOR ALTERNATIVE 4: IN SITU SOIL VAPOR EXTRACTION OF SOURCE AREA SOIL, RECOVERY AND OFF-SITE DISPOSAL OF FREE-PHASE PRODUCT, MANAGEMENT OF DISSOLVED-PHASE CONTAMINANT MIGRATION IN THE OVERBURDEN WATER-BEARING ZONE, ON-SITE TREATMENT OF RECOVERED GROUNDWATER, DISCHARGE OF TREATED GROUNDWATER TO SUBSURFACE RECHARGE TRENCHES, AND INSTITUTIONAL CONTROLS SITE 8, PEASE AFB, NH (Continued)

Medium	Requirement	Requirement Synopsis	Action To Be Taken To Attain Requirements	Status
Historic Places	New Hampshire Historic Protection Act (RSA 227-C)	Authorizes municipalities to establish local historic districts and to regulate construction, alteration, and other activities affecting historic properties and districts.	Remedial actions will be coordinated with preservation agencies and societies to minimize loss of significant scientific, prehistorical, historical, or archeological data.	Applicable
	<u>ACTION-SPECIFIC</u>			
Hazardous Waste/Soil	FEDERAL-RCRA 40 CFR Part 264	RCRA Subtitle C establishes standards applicable to treatment, storage, transport, and disposal of hazardous waste and the closure of hazardous waste facilities.	Management of hazardous waste as part of CERCLA response must comply with substantive requirements of Subtitle C regulations.	Relevant and appropriate. Has effect through state hazardous waste require-ments, which operate in lieu of direct federal regulations. See discussion of these requirements below.
Hazardous Waste/Soil	FEDERAL-RCRA 40 CFR 264.90-264.101 (Subpart F), Releases from Solid Waste Management Units	General facility requirements for groundwater monitoring at affected facilities and general requirements for corrective action programs if required at regulated facilities.	Groundwater monitoring and treatment will be conducted in accordance with these requirements.	Relevant and Appropriate

APPENDIX A

ARARs FOR ALTERNATIVE 4: IN SITU SOIL VAPOR EXTRACTION OF SOURCE AREA SOIL, RECOVERY AND OFF-SITE DISPOSAL OF FREE-PHASE PRODUCT, MANAGEMENT OF DISSOLVED-PHASE CONTAMINANT MIGRATION IN THE OVERBURDEN WATER-BEARING ZONE, ON-SITE TREATMENT OF RECOVERED GROUNDWATER, DISCHARGE OF TREATED GROUNDWATER TO SUBSURFACE RECHARGE TRENCHES, AND INSTITUTIONAL CONTROLS SITE 8, PEASE AFB, NH (Continued)

Medium	Requirement	Requirement Synopsis	Action To Be Taken To Attain Requirements	Status
Hazardous Waste/Soil	RSA Ch. 147-A, NH Hazardous Waste Management Act and Hazardous Waste Rules, Env-Wm, Chapters 100-1000, specific requirements detailed below.	Standards for management of hazardous waste facilities. Operates in lieu of federal RCRA Subtitle C requirements.	Management of waste as part of CERCLA response must comply with the substantive standards of these rules.	See following section-by-section analysis.
Groundwater	STATE — NH Admin. Code Env-Ws 410.26, Groundwater Management Zone	At contaminated sites, requires GMZ to be designated and groundwater use restricted. Where wells are currently in service, alternative drinking water must be provided. Groundwater extraction from wells within the zone must be restricted. Requires development and implementation of remediation plan to meet ambient groundwater criteria.	Remedial action will be designed to meet groundwater quality criteria.	Applicable
Hazardous Waste/Soil	STATE-NH Admin. Code Env-Wm 351-353, 701-705, 707, 708, and 709 Standards for Owners and Operators of Hazardous Waste Facilities	General requirements for owners or operators of hazardous waste site or treatment facilities. Includes siting requirements Env-Wm 353.09-353.10; environmental and health requirements (702.08); general design requirements (702.09); other monitoring requirements (708.02); and technical requirements (708.03).	All remedial activities will comply with the substantive provision of state hazardous waste regulations.	Relevant and Appropriate
Hazardous Waste/Soil	STATE-NH Admin. Code Env-Wm 702.10-702.14, Monitoring of Hazardous Waste Treatment Facilities	Requirements for installation and operation of one or more of the following monitoring systems: • Groundwater monitoring network. • Air emission monitoring network. • Leachate monitoring network.	Environmental monitoring during remedial operations will be developed and installed in accordance with these regulations.	Relevant and Appropriate

APPENDIX A

ARARs FOR ALTERNATIVE 4: IN SITU SOIL VAPOR EXTRACTION OF SOURCE AREA SOIL, RECOVERY AND OFF-SITE DISPOSAL OF FREE-PHASE PRODUCT, MANAGEMENT OF DISSOLVED-PHASE CONTAMINANT MIGRATION IN THE OVERBURDEN WATER-BEARING ZONE, ON-SITE TREATMENT OF RECOVERED GROUNDWATER, DISCHARGE OF TREATED GROUNDWATER TO SUBSURFACE RECHARGE TRENCHES, AND INSTITUTIONAL CONTROLS SITE 8, PEASE AFB, NH (Continued)

Medium	Requirement	Requirement Synopsis	Action To Be Taken To Attain Requirements	Status
Hazardous Waste/Soil	STATE-NH Admin. Code Env-Wm 707.03, Waste Pile Requirements	Incorporates by reference the requirements of 40 CFR 264, Subpart L, regarding waste piles.	The excavated soil stockpiled at the site will comply with these regulations and 40 CFR 264, Subpart L.	Applicable
Hazardous Waste/Soil	STATE-NH Admin. Code Env-Ws 412, Reporting and Remediation of Oil Discharges	Establishes procedures and requirements for notification, reporting, response actions, and investigations for sites where discharges of oil have occurred.	The requirements of this regulation have been used in the development of the remedial alternative.	Relevant and Appropriate
Hazardous Waste/Soil	STATE-NH Guidance Document Interim Policy for the Management of Soils Contaminated from the Spills/Releases of Virgin Petroleum Products	Policy identifies options for treatment and disposal, current analytical methods, and remediation goals for virgin petroleum-contaminated soil.	The requirement has been reviewed during the development of the FS Report.	TBC
Groundwater	STATE-RSA 485-A:12, Enforcement of Classification	Any discharge to groundwater that lowers the quality of the water below its classification is prohibited.	Remedial alternatives involving the discharge to groundwater must comply with these standards.	Applicable
Groundwater	STATE-RSA 485-A:13, Permit for Discharge	Discharge or disposal must comply with effluent limitations.	Remedial measures involving discharge to groundwater must comply with these standards. On-site discharges do not require a permit.	Applicable

APPENDIX A

ARARs FOR ALTERNATIVE 4: IN SITU SOIL VAPOR EXTRACTION OF SOURCE AREA SOIL, RECOVERY AND OFF-SITE DISPOSAL OF FREE-PHASE PRODUCT, MANAGEMENT OF DISSOLVED-PHASE CONTAMINANT MIGRATION IN THE OVERBURDEN WATER-BEARING ZONE, ON-SITE TREATMENT OF RECOVERED GROUNDWATER, DISCHARGE OF TREATED GROUNDWATER TO SUBSURFACE RECHARGE TRENCHES, AND INSTITUTIONAL CONTROLS SITE 8, PEASE AFB, NH (Continued)

Medium	Requirement	Requirement Synopsis	Action To Be Taken To Attain Requirements	Status
Groundwater	STATE-Env-Ws 410.03, Groundwater Quality Criteria	Compliance with Env-Ws 410.03 requires action to ensure that groundwater is suitable for drinking water, does not violate Ambient Groundwater Quality Standards, and does not cause surface water quality violations (unless due to natural conditions or exempt under Env-Ws 410.04).	Remedial action will be conducted in accordance with the requirements.	Applicable
Groundwater	STATE-Env-Ws 410.07, 410.08, 410.09, and 410.10, Prohibited Discharge, Groundwater Discharge Zone, Groundwater Discharge Permit Compliance Criteria	Prohibits discharges to groundwater without use of best available technology (BAT); requires controls on use of groundwater within discharge zone; sets limits on discharges to groundwater	Remedial measures involving discharges to groundwater must comply with this regulation.	Applicable
Groundwater	STATE-Env-Ws 410.20, Notification to Landowners	Requires the permittee to provide notice of the permit to all owners of lots of records within the GMZ within 30 days of the date of approval of Groundwater Management Permit.	Action will be taken in accordance with this requirement.	Substantive requirements applicable
Groundwater	STATE-Env-Ws 410.21, Recordation	Regulates recordation of notice of the groundwater management permit in the registry of deeds in the chain of title for each lot within the GMZ.	Remedial action will be conducted in accordance with the requirement.	Substantive requirements applicable

APPENDIX A

ARARs FOR ALTERNATIVE 4: IN SITU SOIL VAPOR EXTRACTION OF SOURCE AREA SOIL, RECOVERY AND OFF-SITE DISPOSAL OF FREE-PHASE PRODUCT, MANAGEMENT OF DISSOLVED-PHASE CONTAMINANT MIGRATION IN THE OVERBURDEN WATER-BEARING ZONE, ON-SITE TREATMENT OF RECOVERED GROUNDWATER, DISCHARGE OF TREATED GROUNDWATER TO SUBSURFACE RECHARGE TRENCHES, AND INSTITUTIONAL CONTROLS SITE 8, PEASE AFB, NH (Continued)

Medium	Requirement	Requirement Synopsis	Action To Be Taken To Attain Requirements	Status
Groundwater	STATE-Env-Ws 410.18, Groundwater Management Permit	Requires application for a groundwater management permit for sites where discharge of a regulated contaminant at that site has caused and continues to cause the groundwater quality criteria of Env-Ws 410.03 to be violated.	As part of the remedy, a GMZ will be established. Action will be taken to restore groundwater quality criteria and restrict groundwater use within the GMZ. Effectiveness of the remedy will be monitored.	Substantive requirements applicable
Groundwater	STATE-Env-Ws 410.27, Groundwater Management Permit Compliance Criteria	Specifies action to be taken in case of violation of an ambient groundwater quality standard at or outside the GMZ boundary.	Remedial action will be conducted in accordance with this requirement.	Substantive requirements applicable
Groundwater	STATE-Env-Ws 410.30, Water Quality Sampling, Analysis, and Reporting	Specifies requirements for monitoring groundwater quality to ensure compliance with the terms of the permit and groundwater protection rules.	Remedial action will be conducted in accordance with these regulations.	Substantive requirements applicable
Air	FEDERAL-RCRA 40 CFR Part 264, Subpart AA	Contains air pollution emission standards for process vents associated with distillation, fractionation, thin film evaporation, and solvent extraction of air or stripping operations. Applicable to operations that manage hazardous wastes with organics concentrations of 10 parts per million by weight (ppmw).	Equipment used in remedial activities will meet these requirements.	Applicable

APPENDIX A

ARARs FOR ALTERNATIVE 4: IN SITU SOIL VAPOR EXTRACTION OF SOURCE AREA SOIL, RECOVERY AND OFF-SITE DISPOSAL OF FREE-PHASE PRODUCT, MANAGEMENT OF DISSOLVED-PHASE CONTAMINANT MIGRATION IN THE OVERBURDEN WATER-BEARING ZONE, ON-SITE TREATMENT OF RECOVERED GROUNDWATER, DISCHARGE OF TREATED GROUNDWATER TO SUBSURFACE RECHARGE TRENCHES, AND INSTITUTIONAL CONTROLS SITE 8, PEASE AFB, NH (Continued)

Medium	Requirement	Requirement Synopsis	Action To Be Taken To Attain Requirements	Status
Air	FEDERAL-RCRA 40 CFR Part 264, Subpart BB	Contains air pollutant emission standards for equipment leaks at hazardous waste treatment, storage and disposal facilities (TSDFs). Contains design specifications and requirements for monitoring for leak detection. It is applicable to equipment that contains or contacts hazardous wastes with organic concentrations of at least 10% by weight.	Equipment used in remedial activities will meet the design specifications, and will be monitored for leaks.	Relevant and Appropriate
Air	FEDERAL-RCRA 40 CFR Part 264, Subpart CC (proposed)	Contains proposed air pollutant emission standards for owners and operators of TSDFs using tanks, surface impoundments, and containers to manage hazardous wastes. Specific organic emissions controls would have to be installed if volatile organic concentrations equal or are greater than 500 ppmw.	Required emissions controls will be installed.	TBC
Air	STATE-NH Admin. Code Env-A 1024, Control of VOC Emissions	Specifies VOC emission control methods and establishes limitations on VOC emissions for various industries.	Precautions will be taken during remedial actions to minimize VOC emissions.	TBC
Air	FEDERAL-CAA-National Emission Standards for Hazardous Air Pollutants (NESHAP)	Maximum emission standards designed to protect the public from hazardous air pollutants.	Releases of contaminants to the air during SVE and groundwater treatment will not exceed these levels. See Subsection 3.3.3 of the CAA for details on air emission control.	Applicable

APPENDIX A

ARARs FOR ALTERNATIVE 4: IN SITU SOIL VAPOR EXTRACTION OF SOURCE AREA SOIL, RECOVERY AND OFF-SITE DISPOSAL OF FREE-PHASE PRODUCT, MANAGEMENT OF DISSOLVED-PHASE CONTAMINANT MIGRATION IN THE OVERBURDEN WATER-BEARING ZONE, ON-SITE TREATMENT OF RECOVERED GROUNDWATER, DISCHARGE OF TREATED GROUNDWATER TO SUBSURFACE RECHARGE TRENCHES, AND INSTITUTIONAL CONTROLS SITE 8, PEASE AFB, NH (Continued)

Medium	Requirement	Requirement Synopsis	Action To Be Taken To Attain Requirements	Status
Air	FEDERAL-CAA-National Ambient Air Quality Standards (NAAQS), 40 CFR 50	NAAQS define primary and secondary levels for six common air contaminants (sulfur dioxide, particulate matter, carbon monoxide ozone, nitrogen dioxide, and lead) in ambient air.	The levels established for these six air contaminants will be used as target levels that may not be exceeded in ambient air at the nearest receptor during the source control and management of migration treatment system.	Applicable
Air	FEDERAL-EPA Policy on Control of Air Emissions from Superfund Air Strippers at Superfund Groundwater Sites, OSWER Directive 9355.0-28.	Provides guidance on the control of air emissions from air strippers used at Superfund sites for groundwater treatment.	Controls on air stripper will be used as necessary to attain requirements.	TBC
Air	STATE-NH Admin. Code Env-A 800, Testing and Monitoring Procedures	Identifies procedures that must be followed for the testing of air emissions from stationary sources.	During the source control and management of migration treatment operations, air emissions will be monitored and tested to ensure that these sources do not exceed applicable standards.	Applicable
Air	STATE-NH Admin. Code Env-1002, Fugitive Dust Control	Requires precautions to prevent, abate, and control fugitive dust during specified activities, including excavation, construction, and bulk hauling.	Precautions to control fugitive dust emissions will be required during remedial activities. These precautions will be adhered to.	Applicable

APPENDIX A

ARARs FOR ALTERNATIVE 4: IN SITU SOIL VAPOR EXTRACTION OF SOURCE AREA SOIL, RECOVERY AND OFF-SITE DISPOSAL OF FREE-PHASE PRODUCT, MANAGEMENT OF DISSOLVED-PHASE CONTAMINANT MIGRATION IN THE OVERBURDEN WATER-BEARING ZONE, ON-SITE TREATMENT OF RECOVERED GROUNDWATER, DISCHARGE OF TREATED GROUNDWATER TO SUBSURFACE RECHARGE TRENCHES, AND INSTITUTIONAL CONTROLS SITE 8, PEASE AFB, NH (Continued)

Medium	Requirement	Requirement Synopsis	Action To Be Taken To Attain Requirements	Status
Air	STATE-NH Admin. Code Env-A 1300, Toxic Air Pollutants	Establishes Ambient Air Limits (AALs) to protect the public from concentrations of pollutants in ambient air that may cause adverse health effects.	Release of contaminants in the air from any on-site remedial activities will not result in exceedance of the respective AAL, if one exists. Emissions from the GWTP are not expected to result in exceedance of these standards. Proposed air emissions will be coordinated with the Air Resources Division of NHDES.	Applicable
Air	STATE-RSA Ch. 125C, Air Pollution Control, NH Admin. Rules, Env. A 100-1300, as specified below	Air pollution controls as specified below.	See below.	Applicable
Air	STATE-NH Admin. Code Env-A 300, Ambient Air Quality Standards	Establishes primary and secondary levels for eight air contaminants (particulate matter, sulfur dioxide, carbon monoxide, nitrogen dioxide, ozone, hydrocarbons, fluorides, and lead).	These ambient air levels will be incorporated with federal NAAQs to establish target levels that may not be exceeded as a result of emissions from SVE, groundwater treatment, and other remedial activities. Air monitoring will be conducted during remedial activities.	Applicable
Air	STATE-Env-A 505.02(a), Emergency Procedures	Imposes obligations on sources of air pollution in case of emergency.	Comply with directions of state in case of "warning" status.	Applicable

APPENDIX A

ARARs FOR ALTERNATIVE 4: IN SITU SOIL VAPOR EXTRACTION OF SOURCE AREA SOIL, RECOVERY AND OFF-SITE DISPOSAL OF FREE-PHASE PRODUCT, MANAGEMENT OF DISSOLVED-PHASE CONTAMINANT MIGRATION IN THE OVERBURDEN WATER-BEARING ZONE, ON-SITE TREATMENT OF RECOVERED GROUNDWATER, DISCHARGE OF TREATED GROUNDWATER TO SUBSURFACE RECHARGE TRENCHES, AND INSTITUTIONAL CONTROLS SITE 8, PEASE AFB, NH (Continued)

Medium	Requirement	Requirement Synopsis	Action To Be Taken To Attain Requirements	Status
Air	STATE-Env-A 902, Malfunctions of Air Pollution Control Equipment	Provides for limited relief from other requirements in case of malfunction. (Notification requirements are not ARARs.)	No additional action required; provides relief from other requirements.	Applicable
Air	STATE-NH Admin. Rules, Env. A 1002, Fugitive Dust Emission Control	Activities such as construction and excavation must include precautions to prevent, abate, and control fugitive dust emissions.	Maintain dust control during site remediation.	Applicable
Air	STATE-Env-A 1305, Impact Analysis and Permit Requirements	Requires air quality impact analysis of devices emitting regulated substances.	Discharge from any new applicable or modified facility must comply with these requirements.	Applicable

APPENDIX B

DECLARATION OF CONCURRENCE

State of New Hampshire
DEPARTMENT OF ENVIRONMENTAL SERVICES
6 Hazen Drive, P.O. Box 95, Concord, NH 03302-0095
603-271-3503 FAX 603-271-2867
TDD Access: Relay NH 1-800-735-2964

September 13, 1994

Mr. Alan K. Olsen
Director, Air Force Base Conversion Agency
1700 North Moore Street, Suite 2300
Arlington, VA 22209-2802

Re: Record of Decision for Site 8
Pease Air Force Base Superfund Site
Pease Air Force Base, New Hampshire

Subject: Declaration of Concurrence

Dear Mr. Olsen:

The "Record of Decision for Site 8" (Site 8 ROD) presents the selected remedial action, designed to protect human and ecological receptors in the vicinity of the Fire Department Training Area 2 at the Pease Air Force Base Superfund Site, located in Newington and Portsmouth, New Hampshire. Based upon its review of the Site 8 ROD, and acting as agent for the State of New Hampshire, the Department concurs with the remedial action decision, selected under CERCLA, for Site 8.

The Site 8 ROD was developed in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1986 (CERCLA), and outlines source control actions and management of migration actions to be implemented by the Air Force in order to remedy the threat to human health and the environment posed by contamination at Site 8.

Prior to Pease Air Force Base becoming a Superfund site, and as a party to the "Pease Federal Facility Agreement Under CERCLA Section 120" (Pease FFA), the Department has been actively involved in the oversight of the Air Force's environmental response activities at Site 8. The approach to site remediation, as outlined in the Site 8 ROD, is generally consistent with the approach the Department would require in a Remedial Action Plan for similar sites in the State of New Hampshire, regardless of their Superfund status. While the Site 8 ROD is more conceptual than what the Department would require in a Remedial Action Plan, to the extent practicable, the Department evaluated the appropriateness, feasibility and effectiveness of the selected remedial method, both long-term and short-term, to determine the degree of certainty the remedial plan will prove successful in achieving the remedial goals of the Department.

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WASTE MANAGEMENT DIV.
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WATER RESOURCES DIV
64 No. Main Street
P.O. Box 2008
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WATER SUPPLY & POLLUTION CONTROL DIV.
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Consistent with the Department's requirement to remove, treat or contain the contamination source to prevent the additional release of contaminants to groundwater, the selected action includes:

- In-situ soil vapor extraction (SVE) treatment of contaminated source area soil;
- Treatment of extracted soil vapor for removal of Volatile Organic Compounds (VOCs);
- Recovery of free-phase floating product and disposal off-base at a licensed treatment/disposal facility; and,
- A contingency source control measure (i.e., installation of free-phase recovery trenches) will be installed if it is determined free-phase product begins to migrate away from the source area.

Consistent with the Department's requirements to contain and confine contaminated groundwater and restore groundwater quality, the selected action includes:

- Implementation of a groundwater recovery system designed to capture dissolved phase contamination in the overburden groundwater;
- On-site treatment of recovered groundwater by air-stripping with liquid-phase activated carbon and vapor-phase activated carbon (if necessary), and discharge to on-site subsurface recharge trenches;
- A contingency groundwater response action (i.e., recovery of bedrock groundwater) will implemented if it is determined that the cleanup of groundwater in the bedrock water-bearing unit is not progressing; and,
- Monitoring of remedial performance and long-term environmental conditions.

Long-term monitoring of groundwater, surface water and sediments will be necessary in order to determine the effectiveness of the remedial actions at Site 8. Water quality monitoring is determined on a site specific basis and will be addressed in a Groundwater Management Permit, issued by the Department. Frequency and location of water quality monitoring is typically required on a tri-annual basis until a baseline condition is established.

A comprehensive, detailed review of all environmental monitoring data will be conducted by the Air Force, EPA and the Department in order to ensure the remedial action provides adequate protection of human health and the environment and complies with applicable regulations.

Sincerely,

Robert W. Varney
Commissioner

cc: Philip J. O'Brien, Ph.D., Director, DES-WMD
Carl W. Baxter, P.E., DES-WMEB
Richard H. Pease, P.E., DES-WMEB
Martha A. Moore, Esq., NHDOJ-AGO
Michael J. Daly, EPA
Arthur L. Ditto, P.E., AFBCA
James Snyder, AFCEE

APPENDIX C

RESPONSIVENESS SUMMARY

RESPONSIVENESS SUMMARY

OVERVIEW

The Air Force issued the Site 8 Proposed Plan to the public in January 1994. In the Site 8 Proposed Plan, the Air Force identified its preferred alternative for Site 8. The selection of this preferred alternative by the Air Force was coordinated with U.S. EPA Region I (EPA) and NHDES. The preferred alternative involves soil and floating fuel/solvent mixture cleanup at the source area and groundwater containment and treatment.

The subsections that follow describe the background on community involvement with Site 8 activities and the Air Force's response to both written and verbal comments received during the Site 8 Proposed Plan Public Comment Period of 26 January to 10 March 1994.

BACKGROUND ON COMMUNITY INVOLVEMENT

Prior to the start of the public comment period for Site 8, the Air Force issued a Fact Sheet that summarized the contents of the Site 8 Proposed Plan. Presentations on the status of work being conducted and results of the work at Site 8 area were made to the Pease AFB Technical Review Committee (TRC). Additionally, the content of the Site 8 Proposed Plan was provided to the TRC members in draft format and discussed with the TRC members in November 1993. Input from the TRC members was taken into account in preparing the final Site 8 Proposed Plan. Announcements were mailed to all individuals on the Pease AFB Community Relations Plan mailing list in January 1994 prior to the beginning of the public comment period. Additionally, press releases were issued to the media announcing the beginning of the public comment period. Announcements were published in two local newspapers prior to the public hearing date of 1 March 1994. The original public hearing, scheduled for 9 February 1994, had to be postponed due to inclement weather. Notices of cancellation were sent to all media and interested parties. The rescheduled public hearing date and public comment period extension announcements were published in two local newspapers. It is noted that the public comment period and public hearing for Site 8 ran concurrent with Zone 5. Proposed remedial actions for Site 8 and Zone 5 were presented equally to the public.

SUMMARY OF COMMENTS RECEIVED DURING THE COMMENT PERIOD AND AIR FORCE RESPONSES

During the public comment period, three sets of written comments were received and four individuals provided comments at the public hearing held on 1 March 1994. Comments received during the comment period are summarized as follows, along with the Air Force response to each comment. A copy of the public hearing transcript is available for review, along with the written comments received on the Site 8 Proposed Plan, at the Pease AFB Information Repository located at 61 International Drive, Building 43, at Pease AFB, New Hampshire.

1.	Comment (written):	There should be mention of a written Section 106 and Section 110 process which would address the preservation of the forest.
	Response:	As part of the remedial action evaluation process, the Air Force has to evaluate all Applicable or Relevant and Appropriate Requirements, of which the National Historic Preservation is one. Reference to this Act is made in the Site 8 Feasibility Study (FS) and will be referenced in the Site 8 Record of Decision (ROD).
2.	Comment (written):	In all of the maps for both publications, the Newington Town Forest designation is not correct nor outlined.
	Response:	The designation and location of the Newington Town Forest will be clearly shown in the figures included in the Zone 5 and Site 8 RODs, as will Site 11, the Field Maintenance Squadron Equipment Cleaning Site.
3.	Comment (written):	Proposed Plan 3 (sic) does not include the special history that the site is on the National Register of Historic Places.
	Response:	Reference will be made in the Site History section of the Site 8 ROD that a portion of Site 8 lies within the Newington Town Forest. A brief discussion of the history of the Town Forest will be included.
4.	Comment (written):	Why is the ROD not submitted to SHPO (NHDHR) for approval?
	Response:	SHPO does not have approval authority for environmental remedial action RODs; this authority rests with EPA.
5.	Comment (written):	Why is not the National Register designation mentioned since this definitely affects the management of the cleanup and must be a consideration.
	Response:	Reference to the fact that the Newington Town Forest is listed on the National Register of Historic Places will be made in the Site 8 ROD. See response to comment no. 4.
6.	Comment (written):	How do you expect to keep the NHDHR advised over the next 30 years of your cleanup operations at Zone 5.
	Response:	The Air Force believes the question is intended to be directed toward the Site 8 action because that is the only site that would involve the NHDHR. The Air Force and NHDHR are

in the process of developing a Memorandum of Agreement (MOA) governing the Site 8 remedial activities that would occur within the boundaries of the Newington Town Forest. One aspect of this MOA will be a provision for monitoring of these activities. This monitoring requirement will provide the NHDHR with status of activities for the life of the MOA. In addition, the Air Force will use a forestry consultant during design and implementation of the remedial action to employ best management practices for all actions in the Town Forest.

7. Comment (written): Is there a written management plan about the disturbances (now and future) to the Town Forest?

Response: As stated in response to comment no. 6, the Air Force and NHDHR are in the process of developing an MOA that will govern the Site 8 remedial action work within the boundaries of the Newington Town Forest. On 28 February 1994, the Air Force met with representatives of the NHDHR, along with representatives from the Newington Selectmen's Office, to review the proposed activities for Site 8 and to discuss the potential impacts and methods to minimize them. The results of this discussion are being used to develop the MOA. The Town of Newington will be a concurring party to the MOA.

8. Comment (written): The Newington Historic District Commission wishes to be informed of the remedial operation and hopes that the Newington Forest Management Plan recommendation will be a consideration as you implement your remediation at Site 8.

Response: The Air Force has established a Technical Review Committee (TRC) that meets monthly to review and discuss environmental activities at Pease AFB, including the remedial action activities at Site 8. The Town of Newington's Selectmen's Office has a representative on the TRC who can provide the up-to-date status of the Site 8 activities to the various Newington Boards and Commissions. Forest management operation, consistent with the historical use of the Newington Town Forest, is one of the factors being used in the development of the MOA referenced in response to comment no. 6.

9. Comment (written): As for the matter at hand this evening, we concur with the proposed remediation of Site 8, with the understanding that every effort will be made to avoid adverse impacts on the Newington Town Forest, the oldest such forest in the United States, a status that was duly recognized by the U.S. Secretary

of the Interior when the forest was listed on the National Register of Historic Places.

Response: The Air Force is taking into account the potential effect the Site 8 actions might have on the Newington Town Forest. The Air Force is working with the NHDHR to develop an MOA governing the work activities in the Town Forest area. In development of the MOA, strong consideration will be given to specifying methods of work execution to minimize negative effects to the Town Forest area.

10. Comment (written): It is the recommendation to cap rather than remove contaminated soil that I strongly oppose. I believe that removal of contaminated soil from the surface to the top of the high water table is a justified despite the cost and that capping is not an acceptable alternative.

Response: The Air Force intends to fully clean up the soil within the source area at Site 8, meeting the cleanup goals specified in the Proposed Plan. The remedial technology selected by the Air Force to accomplish this cleanup is soil vapor extraction (SVE). SVE will remove the contaminants within the soil without having to excavate the soil. This process is estimated to take approximately 5 years to complete. The cap the commentor refers to is only a component of the SVE process. The cap makes the SVE process more efficient. Several excavation options were considered in the FS; however, using the nine required criteria to evaluate each alternative, the Air Force determined that the SVE was overall a better technology to apply at Site 8 for soil remediation than excavation and on-site treatment of soil.

11. Comment (written): On Figure 1, the General Site Map for Site 8, and Figure 3, AF Preferred Alternative Site Plan, the property boundaries for the Cross lot do not correctly reflect the current town tax maps and site plan for my lot on file in the Rockingham County records. This correction is important as it identifies that the plume of contamination is across my land and I have been directly impacted. For your final report attachments, please adjust the lines as indicated on the copy enclosed.

Response: The general site map for Site 8 and other applicable figures will be correct in future documents, including the Site 8 ROD, to correctly show the Cross property boundary.

12. Comment (written): The last sentence on Page 4-1 states 262 tons of contaminated soil were removed. What was the cost to treat this soil and

what was done to it? Does it become much cheaper when done on a large scale?

Response: The 262 tons, or 175 cubic yards (yd^3), of contaminated soil were transported to a secure landfill in Maine, Sawyer Environmental Recovery Facilities, Inc., of Hampden Maine, in February 1990. The cost of this disposal process was approximately $52,000. The cost of disposal of soil if done today and on a larger scale would not be necessarily any cheaper (unit price). It would potentially be more expensive because of new regulations that have been put into place that specify how, where, and what pretreatment must be done before contaminated items can be disposed of. Additionally, this past disposal method is an example of just moving contaminated media from point A to point B without any reduction of contaminant toxicity or volume. The current preferred EPA objective for remedial actions is to reduce contaminant toxicity, mobility, and volume through on-site actions, i.e., treatment in-place rather than moving the contamination to another location.

13. Comment (written): Page 4-2, Para 4.2.1: How many tons of soil are contained within 500 feet horizontally to a depth of 30 feet? How rapidly does the level of contamination decrease with depth? Can you remove a good portion of the problem with removing only the top "X" many feet? For example, if you removed down to the top of the water table level, how many feet would it be?

Response: The levels of contamination in the soil actually increase with depth, with the highest level of contamination being in the *smear zone* at the water table. This smear zone is approximately 7 feet wide (vertical) and occurs at a depth of approximately 25 feet below ground surface (ft BGS). The total volume of soil that would have to be removed to excavate the contaminated soil in the smear zone is estimated at 175,000 yd^3, of which approximately 59,000 yd^3 of soil are actually contaminated.

14. Comment (written): Page 4-2, Para 4.2.2: Are the contaminants of Pickering Brook not site related because they are a different type than found at Site 8? I could not locate Knights Brook in Figure 1. Did I overlook it? Since you refer to it in the report, it would help to label it in Figure 1.

Response: The results of the Site 8 Remedial Investigation determined that groundwater from the site discharges to Pickering Brook.

The surface water and sediment sampling locations sampled as part of the Site 8 Remedial Investigation detected contaminants in Pickering Brook. The contaminants detected in Pickering Brook are not considered to be Site 8 related because of the limited ability of the contaminants to migrate from Site 8 to Pickering Brook. However, since this property has been owned by the Air Force for the past 40 years, any contamination in Pickering Brook is most likely the result of Air Force activities. Regardless of the source of the contamination, the levels of these contaminants detected in Pickering Brook were either below regulatory criteria or exceeded criteria at a low frequency. These exceedences occurred infrequently during sampling rounds at only one or two of the sampling locations along Pickering Brook. The results of the Site 8 risk assessment revealed that risks posed to human and ecological receptors were acceptable and, consequently, do not require remediation. In addition, the Air Force continues to monitor surface water and sediment quality at Pease AFB and will be monitoring surface water quality in Pickering and Knights Brooks as part of the remedial action for Site 8. Labeling of Knights Brook was inadvertently left off of Figure 1. Knights Brook begins in the wetlands areas shown in the Frink Trust property in Figure 1.

15. Comment (written): Page 5-1: Human Health Risk: None posed. Does this mean that there should be no restrictions on use of the area for a nature trail where hikers would sit on or touch the soil? Ecological Risk: Risks posed to mouse and sparrow. What is the risk to animals that may catch and eat those animals at risk?

Response: True, for all media except for groundwater. Generally, surface use of the area would be unrestricted. For nonresidential use, risks were evaluated assuming future industrial/commercial use of the property in the vicinity of the former burn areas. This future use assumption is consistent with the current zoning for this area. Based on this assumption, risks were evaluated for a maintenance worker who is the most likely maximally exposed individual. The potential for health risks was below EPA's benchmark of concern. Risks to a recreational user, such as a hiker, would be expected to be even lower than risks to a maintenance worker. Animal uptake by evaluated receptors is taken into account in the ecological risk assessment process. Evaluation of other animals that may eat the evaluated receptors was not conducted. As indicated in the Proposed Plan and further explained in the Site 8 Remedial Investigation (RI) Report, ecological risk to the evaluated receptors in Pickering and Knights Brooks is within a range where it has been determined remedial actions are not warranted.

16. Comment (written): Page 6-1, 2nd Para. states that soil cleanup to prevent contact is not required because there is no risk. Please explain why this is an overstatement selected to better support not treating the soil. It conflicts with the previous page which said the ecological risk was in the range of uncertainty.

Response: The risk assessment process is divided into two groups: human health and the environment (ecological). The process for conducting the human health risk assessment evaluation is well established and is based on clearly stated regulatory guidance. The ecological evaluation is somewhat subjective and includes many conservative assumptions that result in the computed risk values having a large range of uncertainty. For Site 8, the results of the human health risk assessment indicate that, for all media except groundwater, the potential for adverse health effects is below EPA's benchmark of concern (i.e., the potential for risk is very low). The Air Force could have better phrased this statement by saying the "soils do not pose an unacceptable risk"; therefore, soil remediation is not considered necessary. The values computed for the ecological risk resulting from surface soil were in the uncertainty range. The assumptions about the physical site conditions to support the representative species are evaluated and a final determination is made. In this case, it was determined that the ecological risks were such that actions were not warranted. The second paragraph on page 6-1 of the Proposed Plan does not state there are "no" risks, but rather the source area soils do not pose a risk.

17. Comment (written): Page 7-3, 1st Bullet: Can the SVE system operate without the cap? SVE wells are to what depth? How do you propose to drill so many wells in the forest without disturbing the root structure and harming the Town Forest? How will the increased air flow change the moisture level next to the roots of the existing trees, and what harm could this do to the existing trees? Will any of the SVE system interconnection piping be aboveground? If so, what will be done to conceal these in the forest? If not, how do you prevent damage to the existing tree roots when installing the pipes?

Response: The SVE system can operate without a cap. The SVE wells will be installed to a depth of approximately 28 feet, with a treatment interval of 10 feet (depth of 18 to 28 feet). The wells to be installed in the Town Forest area will be located to minimize the impact to trees without compromising the SVE process. Work in the Town Forest will be covered under an MOA between the Air Force and NHDHR (see response to comment no. 9). With the treatment interval starting at a depth of 18 feet and the shallow nature of the root system of the pine trees in the town forest, it is not expected the SVE process will impact the moisture level at the tree roots. The connection of the SVE wells will be aboveground to minimize the impacts on the root systems. In relation to the age of the Town Forest (300 years), the SVE system will be present for a short period (estimated at 5 years). For this short duration, it is believed that the negative aspects of the aboveground piping in 1 acre of the forest can be accepted, this subject has been discussed with the NHDHR and Newington Town officials in the development of the MOA for the Newington Town Forest.

18. Comment (written): Page 7-3, 2nd Bullet: The statement that the cap would aid in lowering the water table is incorrect unless the cap removes water rather than just shielding it. Doesn't the water above run to the sides and flow horizontally under to the same level. Isn't the groundwater recovery system based on this free horizontal flow? Would you consider rephrasing your statement to say the cap in the cleared area has a minimal disturbance to the remaining trees although it prevents the Town Forest from reclaiming the FDTA cleared area by re-growth for 30 years?

Response: The cap will be graded such that the water intercepted by the cap is drained away from the site. This will minimize fluctuations in the water table as the Site 8 former burn areas represent a groundwater recharge area. The Newington Town Forest area, as listed on the National Register of Historic Places, does not include the former burn areas of Site 8. The boundary for the Town Forest is the stone wall that lies north of the Site 8 fire training area. Future use of the property encompassed by the Site 8 fire training area will be at the option of the new property owner once transfer occurs. Currently, a majority of the Site 8 fire training area lies within the Airport District at the Pease International Tradeport. The surrounding area is zoned airport industrial by the Town of Newington. The Air Force is unaware of any plan by the reuse organization(s) for Pease to expand the Town Forest into the Site 8 fire training area. The groundwater recovery system is based on horizontal flow, the cap helps stabilize vertical components of the groundwater units. A statement will be made in the Site 8 ROD that the area to be capped will have a minimal effect on the adjacent Town Forest trees.

19. Comment (written): Page 7-3: How deep would the recovery trenches be? At the locations shown in Figure 3, how would you prevent serious damage to the existing Town Forest? To what extent does Newington have a voice in whether and where the trenches will be dug?

Response: The trenches shown in Figure 3 are recharge trenches, not recovery trenches. These recharge trenches are outside the Newington Town Forest area, with the depth of the trench being approximately 6 feet. Please note this figure will clearly show the location of the Town Forest areas in the Site 8 ROD. As for the recovery trenches, first the need has to be established if it is determined that the recovery trenches are needed, then a location must be determined. If any of the recovery trenches need to be located in the Town Forest area the Air Force will have to coordinate this activity in accordance with the MOA governing work in the Town Forest area. As the Town of Newington will be a concurring party to this MOA, its input to the location of the trenches will be solicited.

20. Comment (written): Page 7-3: Is there a formal report by which Newington will be notified of progress in attaining the overburden cleanup goals? Will these only be changed with Newington's concurrence?

Response: The cleanup goals will be specified in the Site 8 ROD. These goals can only be changed through revision to, or modification of, the ROD. This would require EPA and NHDES concurrence and public input before the decision process is completed. The Newington representative on the TRC will be kept apprised of the status of the remedial action at Site 8. Additionally, the reoccurring, 5-year review process will become public information.

21. Comment (written): Page 7-3, Last Bullet: Why is worker protection monitoring needed if the soil is safe for human contact as stated on page 5-1? How are we sure that funds will continue to be available for the monitoring and reporting?

Response: The risk assessment for human health was based on a maintenance worker who is exposed to soil in the 0- to 2- and 0- to 15-foot levels year-round on a long-term basis. It assumes that no major disturbance of the soil occurs. The construction work during installation of the SVE system will result in soil below 15 feet, where the higher contaminants exist, being brought to the surface. This could result in worker exposure to both soil themselves and vapors that may emanate from the soil, and to large quantities of soil that may be generated during construction activities. The concern for the construction worker is for the potential risk posed by relatively short-term exposure to higher doses of contaminants. The risks can be very different from those posed to the maintenance worker as a result of long-term exposure to lower doses. Therefore, worker protection monitoring needs to be put into place during the construction phase. It is the intent of the Air Force to fully fund this remedial action. However, future fund distributions are really a function of what Congress authorizes to the Air Force as part of DOD budget process. The future congressional actions are outside the control of the Air Force.

22. Comment (written): Please send me the cleanup goal (μg/kg) for b,2, EHPh; 1,2 DCA; and TCE.

Response: The cleanup standards for the compounds are established by regulatory standards known as Maximum Contaminant Levels (MCLs). The following MCLs have been used for these contaminants:

- b,2, EHPh — 6 parts per billion (ppb).
- 1,2 DCA — 5 ppb.
- TCE — 5 ppb.

This information has been provided to the commentor; reference Air Force letter of 25 March 1994. This response letter has been filed in the Administrative Record.

23. Comment (written): Please send me an explanation of the medial (sic) expectations on the health of people who become exposed over time to the chemicals detailed in your Site 8 and Zone 5 Proposed Plans.

Response: Information provided to commentor on 25 March 1994; reference Air Force letter of 25 March 1994. This response letter has been filed in the Administrative Record.

24. Comment (verbal): As for the matter at hand this evening, we concur with the proposed remediation of Site 8, with the understanding that every effort will be made to avoid adverse impacts on the Newington Town Forest.

Response: The Air Force is making every effort to avoid adverse impacts on the Newington Town Forest and yet not compromise the integrity of the remedial action. The Air Force is in the process of setting up an MOA with the NHDHR, with the Town of Newington as a concurring party, which will govern the work to be conducted within the boundaries of the Town Forest.

25. Comment (verbal): As for Site 8, the fire training area, SCOPE concurs with the Air Force's proposed alternative and we applaud the Air Force's foresight and its flexibility in implementing active extraction in the bedrock groundwater zone if it is determined that MM-2 is not controlling mitigation of contaminants into the bedrock.

Response: The Air Force acknowledges SCOPE's concurrence.

26. Comment (verbal): One other comment, and that has to do with Site 8, the cover, the asphalt cover that's going to be put over the area that's going to have the soil vapor extraction. In your comments, in your remarks, could you tell us how you're going to deal with that area that's inside the Town Forest, the Newington Town Forest.

Response: The area within the Newington Town Forest where the SVE points are installed will not be capped with asphalt. This will eliminate the need to clearcut the area within the Town Forest where SVE will take place to install the cap. SVE well spacing will be adjusted to compensate for the lack of a cap. This will ensure that the maximum possible efficiency of the SVE process is obtained.

27. Comment (verbal): Something specific to the management of migration alternative for Site 8, just a word of caution that I just want to point out. Any groundwater pump-and-treat action will entail movement or shifting of the contaminant plume around in the overburden. In the absence of active groundwater recovery from the bedrock, we would just like to caution and emphasize the fact that very close monitoring of water levels in both the overburden and bedrock occur during the progress of the remediation.

Response: The Air Force intends to closely monitor effects the groundwater pump-and-treat action has on both the overburden and bedrock water-bearing zones. In some of the monitoring points, the Air Force will use continuous monitoring probes. This water level monitoring will be an integral part of the long-term monitoring plan for the site.

28. Comment (verbal): I have about five comments. One related to the land use and the deed restrictions. And one of the thoughts that I've had in the past is, even when I built my house, the bank before they would give me a mortgage at first was requiring all kinds of things about contamination on the soil and what might have been done in the past before they would even give me a mortgage. And so if there are easements that are put on the deed for certain monitoring of that property, it's like a red flag, saying to any mortgage company, uh-huh, what's going on here? Now I know the land right now is owned by the Air Base, but there is a potential that could become private or public land in the future.

Response: The area of Site 8 that would require deed restrictions would be called a Groundwater Management Zone (GMZ). The zone boundary line is where the groundwater quality goes from unacceptable to acceptable, and usually includes a buffer zone. For Site 8, the GMZ would mostly be on existing Air Force property, with a small portion being on Newington Town property, Town Forest area behind the stone school, adjacent to Pease AFB boundary. If the Air Force does transfer the property to a private entity in the future, a covenant would be in the deed that states the groundwater could not be used, ensure rights of access to property for the Air Force, and state Air Force responsibility to complete the remedial action at the site. These actions would clearly show that the responsibility for remedial action at the site belongs to the Air Force and would insulate the new owner from any liabilities from past Air Force activities.

29. Comment (verbal): The next comment I have related to...I've looked at all the alternatives and, you know, tried to understand what you mean by each one of them. But nowhere have I been able to figure out what the efficiency of this soil vapor process is. Somewhere along the line it was determined that that's an efficient enough process to remove this contamination over a period of 30 years, and I couldn't see anything that would tell me how that related to excavation. So this whole concept that you can remove this contamination by these hydraulic controls, I guess it's pumping water, whatnot, doesn't tell me anything. Will that be ultimately as efficient as taking it out and treating it differently? Is it a time difference? What happens after 30 years?

Response: There are two efficiency issues: one of the efficiencies of the various source area (burn pit) actions, in this case it is the SVE process versus excavation, and the other is the efficiency of the hydraulic controls (groundwater pump and treat). Regardless of which source area action is implemented at Site 8, pumping and treatment of the groundwater will be required. The time it will take to remediate the groundwater to acceptable levels would not likely be significantly affected by selection of one source area action over another. The time difference between the various source area actions (2 to 5 years), as compared to the estimated 30 years required for groundwater treatment, is not that great. The efficiencies of the various source area actions (soils treatment), using time of execution as a measuring unit, are as follows:

- In-place SVE — Estimated at 5 years.
- Soil excavation and on-site biological/SVE treatment — Estimated at 3 years.
- Soil excavation and on-site thermal treatment — Estimated at 2 years.

From this it is seen that the excavation options are shorter. Another factor that needs to be considered in evaluating efficiencies is the ability to be able to actually do the work. In this case, the excavation of the contaminated soil is much more difficult than the installation of the SVE system. The contaminated soil that requires treatment is at the groundwater table. This would result in a maximum excavation depth of 28 feet. To remove the estimated 43,000 yd^3 of contaminated soil, a total of 175,000 yd^3 of soil would have to be excavated. To handle and stage the 132,000 yd^3 of clean soil (175,000 - 43,000), approximately 5 acres of land adjacent to Site 8 would need to be cleared to provide staging area for this soil. Additionally, dewatering of the excavation area would need to occur. Section 5 of the Draft Final Site 8 FS Report contains more detailed information on the implementability of the various alternatives evaluated for Site 8.

