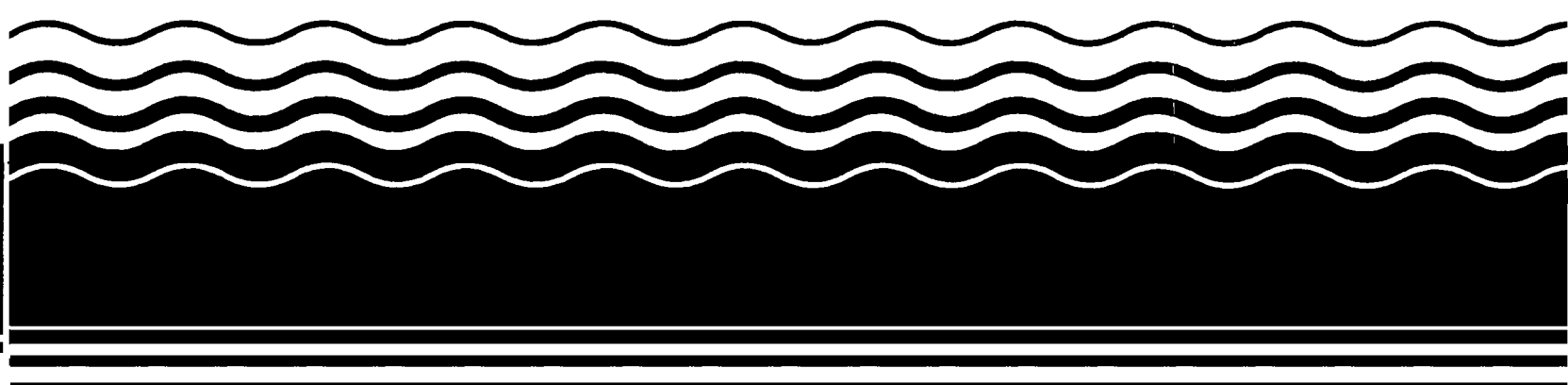




Superfund Record of Decision:

Dover Air Force Base, DE



REPORT DOCUMENTATION PAGE		1. REPORT NO. EPA/ROD/R03-93/163	2	3. Recipient's Accession No.	
4. Title and Subtitle SUPERFUND RECORD OF DECISION Dover Air Force Base, DE Second Remedial Action				5. Report Date 11/04/92	
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				14.	
15. Supplementary Notes PB94-963915					
16. Abstract (Limit: 200 words) The 9-acre Dover Air Force Base site is part of the 4,000-acre Dover Air Force Base (DAFB) located in Kent County, Delaware. Land use in the area is predominantly residential, commercial, industrial, and agricultural. The site is bounded by the Jones Street River on the southwest and Little Creek to the northeast. The site overlies two aquifers, the Cheswold and Piney Point aquifers, which provide 80 percent of the municipal and industrial water supply, but are not currently affected by the site. The site contains two landfills, known as the WP14 (D-4) landfill and the LF18 (D-10) landfill, respectively. The WP14 (D-4) site is used for training and camping. The LF18 (D-10) site is a former landfill, which underlies six acres of the U.S. Air Force Base's golf range, and was used during the 1950s for disposal of Base refuse, spent chemicals, and industrial shop waste. Over the past fifty years, DAFB managed and disposed of hazardous wastes onsite in several ways, including landfilling, storage tanks, wastewater lagoons, and using oil and water separators. From 1941 through 1963, these landfills and/or pits were used to dispose of oils, paints, fuels, solvents, as well as wastewater from the onsite industrial shops. These wastes were discharged into a storm drainage ditch and, ultimately, into surface water. During the 1950s and 1960s, the WP14 (D-4) site was used to dispose of waste solvents, hydraulic fluids, and (See Attached Page)					
17. Document Analysis a. Descriptors Record of Decision - Dover Air Force Base, DE Second Remedial Action Contaminated Medium: gw Key Contaminants: organics (oils) b. Identifiers/Open-Ended Terms c. COSATI Field/Group					
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EPA/ROD/R03-93/163
Dover Air Force Base, DE
Second Remedial Action

Abstract (Continued)

other containerized or free liquids in an unlined trench that was later filled in and reseeded. Floating waste has been reported at two areas of DAFB, and oily releases are known to have occurred from these two onsite landfills. Dark brown oil also has been observed in the monitoring wells at the site. Both of these areas were investigated as part of the Air Force Installation Restoration Program (IRP), although no previous or remedial actions have been conducted at either site. This ROD addresses the floating wastes at both the WP14 (D-4) and LF18 (D-10) sites, and provides an interim remedy, as OU2. A future ROD will address remediation of contaminated soil and ground water. The primary contaminants of concern affecting the ground water are organics, specifically oils.

The selected remedial action for this site includes trenching to collect floating waste; pumping and/or bailing floating wastes from the monitoring wells; storing the hazardous wastes onsite at either Building 1306, a hazardous waste storage area, or in drums at specific sites; testing the waste prior to either RCRA disposal or recycling offsite; disposing of all ground water from the treatment process to a septic system, drainage ditch, or infiltration trench; considering other methods to collect the waste; and developing a monitoring program. The estimated present worth cost for this remedial action ranges from \$140,000 to \$150,000.

PERFORMANCE STANDARDS OR GOALS:

This action will reduce the spread of the plume of floating waste and recover the waste, as practicable. No chemical-specific goals were provided for this interim remedy.

**INTERIM
REMEDIAL ALTERNATIVE SELECTION**

RECORD OF DECISION

**RECOVERY OF FLOATING WASTE
WP 14 (D-4) AND LF 18 (D-10) SITES**

DOVER AIR FORCE BASE, DELAWARE

NOVEMBER 1992

Prepared For:

**Headquarters Air Mobility Command
DCS Civil Engineering (HQ AMC/CEVR)
Scott Air Force Base, Illinois 62225-5022**

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1.0 DECLARATION

1.1 SITE NAME AND LOCATION

Dover Air Force Base
WP 14 (D-4), LF 18 (D-10), ST 05 (JP-4),
and SS 27 (XYZ) Sites
Kent County, Delaware

1.2 STATEMENT OF BASIS AND PURPOSE

This decision document presents the selected interim remedial action for the WP 14 (D-4) and LF 18 (D-10) Sites at the Dover Air Force Base, located in Dover, Delaware. The interim remedial action for the WP 14 and LF 18 Sites was chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 U.S.C. Section 9601, et seq., and to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 CFR Part 300. Regarding Sites ST 05 (JP-4) and SS 27 (XYZ) however, it has been determined, as more fully discussed in Section 2.11 (Explanation of Significant Changes), that CERCLA authorities are not available to address the floating jet fuel at the present time. Therefore, response actions at these Sites may proceed under other, appropriate, authorities, e.g. Subtitle I (Underground Storage Tanks) of the Resource Conservation and Recovery Act (RCRA). This decision is based on the administrative record for these Sites.

The State of Delaware and EPA both concur with the selected remedy.

1.3 ASSESSMENT OF THE SITE

Actual or threatened releases of hazardous substances from the WP 14 and LF 18 Sites, if not addressed by implementing the response action selected in this Record of Decision (ROD), may present an imminent and substantial endangerment to public health, welfare, or the environment.

1.4 DESCRIPTION OF THE SELECTED REMEDY

The selected interim remedy for these Sites addresses the long term, principal threat, continued ground water degradation, present at the WP 14 (D-4) and LF 18 (D-10) Sites. The principal components of the selected remedy are as follows:

- * The installation of a pumping unit or bailing of an existing on-site well to recover and control the migration of floating waste under each Site;
- * The completion of additional monitoring and/or extraction wells as needed to effectively withdraw the floating waste and to ensure protectiveness of human health and the environment and to control the migration of groundwater, respectively; and
- * The treatment or disposal of the recovered floating waste and entrained ground water.


1.5 STATUTORY DETERMINATIONS

This interim action is protective of human health and the environment, complies with Federal and State requirements that are legally applicable or relevant and appropriate to this action, and is cost effective. Although this interim action does not fully address the statutory mandate for permanence and treatment to the maximum extent practicable, this interim action does utilize treatment and thus furthers that aspect of the statutory mandate. Because this action does not constitute the final remedy for any of the Sites, the statutory preference for remedies that employ treatment that reduces toxicity, mobility, or volume as a principal element, although partially addressed in this remedy, will be addressed by the final response action. Subsequent actions are planned to address fully all the threats posed by the conditions at these Sites.

Because this remedy will result in hazardous substances remaining at the Sites above health-based levels, a review will be conducted to ensure that the remedy continues to provide adequate protection of human health and the environment within five years after commencement of the remedial action. Because this is an interim action Record of Decision, review of these Sites and of this remedy will be ongoing as EPA and the Air Force continue to develop final remedial alternatives for each separate Site.


 William Welser, III, Colonel, USAF
 Wing Commander

2 NOV 92
 Date


 Edwin B. Erickson
 Regional Administrator
 EPA Region III

11/4/92
 Date

20 DECISION SUMMARY

2.1 SITE NAME, LOCATION, DESCRIPTION

The Dover Air Force Base (DAFB) is located in Kent County, Delaware, approximately 3.5 miles southeast of the City of Dover (DAFB is within the city limits). Figure 1 presents the regional location of DAFB. Bounded on the southwest by the St. Jones River and Little Creek to the northeast, DAFB covers approximately 4,000 acres of gently, rolling uplands, surrounded primarily by cropland and wetlands. Surface elevations range from 10 feet Mean Sea Level (MSL) along the St. Jones River to 30 feet MSL along the Base's western boundary. The maximum local relief is approximately 12 feet at the St. Jones River.

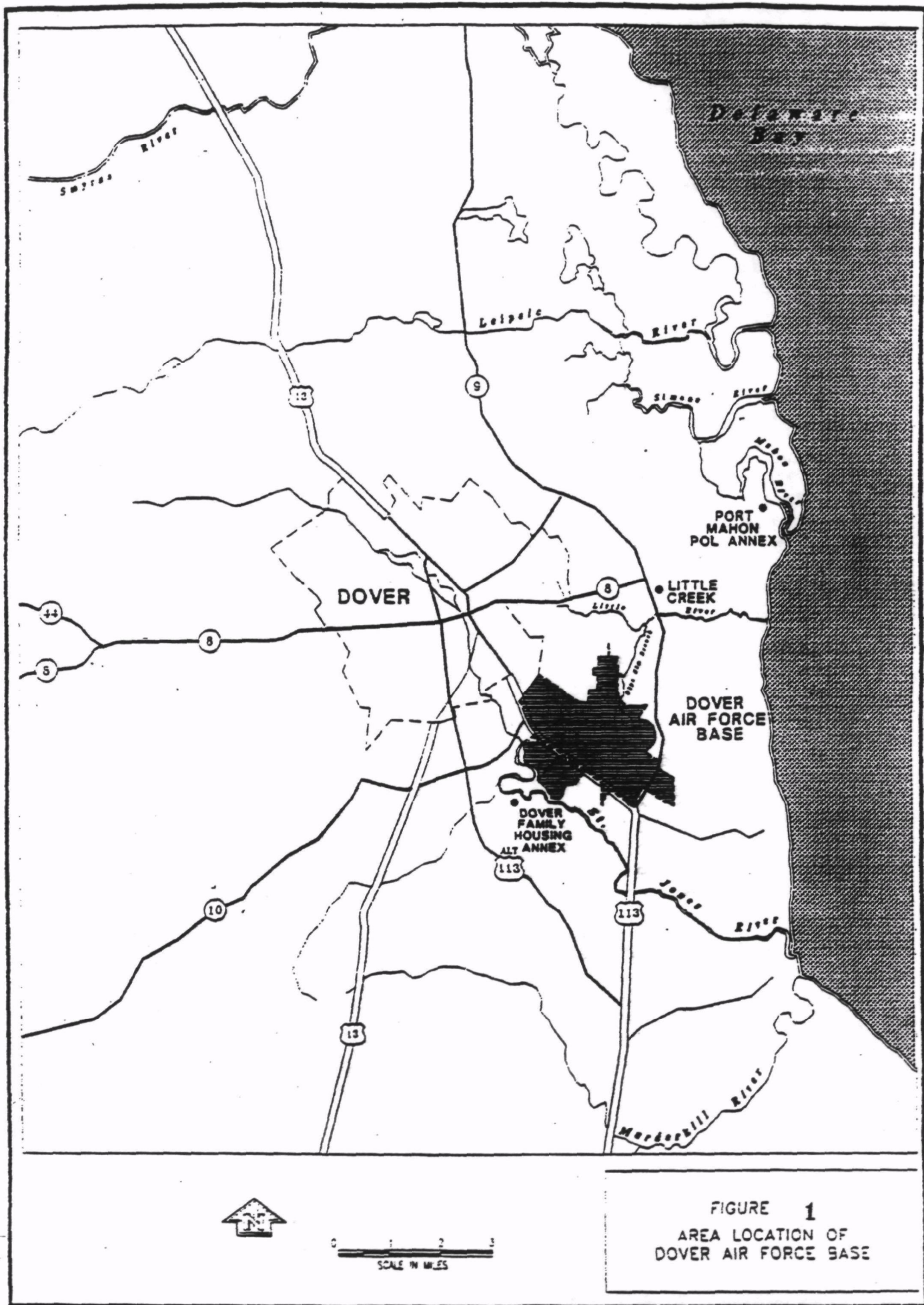
Delaware has a continental type of climate, marked by well defined seasons. The average yearly temperature in Dover ranges from 45.8 to 66.5°F. The wettest months are April and May, averaging over 4 inches of precipitation each month. The mean annual precipitation in the Dover area is 44.44 inches.

Land uses in the vicinity of DAFB include single and multifamily residential areas, industrial zones, commercial land along the major highway (U.S. Rte. 113), and extensive areas of open and agricultural land. Natural resource use in the area includes sand and gravel quarrying operations south of DAFB and boating and fishing along the St. Jones River.

DAFB employs approximately 5,000 military personnel and over 1,400 civilians. Base personnel live in large residential areas across U.S. Rte. 113 and southwest of the Base across the St. Jones River. The City of Dover is the largest population center and has the highest percentage of young people of the population centers surrounding DAFB. The highest percentage of people older than 65 are located in the town of Little Creek, 1 mile northeast of the Base.

The NW/SE runway marks the surface water divide on Base, with drainage either to the north or south accomplished by overland flow to diversion structures and then into area surface streams. The flow to the north is into the Morgan and Pipe Elm Branches of the Little River. Flow to the south is into small tributaries of the St. Jones River. Most streams may receive up to 75 percent of their base flow from the ground water discharge of the Columbia Aquifer, the water table aquifer under the Base.

The Cheswold and Piney Point Aquifers are the primary water supply aquifers in the Dover area, providing approximately 80 percent of the total municipal and industrial water pumped in Kent County. DAFB uses these two aquifers for its water supply.



These aquifers show no contamination in the Base area. The Columbia Aquifer, consisting of fine-to-coarse sand with minor clays, directly underlays the Base. The water table is shallow and as mentioned earlier, provides base flow for many streams.