30. Comment (verbal): The third point that I had is, I've looked at all the alternatives, I can't really figure out who decided which one of these to choose. It sound like the Air Base looked at several of them and decided that they would like to propose what is SC-3, MM2. And then some of the other boards have said, you know, we're withholding our acceptance of this.

Response: The Air Force identifies the alternative that it considers to be most appropriate for the site to EPA and NHDES. This is done in the draft Proposed Plan submitted to EPA and NHDES under the provisions of the Pease AFB Federal Facility Agreement. One aspect of the review of the draft proposed plan by EPA and NHDES is acknowledgment of acceptance of the alternative selected by the Air Force. If acceptance of the alternative cannot be made, the Air Force, EPA, and/or NHDES meet to resolve any outstanding issues and come to an agreement on the most appropriate alternative. This agreed upon preferred alternative along with the other alternatives evaluated in the FS are presented to the public in the final Proposed Plan. What was meant by the statement that other boards (NHDES) were withholding acceptance is that final acceptance was being withheld pending satisfactory completion of the public comment process. The public comment process, especially the input received from the public, plays an important role in the remedial action decisionmaking process. The final decision really cannot be made until public input is received and considered.

31. Comment (verbal): It seems to me that as an absolute minimum, you would have to, from the very beginning, accept MM-3 as your minimum criteria. And the reason I say that is that you already know there is contamination in the bedrock water. If you don't accept that as the minimum alternative right now, I can't figure out at what point in the future in these contingency plans that you would then go back and decide to adopt that. There's nothing that says there would be public input into that, and it's just some undetermined date in the future that I don't feel comfortable with. If it was mandatory now as part of the alternative that gets adopted, if it turns out that it's not a problem, you just don't have to do it, but at least it has been put into the proposal to begin with that is something that needs to be addressed.

Response: The Air Force understands the commentor's concern about contamination in the bedrock water-bearing zone and is equally concerned. The contamination at Site 8 emanates from the former burn areas and enters the overburden water-bearing zone. Migration of contamination in the overburden flows in a northerly direction, and, at a point north of the Site 8 former burn areas, some portion of the contamination in the overburden flows into the bedrock water-bearing zone. The Air Force, based on data developed for Site 8, believes that the migration of contaminated water from the overburden into the bedrock can be controlled by hydraulic controls implemented in the overburden. Contamination in the bedrock water-bearing zone would then attenuate naturally. As part of the design process, the Air Force will further evaluate the migration control process to ensure that this will really work. Additionally, a performance standard, or a measuring stick, will be developed to measure the effectiveness of the migration control implemented in the overburden. The development of the performance standards will be done as part of the design process, which will involve EPA and NHDES review and require their concurrence before the design can become final. A timeline would also be part of the performance standard that would specify when measurements would be taken and at what point a determination would be made to implement pumping of the bedrock water-bearing zone if it were determined to be necessary. Public involvement is available at the present time through the Technical Review Committee. If it is found necessary or appropriate, additional public meetings could be held. In addition, the EPA regulatory process requires a formal review of the remediation process at 5-year intervals. If performance of the remedial action is not meeting the requirements of the ROD, the remedial process could be revised, as necessary.

32. Comment (verbal): Now the next comment I have relates to, again, this whole concept of what is your next alternative, this SC4-MM3, which actually involves excavation and biological treatment. Again, I can't tell from this why that wouldn't be a preferred alternative. I've looked at some of your charts, A, B, C, and all of the criteria that you judged, and it seems that, as far as I can tell, that's just based on cost. And so it gets back to the question, again, is the water pumping efficient or is this more efficient, and how was that decision made? Because right now it's not possible to tell. It does seem to me that thermal treatment of excavated soil is probably a bit of an overkill, but I still have real strong questions about why wasn't ... what is there about Alternative 6 that disqualifies it? So it seems to me that Alternative 5 has to be the bare minimum and then Alternative 6 still has to be addressed.

Response: The presentation made in Table 3 of the Site 8 Proposed Plan, using the A, B, C designation is an extreme oversimplification of the detailed analysis evaluation process performed in the FS. The need to pump the groundwater is common to all the remedial actions except for Alternative 1, no action. The major difference between the various alternatives is how the contamination in the soil will be dealt with, either treatment in-place or by excavation and treatment on-site. The major factor that distinguishes the various soil treatment methods between one another is the ability to implement the action. In this case, the excavation of the soil is much more difficult to implement than is the in-place SVE process. An evaluation of the efficiencies of the two soil treatment processes is provided in response to comment no. 29. Additionally, Section 5 of the Draft Final FS provides much more detailed information on the evaluation of the various alternatives, including soil treatment processes.

33. Comment (verbal): Now the last comment I wanted to make relates to Site 8 and your drawing of where you put your MCL line. And you're being very careful to say that right now that line is inside the Pease boundary. Now I certainly would acknowledge that the Air Base has been excellent in testing our spring in Newington and in telling us what the levels of contamination are that are in the spring. It's certainly true that those levels are below what the health regulations, the whatever minimum baseline that you're using, but it's also very clear that the level has not decreased after 5 years of treatment over on the Air Base. It's not going down, it's not going up, but it's still there. It's coming from the bedrock water that's going, I guess, underground and coming up in springs, which to me says that it's fairly arbitrary to, at this point in time, say this bedrock water and the management of that is not necessary. From my point of view, it's absolutely necessary. We don't know what's going to happen in the future for that contamination.

Response: The MCL line that was drawn on the presentation slide was not just arbitrarily put at a particular location. The location was selected based upon evaluation of the sampling data from the various bedrock monitor wells that have been constructed at the site. Based on this data evaluation, it is possible to indicate where the MCL line is generally located. It is true that the levels of contamination in the spring have not gone down in the past 5 years or since installation of the pilot groundwater treatment plant in August 1990. However, the pilot system was not intended to be the final remediation and did not influence the groundwater flow sufficiently enough to cause levels of contamination to decrease downgradient of the site. The information gained from monitoring the effects of the pilot plant along with the other investigation data generated at Site 8 have provided the Air Force reference information to better select the most effective alternative. Once the management of migration system (groundwater pump and treat) is in place it will be monitored for performance. Please also note that the preferred alternative provides management of migration of contaminants migrating from the overburden water-bearing zone into the bedrock water-bearing zone. In other words, it is intended to intercept the contamination before it enters the bedrock water-bearing zone. Once this occurs, the low levels of contamination now present in the bedrock water-bearing zone will begin to decrease as a result of natural attenuation. The first detectable performance standard would be hydraulic response, followed by chemistry changes. The results of monitoring sampling will be provided, as has been done in the past, to all affected people.

APPENDIX D

ADMINISTRATIVE RECORD INDEX

ADMINISTRATIVE RECORD FILE INDEX

FOR THE

INSTALLATION RESTORATION PROGRAM
ZONE 5 AND SITE 8

PEASE AIR FORCE BASE
NEW HAMPSHIRE

JANUARY 1994

ABOUT THE ADMINISTRATIVE RECORD FILE

The administrative record file is a collection of documents which form the basis for the selection of a response action at a Superfund site. Under section 113(k) of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), the U.S. Air Force is required to establish an administrative record file for every Superfund response action and to make a copy of the administrative record available at or near the site.

The administrative record file must be reasonably available for public review during normal business hours. The record file should be treated as a non-circulating reference document. This will allow the public greater access to the volumes and also minimize the risk of loss or damage. Individuals may photocopy any documents in the non-confidential portion of the file, according to the photocopying procedures at the local repository.

The documents in the administrative record file may become lost or damaged during use. If this occurs, contact the administrative record file manager at Pease AFB. Documents may be added to the administrative record file as site work progresses. This index will be updated as documents are added to the administrative record file.

The administrative record file will be maintained in Building 43 at Pease AFB. Questions and/or comments about the administrative record file should be directed to:

Arthur L. Ditto, Remedial Project Manager
Air Force Base Disposal Agency
Operating Location A, Building 43
61 International Drive
Pease AFB, NH 03803-0157
(603) 430-2586

Dynamac Corporation assisted in the organization, establishment and on-site setup of the Administrative Record File at Pease Air Force Base.

ABOUT THE INDEX NUMBERING SYSTEM

Document Number - Comprised of a 3 letter site code (PEA), the category number, the entry number and the page range of a document. (Both page numbers will be the same for a one page document.) If documents are eventually placed on a microfiche system, the document number consists of the site code followed by the microfilm reel and frame number.

Example: PEA (1.1) #1 001-031

Site Code	(Category #)	Entry #	Page Range
PEA	(1.1)	#1	001-031

Long Title The long title and brief description of document.

Author Indicates author or primary originator of document. If a contractor prepared the document, indicates company and location.

Recipient Indicates primary recipient of document.

Date Indicates date document was issued.

Type Indicates document type

Second Reference Other categories pertaining to the document.

Location Exact location(s) of document.

ADMINISTRATIVE RECORD FILE STRUCTURE

1.0 SITE IDENTIFICATION

- 1.1 Background - RCRA and other Information
- 1.2 Notification/Site Inspection Reports – **No Entries in this Section**
- 1.3 Preliminary Assessment (PA) Report
- 1.4 Site Investigation (SI) Report
- 1.5 Previous Operable Unit Information – **No Entries in this Section**
- 1.6 Correspondence

2.0 REMOVAL RESPONSES

- 2.1 Sampling and Analysis Plans – **No Entries in this Section**
- 2.2 Sampling and Analysis Data / Chain of Custody – **No Entries in this Section**
- 2.3 EE/CA Approval Memorandum (Non-Time-Critical Removals) – **No Entries in this Section**
- 2.4 EE/CA (Engineering Evaluation / Cost Analysis) – **No Entries in this Section**
- 2.5 Action Memorandum – **No Entries in this Section**
- 2.6 Amendments to Action Memorandum – **No Entries in this Section**
- 2.7 Removal Response Reports
- 2.8 Correspondence

3.0 REMEDIAL INVESTIGATION (RI)

- 3.1 Sampling and Analysis Plan (SAP)
- 3.2 Sampling and Analysis Data/Chain of Custody Forms
- 3.3 Work Plan
- 3.4 Preliminary RI Field Work Reports
- 3.5 Remedial Investigation (RI) Reports
- 3.6 Correspondence

4.0 FEASIBILITY STUDY (FS)

- 4.1 ARAR Determinations
- 4.2 Feasibility Reports
- 4.3 Proposed Plan
- 4.4 Supplements and Revisions to the Proposed Plan – **No Entries in this Section**
- 4.5 Correspondence

5.0 RECORD OF DECISION (ROD)

- 5.1 ROD – **No Entries in this Section**
- 5.2 Amendments to ROD – **No Entries in this Section**
- 5.3 Explanations of Significant Differences – **No Entries in this Section**
- 5.4 Correspondence

6.0 STATE AND FEDERAL COORDINATION

6.1 Cooperative Agreements/SMOAs
6.2 Federal Facility Agreement (FFA)
6.3 Coordination - State/Federal
6.4 General Correspondence

7.0 ENFORCEMENT

7.1 Enforcement History – **No Entries in this Section**
7.2 Endangerment Assessments – **No Entries in this Section**
7.3 Administrative Orders
7.4 Consent Decrees – **No Entries in this Section**
7.5 Affidavits – **No Entries in this Section**
7.6 Documentation of Technical Discussions/ Response Actions – **No Entries in this Section**
7.7 Notice Letters and Responses – **No Entries in this Section**

8.0 HEALTH ASSESSMENTS

8.1 ATSDR Health Assessments – **No Entries in this Section**
8.2 Toxicological Profiles
8.3 General Correspondence – **No Entries in this Section**

9.0 NATURAL RESOURCE TRUSTEES

9.1 Notices Issued – **No Entries in this Section**
9.2 Findings of Fact – **No Entries in this Section**
9.3 Reports – **No Entries in this Section**
9.4 General Correspondence – **No Entries in this Section**

10.0 PUBLIC PARTICIPATION

10.1 Comments and Responses
10.2 Community Relations Plan
10.3 Public Notice(s) (Availability of the Admin. Record File, Availability of the Proposed Plan, Public Meetings)
10.4 Public Meeting Transcripts
10.5 Documentation of other Public Meetings
10.6 Fact Sheets, Press Advisories, and News Releases
10.7 Responsiveness Summary – **No Entries in this Section**
10.8 Late Comments – **No Entries in this Section**
10.9 Technical Review Committee Charter – **No Entries in this Section**
10.10 Correspondence

11.0 TECHNICAL SOURCES, GUIDANCE, AND PROCEDURES DOCUMENTS

11.1 EPA Headquarters Guidance
11.2 EPA Regional Guidance
11.3 State Guidance
11.4 Air Force Guidance
11.5 Technical Sources
11.6 Proposed Procedures/Procedures
11.7 Correspondence

12.0 CONFIDENTIAL FILE

12.1 Privileged Documents (Extractions) – **No Entries in this Section**

1.1 Background - RCRA and Other Information

DOCUMENT NUMBER:	PEA (1.1) #1 001-031
LONG TITLE:	"Scope of Work for the Remedial Investigation/Feasibility Study"
AUTHOR:	Pease Air Force Base
RECIPIENT:	EPA, NHDES
DATE:	April 1991
TYPE:	Scope of Work for RI/FS
SECOND REFERENCE:	None
LOCATION:	ARF, IR

#

DOCUMENT NUMBER:	
LONG TITLE:	
AUTHOR:	
RECIPIENT:	
DATE:	
TYPE:	
SECOND REFERENCE:	
LOCATION:	

#

1.3 Preliminary Assessment (PA) Report

DOCUMENT NUMBER:	PEA (1.3) #1 001-068
LONG TITLE:	"Phase II Problem Confirmation and Quantification Presurvey Report (Field Sampling for SI Work)"
AUTHOR:	Roy F. Weston, Inc.
RECIPIENT:	EPA, NHDES, USAF Occupational and Environmental Health Lab (OEHL), Brooks AFB, TX
DATE:	June 1984
TYPE:	Technical Report
SECOND REFERENCE:	None
LOCATION:	ARF, IR

#

DOCUMENT NUMBER:	PEA (1.3) #2 001-182
LONG TITLE:	"Installation Restoration Program Records Search"
AUTHOR:	CH2M Hill
RECIPIENT:	EPA; NHDES; USAF Engineering & Services Center, Tyndall AFB; SAC, Offutt AFB, NE
DATE:	January 1984
TYPE:	Technical Report
SECOND REFERENCE:	None
LOCATION:	ARF, IR

#

DOCUMENT NUMBER:	PEA (1.3) #3 001-041
LONG TITLE:	"Preliminary Assessment -- Updated PA Report"
AUTHOR:	Roy F. Weston, Inc.
RECIPIENT:	EPA, NHDES
DATE:	20 July 1990
TYPE:	Letter Report
SECOND REFERENCE:	None
LOCATION:	ARF, IR

#

1.4 Site Investigation (SI) Report

DOCUMENT NUMBER:	PEA (1.4) #1 001-309
LONG TITLE:	"Installation Restoration Program, Phase II - Confirmation/Quantification Stage I, Volume I (Final Report for Period October 1984 - July 1986)"
AUTHOR:	Roy F. Weston, Inc.
RECIPIENT:	HQ SAC/SGPB, Offutt AFB, NE; EPA; NHDES
DATE:	August 1986
TYPE:	Technical Report: Field Investigations
SECOND REFERENCE:	None
LOCATION:	ARF, IR

#

DOCUMENT NUMBER:	PEA (1.4) #2 001-883
LONG TITLE:	"Installation Restoration Program, Phase II - Confirmation/Quantification Stage 1, Volume II (Appendices)"
AUTHOR:	Roy F. Weston, Inc.
RECIPIENT:	HQ SAC/SGPB, Offutt AFB, NE; EPA; NHDES
DATE:	August 1987
TYPE:	Technical Report: Field Investigations
SECOND REFERENCE:	None
LOCATION:	ARF, IR

#

DOCUMENT NUMBER:	PEA (1.4) #3 001-308
LONG TITLE:	"Installation Restoration Program, Stage 3B Preliminary Assessment/Site Inspection"
AUTHOR:	Roy F. Weston, Inc.
RECIPIENT:	EPA; NHDES; HQ SAC/DE, Offutt AFB, NE; AFSC HSD/YAQ, Brooks AFB, TX
DATE:	February 1991
TYPE:	Technical Report: Also includes review of PA
SECOND REFERENCE:	None
LOCATION:	ARF, IR

#

1.6 Correspondence

DOCUMENT NUMBER:	PEA (1.6) #1 001-002
LONG TITLE:	"Comments Regarding the Installation Restoration Program, Phase I Record Search Report, Pease Air Force Base"
AUTHOR:	The State of New Hampshire, Water Supply and Pollution Control Commission
RECIPIENT:	HQ SAC, Offutt AFB, NE
DATE:	16 March 1984
TYPE:	Letter/Comments
SECOND REFERENCE:	None
LOCATION:	ARF, IR

#

DOCUMENT NUMBER:	PEA (1.6) #2 001-004
LONG TITLE:	"Comments Regarding the Installation Restoration Program Report (09/10/86)"
AUTHOR:	State of New Hampshire, Division of Public Health Services
RECIPIENT:	NH Division of Public Health Services
DATE:	24 November 1986
TYPE:	Comments to SI (1.4)
SECOND REFERENCE:	None
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (1.6) #3 001-005
LONG TITLE:	"Comments Regarding the Phase II, Stage 1 IRP Report (08/86 Draft)"
AUTHOR:	State of New Hampshire, Department of Environmental Services
RECIPIENT:	Air Force
DATE:	3 February 1987
TYPE:	Comments to SI (1.4)
SECOND REFERENCE:	None
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (1.6) #4 001-007
LONG TITLE:	"Air Force Responses to Comments From the New Hampshire Department of Environmental Services on the Phase II, Stage 1 IRP Draft Report"
AUTHOR:	Department of the Air Force
RECIPIENT:	NHDES
DATE:	8 May 1987
TYPE:	Responses to Comments to SI (1.4)
SECOND REFERENCE:	None
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (1.6) #6 001-004
LONG TITLE:	"Letter Concerning Site Walkovers made with Members of Sherburne Civic Group"
AUTHOR:	State of New Hampshire, Department of Environmental Services
RECIPIENT:	Air Force
DATE:	18 July 1990
TYPE:	Letter
SECOND REFERENCE:	None
LOCATION:	ARF

#

2.7 Removal Response Reports

DOCUMENT NUMBER:	PEA (2.7) #2 001-070
LONG TITLE:	"Informal Technical Information Report, Soil Removal at Site 8 (FDTA-2) – Pre-NPL Actions"
AUTHOR:	Roy F. Weston, Inc.
RECIPIENT:	EPA, NHDES
DATE:	December 1990
TYPE:	Technical Report
SECOND REFERENCE:	None
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (2.7) #5 001-900
LONG TITLE:	Installation Restoration Program, Stage 3A, IRP Site 8 Groundwater Treatment Plant, Pease AFB, NH - Volume II
AUTHOR:	Roy F. Weston, Inc.
RECIPIENT:	USAF
DATE:	November 1991
TYPE:	Report
SECOND REFERENCE:	None
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (2.7) #6 001-H.12
LONG TITLE:	Installation Restoration Program, Stage 3A, IRP Site 8 Groundwater Treatment Plant, Pease AFB, NH - Volume I
AUTHOR:	Roy F. Weston, Inc.
RECIPIENT:	USAF
DATE:	November 1991
TYPE:	Report
SECOND REFERENCE:	None
LOCATION:	ARF

#

2.8 Correspondence

DOCUMENT NUMBER: PEA (2.8) #3 001-001
LONG TITLE: "Letter Regarding Fire Training Area No. 2, Pilot Groundwater Treatment System"
AUTHOR: Department of the Air Force
RECIPIENT: Air Force
DATE: 11 October 1990
TYPE: Letter
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (2.8) #6 001-001
LONG TITLE: "Letter Regarding Fire Training Area No. 2, Pilot Groundwater Treatment System"
AUTHOR: Roy F. Weston, Inc.
RECIPIENT: Air Force
DATE: 12 November 1990
TYPE: Letter
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (2.8) #8 001-004
LONG TITLE: "Letter Regarding the Approval of Pease Air Force Base Groundwater Permit No. 8908-25P for the Fire Department Training Area"
AUTHOR: State of New Hampshire, Department of Environmental Services
RECIPIENT: Air Force
DATE: 11 September 1989
TYPE: Letter
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (2.8) #9 001-002
LONG TITLE: "Letter Regarding Review of a Supplemental Proposal to Air Strip Contaminated Groundwater"
AUTHOR: State of New Hampshire, Department of Environmental Services
RECIPIENT: Air Force
DATE: 13 September 1989
TYPE: Letter
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (2.8) #10 001-003
LONG TITLE: "Letter Regarding Revision of Pease Air Force Base Groundwater Permit No. 8908-25P of the Former Fire Department Training Area No. 2, Site 8"
AUTHOR: U.S. Air Force
RECIPIENT: State of New Hampshire
DATE: 18 April 1990
TYPE: Letter
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (2.8) #11 001-001
LONG TITLE: "Letter Regarding Groundwater Discharge Permit No. 8908-25P"
AUTHOR: State of New Hampshire, Department of Environmental Services
RECIPIENT: Air Force

DATE:	5 July 1990
TYPE:	Letter
SECOND REFERENCE:	None
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (2.8) #12 001-002
LONG TITLE:	"Letter to the New Hampshire Department of Environmental Services Regarding Amendments to Groundwater Treatment System air emissions"
AUTHOR:	Air Force
RECIPIENT:	NHDES
DATE:	20 August 1990
TYPE:	Letter
SECOND REFERENCE:	None
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (2.8) #19 001-008
LONG TITLE:	Proposal to Upgrade IRP Site 8 Pilot Groundwater Recovery and Recharge Systems
AUTHOR:	Fred Symmes Assistant Project Engineer Roy F. Weston, Inc.
RECIPIENT:	Mark McKenzie U.S. Air Force/Pease AFB
DATE:	14 September 1992
TYPE:	Letter with Maps
SECOND REFERENCE:	Site 8, Pilot Groundwater Recovery and Recharge Systems
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (2.8) #23 001-004
LONG TITLE:	Site 8 Groundwater Remediation System Update
AUTHOR:	Lee dePersia Task Manager Roy F. Weston, Inc.
RECIPIENT:	Arthur Ditto, RPM U.S. Air Force/Pease AFB
DATE:	2 December 1992
TYPE:	Letter with Maps
SECOND REFERENCE:	Site 8, FDTA - 2
LOCATION:	ARF

#

3.1 Sampling and Analysis Plan (SAP)

DOCUMENT NUMBER:	PEA (3.1) #1 001-210
LONG TITLE:	"Quality Assurance Project Plan, Integrated Installation Restoration Program, Stage 2, to Support the Preliminary Remedial Investigation Field Work, Labelled Stage 2 Field Work"
AUTHOR:	Roy F. Weston, Inc.
RECIPIENT:	EPA; NHDES; HQ SAC/DEPV, Offutt AFB, NE
DATE:	November 1987
TYPE:	Quality Assurance Project Plan
SECOND REFERENCE:	None
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (3.1) #2 001-212
LONG TITLE:	"Quality Assurance Project Plan, Integrated Installation Restoration Program, Stage 3"
AUTHOR:	Roy F. Weston, Inc.
RECIPIENT:	EPA, NHDES
DATE:	August 1989
TYPE:	Quality Assurance Project Plan
SECOND REFERENCE:	None
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (3.1) #3 001-286
LONG TITLE:	"Installation Restoration Program, Stage 4 Sampling and Analysis Plan"
AUTHOR:	Roy F. Weston, Inc.
RECIPIENT:	EPA, NHDES
DATE:	January 1991
TYPE:	Sampling and Analysis Plan
SECOND REFERENCE:	None
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (3.1) #7 001-003
LONG TITLE:	Locations of Background Sampling Locations
AUTHOR:	Arthur L. Ditto RPM, U.S. Air Force/Pease AFB
RECIPIENT:	Johanna Hunter, RPM USEPA, Region 1 and Richard Pease, RPM NHDES
DATE:	15 June 1992
TYPE:	Letter and Map
SECOND REFERENCE:	Stage 3C Background Data Base
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (3.1) #8 001-004
LONG TITLE:	Aquifer Testing Proposed for Site 8 (Bedrock Well 08-622)
AUTHOR:	Robert J. Casper Project Geologist Roy F. Weston, Inc.
RECIPIENT:	Mark McKenzie U.S. Air Force/Pease AFB
DATE:	28 August 1992
TYPE:	Letter with Table and Map
SECOND REFERENCE:	Site 8, Bedrock Well 08-622, Zone 5
LOCATION:	ARF

#

DOCUMENT NUMBER: PEA (3.1) #11 001-R1
LONG TITLE: Installation Restoration Program, Stage 4 Sampling and Analysis Plan Addendum 3, Pease AFB, NH -- Draft
AUTHOR: Roy F. Weston, Inc.
RECIPIENT: USAF
DATE: October 1992
TYPE: Addendum
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.1) #16 001-003
LONG TITLE: Recommendations to Characterize Overburden Groundwater Quality and Flow Direction near Site 8 (Zone 5)
AUTHOR: Jennifer D. Toney, P.G.
Zone Manager
Roy F. Weston, Inc.
RECIPIENT: Arthur Ditto
U.S. Air Force/Pease AFB
DATE: 5 November 1992
TYPE: Letter with Map
SECOND REFERENCE: Site 8, Zone 5
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.1) #17 001-005
LONG TITLE: Ethylene Dibromide (EDB) Analysis using Modified Method E504.1
AUTHOR: Edward S. Barnes, P.E., C.I.H.
Project Director
Roy F. Weston, Inc.
RECIPIENT: Capt Carl Woerhle
U.S. Air Force/Base Closure Division
Air Force Center for Environmental Excellence
DATE: 19 November 1992
TYPE: Letter with 4 Page Attachment
SECOND REFERENCE: Analytical Method Recommended for EDB Analysis
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.1) #19 2.24-R.1
LONG TITLE: Stage 4 Sampling and Analysis Plan, Addendum #3, QAPP Portion
AUTHOR: Roy F. Weston, Inc.
RECIPIENT: USAF
DATE: 2 December 1992
TYPE: Addendum
SECOND REFERENCE: None
LOCATION: ARF

#

3.2 Sampling and Analysis Data / Chain of Custody Forms

DOCUMENT NUMBER:	PEA (3.2) #1 001-027
LONG TITLE:	Volatile Aromatics/Halocarbons by Modified 8010/8020 - Draft Data Sheets
AUTHOR:	Roy F. Roy F. Weston, Inc.
RECIPIENT:	Pease AFB
DATE:	Unknown
TYPE:	Data
SECOND REFERENCE:	None
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (3.2) #2 001-018
LONG TITLE:	Volatile Aromatics/Halocarbons by Modified 8010/8020
AUTHOR:	Roy F. Weston, Inc.
RECIPIENT:	Pease AFB
DATE:	Unknown
TYPE:	Data
SECOND REFERENCE:	None
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (3.2) #3 001-009
LONG TITLE:	CLP Volatile Organic Analysis, Case No. 15175, SDG No. AX086, 8 Water Analytical Results
AUTHOR:	Roy F. Weston, Inc.
RECIPIENT:	Pease AFB
DATE:	Unknown
TYPE:	Data
SECOND REFERENCE:	None
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (3.2) #4 001-037
LONG TITLE:	Pease AFB GWTP Summary Tables
AUTHOR:	Roy F. Weston, Inc.
RECIPIENT:	USAF
DATE:	Unknown
TYPE:	Data
SECOND REFERENCE:	None
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (3.2) #5 001-013
LONG TITLE:	Split Sampling Results Site 8 and Site 34
AUTHOR:	Richard Pease, NHDES
RECIPIENT:	Art Ditto, Pease AFB
DATE:	29 October 1990
TYPE:	Data
SECOND REFERENCE:	Site 8; Site 34
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (3.2) #6 001-013
LONG TITLE:	Preliminary Survey of Metal Concentrations in New Hampshire Soils - Final Report
AUTHOR:	New Hampshire Division of Public Health Services, Bureau of Health Risk Assessment
RECIPIENT:	USAF
DATE:	May 1991
TYPE:	Data
SECOND REFERENCE:	None

LOCATION:	. ARF

#

DOCUMENT NUMBER:	PEA (3.2) #7 001-D1
LONG TITLE:	Background Soluble Metals Concentrations for Groundwater at Pease AFB
AUTHOR:	Roy F. Weston, Inc.
RECIPIENT:	USAF
DATE:	20 November 1991
TYPE:	Letter Report
SECOND REFERENCE:	PEA (3.6)
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (3.2) #8 001-E.1
LONG TITLE:	Tolerance Limits for Background Soils at Pease AFB, NH
AUTHOR:	Roy F. Weston, Inc.
RECIPIENT:	USAF
DATE:	17 April 1992
TYPE:	Letter Report
SECOND REFERENCE:	None
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (3.2) #10 001-002
LONG TITLE:	Results of Background Surface Water/Sediment Location Walkover
AUTHOR:	Arthur L. Ditto, RPM U.S. Air Force/Pease AFB
RECIPIENT:	Johanna Hunter, RPM U.S. EPA, Region 1
DATE:	19 August 1992
TYPE:	Letter
SECOND REFERENCE:	Knights Brook
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (3.2) #12 001-052
LONG TITLE:	Maximum Detected Concentrations for Unfiltered Groundwater at Pease AFB, NH
AUTHOR:	Lee dePersia Task Manager Roy F. Weston, Inc.
RECIPIENT:	Arthur Ditto, RPM U.S. Air Force/Pease AFB
DATE:	25 August 1992
TYPE:	Letter with Attachments (Tables and Graphs)
SECOND REFERENCE:	Characterization of Inorganic Background Levels for Groundwater at Pease AFB
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (3.2) #14 001-009
LONG TITLE:	Newington Water Quality Sampling on July 18, 1992 and Analysis Performed on August 28, 1992 (NHDES Sample #210239-210241)
AUTHOR:	Scott Doane Hydrogeologist NHDES
RECIPIENT:	Wayne Wood 428 Newington Road Newington, NH 03803
DATE:	21 September 1992
TYPE:	Letter with Chain of Custody and Tables
SECOND REFERENCE:	Bedrock Well Serving

	428 Newington Road
	Tax Map 51, Lot 09
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (3.2) #15 001-009
LONG TITLE:	Tissue Sample Letter Report for Great Bay, Bass Pond and McIntyre Brook
AUTHOR:	Lee R. dePersia
	Task Manager
	Roy F. Weston, Inc.
	Through U.S. Air Force
RECIPIENT:	Johanna Hunter, RPM
	U.S. EPA, Region 1
	and
	Richard Pease, RPM
	NHDES
DATE:	9 October 1992
TYPE:	Routing Letters and Letter Report with Map and Table
SECOND REFERENCE:	Great Bay, Bass Pond
	McIntyre Brook
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (3.2) #16 001-009
LONG TITLE:	Thomas Drinking Water Well Sample Analytical Result
AUTHOR:	Kenneth W. Teague, President
	Analytics Environmental Laboratory, Inc.
	Through U.S. Air Force/Arthur Ditto
RECIPIENT:	Evelyn Thomas
	509 Newington Road
	Newington, NH 03801
DATE:	23 November 1992
TYPE:	Transmittal Letters with Attachments (Tables, Questionnaire and Map)
SECOND REFERENCE:	Artesian Well
	at 509 Newington Rd.
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (3.2) #17 001-005
LONG TITLE:	Results of Sampling Frink Estate Well and Spring
AUTHOR:	USAF
RECIPIENT:	Peggy Lamson, Newington Board of Selectmen
DATE:	15 January 1993
TYPE:	Letter with Attachment
SECOND REFERENCE:	None
LOCATION:	ARF (Section 3.2 Binder)

#

3.3 Work Plan

DOCUMENT NUMBER: PEA (3.3) #1 001-144
LONG TITLE: "Work Plan for the Installation Restoration Program, Stage 3"
AUTHOR: Roy F. Weston, Inc.
RECIPIENT: EPA, NHDES
DATE: August 1989
TYPE: Work Plan
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.3) #2 001-019
LONG TITLE: "Installation Restoration Program, Stage 3C, Treatability Study Work Plan: IRP Sites 8 and 34"
AUTHOR: Roy F. Weston, Inc.
RECIPIENT: EPA, NHDES
DATE: May 1991
TYPE: Work Plan
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.3) #3 001-028
LONG TITLE: "Installation Restoration Program, Stage 3C, Action Plan"
AUTHOR: Roy F. Weston, Inc.
RECIPIENT: EPA, NHDES
DATE: May 1991
TYPE: Operations Plan
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.3) #4 001-258
LONG TITLE: "Installation Restoration Program, Stage 4 Work Plan"
AUTHOR: Roy F. Weston, Inc.
RECIPIENT: EPA, NHDES
DATE: January 1991
TYPE: Work Plan
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.3) #5 001-213
LONG TITLE: "Work Plan for the Integrated Installation Restoration Program, Stage 2, Labelled Stage 2 Work Plan"
AUTHOR: Roy F. Weston, Inc.
RECIPIENT: EPA, NHDES
DATE: September 1987
TYPE: Work Plan
SECOND REFERENCE: None
LOCATION: ARF, IR

#

DOCUMENT NUMBER: PEA (3.3) #6 001-GL.2
LONG TITLE: Installation Restoration Program, Stage 4 Work Plan Addendum 1, Pease AFB, NH -- Draft
AUTHOR: Roy F. Weston, Inc.
RECIPIENT: USAF
DATE: September 1991
TYPE: Addendum
SECOND REFERENCE: None

LOCATION:	ARF, IR

#

DOCUMENT NUMBER:	PEA (3.3) #7 001-G5
LONG TITLE:	Installation Restoration Program, Stage 4 Work Plan Addendum Number 2 for Pease AFB, NH – Draft
AUTHOR:	Roy F. Weston, Inc.
RECIPIENT:	USAF
DATE:	March 1992
TYPE:	Addendum
SECOND REFERENCE:	None
LOCATION:	ARF, IR

#

DOCUMENT NUMBER:	PEA (3.3) #8 001-B4
LONG TITLE:	Installation Restoration Program, Stage 3C, Operations Plan for Pease AFB, NH – Draft
AUTHOR:	Roy F. Weston, Inc.
RECIPIENT:	USAF
DATE:	May 1991
TYPE:	Plan
SECOND REFERENCE:	None
LOCATION:	ARF, IR

#

DOCUMENT NUMBER:	PEA (3.3) #9 001-3.5
LONG TITLE:	Installation Restoration Program, Stage 4, Work Plan Addendum 3, Pease AFB, NH
AUTHOR:	Roy F. Weston, Inc.
RECIPIENT:	USAF
DATE:	June 1992
TYPE:	Addendum
SECOND REFERENCE:	None
LOCATION:	ARF, IR

#

DOCUMENT NUMBER:	PEA (3.3) #12 001-004
LONG TITLE:	Groundwater Modeling Process Outline
AUTHOR:	Lee dePersia Task Manager Roy F. Weston, Inc.
RECIPIENT:	Arthur Ditto, RPM U.S. Air Force/Pease AFB
DATE:	2 October 1992
TYPE:	Letter
SECOND REFERENCE:	Groundwater Modeling
LOCATION:	ARF, IR

#

DOCUMENT NUMBER:	PEA (3.3) #13 001-C.31
LONG TITLE:	Installation Restoration Program, Stage 5 Health and Safety Plan, Pease AFB, NH – Draft
AUTHOR:	Roy F. Weston, Inc.
RECIPIENT:	USAF
DATE:	October 1992
TYPE:	Health and Safety Plan
SECOND REFERENCE:	Groundwater Modeling
LOCATION:	ARF, IR

#

DOCUMENT NUMBER:	PEA (3.3) #15 001-F
LONG TITLE:	U.S. Air Force Installation Restoration Program Pease AFB Interim Monitoring Plan
AUTHOR:	USAF
RECIPIENT:	Pease AFB

DATE:	·January 1994
TYPE:	Monitoring Plan
SECOND REFERENCE:	Groundwater Monitoring
LOCATION:	ARF (Zone 7 Shelf)

#

3.4 Preliminary RI Field Work Reports

DOCUMENT NUMBER:	PEA (3.4) #1 001-173
LONG TITLE:	"Interim Technical Report No. 1 for the Installation Restoration Program, Stage 2, Volume I"
AUTHOR:	Roy F. Weston, Inc.
RECIPIENT:	EPA, NHDES
DATE:	February 1988
TYPE:	Technical Report
SECOND REFERENCE:	None
LOCATION:	ARF, IR

#

DOCUMENT NUMBER:	PEA (3.4) #2 001-147
LONG TITLE:	"Interim Technical Report No. 1 for the Installation Restoration Program, Stage 2, Volume II - Appendices"
AUTHOR:	Roy F. Weston, Inc.
RECIPIENT:	EPA, NHDES
DATE:	January 1988
TYPE:	Technical Report - Appendices
SECOND REFERENCE:	None
LOCATION:	ARF, IR

#

DOCUMENT NUMBER:	PEA (3.4) #3 001-214
LONG TITLE:	"Interim Technical Report No. 2 for the Installation Restoration Program, Stage 2, Volume I"
AUTHOR:	Roy F. Weston, Inc.
RECIPIENT:	EPA, NHDES
DATE:	August 1988
TYPE:	Technical Report
SECOND REFERENCE:	None
LOCATION:	ARF, IR

#

DOCUMENT NUMBER:	PEA (3.4) #4 001-696
LONG TITLE:	"Interim Technical Report No. 2 for the Installation Restoration Program, Stage 2, Volume II - Appendices (Sample Tracking Information, Analytical Results)"
AUTHOR:	Roy F. Weston, Inc.
RECIPIENT:	EPA, NHDES
DATE:	August 1988
TYPE:	Technical Report - Appendices (Sample Tracking Information, Analytical Results)
SECOND REFERENCE:	None
LOCATION:	ARF, IR

#

DOCUMENT NUMBER:	PEA (3.4) #5 001-838
LONG TITLE:	"Interim Technical Report No. 2 for the Installation Restoration Program, Stage 2, Volume III - Appendices (Analytical Results)"
AUTHOR:	Roy F. Weston, Inc.
RECIPIENT:	EPA, NHDES
DATE:	August 1988
TYPE:	Technical Report - Appendices (Analytical Results)
SECOND REFERENCE:	None
LOCATION:	ARF, IR

#

DOCUMENT NUMBER:	PEA (3.4) #6 001-722
LONG TITLE:	"Interim Technical Report No. 2 for the Installation Restoration Program, Stage 2, Volume IV - Appendices (Analytical Results)"
AUTHOR:	Roy F. Weston, Inc.
RECIPIENT:	EPA, NHDES

DATE:	August 1988
TYPE:	Technical Report - Appendices (Analytical Results)
SECOND REFERENCE:	None
LOCATION:	ARF, IR

#

DOCUMENT NUMBER:	PEA (3.4) #7 001-289
LONG TITLE:	"Interim Technical Report No. 2 for the Installation Restoration Program, Stage 2, Volume V - Appendices (Field Geological, Geotechnical, and Hydrogeological Data)"
AUTHOR:	Roy F. Weston, Inc.
RECIPIENT:	EPA, NHDES
DATE:	August 1988
TYPE:	Technical Report - Appendices (Field Geological, Geotechnical, and Hydrogeological Data)
SECOND REFERENCE:	None
LOCATION:	ARF, IR

#

DOCUMENT NUMBER:	PEA (3.4) #8 001-106
LONG TITLE:	"Interim Technical Report No. 3 for the Installation Restoration Program, Stage 2, Volume I"
AUTHOR:	Roy F. Weston, Inc.
RECIPIENT:	EPA, NHDES
DATE:	February 1989
TYPE:	Technical Report
SECOND REFERENCE:	None
LOCATION:	ARF, IR

#

DOCUMENT NUMBER:	PEA (3.4) #9 001-658
LONG TITLE:	"Interim Technical Report No. 3 for the Installation Restoration Program, Stage 2, Volume II - Appendices"
AUTHOR:	Roy F. Weston, Inc.
RECIPIENT:	EPA, NHDES
DATE:	February 1989
TYPE:	Technical Report - Appendices
SECOND REFERENCE:	None
LOCATION:	ARF, IR

#

DOCUMENT NUMBER:	PEA (3.4) #10 001-198
LONG TITLE:	"Interim Technical Report No. 4 for the Installation Restoration Program, Stage 2, Volume I"
AUTHOR:	Roy F. Weston, Inc.
RECIPIENT:	EPA, NHDES
DATE:	April 1989
TYPE:	Technical Report
SECOND REFERENCE:	None
LOCATION:	ARF, IR

#

DOCUMENT NUMBER:	PEA (3.4) #11 001-770
LONG TITLE:	"Interim Technical Report No. 4 for the Installation Restoration Program, Stage 2, Volume II - Appendices"
AUTHOR:	Roy F. Weston, Inc.
RECIPIENT:	EPA, NHDES
DATE:	April 1989
TYPE:	Technical Report - Appendices
SECOND REFERENCE:	None
LOCATION:	ARF, IR

#

DOCUMENT NUMBER:	PEA (3.4) #12 001-568
LONG TITLE:	"Interim Technical Report No. 4 for the Installation Restoration Program, Stage 2, Volume III - Appendices"
AUTHOR:	Roy F. Weston, Inc.

RECIPIENT:	EPA, NHDES
DATE:	April 1989
TYPE:	Technical Report - Appendices
SECOND REFERENCE:	None
LOCATION:	ARF, IR

#

DOCUMENT NUMBER:	PEA (3.4) #13 001-770
LONG TITLE:	"Interim Technical Report No. 4 for the Installation Restoration Program, Stage 2, Volume IV - Appendices"
AUTHOR:	Roy F. Weston, Inc.
RECIPIENT:	EPA, NHDES
DATE:	April 1989
TYPE:	Technical Report - Appendices
SECOND REFERENCE:	None
LOCATION:	ARF, IR

#

DOCUMENT NUMBER:	PEA (3.4) #14 001-1,150
LONG TITLE:	"Interim Technical Report No. 4 for the Installation Restoration Program, Stage 2, Volume V - Appendices"
AUTHOR:	Roy F. Weston, Inc.
RECIPIENT:	EPA, NHDES
DATE:	April 1989
TYPE:	Technical Report - Appendices
SECOND REFERENCE:	None
LOCATION:	ARF, IR

#

DOCUMENT NUMBER:	PEA (3.4) #15 001-729
LONG TITLE:	"Interim Technical Report No. 4 for the Installation Restoration Program, Stage 2, Volume VI - Appendices"
AUTHOR:	Roy F. Weston, Inc.
RECIPIENT:	EPA, NHDES
DATE:	April 1989
TYPE:	Technical Report - Appendices
SECOND REFERENCE:	None
LOCATION:	ARF, IR

#

DOCUMENT NUMBER:	PEA (3.4) #16 001-803
LONG TITLE:	"Interim Technical Report No. 4 for the Installation Restoration Program, Stage 2, Volume VII - Appendices"
AUTHOR:	Roy F. Weston, Inc.
RECIPIENT:	EPA, NHDES
DATE:	April 1989
TYPE:	Technical Report - Appendices
SECOND REFERENCE:	None
LOCATION:	ARF, IR

#

DOCUMENT NUMBER:	PEA (3.4) #17 001-251
LONG TITLE:	"Installation Restoration Program, Stage 2, Draft Final Report, Volume I"
AUTHOR:	Roy F. Weston, Inc.
RECIPIENT:	EPA, NHDES
DATE:	July 1990
TYPE:	Technical Report
SECOND REFERENCE:	None
LOCATION:	ARF, IR

#

DOCUMENT NUMBER:	PEA (3.4) #18 001-452
LONG TITLE:	"Installation Restoration Program, Stage 2, Draft Final Report, Volume II"
AUTHOR:	Roy F. Weston, Inc.

RECIPIENT: EPA, NHDES
DATE: July 1990
TYPE: Technical Report
SECOND REFERENCE: None
LOCATION: ARF, IR

#

DOCUMENT NUMBER: PEA (3.4) #19 001-621
LONG TITLE: "Installation Restoration Program, Stage 2, Draft Final Report, Appendices, Volume I"
AUTHOR: Roy F. Weston, Inc.
RECIPIENT: EPA, NHDES
DATE: July 1990
TYPE: Technical Report - Appendices
SECOND REFERENCE: None
LOCATION: ARF, IR

#

DOCUMENT NUMBER: PEA (3.4) #20 001-420
LONG TITLE: "Installation Restoration Program, Stage 2, Draft Final Report, Appendices, Volume II"
AUTHOR: Roy F. Weston, Inc.
RECIPIENT: EPA, NHDES
DATE: July 1990
TYPE: Technical Report - Appendices
SECOND REFERENCE: None
LOCATION: ARF, IR

#

DOCUMENT NUMBER: PEA (3.4) #21 001-658
LONG TITLE: "Installation Restoration Program, Stage 2, Draft Final Report, Appendices, Volume III"
AUTHOR: Roy F. Weston, Inc.
RECIPIENT: EPA, NHDES
DATE: July 1990
TYPE: Technical Report - Appendices
SECOND REFERENCE: None
LOCATION: ARF, IR

#

DOCUMENT NUMBER: PEA (3.4) #22 001-688
LONG TITLE: "Installation Restoration Program, Stage 2, Draft Final Report, Appendices, Volume IV"
AUTHOR: Roy F. Weston, Inc.
RECIPIENT: EPA, NHDES
DATE: July 1990
TYPE: Technical Report - Appendices
SECOND REFERENCE: None
LOCATION: ARF, IR

#

DOCUMENT NUMBER: PEA (3.4) #23 001-261
LONG TITLE: "Installation Restoration Program, Stage 2, Draft Final Report, Appendices, Volume V"
AUTHOR: Roy F. Weston, Inc.
RECIPIENT: EPA, NHDES
DATE: July 1990
TYPE: Technical Report - Appendices
SECOND REFERENCE: None
LOCATION: ARF, IR

#

DOCUMENT NUMBER: PEA (3.4) #24 001-340
LONG TITLE: "Installation Restoration Program, Stage 2, Draft Final Report, Appendices, Summary Analytical Tables"
AUTHOR: Roy F. Weston, Inc.