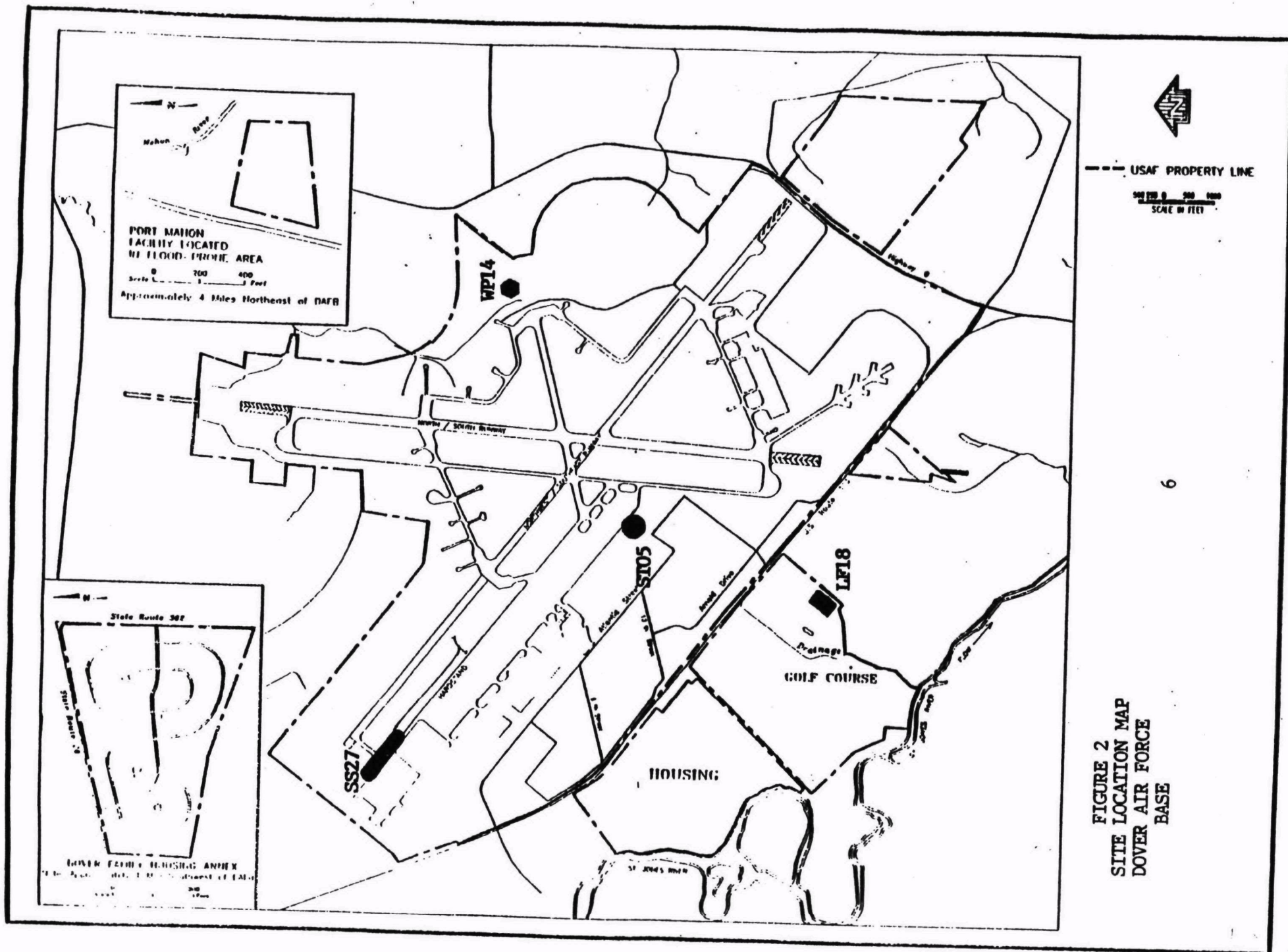
Over the past fifty years, DAFB has managed and disposed of hazardous wastes in several different ways. There are 11 landfills on the Base, several storage tanks, one abandoned waste water lagoon, 12 oil/water separators, and several spill sites. The actions discussed in this Record of Decision (ROD) cover releases of oily waste in two landfills. Figure 2 indicates the locations of the four (4) areas, two of which are covered by this action.

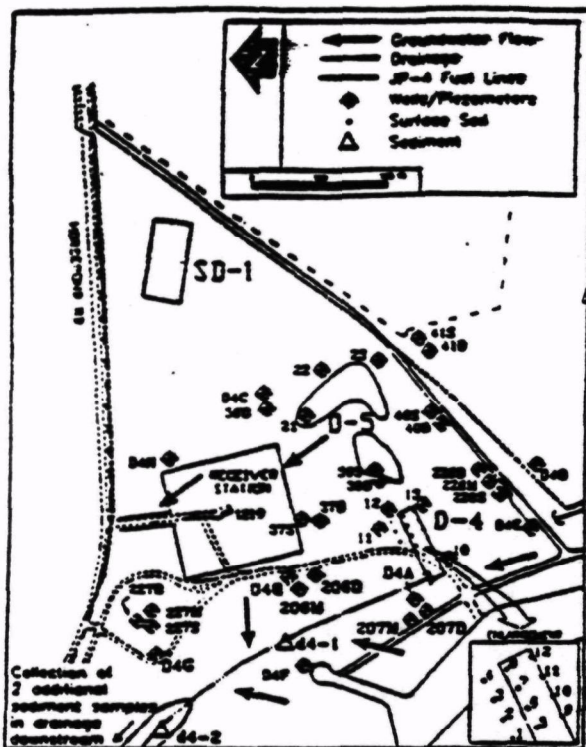
Floating waste is reported to exist in two areas at the Dover AFB. These two areas are referenced as the WP 14 (D-4) landfill, and the LF 18 (D-10) landfill (see Figure 3). Free product is reported to exist in two areas at the Dover AFB. These two areas are referenced as the ST 05 (JP-4) Fuel Leak, and the SS 27 (XYZ) Fuel Pump Station (see Figure 3). This Interim Action Record of Decision (ROD) addresses the floating waste at Sites WP 14 and LF 18. Remediation of Sites ST 05 (JP-4) and SS 27 (XYZ) cannot, at the present time, proceed under CERCLA authorities because available information indicates that the waste present at these Sites (jet fuel) would fall under the "petroleum exclusion" contained in Section 101(14) and (33) of CERCLA. This issue is discussed more fully in Section 2.11 of this document.

As identified in past investigations, the WP 14 Site is relatively small, restricted in area to less than 3 acres. The ground and surface near the WP 14 Site is generally flat, with gentle undulations and a small drainage swale leading to the north-northwest. The WP 14 Site is in an area prone to standing water. A small drainage, the headwaters of the Pipe Elm Branch, exists to the northwest of the Site. Intermittently during the year Base personnel use this area for training, including camping. Personnel may be exposed to ground water discharging into the swale leading to the Pipe Elm Branch. The nearest non-military population (a single small residence) is approximately 1/2 mile off-Base.