RECIPIENT:	EPA, NHDES
DATE:	July 1990
TYPE:	Technical Report - Appendices
SECOND REFERENCE:	None
LOCATION:	ARF, IR

#

DOCUMENT NUMBER:	PEA (3.4) #25 001-007
LONG TITLE:	"Geophysical Survey Letter Report, Stage 3"
AUTHOR:	Roy F. Weston, Inc.
RECIPIENT:	EPA, NHDES
DATE:	19 October 1989
TYPE:	Letter Report
SECOND REFERENCE:	None
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (3.4) #27 001-014
LONG TITLE:	"Recovery Well Selection Letter Report: IRP Site 8"
AUTHOR:	Roy F. Weston, Inc.
RECIPIENT:	EPA, NHDES
DATE:	11 May 1990
TYPE:	Letter Report
SECOND REFERENCE:	None
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (3.4) #31 001-007
LONG TITLE:	"Site 8 Follow-on Letter Report"
AUTHOR:	Roy F. Weston, Inc.
RECIPIENT:	EPA, NHDES
DATE:	9 October 1990
TYPE:	Letter Report
SECOND REFERENCE:	None
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (3.4) #34 001-062
LONG TITLE:	"Installation Restoration Program, Stage 3, IRP Site 8 Column Leach Study Letter Report"
AUTHOR:	Roy F. Weston, Inc.
RECIPIENT:	EPA, NHDES
DATE:	February 1991
TYPE:	Technical Report
SECOND REFERENCE:	None
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (3.4) #38 001-041
LONG TITLE:	Pease AFB Monitor Well Inventory and Inspection
AUTHOR:	Roy F. Weston, Inc.
RECIPIENT:	USAF
DATE:	7 August 1992
TYPE:	Report
SECOND REFERENCE:	None
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (3.4) #39 001-D
LONG TITLE:	Background Values for Soil, Groundwater, Surface Water and Sediment at Pease Air Force Base
AUTHOR:	Roy F. Weston, Inc.
RECIPIENT:	USAF

DATE:	26 February 1993
TYPE:	Letter
SECOND REFERENCE:	None
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (3.4) #40 001-Map 6
LONG TITLE:	Off Base Well Inventory Letter Report for Pease AFB
AUTHOR:	Roy F. Weston, Inc.
RECIPIENT:	USAF
DATE:	17 September 1992
TYPE:	Letter Report
SECOND REFERENCE:	None
LOCATION:	ARF

#

3.5 Remedial Investigation (RI) Reports

DOCUMENT NUMBER:	PEA (3.5) #16 001-B.12
LONG TITLE:	Sampling Locations and Results Drainage Area Letter Report
AUTHOR:	Roy F. Weston, Inc.
RECIPIENT:	USAF
DATE:	May 1992
TYPE:	Report
SECOND REFERENCE:	None
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (3.5) #21 001-C
LONG TITLE:	Installation Restoration Program, Stage 3C, IRP Site 8 Remedial Investigation, Pease AFB, NH, Appendix C – Draft
AUTHOR:	Roy F. Weston, Inc.
RECIPIENT:	USAF
DATE:	July 1992
TYPE:	Appendix
SECOND REFERENCE:	Site 8
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (3.5) #22 001-G
LONG TITLE:	Installation Restoration Program, Stage 3C, IRP Site 8 Remedial Investigation, Pease AFB, NH, Appendices D-G – Draft
AUTHOR:	Roy F. Weston, Inc.
RECIPIENT:	USAF
DATE:	July 1992
TYPE:	Appendices
SECOND REFERENCE:	Site 8
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (3.5) #23 001-K1
LONG TITLE:	Installation Restoration Program, Stage 3C, IRP Site 8 Remedial Investigation, Pease AFB, NH, Appendix K, Part 1 of 2 –Draft
AUTHOR:	Roy F. Weston, Inc.
RECIPIENT:	USAF
DATE:	July 1992
TYPE:	Appendix
SECOND REFERENCE:	Site 8
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (3.5) #24 001-K2
LONG TITLE:	Installation Restoration Program, Stage 3C, IRP Site 8 Remedial Investigation, Pease AFB, NH, Appendix K, Part 2 of 2 –Draft
AUTHOR:	Roy F. Weston, Inc.
RECIPIENT:	USAF
DATE:	July 1992
TYPE:	Appendix
SECOND REFERENCE:	Site 8
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (3.5) #25 001-I1
LONG TITLE:	Installation Restoration Program, Stage 3C, IRP Site 8 Remedial Investigation, Pease AFB, NH, Appendices H-I1 – Draft
AUTHOR:	Roy F. Weston, Inc.
RECIPIENT:	USAF

DATE: July 1992
TYPE: Appendices
SECOND REFERENCE: Site 8
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.5) #26 001-I2
LONG TITLE: Installation Restoration Program, Stage 3C, IRP Site 8 Remedial Investigation, Pease AFB, NH, Appendices H-I2 -- Draft
AUTHOR: Roy F. Weston, Inc.
RECIPIENT: USAF
DATE: July 1992
TYPE: Appendix
SECOND REFERENCE: Site 8
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.5) #27 001-0.31
LONG TITLE: Installation Restoration Program, Stage 3C, IRP Site 8 Remedial Investigation, Pease AFB, NH, Appendices L-O -- Draft
AUTHOR: Roy F. Weston, Inc.
RECIPIENT: USAF
DATE: July 1992
TYPE: Appendices
SECOND REFERENCE: Site 8
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.5) #28 001-J873
LONG TITLE: Installation Restoration Program, Stage 3C, IRP Site 8 Remedial Investigation, Pease AFB, NH, Appendix J, Part 1 of 4 -- Draft
AUTHOR: Roy F. Weston, Inc.
RECIPIENT: USAF
DATE: July 1992
TYPE: Appendix
SECOND REFERENCE: Site 8
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.5) #29 J874-J1752
LONG TITLE: Installation Restoration Program, Stage 3C, IRP Site 8 Remedial Investigation, Pease AFB, NH, Appendix J, Part 2 of 4 -- Draft
AUTHOR: Roy F. Weston, Inc.
RECIPIENT: USAF
DATE: July 1992
TYPE: Appendix
SECOND REFERENCE: Site 8
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.5) #30 J1753-J2661
LONG TITLE: Installation Restoration Program, Stage 3C, IRP Site 8 Remedial Investigation, Pease AFB, NH, Appendix J, Part 3 of 4 -- Draft
AUTHOR: Roy F. Weston, Inc.
RECIPIENT: USAF
DATE: July 1992
TYPE: Appendix
SECOND REFERENCE: Site 8
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.5) #31 J2662-J3221

LONG TITLE: Installation Restoration Program, Stage 3C, IRP Site 8 Remedial Investigation, Pease AFB, NH, Appendix J, Part 4 of 4 – Draft
AUTHOR: Roy F. Weston, Inc.
RECIPIENT: USAF
DATE: July 1992
TYPE: Appendix
SECOND REFERENCE: Site 8
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.5) #36 A-C
LONG TITLE: Installation Restoration Program, Stage 4, Site Characterization Summary, IRP Zone 5, Pease AFB, NH Technical Report and Appendices A-C – Draft
AUTHOR: Roy F. Weston, Inc.
RECIPIENT: USAF
DATE: October 1992
TYPE: Report
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.5) #37 D1-D2
LONG TITLE: Installation Restoration Program, Stage 4, Site Characterization Summary, IRP Zone 5, Pease AFB, NH Appendix D – Draft
AUTHOR: Roy F. Weston, Inc.
RECIPIENT: USAF
DATE: October 1992
TYPE: Appendices
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.5) #38 E-F
LONG TITLE: Installation Restoration Program, Stage 4, Site Characterization Summary, IRP Zone 5, Pease AFB, NH Technical Report and Appendices E-F – Draft
AUTHOR: Roy F. Weston, Inc.
RECIPIENT: USAF
DATE: October 1992
TYPE: Report
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.5) #39 001-L
LONG TITLE: Installation Restoration Program, Stage 3C, IRP Site 8 Remedial Investigation, Pease AFB, NH Appendix L – Draft Final
AUTHOR: Roy F. Weston, Inc.
RECIPIENT: USAF
DATE: November 1992
TYPE: Appendix
SECOND REFERENCE: Site 8
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.5) #40 001-K.29
LONG TITLE: Installation Restoration Program, Stage 3C, IRP Site 8 Remedial Investigation, Pease AFB, NH Appendices B, C, D, G, H, J and K – Draft Final
AUTHOR: Roy F. Weston, Inc.
RECIPIENT: USAF
DATE: November 1992
TYPE: Appendices

SECOND REFERENCE: Site 8
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.5) #41 001-6.4.2
LONG TITLE: Installation Restoration Program, Stage 3C, IRP Site 8 Remedial Investigation, Pease AFB, NH Figures -- Draft Final
AUTHOR: Roy F. Weston, Inc.
RECIPIENT: USAF
DATE: November 1992
TYPE: Figures
SECOND REFERENCE: Site 8
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.5) #42 001-7.8
LONG TITLE: Installation Restoration Program, Stage 3C, IRP Site 8 Remedial Investigation, Pease AFB, NH, Technical Report -- Draft Final
AUTHOR: Roy F. Weston, Inc.
RECIPIENT: USAF
DATE: November 1992
TYPE: Report
SECOND REFERENCE: Site 8
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.5) #55 001-Acr.4
LONG TITLE: U.S. Air Force Installation Restoration Program, Pease Air Force Base, Zone 5 Remedial Investigation Report Text DRAFT FINAL
AUTHOR: Roy F. Weston, Inc.
RECIPIENT: USAF
DATE: August 1993
TYPE: Report
SECOND REFERENCE: Zone 5
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.5) #56 001-Plate 8
LONG TITLE: U.S. Air Force Installation Restoration Program, Pease AFB Zone 5 Remedial Investigation Report Figures DRAFT FINAL
AUTHOR: Roy F. Weston, Inc.
RECIPIENT: USAF
DATE: August 1993
TYPE: Figures
SECOND REFERENCE: Zone 5
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.5) #57 001-C
LONG TITLE: Installation Restoration Program, Stage 4 IRP Zone 5 Remedial Investigation Pease Air Force Base, NH 03803, Appendices A, B & C
AUTHOR: Roy F. Weston, Inc.
RECIPIENT: USAF
DATE: February 1993
TYPE: Appendices
SECOND REFERENCE: Zone 5
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.5) #58 001-L.6-2

LONG TITLE:	U.S. Air Force Installation Restoration Program Pease AFB Zone 5 Remedial Investigation Report Appendices B,D, E, F, G, and L DRAFT FINAL
AUTHOR:	Roy F. Weston, Inc.
RECIPIENT:	USAF
DATE:	August 1993
TYPE:	Appendices
SECOND REFERENCE:	Zone 5
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (3.5) #59 001-I
LONG TITLE:	U.S. Air Force Installation Restoration Program Pease AFB Zone 5 Remedial Investigation Report Appendices H and I DRAFT FINAL
AUTHOR:	Roy F. Weston, Inc.
RECIPIENT:	USAF
DATE:	August 1993
TYPE:	Appendices
SECOND REFERENCE:	Zone 5
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (3.5) #60 001-K
LONG TITLE:	U.S. Air Force Installation Restoration Program Pease AFB Zone 5 Remedial Investigation Report Appendices J and K DRAFT FINAL
AUTHOR:	Roy F. Weston, Inc.
RECIPIENT:	USAF
DATE:	August 1993
TYPE:	Appendices
SECOND REFERENCE:	Zone 5
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (3.5) #61 001-J.2
LONG TITLE:	Installation Restoration Program, Stage 4 IRP Zone 5 Remedial Investigation Pease Air Force Base, NH 03803, Appendices J Part 2 of 3
AUTHOR:	Roy F. Weston, Inc.
RECIPIENT:	USAF
DATE:	February 1993
TYPE:	Appendix
SECOND REFERENCE:	Zone 5
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (3.5) #62 001-J.3
LONG TITLE:	Installation Restoration Program, Stage 4 IRP Zone 5 Remedial Investigation Pease Air Force Base, NH 03803, Appendices J Part 3 of 3
AUTHOR:	Roy F. Weston, Inc.
RECIPIENT:	USAF
DATE:	February 1993
TYPE:	Appendix
SECOND REFERENCE:	Zone 5
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (3.5) #63 001-M
LONG TITLE:	Installation Restoration Program, Stage 4 IRP Zone 5 Remedial Investigation Pease Air Force Base, NH 03803, Appendices K, L & M
AUTHOR:	Roy F. Weston, Inc.
RECIPIENT:	USAF
DATE:	February 1993

TYPE:	Appendices
SECOND REFERENCE:	Zone 5
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (3.5) #64 001-N
LONG TITLE:	Installation Restoration Program, Stage 4 IRP Zone 5 Remedial Investigation Pease Air Force Base, NH 03803, Appendix N
AUTHOR:	Roy F. Weston, Inc.
RECIPIENT:	USAF
DATE:	February 1993
TYPE:	Appendix
SECOND REFERENCE:	Zone 5
LOCATION:	ARF

#

3.6 RI Correspondence

DOCUMENT NUMBER:	PEA (3.6) #1 001-001
LONG TITLE:	"Comments Regarding the Work Plan for the IRP Stage 2"
AUTHOR:	State of New Hampshire, Department of Environmental Services
RECIPIENT:	Air Force
DATE:	27 July 1987
TYPE:	Comments Serving 3.4 (Preliminary RI Field Work Reports)
SECOND REFERENCE:	None
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (3.6) #2 001-006
LONG TITLE:	"Letter Regarding IRP, Stage 2"
AUTHOR:	Roy F. Weston, Inc.
RECIPIENT:	Air Force
DATE:	11 November 1987
TYPE:	Letter Serving 3.4 (Preliminary RI Field Work Reports)
SECOND REFERENCE:	None
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (3.6) #3 001-001
LONG TITLE:	"Letter Stating Conformance of the Stage 2, Quality Assurance Project Plan With Air Force IRP Practices"
AUTHOR:	State of New Hampshire, Department of Environmental Services
RECIPIENT:	Air Force
DATE:	12 November 1987
TYPE:	Letter Serving 3.4 (Preliminary RI Field Work Reports)
SECOND REFERENCE:	None
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (3.6) #4 001-001
LONG TITLE:	"Letter Regarding the Suspect Fire Training Area"
AUTHOR:	Roy F. Weston, Inc.
RECIPIENT:	Air Force
DATE:	16 December 1987
TYPE:	Letter Serving 3.4 (Preliminary RI Field Work Reports)
SECOND REFERENCE:	None
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (3.6) #6 001-001
LONG TITLE:	"Letter Concerning Drilling Program"
AUTHOR:	Roy F. Weston, Inc.
RECIPIENT:	Air Force
DATE:	20 October 1988
TYPE:	Letter Serving 3.4 (Preliminary RI Field Work Reports)
SECOND REFERENCE:	None
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (3.6) #9 001-002
LONG TITLE:	"Letter Concerning Disposal of Drill Cuttings From Stage 2 IRP Investigations"
AUTHOR:	Roy F. Weston, Inc.
RECIPIENT:	Air Force
DATE:	2 October 1989
TYPE:	Letter Serving 3.4 (Preliminary RI Field Work Reports)
SECOND REFERENCE:	None

LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.6) #10 001-003
LONG TITLE: "Review Comments on the Phase II, Stage 2 IRP, Draft Final Report"
AUTHOR: State of New Hampshire, Department of Environmental Services
RECIPIENT: Air Force
DATE: 28 February 1990
TYPE: Review Comments on Phase II, Stage 2, IRP Serving 3.4 (Preliminary RI Field Work Reports)
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.6) #11 001-011
LONG TITLE: "Review Comments for the Pease AFB, Phase II, Stage 2 IRP Draft Final Report"
AUTHOR: U.S. EPA
RECIPIENT: Air Force
DATE: 7 March 1990
TYPE: Review Comments Serving 3.4 (Preliminary RI Field Work Reports)
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.6) #12 001-010
LONG TITLE: "Review Comments Regarding the IRP, Stage 2 Draft Final Report (December 1989)"
AUTHOR: U.S. Department of Commerce, National Oceanic and Atmospheric Administration
RECIPIENT: Air Force via EPA
DATE: 7 March 1990
TYPE: Review Comments Serving 3.4 (Preliminary RI Field Work Reports)
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.6) #13 001-020
LONG TITLE: "Review Comments to the IRP Stage 2 RI/FS Draft Report"
AUTHOR: Department of the Air Force
RECIPIENT: Roy F. Weston, Inc./Air Force
DATE: 15 March 1990
TYPE: Review Comments Serving 3.4 (Preliminary RI Field Work Reports)
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.6) #14 001-004
LONG TITLE: "Sampling Data for Off-Site Sampling at Pease AFB"
AUTHOR: State of New Hampshire, Water Supply and Pollution Control Division
RECIPIENT: Air Force
DATE: 5 July 1990
TYPE: Sampling Data
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.6) #15 001-010
LONG TITLE: "Pease AFB, Site 8 Sampling Data"
AUTHOR: State of New Hampshire, Department of Environmental Services
RECIPIENT: Air Force, EPA
DATE: September 1990
TYPE: Sampling Data
SECOND REFERENCE: None

LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.6) #16 001-003
LONG TITLE: "Off-Base Sampling at Pease AFB"
AUTHOR: State of New Hampshire, Department of Environmental Services
RECIPIENT: Air Force
DATE: 25 October 1990
TYPE: Sampling Results
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.6) #17 001-013
LONG TITLE: "Split Sampling Results, Site 8 and Site 34"
AUTHOR: State of New Hampshire, Department of Environmental Services
RECIPIENT: Air Force
DATE: 29 October 1990
TYPE: Sampling Results
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.6) #18 001-065
LONG TITLE: "Sampling Results from Pease AFB, Newington, Portsmouth"
AUTHOR: State of New Hampshire, Department of Environmental Services
RECIPIENT: Air Force
DATE: 17 January 1991
TYPE: Sampling Data
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.6) #19 001-002
LONG TITLE: "Installation Restoration Program (IRP) at Pease AFB, NH"
AUTHOR: Department of the Air Force
RECIPIENT: Air Force
DATE: 8 March 1989
TYPE: Memorandum -- Pertaining to RI
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.6) #20 001-002
LONG TITLE: "Work Plan for the IRP Stage 3 and ITR #4"
AUTHOR: Department of the Air Force
RECIPIENT: Air Force
DATE: 3 April 1989
TYPE: Memorandum -- Pertaining to RI
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.6) #21 001-007
LONG TITLE: "Consolidated Comments to the IRP Stage 3 Work Plan for Pease Air Force Base, NH"
AUTHOR: Department of the Air Force
RECIPIENT: Roy F. Weston, Inc.
DATE: 1 June 1989
TYPE: Review Comments -- Pertaining to RI
SECOND REFERENCE: None

LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.6) #22 001-001
LONG TITLE: "Review Comments Regarding the Work Plan and QAPP - Stage 3"
AUTHOR: State of New Hampshire, Department of Environmental Services
RECIPIENT: Air Force
DATE: 16 June 1989
TYPE: Review Comments – Pertaining to RI
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.6) #23 001-008
LONG TITLE: "Stage 3 Work Plan - Response to Comments"
AUTHOR: Roy F. Weston, Inc.
RECIPIENT: Air Force
DATE: 29 June 1989
TYPE: Response to Comments – Pertaining to RI
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.6) #24 001-008
LONG TITLE: "Consolidated Comments to the IRP Stage 3 Quality Assurance Project Plan (QAPP) for Pease Air Force Base, NH"
AUTHOR: Department of the Air Force
RECIPIENT: Roy F. Weston, Inc.
DATE: 29 June 1989
TYPE: Review Comments – Pertaining to RI
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.6) #25 001-009
LONG TITLE: "Special Notification concerning the results of sampling monitor Well 562A at Site 8"
AUTHOR: Roy F. Weston, Inc.
RECIPIENT: Air Force
DATE: 1 February 1990
TYPE: Letter – Pertaining to RI
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.6) #26 001-002
LONG TITLE: "Followup to Special Notification (1 February 1990) concerning groundwater samples from Well 562A at Site 8"
AUTHOR: Roy F. Weston, Inc.
RECIPIENT: Air Force
DATE: 16 February 1990
TYPE: Letter – Pertaining to RI
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.6) #27 001-002
LONG TITLE: "Letter summarizing discussions between Roy F. Weston, Inc. and the New Hampshire Department of Environmental Services concerning on-site handling and disposal of soil and water generated during drilling, development, purging, and pump testing of wells"
AUTHOR: Roy F. Weston, Inc.
RECIPIENT: Air Force
DATE: 12 March 1990

TYPE: Letter -- Pertaining to 3.4
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.6) #29 001-007
LONG TITLE: "Review comments on the Stage 3 Work Plan for the IRP"
AUTHOR: U.S. EPA
RECIPIENT: Air Force
DATE: 7 June 1990
TYPE: Review Comments -- Pertaining to RI
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.6) #31 001-002
LONG TITLE: "Letter regarding well installation modification"
AUTHOR: Roy F. Weston, Inc.
RECIPIENT: Air Force
DATE: 5 July 1990
TYPE: Letter
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.6) #32 001-004
LONG TITLE: "Letter regarding procedures used in installing and abandoning monitor well 632"
AUTHOR: Roy F. Weston, Inc.
RECIPIENT: Air Force
DATE: 8 August 1990
TYPE: Letter
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.6) #33 001-001
LONG TITLE: "Letter regarding June 1990 Pickering Spring sampling results"
AUTHOR: State of New Hampshire, Department of Environmental Services
RECIPIENT: Peggy Lamson, Selectman & Town Health Officer, Newington, NH
DATE: 15 August 1990
TYPE: Letter
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.6) #34 001-004
LONG TITLE: "Letter regarding the disposal of clean water, drilling mud and soil"
AUTHOR: Roy F. Weston, Inc.
RECIPIENT: Air Force
DATE: 25 September 1990
TYPE: Letter
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.6) #35 001-002
LONG TITLE: "Letter regarding procedures for handling solids and liquids during well construction and soil borings"
AUTHOR: State of New Hampshire, Department of Environmental Services
RECIPIENT: Air Force
DATE: 25 September 1990

TYPE: Letter
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.6) #36 001-006
LONG TITLE: "Letter regarding Pease Air Force Base well installation - IRP Site 8"
AUTHOR: Roy F. Weston, Inc.
RECIPIENT: Air Force
DATE: 26 September 1990
TYPE: Letter
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.6) #38 001-002
LONG TITLE: "Information Letter 3 - Documenting discussion on 25 October 1990"
AUTHOR: Roy F. Weston, Inc.
RECIPIENT: Air Force
DATE: 29 October 1990
TYPE: Letter
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.6) #39 001-002
LONG TITLE: "Letter regarding the disposal of clean soil cuttings and drilling mud"
AUTHOR: Department of the Air Force
RECIPIENT: Roy F. Weston, Inc.
DATE: 1 November 1990
TYPE: Letter
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.6) #41 001-008
LONG TITLE: "Response to Comments - Draft Final Stage 4 Work Plan and Sampling And Analysis Plan"
AUTHOR: Roy F. Weston, Inc.
RECIPIENT: Air Force
DATE: 7 February 1991
TYPE: Letter/Response to Comments
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.6) #43 001-004
LONG TITLE: "Issues Needing Resolution Prior to the Upcoming Field Efforts"
AUTHOR: U.S. EPA
RECIPIENT: Air Force
DATE: 10 April 1991
TYPE: Letter
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.6) #46 001-038
LONG TITLE: "Response to Comments - Stage 4 Work Plan and SAP"
AUTHOR: Roy F. Weston, Inc.
RECIPIENT: Air Force
DATE: 28 September 1990

TYPE: Response to Comments
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.6) #47 001-011
LONG TITLE: "Review comments on the Installation Restoration Plan (IRP) Stage 4 Work Plan and Sampling and Analysis Plan"
AUTHOR: State of New Hampshire, Department of Environmental Services
RECIPIENT: Air Force
DATE: 16 October 1990
TYPE: Review Comments
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.6) #48 001-017
LONG TITLE: "The Town of Newington review comments on the IRP Stage 4 Work Plan"
AUTHOR: The Town of Newington
RECIPIENT: Air Force
DATE: 29 October 1990
TYPE: Review Comments
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.6) #49 001-076
LONG TITLE: "EPA technical review of the Draft IRP Stage 4 Work Plan and Sampling and Analysis Plan for Pease Air Force Base"
AUTHOR: U.S. EPA
RECIPIENT: Air Force
DATE: 2 November 1990
TYPE: Review Comments
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.6) #50 001-002
LONG TITLE: "Response to Air Force questions on state comments to the Stage 4 Work Plan"
AUTHOR: State of New Hampshire, Department of Environmental Services
RECIPIENT: Air Force
DATE: 3 December 1990
TYPE: Response to Air Force questions on State of New Hampshire comments
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.6) #51 001-007
LONG TITLE: "Response to EPA comments on the Pease AFB Stage 4 Work Plan/Sampling and Analysis Plan"
AUTHOR: U.S. Air Force
RECIPIENT: EPA
DATE: 10 December 1990
TYPE: Air Force responses to EPA comments
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.6) #52 001-008
LONG TITLE: "Air Force Response to NHDES Comments - Draft Final Stage 4 Work Plan and Sampling and Analysis Plan"
AUTHOR: Roy F. Weston, Inc.
RECIPIENT: Air Force
DATE: 7 February 1991

TYPE: Response to Comments
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.6) #53 001-008
LONG TITLE: "EPA initial approval of the IRP Stage 4 Work Plan and Sampling and Analysis Plan"
AUTHOR: U.S. EPA
RECIPIENT: Air Force
DATE: 13 March 1991
TYPE: Letter concerning EPA initial approval of Stage 4 Work Plan and Sampling and Analysis Plan
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.6) #54 001-058
LONG TITLE: "Air Force Response to EPA comments on the Stage 4 Work Plan and Sampling and Analysis Plan"
AUTHOR: Roy F. Weston, Inc.
RECIPIENT: EPA
DATE: 1991
TYPE: Response to Comments
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.6) #55 001-003
LONG TITLE: Off-Base Sampling at Pease Air Force Base
AUTHOR: Richard Pease, NHDES
RECIPIENT: Art Ditto, Pease AFB
DATE: 25 October 1990
TYPE: Letter
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.6) #56 001-001
LONG TITLE: EPA Concerns
AUTHOR: U.S. Air Force - Internal Note
RECIPIENT: Art Ditto/USAF/Pease AFB
DATE: 8 April 1991
TYPE: Internal Record of Phone Conversation with EPA and NHDES
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.6) #57 001-004
LONG TITLE: Issues Needing Resolution Prior to Upcoming Field Efforts
AUTHOR: Johanna Hunter, RPM
U.S. EPA, Region 1
RECIPIENT: Arthur Ditto, RPM
USAF, Pease AFB
DATE: 10 April 1991
TYPE: Letter
SECOND REFERENCE: Stage 3 and 4 Work Plan (3.3)
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.6) #58 001-002
LONG TITLE: Review of Risk Assessment Data and Sampling Procedures
AUTHOR: Johanna Hunter, USEPA

RECIPIENT: Arthur Ditto, Pease AFB
DATE: 16 April 1991
TYPE: Letter
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.6) #59 001-067
LONG TITLE: Concerns about Analytical Methods
AUTHOR: USAF
RECIPIENT: USAF
Johanna Hunter, USEPA
Roy F. Weston, Inc.
DATE: 23 April 1991
TYPE: Fax with Attachments
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.6) #60 001-001
LONG TITLE: Surface Water and Sediment Sampling Locations
AUTHOR: Arthur Ditto, RPM
USAF/Pease AFB
RECIPIENT: Johanna Hunter, RPM
U.S. EPA, Region 1
DATE: 24 April 1991
TYPE: Letter (Transmittal)
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.6) #61 001-008
LONG TITLE: Field Oversight Coordination
AUTHOR: Johanna Hunter, USEPA
RECIPIENT: Arthur Ditto, Pease AFB
DATE: 29 April 1991
TYPE: Letter
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.6) #62 001-004
LONG TITLE: Preliminary Sampling Schedule for Stage 3C IRP Sites through November 1991
AUTHOR: USAF
RECIPIENT: Johanna Hunter, USEPA
Richard Pease, NHDES
DATE: 02 May 1991
TYPE: Fax
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.6) #63 001-003
LONG TITLE: Review of April 25, 1991 Revised Analytical Methods
AUTHOR: Johanna Hunter, USEPA
RECIPIENT: Art Ditto, Pease AFB
DATE: 08 May 1991
TYPE: Letter
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.6) #64 001-002
LONG TITLE: Review of April 25, 1991 Revised Analytical Methods
AUTHOR: Johanna Hunter, USEPA
RECIPIENT: Art Ditto, Pease AFB
DATE: 08 May 1991
TYPE: Letter
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.6) #65 001-005
LONG TITLE: Field Performance Review of Weston Activities, Pease Air Force Base, New Hampshire
AUTHOR: Mitre Corporation
RECIPIENT: Dennis Lundquist
Human Systems Division
IRP Program Office
HSD/YAQ
Brooks AFB, TX 78235-5000
DATE: 14 May 1991
TYPE: Letter
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.6) #66 001-002
LONG TITLE: Revised Analytical Methods for Pease AFB
AUTHOR: Logan VanLeigh, Capt., USAF, BSC
Technical Program Manager
RECIPIENT: Johanna Hunter, RPM
U.S. EPA, Region 1
DATE: 31 May 1991
TYPE: Letter
SECOND REFERENCE: Sampling and Analysis Plan (3.1)
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.6) #67 001-005
LONG TITLE: Procedure for Establishing Background Metal Concentrations for Groundwater and Soil
AUTHOR: Edward S. Barnes, Roy F. Weston, Inc.
RECIPIENT: USAF
DATE: 03 June 1991
TYPE: Letter
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.6) #68 001-012
LONG TITLE: Information to Assist Interpretation of Data Submitted by EPA to the Air Force
AUTHOR: Johanna Hunter, USEPA
RECIPIENT: Art Ditto, Pease AFB
DATE: 06 June 1991
TYPE: Letter
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.6) #69 001-004
LONG TITLE: Resolution Letter for Procedures for 8260 for VOC Analysis of Water

AUTHOR: Mark McKenzie, Pease AFB
RECIPIENT: Richard Pease, NHDES
Carl Gysler, Earth Technology, San Bernardino, CA
Johanna Hunter, USEPA
DATE: 06 June 1991
TYPE: Fax
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.6) #70 001-001
LONG TITLE: Background Determination Protocols
AUTHOR: USAF
RECIPIENT: Richard Pease, NHDES
DATE: 07 June 1991
TYPE: Letter
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.6) #71 001-001
LONG TITLE: Background Determination Protocols
AUTHOR: USAF
RECIPIENT: Johanna Hunter, USEPA
DATE: 07 June 1991
TYPE: Letter
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.6) #72 001-003
LONG TITLE: Revised Analytical Methods for Pease AFB GC/MS Method 8260 for VOA
AUTHOR: Edward S. Barnes, Roy F. Weston, Inc.
RECIPIENT: USAF
DATE: 11 June 1991
TYPE: Letter
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.6) #73 001-001
LONG TITLE: Laboratory Services
AUTHOR: Richard Pease, NHDES
RECIPIENT: Art Ditto, Pease AFB
DATE: 13 June 1991
TYPE: Letter
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.6) #74 001-004
LONG TITLE: Pease AFB Feedback on Site 8 Sampling - June 1991
AUTHOR: Richard Pease, NHDES
RECIPIENT: Art Ditto, Pease AFB
DATE: 19 June 1991
TYPE: Letter
SECOND REFERENCE: Site 8
LOCATION: ARF

#

DOCUMENT NUMBER:	PEA (3.6) #75 001-002
LONG TITLE:	EPA Pump Test Information Request to be Provided by Air Force
AUTHOR:	Johanna Hunter, RPM U.S. EPA Region 1
RECIPIENT:	Art Ditto, RPM USAF Pease AFB
DATE:	27 June 1991
TYPE:	Letter
SECOND REFERENCE:	None
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (3.6) #76 001-002
LONG TITLE:	Roy F. Weston, Inc., Proposed Methods for Determining Background Concentrations at Pease Air Force Base, New Hampshire
AUTHOR:	George Rice, Mitre Corporation
RECIPIENT:	Dennis Lundquist Human Systems Division IRP Program Office HSD/YAQ Brooks AFB, TX 78235-5000
DATE:	02 July 1991
TYPE:	Letter
SECOND REFERENCE:	None
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (3.6) #77 001-001
LONG TITLE:	Transmittal Letter for Protocols for Baseline Risk Assessments
AUTHOR:	Arthur Ditto, RPM USAF/Pease AFB
RECIPIENT:	Richard Pease, RPM NHDES
DATE:	18 July 1991
TYPE:	Transmittal Letter
SECOND REFERENCE:	Baseline Risk Assessments
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (3.6) #78 001-001
LONG TITLE:	Transmittal Letter for Protocols for Baseline Risk Assessments
AUTHOR:	Arthur Ditto, RPM USAF/Pease AFB
RECIPIENT:	Johanna Hunter, RPM U.S. EPA, Region 1
DATE:	18 July 1991
TYPE:	Transmittal Letter
SECOND REFERENCE:	Baseline Risk Assessments
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (3.6) #79 001-001
LONG TITLE:	Submittal of Secondary Document
AUTHOR:	USAF
RECIPIENT:	Richard Pease, NHDES Johanna Hunter, USEPA
DATE:	18 July 1991
TYPE:	Letter
SECOND REFERENCE:	Site 32/36
LOCATION:	ARF

#

DOCUMENT NUMBER: PEA (3.6) #80 001-002
LONG TITLE: Exploratory Boring Soil Sampling Procedures
AUTHOR: Edward S. Barnes
Roy F. Weston, Inc.
RECIPIENT: Capt. Logan Van Leigh
U.S. Air Force
Air Force Center for Environmental Excellence
DATE: 26 July 1991
TYPE: Letter
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.6) #81 001-001
LONG TITLE: Vented Monitoring Wells
AUTHOR: Scott Doane, Hydrogeologist
Groundwater Technology Section
Groundwater Protection Bureau
NHDES
RECIPIENT: Mark McKenzie
USAF/Pease AFB
DATE: 31 July 1991
TYPE: Letter
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.6) #82 001-006
LONG TITLE: Review of the Proposed Procedure for Background Determination Protocols for Pease Air Force Base, Portsmouth, NH
AUTHOR: Johanna Hunter, USEPA
RECIPIENT: Art Ditto, Pease AFB
DATE: 02 August 1991
TYPE: Letter
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.6) #83 001-001
LONG TITLE: Vented Monitoring Wells - Response to July 31, 1991 Letter on same Issue Form NHDES
AUTHOR: Arthur Ditto, RPM
USAF/Pease AFB
RECIPIENT: Scott Doane
NHDES
DATE: 26 August 1991
TYPE: Letter
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.6) #84 001-001
LONG TITLE: Split Sampling Results
AUTHOR: Arthur Ditto, RPM
U. S. Air Force/Pease AFB
RECIPIENT: Johanna Hunter, RPM
U.S. EPA, Region 1
and
Richard Pease, RPM
NHDES

DATE: 9 September 1991
TYPE: Letter
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.6) #85 001-002
LONG TITLE: Field Oversight - September 1991
AUTHOR: Richard Pease, NHDES
RECIPIENT: Arthur Ditto, USAF RPM
DATE: 28 October 1991
TYPE: Letter
SECOND REFERENCE: RI Field Work (3.4)
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.6) #86 001-001
LONG TITLE: Transmittal Letter for Data Collected on Surface Water and Sediment Background Concentration
AUTHOR: Johanna Hunter, RPM
U.S. EPA, Region 1
RECIPIENT: Ed Barnes
Project Manager
Roy F. Weston, Inc.
DATE: 2 December 1991
TYPE: Transmittal Letter
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.6) #87 001-002
LONG TITLE: Regional Literature Search to Assist Development of the Sediment and Surface Water Background Determination for Pease AFB, Portsmouth, NH
AUTHOR: Johanna Hunter, USEPA
RECIPIENT: Art Ditto, Pease AFB
DATE: 2 December 1991
TYPE: Letter
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.6) #88 001-001
LONG TITLE: Fugitive Dust Pathway in the Baseline Risk Assessment
AUTHOR: Arthur Ditto, RPM, USAF
Pease AFB
RECIPIENT: Johanna Hunter RPM
U.S. EPA Region 1
DATE: 3 January 1992
TYPE: Letter
SECOND REFERENCE: Baseline Risk Assessment (3.5) - RI Reports
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.6) #89 001-001
LONG TITLE: Evaluation of the Air Pathway in Baseline Risk Assessment
AUTHOR: USAF
RECIPIENT: Johanna Hunter, USEPA
DATE: 11 February 1992
TYPE: Letter
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER:	PEA (3.6) #90 001-001
LONG TITLE:	Evaluation of the Air Pathway in Baseline Risk Assessment
AUTHOR:	USAF
RECIPIENT:	Richard Pease, NHDES
DATE:	11 February 1992
TYPE:	Letter
SECOND REFERENCE:	None
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (3.6) #95 001-001
LONG TITLE:	Transmittal Letter for Submittal of Baseline Risk Assessment Protocols
AUTHOR:	Arthur Ditto, RPM USAF/Pease AFB
RECIPIENT:	Richard Pease, RPM NHDES
DATE:	25 February 1992
TYPE:	Transmittal Letter
SECOND REFERENCE:	Baseline Risk Assessment
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (3.6) #96 001-001
LONG TITLE:	Transmittal Letter for Revised Baseline Risk Assessment Protocols
AUTHOR:	Arthur Ditto, RPM USAF/Pease AFB
RECIPIENT:	Johanna Hunter, RPM USEPA, Region 1
DATE:	25 February 1992
TYPE:	Transmittal Letter
SECOND REFERENCE:	Revised Baseline Risk Assessment
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (3.6) #98 001-003
LONG TITLE:	Request for EPA Split Sampling Results
AUTHOR:	Arthur Ditto, RPM USAF/Pease AFB
RECIPIENT:	Johanna Hunter, RPM U.S. EPA, Region 1
DATE:	9 March 1992
TYPE:	Letter
SECOND REFERENCE:	None
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (3.6) #99 001-D1
LONG TITLE:	Letter Report of Results of Statistical Comparison of Stage 3C Samples to the 66 Other Background Samples
AUTHOR:	Roy F. Weston, Inc.
RECIPIENT:	USAF
DATE:	9 March 1992
TYPE:	Letter Report
SECOND REFERENCE:	PEA (3.5)
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (3.6) #100 001-001

LONG TITLE:	Transmittal Letter for Submittal of Stage 4 Work Plan Addendum Number 2 on the Draft Stage 4 Sampling and Analysis Plan Addendum Number 2
AUTHOR:	Arthur Ditto, RPM USAF/Pease AFB
RECIPIENT:	Johanna Hunter U.S. EPA, Region 1
DATE:	24 March 1992
TYPE:	Transmittal Letter
SECOND REFERENCE:	PEA (3.1), PEA (3.3)
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (3.6) #101 001-001
LONG TITLE:	Transmittal Letter for Submittal of Stage 4 Addendum Number 2 Work Plan and Sampling and Analysis Plan
AUTHOR:	Arthur Ditto, RPM USAF/Pease AFB
RECIPIENT:	Richard Pease, RPM NHDES
DATE:	24 March 1992
TYPE:	Transmittal Letter
SECOND REFERENCE:	PEA (3.1), PEA (3.3)
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (3.6) #102 001-001
LONG TITLE:	Data You May Be Able to Provide
AUTHOR:	Thomas R. Marks, Roy F. Weston, Inc.
RECIPIENT:	Mark McKenzie, Pease AFB
DATE:	26 May 1992
TYPE:	Letter
SECOND REFERENCE:	None
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (3.6) #103 001-022
LONG TITLE:	Evaluation of Air Pathway in Baseline Risk Assessments
AUTHOR:	Richard Pease, NHDES
RECIPIENT:	Art Ditto, Pease AFB
DATE:	13 April 1992
TYPE:	Letter with Attachments
SECOND REFERENCE:	None
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (3.6) #106 001-002
LONG TITLE:	Oversight Role of Regulatory Agencies at Pease AFB
AUTHOR:	Michael Daly, USEPA
RECIPIENT:	Mark McKenzie, Pease AFB
DATE:	26 May 1992
TYPE:	Letter
SECOND REFERENCE:	None
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (3.6) #111 001-001
LONG TITLE:	Submittal of Draft Secondary Documents, Stage 4 Work Plan Addendum 3 and Stage 4 Health and Safety Plan Addendum
AUTHOR:	USAF
RECIPIENT:	Richard Pease, NHDES
DATE:	24 June 1992
TYPE:	Letter

SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.6) #112 001-001
LONG TITLE: Submittal of Draft Secondary Documents, Stage 4 Work Plan Addendum 3 and Stage 4 Health and Safety Plan Addendum
AUTHOR: USAF
RECIPIENT: Johanna Hunter, USEPA
DATE: 24 June 1992
TYPE: Letter
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.6) #113 001-002
LONG TITLE: Additional Field Oversight
AUTHOR: USAF
RECIPIENT: Michael Daly, USEPA
DATE: 8 July 1992
TYPE: Letter
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.6) #115 001-003
LONG TITLE: Pease Air Force FDTA-2 Draft RI Report
AUTHOR: Lee dePersia, Roy F. Weston, Inc.
RECIPIENT: USAF
Johanna Hunter, USEPA
Richard Pease, NHDES
DATE: 29 July 1992
TYPE: Letter
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.6) #116 001-021
LONG TITLE: Pease Air Force Base Groundwater Modeling Letter Report
AUTHOR: Lee dePersia, Roy F. Weston, Inc.
RECIPIENT: USAF
Johanna Hunter, USEPA
Richard Pease, NHDES
DATE: 29 July 1992
TYPE: Letter with Report
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.6) #117 001-001
LONG TITLE: Submittal of Draft Primary Document, Site 8 Remedial Investigation Report
AUTHOR: USAF
RECIPIENT: Johanna Hunter, USEPA
DATE: 30 July 1992
TYPE: Letter
SECOND REFERENCE: Site 8
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.6) #118 001-001
LONG TITLE: Submittal of Draft Primary Document, Site 8 Remedial Investigation Report

AUTHOR: ·USAF
RECIPIENT: Richard Pease, NHDES
DATE: 30 July 1992
TYPE: Letter
SECOND REFERENCE: Site 8
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.6) #119 001-001
LONG TITLE: Transmittal Letter for Summary of Groundwater Treatment Plant Influent/Effluent Results
AUTHOR: Arthur Ditto, RPM
USAF/Pease AFB
RECIPIENT: Johanna Hunter, RPM
USEPA, Region 1
and
Richard Pease, RPM
NHDES
DATE: 11 August 1992
TYPE: Letter
SECOND REFERENCE: PEA (2.7)
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.6) #120 001-001
LONG TITLE: Monitor Well Inventory and Inspection Report
AUTHOR: USAF
RECIPIENT: Johanna Hunter, USEPA
Richard Pease, NHDES
DATE: 18 August 1992
TYPE: Letter
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.6) #122 001-002
LONG TITLE: Results of Background Surface Water Sediment Location Walkover
AUTHOR: Richard Pease, RPM, NHDES
RECIPIENT: Arthur Ditto, RPM, Pease AFB
DATE: 27 August 1992
TYPE: Letter
SECOND REFERENCE: PEA (6.4)
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.6) #123 001-005
LONG TITLE: Risk Assessment Issues for Pease AFB
AUTHOR: Lee dePersia
Task Manager
Roy F. Weston, Inc.
RECIPIENT: Arthur Ditto, RPM
USAF/Pease AFB
DATE: 28 August 1992
TYPE: Letter Report
SECOND REFERENCE: PEA (3.5)
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.6) #124 001-001
LONG TITLE: Transmittal Letter for Submittal of Groundwater Background Letter Report
AUTHOR: Mark McKenzie for Arthur Ditto

	USAF/Pease AFB
RECIPIENT:	Richard Pease, RPM NHDES and Johanna Hunter U.S. EPA, Region 1
DATE:	1 September 1992
TYPE:	Letter
SECOND REFERENCE:	None
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (3.6) #125 001-002
LONG TITLE:	Policy on Data Transfer During Pumping Tests
AUTHOR:	Arthur Ditto, RPM USAF/Pease AFB
RECIPIENT:	Richard Pease, RPM NHDES and Johanna Hunter, RPM U.S. EPA, Region 1
DATE:	9 September 1992
TYPE:	Letter
SECOND REFERENCE:	None
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (3.6) #128 001-003
LONG TITLE:	Summary of Risk Issues Meeting of August 19, 1992
AUTHOR:	Johanna Hunter, RPM U.S. EPA, Region 1
RECIPIENT:	Arthur Ditto, RPM USAF/Pease AFB
DATE:	16 September 1992
TYPE:	Letter
SECOND REFERENCE:	None
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (3.6) #129 001-001
LONG TITLE:	Extension of Draft Final Report Submittal Date, Site 8 Remedial Investigation Report
AUTHOR:	USAF
RECIPIENT:	Johanna Hunter, USEPA Richard Pease, NHDES
DATE:	6 October 1992
TYPE:	Letter
SECOND REFERENCE:	Site 8
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (3.6) #130 001-002
LONG TITLE:	Field Oversight - Mid-August-Mid-September
AUTHOR:	Richard Pease, NHDES
RECIPIENT:	Arthur Ditto, RPM Pease AFB
DATE:	7 October 1991
TYPE:	Letter
SECOND REFERENCE:	PEA (3.4)
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (3.6) #132 001-001
LONG TITLE:	Pease AFB Zone 5 Site Characterization Summary
AUTHOR:	Lee dePersia, Roy F. Weston, Inc.
RECIPIENT:	USAF
	Johanna Hunter, USEPA
	Richard Pease, NHDES
DATE:	22 October 1992
TYPE:	Letter
SECOND REFERENCE:	None
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (3.6) #137 001-001
LONG TITLE:	Submittal of Draft Secondary Documents, Zones 1, 2, and 5 Site Characterization Summaries
AUTHOR:	USAF
RECIPIENT:	Richard Pease, NHDES
DATE:	26 October 1992
TYPE:	Letter
SECOND REFERENCE:	None
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (3.6) #138 001-001
LONG TITLE:	Submittal of Draft Secondary Documents, Zones 1, 2, and 5 Site Characterization Summaries
AUTHOR:	USAF
RECIPIENT:	Johanna Hunter, USEPA
DATE:	26 October 1992
TYPE:	Letter
SECOND REFERENCE:	None
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (3.6) #139 001-001
LONG TITLE:	Submittal of Stage 4 Sampling and Analysis Plan Addendum 3
AUTHOR:	USAF
RECIPIENT:	Johanna Hunter, USEPA
DATE:	26 October 1992
TYPE:	Letter
SECOND REFERENCE:	None
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (3.6) #140 001-001
LONG TITLE:	Submittal of Stage 4 Sampling and Analysis Plan Addendum 3
AUTHOR:	USAF
RECIPIENT:	Richard Pease, NHDES
DATE:	26 October 1992
TYPE:	Letter
SECOND REFERENCE:	None
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (3.6) #141 001-002
LONG TITLE:	Pease Air Force Base Draft Final IRP Site 8 RI Report
AUTHOR:	Lee dePersia, Roy F. Weston, Inc.
RECIPIENT:	USAF
	Johanna Hunter, USEPA
	Richard Pease, NHDES
DATE:	13 November 1992
TYPE:	Letter

SECOND REFERENCE: Site 8
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.6) #143 001-001
LONG TITLE: Transmittal Letter for Submittal of Draft Final Primary Document, Site 8 RI Report
AUTHOR: Arthur Ditto, RPM
USAF, Pease AFB
RECIPIENT: Richard Pease, RPM
NHDES
DATE: 17 November 1992
TYPE: Letter
SECOND REFERENCE: Site 8
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.6) #144 001-001
LONG TITLE: Transmittal Letter for Submittal of Draft Final Primary Document, Site 8 RI Report
AUTHOR: Arthur Ditto, RPM
USAF, Pease AFB
RECIPIENT: Johanna Hunter, RPM
U.S. EPA, Region 1
DATE: 17 November 1992
TYPE: Letter
SECOND REFERENCE: Site 8
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.6) #146 001-001
LONG TITLE: Application of the Reasonable Maximum Exposure (RME) in Risk Assessments
AUTHOR: Arthur Ditto, RPM
USAF, Pease AFB
RECIPIENT: Richard Pease, RPM
NHDES
DATE: 1 December 1992
TYPE: Letter
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.6) #147 001-001
LONG TITLE: Explanation of Off-Base Well Inventory Report
AUTHOR: Arthur Ditto, RPM
USAF, Pease AFB
RECIPIENT: Richard Pease, RPM
NHDES
DATE: 4 December 1992
TYPE: Letter
SECOND REFERENCE: Off-Base Well Inventory Letter Report of 17 September 1992
PEA (3.5)
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (3.6) #148 001-001
LONG TITLE: Transmittal Letter for Submittal of Quality Assurance Project Plan (QAPP) Portion of the Stage 4 Sampling and Analysis Plan (SAP) Number 3
AUTHOR: Arthur Ditto, RPM
USAF, Pease AFB
RECIPIENT: Johanna Hunter, RPM
U.S. EPA, Region 1

	and
	Richard Pease, RPM
	NHDES
DATE:	11 December 1992
TYPE:	Letter
SECOND REFERENCE:	PEA (3.1)
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (3.6) #149 001-002
LONG TITLE:	Request for Deadline Extension
AUTHOR:	Arthur Ditto, RPM USAF, Pease AFB
RECIPIENT:	Johanna Hunter, RPM U.S. EPA, Region 1 and Richard Pease, RPM NHDES
DATE:	23 December 1992
TYPE:	Letter
SECOND REFERENCE:	PEA (6.3)
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (3.6) #150 001-001
LONG TITLE:	Transmittal of EPA Maximum Risk Calculation Addenda to Site 5, 8, 32/36 and 34 Draft Final RI Reports
AUTHOR:	Arthur Ditto, RPM USAF, Pease AFB
RECIPIENT:	Johanna Hunter, RPM U.S. EPA, Region 1 and Richard Pease, RPM NHDES
DATE:	29 December 1992
TYPE:	Letter
SECOND REFERENCE:	Sites 5, 8, 32/36 and 34; PEA (3.5)
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (3.6) #151 001-002
LONG TITLE:	Selection of Remediation Action Alternative for Site 8, FDTA #2
AUTHOR:	USAF
RECIPIENT:	Johanna Hunter, USEPA Richard Pease, NHDES
DATE:	08 January 1993
TYPE:	Letter
SECOND REFERENCE:	Site 8; PEA (4.6)
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (3.6) #156 001-002
LONG TITLE:	Request for Deadline Extension
AUTHOR:	USAF
RECIPIENT:	Johanna Hunter, EPA Richard Pease, NHDES
DATE:	19 March 1993
TYPE:	Letter
SECOND REFERENCE:	PEA (3.5)
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (3.6) #158 001-001
LONG TITLE:	Submittal of Draft Primary Document, Zone 5 Remedial Investigation Report
AUTHOR:	USAF
RECIPIENT:	Richard Pease, NHDES
DATE:	9 March 1993
TYPE:	Letter
SECOND REFERENCE:	PEA (3.5); Zone 5
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (3.6) #159 001-001
LONG TITLE:	Submittal of Draft Primary Document, Zone 5 Remedial Investigation Report
AUTHOR:	USAF
RECIPIENT:	Johanna Hunter, EPA
DATE:	Undated
TYPE:	Letter
SECOND REFERENCE:	PEA (3.5); Zone 5
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (3.6) #161 001-001
LONG TITLE:	Submittal of Draft Documents
AUTHOR:	USAF
RECIPIENT:	Richard Pease, NHDES
DATE:	21 April 1993
TYPE:	Letter
SECOND REFERENCE:	Zone 3, Zone 4, LF-5
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (3.6) #162 001-001
LONG TITLE:	Submittal of Draft Documents
AUTHOR:	USAF
RECIPIENT:	Richard Pease, NHDES
DATE:	21 April 1993
TYPE:	Letter
SECOND REFERENCE:	Zone 3, Zone 4, LF-5
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (3.6) #167 001-001
LONG TITLE:	Submittal of Draft Primary Document, Zone 5 Draft Final Remedial Investigation Report
AUTHOR:	Arthur Ditto, Pease AFB
RECIPIENT:	Michael Daly, EPA Richard Pease, NHDES
DATE:	5 August 1993
TYPE:	Letter
SECOND REFERENCE:	Zone 5
LOCATION:	ARF (Section 3.6 Binder)

#

DOCUMENT NUMBER:	PEA (3.6) #170 001-008
LONG TITLE:	Locations of Surface Waters of the State of New Hampshire in the Vicinity of Former Pease AFB
AUTHOR:	Arthur Ditto, Pease AFB
RECIPIENT:	Richard Pease, NHDES
DATE:	16 November 1993
TYPE:	Letter with Attachment
SECOND REFERENCE:	None
LOCATION:	ARF (Section 3.6 Binder)

•
#

DOCUMENT NUMBER:	PEA (3.6) #172 001-001
LONG TITLE:	Draft Final Zone 3, 4, and 5 Remedial Investigation Reports, Pease AFB, NH
AUTHOR:	EPA
RECIPIENT:	USAF
DATE:	30 November 1993
TYPE:	Memorandum
SECOND REFERENCE:	Zone 3; Zone 4; Zone 5
LOCATION:	ARF (Section 3.6 Binder)

#

4.1 ARAR Determinations

DOCUMENT NUMBER:	PEA (4.1) #1 001-024
LONG TITLE:	New Hampshire ARAR List Update
AUTHOR:	Richard H. Pease, P.E. NHDES
RECIPIENT:	Arthur Ditto, P.E. RPM, U.S. Air Force/Pease AFB
DATE:	13 April 1992
TYPE:	Letter and Tables
SECOND REFERENCE:	None
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (4.1) #2 001-B.3
LONG TITLE:	Installation Restoration Program Stage 4, Basewide ARARs, Pease Air Force Base, NH 03803 – Draft
AUTHOR:	Roy F. Weston, Inc.
RECIPIENT:	USAF
DATE:	January 1993
TYPE:	ARARs
SECOND REFERENCE:	None
LOCATION:	ARF, IR

#

DOCUMENT NUMBER:	PEA (4.1) #3 001-002
LONG TITLE:	Waiverability of Env-WS 430, Surface Water Quality Regulations, as an ARAR
AUTHOR:	Arthur Ditto, Pease AFB
RECIPIENT:	Richard Pease, NHDES
DATE:	21 December 1993
TYPE:	Letter
SECOND REFERENCE:	None
LOCATION:	ARF (Section 4.1 Binder)

#

DOCUMENT NUMBER:	PEA (4.1) #4 001-025
LONG TITLE:	New Hampshire ARAR List Update
AUTHOR:	NHDES
RECIPIENT:	USAF
DATE:	23 December 1993
TYPE:	Letter with Attachment
SECOND REFERENCE:	None
LOCATION:	ARF (Section 4.1 Binder)

#

4.2 Feasibility Reports

DOCUMENT NUMBER:	PEA (4.2) #4 001-D.45
LONG TITLE:	Installation Restoration Program, Stage 3C, Initial Screening of Alternatives for IRP Site 8, Pease AFB, NH Technical Report and Appendices - Draft
AUTHOR:	Roy F. Weston, Inc.
RECIPIENT:	USAF
DATE:	June 1992
TYPE:	Report
SECOND REFERENCE:	Site 8
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (4.2) #5 001-C.5
LONG TITLE:	Installation Restoration Program, Stage 3C, Initial Screening of Alternatives for IRP Site 8, Pease AFB, NH Figures - Draft
AUTHOR:	Roy F. Weston, Inc.
RECIPIENT:	USAF
DATE:	June 1992
TYPE:	Figures
SECOND REFERENCE:	Site 8
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (4.2) #9 001-B21
LONG TITLE:	Installation Restoration Program, Stage 3C, IRP Site 8, Soil Vapor Extraction Treatability Study Work Plan for Pease AFB, NH --Draft
AUTHOR:	Roy F. Weston, Inc.
RECIPIENT:	USAF
DATE:	September 1992
TYPE:	Treatability Study Work Plan
SECOND REFERENCE:	Site 8
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (4.2) #10 001-L.4
LONG TITLE:	Installation Restoration Program, Stage 3C, Feasibility Study for IRP Site 8, Pease AFB, NH -- Appendices A-L -- Draft
AUTHOR:	Roy F. Weston, Inc.
RECIPIENT:	USAF
DATE:	October 1992
TYPE:	Appendices
SECOND REFERENCE:	Site 8
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (4.2) #11 001-5.2.16
LONG TITLE:	Installation Restoration Program, Stage 3C, Feasibility Study for IRP Site 8, Pease AFB, NH, Figures -- Draft
AUTHOR:	Roy F. Weston, Inc.
RECIPIENT:	USAF
DATE:	October 1992
TYPE:	Figures
SECOND REFERENCE:	Site 8
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (4.2) #12 001-5.126
LONG TITLE:	Installation Restoration Program, Stage 3C, Feasibility Study for IRP Site 8, Pease AFB, NH, Technical Report -- Draft
AUTHOR:	Roy F. Weston, Inc.
RECIPIENT:	USAF

DATE:	October 1992
TYPE:	Report
SECOND REFERENCE:	Site 8
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (4.2) #19 001-Acr.1
LONG TITLE:	United States Air Force Installation Restoration Program, Pease AFB, Zone 5 Initial Screening of Alternatives Report – Draft
AUTHOR:	Roy F. Weston, Inc.
RECIPIENT:	USAF
DATE:	March 1993
TYPE:	Report
SECOND REFERENCE:	Zone 5
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (4.2) #20 001-E.4
LONG TITLE:	Installation Restoration Program, Stage 4 No Further Action Decision Document for IRP Site 11, Pease AFB, NH 03803
AUTHOR:	Roy F. Weston, Inc.
RECIPIENT:	USAF
DATE:	February 1993
TYPE:	Report
SECOND REFERENCE:	Site 11
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (4.2) #21 001-Acr.3
LONG TITLE:	Installation Restoration Program, Stage 3C Feasibility Study for IRP Site 8, Pease AFB, NH 03803, Technical Report -- Draft Final
AUTHOR:	Roy F. Weston, Inc.
RECIPIENT:	USAF
DATE:	January 1993
TYPE:	Report
SECOND REFERENCE:	Site 8
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (4.2) #22 001-5.2-16
LONG TITLE:	Installation Restoration Program, Stage 3C Feasibility Study for IRP Site 8, Pease AFB, NH 03803. Figures – Draft Final
AUTHOR:	Roy F. Weston, Inc.
RECIPIENT:	USAF
DATE:	January 1993
TYPE:	Figures
SECOND REFERENCE:	Site 8
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (4.2) #23 001-L.6
LONG TITLE:	Installation Restoration Program, Stage 3C Feasibility Study for IRP Site 8, Pease AFB, NH 03803. Appendices A through L – Draft Final
AUTHOR:	Roy F. Weston, Inc.
RECIPIENT:	USAF
DATE:	January 1993
TYPE:	Appendices
SECOND REFERENCE:	Site 8
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (4.2) #29 001-A.8
LONG TITLE:	U.S. Air Force Installation Restoration Program Pease AFB Zone 5 Feasibility Study Report – Draft Final
AUTHOR:	Roy F. Weston, Inc.
RECIPIENT:	USAF

DATE:	October 1993
TYPE:	Feasibility Study
SECOND REFERENCE:	Zone 5
LOCATION:	ARF (Zone 5 Shelf)

#

4.3 Proposed Plan

DOCUMENT NUMBER:	PEA (4.3) #1 001-220
LONG TITLE:	"Proposed Plan for Landfill 3, Field Maintenance Squadron Equipment Cleaning Site, Fire Department Training Area 1"
AUTHOR:	Roy F. Weston, Inc., Inc
RECIPIENT:	EPA, NHDES
DATE:	October 1990
TYPE:	Work Plan
SECOND REFERENCE:	None
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (4.3) #7 001-G.3
LONG TITLE:	Installation Restoration Program, Proposed Plan for Zone 5, Pease AFB, NH--DRAFT
AUTHOR:	Roy F. Weston, Inc.
RECIPIENT:	USAF
DATE:	October 1993
TYPE:	Proposed Plan
SECOND REFERENCE:	Zone 5
LOCATION:	ARF (Zone 5 Shelf)

#

4.5 Correspondence

DOCUMENT NUMBER:	PEA (4.5) #1 001-006
LONG TITLE:	"IRP Proposed Plan for Landfill 3, Field Maintenance Squadron Equipment Cleaning Site, Fire Department Training Area 1 (October 1990, draft) Review Comments"
AUTHOR:	State of New Hampshire, Department of Environmental Services
RECIPIENT:	Air Force
DATE:	27 November 1990
TYPE:	State of New Hampshire Review Comments
SECOND REFERENCE:	None
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (4.5) #2 001-016
LONG TITLE:	"EPA Region I comments on the IRP Proposed Plan for Landfill 3, Field Maintenance Squadron Equipment Cleaning Site, Fire Department Training Area 1 (October 1990, draft)"
AUTHOR:	U.S. EPA
RECIPIENT:	Air Force
DATE:	28 November 1990
TYPE:	EPA Review Comments
SECOND REFERENCE:	None
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (4.5) #3 001-008
LONG TITLE:	"EPA Region I additional comments on the IRP proposed plan for Landfill 3, field maintenance squadron equipment cleaning site, Fire Department Training Area 1 (October 1990, draft); review comments"
AUTHOR:	U.S. EPA
RECIPIENT:	Air Force
DATE:	3 December 1990
TYPE:	Review Comments
SECOND REFERENCE:	None
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (4.5) #5 001-002
LONG TITLE:	Applicable or Relevant and Appropriate Requirements (ARARs)
AUTHOR:	Richard Pease, NHDES
RECIPIENT:	Art Ditto, Pease AFB
DATE:	25 November 1991
TYPE:	Letter
SECOND REFERENCE:	Pea (6.4)
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (4.5) #14 001-001
LONG TITLE:	Document Submittals
AUTHOR:	USAF
RECIPIENT:	Johanna Hunter, USEPA Richard Pease, NHDES
DATE:	26 May 1992
TYPE:	Letter
SECOND REFERENCE:	Pea (10.1); Site 34
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (4.5) #16 001-001
LONG TITLE:	Submittal of Draft Secondary Document, Site 8 Initial Screening of Alternatives
AUTHOR:	USAF

RECIPIENT:	Johanna Hunter, USEPA
DATE:	24 June 1992
TYPE:	Letter
SECOND REFERENCE:	Site 8
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (4.5) #17 001-001
LONG TITLE:	Submittal of Draft Secondary Document, Site 8 Initial Screening of Alternatives
AUTHOR:	USAF
RECIPIENT:	Richard Pease, NHDES
DATE:	24 June 1992
TYPE:	Letter
SECOND REFERENCE:	Site 8
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (4.5) #24 001-004
LONG TITLE:	Pease Air Force Base Site 8 Draft Feasibility Study
AUTHOR:	Roy F. Weston, Inc.
RECIPIENT:	USAF NHDES USEPA
DATE:	29 October 1992
TYPE:	Letter
SECOND REFERENCE:	Site 8
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (4.5) #25 001-001
LONG TITLE:	Submittal of Draft Primary Document, Site 8 Feasibility Study Report
AUTHOR:	USAF
RECIPIENT:	Johanna Hunter, USEPA
DATE:	3 November 1992
TYPE:	Letter
SECOND REFERENCE:	Site 8
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (4.5) #26 001-001
LONG TITLE:	Submittal of Draft Primary Document, Site 8 Feasibility Study Report
AUTHOR:	USAF
RECIPIENT:	Richard Pease, NHDES
DATE:	3 November 1992
TYPE:	Letter
SECOND REFERENCE:	Site 8
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (4.5) #31 001-001
LONG TITLE:	Determination of Site Boundaries at the Time of Remedial Action Implementation (Will Migrate to Proposal)
AUTHOR:	USAF
RECIPIENT:	Johanna Hunter, USEPA Richard Pease, NHDES
DATE:	2 December 1992
TYPE:	Letter
SECOND REFERENCE:	None
LOCATION:	ARF

#

DOCUMENT NUMBER: PEA (4.5) #32 001-002
LONG TITLE: Request for Deadline Extension
AUTHOR: USAF
RECIPIENT: Johanna Hunter, USEPA
Richard Pease, NHDES
DATE: 4 December 1992
TYPE: Letter
SECOND REFERENCE: Site 34
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (4.5) #39 001-001
LONG TITLE: Submittal of the Draft Site 8 Proposed Plan
AUTHOR: USAF
RECIPIENT: Richard Pease, NHDES
Johanna Hunter, USEPA
DATE: 23 March 1993
TYPE: Letter
SECOND REFERENCE: Site 8
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (4.5) #40 001-001
LONG TITLE: Submittal of Draft Secondary Document, Zone 5 Initial Screening of Alternatives
AUTHOR: USAF
RECIPIENT: Richard Pease, NHDES
DATE: 12 March 1993
TYPE: Letter
SECOND REFERENCE: Zone 5
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (4.5) #41 001-001
LONG TITLE: Submittal of Draft Secondary Document, Zone 5 Initial Screening of Alternatives
AUTHOR: USAF
RECIPIENT: Johanna Hunter, USEPA
DATE: 12 March 1993
TYPE: Letter
SECOND REFERENCE: Zone 5
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (4.5) #43 001-004
LONG TITLE: Selection of Remedial Action Alternatives for Site 8, FDTA-2
AUTHOR: NHDES
RECIPIENT: Art Ditto, AFBDA
DATE: 12 February 1993
TYPE: Letter
SECOND REFERENCE: PEA (6.3)
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (4.5) #45 001-001
LONG TITLE: Submittal of Draft Final Primary Document, Site 8 Feasibility Study Report
AUTHOR: USAF
RECIPIENT: Johanna Hunter, EPA
DATE: 29 February 1993
TYPE: Letter
SECOND REFERENCE: Site 8
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (4.5) #46 001-001
LONG TITLE: Submittal of Draft Final Primary Document, Site 8 Feasibility Study Report
AUTHOR: USAF
RECIPIENT: Richard Pease, NHDES
DATE: 29 January 1993
TYPE: Letter
SECOND REFERENCE: Site 8
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (4.5) #55 001-001
LONG TITLE: Submittal of Draft Primary Document, Zone 5 Draft Feasibility Study
AUTHOR: Arthur Ditto, Pease AFB
RECIPIENT: Richard Pease, NHDES
DATE: 14 July 1993
TYPE: Letter
SECOND REFERENCE: Zone 5
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (4.5) #56 001-001
LONG TITLE: Submittal of Draft Primary Document, Zone 5 Draft Feasibility Study
AUTHOR: Arthur Ditto, Pease AFB
RECIPIENT: Mike Daly, EPA Region 1
DATE: 14 July 1993
TYPE: Letter
SECOND REFERENCE: Zone 5
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (4.5) #57 001-002
LONG TITLE: Submittal of the Revised Site 8 Proposed Plan
AUTHOR: Arthur Ditto, Pease AFB
RECIPIENT: Mike Daly, EPA Region 1
Richard Pease, NHDES
DATE: 28 July 1993
TYPE: Letter
SECOND REFERENCE: Site 8
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (4.5) #58 001-003
LONG TITLE: Former Pease AFB, Surface Water Issues
AUTHOR: Richard Pease, NHDES
RECIPIENT: Arthur Ditto, Pease AFB
DATE: 29 November 1993
TYPE: Letter
SECOND REFERENCE: None
LOCATION: ARF (Section 4.5 Binder)

#

DOCUMENT NUMBER: PEA (4.5) #59 001-001
LONG TITLE: Site 8, Fire Department Training Area #2, Chemicals of Concern for Metals
AUTHOR: Arthur Ditto, Pease AFB
RECIPIENT: Michael Daly, EPA
DATE: 29 November 1993
TYPE: Letter
SECOND REFERENCE: Site 8

LOCATION: ·ARF (Section 4.5 Binder)

#

DOCUMENT NUMBER: PEA (4.5) #62 001-007
LONG TITLE: Groundwater Treatment Plant Influent/Effluent Results, Quarterly Reporting
ARTHUR: Arthur Ditto, Pease AFB
RECIPIENT: Bill Wandle, EPA Region I
Jeff Andrews, NHDES
DATE: 24 January 1994
TYPE: Letter Report
SECOND REFERENCE: Site 32/36; Site 34
LOCATION: ARF (Section ____ Binder)

#

DOCUMENT NUMBER: PEA (4.5) #61 001-001
LONG TITLE: Groundwater Treatment Plant Influent/Effluent Results, Quarterly Reporting
AUTHOR: Arthur Ditto, Pease AFB
RECIPIENT: Bill Wandle, EPA
Jeff Andrews, NHDES
DATE: 9 December 1993
TYPE: Letter
SECOND REFERENCE: Site 32/36; Site 34; Site 39
LOCATION: ARF (Section 4.5 Binder)

#

5.4 Correspondence

DOCUMENT NUMBER: PEA (5.4) #1 001-001
LONG TITLE: Region 1 ROD Model Language
AUTHOR: USAF
RECIPIENT: Johanna Hunter, USEPA
DATE: Unknown
TYPE: Letter
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (5.4) #4 001-002
LONG TITLE: Pease AFB IRP ROD Review Process
AUTHOR: Arthur Ditto, Pease AFB
RECIPIENT: AFBCA/NE
DATE: 15 December 1993
TYPE: Letter
SECOND REFERENCE: None
LOCATION: ARF (Section 5.4 Binder)

#

DOCUMENT NUMBER: PEA (5.4) #5 001-002
LONG TITLE: Getting to a ROD, Revised Milestones
AUTHOR: Arthur Ditto, Pease AFB
RECIPIENT: Michael Daly, EPA Region I
Richard Pease, NHDES
DATE: 4 February 1994
TYPE: Letter
SECOND REFERENCE: Zone 1; Zone 2; Zone 3; Zone 4
Site 32/36
LOCATION: ARF (Section 5.4 Binder)

#

DOCUMENT NUMBER: PEA (5.4) #10 001-001
LONG TITLE: Site 8 Record of Decision (ROD)
AUTHOR: Arthur Ditto, AFBCA/OL-A
RECIPIENT: Michael Daly, EPA Region I
Richard Pease, NHDES
DATE: 16 September 1994
TYPE: Memorandum
SECOND REFERENCE: Site 8
LOCATION: ARF (Section 5.4 Binder)

#

6.1 Cooperative Agreements / SMOAs

DOCUMENT NUMBER:	PEA (6.1) #1 001-013
LONG TITLE:	"Memorandum of Understanding Executed Between the Town of Newington, NH, and Pease Air Force Base, NH"
AUTHOR:	Town of Newington/Pease Air Force Base
RECIPIENT:	Air Force
DATE:	22 August 1980
TYPE:	Memorandum of Understanding
SECOND REFERENCE:	None
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (6.1) #2 001-004
LONG TITLE:	"Memorandum of Understanding (MOU) between the U.S. Air Force Occupational and Environmental Health Laboratory (USAFOEHL) and Pease Air Force Base relating to procedures for conducting the IRP"
AUTHOR:	U.S. Department of the Air Force
RECIPIENT:	Air Force
DATE:	31 July 1987
TYPE:	Memorandum of Understanding
SECOND REFERENCE:	None
LOCATION:	ARF

#

6.2 Federal Facility Agreement (FFA)

DOCUMENT NUMBER:	PEA (6.2) #1 001-097
LONG TITLE:	"Federal Facility Agreement under CERCLA Section 120"
AUTHOR:	U.S. EPA, Region I, State of New Hampshire and the U.S. Department of the Air Force"
RECIPIENT:	EPA, NHDES, Air Force
DATE:	24 April 1991
TYPE:	Federal Facility Agreement
SECOND REFERENCE:	None
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (6.2) #2 001-003
LONG TITLE:	"Remedial Project Managers Meeting Minutes"
AUTHOR:	Pease Air Force Base
RECIPIENT:	See Distribution List
DATE:	16 January 1991
TYPE:	Meeting Minutes
SECOND REFERENCE:	None
LOCATION:	ARF, IR

#

DOCUMENT NUMBER:	PEA (6.2) #3 001-003
LONG TITLE:	"Remedial Project Managers Meeting Minutes"
AUTHOR:	Pease Air Force Base
RECIPIENT:	See Distribution List
DATE:	20 February 1991
TYPE:	Meeting Minutes
SECOND REFERENCE:	None
LOCATION:	ARF, IR

#

DOCUMENT NUMBER:	PEA (6.2) #4 001-003
LONG TITLE:	"Remedial Project Managers Meeting Minutes"
AUTHOR:	Pease Air Force Base
RECIPIENT:	See Distribution List
DATE:	20 March 1991
TYPE:	Meeting Minutes
SECOND REFERENCE:	None
LOCATION:	ARF, IR

#

DOCUMENT NUMBER:	PEA (6.2) #5 001-002
LONG TITLE:	"Remedial Project Managers Meeting Minutes"
AUTHOR:	Pease Air Force Base
RECIPIENT:	See Distribution List
DATE:	17 April 1991
TYPE:	Meeting Minutes
SECOND REFERENCE:	None
LOCATION:	ARF, IR

#

DOCUMENT NUMBER:	PEA (6.2) #6 001-002
LONG TITLE:	"Remedial Project Managers Meeting Minutes"
AUTHOR:	Pease Air Force Base
RECIPIENT:	See Distribution List
DATE:	21 May 1991
TYPE:	Meeting Minutes
SECOND REFERENCE:	None

LOCATION:	ARF, IR

#

DOCUMENT NUMBER:	PEA (6.2) #7 001-002
LONG TITLE:	"Remedial Project Managers Meeting Minutes"
AUTHOR:	Pease Air Force Base
RECIPIENT:	See Distribution List
DATE:	24 June 1991
TYPE:	Meeting Minutes
SECOND REFERENCE:	None
LOCATION:	ARF, IR

#

DOCUMENT NUMBER:	PEA (6.2) #8 001-II.4
LONG TITLE:	Modification 1 to Pease AFB Federal Facilities Agreement
AUTHOR:	USAF
RECIPIENT:	Michael Daly, EPA Region I Richard Pease, NHDES
DATE:	8 September 1993
TYPE:	FFA Modification
SECOND REFERENCE:	None
LOCATION:	ARF, (Section 6.2 Binder)

#

6.3 Coordination - State / Federal

DOCUMENT NUMBER:	PEA (6.3) #1 001-003
LONG TITLE:	"Meeting minutes from Air Force meeting with state officials concerning Pease Air Force Base IRP"
AUTHOR:	U.S. Air Force
RECIPIENT:	See Distribution List
DATE:	11 March 1987
TYPE:	Meeting Minutes
SECOND REFERENCE:	None
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (6.3) #2 001-002
LONG TITLE:	"Agenda for Meeting with State DES, Air Force, and EPA Technical Team"
AUTHOR:	Pease Air Force Base
RECIPIENT:	See Distribution List
DATE:	26 April 1990
TYPE:	Agenda
SECOND REFERENCE:	None
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (6.3) #3 001-031
LONG TITLE:	"Completed Applications for Department of the Army Permit (ENG Form 435) and New Hampshire Wetlands Board Permit"
AUTHOR:	Department of the Air Force
RECIPIENT:	Army Corps of Engineers, New England Division
DATE:	31 August 1989
TYPE:	Letter and Attachments
SECOND REFERENCE:	None
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (6.3) #4 001-002
LONG TITLE:	"Letter regarding emergency discharge exclusion from the requirement for a permit under the National Pollutant Discharge Elimination System (NPDES)"
AUTHOR:	US EPA
RECIPIENT:	Air Force
DATE:	29 September 1989
TYPE:	Letter
SECOND REFERENCE:	None
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (6.3) #6 001-001
LONG TITLE:	"Agenda and Notes for Working Meeting with U.S. EPA and State of New Hampshire"
AUTHOR:	US Air Force
RECIPIENT:	See Distribution List
DATE:	21 November 1989
TYPE:	Agenda and Meeting Notes
SECOND REFERENCE:	None
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (6.3) #7 001-025
LONG TITLE:	"Letter response to Air Force letter of 22 August 1990 regarding CERCLA remedial actions at Pease Air Force Base, 404 permit not required"
AUTHOR:	Department of the Army
RECIPIENT:	Air Force

DATE:	3 October 1990
TYPE:	Response Letter
SECOND REFERENCE:	None
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (6.3) #8 001-033
LONG TITLE:	"Point Paper on Installation Restoration Program (Pease AFB) and Attachments (Prepared for a meeting of J. Coit and M. Aldrich, of Senator Humphrey's office, with Pease, NHDES, WESTON, and OEHL)"
AUTHOR:	Pease Air Force Base
RECIPIENT:	J. Coit & M. Aldrich of Senator Humphrey's Office
DATE:	31 March 1989
TYPE:	Letter
SECOND REFERENCE:	None
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (6.3) #9 001-003
LONG TITLE:	"Recommendation to Place Pease AFB on the National Priority List (NPL)"
AUTHOR:	Department of the Air Force
RECIPIENT:	US EPA
DATE:	27 June 1989
TYPE:	Letter
SECOND REFERENCE:	None
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (6.3) #10 001-004
LONG TITLE:	Remedial Project Managers' Meeting Minutes of January 16, 1991
AUTHOR:	Arthur Ditto, RPM USAF/Pease AFB
RECIPIENT:	U.S. EPA/NHDES/USAF Attendees
DATE:	Meeting Date: 16 January 1991
TYPE:	Meeting Minutes
SECOND REFERENCE:	None
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (6.3) #11 001-004
LONG TITLE:	Remedial Project Managers' Meeting Minutes of February 20, 1991
AUTHOR:	Arthur Ditto, RPM USAF/Pease AFB
RECIPIENT:	U.S. EPA/NHDES/USAF Attendees
DATE:	Meeting Date: 20 February 1991
TYPE:	Meeting Minutes
SECOND REFERENCE:	None
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (6.3) #12 001-004
LONG TITLE:	Remedial Project Managers' Meeting Minutes
AUTHOR:	USAF
RECIPIENT:	See Distribution
DATE:	20 March 1991
TYPE:	Meeting Minutes
SECOND REFERENCE:	None
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (6.3) #13 001-004

LONG TITLE:	Remedial Project Managers' Meeting Minutes of April 17, 1991
AUTHOR:	Arthur Ditto, RPM USAF/Pease AFB
RECIPIENT:	U.S. EPA/NHDES/USAF Attendees
DATE:	17 April 1991
TYPE:	Meeting Minutes
SECOND REFERENCE:	None
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (6.3) #14 001-003
LONG TITLE:	Remedial Project Managers' Meeting Minutes of May 21, 1991
AUTHOR:	Arthur Ditto, RPM USAF/Pease AFB
RECIPIENT:	U.S. EPA/NHDES/USAF Attendees
DATE:	21 May 1991
TYPE:	Meeting Minutes
SECOND REFERENCE:	None
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (6.3) #15 001-004
LONG TITLE:	Notification of Additional Investigative Work in a Wetland
AUTHOR:	USAF
RECIPIENT:	NHDES Wetlands Board P.O. Box 2008 Concord, NH 03301-3406
DATE:	14 June 1991
TYPE:	Letter
SECOND REFERENCE:	None
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (6.3) #16 001-003
LONG TITLE:	Remedial Project Managers' Meeting Minutes of July 24, 1991
AUTHOR:	Arthur Ditto, RPM USAF/Pease AFB
RECIPIENT:	U.S. EPA/NHDES/USAF Attendees
DATE:	24 June 1991
TYPE:	Meeting Minutes
SECOND REFERENCE:	None
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (6.3) #17 001-003
LONG TITLE:	Remedial Project Managers' Meeting Minutes of August 26, 1991
AUTHOR:	Arthur Ditto, RPM USAF/Pease AFB
RECIPIENT:	U.S. EPA/NHDES/USAF Attendees
DATE:	24 July 1991
TYPE:	Meeting Minutes
SECOND REFERENCE:	None
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (6.3) #18 001-004
LONG TITLE:	Remedial Project Managers' Meeting Minutes of September 26, 1991
AUTHOR:	Arthur Ditto, RPM USAF/Pease AFB

RECIPIENT: U.S. EPA/NHDES/USAF Attendees
DATE: 21 August 1991
TYPE: Meeting Minutes
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (6.3) #19 001-004
LONG TITLE: Remedial Project Managers' Meeting Minutes
AUTHOR: Arthur Ditto, RPM
USAF/Pease AFB
RECIPIENT: U.S. EPA/NHDES/USAF Attendees
DATE: 26 September 1991
TYPE: Meeting Minutes
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (6.3) #20 001-004
LONG TITLE: Remedial Project Managers' Meeting Minutes
AUTHOR: Arthur Ditto, RPM
USAF/Pease AFB
RECIPIENT: U.S. EPA/NHDES/USAF Attendees
DATE: 27 October 1991
TYPE: Meeting Minutes
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (6.3) #21 001-003
LONG TITLE: Remedial Project Managers' Meeting Minutes
AUTHOR: Arthur Ditto, RPM
USAF/Pease AFB
RECIPIENT: U.S. EPA/NHDES/USAF Attendees
DATE: 20 November 1991
TYPE: Meeting Minutes
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (6.3) #22 001-003
LONG TITLE: Remedial Project Managers' Meeting Minutes of January 27, 1992
AUTHOR: Arthur Ditto, RPM
USAF/Pease AFB
RECIPIENT: U.S. EPA/NHDES/USAF Attendees
DATE: 19 December 1991
TYPE: Meeting Minutes
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (6.3) #23 001-003
LONG TITLE: Remedial Project Managers' Meeting Minutes
AUTHOR: Arthur Ditto, RPM
USAF/Pease AFB
RECIPIENT: U.S. EPA/NHDES/USAF Attendees
DATE: 27 January 1992
TYPE: Meeting Minutes
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (6.3) #24 001-003
LONG TITLE: Remedial Project Managers' Meeting Minutes
AUTHOR: Arthur Ditto, RPM
USAF/Pease AFB
RECIPIENT: U.S. EPA/NHDES/USAF Attendees
DATE: 25 February 1992
TYPE: Meeting Minutes
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (6.3) #25 001-002
LONG TITLE: Remedial Project Managers' Meeting Minutes
AUTHOR: Arthur Ditto, RPM
USAF/Pease AFB
RECIPIENT: U.S. EPA/NHDES/USAF Attendees
DATE: 07 April 1992
TYPE: Meeting Minutes
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (6.3) #26 001-004
LONG TITLE: NH Wetlands Permit for National Priorities List Related Work
AUTHOR: USAF
RECIPIENT: NHDES
Wetlands Board
P.O. Box 2008
Concord, NH 03301-2008
DATE: 24 April 1992
TYPE: Letter
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (6.3) #27 001-002
LONG TITLE: Remedial Project Managers' Meeting Minutes
AUTHOR: USAF
RECIPIENT: See Distribution
DATE: 22 April 1992
TYPE: Minutes
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (6.3) #28 001-008
LONG TITLE: Remedial Project Managers' Meeting Minutes, June 3, 1992
AUTHOR: Arthur Ditto, RPM
USAF/Pease AFB
RECIPIENT: U.S. EPA/NHDES/USAF Attendees
DATE: 3 June 1992
TYPE: Meeting Minutes
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (6.3) #29 001-003
LONG TITLE: Remedial Project Managers' Meeting Minutes of August 21, 1991

AUTHOR:	Arthur Ditto, RPM USAF/Pease AFB
RECIPIENT:	U.S. EPA/NHDES/USAF Attendees
DATE:	Meeting Date: 21 August 1992
TYPE:	Meeting Minutes
SECOND REFERENCE:	None
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (6.3) #30 001-003
LONG TITLE:	Remedial Project Managers' Meeting Minutes - September 10, 1992
AUTHOR:	Arthur Ditto, RPM USAF/Pease AFB
RECIPIENT:	U.S. EPA/NHDES/USAF Attendees
DATE:	10 September 1992
TYPE:	Meeting Minutes
SECOND REFERENCE:	None
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (6.3) #31 001-002
LONG TITLE:	New Hampshire Sites Where SVE is Used for NAPL Removal
AUTHOR:	John Regan, NHDES
RECIPIENT:	Art Ditto, Pease AFB Mike Daly, USEPA Richard Pease, NHDES Scott Doane, NHDES
DATE:	30 September 1992
TYPE:	Letter
SECOND REFERENCE:	None
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (6.3) #32 001-002
LONG TITLE:	Remedial Project Managers' Meeting Minutes - October 20, 1992
AUTHOR:	Arthur Ditto, RPM
RECIPIENT:	EPA, NHDES, USAF Attendees
DATE:	20 October 1992
TYPE:	Minutes
SECOND REFERENCE:	None
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (6.3) #33 001-003
LONG TITLE:	Application of the Reasonable Maximum Exposure (RME) in Risk Assessments; Request for Site Specific Justification for Using the "Average Maximum"
AUTHOR:	Richard Pease, NHDES
RECIPIENT:	Art Ditto, Pease AFB Johanna Hunter, USEPA Capt. Woerhle, AFCEE
DATE:	22 October 1992
TYPE:	Letter
SECOND REFERENCE:	None
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (6.3) #34 001-001
LONG TITLE:	Guidebook for Environmental Permits in New Hampshire
AUTHOR:	Richard Pease, NHDES

RECIPIENT: Art Ditto, Pease AFB
Johanna Hunter, USEPA
DATE: 4 November 1992
TYPE: Letter
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (6.3) #35 001-004
LONG TITLE: Newington Water Quality Sampling on October 14, 1992 and Analysis Performed on October 28, 1992, NHDES Sample #220009
AUTHOR: Scott Doane, NHDES
RECIPIENT: Wayne Wood, Newington, NH
Richard Pease, NHDES
Mark McKenzie, Pease AFB
DATE: 11 December 1992
TYPE: Letter
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (6.3) #36 001-Attachment 6
LONG TITLE: Quarterly Report, Second Quarter 1991
AUTHOR: Roy F. Weston, Inc.
RECIPIENT: EPA, NHDES, USAF
DATE: 19 July 1991
TYPE: Quarterly Report
SECOND REFERENCE: None
LOCATION: ARF, Art Ditto's office files

#

DOCUMENT NUMBER: PEA (6.3) #37 001-034
LONG TITLE: Quarterly Report, Third Quarter 1991
AUTHOR: Roy F. Weston, Inc.
RECIPIENT: EPA, NHDES, USAF
DATE: 24 October 1991
TYPE: Quarterly Report, Transmittal Letters
SECOND REFERENCE: None
LOCATION: ARF, Art Ditto's office files

#

DOCUMENT NUMBER: PEA (6.3) #38 001-030
LONG TITLE: Quarterly Report, Fourth Quarter 1991
AUTHOR: Roy F. Weston, Inc.
RECIPIENT: EPA, NHDES, USAF
DATE: 14 January 1992
TYPE: Quarterly Report
SECOND REFERENCE: None
LOCATION: ARF, Art Ditto's office files

#

DOCUMENT NUMBER: PEA (6.3) #39 001-020
LONG TITLE: Quarterly Report, First Quarter 1992
AUTHOR: Roy F. Weston, Inc.
RECIPIENT: EPA, NHDES, USAF
DATE: 15 April 1992
TYPE: Quarterly Report
SECOND REFERENCE: None
LOCATION: ARF, Art Ditto's office files

#

DOCUMENT NUMBER:	. PEA (6.3) #40 001-032
LONG TITLE:	Quarterly Report, Second Quarter 1992
AUTHOR:	Roy F. Weston, Inc.
RECIPIENT:	EPA, NHDES, USAF
DATE:	14 July 1992
TYPE:	Quarterly Report
SECOND REFERENCE:	None
LOCATION:	ARF, Art Ditto's office files

#

DOCUMENT NUMBER:	PEA (6.3) #41 001-043
LONG TITLE:	Quarterly Report, Third Quarter 1992
AUTHOR:	Roy F. Weston, Inc.
RECIPIENT:	EPA, NHDES, USAF
DATE:	20 October 1992
TYPE:	Quarterly Report
SECOND REFERENCE:	None
LOCATION:	ARF, Art Ditto's office files

#

DOCUMENT NUMBER:	PEA (6.3) #42 001-Q4
LONG TITLE:	Transmittal Letter for Quarterly Progress Report, Fourth Quarter 1992
AUTHOR:	Art Ditto, RPM, Pease AFB
RECIPIENT:	Johanna Hunter, RPM, USEPA Region 1 Richard Pease, RPM, NHDES
DATE:	19 January 1993
TYPE:	Transmittal Letter and Quarterly Report
SECOND REFERENCE:	None
LOCATION:	ARF, Art Ditto's office files

#

DOCUMENT NUMBER:	PEA (6.3) #43 001-E.1
LONG TITLE:	Quarterly Progress Report for Pease AFB
AUTHOR:	Art Ditto, RPM, Pease AFB
RECIPIENT:	Johanna Hunter, RPM, USEPA Region 1 Richard Pease, RPM, NHDES
DATE:	26 April 1993
TYPE:	Report
SECOND REFERENCE:	None
LOCATION:	ARF

#

6.4 General Correspondence

DOCUMENT NUMBER: PEA (6.4) #1 001-003
LONG TITLE: "Wetlands Application No. 89-1805"
AUTHOR: State of New Hampshire, Department of Environmental Services, Water Supply and Pollution Control Division
RECIPIENT: State of New Hampshire
DATE: 14 September 1989
TYPE: Letter
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (6.4) #2 001-001
LONG TITLE: "Request for information for wetlands permit"
AUTHOR: State of New Hampshire, Department of Environmental Services
RECIPIENT: Air Force
DATE: 18 September 1989
TYPE: Letter
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (6.4) #4 001-005
LONG TITLE: "Air Force Letter to the Wetlands Board regarding a request for approval for a modification to the wetlands permitted scope of work"
AUTHOR: Roy F. Weston, Inc.
RECIPIENT: Delbert Downing, Wetlands Board, Concord, NH
DATE: 21 November 1989
TYPE: Letter
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (6.4) #5 001-010
LONG TITLE: "Letter to EPA regarding background information on Pease Air Force Base"
AUTHOR: US Department of Commerce
RECIPIENT: Air Force via US EPA
DATE: 7 March 1990
TYPE: Letter
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (6.4) #6 001-001
LONG TITLE: File # 92-679; CERCLA Related Temporary Fill of 2000 Square Feet for Wells at Pease AFB, NH
AUTHOR: Kenneth N. Kettenring
NHDES
Wetlands Board
P.O. Box 2008
Concord, NH 03302-2008
RECIPIENT: Art Ditto, Pease AFB
DATE: 26 May 1992
TYPE: Letter
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (6.4) #7 001-002
LONG TITLE: State Review Comments to Site 8 Initial Screening of Alternatives; Clarification of TSCA Regulation of PCBs

AUTHOR:	Richard Pease, NHDES
RECIPIENT:	Art Ditto, Pease AFB
DATE:	11 August 1992
TYPE:	Letter
SECOND REFERENCE:	PEA (10.10); PEA (4.2)
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (6.4) #8 001-019
LONG TITLE:	Lab results of groundwater samples from monitoring wells 05-5113, 05-6101, and 08-6024.
AUTHOR:	NHDES
RECIPIENT:	Art Ditto, Pease AFB
DATE:	11 February 1993
TYPE:	Letter w/ attachment
SECOND REFERENCE:	None
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (6.4) #9 001-041
LONG TITLE:	Quarterly Progress Report, Period of Performance July, August and September 1993
AUTHOR:	Roy F. Weston, Inc.
RECIPIENT:	USAF
DATE:	October 1993
TYPE:	Report
SECOND REFERENCE:	None
LOCATION:	ARF (Section 6.4 Binder)

#

7.3 Administrative Orders

DOCUMENT NUMBER:	PEA (7.3) #1 001-II.3
LONG TITLE:	Pease AFB Federal Facilities Agreement Modification
AUTHOR:	USAF
RECIPIENT:	Pease AFB EPA Region 1 NHDES NH Attorney General
DATE:	January 1993
TYPE:	FFA Modification
SECOND REFERENCE:	none
LOCATION:	ARF