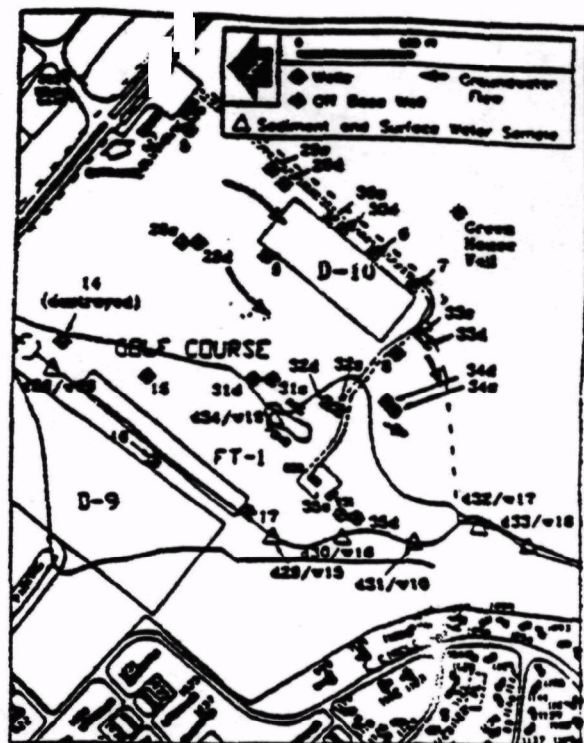
The LF 18 Landfill underlays six acres presently covered by the Base golf course. The ground surface is well maintained and slopes gently to the northwest towards a small drainage and man-made pond. The surface waters from this pond and drainage are directed towards the St. Jones River. Residential base housing is located within 1/2 mile of the LF 18 Site in a northwest direction beyond the surface water drainage.

The ST 05 Fuel Leak Site is an area of underground fuel supply lines in the south central portion of the Base. The Site occurs along the aircraft parking apron between Buildings 500 and 501.

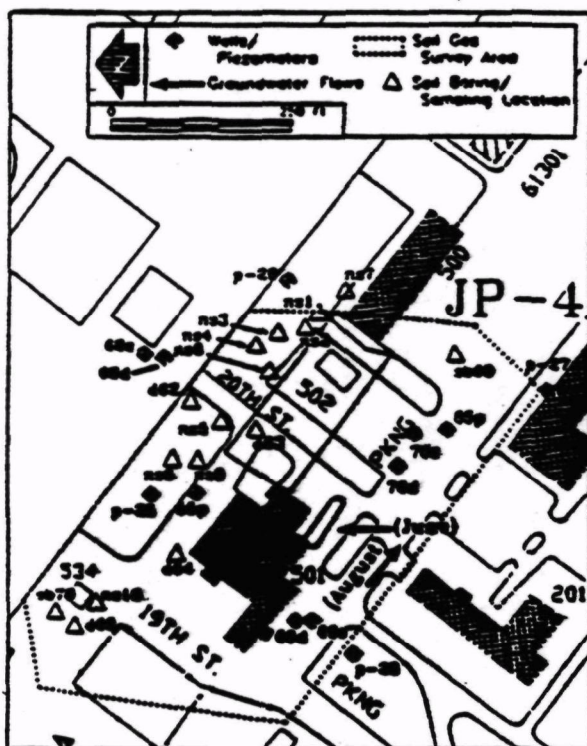




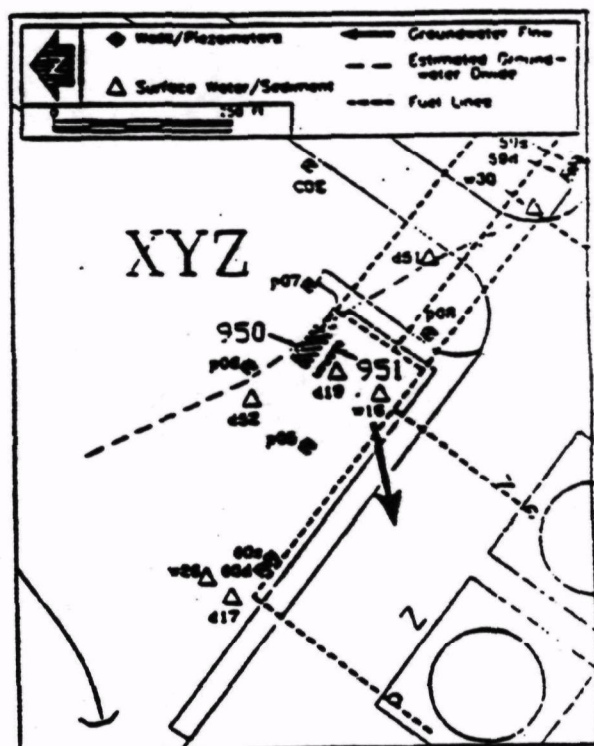
Site WP 14 (D-4 Landfill)



Site LF 18 (D-10 Landfill)



Site ST 05 (JP-4 Fuel Spill)



Site SS 27 (XYZ Fuel Pump Sta.)

FIGURE 3
SITE LOCATION MAPS

The entire area is relatively flat and paved with asphalt. Elevations range from 20 to 21 feet above MSL. Surface waters drain into a storm drain and are discharged from the Site into the North Drainage Ditch and then into the Pipe Elm Branch.

A few Base personnel are stationed in the area during working hours, otherwise the area is removed from personnel activities. Because the Site is located in the central portion of the Base, residential areas are far removed.

The SS 27 Fuel Pump Station is at the northwest end of the Base, at the farthest extent of the parking and refueling apron. Underground fuel lines connect the pump station to the X, Y, and Z refueling hydrants and pads. The area around the SS 27 Site has controlled grading, with two large drainage ditches located north and southeast of the Site, respectively. Personnel on Base are present in the area during limited hours of the day. An off-Base residential area is located approximately 1/2 mile to the northwest. Ground water flow is estimated to be towards the St. Jones River and may be discharging into wetlands along the river west of the Site.

2.2 SITE HISTORY AND ENFORCEMENT ACTIVITIES

DAFB began operations in December, 1941 when the U.S. Army Air Corps leased the Dover Municipal Airfield for use by Eastern Defense Command as a coastal patrol base. In August 1943, the mission of the field changed to an operational training base for combat training and the development of air-launched rockets.

The base was deactivated in September 1946, but was periodically used by the Air National Guard up to 1950. In July, 1950 the base was reactivated and designated the Dover Air Force Base. In March 1952, accompanying a transfer of command to the Military Air Transport Services, the base mission changed from air and land defense to cargo operations. The base is at present a member of the Air Mobility Command and is equipped with C-5 Galaxy aircraft to provide global strategic airlift capability.

Hazardous wastes have been handled in various manners at the base since 1941. From 1941 through 1963, landfills and/or pits located along the perimeter of the base were used as disposal sites for oils, paint, hydraulic fluid, and solvents: combustible chemicals such as oils, fuels, and solvents were used at fire training areas: and waste water from industrial shops, such as the engine buildup shop and the plating shop, were discharged to a storm drainage ditch that emptied into a tributary of Little Creek.

During the 1950's and 1960's DAFB managed its waste very differently then it does now. On-site landfills, usually trench-type or large area fill-type, were used for general trash and out-of-date or residual maintenance supplies. Some areas were used for the disposal of solvent bath fluids and oils. Previous investigations have identified several areas where there is oily waste product floating on the water table.

The WP 14 (D-4) Site was used during the late 1950's for disposal of waste solvents, hydraulic fluids, waste oils, and other liquid wastes, both containerized and free, generated by shop operations taking place in the industrial section of the Base. The waste oils and materials were disposed of in an unlined trench, reported to be 20 feet wide, 45 feet long, and 10 feet deep. The trench was filled in and seeded over sometime during the late 1960's.

The area around the WP 14 Site has been investigated during four previous studies, starting as early as 1983 under the Air Force Installation Restoration Program (IRP). More detailed studies with soil and sediment sampling and groundwater analysis were undertaken in 1986 and 1989 during later phases of the IRP. The latest study was prepared in 1990 and provided more detailed analysis.

Site LF 18 (D-10) is a former landfill used during the 1950s for the disposal of general Base refuse, spent chemicals, and industrial shop wastes. The landfill was closed and is currently covered by the Base golf course. A dark brown heavy oil has been found in one monitoring well installed to study the area.

The LF 18 landfill has been the focus of four studies by the Air Force under the IRP and Site Investigation portion of the CERCLA programs. The earliest study is dated from 1983 and the most recent investigation included additional soil sampling in 1991.