#

DOCUMENT NUMBER:	
LONG TITLE:	
AUTHOR:	
RECIPIENT:	
DATE:	
TYPE:	
SECOND REFERENCE:	
LOCATION:	

#

8.2 Toxicological Profiles

DOCUMENT NUMBER:	PEA (8.2) #1 001-ZN4
LONG TITLE:	Installation Restoration Program Stage 4 Toxicity Profiles, Pease Air Force Base, NH 03803
AUTHOR:	Roy F. Weston, Inc.
RECIPIENT:	USAF
DATE:	January 1993
TYPE:	Toxicity Profiles
SECOND REFERENCE:	None
LOCATION:	ARF, IR

#

10.1 Comments and Responses

DOCUMENT NUMBER:	PEA (10.1) #1 001-005
LONG TITLE:	"Response to Comments - Draft Final Community Relations Plan"
AUTHOR:	Roy F. Weston, Inc.
RECIPIENT:	Air Force
DATE:	7 February 1991
TYPE:	Letter/Response to Comments
SECOND REFERENCE:	None
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (10.1) #2 001-003
LONG TITLE:	Draft Community Relations Plan Comments
AUTHOR:	Richard Pease, P.E. RPM, NHDES
RECIPIENT:	Arthur Ditto, P.E. RPM, U.S. Air Force
DATE:	30 November 1990
TYPE:	Letter Comment Report
SECOND REFERENCE:	Community Relations
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (10.1) #3 001-010
LONG TITLE:	EPA Region 1 Comments to IRP Draft Community Relations Plan; Pease AFB
AUTHOR:	Douglas S. Gutto U.S. EPA Region 1 Superfund Community Relations
RECIPIENT:	Arthur Ditto, RPM U.S. Air Force Pease AFB
DATE:	7 December 1990
TYPE:	Letter Comment Report
SECOND REFERENCE:	Community Relations
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (10.1) #4 001-011
LONG TITLE:	EPA Comments on Pease AFB Community Relations Plan with Air Force's Responses
AUTHOR:	Individual Unknown (From Air Force)
RECIPIENT:	U.S. Air Force
DATE:	January 1991
TYPE:	Comment Report
SECOND REFERENCE:	Community Relations
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (10.1) #5 001-004
LONG TITLE:	NHDES Comments on Pease AFB Community Relations Plan with Air Force Responses
AUTHOR:	Individual Unknown (Through Air Force)
RECIPIENT:	U.S. Air Force
DATE:	January 1991
TYPE:	Comment Report
SECOND REFERENCE:	Community Relations
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (10.1) #6 001-002

LONG TITLE:	Review of Draft (Revised) Final Report IRP Community Relations Plan
AUTHOR:	Johanna Hunter, RPM U.S. EPA, Region 1
RECIPIENT:	Arthur Ditto, RPM U.S. Air Force Pease AFB
DATE:	25 March 1991
TYPE:	Letter
SECOND REFERENCE:	Community Relations
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (10.1) #7 001-003
LONG TITLE:	Comments Remaining Unresolved for Stage 4 Work Plan Analysis Method
AUTHOR:	Mark McKenzie, Pease AFB
RECIPIENT:	Lee dePersia, Roy F. Weston, Inc.
DATE:	05 May 1991
TYPE:	Comments
SECOND REFERENCE:	PEA (3.1)
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (10.1) #8 001-002
LONG TITLE:	Oversight Comments on the Soil Boring/Piezometer Installation Program
AUTHOR:	Scott Doane John Regan NHDES
RECIPIENT:	Arthur Ditto, P.E. RPM, U.S. Air Force Pease AFB
DATE:	13 April 1992
TYPE:	Letter
SECOND REFERENCE:	CRD-1
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (10.1) #12 001-003
LONG TITLE:	Review Comments for Stage 4 Work Plan Addendum Number 2
AUTHOR:	Richard H. Pease, P.E. RPM, NHDES
RECIPIENT:	Arthur Ditto, P.E. RPM, USAF Pease AFB
DATE:	08 May 1992
TYPE:	Letter
SECOND REFERENCE:	PEA (3.3)
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (10.1) #13 001-014
LONG TITLE:	Review Comments for Stage 4 Work Plan and Sampling and Analysis Plan Addendum Number 2
AUTHOR:	Michael Daly U.S. EPA Region 1 Federal Facilities Superfund Section
RECIPIENT:	Arthur Ditto, RPM U.S. Air Force Pease AFB
DATE:	14 May 1992
TYPE:	Transmittal Sheet, Letter and Comment Report
SECOND REFERENCE:	PEA (3.1); PEA (3.3)

LOCATION: ARF

#

DOCUMENT NUMBER: PEA (10.1) #14 001-013
LONG TITLE: Review of Stage 4 Work Plan and Sampling and Analysis Plan Addendum Number 2 for Pease AFB
AUTHOR: Michael J. Daly
U.S. EPA Region 1
Federal Facilities Superfund Section
RECIPIENT: Arthur Ditto, RPM
U.S. Air Force/Pease AFB
DATE: 14 May 1992
TYPE: Letter with Comment Report
SECOND REFERENCE: PEA (3.1); PEA (3.3)
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (10.1) #25 001-007
LONG TITLE: Stage 3C Review of Initial Screening of Alternatives for IRP Site 8 Fire Training Area, Pease Air Force Pease, NH Draft, June 1992
AUTHOR: Johanna Hunter, USEPA
RECIPIENT: Arthur Ditto, Pease AFB
DATE: 10 August 1992
TYPE: Comments
SECOND REFERENCE: Site 8
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (10.1) #27 001-002
LONG TITLE: Stage 4 Work Plan Addendum 3 Review Comments
AUTHOR: Richard Pease, NHDES
RECIPIENT: Arthur Ditto, Pease AFB
DATE: 14 August 1992
TYPE: Comments
SECOND REFERENCE: PEA (6.3)
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (10.1) #33 001-006
LONG TITLE: Review of Stage 3C Soil Vapor Extraction Treatability Study Work Plan for IP Site 8 - September 1992
AUTHOR: Michael J. Daly
U.S. EPA Region 1
Federal Facilities Superfund Section
RECIPIENT: Arthur Ditto
RPM, USAF
Pease AFB
DATE: 30 September 1992
TYPE: Letter with 2 Attachments
SECOND REFERENCE: Site 8; PEA (2.0)
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (10.1) #37 001-002
LONG TITLE: Proposed Locations for Additional Monitoring Wells at Site 8
AUTHOR: Scott Doane, Hydrogeologist NHDES
and
John Regan, Supervisor NHDES
RECIPIENT: Arthur Ditto, RPM, USAF
Pease AFB
DATE: 9 October 1992
TYPE: Letter

SECOND REFERENCE: Site 8; PEA (3.1)
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (10.1) #38 001-032
LONG TITLE: Response to Comments; Site 8 Initial Screening of Alternatives
AUTHOR: Roy F. Weston, Inc.
through U.S. Air Force (Arthur Ditto)
RECIPIENT: Johanna Hunter, RPM
U.S. EPA, Region 1
and
Richard Pease
RPM, NHDES
DATE: 13 October 1992
TYPE: Transmittal Letters with 2 Attachments
SECOND REFERENCE: Site 8; PEA (3.5)
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (10.1) #40 001-006
LONG TITLE: Response to Comments, Stage 4 Work Plan and Sampling and Analysis Plan Addendum 2
AUTHOR: Arthur Ditto, RPM
U.S. Air Force
Pease AFB
RECIPIENT: Johanna Hunter, RPM
U.S. EPA, Region 1
and
Richard Pease, RPM
NHDES
DATE: 3 November 1992
TYPE: Letter
SECOND REFERENCE: PEA (3.3); PEA (3.1)
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (10.1) #42 001-003
LONG TITLE: Comments on Pease Off-Base Well Inventory Letter Report
AUTHOR: Richard H. Pease, P.E.
RPM, NHDES
RECIPIENT: Arthur Ditto, P.E.
RPM, U.S. Air Force
Pease AFB
DATE: 12 November 1992
TYPE: Letter
SECOND REFERENCE: Zone 2; Zone 5; Site 8
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (10.1) #44 001-002
LONG TITLE: Review of Stage 4 Sampling and Analysis Plan Addendum 3, Pease AFB
AUTHOR: Michael J. Daly
U.S. EPA, Region I
Federal Facilities Superfund Section
RECIPIENT: Arthur Ditto, P.E.
RPM, U.S. Air Force
Pease AFB
DATE: 23 November 1992
TYPE: Letter
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER:	PEA (10.1) #47 001-002
LONG TITLE:	Review Comments of Stage 4, Site Characterization Summary, IRP Zone 5
AUTHOR:	Richard H. Pease, P.E. RPM, NHDES
RECIPIENT:	Arthur Ditto, P.E. RPM, U.S. Air Force Pease AFB
DATE:	1 December 1992
TYPE:	Letter
SECOND REFERENCE:	Zone 5
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (10.1) #49 001-008
LONG TITLE:	Review of Zone 2 and Zone 5, Site Characterization Summaries for Pease AFB
AUTHOR:	Michael J. Daly U.S. EPA, Region 1 Federal Facilities Superfund Section
RECIPIENT:	Arthur Ditto, P.E. U.S. Air Force Pease AFB
DATE:	4 December 1992
TYPE:	Letter with Comment Reports
SECOND REFERENCE:	Zone 2; Zone 5
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (10.1) #61 001-002
LONG TITLE:	Review Comments of Pease AFB Preliminary Findings - Fish and Shellfish Tissue Analysis
AUTHOR:	Richard Pease, RPM, NHDES
RECIPIENT:	Arthur Ditto, RPM, USAF, Pease AFB
DATE:	21 January 1993
TYPE:	Letter
SECOND REFERENCE:	None
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (10.1) #62 001-002
LONG TITLE:	Review of the Air Force Selection of Remedial Action Alternative Letter for Site 8, FDTA #2, dated January 8, 1993
AUTHOR:	EPA, Region 1
RECIPIENT:	Arthur Ditto, AFBDA
DATE:	26 February 1993
TYPE:	Letter
SECOND REFERENCE:	Site 8
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (10.1) #63 001-004
LONG TITLE:	Review of Site 8 Draft Final Feasibility Study IRP Pease Air Force Base, NH 03801, Draft January 1993
AUTHOR:	EPA, Region 1
RECIPIENT:	Arthur Ditto, AFBDA
DATE:	26 February 1993
TYPE:	Letter and Comments
SECOND REFERENCE:	Site 8
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (10.1) #69 001-018
LONG TITLE:	Response to EPA Comments on Site 8 Draft FS

AUTHOR: USAF
RECIPIENT: EPA
DATE: 27 January 1993
TYPE: Response to Comments
SECOND REFERENCE: Site 8
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (10.1) #70 001-021
LONG TITLE: Response to NHDES Comments on Site 8 Draft FS
AUTHOR: USAF
RECIPIENT: NHDES
DATE: 28 January 1993
TYPE: Response to Comments
SECOND REFERENCE: Site 8
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (10.1) #71 001-006
LONG TITLE: Response to NHDES Comments on Zone 5 FS
AUTHOR: USAF
RECIPIENT: NHDES
DATE: 07 January 1993
TYPE: Response to Comments
SECOND REFERENCE: Zone 5
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (10.1) #72 001-009
LONG TITLE: Response to EPA Comments on Site 8 Draft FS
AUTHOR: USAF
RECIPIENT: EPA
DATE: 11 January 1993
TYPE: Response to Comments
SECOND REFERENCE: Site 8
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (10.1) #75 001-002
LONG TITLE: DES Review of Site 8 Draft Final Feasibility Study, january 1993 and Air Force's Response to Comments to DES Review Comments to Site 8 Draft Feasibility Study
AUTHOR: NHDES
RECIPIENT: Art Ditto, AFBDA
DATE: 01 March 1993
TYPE: Comments
SECOND REFERENCE: Site 8
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (10.1) #76 001-009
LONG TITLE: EPA Review of Air Force Installation Restoration Program, Draft Remedial Investigation Report, Zone 5, Pease Air Force Base - February 1993
AUTHOR: EPA
RECIPIENT: Art Ditto, AFBDA
DATE: 26 March 1993
TYPE: Comments
SECOND REFERENCE: Zone 5
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (10.1) #77 001-011

LONG TITLE:	IRP Stage 4 Zone 5 Remedial Investigation, February 1993 – Draft
AUTHOR:	NHDES
RECIPIENT:	Art Ditto, AFBDA
DATE:	26 March 1993
TYPE:	Comments
SECOND REFERENCE:	Zone 5
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (10.1) #81 001-005
LONG TITLE:	Response to EPA Comments on the Draft Zone 5 ISA
AUTHOR:	USAF
RECIPIENT:	EPA Region 1
DATE:	14 June 1993
TYPE:	Response to Comments
SECOND REFERENCE:	Zone 5
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (10.1) #82 001-025
LONG TITLE:	Response to NHDES Comments on the Draft Zone 5 ISA
AUTHOR:	USAF
RECIPIENT:	NHDES
DATE:	14 June 1993
TYPE:	Response to Comments
SECOND REFERENCE:	Zone 5
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (10.1) #99 001-019
LONG TITLE:	Response to EPA Comments on the Draft Zone 5 RI Report
AUTHOR:	USAF
RECIPIENT:	EPA
DATE:	4 August 1993
TYPE:	Response to Comments
SECOND REFERENCE:	Zone 5
LOCATION:	ARF (Section 10.1 Binder)

#

DOCUMENT NUMBER:	PEA (10.1) #100 001-020
LONG TITLE:	Response to the NHDES Comments on the Draft Zone 5 RI Report
AUTHOR:	USAF
RECIPIENT:	NHDES
DATE:	5 August 1993
TYPE:	Response to Comments
SECOND REFERENCE:	Zone 5
LOCATION:	ARF (Section 10.1 Binder)

#

DOCUMENT NUMBER:	PEA (10.1) #101 001-006
LONG TITLE:	Response to Comments on the Draft Zone 5 RI Report Addendum 1
AUTHOR:	USAF
RECIPIENT:	EPA NHDES
DATE:	5 August 1993
TYPE:	Response to Comments
SECOND REFERENCE:	Zone 5
LOCATION:	ARF (Section 10.1 Binder)

#

DOCUMENT NUMBER: PEA (10.1) #102 001-006
LONG TITLE: Response to NHDES Comments on the Draft Zone 5 FS
AUTHOR: USAF
RECIPIENT: NHDES
DATE: 10 October 1993 (Attached letter is dated August 27, 1993)
TYPE: Response to Comments
SECOND REFERENCE: Zone 5
LOCATION: ARF (Section 10.1 Binder)

#

DOCUMENT NUMBER: PEA (10.1) #103 001-033
LONG TITLE: Response to EPA Comments on the Draft Zone 5 RI Report
AUTHOR: USAF
RECIPIENT: EPA
DATE: 28 September 1993
TYPE: Response to Comments
SECOND REFERENCE: Zone 3
LOCATION: ARF (Section 10.1 Binder)

#

DOCUMENT NUMBER: PEA (10.1) #110 001-017
LONG TITLE: Response to NHDES Comments on the Draft Final Site 8 RI Report
AUTHOR: USAF
RECIPIENT: NHDES
DATE: 13 April 1993
TYPE: Response to Comments
SECOND REFERENCE: Site 8
LOCATION: ARF (Section 10.1 Binder)

#

DOCUMENT NUMBER: PEA (10.1) #111 001-010
LONG TITLE: Response to EPA Comments on the Draft Final Site 8 RI Report
AUTHOR: USAF
RECIPIENT: EPA
DATE: 13 April 1993
TYPE: Response to Comments
SECOND REFERENCE: Site 8
LOCATION: ARF (Section 10.1 Binder)

#

DOCUMENT NUMBER: PEA (10.1) #114 001-003
LONG TITLE: Remedial Technology Peer Review, Pease International Tradeport and Air National Base, New Hampshire, Peer Review
AUTHOR: Fred Price, Mitre Corporation
RECIPIENT: Major Charles Howell, AFCEE
DATE: 13 April 1993
TYPE: Letter
SECOND REFERENCE: Zone 5
LOCATION: ARF (Section 10.1 Binder)

#

DOCUMENT NUMBER: PEA (10.1) #116 001-003
LONG TITLE: Review of U.S. Environmental Protection Agency Comments on Background Data for Pease AFB, NH
AUTHOR: Fred Price, Mitre Corporation
RECIPIENT: Major Charles Howell, AFCEE
DATE: 11 June 1993
TYPE: Letter
SECOND REFERENCE: None
LOCATION: ARF (Section 10.1 Binder)

#

DOCUMENT NUMBER:	PEA (10.1) #130 001-003
LONG TITLE:	Zone 5 Draft Final Feasibility Study and the Zone 5 Draft Proposed Plan Review Comments
AUTHOR:	NHDES
RECIPIENT:	USAF
DATE:	29 November 1993
TYPE:	Comments
SECOND REFERENCE:	Zone 5
LOCATION:	ARF (Section 10.1 Binder)

#

DOCUMENT NUMBER:	PEA (10.1) #133 001-004
LONG TITLE:	Zone 5 and Site 8 Draft Fact Sheets for Proposed Plans Review Comments
AUTHOR:	NHDES
RECIPIENT:	USAF
DATE:	30 December 1993
TYPE:	Comments
SECOND REFERENCE:	Zone 5; Site 8
LOCATION:	ARF (Section 10.1 Binder)

#

10.2 Community Relations Plan

DOCUMENT NUMBER:	PEA (10.2) #1 001-040
LONG TITLE:	"Installation Restoration Program Community Relations Plan"
AUTHOR:	Roy F. Weston, Inc.
RECIPIENT:	EPA, NHDES, USAF
DATE:	January 1991
TYPE:	Community Relations Plan
SECOND REFERENCE:	None
LOCATION:	ARF, IR

#

DOCUMENT NUMBER:	PEA (10.2) #2 001-080
LONG TITLE:	U.S. Air Force Installation Restoration Program Community Relations Plan for Pease AFB, NH Interim Final
AUTHOR:	Dynamac Corporation 230 Peachtree St., N.W., Ste. 500 Atlanta, GA 30303
RECIPIENT:	USAF
DATE:	July 1993
TYPE:	CRP
SECOND REFERENCE:	None
LOCATION:	ARF

#

10.3 Public Notices

#

DOCUMENT NUMBER:	PEA (10.3) #7 001-001
LONG TITLE:	Paid Advertisement in *Portsmouth Herald* for Zone 5 and Site 8 Proposed Plan Public Comment Period and Public Hearing
AUTHOR:	USAF
RECIPIENT:	*Portsmouth Herald*, Public
DATE:	6 February 1994
TYPE:	Public Notice
SECOND REFERENCE:	Zone 5; Sitr 8
LOCATION:	ARF (Section 10.3 Binder)

#

DOCUMENT NUMBER:	PEA (10.3) #8 001-001
LONG TITLE:	Paid Advertisement in *Foster's Daily Democrat* for Zone 5 and Site 8 Public Comment Period and Public Hearing
AUTHOR:	USAF
RECIPIENT:	*Foster's Daily Democrat;* Public
DATE:	5 February 1994
TYPE:	Public Notice
SECOND REFERENCE:	Zone 5; Site 8
LOCATION:	ARF (Section 10.3 Binder)

#

DOCUMENT NUMBER:	PEA (10.3) #9 001-001
LONG TITLE:	Paid Advertisement in *Foster's Daily Democrat* for Zone 5 and Site 8 Public Comment Period and Public Hearing
AUTHOR:	USAF
RECIPIENT:	*Foster's Daily Democrat;* Public
DATE:	26 February 1994
TYPE:	Public Notice
SECOND REFERENCE:	Zone 5; Site 8
LOCATION:	ARF (Section 10.3 Binder)

#

DOCUMENT NUMBER:	PEA (10.3) #10 001-001
LONG TITLE:	Paid Advertisement in the *Portsmouth Herald* for Zone 5 and Site 8 Public Comment Period and Public Hearing
AUTHOR:	USAF
RECIPIENT:	*Portsmouth Herald*; Public
DATE:	27 February 1994
TYPE:	Public Notice
SECOND REFERENCE:	Zone 5; Site 8
LOCATION:	ARF (Section 10.3 Binder)

#

10.4 Public Meeting Transcripts

DOCUMENT NUMBER:	PEA (10.4) #3 001-025
LONG TITLE:	Pease Air Force Base Public Workshop and Information Meeting: Installation Restoration Program
AUTHOR:	Dynamac Corporation 230 Peachtree St., N.W. Suite 500 Atlanta, Georgia 30303
RECIPIENT:	USAF
DATE:	12 January 1993
TYPE:	Meeting Summary
SECOND REFERENCE:	None
LOCATION:	IR

#

10.5 Documentation of Other Public Meetings

DOCUMENT NUMBER:	PEA (10.5) #1 001-007
LONG TITLE:	Meeting Minutes of Technical Review Committee
AUTHOR:	USAF
RECIPIENT:	See Distribution List
DATE:	30 July 1991
TYPE:	Meeting Minutes
SECOND REFERENCE:	None
LOCATION:	ARF (Section 10.5 Binder)

#

DOCUMENT NUMBER:	PEA (10.5) #2 001-007
LONG TITLE:	Meeting Minutes of Technical Review Committee
AUTHOR:	USAF
RECIPIENT:	See Distribution List
DATE:	27 August 1991
TYPE:	Meeting Minutes
SECOND REFERENCE:	None
LOCATION:	ARF (Section 10.5 Binder)

#

DOCUMENT NUMBER:	PEA (10.5) #3 001-010
LONG TITLE:	Meeting Minutes of Technical Review Committee
AUTHOR:	USAF
RECIPIENT:	See Distribution List
DATE:	01 October 1991
TYPE:	Meeting Minutes
SECOND REFERENCE:	None
LOCATION:	ARF (Section 10.5 Binder)

#

DOCUMENT NUMBER:	PEA (10.5) #4 001-003
LONG TITLE:	Meeting Minutes of Technical Review Committee
AUTHOR:	USAF
RECIPIENT:	See Distribution List
DATE:	29 October 1991
TYPE:	Meeting Minutes
SECOND REFERENCE:	None
LOCATION:	ARF (Section 10.5 Binder)

#

DOCUMENT NUMBER:	PEA (10.5) #5 001-013
LONG TITLE:	Meeting Minutes of Technical Review Committee
AUTHOR:	USAF
RECIPIENT:	See Distribution List
DATE:	26 November 1991
TYPE:	Meeting Minutes
SECOND REFERENCE:	None
LOCATION:	ARF (Section 10.5 Binder)

#

DOCUMENT NUMBER:	PEA (10.5) #6 001-005
LONG TITLE:	Meeting Minutes of Technical Review Committee
AUTHOR:	USAF
RECIPIENT:	See Distribution List
DATE:	07 January 1992
TYPE:	Meeting Minutes
SECOND REFERENCE:	None

LOCATION: ARF (Section 10.5 Binder)

#

DOCUMENT NUMBER: PEA (10.5) #7 001-003
LONG TITLE: Meeting Minutes of Technical Review Committee
AUTHOR: USAF
RECIPIENT: See Distribution List
DATE: 31 March 1992
TYPE: Meeting Minutes
SECOND REFERENCE: None
LOCATION: ARF (Section 10.5 Binder)

#

DOCUMENT NUMBER: PEA (10.5) #8 001-002
LONG TITLE: Meeting Minutes of Technical Review Committee
AUTHOR: USAF
RECIPIENT: See Distribution List
DATE: 28 April 1992
TYPE: Meeting Minutes
SECOND REFERENCE: None
LOCATION: ARF (Section 10.5 Binder)

#

DOCUMENT NUMBER: PEA (10.5) #9 001-003
LONG TITLE: Meeting Minutes of Technical Review Committee
AUTHOR: USAF
RECIPIENT: See Distribution List
DATE: 20 May 1992
TYPE: Meeting Minutes
SECOND REFERENCE: None
LOCATION: ARF (Section 10.5 Binder)

#

DOCUMENT NUMBER: PEA (10.5) #10 001-005
LONG TITLE: Meeting Minutes of Technical Review Committee
AUTHOR: USAF
RECIPIENT: See Distribution List
DATE: 29 September 1992
TYPE: Meeting Minutes
SECOND REFERENCE: None
LOCATION: ARF (Section 10.5 Binder)

#

DOCUMENT NUMBER: PEA (10.5) #11 001-013
LONG TITLE: Meeting Minutes of Technical Review Committee
AUTHOR: USAF
RECIPIENT: See Distribution List
DATE: 27 October 1992
TYPE: Meeting Minutes
SECOND REFERENCE: None
LOCATION: ARF (Section 10.5 Binder)

#

DOCUMENT NUMBER: PEA (10.5) #12 001-004
LONG TITLE: Meeting Minutes of Technical Review Committee
AUTHOR: USAF
RECIPIENT: See Distribution List
DATE: 16 December 1992
TYPE: Meeting Minutes
SECOND REFERENCE: None

LOCATION: ARF (Section 10.5 Binder)

#

DOCUMENT NUMBER: PEA (10.5) #13 001-004
LONG TITLE: Meeting Minutes of the Technical Review Committee
AUTHOR: USAF
RECIPIENT: See Distribution List
DATE: 22 February 1990
TYPE: Meeting Minutes
SECOND REFERENCE: None
LOCATION: ARF (Section 10.5 Binder)

#

DOCUMENT NUMBER: PEA (10.5) #14 001-013
LONG TITLE: Meeting Minutes of the Technical Review Committee
AUTHOR: USAF
RECIPIENT: See Distribution List
DATE: 30 March 1990
TYPE: Meeting Minutes
SECOND REFERENCE: None
LOCATION: ARF (Section 10.5 Binder)

#

DOCUMENT NUMBER: PEA (10.5) #15 001-004
LONG TITLE: Meeting Minutes of the Technical Review Committee
AUTHOR: USAF
RECIPIENT: See Distribution List
DATE: 27 April 1990
TYPE: Meeting Minutes
SECOND REFERENCE: None
LOCATION: ARF (Section 10.5 Binder)

#

DOCUMENT NUMBER: PEA (10.5) #16 001-010
LONG TITLE: Meeting minutes of the Technical Review Committee
AUTHOR: Department of the Air Force
RECIPIENT: See Distribution List
DATE: 30 May 1990
TYPE: Meeting Minutes
SECOND REFERENCE: None
LOCATION: ARF (Section 10.5 Binder)

#

DOCUMENT NUMBER: PEA (10.5) #17 001-008
LONG TITLE: Meeting minutes of the Technical Review Committee
AUTHOR: Department of the Air Force
RECIPIENT: See Distribution List
DATE: 27 June 1990
TYPE: Meeting Minutes
SECOND REFERENCE: None
LOCATION: ARF (Section 10.5 Binder)

#

DOCUMENT NUMBER: PEA (10.5) 18 001-005
LONG TITLE: Meeting minutes of the Technical Review Committee
AUTHOR: Department of the Air Force
RECIPIENT: See Distribution List
DATE: 25 July 1990
TYPE: Meeting Minutes
SECOND REFERENCE: None

LOCATION: ARF (Section 10.5 Binder)

#

DOCUMENT NUMBER: PEA (10.5) #19 001-005
LONG TITLE: Meeting minutes of the Technical Review Committee
AUTHOR: Department of the Air Force
RECIPIENT: See Distribution List
DATE: 29 August 1990
TYPE: Meeting Minutes
SECOND REFERENCE: None
LOCATION: ARF (Section 10.5 Binder)

#

DOCUMENT NUMBER: PEA (10.5) #20 001-012
LONG TITLE: Meeting minutes of the Technical Review Committee
AUTHOR: Department of the Air Force
RECIPIENT: See Distribution List
DATE: 26 September 1990
TYPE: Meeting Minutes
SECOND REFERENCE: None
LOCATION: ARF (Section 10.5 Binder)

#

DOCUMENT NUMBER: PEA (10.5) #21 001-008
LONG TITLE: Meeting minutes of the Technical Review Committee
AUTHOR: Department of the Air Force
RECIPIENT: See Distribution List
DATE: 31 October 1990
TYPE: Meeting Minutes
SECOND REFERENCE: None
LOCATION: ARF (Section 10.5 Binder)

#

DOCUMENT NUMBER: PEA (10.5) #22 001-004
LONG TITLE: Meeting minutes of the Technical Review Committee
AUTHOR: Department of the Air Force
RECIPIENT: See Distribution List
DATE: 29 November 1990
TYPE: Meeting Minutes
SECOND REFERENCE: None
LOCATION: ARF (Section 10.5 Binder)

#

DOCUMENT NUMBER: PEA (10.5) #23 001-003
LONG TITLE: Meeting minutes of the Technical Review Committee
AUTHOR: Department of the Air Force
RECIPIENT: See Distribution List
DATE: 31 January 1991
TYPE: Meeting Minutes
SECOND REFERENCE: None
LOCATION: ARF (Section 10.5 Binder)

#

DOCUMENT NUMBER: PEA (10.5) #24 001-003
LONG TITLE: Meeting minutes of the Technical Review Committee
AUTHOR: Department of the Air Force
RECIPIENT: See Distribution List
DATE: 27 March 1991
TYPE: Meeting Minutes
SECOND REFERENCE: None

LOCATION: ARF (Section 10.5 Binder)

#

DOCUMENT NUMBER: PEA (10.5) #25 001-006
LONG TITLE: Meeting minutes of the Technical Review Committee
AUTHOR: Department of the Air Force
RECIPIENT: See Distribution List
DATE: 24 April 1991
TYPE: Meeting Minutes
SECOND REFERENCE: None
LOCATION: ARF (Section 10.5 Binder)

#

DOCUMENT NUMBER: PEA (10.5) #26 001-003
LONG TITLE: Meeting minutes of the Technical Review Committee
AUTHOR: Department of the Air Force
RECIPIENT: See Distribution List
DATE: 28 May 1991
TYPE: Meeting Minutes
SECOND REFERENCE: None
LOCATION: ARF (Section 10.5 Binder)

#

DOCUMENT NUMBER: PEA (10.5) #27 001-006
LONG TITLE: Meeting minutes of the Technical Review Committee
AUTHOR: Department of the Air Force
RECIPIENT: See Distribution List
DATE: 25 June 1991
TYPE: Meeting Minutes
SECOND REFERENCE: None
LOCATION: ARF (Section 10.5 Binder)

#

DOCUMENT NUMBER: PEA (10.5) #28 001-008
LONG TITLE: Meeting Minutes of the Technical Review Committee
AUTHOR: USAF
RECIPIENT: See Distribution List
DATE: 31 August 1993
TYPE: Meeting Minutes
SECOND REFERENCE: None
LOCATION: ARF (Section 10.5 Binder)

#

DOCUMENT NUMBER: PEA (10.5) #29 001-011
LONG TITLE: Technical Review Committee Meeting Minutes
AUTHOR: USAF
RECIPIENT: See Distribution List
DATE: 30 November 1993
TYPE: Meeting Minutes
SECOND REFERENCE: None
LOCATION: ARF (Section 10.5 Binder)

#

DOCUMENT NUMBER: PEA (10.5) #30 001-009
LONG TITLE: Meeting Minutes of Technical Review Committee
AUTHOR: USAF
RECIPIENT: See Distribution List
DATE: 28 September 1993
TYPE: Meeting Minutes
SECOND REFERENCE: None

LOCATION:	ARF (Section 10.5 Binder)

#

DOCUMENT NUMBER:	PEA (10.5) #31 001-010
LONG TITLE:	Technical Review Committee Meeting Minutes
AUTHOR:	USAF
RECIPIENT:	See Distribution List
DATE:	26 October 1993
TYPE:	Meeting Minutes
SECOND REFERENCE:	None
LOCATION:	ARF (Section 10.5 Binder)

#

DOCUMENT NUMBER:	PEA (10.5) #32 001-002
LONG TITLE:	Technical Review Committee Meeting Minutes
AUTHOR:	USAF
RECIPIENT:	See Distribution List
DATE:	18 January 1994
TYPE:	Meeting Minutes
SECOND REFERENCE:	None
LOCATION:	ARF (Section 10.5 Binder)

#

10.6 Fact Sheets, Press Advisories, and News Releases

DOCUMENT NUMBER: PEA (10.6) #1 001-003
LONG TITLE: "News release regarding the investigation of 22 sites on Pease AFB"
AUTHOR: U.S. Air Force
RECIPIENT: Media
DATE: 30 September 1987
TYPE: News Release
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (10.6) #2 001-002
LONG TITLE: "News release regarding presentation of the second interim technical report"
AUTHOR: U.S. Air Force
RECIPIENT: Media
DATE: 21 September 1988
TYPE: News Release
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (10.6) #3 001-003
LONG TITLE: "News release regarding the underground water sampling program"
AUTHOR: U.S. Air Force
RECIPIENT: Media
DATE: 29 November 1988
TYPE: News Release
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (10.6) #4 001-002
LONG TITLE: "News release regarding the release of the third interim technical report"
AUTHOR: U.S. Air Force
RECIPIENT: Media
DATE: 22 March 1989
TYPE: News Release
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (10.6) #5 001-004
LONG TITLE: "News release regarding off-base well water sampling results"
AUTHOR: U.S. Air Force
RECIPIENT: Media
DATE: 7 June 1989
TYPE: News Release
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (10.6) #7 001-003
LONG TITLE: "Superfund Program Draft Interagency Agreement Fact Sheet"
AUTHOR: U.S. EPA, Region I
RECIPIENT: See Mailing List
DATE: December 1990
TYPE: Fact Sheet
SECOND REFERENCE: None

LOCATION: ARF

#

DOCUMENT NUMBER: PEA (10.6) #8 001-008
LONG TITLE: Pease Air Force Base Installation Restoration Program Update: Remedial Investigation/Feasibility Study
AUTHOR: USAF
RECIPIENT: See Distribution List
DATE: October 1991
TYPE: Fact Sheet
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (10.6) #9 001-011
LONG TITLE: Pease Air Force Base Installation Restoration Program Update: Information Update
AUTHOR: USAF
RECIPIENT: See Distribution List
DATE: December 1992
TYPE: Fact Sheet
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (10.6) #10 001-004
LONG TITLE: Pease Air Force Base Installation Restoration Program Update: Interim Groundwater Treatment - Sites 8, 32/36 and 34
AUTHOR: USAF
RECIPIENT: See Distribution List
DATE: January 1993
TYPE: Fact Sheet
SECOND REFERENCE: Sites 8, 34, 32/36
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (10.6) #20 001-004
LONG TITLE: Pease AFB Environmental Reporter Volume 1, Number 1
AUTHOR: USAF
RECIPIENT: See Mailing List
DATE: January 1994
TYPE: Newsletter
SECOND REFERENCE: None
LOCATION: ARF (Section 10.6 Binder)

#

DOCUMENT NUMBER: PEA (10.6) #21 001-004
LONG TITLE: Pease AFB Installation Restoration Program Update, Proposed Plan for IRP Site 8
AUTHOR: USAF
RECIPIENT: See Mailing List
DATE: January 1994
TYPE: Fact Sheet
SECOND REFERENCE: Site 8
LOCATION: ARF (Section 10.6 Binder)

#

DOCUMENT NUMBER: PEA (10.6) #22 001-004
LONG TITLE: Pease AFB Installation Restoration Program Update, Proposed Plan for IRP Zone 5 (Site 9 and 11)
AUTHOR: USAF
RECIPIENT: See Mailing List
DATE: January 1994
TYPE: Fact Sheet
SECOND REFERENCE: Zone 5
LOCATION: ARF (Section 10.6 Binder)

#

DOCUMENT NUMBER:	PEA (10.6) #23 001-001
LONG TITLE:	News Release Regarding Postponement of Site 8/Zone 5 Public Hearing
AUTHOR:	USAF
RECIPIENT:	Media
DATE:	9 February 1994
TYPE:	News Release
SECOND REFERENCE:	Site 8; Zone 5
LOCATION:	ARF (Section 10.6 Binder)

#

10.10 Correspondence

DOCUMENT NUMBER: PEA (10.10) #1 001-001
LONG TITLE: "Letter regarding concern about the hazardous waste sites at Pease AFB"
AUTHOR: Gordon J. Humphrey, U.S. Senate
RECIPIENT: James F. McGovern, Acting Secretary of the Air Force
DATE: 24 March 1989
TYPE: Letter
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (10.10) #2 001-002
LONG TITLE: "Letter regarding the migration of Air Force hazardous waste beyond the Pease AFB perimeter"
AUTHOR: Town of Newington
RECIPIENT: Robert Field, Environmental Cleanup Advisory Committee, Portsmouth, NH
DATE: 11 May 1990
TYPE: Letter
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (10.10) #3 001-008
LONG TITLE: "Letter regarding groundwater sampling conducted on private property"
AUTHOR: Department of the Air Force
RECIPIENT: Will Gilbert, Newington, NH
DATE: 6 June 1989
TYPE: Letter
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (10.10) #4 001-001
LONG TITLE: Submittal Letter for Draft Community Relations Plan for the Massachusetts Military Reservation (MMR) on Cape Cod, Massachusetts
AUTHOR: Douglas S. Gutro, USEPA
RECIPIENT: Karen Cowden,
Roy F. Weston, Inc.
DATE: 19 June 1990
TYPE: Letter
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (10.10) #5 001-002
LONG TITLE: Impact of Base Closure on Personnel Responsible for the Installation Restoration Program and Public Affairs
AUTHOR: Merrill S. Hohman, USEPA
RECIPIENT: Col. James R. Wilson
Pease AFB, NH
DATE: 27 August 1990
TYPE: Letter
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (10.10) #6 001-001
LONG TITLE: Impact of Base Closure on Personnel Responsible for the Installation Restoration Program and Public Affairs (Your Letter, August 27, 1990)
AUTHOR: USAF
RECIPIENT: Merrill S. Hohman, USEPA

DATE:	11 October 1990
TYPE:	Letter
SECOND REFERENCE:	None
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (10.10) #7 001-001
LONG TITLE:	Submittal of Primary Documents (Community Relations Plan)
AUTHOR:	USAF
RECIPIENT:	Jim Brown, USEPA
DATE:	24 October 1990
TYPE:	Letter
SECOND REFERENCE:	PEA (10.2)
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (10.10) #8 001-001
LONG TITLE:	Submittal of Primary Documents (Community Relations Plan)
AUTHOR:	USAF
RECIPIENT:	Richard Pease, NHDES
DATE:	24 October 1990
TYPE:	Letter
SECOND REFERENCE:	PEA (10.2)
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (10.10) #9 001-001
LONG TITLE:	Community Relations Plan Development Extension
AUTHOR:	USAF
RECIPIENT:	Johanna Hunter, USEPA
DATE:	17 January 1991
TYPE:	Letter
SECOND REFERENCE:	PEA (10.2)
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (10.10) #10 001-001
LONG TITLE:	Community Relations Plan Development Extension
AUTHOR:	USAF
RECIPIENT:	Richard Pease, NHDES
DATE:	17 January 1991
TYPE:	Letter
SECOND REFERENCE:	PEA (10.2)
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (10.10) #11 001-001
LONG TITLE:	Submittal of Draft Final Primary Documents
AUTHOR:	USAF
RECIPIENT:	Richard Pease, NHDES
DATE:	5 February 1991
TYPE:	Letter
SECOND REFERENCE:	PEA (3.1); PEA (3.3)
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (10.10) #12 001-001
LONG TITLE:	Submittal of Draft Final Primary Documents
AUTHOR:	USAF
RECIPIENT:	Johanna Hunter, USEPA

DATE: 5 February 1991
TYPE: Letter
SECOND REFERENCE: PEA (3.1); PEA (3.3)
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (10.10) #13 001-001
LONG TITLE: Community Relations Plan
AUTHOR: USAF
RECIPIENT: Johanna Hunter, USEPA
DATE: 12 April 1991
TYPE: Letter
SECOND REFERENCE: PEA (10.2)
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (10.10) #14 001-004
LONG TITLE: Basewide ARARs Pease AFB, NH 03803, January 1993, DRAFT – Review Comments
AUTHOR: Richard Pease, NHDES
RECIPIENT: Arthur Ditto, Pease AFB
DATE: 1 April 1993
TYPE: Letter
SECOND REFERENCE: PEA (4.1)
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (10.10) #15 001-002
LONG TITLE: Installation Restoration Program, Stage 4, No Further Action Decision Document for IRP Site 11, February 1993 Review Comments
AUTHOR: Richard Pease, NHDES
RECIPIENT: Arthur Ditto, Pease AFB
DATE: 2 April 1993
TYPE: Letter
SECOND REFERENCE: Site 11
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (10.10) #17 001-010
LONG TITLE: Zone 5 Initial Screening of Alternatives Report DRAFT March 1993 – Review Comments
AUTHOR: Richard Pease, NHDES
RECIPIENT: Arthur Ditto, Pease AFB
DATE: 23 April 1993
TYPE: Letter
SECOND REFERENCE: Zone 5
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (10.10) #21 001-012
LONG TITLE: Proposed Plan for IRP Site 8, Fire Department Training Area 2, March 1993, DRAFT – Review Comments
AUTHOR: Richard Pease, NHDES
RECIPIENT: Arthur Ditto, Pease AFB
DATE: 14 May 1993
TYPE: Letter
SECOND REFERENCE: Site 8
LOCATION: ARF

#

11.1 EPA Headquarters Guidance

* **NOTE:** **Guidance documents listed as bibliographic sources for a document already included in the Administrative Record are not listed separately in this index.**

DOCUMENT NUMBER: PEA (11.1) #1 001-003
LONG TITLE: Risk Assessment Issue Paper for Carcinogenicity Characterization for Trichloroethylene (CASRN 79-01-6), Tetrachloroethylene (CASRN 127-18-4), and Styrene (CASRN 100-42-5)
AUTHOR: USEPA
RECIPIENT: USAF
DATE: 14 July 1992
TYPE: Guidance
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (11.1) #2 001-G.2
LONG TITLE: Draft Guidance on Preparing Superfund Decision Documents: The Proposed Plan and Record of Decision
AUTHOR: Office of Emergency & Remedial Response, EPA, Washington, DC
RECIPIENT: USAF
DATE: March 1988
TYPE: Guidance
SECOND REFERENCE: None
LOCATION: Art's Office

#

DOCUMENT NUMBER: PEA (11.1) #3 001-B.9
LONG TITLE: The RPM Primer: An Introductory Guide to the Role and Responsibilities of the Superfund Remedial Project Manager
AUTHOR: Office of Emergency and Remedial Response, EPA, Washington, DC
RECIPIENT: USAF
DATE: September 1987
TYPE: Guidance
SECOND REFERENCE: None
LOCATION: Art's Office

#

DOCUMENT NUMBER: PEA (11.1) #4 001-11.1
LONG TITLE: CERCLA Site Discrepancies to POTWs Guidance Manual
AUTHOR: Office of Emergency and Remedial Response, EPA, Washington, DC
RECIPIENT: USAF
DATE: August 1990
TYPE: Guidance
SECOND REFERENCE: None
LOCATION: Art's Office

#

DOCUMENT NUMBER: PEA (11.1) #5 001-041
LONG TITLE: Framework for Ecological Risk Assessment
AUTHOR: EPA
RECIPIENT: USAF
DATE: February 1992
TYPE: Guidance
SECOND REFERENCE: None
LOCATION: Art's Office

#

DOCUMENT NUMBER: PEA (11.1) #6 001-E.1
LONG TITLE: Preliminary Assessment Guidance Fiscal Year 1988

AUTHOR: Office of Emergency and Remedial Response, EPA, Washington, DC
RECIPIENT: USAF
DATE: January 1988
TYPE: Guidance
SECOND REFERENCE: None
LOCATION: Art's Office

#

DOCUMENT NUMBER: PEA (11.1) #7 001-G.1
LONG TITLE: Community Relations in Superfund: A Handbook (Interim Version)
AUTHOR: Office of Emergency and Remedial Response, EPA, Washington, DC
RECIPIENT: USAF
DATE: 1988
TYPE: Guidance
SECOND REFERENCE: None
LOCATION: Art's Office

#

DOCUMENT NUMBER: PEA (11.1) #8 001-H.6
LONG TITLE: Summary Report on Issues in Ecological Risk Assessment
AUTHOR: EPA
RECIPIENT: USAF
DATE: February 1991
TYPE: Guidance
SECOND REFERENCE: None
LOCATION: Art's Office

#

DOCUMENT NUMBER: PEA (11.1) #9 001-127
LONG TITLE: Technology Screening Guide for Treatment of CERCLA Soils and Sludges
AUTHOR: EPA
RECIPIENT: USAF
DATE: September 1988
TYPE: Guidance
SECOND REFERENCE: None
LOCATION: Art's Office

#

DOCUMENT NUMBER: PEA (11.1) #10 001-F.19
LONG TITLE: Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA -- Interim Final
AUTHOR: Office of Emergency and Remedial Response, EPA, Washington, DC
RECIPIENT: USAF
DATE: October 1988
TYPE: Guidance
SECOND REFERENCE: None
LOCATION: Art's Office

#

DOCUMENT NUMBER: PEA (11.1) #11 001-103
LONG TITLE: Final Guidance on Administrative Records for Selecting CERCLA Response Actions
AUTHOR: Office of Solid Waste and Emergency Response, EPA, Washington, DC
RECIPIENT: USAF
DATE: 1190/91
TYPE: Guidance
SECOND REFERENCE: None
LOCATION: Art's Office

#

DOCUMENT NUMBER: PEA (11.1) #12 001-B.2

LONG TITLE:	Implementing EPA's Groundwater Protection Strategy for the 1990's: Draft Comprehensive State Groundwater Protection Program Guidance
AUTHOR:	EPA
RECIPIENT:	USAF
DATE:	1992
TYPE:	Guidance
SECOND REFERENCE:	None
LOCATION:	Art's Office

#

DOCUMENT NUMBER:	PEA (11.1) #13 001-021
LONG TITLE:	A Handbook for State Groundwater Managers
AUTHOR:	Office of Water, EPA, Washington, DC
RECIPIENT:	USAF
DATE:	May 1992
TYPE:	Guidance
SECOND REFERENCE:	None
LOCATION:	Art's Office

#

DOCUMENT NUMBER:	PEA (11.1) #14 001-3.40
LONG TITLE:	Conducting Remedial Investigations/Feasibility Studies for CERCLA Municipal Landfill Sites
AUTHOR:	Office of Emergency and Remedial Response, EPA, Washington, DC
RECIPIENT:	USAF
DATE:	February 1991
TYPE:	Guidance
SECOND REFERENCE:	None
LOCATION:	Art's Office