No remedial or removal actions have been conducted at either the WP 14 or LF 18 Sites.

DAFB uses pipelines, feeder lines, and storage tanks for all jet fuel (JP-4) requirements on Base. Delivery, storage, and handling of this jet fuel has, over the years, led to various spills and leaks. Previous investigations have identified several areas where there is free product floating on the water table at presumed leak sites.

The ST 05 (JP-4) Site is related to leaks from the fuel supply lines along the aircraft apron. The supply lines have been in use for many years. There is no information concerning leaks from these lines in the early years. After some repairs were made to the supply lines and valves in early 1987, there were at least three leaks reported during pressure testing of the lines.

All the leaks were repaired, however the residual fuel in the soil was not cleaned up.

The area around the ST 05 Site was investigated as part of the Air Force's IRP in 1989. During this investigation, the soil gas and ground water were analyzed, soil samples were taken, and surface drainage sediments were tested.

The SS 27 (XYZ) Site is the main pumping unit for the northwest end of the refueling system. DAFB personnel recall that a fuel spill did occur in the area in the past, however the quantity that was spilled is unknown. Additionally, a visual layer of fuel has been reported on rainwater in nearby manholes. The Site was constructed in the late 1950's and has always been used as a refueling area.

The SS 27 Site was investigated two times under the Air Force's IRP. The first study, in 1986 involved the collection of four ground water samples, a surface water sample, and two sediment samples. During the 1989 study a total of eight ground water samples and two surface water and sediment samples were taken, and a soil gas survey was undertaken.

No remedial or removal actions have been undertaken at either the ST 05 or the SS 27 Sites.

Enforcement Activities

In early 1989 Dover Air Force Base was listed on the National Priorities List (NPL). The Air Force, EPA, and DNREC signed a Interagency Agreement (IAG) on June 29, 1989, under Section 120 of CERCLA. Additionally, EPA issued a Corrective Action Permit pursuant to Sections 3004(u) and (v) of RCRA which defers corrective action under Subtitle C of RCRA to implementation of Remedial Actions under the IAG.

2.3 HIGHLIGHTS OF COMMUNITY PARTICIPATION

There has been consistent community interest in the Dover Air Force Base NPL site due to its proximity to and its potential impact on the nearby city of Dover.

In accordance with Sections 113 (k)(2)(B)(i-v) and 117 of CERCLA, 42 U.S.C. Sections 9613 and 9617, Dover AFB and EPA held a public comment period from June 12, 1992 through July 27, 1992 for the proposed interim remedy at the WP 14 (D-4), LF 18 (D-10), ST 05 (JP-4), and SS 27 (XYZ) Sites. The Proposed Plan was made available to the public for review at the Dover Public Library during the entire comment period.

The notice of availability of this document, the comment period, and the announcement of the public meeting were published in the Delaware State News dated June 11, 1992. Additionally, television coverage of remedial activities at Dover Air Force Base was provided on June 23, 1992 and an additional newspaper article, concerning the proposed interim action, was published on June 24, 1992.

A public meeting concerning the proposed remedy for the four Sites was held on June 25, 1992 at the Richardson and Robbins Building at 89 Kings Highway, Dover, Kent County, DE. The meeting lasted about one hour and there were six members of the public and press in attendance. With respect to the proposed remedy for these Sites, however, there were few questions and little community concern exists. All the questions from the public were answered at the meeting. There was a follow-up newspaper article, covering the Public Meeting, published in the Delaware State News on June 26, 1992.

The Responsiveness Summary, at the end of this document, provides the responses to all questions received from the public, either in writing or during the public meeting.

2.4 SCOPE AND ROLE OF OPERABLE UNIT

This operable unit, floating waste, is one of several management units for the WP 14 (D-4) and LF 18 (D-10) Sites, and addresses the floating wastes at each Site. This interim action remedy addresses the principal threats of the floating waste: its potential migration or discharge to the interconnecting surface waters near some Sites; continued degradation of a potential ground water source; and the discharge of volatile organic compounds (VOCs) through the surface soils.

The cleanup objective of this interim action is to immediately reduce the volume of waste floating on the ground water.

The benefits of the interim action include:

- Reducing the volume of the floating waste,

- Containing the existing floating waste plume,

- Limiting the extent of future migration and additional contamination, and

- Reducing VOC concentrations in soil gases.

This interim action remedy is consistent with an anticipated final remedy that will address the restoration of the ground water operable unit and cleanup the subsurface soils at the WP 14 (D-4), LF 18 (D-10), ST 05 (JP-4), and SS 27 (XYZ) Sites. Data generated during the implementation of the interim action will be utilized during the final remedy selection and this data will be used to evaluate the potential aquifer response to remediation.

2.5 SITE CHARACTERISTICS

WP 14 (D-4)

Site WP 14 was a liquid waste disposal area located in the northeast area of Dover AFB. It appears to have been a single trench, probably excavated in the late 1950s to a depth of approximately 10 feet. The trench was used for disposal of liquids and waste oils generated during industrial shop activities at Dover AFB. Most of the liquid wastes were probably dumped directly into the trench, however metal drums containing liquids may also be buried in the trench.

An old Liquid Fuel (JP-4) Pipeline is located upgradient from the WP 14 Site. The pipeline was investigated as a possible source. Two wells, located between the pipeline and the Site, have not detected contamination or floating wastes on the water table.

A brown floating waste oil was found in one monitoring well in the WP 14 area. Based on one year's (1991) measurements, the floating waste in the monitoring well varied from just a strong petroleum odor to a thickness of over two feet. Floating waste thickness measurements taken in a monitoring well of small diameter do not represent the potential thickness of the waste on the ground water in the aquifer. Potential waste thicknesses in the aquifer are a function of the type of floating waste, characteristics of the aquifer, and the size of the monitoring well. In July 1992, a series of measurements and calculations were made that indicated 0.45 feet of waste floating on the ground water near this monitoring well. At this time, because the extent of the floating waste is not known, there is not a firm estimate of the volume of floating waste at the WP 14 Site.

Ground water analysis of samples from the well containing floating waste showed moderate to low benzene, ethylbenzene, and toluene concentrations, moderate to high 1,2 dichloroethene (1,2 DCE) levels, and low trichloroethylene (TCE) and tetrachloroethylene (PCE) concentrations. The last three compounds are characteristic of solvents and not of a petroleum product.

This observation, in conjunction with an analysis of the location of this Site relative to other areas of contamination at the Base (WP 14 is far removed from other areas) leads to the conclusion that the floating waste is a source of hazardous substances contaminating the underlying groundwater. No analysis of the floating waste has been performed. However, ground water collected from the well at this Site contained substances (benzene, 1,2 DCE, PCE, and TCE) which are toxic and probably carcinogenic (all three are Class B2 carcinogens: Class B2 means there is sufficient evidence of carcinogenicity in animals to support an inference that the substance is a probable human carcinogen).

The floating waste at WP 14 was detected upgradient from the supposed disposal location. However, an EPA review of aerial photography in the area found the outline of a trench upgradient from the contaminated monitoring well. One of the primary objectives of the ongoing remedial investigation is to determine the lateral and vertical extent of floating waste at WP 14.

Dissolved contaminants are being discharged with the ground water into the Pipe Elm Branch leading to environmental degradation and to potential exposure of base personnel if they were to drink the waters during field exercises. At the present, the floating waste does not appear to be migrating on the ground water away from the Site.

LF 18 (D-10)

Site LF 18 is a former landfill used during the 1950s for the disposal of general Base refuse, spent chemicals, and industrial shop wastes. Four trenches, some up to 10 feet deep, may have been used to dispose of the waste. An early study at this Site has shown that the trenches may be in excess of ten feet deep. The landfill was covered during the construction of the Base golf course.