#

DOCUMENT NUMBER:	PEA (11.1) #15 001-F.2
LONG TITLE:	Guidance on Preparing Superfund Decision Documents: The Proposed Plan, The Record of Decision, and Explanation of Significant Differences, The Record of Decision Amendment
AUTHOR:	Office of Emergency and Remedial Response, EPA, Washington, DC
RECIPIENT:	USAF
DATE:	July 1989
TYPE:	Guidance
SECOND REFERENCE:	None
LOCATION:	Art's Office

#

DOCUMENT NUMBER:	PEA (11.1) #16 001-B.12
LONG TITLE:	Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part A) Interim Final
AUTHOR:	Office of Emergency and Remedial Response, EPA, Washington, DC
RECIPIENT:	USAF
DATE:	December 1989
TYPE:	Guidance
SECOND REFERENCE:	None
LOCATION:	Art's Office

#

DOCUMENT NUMBER:	PEA (11.1) #17 001-057
LONG TITLE:	Risk Assessment Guidance for Superfund Volume II: Environmental Evaluation Manual Interim Final
AUTHOR:	Office of Emergency and Remedial Response, EPA, Washington, DC
RECIPIENT:	USAF
DATE:	March 1989
TYPE:	Guidance
SECOND REFERENCE:	None
LOCATION:	Art's Office

#

DOCUMENT NUMBER: PEA (11.1) #18 Deleted

#

DOCUMENT NUMBER: PEA (11.1) #19 001-B.2
LONG TITLE: Superfund Removal Procedures Action Memorandum Guidance
AUTHOR: EPA
RECIPIENT: USAF
DATE: December 1990
TYPE: Guidance
SECOND REFERENCE: None
LOCATION: Art's Office

#

DOCUMENT NUMBER: PEA (11.1) #20 001-G
LONG TITLE: RCRA Orientation Manual
AUTHOR: EPA
RECIPIENT: USAF
DATE: 1990
TYPE: Guidance
SECOND REFERENCE: None
LOCATION: Art's Office

#

DOCUMENT NUMBER: PEA (11.1) #21 001-295
LONG TITLE: The Superfund Innovative Technology Evaluation Program: Technology Profiles
AUTHOR: EPA
RECIPIENT: USAF
DATE: November 1991
TYPE: Guidance
SECOND REFERENCE: None
LOCATION: Art's Office

#

DOCUMENT NUMBER: PEA (11.1) #22 001-017
LONG TITLE: Accessing Federal Data Bases for Contaminated Site Clean-Up Technologies
AUTHOR: EPA
RECIPIENT: USAF
DATE: May 1991
TYPE: Guidance
SECOND REFERENCE: None
LOCATION: Art's Office

#

DOCUMENT NUMBER: PEA (11.1) #23 001-023
LONG TITLE: Bibliography of Federal Reports and Publications Describing Alternatives and Innovative Treatment Technologies for Corrective Action and Site Remediation
AUTHOR: EPA
RECIPIENT: USAF
DATE: May 1991
TYPE: Guidance
SECOND REFERENCE: None
LOCATION: Art's Office

#

DOCUMENT NUMBER: PEA (11.1) #24 001-111
LONG TITLE: Synopses of Federal Demonstrations of Innovative Site Remediation Technologies
AUTHOR: EPA
RECIPIENT: USAF
DATE: May 1991

TYPE:	Guidance
SECOND REFERENCE:	None
LOCATION:	Art's Office

#

11.2 EPA Regional Guidance

* **NOTE:** **Guidance documents listed as bibliographic sources for a document already included in the Administrative Record are not listed separately in this index.**

DOCUMENT NUMBER:	PEA (11.2) #1 001-C.1
LONG TITLE:	Land Disposal Restrictions Summary of Requirements
AUTHOR:	EPA, Region 1
RECIPIENT:	USAF
DATE:	August 1990
TYPE:	Guidance
SECOND REFERENCE:	None
LOCATION:	Art's Office

#

DOCUMENT NUMBER:	PEA (11.2) #2 001-107
LONG TITLE:	Supplemental Risk Assessment Guidance for the Superfund Program
AUTHOR:	EPA, Region 1
RECIPIENT:	USAF
DATE:	June 1989
TYPE:	Guidance
SECOND REFERENCE:	None
LOCATION:	Art's Office

#

11.3 State Guidance

* **NOTE:** **Guidance documents listed as bibliographic sources for a document already included in the Administrative Record are not listed separately in this index.**

DOCUMENT NUMBER: PEA (11.3) #1 001-001
LONG TITLE: ENC-WS 410 Groundwater Protection Rules
AUTHOR: NHDES
RECIPIENT: Art Ditto, AFBDA
DATE: February 18, 1993
TYPE: Letter
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (11.3) #2 001-B.8
LONG TITLE: Interim Policy for the Management of Soils Contaminated from Spills/Releases of Virgin Petroleum Products
AUTHOR: NHDES
RECIPIENT: USAF
DATE: September 1991
TYPE: Guidance
SECOND REFERENCE: None
LOCATION: Art's Office

#

DOCUMENT NUMBER: PEA (11.3) #3 001-048
LONG TITLE: Groundwater Protection Rules
AUTHOR: NHDES
RECIPIENT: USAF
DATE: February 1993
TYPE: Guidance
SECOND REFERENCE: None
LOCATION: Art's Office

#

DOCUMENT NUMBER: PEA (11.3) #4 001-37.3
LONG TITLE: New Hampshire Rules for the Control of Radiation
AUTHOR: NHDES
RECIPIENT: USAF
DATE: April 1983
TYPE: Guidance
SECOND REFERENCE: None
LOCATION: Art's Office

#

DOCUMENT NUMBER: PEA (11.3) #5 001-C.15
LONG TITLE: Guidance Document for the Closure of Solid Waste Landfills in New Hampshire
AUTHOR: NHDES
RECIPIENT: USAF
DATE: May 1990
TYPE: Guidance
SECOND REFERENCE: None
LOCATION: Art's Office

#

DOCUMENT NUMBER: PEA (11.3) #6 001-D.7
LONG TITLE: Guidebook for Environmental Permits in New Hampshire
AUTHOR: NHDES
RECIPIENT: USAF
DATE: 1992

TYPE:	Guidance
SECOND REFERENCE:	None
LOCATION:	Art's Office

#

11.4 Air Force Guidance

DOCUMENT NUMBER:	PEA (11.4) #1 001-024
LONG TITLE:	"Ecological Risk Assessment Guidance for Pease AFB, New Hampshire"
AUTHOR:	Mitre Corporation, Civil Systems Division
RECIPIENT:	Air Force
DATE:	20 June 1990
TYPE:	Letter Report
SECOND REFERENCE:	None
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (11.4) #2 001-016
LONG TITLE:	"Implementation of Department of Defense (DOD) policy guidance on IRP Policy No. 1"
AUTHOR:	Department of the Air Force
RECIPIENT:	See Distribution List
DATE:	11 December 1981
TYPE:	Policy/Guidance Document
SECOND REFERENCE:	None
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (11.4) #3 001-002
LONG TITLE:	"Implementation of DOD policy guidance on Installation Restoration Plan (IRP), Policy No. 1"
AUTHOR:	Department of the Air Force
RECIPIENT:	See Distribution List
DATE:	5 March 1982
TYPE:	Policy/Guidance Document
SECOND REFERENCE:	None
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (11.4) #4 001-003
LONG TITLE:	"Relationship of the IRP to RCRA enforcement actions
AUTHOR:	Department of the Air Force"
RECIPIENT:	See Distribution List
DATE:	26 December 1985
TYPE:	Policy Document
SECOND REFERENCE:	None
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (11.4) #5 001-002
LONG TITLE:	"Guidance for Air Force Installation Compliance with Volatile Organic Compound Regulations"
AUTHOR:	Department of the Air Force"
RECIPIENT:	See Distribution List
DATE:	8 October 1986
TYPE:	Guidance Document
SECOND REFERENCE:	None
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (11.4) #6 001-003
LONG TITLE:	"IRP Decision Documentation Policy"
AUTHOR:	Department of the Air Force"
RECIPIENT:	See Distribution List
DATE:	25 May 1988
TYPE:	Policy Letter
SECOND REFERENCE:	None

LOCATION: ARF

#

DOCUMENT NUMBER: PEA (11.4) #7 001-003
LONG TITLE: "RCRA Facility Assessment Guidance to Installation"
AUTHOR: Department of the Air Force"
RECIPIENT: See Distribution List
DATE: 3 August 1988
TYPE: Guidance
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (11.4) #8 001-003
LONG TITLE: "Guidance on base map construction and digitization D.O. 006 Pease AFB"
AUTHOR: Department of the Air Force"
RECIPIENT: Roy F. Weston, Inc.
DATE: 6 March 1989
TYPE: Guidance Document
SECOND REFERENCE: None
LOCATION: ARF

#

DOCUMENT NUMBER: PEA (11.4) #9 001-I.3
LONG TITLE: Handbook to Support the Installation Restoration Program Statements of Work for Remedial Investigation/Feasibility Studies Version 3.0
AUTHOR: Air Force Occupational and Environmental Health Laboratory Technical Services Division
RECIPIENT: Pease AFB
DATE: May 1989
TYPE: Handbook
SECOND REFERENCE: None
LOCATION: Art's Office

#

DOCUMENT NUMBER: PEA (11.4) #10 001-BI.3
LONG TITLE: United States Air Force Environmental Restoration Program NFRAP Guide: Making, Documenting and Evacuating No Further Response Action Planned Decisions -- Final Draft
AUTHOR: USAF
RECIPIENT: Pease AFB
DATE: February 1993
TYPE: Guidance
SECOND REFERENCE: None
LOCATION: Art's Office

#

DOCUMENT NUMBER: PEA (11.4) #11 001-087
LONG TITLE: Air Force Logistics Command Public Affairs Environmental Guidance
AUTHOR: USAF
RECIPIENT: Pease AFB
DATE: March 31, 1989
TYPE: Guidance
SECOND REFERENCE: None
LOCATION: Art's Office

#

DOCUMENT NUMBER: PEA (11.4) #12 001-IX.A1.3
LONG TITLE: Recommended Sampling Procedures
AUTHOR: Air Force Occupational and Environmental Health Laboratory
RECIPIENT: Pease AFB
DATE: March 1989

TYPE: Guidance
SECOND REFERENCE: None
LOCATION: Art's Office

#

DOCUMENT NUMBER: PEA (11.4) #13 001-J.2
LONG TITLE: Report of the Defense Environmental Response Task Force
AUTHOR: Department of Defense
RECIPIENT: Pease AFB
DATE: October 1991
TYPE: Guidance
SECOND REFERENCE: None
LOCATION: Art's Office

#

DOCUMENT NUMBER: PEA (11.4) #14 001-1.5
LONG TITLE: Initiatives for Accelerating Cleanup at BRAC Installations
AUTHOR: Department of Defense
RECIPIENT: Pease AFB
DATE: June 1992
TYPE: Guidance
SECOND REFERENCE: None
LOCATION: Art's Office

#

DOCUMENT NUMBER: PEA (11.4) #15 – Deleted

#

11.5 Technical Sources

DOCUMENT NUMBER:	PEA (11.5) #1 001-022
LONG TITLE:	Trichloroethylene in the Groundwater Supply of Pease Air Force Base Portsmouth, NH
AUTHOR:	U.S. Geological Survey
RECIPIENT:	USAF
DATE:	1982
TYPE:	Technical Source
SECOND REFERENCE:	None
LOCATION:	Art's Office

#

DOCUMENT NUMBER:	PEA (11.5) #2 001-080
LONG TITLE:	Geology and Groundwater Resources of Southeastern New Hampshire
AUTHOR:	U.S. Geological Survey
RECIPIENT:	USAF
DATE:	1964
TYPE:	Technical Source
SECOND REFERENCE:	None
LOCATION:	Art's Office

#

DOCUMENT NUMBER:	PEA (11.5) #3 001-010
LONG TITLE:	Preliminary Wetland Delineation and Evaluation Report for Pease Air Force Base, NH -- Draft
AUTHOR:	The Smart Associates, Environmental Consultants, Inc.
RECIPIENT:	USAF
DATE:	April 1990
TYPE:	Technical Source
SECOND REFERENCE:	None
LOCATION:	Art's Office

#

DOCUMENT NUMBER:	PEA (11.5) #4 001-222
LONG TITLE:	The Ecology of the Great Bay Estuary, New Hampshire and Maine: An Estuarine Profile and Bibliography
AUTHOR:	Jackson Estuarine Laboratory, Durham, NH
RECIPIENT:	USAF
DATE:	October 1992
TYPE:	Technical Source
SECOND REFERENCE:	None
LOCATION:	Art's Office

#

11.6 Proposed Procedures / Procedures

DOCUMENT NUMBER:	PEA (11.6) #1 001-005
LONG TITLE:	"Risk Assessment Data Needs and Sampling Procedures Letter Report"
AUTHOR:	Roy F. Weston, Inc
RECIPIENT:	EPA, NHDES
DATE:	8 March 1991
TYPE:	Letter Report
SECOND REFERENCE:	None
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (11.6) #2 001-051
LONG TITLE:	"Analytical Methods Letter Report" -- Supplemental Information to Stage 4 Sampling and Analysis Plan
AUTHOR:	Roy F. Weston, Inc.
RECIPIENT:	EPA, NHDES
DATE:	23 April 1991
TYPE:	Letter Report
SECOND REFERENCE:	PEA (3.1)
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (11.6) #3 001-055
LONG TITLE:	"Protocols for Generation of Baseline Risk Assessments for the Pease AFB Sites -- Revised"
AUTHOR:	Roy F. Weston, Inc.
RECIPIENT:	EPA, NHDES
DATE:	July 1991
TYPE:	Report
SECOND REFERENCE:	None
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (11.6) #4 001-002
LONG TITLE:	"Procedures for handling solids and liquids produced during well construction and soil borings at Site 8 investigations"
AUTHOR:	Department of the Air Force
RECIPIENT:	NHDES
DATE:	21 August 1990
TYPE:	Procedures
SECOND REFERENCE:	Site 8
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (11.6) #5 001-002
LONG TITLE:	"Disposal of Drill Cuttings From Stage 2 and 3 Investigations"
AUTHOR:	Department of the Air Force
RECIPIENT:	NHDES
DATE:	14 August 1990
TYPE:	Procedures
SECOND REFERENCE:	None
LOCATION:	ARF

#

11.7 Correspondence

DOCUMENT NUMBER:	PEA (11.7) #1 001-006
LONG TITLE:	"Letter to EPA requesting review and concurrence of risk assessment data and sampling procedure letter report"
AUTHOR:	Department of the Air Force
RECIPIENT:	State of New Hampshire
DATE:	20 March 1991
TYPE:	Letter
SECOND REFERENCE:	None
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (11.7) #2 001-002
LONG TITLE:	"Letter concerning use of drilling mud"
AUTHOR:	Roy F. Weston, Inc.
RECIPIENT:	Air Force
DATE:	26 December 1990
TYPE:	Letter
SECOND REFERENCE:	None
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA(11.7) #3 001-002
LONG TITLE:	"Analytical Methods for Pease AFB"
AUTHOR:	Roy F. Weston, Inc.
RECIPIENT:	Air Force
DATE:	23 April 1991
TYPE:	Letter
SECOND REFERENCE:	None
LOCATION:	ARF

#

DOCUMENT NUMBER:	PEA (11.7) #4 001-001
LONG TITLE:	Consolidated Background Values Letter Report
AUTHOR:	USAF
RECIPIENT:	Richard Pease, NHDES Johanna Hunter, EPA
DATE:	March 9, 1993
TYPE:	Letter Report
SECOND REFERENCE:	None
LOCATION:	ARF

#

APPENDIX E

TABLES

Table 1

Summary of Stages 1, 2, and 3 Activities
Site 8, Pease AFB, NH

Date	Activity	Scope	Purpose
10/84 and 1/85	Excavation of test pits	8-TP-1 through 8-TP-10	Assess the lateral extent of potential soil contamination.
11/84 to 2/85	Monitor well installation and development	510 through 515 (RFW-10) through (RFW-15)	Establish both upgradient and downgradient water quality conditions.
3/85 to 4/85	Groundwater sampling (round 1)	510-515	Evaluate groundwater for TOX, TOC, and O&G.
4/85 to 5/85	Groundwater sampling (round 2)	510-515	Same as round 1.
5/85	Surveying	510-515	Determine elevations and locations.
1/86	Groundwater resampling	511 and 512	Re-evaluate groundwater for TOX, TOC, and O&G because of suspected mislabeling of bottles.
	Slug tests	510, 512-515	Assess hydraulic conductivity.
10/87-12/87	Aerial photograph review	Photographs from 1952, 1960, and 1976	Evaluate areal extent of Site 8.
10/87-12/87	Soil-gas sampling	Soil-gas analyzed for petroleum hydrocarbons, total hydrocarbons, and methyl ethyl ketone	Screen soil for volatile contaminants to select soil boring locations.
Begin 11/87	Water level measurements (quarterly)	Stage 1 wells; Stage 2 wells as installed	Assess hydrologic characteristics.
4/88	Soil borings	15 soil borings: 708-722	Characterize soil contamination, both lateral and vertical.
4/88	Piezometer installation	In soil borings 709, 715, 719 and 720	Obtain water level measurements.

Table 1

Summary of Stages 1, 2, and 3 Activities
Site 8, Pease AFB, NH
(Continued)

Date	Activity	Scope	Purpose
4/88	Test pits	5 pits: 940 to 944	Assess subsurface stratigraphy and characterize soil contamination.
4/88	Staff gage installation	801A	Obtain water level measurements; establish surface water and sediment sampling locations.
4/88-5/88	Survey	Test pits, borings, gages, and piezometers	Determine elevations and locations.
9/88-10/88	Bedrock and overburden well installation and development	539, 540, 541, 611, 612, and 613	Evaluate bedrock and overburden water quality.
11/88-12/88	Survey	Monitor wells	Determine elevations and locations.
11/88	Surface water and sediment sampling	801A	Evaluate surface water for VOCs, total metals, and SVOCs. Evaluate sediment for VOCs, metals, and SVOCs.
11/88	Short-duration pumping test	539 and 611	Evaluate aquifer characteristics in the overburden and bedrock.
11/88-12/88	Round 1 groundwater sampling	510-515, 539-541, 611-613, 99-016, 99-005, 99-009, and 99-015	Evaluate groundwater for VOCs, SVOCs, pesticides/PCBs, herbicides, dissolved metals, common anions, total hardness, and nitrate/nitrite.
5/89	Surface water and sediment sampling	801A	Evaluate surface water for VOCs, pesticides/PCBs, SVOCs, total metals, BOD, and ammonia/nitrogen. Evaluate sediment for cyanide, VOCs, TPHs, total metals, SVOCs, pesticides/PCBs, and herbicides.
5/89	Off-base residential wells sampled for groundwater	99-016, 99-009, 99-005, 99-015	Evaluate groundwater for VOCs.

Table 1

Summary of Stages 1, 2, and 3 Activities
Site 8, Pease AFB, NH
(Continued)

Date	Activity	Scope	Purpose
9/89	Seismic refraction and VLF electromagnetic surveys	100 by 100-foot grid (on-site)	Characterize bedrock topography and identify potential bedrock contaminant migration pathways, respectively.
9/89	Monthly water level measurements	All monitor wells, piezometers, and staff gages	Characterize overburden and bedrock groundwater flow patterns.
10/89	Stratigraphic borings	9 borings: 7002-7010	Optimize well placement and support seismic refraction survey data.
11/89	Overburden well installation	3 wells: 560, 561, and 565	Monitor overburden water quality.
11/89	Recovery well installation	4 wells: 562A, 563, 564, and 566	Recover product near the former burn areas and limit off-site contaminant migration.
11/89	Column leach tests	7001, 7015, 7016, and 7017 (background = 7001)	Evaluate the potential effects of untreated soil contamination on groundwater.
11/89	Bedrock well installation	5 wells: 620-624	Monitor for bedrock water quality.
11/89	Survey	5 bedrock wells, 7 overburden wells, and 13 borings	Establish accurate locations and elevations.
2/90	Soil removal from drainage ditch.	262 tons removed	Source control IRM.
3/90	Slug tests	563, 564, 565, and 566	Evaluate overburden aquifer characteristics.
3/90	Step-drawdown test	562A	Evaluate overburden aquifer characteristics.
3/90	Short-duration pumping test	565	Evaluate overburden aquifer characteristics.
3/90	Short-duration pumping test	622 and 623	Evaluate bedrock aquifer characteristics.

Table 1

Summary of Stages 1, 2, and 3 Activities
Site 8, Pease AFB, NH
(Continued)

Date	Activity	Scope	Purpose
9/89, 3/90, 6/91, 10/91, 3/92	Groundwater sampling	See Appendix B of the Draft Final Site 8 RI Report (G-577)	Characterize water quality of site overburden and bedrock monitor wells, residential wells, and off-base springs.
7/90	Seismic refraction survey	Off-base between grid coordinates 1,200 north and 2,000 north and 1,000 east and 2,000 east (see Figure 2.3-4) of the Draft Final Site 8 RI Report (G-577)	Characterize bedrock topography north of Site 8 and locate the proposed exploratory soil borings.
8/90	Exploratory soil borings and soil sampling	17 soil borings: 7018-7034	Perform VOC screening analyses using a portable gas chromatograph (GC) and verify seismic refraction interpretation.
8/90	Piezometer installation	5 piezometers; 7020, 7022, 7024, 7025, and 7026	Characterize the overburden groundwater flow pattern.
8/90	Pilot GWTP became operational	Pump and treat groundwater from overburden wells 562A, 563, 564, and 566	Source control and management of migration IRM.
9/90	Stratigraphic borings	4 borings: 7035-7038	Optimize overburden well placement.
9/90	Overburden well installation	3 wells: 575, 576, and 577	Monitor potential contaminant migration to the north-northeast (575 and 576) and overburden groundwater quality south of Site 8 (577).
9/90	Bedrock well installation	2 wells: 636 and 637	Evaluate water quality in the bedrock water-bearing zone north of Site 8 near the base boundary (636) and downgradient of Site 8 (637).

Table 1

Summary of Stages 1, 2, and 3 Activities
Site 8, Pease AFB, NH
(Continued)

Date	Activity	Scope	Purpose
9/90-10/90	Survey	Soil borings: 7018-7038; piezometers: 7020, 7022, 7024, 7025, and 7026; overburden wells: 575-577; bedrock wells: 636 and 637	Establish accurate location and elevations.
10/90	Site 8 GWTP permit groundwater sampling	25 wells and 1 spring; see Appendix B of the Draft Final Site 8 RI Report (G-577)	Characterize groundwater quality and support the GWTP operational permit.
4/91	Gridding	Off base properties: Coleman and Watson	To more effectively locate characterization borings.
4/91	Site 8 GWTP permit groundwater sampling	25 wells and 1 spring; see Appendix B of the Draft Final Site 8 RI Report (G-577)	Characterize groundwater quality and support the GWTP operational permit.
4/91-6/91	Wetlands delineation	North-northeast of Site 8	Delineate wetlands boundaries.
4/91-6/91	Survey wetlands	Wetlands delineation	Determine accurate boundary.
4/91-6/91	Staff gage installation	8 staff gages: 8001, 8089, 8002, 8024, 8025, 8026, 8027, and 801B	Establish sampling locations and monitor water elevations.
5/91	Overburden well installation	5001 and 5002	Monitor overburden groundwater quality at the base boundary. Paired to determine vertical hydraulic gradient in the overburden water-bearing zone.

Table 1

Summary of Stages 1, 2, and 3 Activities
Site 8, Pease AFB, NH
(Continued)

Date	Activity	Scope	Purpose
5/91	Overburden well installation	5003	Monitor overburden water quality on base to the northeast.
5/91	Overburden well installation	5004 and 5005	Monitor overburden groundwater quality off base.
6/91	Overburden well installation	5006	To replace hybrid well 511.
6/91	Exploratory borings	7057-7078; piezometers: 7057-7059, 7061-7068, 7070, 7071, 7073, 7074, and 7076-7078	Evaluate the northern extent of VOC contamination and delineate the bedrock surface.
6/91	Survey	Borings/piezometers: 7057-7078; overburden wells: 5001-5006	Determine accurate locations and elevations.
6/91	Risk assessment borings	7141-7152	Characterize soil for risk assessment.
6/91	Surface water and sediment sampling	7 locations; 801B, 8001, 8024, 8025, 8026, 8027, and 8089	Evaluate the potential impacts that activities at Site 8 may have had on surface water and sediment quality.
7/91	Pumping test	48-hour test on well 562A	Evaluate aquifer characteristics.
7/91	Survey	Risk assessment borings 7141-7152	Determine accurate locations and elevations.
9/91	Exploratory borings	7270, 7271, and 7272 (piezometers installed)	Assess the areal extent of VOCs in the vicinity of 7076 and optimize overburden well placement.

Table 1

Summary of Stages 1, 2, and 3 Activities
Site 8, Pease AFB, NH
(Continued)

Date	Activity	Scope	Purpose
9/91	Bedrock well installation	6021-6023 and 6025	Evaluate bedrock groundwater quality north-northeast of Site 8 (6021 and 6025). Assess extent of VOC contamination in bedrock water-bearing zone northwest of Site 8 (6022 and 6023).
9/91	Ecological habitat characterization	Site 8	Describe existing ecological communities for risk assessment.
10/91	Exploratory borings	7376 and 7377 (piezometers installed)	Assess the areal extent of VOCs in the vicinity of 7076 and optimize overburden well placement.
10/91	Bedrock well installation	6024	Confirm that well 512 is upgradient of Site 8.
10/91	Survey	New locations from 9/91-10/91	Determine accurate locations and elevations.
10/91	Slug tests	5001, 5002, 5003, and 576	Evaluate overburden aquifer characteristics.
10/91	Site 8 GWTP permit groundwater sampling	25 wells and 1 spring; see Appendix B of the Draft Final Site 8 RI Report (G-577)	Characterize groundwater quality and support the GWTP operational permit.
11/91	Exploratory borings	7383, 7384, and 7385; piezometer 7385	Assess the northeast extent of the VOC plume and optimize overburden well placement.
12/91	Overburden well installation and development	5049 and 5050	Assess off-base overburden groundwater quality (5049). Delineate the northeast extent of the VOC plume (5050).
12/91	Survey	New locations from 11/91-12/91	Determine accurate locations and elevations.

Table 1

Summary of Stages 1, 2, and 3 Activities
Site 8, Pease AFB, NH
(Continued)

Date	Activity	Scope	Purpose
2/92	Bedrock well installation and development	3 bedrock wells: 6044, 6045, and 6046	Determine extent of VOC contamination in the bedrock water-bearing zone downgradient of Site 8.
2/92	Modify construction of well 613	Reconstruct open-hole hybrid well 613 to screened bedrock well 613A	Reconstruct well 613 to monitor groundwater in the bedrock.
3/92	Survey	4 bedrock wells: 6044, 6045, 6046, and 613A	Determine accurate locations and elevations.
3/92	Site 8 GWTP permit groundwater sampling	25 wells and 1 spring; see Appendix B of the Draft Final Site 8 RI Report (G-577)	Characterize groundwater quality and support the GWTP operational permit.
3/92	Surface soil sampling	9 locations; 7141, 7143, 7144, 7145, 7146, 7149, 7150, 7151, and 7152	Determine the presence or absence of dioxins in and around the former burn areas.
3/92	Surface water and sediment sampling	7 locations: 801B, 8001, 8024, 8025, 8026, 8027, and 8089	Evaluate the potential impacts that activities at Site 8 may have had on surface water and sediment quality.
4/92	Treatability study borings	7447 and 7448	Evaluate soil treatability characteristics.
9/92	Pumping test	48-hour test on well 622	Evaluate aquifer characteristics.
9/92	Slug tests	575, 577, 5004, 5005, and 5050	Evaluate overburden aquifer characteristics.

Table 1

Summary of Stages 1, 2, and 3 Activities
Site 8, Pease AFB, NH
(Continued)

Date	Activity	Scope	Purpose
9/92	Soil sampling	9 surface soil samples [0 to 2 ft below ground surface (BGS)], 8 soil samples (2 to 15 ft BGS)	Assess the presence of dioxins (by individual isomers) in and around the former burn area.
9/92	Resurvey	Stages 1 and 2 and select Stage 3 locations	Act as a quality control measure; resurvey to establish accurate locations and elevations.
9/92	Groundwater sampling	2 overburden wells: 565 and 566; 1 bedrock well: 613A	Determine the presence or absence of dioxins (by individual isomers) in groundwater in the vicinity of the former burn areas.
9/92-10/92	Soil boring/monitor well installation	Install bedrock well 6083 in soil boring location 7597	Evaluate whether overburden is discharging to shallow bedrock west of the former burn areas.
10/92-1/93	Upgrade pilot GWTP	Install eight Microwells• and two additional recovery trenches; upgrade GWTP; reconfigure wells 563 and 564 for product recovery	Improve recovery of contaminant plume and product. Control contaminant migration to the south of the former burn areas.
11/92	Groundwater sampling	2 overburden wells: 562A and 566; 2 bedrock wells: 636 and 6072	Analyze the ethylene dibromide using analytical Method E504.
4/93-6/93	Pilot SVE treatability study	Operate pilot SVE system on-site for 49 days.	Evaluation of SVE for remediation of vadose zone soil.

Note: Soil borings 7001, 7015, 7016, and 7017 were originally numbered 401, 402, 403, and 404, respectively.

Table 2

Summary of Highest Concentrations of Organic Compounds — Stage 2 and Stage 3 Soil Sample Results Site 8, Pease AFB, NH

Compound	Maximum Detected Concentration	Sample ID	Sampling Interval (ft BGS)
Aromatic Hydrocarbons			
1,2-Dichlorobenzene (μg/kg)	3,300	08-7145-B002	0.0-2.0
1,2,4-Trichlorobenzene (μg/kg)	800	08-403-B001*	13-24
1,4-Dichlorobenzene (μg/kg)	1,300	08-403-B001*	13-24
Benzene (μg/kg)	8,000	08-721-B009	30-30.5
Chlorobenzene (μg/kg)	2	08-7145-B003	2.0-4.0
Ethylbenzene (μg/kg)	54,000	08-721-B009	30-30.5
Toluene (μg/kg)	128,000	08-721-B009	30-30.5
Xylenes (total) (μg/kg)	210,000	08-714-B007	21.5-22.0
Halogenated Hydrocarbons			
1,1,1-Trichloroethane (μg/kg)	5	08-402-B001*	3.0-9.0
1,1,2,2-Tetrachloroethane (μg/kg)	2,500	08-717-B102	4.0-4.5
1,2-Dichloroethane (μg/kg)	5	08-7150-B004	3.0-4.0
1,2-Dichloroethene (total) (μg/kg)	10	08-7150-B004	3.0-4.0
Tetrachloroethene (μg/kg)	18	08-7148-B014	12.0-14.0
Trichloroethene (μg/kg)	5,000	08-721-B009	30-30.5
Oxygenated Hydrocarbons			
Acetone (μg/kg)	4,000	08-719-B002	0.0-2.0
2-Butanone (μg/kg)	70	08-7144-B012	2.0-15.0
4-Methyl-2-pentanone (μg/kg)	34,000	08-714-B007	21.5-22.0
Diethyl ether (μg/kg)	4	08-7142-B002	1.2-2.0
Isophorone (μg/kg)	4,700	08-721-B008	26.0-26.5
Vinyl acetate (μg/kg)	160	08-7144-B004	2.0-4.0
Polynuclear Aromatic Hydrocarbons			
2-Methylnaphthalene (μg/kg)	43,000	08-7149-B014	12.0-14.0
Benzo(a)anthracene (μg/kg)	1,700	08-7145-B002	0.0-2.0
Benzo(a)pyrene (μg/kg)	230	08-7143-B002	0.0-2.0

Table 2

Summary of Highest Concentrations of Organic Compounds – Stage 2 and Stage 3 Soil Sample Results Site 8, Pease AFB, NH (Continued)

Compound	Maximum Detected Concentration	Sample ID	Sampling Interval (ft BGS)
Polynuclear Aromatic Hydrocarbons (Continued)			
Benzo(b)fluoranthene (µg/kg)	150	08-7143-B002	0.0-2.0
Benzo(g,h,i)perylene (µg/kg)	200	08-7143-B002	0.0-2.0
Benzo(k)fluoranthene (µg/kg)	160	08-7143-B002	0.0-2.0
Chrysene (µg/kg)	6,100	08-721-B008	26.0-26.5
Dibenzo(a,h)anthracene (µg/kg)	37	08-7143-B002	0.0-2.0
Fluoranthene (µg/kg)	450	08-7145-B002	0.0-2.0
Fluorene (µg/kg)	1,700	08-721-B008	26.0-26.5
Indeno(1,2,3-cd)pyrene (µg/kg)	410	08-721-B008	26.0-26.5
Naphthalene (µg/kg)	36,000	08-721-B008	26.0-26.5
Phenanthrene (µg/kg)	3,200	08-721-B008	26.0-26.5
Pyrene (µg/kg)	2,400	08-7145-B002	0.0-2.0
Phenols			
4-Methylphenol (µg/kg)	37	08-7143-B002	0.0-2.0
Phthalates			
Di-n-butyl phthalate (µg/kg)	5,900	08-7149-B002	1.0-2.0
Butyl benzyl phthalate (µg/kg)	4,400	08-7149-B014	12.0-14.0
Bis(2-ethylhexyl) phthalate (µg/kg)	2,000	08-719-B002	2.5-4.0
Nitrogenated Semivolatiles			
n-Nitrosodiphenylamine (µg/kg)	600	08-7145-B002	0.0-2.0
Nitrobenzene (µg/kg)	61	08-403-B001*	13-24
Pesticides			
4,4'-DDD (µg/kg)	120	08-404-B001*	15-30
4,4'-DDE (µg/kg)	17	08-401-B001*	4-12
4,4'-DDT (µg/kg)	79	08-404-B001*	15-30
alpha-Chlordane (µg/kg)	43	08-7143-B002	0.0-2.0
Dieldrin (µg/kg)	24	08-7143-B002	0.0-2.0

Table 2

Summary of Highest Concentrations of Organic Compounds — Stage 2 and Stage 3 Soil Sample Results Site 8, Pease AFB, NH (Continued)

Compound	Maximum Detected Concentration	Sample ID	Sampling Interval (ft BGS)
Pesticides (continued)			
gamma-BHC (Lindane) (μg/kg)	12	08-404-B001*	15-30
gamma-Chlordane (μg/kg)	39	08-7143-B002	0.0-2.0
Heptachlor epoxide (μg/kg)	3	7141	0.0-2.0
PCBs			
Aroclor-1260 (μg/kg)	110	08-7144-B013	2.0-15.0
Dioxins			
HpCDD (ng/g)	0.94	08-7555-B001	0.5-2.0
HpCDF (ng/g)	0.6	08-7150-S001	0.0-2.0
HxCDD (ng/g)	11.5	08-7143-S001	0.0-2.0
OCDD (ng/g)	4	08-7555-B001	0.5-2.0
OCDF (ng/g)	0.5	08-7143-S001	0.0-2.0
TCDF (ng/g)	0.5	08-7144-S001	0.0-2.0
Other			
Total organic carbon (mg/kg)	3,410	08-404-B001*	15-30
Petroleum hydrocarbons (mg/kg)	181,000	08-721-B008	26.0-26.5

*Samples 401, 402, 403, and 404 were collected from soil borings 7001, 7015, 7016, and 7017, respectively.

Table 3

Summary of Highest Metals Concentrations Above Background Levels
Stage 2 and Stage 3 Soil Sample Results
Site 8, Pease AFB, NH

Metal	Background Concentration* (mg/kg)	Maximum Detected Concentration (mg/kg)	Sample ID	Sampling Interval (ft BGS)
Antimony, total	ND	55.5	08-708-B005	11.0-11.5
Arsenic, total	15.3	264.0	08-708-B005	11.0-11.5
Cadmium, total	ND	3.1	08-7144-B002	0.0-2.0
Chromium, total	37.5	58.1	08-7150-B011	10.0-10.8
Copper, total	42.0	121	08-7144-B002	0.0-2.0
Lead, total	65.3	167	08-719-B002	2.5-3.0
Magnesium	8,240	10,800	08-7150-B011	10.0-10.5
Manganese	623	706	08-708-B005	10.0-10.5
Mercury, total	ND	0.12	08-7145-B002	0.0-2.0
Molybdenum, total	ND	0.75	08-7150-B002	0.0-2.0
Nickel, total	43.4	73.6	08-708-B005	11.0-11.5
Thallium	ND	36.4	08-708-B005	11.0-11.5
Zinc	92.3	136	08-7144-B002	1.5-2.0

ND ( ) = Not detected (detection limit).
ft BGS = Feet below ground surface.
*From background boring concentrations (G-609).

Table 4

Summary of Highest Concentrations of Dissolved Organic Compounds
Stages 2, 3, and 4 Overburden (Product-Containing Wells) Sample Results
Site 8, Pease AFB, NH

Compound	Regulatory Guidance Value	Source[a]	Maximum Detected Concentration	Location ID
VOCs (µg/L)				
Aromatic Hydrocarbons				
1,2-Dichlorobenzene	600	MCL	560	564-M001
1,2,4-Trimethylbenzene			1,400	563-M005
1,3-Dichlorobenzene			4 J	564-M001
1,3,5-Trimethylbenzene			500	563-M005
1,4-Dichlorobenzene	75	MCL	41	564-M003
4-Isopropyltoluene			170 J	510-M006
Benzene	5	MCL	4,700	563-M001
Chlorobenzene	100	MCL	5.4	563-M003
Ethylbenzene	700	MCL	2,200	563-M001
Isopropylbenzene			180	563-M005
n-Butylbenzene			1	566-M006
n-Propylbenzene			210	563-M005
sec-Butylbenzene			77 J	510-M006
tert-Butylbenzene			0.5 J	566-M006
Toluene	1000	MCL	29,000 J	563-M003
Xylenes (total)	10000	MCL	9,900	563-M003
Halogenated Hydrocarbons				
1,1-Dichloroethane			2.8	563-M003
1,1-Dichloroethene	7	MCL	1.4	563-M003
1,1,1-Trichloroethane	200	MCL	7 J	564-M004
1,2-Dibromoethane	0.05	MCL	510	563-M005
1,2-Dichloroethane	5	MCL	20	563-M003
1,2-Dichloropropane	5	MCL	0.88	563-M002
Bromochloromethane			1,000	563-M005
cis-1,2-Dichloroethene	70	MCL	1,600	540-M004
Methylene chloride	5	MCL	280	563-M003[b]
Tetrachloroethene	5	MCL	9 J	566-M007
trans-1,2-Dichloroethene	100	MCL	710	566-M003

Table 4

Summary of Highest Concentrations of Dissolved Organic Compounds Stages 2, 3, and 4 Overburden (Product-Containing Wells) Sample Results Site 8, Pease AFB, NH (Continued)

Compound	Regulatory Guidance Value	Source[a]	Maximum Detected Concentration	Location ID
Halogenated Hydrocarbons (continued)				
Trichloroethene	5	MCL	4,400	563-M001
Vinyl chloride	2	MCL	11	563-M003
SVOCs (μg/L)				
Polynuclear Aromatic Hydrocarbons				
Naphthalene			1,800	563-M001
2-Methylnaphthalene			2,700	563-M004
Acenaphthylene			2 J	564-M001
Acenaphthene			3 J	510-M006
Phenanthrene			78 J	563-M001
Fluorene	0.2	MCL[*]	14 J	563-M005
Phthalates				
Bis(2-ethylhexyl) phthalate	6	MCL	140 J	563-M001
Di-n-octyl phthalate			140 J	540-M004
Phenols				
Phenol			2 J	566-M002
2,4-Dimethylphenol			120	563-M003
4-Methylphenol			1,400	563-M003
2-Methylphenol			110	563-M005
Nitrogenated Semivolatiles				
2-Nitroaniline			170 J	540-M004
n-Nitrosodiphenylamine			2 J	564-M004
Pesticides (μg/L)				
Heptachlor epoxide	0.2	MCL	0.2 J	08-510-M006
beta-BHC			0.43 J	08-540-M001
4,4'-DDT			92 J	08-510-M005
alpha-Chlordane	2	MCL	0.81 J	08-510-M006
gamma-Chlordane	2	MCL	2 J	08-510-M005

Table 4

Summary of Highest Concentrations of Dissolved Organic Compounds Stages 2, 3, and 4 Overburden (Product-Containing Wells) Sample Results Site 8, Pease AFB, NH (Continued)

Compound	Regulatory Guidance Value	Source[a]	Maximum Detected Concentration	Location ID
Pesticides (µg/L) (continued)				
gamma-BHC	0.2	MCL	11 J	08-510-M005
4,4'-DDD			440	08-540-M004
4,4'-DDE			5.6 J	08-510-M005
Heptachlor	0.4	MCL	0.69 J	08-510-M005
Petroleum Hydrocarbons (mg/L)			5,900	08-563-M003

[a]MCL = Federal Maximum Contaminant Level, June 1992, SDWA; MCL* = Proposed Federal Maximum Contaminant Level, June 1992, SDWA.
[b]Common laboratory contaminant.
J = Estimated detected value.
(shaded) = Location where an MCL guideline was exceeded.

Table 5

Summary of Highest Detected Concentrations of Dissolved Metals[a]
Stages 2, 3, and 4 Overburden (Product-Containing Wells) Sample Results
Site 8, Pease AFB, NH

Metal	Background Concentration[b] (μg/L)	Maximum Detected Concentration (μg/L)	Location ID
Arsenic	23.1	*270	564-M003
Barium	88.3	65.8	563-M005
Calcium	73,200	41,000	564-M005
Cobalt	ND	326	563-M005
Iron	584	164,000	563-M005
Lead	ND	92.4	563-M005
Magnesium	18,900	16,400	566-M006
Manganese	942	32,800	563-M004
Nickel	32.8	82.7	563-M005
Potassium	7,060	15,000	5006-M001
Silicon	6,400	8,540	5006-M001
Silver	30	53.7	563-M005
Sodium	10,200	60,100	5006-M001
Zinc	168	45.9	563-M005

ND = Not detected.
[a]Field-filtered using a 0.45-micron filter.
[b]Background values taken from G-609.
(shaded) = Location where detected concentration is above the maximum background value.

Table 6

Summary of Highest Detected Concentrations of Total Metals
Stages 2, 3, and 4 Overburden (Product-Containing Wells) Sample Results
Site 8, Pease AFB, NH

Metal	Background Concentration[a] (μg/L)	Regulatory Guidance Value (μg/L)	Source[b]	Maximum Detected Concentration (μg/L)	Location ID
Aluminum	46,400			30,700 J	08-5006-M001
Arsenic	72	50	MCL	178 J	08-563-M005
Barium	221	1,000	MCL	194 J	08-5006-M001
Beryllium	3.1	1	MCL	2.9	08-5006-M001
Calcium	90,300			36,900	08-564-M005
Chromium	94.3	100	MCL	44.5 J	08-5006-M001
Cobalt	106			202 J	08-563-M005
Copper	88.1	1,300	MCL	83.1	08-5006-M001
Iron	62,800			173,000	08-563-M004
Lead	97.6	15	MCL	214 J	08-563-M005
Magnesium	38,300			16,900	08-613-M006
Manganese	5,660			29,100	08-563-M004
Nickel	126	100	MCL	102 J	08-5006-M001
Potassium	8,870			17,100	08-5006-M001
Silicon	42,300			40,500 J	08-5006-M001
Sodium	8,970			54,000	08-5006-M001
Zinc	220			184	08-563-M005

[a]Background values taken from G-609.
[b]MCL = Federal Maximum Contaminant Level, June 1992, SDWA.
J = Estimated detected value.

Table 7

Summary of Highest Detected Concentrations of Organic Compounds Overburden Well Sample Results — Dissolved Phase Site 8, Pease AFB, NH

Compound	Regulatory Guidance Value	Source[a]	Maximum Detected Concentration (μg/L)	Location ID
VOCs				
Aromatic Hydrocarbons				
1,2-Dichlorobenzene	600	MCL	11	562A-M001
1,2,4-Trimethylbenzene			380	541-M006
1,3-Dichlorobenzene			5.3	562A-M001
1,3,5-Trimethylbenzene			96	541-M006
1,4-Dichlorobenzene	75	MCL	17	562A-M001
4-Isopropyltoluene			32 J	541-M006
Benzene	5	MCL	38	511-M004
Chlorobenzene	100	MCL	7.2	562A-M001
Ethylbenzene	700	MCL	100	511-M004
Isopropylbenzene			30	541-M006
n-Butylbenzene			1 J	562A-M005
n-Propylbenzene			28 J	541-M006
sec-Butylbenzene			18	541-M006
tert-Butylbenzene			0.6 J	562A-M006
Toluene	1,000	MCL	140	511-M004
Xylenes (total)	10,000	MCL	520	511-M004
Halogenated Hydrocarbons				
1,1-Dichloroethane			2.2	562A-M002
1,1,1-Trichloroethane	200	MCL	2	539-M006
1,2-Dichloroethane	5	MCL	9.8	562A-M001
Chloroethane			0.9 J	565-M003
cis-1,2-Dichloroethene	70	MCL	1,100	562A-M001
Dichlorodifluoromethane			3	565-M004
Tetrachloroethene	5	MCL	2 J	511-M005
trans-1,2-Dichloroethene	100	MCL	0.5 J	562A-M006
Trichloroethene	5	MCL	5.0	562A-M001
Vinyl chloride	2	MCL	1.0 J	562A-M006

Table 7

Summary of Highest Detected Concentrations of Organic Compounds
Overburden Well Sample Results — Dissolved Phase
Site 8, Pease AFB, NH
(Continued)

Compound	Regulatory Guidance Value	Source[a]	Maximum Detected Concentration (μg/L)	Location ID
SVOCs				
Polynuclear Aromatic Hydrocarbons				
Naphthalene			92	511-M005
2-Methylnaphthalene			47 J	511-M004
Phthalates				
Bis(2-ethylhexyl) phthalate	6	MCL	7 J	5049-M001
Di-n-octyl phthalate			6 J	541-M004
Phenols				
4-Methylphenol			1 J	541-M004
Pesticides				
4,4'-DDT			1.8	539-M001
Endosulfan I			0.04 J	511-M005
beta-BHC			0.03 J	539-M001
4,4'-DDD			0.02 J	539-M001
Dioxins			(pg/L)	
OCDD			59	565-M005

[a]MCL – Federal Maximum Contaminant Level, June 1992, SDWA.
J = Estimated detected value.
[shaded] = Location where an MCL guideline was exceeded.

Table 8

Summary of Highest Detected Concentrations of Dissolved Metals[a] Overburden Well Sample Results — Dissolved Phase Site 8, Pease AFB, NH

Metal	Maximum Background Concentration[b] (μg/L)	Maximum Detected Concentration (μg/L)	Location ID
Arsenic	23.1	174	511-M004
Barium	88.3	69.3	561-M004
Calcium	73,200	56,300 J	562A-M007
Cobalt	ND	66.1	561-M004
Copper	ND	26.7	561-M004
Iron	584	41,200 J	541-M005
Lead	ND	3.4	575-M003
Magnesium	18,900	15,400	5002-M004
Manganese	942	20,000	511-M004
Mercury	ND	0.12	5003-M002
Nickel	32.8	27.8	561-M004
Potassium	7,060	19,800	5002-M003
Silicon	6,400	11,300	562A-M007
Sodium	10,200	18,300	5003-M002
Thallium	ND	548	511-M003
Vanadium	ND	50.3	5002-M002
Zinc	168	74.9	561-M004

ND = Not detected.
[a]Field-filtered using a 0.45-micron filter.
[b]Background values taken from G-609.
= Location where the detected concentration is above the maximum background value.

Table 9

Summary of Highest Detected Concentrations of Total Metals — Stages 2, 3, and 4 Overburden Wells Sample Results Site 8, Pease AFB, NH

Metal	Background Concentration[a] (μg/L)	Regulatory Guidance Value (μg/L)	Source[b]	Maximum Detected Concentration (μg/L)	Location ID
Aluminum	46,400			29,300	08-541-M007
Antimony	ND	6	MCL	459	08-5004-M002
Arsenic	72	50	MCL	512	08-511-M005
Barium	221	1,000	MCL	1,880	08-5004-M002
Beryllium	3.1	1	MCL	47.3	08-5004-M002
Boron	ND			896	08-5004-M002
Cadmium	ND	5	MCL	54.1	08-5004-M002
Calcium	90,300			54,600	08-539-M006
Chromium	94.3	100	MCL	188	08-5004-M002
Cobalt	106			475	08-5004-M002
Copper	88.1	1,300	AL	241	08-5004-M002
Iron	62,800			124,000 J	08-5005-M101
Lead	97.6	15	AL	49.4	08-541-M007
Magnesium	38,300			26,400 J	08-5004-M002
Manganese	5,660			20,000	08-511-M004
Mercury	0.16	2	MCL	0.12	08-5003-M002
Molybdenum	ND			880	08-5004-M002
Nickel	126	100	MCL	461	08-5004-M002
Potassium	8,870			22,900	08-5004-M002
Silicon	42,500			26,900	08-5050-M001
Silver	ND			48.6	08-5004-M002
Sodium	8,970			26,000	08-5004-M002
Vanadium	58.4			488	08-5004-M002
Zinc	220			502	08-5004-M002

[a]Background values taken from G-609.
[b]MCL = Federal Maximum Contaminant Level, June 1992, SDWA.
AL = Action level (at tap), June 1991, Lead and Copper Rule.
J = Estimated detected value.
ND = Not detected.

Table 10

Chemicals of Concern in Main Soil[a] (0 to 2 feet deep)
Site 8, Pease AFB, NH

Chemical	Frequency of Detection[b]	Range of Sample Quantitation Limits (mg/kg)	Range of Averaged (Detected) Concentrations[c] (mg/kg)	Mean Concentration[d] (mg/kg)	Upper 95% Confidence Limit of the Mean (mg/kg)
Organics					
Bis(2-ethylhexyl) phthalate	6/15	0.34-6.1	0.040-1.0	0.51	0.90
Butyl benzyl phthalate	3/15	0.34-6.1	0.12-3.8	0.81	1.3
alpha-Chlordane	1/16	0.078-0.94	0.043	0.087[e]	0.14[e]
gamma-Chlordane	1/16	0.078-0.66	0.039	0.060[e]	0.092[e]
4,4'-DDD	4/16	0.016-0.19	0.004-0.12	0.021	0.036
4,4'-DDE	3/16	0.016-0.19	0.002-0.017	0.018[e]	0.029[e]
4,4'-DDT	3/16	0.016-0.19	0.004-0.079	0.019	0.031
1,2-Dichlorobenzene	1/15	0.005-0.70	3.3	0.27	0.65
1,4-Dichlorobenzene	2/15	0.34-6.1	0.51-1.3	0.62	1.0
Dieldrin	4/16	0.016-0.19	0.007-0.024	0.016	0.025[e]
Di-n-butyl phthalate	8/15	0.34-6.1	0.053-3.6	1.2	1.8
Dioxins/furans (as 2,3,7,8-TCDD)	8/8	0.10-0.80[f]	0.0000067-0.0012	0.00015	0.00042
Ethylbenzene	3/15	0.005-0.008	0.46-2.5	0.25	0.55
2-Methylnaphthalene	3/15	0.34-6.1	0.26-3.0	0.60	1.1
4-Methyl-2-pentanone	2/15	0.010-1.4	0.006-11	0.83	2.1
Naphthalene	3/15	0.34-6.1	0.12-0.51	0.41	0.75[e]
n-Nitrosodiphenylamine	1/15	0.34-6.1	0.60	0.45	0.79[e]
PAHs					
Benzo(a)anthracene	3/15	0.34-6.1	0.073-1.7	0.51	0.89
Benzo(a)pyrene	2/15	0.34-6.1	0.090-0.23	0.53[e]	0.90[e]
Benzo(b)fluoranthene	2/15	0.34-6.1	0.084-0.15	0.52[e]	0.90[e]
Benzo(g,h,i)perylene	2/15	0.34-6.1	0.071-0.20	0.52[e]	0.90[e]

Table 10

Chemicals of Concern in Main Soil[a] (0 to 2 feet deep)
Site 8, Pease AFB, NH
(Continued)

Chemical	Frequency of Detection[b]	Range of Sample Quantitation Limits (mg/kg)	Range of Averaged (Detected) Concentrations[c] (mg/kg)	Mean Concentration[d] (mg/kg)	Upper 95% Confidence Limit of the Mean (mg/kg)
Benzo(k)fluoranthene	2/15	3.4-6.1	0.077-0.16	0.52[e]	0.90[e]
Chrysene	3/15	0.34-6.1	0.10-0.35	0.49[e]	0.86[e]
Dibenzo(a,h)-anthracene	1/15	0.34-6.1	0.037	0.52[e]	0.90[e]
Fluoranthene	6/15	0.34-6.1	0.048-0.45	0.42	0.76[e]
Indeno(1,2,3-cd)-pyrene	2/15	0.34-6.1	0.062-0.16	0.52[e]	0.90[e]
Phenanthrene	5/15	0.34-6.1	0.039-2.0	0.48	0.87
Pyrene	7/15	0.34-6.1	0.040-2.4	0.51	0.93
Toluene	3/15	0.005-0.66	0.006-0.85	0.095	0.20
1,2,4-Trichlorobenzene	2/15	0.34-6.1	0.31-0.80	0.58	0.95[e]
Trichloroethene	1/15	0.005-0.70	0.011	0.070[e]	0.13[e]
Xylenes (total)	3/15	0.005-0.008	2.7-16	1.6	3.6
Inorganics					
Boron	3/11	17-21	5.0-9.3	8.8	9.6[e]
Chromium	11/11	4.0[g]	5.0-54	16	23
Copper	11/11	3.0[g]	6.0-121	26	43
Lead	11/11	20[g]	5.3-99	37	54
Molybdenum	3/11	85-104	0.41-0.75	34[e]	46[e]

[a]The listed chemicals were selected as chemicals of concern for both the human health and ecological risk assessments.
[b]Number of sampling locations at which the chemical was detected compared with the total number of sampling locations.
[c]The ranges of detected concentrations were the same as the ranges of averaged concentrations.
[d]Arithmetic mean.
[e]Exceeds the maximum detected concentration.
[f]The quantitation limits are for the individual categories of dioxins/furans.
[g]Sample quantitation limits were not available. The method detection limit is indicated (G-563).

Table 11

Chemicals of Concern in Main Soil[a] (0 to 15 feet deep)
Site 8, Pease AFB, NH

Chemical	Frequency of Detection[b]	Range of Sample Quantitation Limits (mg/kg)	Range of Averaged (Detected) Concentrations[c] (mg/kg)	Mean Concentration[d] (mg/kg)	Upper 95% Confidence Limit of the Mean (mg/kg)
Organics					
Aroclor-1260	1/17	0.15-1.9	0.095(0.11)	0.22[e]	0.34[e]
Bis(2-ethylhexyl) phthalate	7/21	0.33-6.1	0.060(0.040)-2.0	0.46	0.73
Butyl benzyl phthalate	3/21	0.33-6.1	0.082(0.044)-2.3(3.8)	0.56	0.87
alpha-Chlordane	1/17	0.075-0.94	0.041(0.043)	0.11[e]	0.17[e]
gamma-Chlordane	1/17	0.075-0.66	0.039	0.060[e]	0.090[e]
4,4'-DDD	5/17	0.015-0.19	0.005(0.002)-0.12	0.025	0.40
4,4'-DDE	3/17	0.015-0.19	0.005(0.002)-0.017	0.022[e]	0.034[e]
4,4'-DDT	3/17	0.015-0.19	0.004-0.079	0.022	0.035
1,4-Dichlorobenzene	2/21	0.33-6.1	0.51-1.3	0.52	0.80
Dieldrin	4/17	0.015-0.19	0.008(0.003)-0.017(0.024)	0.019[e]	0.31[e]
Di-n-butyl phthalate	11/21	0.33-6.1	0.039-2.7(3.6)	0.86	1.3
Dioxins/furans (as 2,3,7,8-TCDD)	8/8	0.10-0.80[f]	0.0000067-0.0012	0.00015	0.00042
Ethylbenzene	5/26	0.005-0.022	0.16(0.002)-10(20)	0.65	1.4
2-Methylnaphthalene	3/15	0.34-6.1	0.22(0.26)-1.6(3.0)	0.55	0.93
4-Methyl-2-pentanone	4/26	0.010-6.8	0.005(0.004)-3.7(11)	0.28	0.54
Naphthalene	3/21	0.33-6.1	0.15(0.12)-1.2(1.8)	0.38	0.63
n-Nitrosodiphenylamine	1/15	0.34-6.1	0.39 (0.60)	0.41[e]	0.75[e]
PAHs					
Benzo(a)anthracene	3/21	0.33-6.1	0.12(0.073)-0.94(1.7)	0.45	0.72
Benzo(a)pyrene	2/21	0.33-6.1	0.13(0.090)-0.20(0.23)	0.45[e]	0.73[e]
Benzo(b)fluoranthene	2/21	0.33-6.1	0.13(0.084)-0.16(0.15)	0.45[e]	0.72[e]
Benzo(g,h,i)perylene	3/21	0.33-6.1	0.12(0.059)-0.48(0.20)	0.45[e]	0.72[e]
Benzo(k)fluoranthene	2/21	0.33-6.1	0.13(0.077)-0.17(0.16)	0.45[e]	0.72[e]

Table 11

Chemicals of Concern in Main Soil[a] (0 to 15 feet deep)
Site 8, Pease AFB, NH
(Continued)

Chemical	Frequency of Detection[b]	Range of Sample Quantitation Limits (mg/kg)	Range of Averaged (Detected) Concentrations[c] (mg/kg)	Mean Concentration[d] (mg/kg)	Upper 95% Confidence Limit of the Mean (mg/kg)
Chrysene	3/21	0.33-6.1	0.10(0.037)-0.20(0.35)	0.43[e]	0.72[e]
Fluoranthene	7/21	0.33-6.1	0.11(0.048)-0.53(0.45)	0.41	0.68[e]
Indeno(1,2,3-cd)-pyrene	2/21	0.33-6.1	0.12(0.062)-0.17(0.16)	0.45[e]	0.72[e]
Phenanthrene	5/21	0.33-6.1	0.10(0.039)-1.1(2.0)	0.44	0.72
Pyrene	7/21	0.33-6.1	0.11(0.040)-1.3	0.45	0.73
Toluene	7/26	0.002-3.4	0.001-0.28(0.85)	0.069	0.13
1,2,4-Trichlorobenzene	2/21	0.33-6.1	0.031-0.80	0.49	0.76
Trichloroethene	3/26	0.005-3.4	0.004-0.12(0.011)	0.066[e]	0.13[e]
Xylenes (total)	5/26	0.005-0.022	0.91(0.012)-70(140)	4.6	9.7
Inorganics					
Arsenic	21/21	1.0[g]	4.8(4.0)-264	21	42
Boron	3/17	16-22	5.0(4.9)-9.3(10)	9.0	9.5[e]
Chromium	17/17	4.0[g]	4.6(4.1)-56(58)	15	21
Copper	17/17	3.0[g]	8.6(6.0)-85(121)	26	34
Lead	15/17	2.7-17	3.7(2.0)-167	31	47
Molybdenum	3/17	0.39-106	0.43(0.41)-0.71(0.75)	25[e]	33[e]

[a]The listed chemicals were selected as chemicals of concern for the human health risk assessment only. Data for 0- to 15-foot-deep soil are not used in the ecological risk assessment.
[b]Number of sampling locations at which the chemical was detected compared with the total number of sampling locations.
[c]If the minimum or maximum detected concentration differed from the respective minimum or maximum averaged concentration, the detected concentration is given in parentheses.
[d]Arithmetic mean.
[e]Exceeds the maximum detected and/or averaged concentration.
[f]The quantitation limits are for the individual categories of dioxins/furans.
[g]Sample quantitation limits were not available. The method detection limit is indicated (G-563).

Table 12

Chemicals of Concern in Hot Spot Soil[a] (0 to 2 feet deep)
Site 8, Pease AFB, NH

Chemical	Frequency of Detection[b]	Range of Sample Quantitation Limits[c] (mg/kg)	Range of Averaged (Detected) Concentrations[d] (mg/kg)	Mean Concentration[e] (mg/kg)
Organics				
Butyl benzyl phthalate	1/1	0.33	3.4	3.4
Di-n-butyl phthalate	1/1	0.33	5.9	5.9
Dioxins/furans (as 2,3,7,8-TCDD)	1/1	0.10-0.80[f]	0.000013	0.000013
Ethylbenzene	1/1	0.005	6.6	6.6
Heptachlor epoxide	1/1	0.010	0.003	0.003
2-Methylnaphthalene	1/1	0.33	22	22
PAHs				
Fluorene	1/1	0.33	0.87	0.87
Phenanthrene	1/1	0.33	0.52	0.52
Pyrene	1/1	0.33	0.45	0.45
Toluene	1/1	0.005	8.0	8.0
Xylenes (total)	1/1	0.005	56	56
Inorganics				
Lead	1/1	20	11	11

[a]The listed chemicals were selected as chemicals of concern for both the human health and ecological risk assessments.
[b]Number of sampling locations at which the chemical was detected compared with the total number of sampling locations.
[c]Sample quantitation limits were unavailable. The method detection limit is indicated (G-563).
[d]The detected concentrations were the same as the averaged concentrations.
[e]Arithmetic mean. Because there was only one data point, the upper 95% confidence limit of the mean was not calculated.
[f]The quantitation limits are for the individual categories of dioxins/furans.

Table 13

Chemicals of Concern in Hot Spot Soil[a] (0 to 15 feet deep)
Site 8, Pease AFB, NH

Chemical	Frequency of Detection[b]	Range of Sample Quantitation Limits (mg/kg)	Range of Averaged (Detected) Concentrations[c] (mg/kg)	Mean Concentration[d] (mg/kg)	Upper 95% Confidence Limit of the Mean (mg/kg)
Organics					
Butyl benzyl phthalate	1/2	0.34	3.9(3.4)-3.9(4.4)	2.0	14[e]
Di-n-butyl phthalate	2/2	0.33	0.059-4.2(5.9)	2.1	15[e]
Dioxins/furans (as 2,3,7,8-TCDD)	1/1		0.000013	0.000013	NA[g]
Ethylbenzene	1/1	0.005[f]	10(6.6)-10(12)	10	NA[g]
Heptachlor epoxide	1/1	0.007	0.003	0.003	NA[g]
2-Methylnaphthalene	1/1	0.33[f]	33(22)-33(43)	33	NA[g]
PAHs					
Fluorene	1/2	0.34-3.5	1.3(0.87)	0.74	4.3[e]
Phenanthrene	1/2	0.34	0.61(0.52)-0.61(0.70)	0.39	1.8[e]
Pyrene	1/2	0.34-3.5	1.1(0.45)	0.64[e]	3.6[e]
Toluene	1/1	0.005[f]	14(8.0)-14(17)	14	NA[g]
Xylenes (total)	1/1	0.005[f]	97(56)-97(150)	97	NA[g]
Inorganics					
Arsenic	2/2	1.0[f]	7.7(5.8)-9.9	8.8	16[e]
Chromium	2/2	3.6	3.1(4.3)-57	30	200[e]
Lead	2/2	20[f]	7.8(4.2)-25	17	72[e]
Nickel	2/2	5.0[f]	7.7(5.8)-40	24	125[e]

[a]The listed chemicals were selected as chemicals of concern for the human health risk assessment only. Data for 0- to 15-foot-deep soil are not used in the ecological risk assessment.
[b]Number of sampling locations at which the chemical was detected compared with the total number of sampling locations.
[c]If the minimum or maximum detected concentration differed from the respective minimum or maximum averaged concentration, the detected concentration is given in parentheses.
[d]Arithmetic mean.
[e]Exceeds the maximum detected concentration.
[f]Sample quantitation limits were not available. The method detection limit is indicated (G-563).
[g]Not applicable. Because there was only one data point, the upper 95% confidence limit of the mean was not calculated.

Table 14

Chemicals of Concern in Groundwater[a] — Overburden
Site 8, Pease AFB, NH

Chemical	Frequency of Detection[b]	Range of Sample Quantitation Limits (μg/L)	Range of Averaged (Detected) Concentrations[c] (μg/L)	Mean Concentration[d] (μg/L)	Upper 95% Confidence Limit of the Mean (μg/L)
Organics					
Benzene	4/15	0.70-7.0	0.40(0.20)-8.8(15)	1.1	2.1
Bis(2-ethylhexyl) phthalate	5/15	10-11	3.9(1.0)-7.0	5.1	5.5
sec-Butylbenzene	4/15	1.0	0.55(0.40)-13(18)	1.6	3.2
Chlorobenzene	2/15	1.0-12	0.35(0.20)-2.4(7.2)	0.68	0.90
1,2-Dichlorobenzene	3/15	0.50-5.0	0.35(0.20)-5.3(11)	0.78	1.4
1,3-Dichlorobenzene	1/15	1.0-2.0	1.5(0.70)-5.3	0.57	0.69
1,4-Dichlorobenzene	3/15	0.50-5.0	0.32(0.10)-4.3(17)	0.71	1.2
Dichlorodifluoromethane	1/15	2.0-90	14(3.0)	2.8	4.3[e]
1,2-Dichloroethane	1/15	0.20-2.0	4.2(0.80)-4.2(12)	0.68	1.1
cis-1,2-Dichloroethene	6/15	0.50-5.0	1.2(0.40)-332(1,100)	25	64
trans-1,2-Dichloroethene	1/15	0.50-25	3.1(0.50)	0.81[e]	1.2[e]
Di-n-octyl phthalate	3/15	10-12	4.1(1.0)-4.8(6.0)	5.2[e]	5.4[e]
Ethylbenzene	4/15	1.0-10	2.3(0.70)-54(100)	7.5	15
Isopropylbenzene	4/15	1.0	1.7(0.20)-26(30)	3.7	7.4
4-Isopropyltoluene	4/15	1.0	0.40(0.20)-28(32)	2.8	6.1
2-Methylnaphthalene	2/15	10-12	7.3(4.0)-9.0(16)	5.7	6.2
4-Methylphenol	1/15	10-12	4.2(1.0)	5.3[e]	5.4[e]
Naphthalene	3/15	1.0	9.5(6.0)-32(60)	4.4	8.5
n-Nitrosodiphenylamine	1/15	10-12	4.1(1.0)	5.3[e]	5.4[e]
n-Propylbenzene	4/15	1.0	0.40(0.20)-25(28)	2.6	5.5
Toluene	4/15	1.0-10	0.40(0.10)-1.6(3.4)	0.66	0.82
1,1,1-Trichloroethane	2/15	0.20-5.0	0.65(0.37)-0.71(2.0)	0.48	0.53
Trichloroethene	8/15	0.60-6.0	0.35(0.20)-2.1(6.0)	0.65	0.85
1,2,4-Trimethylbenzene	4/15	1.0	1.0(2.0)-238(380)	23	52

Table 14

Chemicals of Concern in Groundwater[a] — Overburden
Site 8, Pease AFB, NH
(Continued)

Chemical		Frequency of Detection[b]	Range of Sample Quantitation Limits (µg/L)	Range of Averaged (Detected) Concentrations[c] (µg/L)	Mean Concentration[d] (µg/L)	Upper 95% Confidence Limit of the Mean (µg/L)
1,3,5-Trimethylbenzene		4/15	1.0	0.40(0.20)-44(96)	6.2	13
Vinyl chloride		1/15	0.20-10	1.2(1.0)	0.86	0.96
Xylenes (total)		4/15	2.0-5.0	2.0(0.60)-296(410)	31	69
Inorganics						
Barium	(filtered)	2/15	50	41(56)-69	29	34
	(total)	7/15	50	52-952(1,880)	109	216
Chromium	(filtered)	0/15	10-30	NA	NA	NA
	(total)	7/15	10	7.8(10)-106(188)	20	33
Cobalt	(filtered)	1/15	40	66	23	28
	(total)	3/15	40	31(42)-248(475)	39	65
Copper	(filtered)	5/15	10-30	10(11)-27	9.6	13
	(total)	8/15	10-45	10-132(241)	26	41
Iron	(filtered)	10/15	101-414	31(57)-25,700(41,200)	2,419	5,434
	(total)	15/15	100[f]	599 (1,540)-77,900(124,000)	27,407	38,593
Manganese	(filtered)	14/15	15[f]	18(10)-6,012(9,410)	1,148	2,105
	(total)	15/15	15[f]	28(15)-6,907(9,470)	1,762	2,756
Nickel	(filtered)	2/15	15	17(15)-28	9.5	12
	(total)	10/15	15	11(15)-248(461)	43	72
Vanadium	(filtered)	3/15	40	32(42)-35(50)	23	25
	(total)	4/15	40	30(40)-254(488)	40	67
Zinc	(filtered)	4/15	10-24	21(13)-75	14	23
	(total)	12/15	10-107	28(26)-274(502)	67	99

NA = Not applicable. Chemical was not detected in any samples.
[a]Selected as chemicals of concern for the human health risk assessment only.
[b]Number of wells at which the chemical was detected compared with the total number of wells.
[c]If the minimum or maximum detected concentration differed from the respective minimum or maximum averaged concentration, the detected concentration is given in parentheses.
[d]Arithmetic mean based on averaged concentrations.
[e]Exceeds the maximum detected and/or averaged concentration.
[f]Sample quantitation limits were unavailable. The method detection limit is indicated (G-563).

Table 15

Chemicals of Concern in Groundwater[a] — Bedrock
Site 8, Pease AFB, NH

Chemical	Frequency of Detection[b]	Range of Sample Quantitation Limits (μg/L)	Range of Averaged (Detected) Concentrations[c] (μg/L)	Mean Concentration[d] (μg/L)	Upper 95% Confidence Limit of the Mean (μg/L)
Organics					
Benzene	9/20	0.70-1.0	0.38(0.20)-8.8(13)	1.4	2.3
Benzoic acid	1/19	11-60	19(1.0)-19(24)	25[e]	27[e]
Bis(2-ethylhexyl) phthalate	13/19	10-12	2.0(1.0)-59(110)	7.5	12
sec-Butylbenzene	4/20	1.0-2.0	0.45(0.20)-1.2(2.0)	0.55	0.62
1,2-Dichlorobenzene	5/20	0.50-1.0	0.41(0.40)-1.5(2.0)	0.50	0.59
1,2-Dichloroethane	3/20	0.20-2.0	0.43(0.57)-1.1(2.0)	0.48	0.55
cis-1,2-Dichloroethene	10/20	0.50-1.0	0.52(0.57)-75(94)	12	20
Diethyl phthalate	1/19	10-12	4.6(3.0)	5.3[e]	5.4[e]
Dimethyl phthalate	8/19	10-12	3.8(1.0)-12(26)	5.5	6.2
Di-n-butyl phthalate	1/19	10-12	4.0(2.0)	5.2[e]	5.4[e]
Di-n-octyl phthalate	3/19	10-12	4.1(1.0)-4.6(2.0)	5.2[e]	5.3[e]
Ethylbenzene	3/20	1.0-2.0	0.48(0.20)-3.9(8.8)	0.76	1.1
Isopropylbenzene	3/20	1.0-2.0	0.33(0.20)-1.6(3.0)	0.57	0.68
4-Isopropyltoluene	2/20	1.0-2.0	0.43(0.30)-1.8(3.0)	0.57	0.68
2-Methylnaphthalene	1/19	10-12	4.4(2.0)	5.2[e]	5.4[e]
Naphthalene	3/20	1.0-2.0	0.67(1.0)-4.8(9.0)	0.95	1.5
n-Nitrosodiphenylamine	4/19	10-11	4.6(2.0)	5.1[e]	5.3[e]
n-Propylbenzene	2/20	1.0-2.0	0.60(0.30)-2.2(4.0)	0.60	0.74
Toluene	10/20	1.0	0.10-0.80(2.0)	0.47	0.52
1,1,1-Trichlorethane	1/20	0.20-2.0	0.64(1.2)	0.44	0.48
Trichloroethene	8/20	0.40-2.0	0.30(0.10)-1.4(3.0)	0.56	0.68
1,2,4-Trimethylbenzene	3/20	1.0-2.0	0.53(0.60)-16(29)	1.3	2.7
1,3,5-Trimethylbenzene	2/20	1.0-2.0	8.0(1.0)	0.52	0.55
Xylenes (total)	5/20	2.0-4.0	0.82(0.50)-11(31)	1.5	2.3

Table 15

Chemicals of Concern in Groundwater[a] — Bedrock
Site 8, Pease AFB, NH
(Continued)

Chemical		Frequency of Detection[b]	Range of Sample Quantitation Limits (µg/L)	Range of Averaged (Detected) Concentrations[c] (µg/L)	Mean Concentration[d] (µg/L)	Upper 95% Confidence Limit of the Mean (µg/L)
Inorganics						
Aluminum	(filtered)	0/20	200	NA	NA	NA
	(total)	7/20	200	161(222)-174,300(318,000)	9,157	24,188
Arsenic	(filtered)	6/20	3.0-5.0	2.8(5.0)-9.8(16)	3.3	4.1
	(total)	5/20	3.0-5.0	4.2(5.8)-147(196)	12	24
Barium	(filtered)	0/20	50	NA	NA	NA
	(total)	3/20	50	21(16)-1,201(2,100)	85	186
Chromium	(filtered)	0/20	10	NA	NA	NA
	(total)	4/20	10	7.6(10)-400(739)	26	60
Copper	(filtered)	2/20	10	10(16)-10(16)	5.5	6.2
	(total)	4/20	10-30	7.9(10)-908(1,600)	51	129
Iron	(filtered)	11/20	40-190	26(42)-10,485(38,800)	1,175	2,274
	(total)	20/20	40-7,640	418-700,000 (1,270,000)	52,720	112,241
Lead	(filtered)	3/20	2.0-3.0	2.5(3.5)-13(24)	2.2	3.2
	(total)	7/20	2.0-12	3.9-156(244)	12	25
Manganese	(filtered)	19/20	10-26	10-2,055(3,040)	259	480
	(total)	20/20	71	14-6,105(10,600)	765	1,324
Nickel	(filtered)	2/20	15	12(15)-17(19)	8.2	9.0
	(total)	5/20	15	14(16)-1,596(2,870)	92	229
Vanadium	(filtered)	4/20	40	30(41)-39(58)	23	25
	(total)	4/20	40	30(41)-174(328)	28	42
Zinc	(filtered)	4/20	10-18	7.7(10)-34	7.2	9.7
	(total)	17/20	10-105	8.6(10)-1,154(2,060)	81	179

NA - Not applicable. Chemical was not detected in any samples.
[a]Selected as chemicals of concern for the human health risk assessment only.
[b]Number of wells at which the chemical was detected compared with the total number of wells.
[c]If the minimum or maximum detected concentration differed from the respective minimum or maximum averaged concentration, the detected concentration is given in parentheses.
[d]Arithmetic mean based on averaged concentrations.
[e]Exceeded the maximum detected and/or averaged concentration.

Table 16

Chemicals of Concern in Groundwater — Hot Spot[a]
Site 8, Pease AFB, NH

Chemical	Frequency of Detection[b]	Range of Sample Quantitation Limits (μg/L)	Range of Averaged (Detected) Concentrations[c] (μg/L)	Mean Concentration[d] (μg/L)	Upper 95% Confidence Limit of the Mean (μg/L)
Organics					
Benzene	6/6	0.70-50	25 (7.8)-2,505 (4,700)	689	1,507
Bis(2-ethylhexyl) phthalate	4/6	10-1,600	8.3 (1.0)-214(140)	60	124
Bromochloromethane	1/6	1.0-6,200	1,275 (1,000)	226	649
sec-Butylbenzene	6/6	1.0-3,100	5.3 (3.0)-800(77)	155[e]	416[e]
4,4′-DDD	4/6	0.10-5.3	0.21-157 (440)	41	95
4,4′-DDT	4/6	0.10-53	0.050 (0.040)-24 (92)	8.1	16
1,2-Dibromoethane	1/6	1.0-6,200	1,805 (510)	328	924[e]
1,2-Dichlorobenzene	2/6	0.50-3,100	5.3 (16)-330 (560)	118	250
1,4-Dichlorobenzene	2/6	0.50-3,100	3.0 (2.0)-16 (41)	65[e]	168[e]
cis-1,2-Dichloroethene	5/6	25-100	22 (1.8)-1,017 (1,600)	466	787
trans-1,2-Dichloroethene	3/6	0.50-3,100	105 (0.60)-321 (710)	100	197
2,4-Dimethylphenol	2/6	10-1,600	4.5 (2.0)-266 (120)	72	152[e]
Di-n-octyl phthalate	1/6	10-1,600	72 (140)	72	147[e]
Ethylbenzene	6/6	1.0-10	36 (2.9)-1,424 (2,200)	445	880
Isopropylbenzene	6/6	1.0-3,100	5.3 (6.0)-865 (180)	180	458[e]
4-Isopropyltoluene	4/6	1.0-3,100	5.3 (3.0)-110 (170)	159[e]	414[e]
Methylene chloride	1/6	0.20-28,000	2,940 (280)	565[e]	1,524[e]
2-Methylnaphthalene	5/6	10-11	30 (9.0)-1,330 (2,700)	364	769
2-Methylphenol	3/6	10-1,600	4.6 (1.0)-252 (110)	70	145[e]
4-Methylphenol	4/6	10-500	7.7 (2.0)-808 (1,400)	171	430
Naphthalene	6/6	25-3,100	10 (8.0)-1,300	543	1,014
2-Nitroaniline	1/6	5.0-8,000	182 (170)	317[e]	685[e]
n-Propylbenzene	6/6	1.0-3,100	2.5 (3.0)-880 (210)	195	475[e]
PAHs					
Phenanthrene	3/6	10-1,600	4.3 (1.0)-194 (78)	59	117[e]
Toluene	6/6	1.0	85 (4.4)-14,580 (29,000)	3,215	7,885
Trichloroethene	6/6	0.60-30	5.2 (0.40)-1,694 (4,400)	336	886
1,2,4-Trimethylbenzene	6/6	1.0-10	17 (13)-1,200 (1,400)	572	996
1,3,5-Trimethylbenzene	6/6	3,100	6.0 (2.0)-1,025 (500)	322	645[e]

Table 16

Chemicals of Concern in Groundwater — Hot Spot[a]
Site 8, Pease AFB, NH
(Continued)

Chemical		Frequency of Detection[b]	Range of Sample Quantitation Limits (μg/L)	Range of Averaged (Detected) Concentrations[c] (μg/L)	Mean Concentration[d] (μg/L)	Upper 95% Confidence Limit of the Mean (μg/L)
Vinyl chloride		2/6	0.20-6,200	4.7 (0.90)-634 (11)	124[e]	330[e]
Xylenes (total)		6/6	0.50[f]	116 (4.5)-6,800 (9,900)	2,529	4,626
Inorganics						
Arsenic	(filtered)	5/6	5.0	4.3 (11)-174 (196)	61	116
	(total)	5/6	5.0	4.8 (5.5)-186 (270)	98	164
Cobalt	(filtered)	2/5	40	75-326	92	218
	(total)	2/5	40	157-202	84	168
Iron	(filtered)	6/6	40-283	108 (52)-111,000 (164,000)	50,244	92,600
	(total)	6/6	101,000	4,323 (463)-171,000 (173,000)	80,009	143,330
Lead	(filtered)	1/5	3.0	92	20	58
	(total)	3/5	3.0	34 (16)-214	58	143
Manganese	(filtered)	6/6	10[f]	175 (73)-19,352 (32,800)	8,834	16,154
	(total)	6/6	10[f]	289 (164)-22,500 (29,100)	9,588	17,362

[a]Selected as chemicals of concern for the human health risk assessment only.
[b]Number of wells at which the chemical was detected compared with the total number of wells.
[c]If the minimum or maximum detected concentration differed from the respective minimum or maximum averaged concentration, the detected concentration is given in parentheses.
[d]Arithmetic mean based on averaged concentrations.
[e]Exceeded the maximum detected and/or averaged concentration.
[f]Sample quantitation limits were unavailable. The method detection limit is indicated (G-563).

Table 17

Most Reasonable Maximally Exposed Receptor (RME)
Site 8, Pease AFB, NH

Pathway	Current Scenario	Future Scenario
Soil	Maintenance Worker	Maintenance Worker
Groundwater	None	Off-Base Resident
Surface Water	Off-Base Resident/Recreational User	Off-Base Resident/Recreational User
Sediment	Off-Base Resident/Recreational User	Off-Base Resident/Recreational User

Table 18

Potential Exposure Routes
Site 8, Pease AFB, NH

Pathway	Exposure Routes
Soil	• Incidental ingestion. • Dermal contact.
Groundwater	• Ingestion. • Noningestion use (e.g., showering).
Surface Water	• Dermal contact.
Sediment	• Incidental ingestion. • Dermal contact.

Table 19

Summary of Total Lifetime Cancer Risks and Hazard Indices — Soil
Site 8, Pease AFB, NH

Location and Depth	RME	Total Lifetime Cancer Risk[a]			Total Hazard Index		
		Mean	Upper 95% Confidence Limit	Maximum	Mean	Upper 95% Confidence Limit	Maximum
Main Soil (0 to 2 feet deep)	Current Maintenance Worker	3E-07	5E-07	1E-06	8E-04	1E-03	2E-03
	Future Maintenance Worker	5E-06	1E-05	3E-05	2E-02	2E-02	4E-02 to 5E-02[b]
Main Soil (0 to 15 feet deep)	Future Maintenance Worker	1E-05	2E-05	9E-05	4E-02	7E-02	4E-01
Hot Spot Soil (0 to 2 feet deep)	Current Maintenance Worker	1E-08	NA	NA	2E-04	NA	NA
	Future Maintenance Worker	2E-07	NA	NA	4E-03	NA	NA
Hot Spot Soils (0 to 15 feet deep)	Future Maintenance Worker	2E-07	2E-07	2E-07	6E-03	7E-03 to 8E-03[b]	7E-03 to 8E-03[b]

NA = Not applicable. There was only one data point.

[a]Chemicals posing greater than a 10^{-6} (1E-06) lifetime cancer risk at one or more exposure concentrations:
Main soil (0 to 2 feet deep) — dioxins/furans and PAHs.
Main soil (0 to 15 feet deep) — dioxins/furans, PAHs, and arsenic.

[b]The first and second values are based on the assumption that chromium is present as chromium III and chromium VI, respectively. A range is presented only when the two values differed after rounding to one significant figure.

Table 20

Summary of Total Lifetime Cancer Risks and Hazard Indices — Groundwater
Site 8, Pease AFB, NH

Groundwater Zone	RME	Total Lifetime Cancer Risk[a]			Total Hazard Index[b]		
		Mean	Upper 95% Confidence Limit	Maximum	Mean	Upper 95% Confidence Limit	Maximum
Overburden[c]	Future Resident	3E-05 (filtered) 3E-05 (total)	3E-05 (filtered) 3E-05 (total)	4E-05 (filtered) 4E-05 (total)	3E+00 (filtered) 3E+00 (total)	5E+00 (filtered) 5E+00 to 6E+00[d] (total)	2E+01 (filtered) 2E+01 (total)
Bedrock[c]	Future Resident	7E-05 (filtered) 3E-04 (total)	9E-05 (filtered) 5E-04 (total)	2E-04 (filtered) 3E-03 (total)	1E+00 (filtered) 3E+00 (total)	1E+00 (filtered) 6E+00 (total)	5E+00 (filtered) 4E+01 (total)
Hot Spot[c]	Future Resident	1E-01 (filtered) 1E-01 (total)	3E-01 (filtered) 3E-01 (total)	5E-01 (filtered) 5E-01 (total)	2E+02 (filtered) 2E+02 (total)	3E+02 (filtered) 3E+02 (total)	4E+02 (filtered) 4E+02 (total)

[a]Chemicals posing greater than a 10^{-6} (1E-06), but less than 10^{-4} (1E-04), lifetime cancer risk at one or more exposure concentrations:
Overburden: benzene, bis(2-ethylhexyl) phthalate, 1,4-dichlorobenzene, 1,2-dichloroethane, and vinyl chloride.
Bedrock: benzene, bis(2-ethylhexyl) phthalate, and 1,2-dichloroethane.
Hot spot: bis(2-ethylhexyl) phthalate, 1,4-dichlorobenzene, and methylene chloride.

Chemicals posing greater than a 10^{-4} (1E-04) lifetime cancer risk at one or more exposure concentrations:
Bedrock: arsenic.
Hot spot: benzene, 4,4'-DDD, 4,4'-DDT, 1,2-dibromoethane, trichloroethene, vinyl chloride, and arsenic.

[b]Chemicals posing greater than a hazard index of 1 but less than a hazard index of 10 at one or more exposure concentrations:
Overburden: naphthalene and manganese.
Bedrock: chromium (as chromium VI), manganese, and nickel.
Hot spot: sec-butylbenzene, 4,4'-DDD, 4,4'-DDT, cis-1,2-dichloroethene, isopropylbenzene, phenanthrene, toluene, trichloroethene, lead, and manganese.

Chemicals posing greater than a hazard index of 10 at one or more exposure concentrations:
Overburden: 1,2,4-trimethylbenzene.
Bedrock: arsenic and lead.
Hot spot: 2-methylnaphthalene, naphthalene, 2-nitroaniline, 1,2,4-trimethylbenzene, and arsenic.

[c]*Filtered* and *total* values are based on organics data plus inorganics data for filtered and unfiltered (total) samples, respectively.

[d]The first and second values are based on the assumption that chromium is present as chromium III and chromium VI, respectively. A range is presented only when the two values differed after rounding to one significant figure.

Table 21

Summary of Total Lifetime Cancer Risks and Hazard Indices — Surface Water
Site 8, Pease AFB, NH

Surface Water Body	RME	Total Lifetime Cancer Risk			Total Hazard Index		
		Mean	Upper 95% Confidence Limit	Maximum	Mean	Upper 95% Confidence Limit	Maximum
Knights Brook	Current or Future Resident/Recreational User	5E-08	6E-08	6E-08	2E-04	3E-04	3E-04
Pickering Brook	Current or Future Resident/Recreational User	2E-07	3E-07	5E-07	2E-03	6E-03	9E-03

Table 22

Summary of Total Lifetime Cancer Risks and Hazard Indices — Sediment
Site 8, Pease AFB, NH

Surface Water Body	RME	Total Lifetime Cancer Risk			Total Hazard Index		
		Mean	Upper 95% Confidence Limit	Maximum	Mean	Upper 95% Confidence Limit	Maximum
Knights Brook	Current or Future Resident/Recreational User	2E-07	2E-07	2E-07	1E-03	2E-03	2E-03
Pickering Brook	Current or Future Resident/Recreational User	2E-07	3E-07	4E-07	2E-03	3E-03	3E-03

Table 23

Summary of Chemicals of Concern by Medium[a]
Site 8, Pease AFB, NH

Chemical	Soil—Main[b]	Soil—Hot Spot[b]	Groundwater—Overburden[c]	Groundwater—Bedrock[c]	Groundwater—Hot Spot[c]	Surface Water—Knights Brook	Surface Water—Pickering Brook	Sediment—Knights Brook	Sediment—Pickering Brook
Organics									
Aroclor-1260	x(d)								x
Benzene			x	x	x				
Benzoic acid				x					
Bis(2-ethylhexyl) phthalate	x (s,d)		x	x	x	x			
Bromochloromethane					x				
sec-Butylbenzene			x	x	x				
Butyl benzyl phthalate	x (s,d)	x (s,d)							
alpha-Chlordane	x (s,d)								
gamma-Chlordane	x (s,d)								
Chlorobenzene			x						
Chloroform						x			
4,4′-DDD	x (s,d)				x	x	x		x
4,4′-DDE	x (s,d)								x
4,4′-DDT	x (s,d)				x				x
1,2-Dibromoethane					x				
1,2-Dichlorobenzene	x (s)		x	x	x				
1,3-Dichlorobenzene			x						
1,4-Dichlorobenzene	x(s,d)		x		x				
Dichlorodifluoromethane			x						
1,2-Dichloroethane			x	x					
cis-1,2-Dichloroethene			x	x	x	x			
trans-1,2-Dichloroethene			x		x				
Dieldrin	x (s,d)								
Diethyl phthalate				x					
2,4-Dimethylphenol					x				
Dimethyl phthalate				x					
Di-n-butyl phthalate	x (s,d)	x (s,d)		x					
Di-n-octyl phthalate			x	x	x				
Dioxins/furans (as 2,3,7,8-TCDD)	x (s,d)	x (s,d)							
Endosulfan I						x	x		
Ethylbenzene	x (s,d)	x (s,d)	x	x	x				
Heptachlor epoxide		x (s,d)							

Table 23

Summary of Chemicals of Concern by Medium[a]
Site 8, Pease AFB, NH
(Continued)

Chemical	Soil—Main[b]	Soil—Hot Spot[b]	Groundwater—Overburden[c]	Groundwater—Bedrock[c]	Groundwater—Hot Spot[c]	Surface Water—Knights Brook	Surface Water—Pickering Brook	Sediment—Knights Brook	Sediment—Pickering Brook
Organics (continued)									
Isopropylbenzene			x	x	x				
Isopropyltoluene			x	x	x				
Methylene chloride					x				
2-Methylnaphthalene	x (s,d)	x (s,d)	x	x	x				
4-Methyl-2-pentanone	x(s,d)							x	
2-Methylphenol					x				
4-Methylphenol			x		x				
Naphthalene	x (s,d)		x	x	x			x	x
2-Nitroaniline					x				
n-Nitrosodiphenylamine	x(s,d)		x	x					
PAHs									
Acenaphthene								x	
Benzo(a)anthracene	x (s,d)							x	x
Benzo(a)pyrene	x (s,d)							x	x
Benzo(b)fluoranthene	x (s,d)							x	x
Benzo(g,h,i)perylene	x (s,d)								x
Benzo(k)fluoranthene	x (s,d)							x	x
Chrysene	x (s,d)							x	x
Dibenzo(a,h)anthracene	x (s)								
Fluoranthene	x (s,d)							x	x
Fluorene		x (s,d)							x
Indeno(1,2,3-cd)pyrene	x (s,d)								x
Phenanthrene	x (s,d)	x (s,d)			x				x
Pyrene	x (s,d)	x (s,d)						x	x
n-Propylbenzene			x	x	x				
Toluene	x (s,d)	x (s,d)	x	x	x			x	
1,2,4-Trichlorobenzene	x (s,d)								

Table 23

Summary of Chemicals of Concern by Medium[a]
Site 8, Pease AFB, NH
(Continued)

Chemical	Soil—Main[b]	Soil—Hot Spot[b]	Groundwater—Overburden[c]	Groundwater—Bedrock[c]	Groundwater—Hot Spot[c]	Surface Water—Knights Brook	Surface Water—Pickering Brook	Sediment—Knights Brook	Sediment—Pickering Brook
Organics (continued)									
1,1,1-Trichloroethane			x	x					
Trichloroethene	x (s,d)		x	x	x	x			
1,2,4-Trimethylbenzene			x	x	x				
1,3,5-Trimethylbenzene			x	x	x				
Vinyl chloride			x		x				
Xylenes (total)	x (s,d)	x (s,d)	x	x	x				
Inorganics									
Aluminum				x		x	x	x	x
Arsenic	x (d)			x	x		x	x	x
Barium			x	x			x	x	x
Beryllium							x	x	x
Boron	x (s,d)						x	x	x
Calcium						x	x		
Chromium	x (s,d)	x (d)	x	x			x	x	x
Cobalt			x		x			x	x
Copper	x (s,d)		x	x				x	x
Iron			x	x	x	x	x	x	x
Lead	x (s,d)	x (s,d)		x	x		x	x	x
Magnesium						x	x		
Manganese			x	x	x	x	x	x	x
Mercury								x	x
Molybdenum	x (s,d)								
Nickel		x (d)	x	x			x	x	x
Selenium								x	x
Silicon						x	x		
Sodium						x	x		
Thallium									x

Table 23

Summary of Chemicals of Concern by Medium[a]
Site 8, Pease AFB, NH
(Continued)

Chemical	Soil—Main[b]	Soil—Hot Spot[b]	Groundwater—Overburden[c]	Groundwater—Bedrock[c]	Groundwater—Hot Spot[c]	Surface Water—Knights Brook	Surface Water—Pickering Brook	Sediment—Knights Brook	Sediment—Pickering Brook
Inorganics (continued)									
Vanadium			x	x			x	x	x
Zinc			x	x		x	x	x	x

[a]An "x" indicates that the chemical was selected as a chemical of concern for both the human health and ecological risk assessments, unless otherwise indicated.
[b]An "s" indicates a chemical of concern in 0- to 2-foot-deep soil; a "d" indicates a chemical of concern in 0- to 15-foot-deep soil. Only the chemicals of concern in 0- to 2-foot-deep soil were evaluated in the ecological risk assessment.
[c]Selected as chemicals of concern for the human health risk assessment only.