A dark brown heavy oil was found in one of the monitoring wells installed to study the area. The thickness of measured oil in the one monitoring well varied slightly during the year (1991) of monitoring from 1.17 to 1.50 feet thick. Again, thickness measurements in the monitoring well do not represent the potential thickness in the aquifer. Based on August 1992 measurements and calculations, the waste floating on the ground water in the aquifer near this well is estimated to be 0.13 feet thick.

The full extent of floating waste contamination at this Site has not been determined and therefore the volume cannot be estimated at this time.

The ground water in the well containing floating waste has been analyzed and contains moderate to high levels of TCE, moderate to low levels of 1,4 dichlorobenzene and low benzene, ethyl benzene, and toluene concentrations. TCE and 1,4 dichlorobenzene are not associated with petroleum products. This observation, in conjunction with an analysis of the location of this Site relative to other areas of contamination at the Base (LF 18 is far removed from other areas) leads to the conclusion that the floating waste is a source of hazardous substances contaminating the underlying groundwater. Analysis of the floating waste has not been performed. However, the contaminants dissolved in the ground water collected from this well (benzene, 1,4 dichlorobenzene, and TCE) are carcinogenic (benzene is a Class A carcinogen: Class A means there is sufficient evidence from epidemiological studies to support a causal association between exposure and cancer in humans. TCE, as described previously, is a Class B2 carcinogen) and/or toxic.

The floating waste at Site LF 18 is located in an upgradient position from the former landfill trenches. The floating waste may be migrating off-Base, considering the base boundary is only 50 feet away. The ground water, with dissolved contaminants, is discharging to surface water drainages and possibly to the nearby wetlands.

ST 05 (JP-4)

ST 05 Fuel Spill Site is located along the aircraft parking apron in front of, or northeast of, Building 501. Leaks to the supply pipeline and associated valve were repaired in 1987, but residual fuel in the soil was not cleaned up.

The movement of the ground water at this Site is reported to be variable in direction and gradient. This situation arises because Site ST 05 is located along one of the major ground water divides that underlays the Base. In June ground water flows to the north, while in August the flow may be towards the east-southeast.

Toluene, xylene, and total petroleum hydrocarbons were detected in the soils, sediment, and ground water at the ST 05 Site. TCE, 1,2-DCE, 1,1-DCA, and carbon tetrachloride (CCL_4) along with high concentrations of total purgeable hydrocarbons were detected in the ground water. There are two wells, close to the fuel lines, which detected floating product. No analysis of the floating product was performed, but because it is near the fuel lines that were reported to have leaked in the past, the floating product at this Site is assumed to be JP-4 jet fuel.

Based on one year's (1991) measurements, the thickness of the floating jet fuel varied from approximately one foot to over 2.8 feet in both wells. No measurements were made of the potential thickness of the floating waste hydrocarbon in the aquifer.

At this time there is not a good estimate of the total volume of waste jet fuel floating beneath the ST 05 Site. This floating product is, however, very mobile and contains hazardous substances, such as benzene and toluene.

As discussed in Sections 1.2 and 2.11, the remediation of Site ST 05 is not addressed in this ROD. Remediation of this Site must proceed, initially, under other statutory authorities, such as Subtitle I of RCRA.

SS 27 (XYZ)

SS 27 Site is the main fuel pumping station in the refueling hydrant system on the Base.

The ground water at the SS 27 Site is contaminated with a dissolved plume containing elevated levels of benzene, 1,4-dichlorobenzene, ethylbenzene, and xylene that exceed applicable or relevant and appropriate requirements, such as the maximum contaminant levels promulgated under the Safe Drinking Water Act. Free-product was detected in two of the sampling points, with a maximum thickness in the shallow monitoring well of over 11.0 feet of waste jet fuel. The thickness of the floating product in one monitoring well varied from 6.3 to 11.1 feet over one year's (1991) monitoring. No measurements or calculations of the potential floating waste thickness in the aquifer near this Site were made. The extent of the floating waste jet fuel plume is not known at this time and therefore the volume of the fuel to be recovered has not been estimated.

The free product at the SS 27 Site is spreading under the Site and has been detected in manhole areas. Additionally, the dissolved plume from the floating product may be migrating off-Base in the direction of the wetlands along the St. Jones River.

As discussed in Sections 1.2 and 2.11, the remediation of Site SS 27 is not addressed in this ROD. Remediation of this Site must proceed, initially, under other statutory authorities, such as Subtitle I of RCRA.

2.6 SUMMARY OF SITE RISKS

For the Sites WP 14 and LF 18, hazardous substances in the floating waste are acting as a source of hazardous substances causing ground water contamination. Control and recovery of the floating waste in turn will reduce continued contamination of these ground waters.

For the Sites ST 05 and SS 27, underground pipeline leaks and jet fuel spills during aircraft refueling have resulted in the development of a floating waste layer beneath the Sites. This floating layer of waste is acting as a source of ground water contamination. Reduction and control of the floating product in turn will reduce continued contamination of these ground waters.

Table 1 summarizes the information developed for one sampling round of the floating waste thickness at each Site.

TABLE 1 ESTIMATED THICKNESS OF FLOATING WASTE AT EACH SITE

<u>Site</u>	<u>Monitoring Well Number</u>	<u>Date</u>	<u>Estimated Floating Waste Thickness</u>	<u>Comment</u>
WP 14	13	8/8/91	0.4 feet	(Brn. Oil)
LF 18	07 J	8/9/91	0.3 feet	(Brn. Oil)
ST 05	55 P	8/8/91	0.5 feet	Piezometer
	68 S	8/8/91	0.5 feet	(Jet Fuel)
SS 27	59 S	8/8/91	1.6 feet	(Jet Fuel)

The soils immediately above the water table have been saturated with floating waste at the WP 14 and LF18 Sites. This soil contamination will continue to act as a source of leachable constituents for future ground water contamination, even after the floating waste is removed.

This interim action remedy will control the migration potential of the floating waste thereby reducing the development of additional soil contamination at Sites WP 14 and LF18.

Actual or threatened releases from Sites WP 14 and LF 18 of hazardous substances associated with the floating waste, if not addressed by implementing the interim action selected in this Record of Decision, may present an imminent and substantial threat to public health, welfare, or the environment.

In summary, the removal of floating waste will reduce a principal threat of continued ground water degradation, and a potential threat of subsurface soil contamination at Sites WP 14 and LF 18.

2.7 DESCRIPTION OF ALTERNATIVES

CERCLA requires that each selected Site remedy be protective of human health and the environment, comply with applicable or relevant and appropriate requirements (ARARs), utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable, and be cost effective.

As discussed previously, it has been determined that CERCLA authorities are not available at Sites ST 05 (JP-4) and SS 27 (XYZ) at the present time. Therefore, the following discussion does not apply to these Sites.

This section summarizes the three alternatives reviewed for analysis and fulfillment of applicable or relevant and appropriate requirements. The selected alternatives for the removal of floating waste at the identified Sites include:

- * Alternative 1: No Action
- * Alternative 2: Bioremediation
- * Alternative 3: Pumping/Bailing with off-Base Disposal

2.7.1 ALTERNATIVE 1

The Superfund program requires that a "no action" alternative be evaluated at every site to establish a baseline of comparison. If this alternative is selected then, as the name implies, no remedial action would be undertaken at this time. The site conditions would remain as they are and the qualitative risks discussed above would continue. The threat to human health and the environment would not be reduced.

2.7.2 ALTERNATIVE 2

Alternative 2, bioremediation, is the process of using microorganisms to convert the hazardous chemicals into harmless materials. The process requires suitable microbes that can biodegrade or transform the wastes and a "good" growth environment for the microbes. The growth environment includes such factors as a favorable temperature range, a supply of inorganic nutrients, the proper pH range, and the reduction of competitor or predator microorganisms.

The advantage of bioremediation, if it could work at the Sites, is that it is a destruction technology or treatment which eliminates the hazardous waste and leaves only harmless substances. Two other advantages of bioremediation are that it requires only minimal site disruption and that there are low costs associated with the treatment of the waste on site, if the soils are not saturated with hydrocarbons.

Bioremediation, as an alternative for these Sites would require increasing the number of microbes adapted to the existing Site conditions and the installation of at least two new wells to provide oxygen and inorganic nutrients to the microorganisms. This process would require above ground pumping and storage systems for these materials. The start-up time for this process would be lengthy. Additionally, a major drawback for bioremediation at the Sites is that the microbes are not effective when the hydrocarbons saturate the soils and exist as a separate phase.

2.7.3 ALTERNATIVE 3

Under Alternative 3, floating waste would initially be recovered from the existing monitoring wells, using a pump or hand bailer on at least a weekly basis. Floating waste recovered at Sites LF 18 and WP 14 would be taken to the RCRA permitted storage area (Bldg. 1306). The waste would be analyzed for hazardous constituents/substances and suitability for energy recovery, and then disposed of in accordance with applicable regulations. If the test results indicate that hazardous waste or hazardous constituents are present then the material would be disposed of in accordance with RCRA. If the test results do not indicate the presence of hazardous wastes or hazardous constituents, then the waste would be utilized in an energy recovery (heat) facility.

All produced ground waters would be either discharged to a constructed septic system (an infiltration trench), permitted by the State, or into a drainage ditch if the contaminant concentrations are below the limits required by a NPDES permit. Appropriate consideration will be provided to control the escape of volatiles from the recovered ground water during its disposal. A control mechanism might involve a cover over the infiltration trench.

As additional information is developed during the next phase of the remedial investigation, other mechanisms for collecting the floating waste at each Site would be considered.

These methods might include trenching to collect the floating waste, followed by skimmer pumping to an oil/water separator and then off-Base disposal of the waste at a permitted facility and discharge of the recovered ground water as outlined above. If the field data indicate that a new, separate pumping well would be more effective, then a dual pump or single pump recovery well may be installed to optimize removal of the floating waste. Under this method, the recovered fluids would be handled the same way as the oil and water removed from the above-described trench.

2.8 SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES

The proposed remedial action alternatives described above were evaluated under the nine criteria in the NCP, 40 CFR 300.430(e)(9). These nine criteria can be further categorized into three groups: threshold criteria, primary balancing criteria, and modifying criteria, as follows:

THRESHOLD CRITERIA

- **Overall Protection of Human Health and the Environment**

This criterion 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.

- **Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)**

This criterion addresses whether a remedy will meet all the applicable or relevant and appropriate requirements of other Federal and State environmental statutes or provide grounds for an ARARs waiver.

PRIMARY BALANCING CRITERIA

- **Long-Term Effectiveness and Permanence**

This criterion references the magnitude of residual risks and the ability of the remedy to provide continued protection of human health and the environment once cleanup goals have been met.

- **Reduction of Toxicity, Mobility, or Volume Through Treatment**

This criterion highlights the objective that treatment technologies should be employed as a remedy at the Sites.

- Short-Term Effectiveness

This criterion covers how fast a remedy may achieve its goals and if a remedy potentially can create adverse human health and environmental impacts during implementation of the remedy.

- Implementability

This criterion references the technical and administrative feasibility and practicability of the remedy.

- Cost

This criterion covers capital and operation and maintenance costs and can be discussed in a comparative fashion.

MODIFYING CRITERIA

- Community Acceptance

This criterion insures that the public was informed and provided comment on the proposed plan or RI/FS report.

- State Acceptance

This criterion indicates that the State and support agencies have reviewed, commented on, and concur with the proposed plan or RI/FS report.

These evaluation criteria, which measure the overall feasibility and acceptability of the remedy, relate directly to requirements in Section 121 of CERCLA, 42 U.S.C. Section 9621. Threshold criteria must be satisfied in order for a remedy to be eligible for selection. Primary balancing criteria are used to weigh major trade-offs between alternatives.

State and community acceptance are modifying criteria formally taken into account after public comment is received on the Proposed Plan.

The comparative evaluation of alternatives follows.

2.8.1 Overall Protection. Alternatives 2 and 3 will provide an acceptable level of protection of human health and environmental safety by eliminating the principal threats through contaminant source reduction and treatment.

Because the "no action" alternative is not protective of human health and the environment, it is not considered further in this analysis as an option for these sites.

2.8.2 Compliance with ARARs. All acceptable alternatives would meet their respective applicable or relevant and appropriate requirements of Federal and State environmental laws.

Table 2 identifies the list of ARARs that were reviewed as part of this criterion.

2.8.3 Long-term Effectiveness and Permanence. Alternative 3 will greatly reduce the risks presented by the continuation of a floating layer of waste beneath the sites.

The reduction in the volume of waste and in the physical (hydraulic gradient) control of the spread of the contaminant layer will have long-term effects at each Site. However, this is only an interim remedial action to effect the source of the potential risks and the final remedy selected at the Sites will provide a more permanent reduction in overall risks. Alternative 2, after full implementation, would maintain a reliable measure of overall protection. However, Alternative 2 does not provide a physical control on the gradient of the floating waste.

2.8.4 Reduction in Toxicity, Mobility, or Volume Through Treatment. Alternative 3 reduces toxicity and mobility of the floating waste by volume reduction. Alternative 2 would reduce toxicity, mobility, and volume by in-situ treatment.

2.8.5 Short-term Effectiveness. Alternative 2 will require the disruption of present surface operations over a longer period than Alternative 3. The overall effectiveness of Alternative 2 is only realized after removal of the free product and the microbes have become acclimated after the addition of oxygen and other nutrients. Since the soils are saturated with floating product, bioremediation (Alternative 2) is not an appropriate technology at this time.

Alternative 3 will produce an immediate reduction in the volume of free product. However, this alternative may increase the risk to human health and the environment over the short term because of the increase in handling and disposal of the hazardous materials.

This increase in short term risk will be managed by close monitoring of personnel involved in the removal process, inspection of storage and transfer facilities, and the use of appropriate equipment.

TABLE 2
POTENTIAL APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS
(ARARs)

<u>TYPE OF ARAR</u>	<u>ARAR</u>	<u>REQUIREMENT</u>
<u>CHEMICAL-SPECIFIC</u>	None	Risk-based soil action level based on worker exposure. Soil concentrations which will not result in leachate or ground water concentrations greater than MCLs.
<u>LOCATION-SPECIFIC</u>	None	None
<u>ACTION-SPECIFIC</u>		
No Action	None	None
Biotreatment	None	None
Removal of Floating Waste	Delaware UST Act (7 Del. Code Ch. 74)	Delaware UST Regulations Part B, Section 4
	Safe Drinking Water Act	MCLs and MCLGs (40 CFR Part 141)
	Delaware Hazardous Waste Management Act (7 Del. Code Ch. 63)	Protection of ground water (Del. Haz. Waste Rules Parts 264, 265)
Transport and Disposal of Floating Waste	"	Del. Haz. Waste Rules Parts 262, 263, 264, 265 and 268)
Disposal of Effluent	Clean Water Act NPDES	Del. Water Pollution Control Regulations
Recovery Well Installation	Delaware Water Well Construction (January 1987)	Well permits, submittal of construction/abandonment records, licensing drillers, and prevent ground water pollution.
Ground Water Pumping Over 100,000 GPD	Delaware River Basin Comm. Compact (7 Del. Code § 6501)	Del. River Basin Commission Water Quality Regulations

2.8.6 Implementability. Alternative 3 requires a minimum of equipment and supplies to operate. The existing wells at each Site could be utilized, the waste will be stored while undergoing tests, and would be disposed of off-Base by the Base waste and/or hazardous waste contractors. RCRA permits are in place for storage of the waste and manifests would be used for all off-Base shipments. Contaminated ground water recovered with the floating waste would be discharged under State permit, to a constructed septic system (infiltration trench) or, if allowed, discharged to a drainage ditch.