Table 24

Exposure Routes of Potential Concern to Ecological Receptors
Site 8, Pease AFB, NH

Deer Mouse • Incidental ingestion of soil. • Ingestion of vegetation (browse).
Chipping Sparrow • Ingestion of plant seeds. • Ingestion of surface water. • Incidental ingestion of soil.
Aquatic Biota • Direct contact with surface water. • Direct contact with sediment.
Terrestrial Plants • Direct contact with soil.

Table 25

Deer Mouse — Total Hazard Indices
Site 8, Pease AFB, NH

Main Site (average)	Main Site (maximum)	Hot Spot (average)
3.3E+01	8.8E+01	9.2E+00
>10 Lead (soil)	>10 Lead (soil and vegetation)	>1 Lead (soil and vegetation)
>1 Boron (vegetation)	>1 Dioxins/furans (soil)	
>1 n-Nitrosodiphenylamine (vegetation)	>1 Boron (vegetation)	
>1 Dioxins/furans (soil)	>1 n-Nitrosodiphenylamine (vegetation)	

Table 26

Chipping Sparrow — Total Hazard Indices
Site 8, Pease AFB, NH

Main Site (average)	Main Site (maximum)	Hot Spot (average)	Hot Spot (maximum)
4.80E+00	1.6E+01	4.6E+00	5.2E+00
>1 Copper (vegetation)	>1 Copper (vegetation)	>1 Xylenes (total) (vegetation)	>1 Xylenes (total) (vegetation)
	>1 Xylenes (total) (vegetation)		

Table 27

Comparison of Hazard Quotients in Pickering Brook Based on Ambient Water Quality Criteria Site 8, Pease AFB, NH

Chemical	Hazard Quotients Based on Acute Criteria		Hazard Quotients Based on Chronic Criteria	
	Average	Maximum	Average	Maximum
Organics				
4,4'-DDD	4.67E-01	8.33E-01	NE	NE
Endosulfan	1.00E-01	1.82E-01	3.93E-01	7.14E-01
Inorganics				
Aluminum	5.97E+00	2.59E+01	5.15E+01	2.23E+02
Arsenic	8.54E-03	3.09E-02	1.51E-01	5.48E-01
Barium	1.77E-03	6.84E-03	NE	NE
Beryllium	1.00E-02	1.92E-02	2.45E-01	4.72E-01
Boron	NE	NE	NE	NE
Calcium	NE	NE	NE	NE
Chromium				
Hexavalent	7.13E-02	2.31E-01	1.04E-01	3.35E-01
Trivalent	9.04E-03	2.91E-02	7.58E-02	2.44E-01
Iron	NE	NE	5.86E+00	2.45E+01
Lead	2.68E-02	1.00E-01	6.71E+00	2.51E+01
Magnesium	NE	NE	NE	NE
Manganese	NE	NE	NE	NE
Nickel	1.56E-02	4.54E-02	1.41E-01	4.10E-01
Silicon	NE	NE	NE	NE
Sodium	NE	NE	NE	NE
Vanadium	NE	NE	NE	NE
Zinc	6.62E-01	1.78E+00	7.29E-01	1.96E+00

NE = Not evaluated because of lack of data.

Table 28

Comparison of Hazard Quotients in Knights Brook Based on Ambient Water Quality Criteria Site 8, Pease AFB, NH

Chemical	Hazard Quotients Based on Acute Criteria		Hazard Quotients Based on Chronic Criteria	
	Average	Maximum	Average	Maximum
Organics				
Bis(2-ethylhexyl) phthalate	1.06E-03	1.06E-03	3.33E-01	3.33E-01
4,4'-DDD	1.38E+00	1.67E+00	NE	NE
Chloroform	1.04E-05	1.04E-05	2.42E-04	2.42E-04
cis-1,2-Dichloroethene	4.40E-04	1.72E-03	NE	NE
Endosulfan	9.09E-02	9.09E-02	3.57E-01	3.57E-01
Trichloroethene	1.07E-05	1.11E-05	2.19E-05	2.28E-05
Inorganics				
Aluminum	2.11E-01	4.55E-01	1.82E+00	3.92E+00
Calcium	NE	NE	NE	NE
Iron	NE	NE	1.55E-01	4.88E-01
Magnesium	NE	NE	NE	NE
Manganese	NE	NE	NE	NE
Silicon	NE	NE	NE	NE
Sodium	NE	NE	NE	NE
Zinc	1.36E-01	3.55E-01	1.49E-01	3.91E-01

NE = Not evaluated because of lack of data.

Table 29

Comparison of Sediment or Interstitial Water Concentrations in Pickering Brook with NOAA Biological Effect Levels or AWQC Site 8, Pease AFB, NH

Chemical	NOAA Biological Effect Levels (ER-Ls) (mg/kg)	New Hampshire Chronic Water Quality Criteria ($\mu g/L$)	Hazard Quotients	
			Mean	Maximum
Organics				
Aroclor-1260*	0.05	0.014	2.2E-02	2.4E-02
4,4'-DDD	0.002	NA	2.1E+01	7.5E+01
4,4'-DDE	0.002	NA	4.1E+01	1.5E+02
4,4'-DDT	0.001	NA	2.3E+01	3.4E+01
Naphthalene	0.34	NA	3.5E-01	8.1E-01
PAHs				
Benzo(a)anthracene	0.23	NCA	3.9E-02	1.0E-01
Benzo(a)pyrene	0.4	NA	2.2E-02	5.5E-02
Benzo(b)fluoranthene	NCA	NCA	NE	NE
Benzo(k)fluoranthene	NCA	NCA	NE	NE
Benzo(g,h,i)perylene	NCA	NCA	NE	NE
Chrysene	0.4	NA	4.5E-02	1.0E-01
Fluoranthene	0.6	NA	5.0E-02	1.4E-01
Fluorene	0.035	NA	3.1E-01	3.1E-01
Indeno(1,2,3-cd)pyrene	NCA	NCA	NE	NE
Phenanthrene	0.225	NA	1.8E-01	2.6E-01
Pyrene	0.35	NA	8.0E-02	1.9E-01
PAHs (total)	4	NA	4.5E-02	8.7E-02
Inorganics				
Aluminum	NCA	NA	NE	NE
Arsenic	33	NA	4.0E-01	6.1E-01
Barium	NCA	NCA	NE	NE
Beryllium	NCA	NA	NE	NE
Boron	NCA	NCA	NE	NE
Chromium	80	NA	3.2E-01	4.8E-01
Cobalt	NCA	NCA	NE	NE
Copper	70	NA	1.3E-01	2.5E-01
Iron	NCA	NA	NE	NE
Lead	35	NA	1.2E+00	2.1E+00
Manganese	NCA	NCA	NE	NE
Mercury	0.15	NA	1.0E+00	1.1E+00
Nickel	30	NA	6.6E-01	1.1E+00
Selenium	NCA	NA	NE	NE
Thallium	NCA	NA	NE	NE
Vanadium	NCA	NCA	NE	NE
Zinc	120	NA	5.1E-01	9.7E-01

*Estimated interstitial concentrations, all others are sediment concentrations.
NCA = No criterion available.
NA = Not applicable.
NE Not evaluated because of lack of data.

Table 30

Comparison of Sediment or Interstitial Water Concentrations in Knights Brook with NOAA Biological Effect Levels or AWQC Site 8, Pease AFB, NH

Chemical	NOAA Biological Effect Levels (ER-Ls) (mg/kg)	New Hampshire Chronic Water Quality Criteria (μg/L)	Hazard Quotients	
			Mean	Maximum
Organics				
4-Methyl-2-pentanone	NCA	NCA	NE	NE
Naphthalene	0.34	NA	9.7E-01	1.6E+00
PAHs			NE	NE
Acenaphthene	0.15	NA	6.2E+00	1.2E+01
Benzo(a)anthracene	0.23	NA	1.3E-02	2.6E-02
Benzo(a)pyrene	0.4	NA	7.5E-03	1.2E-02
Benzo(b)fluoranthene	NCA	NCA	NE	NE
Benzo(k)fluoranthene	NCA	NCA	NE	NE
Chrysene	0.4	NA	6.7E-02	8.0E-02
Fluoranthene	0.6	NA	3.0E-02	3.5E-02
Pyrene	0.35	NA	4.6E-02	4.6E-02
PAHs (total)	4	NA	2.5E-01	4.6E-01
Toluene	NCA	NCA	NE	NE
Inorganics				
Arsenic	33	NA	2.8E-01	4.2E-01
Aluminum	NCA	NA	NE	NE
Barium	NCA	NCA	NE	NE
Beryllium	NCA	NA	NE	NE
Boron	NCA	NCA	NE	NE
Chromium	80	NA	2.3E-01	3.8E-01
Cobalt	NCA	NCA	NE	NE
Copper	70	NA	1.4E-01	2.2E-01
Iron	NCA	NA	NE	NE
Lead	35	NA	4.4E-01	7.3E-01
Manganese	NCA	NCA	NE	NE
Mercury	0.15	NA	1.3E+00	1.6E+00
Nickel	30	NA	4.5E-01	6.6E-01
Selenium	NCA	NA	NE	NE
Vanadium	NCA	NCA	NE	NE
Zinc	120	NA	3.1E-01	4.3E-01

NCA = No criterion available.
NA = Not applicable.
NE = Not evaluated because of lack of data.

Table 31

Alternatives Retained for Detailed Analysis
Site 8, Pease AFB, NH

Alternative No.	Description
1	No Action/Access Restrictions and Institutional Controls (fencing, deed restrictions, monitoring, and extension of public water supply).
2	Management of Dissolved-Phase Contaminant Migration in the Overburden and Bedrock Water-Bearing Zones, On-Base Treatment of Recovered Groundwater, Discharge of Treated Groundwater to Subsurface Recharge Trenches, and Institutional Controls.
3	Downgradient Groundwater Recovery Trench to Minimize Off-Site Contaminant Migration, Recovery and Off-Site Disposal of Free-Phase Product, Management of Dissolved-Phase Contaminant Migration in the Overburden and Bedrock Water-Bearing Zones, On-Base Treatment of Recovered Groundwater, Discharge of Treated Groundwater to Subsurface Recharge Trenches, and Institutional Controls.
4	In Situ Soil Vapor Extraction of Source Area Soil, Recovery and Off-Base Disposal of Free-Phase Product, Management of Dissolved Contaminant Migration in the Overburden Water-Bearing Zone, On-Site Treatment of Recovered Groundwater, Discharge of Treated Groundwater to Subsurface Recharge Trenches, and Institutional Controls.
5	In Situ Soil Vapor Extraction of Source Area Soil, Recovery and Off-Base Disposal of Free-Phase Product, Management of Dissolved-Phase Contaminant Migration in the Overburden and Bedrock Water-Bearing Zones, On-Site Treatment of Recovered Groundwater, Discharge of Treated Groundwater to Subsurface Recharge Trenches, and Institutional Controls.
6	Excavation and Ex Situ Biological/Vapor Extraction Treatment of Former Burn Area Soil Contaminated Above Cleanup Goals, Dewatering of Open Excavation, Recovery and Off-Base Disposal of Free-Phase Product, In Situ Soil Vapor Extraction of Migrating Free-Phase Product Area Soil, Management of Dissolved Contaminant Migration in the Overburden and Bedrock Water-Bearing Zones, On-Site Treatment of Recovered Groundwater, Discharge of Treated Groundwater to Subsurface Recharge Trenches, and Institutional Controls.
7	Excavation and On-Site Thermal Treatment of Former Burn Area Soil Contaminated Above Cleanup Goals, Dewatering of the Open Excavation, Recovery and Off-Base Disposal of Free-Phase Product, In Situ Soil Vapor Extraction of Migrating Free-Phase Product Area Soil, Management of Dissolved-Phase Contaminant Migration in the Overburden and Bedrock Water-Bearing Zones, On-Site Treatment of Recovered Groundwater, Discharge of Treated Groundwater to Subsurface Recharge Trenches, and Institutional Controls.
8	Excavation and On-Site Thermal Treatment of All Soil Contaminated Above Cleanup Goals, Dewatering of the Open Excavation, Recovery and Off-Base Disposal of Free-Phase Product, Management of Dissolved-Phase Contaminant Migration in the Overburden and Bedrock Water-Bearing Zones, On-Site Treatment of Recovered Groundwater, Discharge of Treated Groundwater to Subsurface Recharge Trenches, and Institutional Controls.

Table 32

Summary of Detailed Alternatives Evaluation[a]
Site 8, Pease AFB, NH

Remedial Alternative	Short-Term Effectiveness Ranking	Long-Term Effectiveness Ranking	Reduction in TMV of Contaminants Ranking	Implementability Ranking	Protection of Human Health and Environment Ranking	Compliance with ARARs Ranking	Cost Analysis[b] (sensitivity analysis)[c]
1. No Action/Institutional Controls (deed restrictions, monitoring, and extension of public water supply).	AB	C	C	A	C	BC	$1,340,100
2. Management of Dissolved-Phase Contaminant Migration in the Overburden and Bedrock Water-Bearing Zones, On-Site Treatment of Recovered Groundwater, Discharge of Treated Groundwater to Subsurface Recharge Trenches, and Institutional Controls.	AB	BC	BC	AB	BC	B	$6,635,000 ($5,956,000 to $8,146,000)
3. Downgradient Groundwater Recovery Trench to Minimize Off-Site Contaminant Migration, Recovery and Off-Site Disposal of Free-Phase Product, Discharge of Treated Groundwater to Subsurface Recharge Trenches, and Institutional Controls.	AB	BC	B	AB	BC	B	$7,846,000 ($6,346,000 to $8,238,000)
4. In Situ Soil Vapor Extraction of Source Area Soil, Recovery and Off-Site Disposal of Free-Phase Product, Management of Dissolved-Phase Contaminant Migration in the Overburden Water-Bearing Zone, On-Site Treatment of Recovered Groundwater, Discharge of Treated Groundwater to Subsurface Recharge Trenches, and Institutional Controls.	AB	AB	B	B	B	AB	$10,674,000 ($10,021,000 to $11,355,000)

Table 32

Summary of Detailed Alternatives Evaluation[a]
Site 8, Pease AFB, NH
(Continued)

Remedial Alternative	Short-Term Effectiveness Ranking	Long-Term Effectiveness Ranking	Reduction in TMV of Contaminants Ranking	Implementability Ranking	Protection of Human Health and Environment Ranking	Compliance with ARARs Ranking	Cost Analysis[b] (sensitivity analysis)[c]
5. In Situ Soil Vapor Extraction of Source Area Soil, Recovery and Off-Site Disposal of Free-Phase Product, Management of Dissolved-Phase Contaminant Migration in the Overburden and Bedrock Water-Bearing Zones, On-Site Treatment of Recovered Groundwater, Discharge of Treated Groundwater to Subsurface Recharge Trenches, and Institutional Controls.	AB	AB	B	B	B	AB	$13,890,000 ($12,610,000 to $14,608,000)
6. Excavation and Ex Situ Biological/Vapor Extraction Treatment of Former Burn Area Soil Contaminated Above Cleanup Goals, Dewatering of the Open Excavation, Recovery and Off-Site Disposal of Free-Phase Product, In Situ Soil Vapor Extraction of Migrating Free-Phase Product Area Soil, Management of Dissolved-Phase Contaminant Migration in the Overburden and Bedrock Water-Bearing Zones, On-Site Treatment of Recovered Groundwater, Discharge of Treated Groundwater to Subsurface Recharge Trenches, and Institutional Controls.	B	AB	AB	BC	AB	AB	$25,306,000 ($23,128,000 to $26,786,000)

Table 32

Summary of Detailed Alternatives Evaluation[a]
Site 8, Pease AFB, NH
(Continued)

Remedial Alternative	Short-Term Effectiveness Ranking	Long-Term Effectiveness Ranking	Reduction in TMV of Contaminants Ranking	Implementability Ranking	Protection of Human Health and Environment Ranking	Compliance with ARARs Ranking	Cost Analysis[b] (sensitivity analysis)[c]
7. Excavation and On-Site Thermal Treatment of Former Burn Area Soil Contaminated Above Cleanup Goals, Dewatering of the Open Excavation, Recovery and Off-Site Disposal of Free-Phase Product, In Situ Soil Vapor Extraction of Migrating Free-Phase Product Area Soil, Management of Dissolved-Phase Contaminant Migration in the Overburden and Bedrock Water-Bearing Zones, On-Site Treatment of Recovered Groundwater, Discharge of Treated Groundwater to Subsurface Recharge Trenches, and Institutional Controls.	B	AB	AB	B	AB	AB	$33,362,000 ($28,901,000 to $37,743,000)
8. Excavation and On-Site Thermal Treatment of All Soil Contaminated Above Cleanup Goals, Dewatering of the Open Excavation, Recovery and Off-Site Disposal of Free-Phase Product, Management of Dissolved-Phase Contaminant Migration in the Overburden and Bedrock Water-Bearing Zones, On-Site Treatment of Recovered Groundwater, Discharge of Treated Groundwater to Subsurface Recharge Trenches, and Institutional Controls.	B	A	A	B	AB	A	$40,674,000 ($46,309,000 to $34,095,000)

[a]The letter ranking system is described in Subsection 5.3 of the Draft Final Site 8 FS Report (G-611). The ranking worksheet is presented in Appendix H of the Draft Final Site 8 FS Report (G-611).
[b]Estimated costs represent present-worth costs. Detailed cost estimates are presented in Appendix D of the Draft Final Site 8 FS Report (G-611).
[c]The sensitivity analysis costs represent the upper and lower limits of the 50% confidence interval.

Table 33

Present-Worth Costs of Alternatives 1 Through 8
Site 8, Pease AFB, NH

Remedial Alternative	Capital Cost	30-Year Present-Worth O&M Cost	Present-Worth Cost
1. No Action/Access Restrictions and Institutional Controls (fencing, deed restrictions, monitoring, and extension of public water supply).	$313,000.	$1,113,305.	$1,340,000.
2. Management of Dissolved-Phase Contaminant Migration in the Overburden and Bedrock Water-Bearing Zones, On-Site Treatment of Recovered Groundwater, Discharge of Treated Groundwater to Subsurface Recharge Trenches, and Institutional Controls.	$1,189,500.	$5,445,000.	$6,635,000.
3. Downgradient Groundwater Recovery Trench to Minimize Off-Site Contaminant Migration, Recovery and Off-Base Disposal of Free-Phase Product, Management of Dissolved-Phase Contaminant Migration in the Overburden and Bedrock Water-Bearing Zones, On-Site Treatment of Recovered Groundwater, Discharge of Treated Groundwater to Subsurface Recharge Trenches, and Institutional Controls.	$1,830,300.	$6,016,000.	$7,846,000.
4. In Situ Soil Vapor Extraction of Source Area Soil, Recovery and Off-Base Disposal of Free-Phase Product, Management of Dissolved-Phase Contaminant Migration in the Overburden Water-Bearing Zone, On-Site Treatment of Recovered Groundwater, Discharge of Treated Groundwater to Subsurface Recharge Trenches, and Institutional Controls.	$7,257,596.	$6,117,375.	$13,374,971.
5. In Situ Soil Vapor Extraction of Source Area Soil, Recovery and Off-Base Disposal of Free-Phase Product, Management of Dissolved-Phase Contaminant Migration in the Overburden and Bedrock Water-Bearing Zones, On-Site Treatment of Recovered Groundwater, Discharge of Treated Groundwater to Subsurface Recharge Trenches, and Institutional Controls.	$5,720,000.	$8,169,569.	$13,890,000.
6. Excavation and Ex Situ Biological/Vapor Extraction Treatment of Burn Area Soil Contaminated Above Cleanup Goals, Dewatering of the Open Excavation, Recovery and Off-Base Disposal of Free-Phase Product, In Situ Soil Vapor Extraction of Migrating Free-Phase Product Area Soil, Management of Dissolved-Phase Contaminant Migration in the Overburden and Bedrock Water-Bearing Zones, On-Site Treatment of Recovered Groundwater, Discharge of Treated Groundwater to Subsurface Recharge Trenches, and Institutional Controls.	$18,430,300.	$6,876,000.	$25,306,000.
7. Excavation and On-Site Thermal Treatment of Burn Area Soil Contaminated Above Cleanup Goals, Dewatering of the Open Excavation, Recovery and Off-Base Disposal of Free-Phase Product, In Situ Soil Vapor Extraction of Migrating Free-Phase Product Area Soil, Management of Dissolved-Phase Contaminant Migration in the Overburden and Bedrock Water-Bearing Zones, On-Site Treatment of Recovered Groundwater, Discharge of Treated Groundwater to Subsurface Recharge Trenches, and Institutional Controls.	$27,271,400.	$6,091,000.	$33,362,000.
8. Excavation and On-Site Thermal Treatment of All Soil Contaminated Above Cleanup Goals, Dewatering of Open Excavation, Recovery and Off-Base Disposal of Free-Phase Product, Management of Dissolved-Phase Contaminant Migration in the Overburden and Bedrock Water-Bearing Zones, On-Site Treatment of Recovered Groundwater, Discharge of Treated Groundwater to Subsurface Recharge Trenches, and Institutional Controls.	$35,616,100.	$5,057,000.	$40,674,000.

Table 34

Data and Criteria Used for Evaluation of Leaching Potential of Metals in Soil
Site 8, Pease AFB, NH

Contaminant	Maximum Groundwater Concentration Detected (μg/L)	Groundwater ARAR[a] (μg/L)	Maximum Soil Concentration Detected (mg/kg)	Stage 3 Soil Background Concentration[b] (mg/kg)
Aluminum	30,700	NA	17,900	56,400
Antimony	459	6	55.5	ND (20.7)[c]
Arsenic (total)	512	50	264	25.2
Barium	1,880	2,000	55.1	262
Beryllium	47.3	4	0.59	3.83
Boron	896	620[d]	10.3	ND (20.7)[c]
Cadmium	54.1	5	3.1	ND (2.1)[c]
Calcium	75,600	NA	2,460	20,900
Chromium (total)	188	100	58.1	49.4
Cobalt	475	NA	21.2	32.4
Copper	241	1,300	121	54.3
Iron	173,000	NA	33,300	115,000
Lead	214	15	167	54.0
Magnesium	26,400	NA	10,800	15,500
Manganese	29,100	NA	706	1,020
Mercury	0.12	2	0.12	ND (0.14)[c]
Molybdenum	880	40[e]	0.75	ND (104)[c]
Nickel	461	100	73.6	70.5
Potassium	22,900	35,000[d]	2,320	4,780
Selenium	ND	50	ND (1.2)[f]	ND (1.2)[c]
Silicon	40,500	NA	1,400	2,710

Table 34

Data and Criteria Used for Evaluation of Leaching Potential of Metals in Soil Site 8, Pease AFB, NH (Continued)

Contaminant	Maximum Groundwater Concentration Detected (μg/L)	Groundwater ARAR[a] (μg/L)	Maximum Soil Concentration Detected (mg/kg)	Stage 3 Soil Background Concentration[b] (mg/kg)
Silver	48.6	100[e]	ND (5.2)[f]	3.4
Sodium	57,100	NA	191	174
Thallium	548	2	ND (23.2)[f]	ND (2.4)[c]
Vanadium	488	20[e]	44.4	150
Zinc	502	2,000[e]	136	219

[a]Value presented is an MCL unless otherwise noted.
[b]Stage 3 background levels reported are the upper 95% tolerance limits for the nine background soil samples collected during Stage 3 (G-603) for the metals detected. The leaching potential of metals in soil will be re-evaluated using Stage 4 background data when they are available.
[c]Highest detection limit reported for the nine background samples for the metals not detected.
[d]New Hampshire Department of Public Health Services.
[e]EPA Lifetime Health Advisory.
[f]Highest detection limit reported for Site 8 soil samples.
NA = Not applicable.
ND = Not detected.

Table 35

Selection of Cleanup Goals for Organics in Soil
Site 8, Pease AFB, NH

Organic Chemical	ARARs		Target Levels Based on Leaching[c] (unsaturated) (mg/kg)	Cancer Risks and Hazard Indices Calculated Using Target Levels Based on Leaching		Maximum Concentration Detected[e] (mg/kg)	Cleanup Goals (mg/kg)
	RCRA[a] (mg/kg)	New Hampshire[b] (mg/kg)		Hazard Index	Cancer Risk		
Aroclor-1260			19	NTV	2.05E-05	0.110	NA
Benzene		1.0[d]	0.030	NTV	9.12E-10	8.000	1.0[d]
gamma-BHC (Lindane)			0.016	1.57E-04	2.18E-08	0.012	NA
Bis(2-ethylhexyl) phthalate	50		44	6.46E-03	6.46E-07	2.000	NA
Butyl benzyl phthalate	20,000		1.5	2.20E-05	NTV	4.400	1.5
alpha-Chlordane			20	1.30E-01	3.63E-06	0.043	NA
gamma-Chlordane			20	1.30E-01	3.63E-06	0.039	NA
4,4'-DDD	3		6.2	8.09E-04	2.08E-07	0.120	NA
4,4'-DDE	2		0.44	2.46E-04	2.09E-08	0.017	NA
4,4'-DDT	2		1.8	1.41E-03	8.55E-08	0.079	NA
1,2-Dichlorobenzene			74	2.41E-03	NC	3.300	NA
1,4-Dichlorobenzene			9.3	9.10E-05	2.34E-07	1.300	NA
1,2-Dichloroethane	8		0.005	NTV	4.77E-10	0.005	NA
cis-1,2-Dichloroethene			0.30	8.81E-05	NC	0.010[f]	NA
trans-1,2-Dichloroethene			0.43	6.31E-05	NC	0.010[f]	NA
Dieldrin	0.04		0.002	1.17E-04	3.35E-08	0.024	0.002
Di-n-butyl phthalate			3,410	1.00E-01	NC	5.900	NA
Ethylbenzene	8,000	1.0[d]	56	1.64E-03	NC	54.000	1.0[d]

Table 35

Selection of Cleanup Goals for Organics in Soil
Site 8, Pease AFB, NH
(Continued)

Organic Chemical	ARARs RCRA[a] (mg/kg)	ARARs New Hampshire[b] (mg/kg)	Target Levels Based on Leaching[c] (unsaturated) (mg/kg)	Cancer Risks and Hazard Indices Calculated Using Target Levels Based on Leaching: Hazard Index	Cancer Risks and Hazard Indices Calculated Using Target Levels Based on Leaching: Cancer Risk	Maximum Concentration Detected[e] (mg/kg)	Cleanup Goals (mg/kg)
Heptachlor epoxide	0.08		0.31	7.00E-02	2.96E-06	0.003	NA
1,2,3,4,6,7,8-HpCDD (dioxin)			0.014	NTV	1.96E-06	0.00055	NA
2-Methylnaphthalene			5.4	3.96E-04	NC	43.000	5.4
4-Methyl-2-pentanone	4,000		2.8	1.64E-04	NC	34.000	2.8
4-Methylphenol			43	2.52E-03	NTV	0.037	NA
Naphthalene			1.4	1.03E-04	NC	36.000	1.4
n-Nitrosodiphenylamine	100		0.36	5.28E-05	1.85E-09	0.600	0.36
OCDD (dioxin)			0.14	NTV	1.96E-06	0.004	NA
PAHs							
Benzo(a)anthracene			10	NTV	1.91E-05	1.700	NA
Benzo(b)fluoranthene			8.0	NTV	1.53E-05	0.150	NA
Benzo(k)fluoranthene			64	NTV	1.22E-04	0.160	NA
Benzo(g,h,i)perylene			827,000	1.52E+01	NC	0.200	NA
Benzo(a)pyrene			80	NTV	1.53E-04	0.230	NA
Chrysene			2.9	NTV	5.55E-06	6.100	2.9
Dibenzo(a,h)anthracene			72	NTV	1.38E-04	0.037	NA
Fluoranthene			460	8.44E-03	NC	0.450	NA

Table 35

Selection of Cleanup Goals for Organics in Soil
Site 8, Pease AFB, NH
(Continued)

Organic Chemical	ARARs		Target Levels Based on Leaching[c] (unsaturated) (mg/kg)	Cancer Risks and Hazard Indices Calculated Using Target Levels Based on Leaching		Maximum Concentration Detected[e] (mg/kg)	Cleanup Goals (mg/kg)
	RCRA[a] (mg/kg)	New Hampshire[b] (mg/kg)		Hazard Index	Cancer Risk		
Fluorene			530	9.72E-03	NC	1.700	NA
Indeno(1,2,3-cd)pyrene			46	NTV	8.80E-05	0.410	NA
Phenanthrene			18	3.30E-04	NC	3.200	NA
Pyrene			820	2.01E-02	NC	2.400	NA
Toluene	20,000	1.0[d]	18	2.64E-04	NC	128.000	1.0[d]
1,2,4-Trichlorobenzene	3,000		47	1.38E-02	NC	0.800	NA
Trichloroethene	60		0.046	2.25E-05	4.30E-10	5.000	0.046
Xylenes (total)	200,000	1.0[d]	190	2.79E-04	NC	210.000	1.0[d]

[a]Soil values from RCRA Corrective Action Levels, 1990.
[b]State of New Hampshire Interim Policy for the Management of Soils Contaminated from Spills/Releases of Virgin Petroleum Products, 1991.
[c]Soil concentration developed from leaching model as discussed in Subsection 2.5 and Appendix A of the Draft Final Site 8 FS Report (G-611).
[d]Represents 1.0 mg/kg of total BTEX (benzene, toluene, ethylbenzene, and xylenes).
[e]Maximum as presented in the Draft Final Site 8 RI Report (G-577).
[f]Maximum detected value presented is for total 1,2-dichloroethene.
NTV = No available applicable toxicity value.
NTVA = No applicable toxicity or ARAR value available.
NA = Not applicable. ARARs and risk-based concentrations exceed maximum detected concentrations.
NC = Not applicable. Chemical is not a carcinogen.

Table 36

Selection of Cleanup Goals for Organics in Groundwater
Site 8, Pease AFB, NH

Contaminant	ARARs				Risk-Based Concentrations		Basis of Cleanup Goal	Maximum Detected Concentration (μg/L)	Cleanup Goal (μg/L)
	MCL[a] (μg/L)	MCLG[b] (μg/L)	NHDPHS[c] (μg/L)	Lifetime Health Advisory[d] (μg/L)	Based on Noncancer Hazard[e] (μg/L)	Based on Cancer Risk[f] (μg/L)			
Organics									
Benzene	5	0	5			1.47	MCL	4,700	5
Bis(2-ethylhexyl) phthalate	6	0	6			6.08		140	6
Bromochloromethane				90	NTV		LHA	1,000	90
sec-Butylbenzene					7.30		HR	77	7.30
Chlorobenzene	100	100	100	100	146		MCL	7.2	NA
1,2-Dibromoethane						0.000993	CR	510	0.000501
1,2-Dichlorobenzene	600	600	600	600	1,010		MCL	560	NA
1,3-Dichlorobenzene	600	600		600	NTV		MCL	5.3	NA
1,4-Dichlorobenzene	75	75	75	75		1.85	MCL	41	75
Dichlorodifluoromethane			1,000	1,000	1,460		HR	3	NA
1,2-Dichloroethane	5	0	5			0.468	MCL	20	5
cis-1,2-Dichloroethene	70	70	70	70	183		MCL	1,600	70
trans-1,2-Dichloroethene	100	100	100	100	365		MCL	710	100
Diethyl phthalate				5,000	29,200		LHA	3	NA
2,4-Dimethyl phenol					730		HR	120	NA
Dimethyl phthalate				800	36,500		LHA	26	NA
Di-n-butyl phthalate			34,400		3,650		-	2	NA

Table 36

Selection of Cleanup Goals for Organics in Groundwater
Site 8, Pease AFB, NH
(Continued)

Contaminant	ARARs				Risk-Based Concentrations		Basis of Cleanup Goal	Maximum Detected Concentration (μg/L)	Cleanup Goal (μg/L)
	MCL[a] (μg/L)	MCLG[b] (μg/L)	NHDPHS[c] (μg/L)	Lifetime Health Advisory[d] (μg/L)	Based on Noncancer Hazard[e] (μg/L)	Based on Cancer Risk[f] (μg/L)			
Di-n-octyl phthalate					730		HR	140	NA
Ethylbenzene	700	700	700	700	2,700		MCL	2,200	700
Heptachlor	0.4	0	0.4			0.00941	MCL	0.69	0.4
Isopropylbenzene					89.1		HR	180	89.1
4-Isopropyltoluene					NTV		NTVA	170	NTVA
Methylene chloride	5	0	5			9.31	MCL	280	5
2-Methylnaphthalene					13.4		HR	2,700	12.4
2-Methylphenol			350		1,830		NHDPHS	110	NA
4-Methylphenol			350		1,830		NHDPHS	1,400	350
2-Nitroaniline					2.13		NTVA	170	NTVA
n-Nitrosodiphenylamine						8.69	CR	2	NA
OCDD (dioxin)	3E-02[g]			3E-02[g]	NTV	5.7E-02[h]	MCL	5.9E-05	NA
n-Propylbenzene					NTV		NTVA	210	NTVA
Tetrachloroethene	5	0	5			1.58	MCL	9	5
Toluene	1,000	1,000	1,000	1,000	2,650		MCL	29,000	1,000
1,1,1-Trichloroethane	200	200	200	200	2,530		MCL	7	NA
Trichloroethene	5	0	5			5.01	MCL	4,400	5
1,2,4-Trimethylbenzene					19.8		HR	1,400	19.8

Table 36

Selection of Cleanup Goals for Organics in Groundwater
Site 8, Pease AFB, NH
(Continued)

Contaminant	ARARs				Risk-Based Concentrations		Basis of Cleanup Goal	Maximum Detected Concentration ($\mu g/L$)	Cleanup Goal ($\mu g/L$)
	MCL[a] ($\mu g/L$)	MCLG[b] ($\mu g/L$)	NHDPHS[c] ($\mu g/L$)	Lifetime Health Advisory[d] ($\mu g/L$)	Based on Noncancer Hazard[e] ($\mu g/L$)	Based on Cancer Risk[f] ($\mu g/L$)			
1,3,5-Trimethylbenzene					NTV		NTVA	500	NTVA
Vinyl chloride	2	0	2			0.0388	MCL	11	2
Xylenes (total)	10,000	10,000	10,000	10,000	36,500		MCL	9,900	NA
gamma-BHC (lindane)	0.2	0.2	0.2	0.2		0.0655	MCL	11	0.2
4,4'-DDD						0.355	CR	440	0.177
4,4'-DDT			0.1			0.25	NHDPHS	92	0.1
Benzoic acid			28,000		146,000		NHDPHS	24	NA
Naphthalene			20	20	13.4		NHDPHS	1,800	20
Phenanthrene					13.4		HR	78	12.4

[a]Maximum Contaminant Level, April 1992.
[b]Maximum Contaminant Level Goal, April 1992.
[c]New Hampshire Department of Public Health Services.
[d]EPA Lifetime Health Advisory.
[e]Developed based on noncancer hazard index of 1 and the exposure scenarios, assumptions, and toxicity values presented in Subsection 2.3 of the Draft Final Site 8 FS Report (G-611).
[f]Developed based on 10^{-6} cancer risk and the exposure scenario, assumptions, and toxicity values presented in Subsection 2.3 of the Draft Final Site 8 FS Report (G-611).
[g]Calculated using MCL of 3 x 10^{-5} $\mu g/L$ for total 2,3,7,8-TCDD toxic equivalents. The toxic equivalent for OCDD is 0.001.
[h]Calculated using risk-based concentrations of 5.7 x 10^{-5} for total 2,3,7,8-TCDD toxic equivalents. The toxic equivalent for OCDD is 0.001.
CR = Carcinogenic risk.
HR = Hazard risk.
NTV = No available applicable toxicity value.
NTVA = No applicable toxicity or ARAR value available.
NA = Not applicable. ARARs and risk-based concentrations exceed maximum detected concentrations.
p = Proposed standard.

Table 37

Selection of Cleanup Goals for Inorganics in Groundwater
Site 8, Pease AFB, NH

Inorganic Chemical	ARARs				Risk-Based Concentrations[e]		Background Concentration (μg/L)		Maximum Detected Concentration (μg/L)		Cleanup Goal (μg/L)
	MCL[a] (μg/L)	MCLG[b] (μg/L)	NHDPHS[c] (μg/L)	Lifetime Health Advisory[d] (μg/L)	Based on Noncancer Hazard (μg/L)	Based on Cancer Risk (μg/L)	Total	Dissolved	Total	Dissolved	
Aluminum					NTV		46,400	-	30,700	-	NTVA
Antimony	6	6	6	3	14.6		NA	-	459	-	6
Arsenic	50[f]		50			0.0487	72	23.1	512	270	50
Barium	2,000	2,000	2,000	5,000	2,560		221	136	1,880	69.3	NA
Beryllium	4	4	4			0.0198	3.1	-	47.3	-	4
Cadmium	5[f]	5	5	5	18.3		NA	-	54.1	-	5
Chromium (total)	100	100	100	100	183[g]		94.3	-	188	-	100
Cobalt					NTV		106	50	475	326	NTVA
Copper	1,300	1,300	1,300		1,350		88.1	31.6	241	26.7	NA
Iron					NTV		62,800	1,090	124,000 J	164,400	NTVA
Lead	15[g]	0	15		10.6		97.6	16.1	214	92.4	15
Manganese			1,500		183		5,660	3,170	29,100	32,800	1,500
Nickel	100	100	100	100	730		126	67.3	461	82.7	100
Silver			50	100	183		NA	-	48.6	53.7	NA
Thallium	2	0.5	2	0.4	NTV		-	200	-	548	2

Table 37

Selection of Cleanup Goals for Inorganics in Groundwater
Site 8, Pease AFB, NH
(Continued)

Inorganic Chemical	ARARs: MCL[a] (µg/L)	ARARs: MCLG[b] (µg/L)	ARARs: NHDPHS[c] (µg/L)	ARARs: Lifetime Health Advisory[d] (µg/L)	Risk-Based Concentrations[e]: Based on Noncancer Hazard (µg/L)	Risk-Based Concentrations[e]: Based on Cancer Risk (µg/L)	Background Concentration (µg/L): Total	Background Concentration (µg/L): Dissolved	Maximum Detected Concentration (µg/L): Total	Maximum Detected Concentration (µg/L): Dissolved	Cleanup Goal (µg/L)
Vanadium				20	256		72.3	50	488	57.7	50
Zinc					11,000		220	234	502	74.9	NA

[a]MCL = Maximum Contaminant Level, December 1992.
[b]MCLG = Maximum Contaminant Level Goal, December 1992.
[c]NHDPHS = New Hampshire Department of Public Health Services, March 1991.
[d]EPA Lifetime Health Advisory, December 1992.
[e]Developed based on a noncancer hazard index of 1 and a cancer risk of 10^{-6}, using the exposure scenario, assumptions, and toxicity values presented in Subsection 2.3 of the Draft Final Site 8 FS Report (G-611).
[f]Basis of cleanup goal.
[g]Value reported is the Federal Action Level. The MCL is 50 µg/L.
NTV = A risk-based concentration was not calculated because the applicable toxicity value was not available.
NTVA = No applicable toxicity value or ARAR.
NA = ARAR or risk-based concentration exceeds maximum detected concentration.

Table 38

Carcinogenic Risks and Hazard Indices Calculated Based on Groundwater ARAR Concentrations Site 8, Pease AFB, NH

Contaminant	MCL (μg/L)	MCL Hazard Index	MCL Cancer Risk	MCLG (μg/L)	MCLG Hazard Index	MCLG Cancer Risk	NHDPHS (μg/L)	NHDPHS Hazard Index	NHDPHS Cancer Risk	LHA (μg/L)	LHA Hazard Index	LHA Cancer Risk
Organics												
Benzene	5	NTV	3.41E-06	0	0	0	5	NTV	3.41E-06			
Bis(2-ethylhexyl) phthalate	6	0.0082	9.86E-07	0	0	0	6	0.0082	9.86E-07			
Bromochloromethane										90	NTV	NA
sec-Butylbenzene												
Chlorobenzene	100	0.685	NA	100	0.685	NA	100	0.685	NA	100	0.685	NA
1,2-Dibromoethane												
1,2-Dichlorobenzene	600	0.594	NA	600	0.594	NA	600	0.594	NA	600	0.594	NA
1,3-Dichlorobenzene	600	NTV	NA	600	NTV	NA	600	NTV	NA	600	NTV	NA
1,4-Dichlorobenzene	75	0.017	4.05E-05	75	0.017	4.05E-05	75	0.017	4.05E-05	75	0.017	4.05E-05
Dichlorodifluoromethane							1,000	0.685	NA	1,000	0.685	NA
1,2-Dichloroethane	5	NTV	1.07E-05	0	NTV	0	5	NTV	1.07E-05			
cis-1,2-Dichloroethene	70	0.384	NA	70	0.384	NA	70	0.384	NA	70	0.384	NA
trans-1,2-Dichloroethene	100	0.274	NA	100	0.274	NA	100	0.274	NA	100	0.274	NA
Diethyl phthalate										5,000	0.171	NA
2,4-Dimethylphenol												
Dimethyl phthalate										800	0.022	NA
Di-n-butyl phthalate							34,000	9.32	NA			
Di-n-octyl phthalate												
Ethylbenzene	700	0.259	NA	700	0.259	NA	700	0.259	NA	700	0.259	NA
Heptachlor	0.4	0.044	4.25E-05	0	0	0	0.4	0.044	4.23E-05			
Isopropylbenzene												
4-Isopropyltoluene												

Table 38

Carcinogenic Risks and Hazard Indices Calculated Based on Groundwater ARAR Concentrations Site 8, Pease AFB, NH (Continued)

Contaminant	MCL (μg/L)	MCL Hazard Index	MCL Cancer Risk	MCLG (μg/L)	MCLG Hazard Index	MCLG Cancer Risk	NHDPHS (μg/L)	NHDPHS Hazard Index	NHDPHS Cancer Risk	LHA (μg/L)	LHA Hazard Index	LHA Cancer Risk
Methylene chloride	5	0.0024	5.37E-07	0	0	0	5	0.0024	5.37E-07			
2-Nitroaniline												
n-Nitrosodiphenylamine												
OCDD (dioxin)	3E-02[a]	NTV	5.28E-05				3E-02[a]	NTV	5.28E-05			
n-Propylbenzene												
Tetrachloroethene	5	0.027	3.17E-06	0	0	0	5	0.027	3.17E-06			
Toluene	1,000	0.377	NA	1,000	0.377	NA	1,000	0.377	NA	1,000	0.377	NA
1,1,1-Trichloroethane	200	0.079	NA	200	0.079	NA	200	0.079	NA	200	0.079	NA
Trichloroethene	5	0.046	9.98E-07	0	0	0	5	0.046	9.98E-07			
1,2,4-Trimethylbenzene												
1,3,5-Trimethylbenzene												
Vinyl chloride	2	NTV	5.15E-05	0	0	0	2	NTV	5.15E-05			
Xylenes (total)	10,000	0.274	NA	10,000	0.274	NA	10,000	0.274	NA	10,000	0.274	NA
gamma-BHC (Lindane)	0.2	0.018	3.05E-06	0.2	0.018	3.05E-06	0.2	0.018	3.05E-06	0.2	0.018	3.05E-06
4,4′-DDD												
4,4′-DDT							0.1	0.011	7.98E-07			
Benzoic acid							28,000	0.192	NA			
2-Methylnaphthalene												
2-Methylphenol							350	0.192	NTV			
4-Methylphenol							350	0.192	NTV			
Naphthalene							20	1.49	NA	20	1.49	NA
Phenanthrene												

Table 38

Carcinogenic Risks and Hazard Indices Calculated Based on Groundwater ARAR Concentrations Site 8, Pease AFB, NH (Continued)

Contaminant	MCL (μg/L)	MCL Hazard Index	MCL Cancer Risk	MCLG (μg/L)	MCLG Hazard Index	MCLG Cancer Risk	NHDPHS (μg/L)	NHDPHS Hazard Index	NHDPHS Cancer Risk	LHA (μg/L)	LHA Hazard Index	LHA Cancer Risk
Metals												
Antimony	6	0.411	NA	6	0.411	NA	6	0.411	NA	3	0.205	NA
Arsenic	50	4.57	1.03E-03				50	4.57	1.03E-03			
Cadmium	5	0.274	NA	5	0.274	NA	5	0.274	NA	5	0.274	NA
Chromium (total)	100	0.003-0.548[b]	NA	100	0.003-0.548[b]	NA	100	0.003-0.548[b]	NA	100	0.003-0.548[b]	NA
Cobalt												
Iron												
Lead	15[c]	1.42	NTV	0	0	0	15[c]	1.42	NTV			
Manganese												
Silver							50	0.274	NA	100	0.548	NA
Thallium	2	NTV	NA	0.5	NTV	NA				0.4	NTV	NA
Vanadium										20	0.078	NA

MCL = Maximum Contaminant Level.
MCLG = Maximum Contaminant Level Goal.
NHDPHS = New Hampshire Department of Public Health Services.
LHA = EPA Lifetime Health Advisory.
p = Proposed value.
NA = Not applicable. Chemical is not a carcinogen or is not of carcinogenic concern through the evaluated exposure routes.
NTV = An applicable toxicity value(s) was not available.
[a]Calculated using MCL of 3×10^{-5} μg/L for total 2,3,7,8-TCDD toxic equivalents. The toxic equivalent for OCDD is 0.001.
[b]The hazard index depends on the relative concentrations of chromium III and chromium VI.
[c]Action level.