Alternative 2 is more difficult to implement because of the new wells and the required above ground delivery system. Additionally, Alternative 2 would require the enhanced growth of microorganisms acclimated to the existing Site wastes and environment.

2.8.7 Cost. Costs have been compared on a relative, qualitative basis for the limited options considered. Alternative 2 would be the most costly, because it involves the installation of new wells; development of a storage, supply, and delivery system for oxygen and nutrients, and continued monitoring. Total costs estimated for implementation of Alternative 2 are \$300,000 to \$600,000. Alternative 3 is generally considered to require less capital investment and operation and maintenance costs (Total estimated costs = \$150,000 to \$400,000).

2.8.8 State Acceptance. The State of Delaware, after review of the Proposed Plan, concurs with the preferred alternative.

2.8.9 Community Acceptance. Community acceptance of the preferred alternative was evaluated after comments received concerning the Proposed Plan. Community acceptance is outlined in the Responsiveness Summary of this Record of Decision.

2.9 SELECTED REMEDY

Based on the above analysis of alternatives and the limited scope of this interim remedial action, the Air Force has determined that Alternative 3 (Recovery of Floating Waste) is the most effective and appropriate option at the WP 14 and LF 18 Sites. The EPA and DNREC concur with this determination.

Alternative 3 involves recovery of floating waste from the WP 14 and LF 18 Sites and off-Base disposal of this waste. Initially, the floating waste will be pumped and/or bailed from existing monitoring wells. The recovered waste material will either be stored at Building 1306, the hazardous waste storage area, or in drums at specific Sites. After testing of the floating waste, it will be disposed of off-base either for energy recovery or according to RCRA regulations.

This alternative appears to provide the best balance of tradeoffs among the listed evaluation criteria and the mandate for permanence and alternative treatment.

This alternative calls for the design and implementation of an interim remedial action as a source control to protect human health and the environment. The goals of this interim action are to reduce the spread of the plume of floating waste, to recover as much floating waste as is practicable through pumping, and to collect data on aquifer and contaminant response to these remedial measures.

The ultimate level of remediation to be attained will be determined in a final remedial action for source control at these Sites. This remedial action will be monitored carefully to determine the feasibility and practicability of recovering floating waste hydrocarbon and to ensure that the floating plume is contained. After the period of time necessary, in the Air Force's, and EPA's judgment, to arrive at a final decision for the Sites, a final Record of Decision for source control, which specifies the ultimate goal, remedy, cleanup levels for the soils at each Site, and anticipated time-frames will be prepared.

Upon completion of the remedial investigation/feasibility study, this interim system may be incorporated into the design of the Site remedy specified in the final action Record of Decision.

A monitoring program shall be developed to evaluate the extent to which the floating waste extraction under this interim remedial action performs.

2.10 STATUTORY DETERMINATIONS

To meet the statutory requirements of CERCLA Section 121, the selected remedy must:

- Be Protective of Human Health and the Environment;
- Comply with ARARs;
- Be Cost Effective;
- Utilize Permanent Solutions and Alternative Treatment Technologies to the Maximum Extent Practicable; and
- Satisfy the Preference for Treatment That Reduces Toxicity, Mobility, or Volume as a Principal Element.

The description of how the selected Alternative fulfills these requirements follows.

Protective of Human Health and the Environment

This selected Alternative will implement an interim remedial action that is protective of human health and the environment. The recovered floating waste will also be handled, stored, and treated in a protective manner. Waste recovery by pumping or bailing at these Sites will require that personnel be outfitted in full protective gear including full face air purifying respirators. When pumping is employed, explosion proof pumps will be used.

Comply with ARARs

The interim remedial action will comply with Federal and State applicable or relevant and appropriate requirements.

Cost Effective

The selected interim remedial action is cost effective and in terms of time for effective reduction of the potential threat at the Sites, it is a very reasonable value. The cost of implementation of the selected alternative is estimated to be between \$150,000 and \$400,000.

Utilize Permanent Solutions and Alternative Treatment Technologies

The goals of this interim remedy are to remove waste floating on the water table, to remove some contaminant mass, and to reduce the spread of contamination.

This interim remedial action will be monitored carefully to determine the feasibility of achieving an optimal level of reduction of floating waste. These actions are in furtherance of the mandate for permanence and treatment to the maximum extent practicable.

Satisfy Preference for Treatment that Reduces Toxicity, Mobility, or Volume

This interim remedial action is of limited scope and addresses a specific component for contaminant source control at the WP 14 and LF 18 Sites. The Alternative will reduce the mobility and volume of the floating waste. The ultimate level of remediation to be attained at these Sites will be determined in a final remedial action.

The statutory preference for remedies that employ treatment, that reduce toxicity, mobility, or volume, although partially addressed in this interim remedial action, will be addressed by the final response action. Upon completion of the next phase RI/FS, this interim system may be incorporated into the design of the site remedy specified in the final action ROD.

2.11 EXPLANATION OF SIGNIFICANT CHANGES

Only one significant change from the proposed plan has been made. Jet fuel, detected floating on the water table at the ST 05 and SS 27 Sites is subject to the "petroleum exclusion" under CERCLA. CERCLA response actions are limited to releases of hazardous substances and/or pollutants or contaminants. The definitions of these terms do not include "petroleum, including crude oil or any fraction thereof [e.g. jet fuel] which is not specifically listed or designated as a hazardous substance under [CERCLA]." Section 101(14) and (33) of CERCLA. Although hazardous substances have been detected in ground water beneath the ST 05 (JP-4) and SS 27 (XYZ) Sites, on the basis of information presently available, it cannot be determined that the jet fuel released at these Sites contains levels of hazardous substances which would remove the jet fuel from the petroleum exclusion of CERCLA. Therefore, remediation of jet fuel contamination at these Sites may not proceed, initially, under this ROD but must take place under other statutory authorities, e.g. Subtitle I of RCRA (Underground Storage Tanks).

Also, reflecting the above discussion, the name of the selected remedy has been changed from FREE PRODUCT RECOVERY WP 14 (D-4), LF 18 (D-10), ST 05 (JP-4) AND SS 27 (XYZ) SITES to RECOVERY OF FLOATING WASTE WP 14 (D-4) AND LF 18 (D-10) SITES.

Remediation of the ground water and soil at these Sites will be the subject of a subsequent ROD(s).

3.0 RESPONSIVENESS SUMMARY

A responsiveness summary is required to provide a summary of the citizen comments and concerns about the Sites, raised during the public comment period, and the responses to those concerns. All comments summarized in this document have been considered in evaluating the final decision of the interim remedial action for the Sites.

This responsiveness summary for the waste recovery at four Sites on Dover Air Force Base is divided into the following sections:

Section A: Overview - A description of the selected remedy and community reaction to the selected remedy.

Section B: Background of Community Involvement and Concerns - A brief history of community interest in the Free Product Recovery project and Dover Air Force Base.

Section C: Summary of Public Comments and Air Force Responses - Replies to public comments.

Section D: Remedial Designs/Remedial Action Concerns - Discussion of public concerns which have a bearing on the remedial action.

A. Overview

The Proposed Interim Remedial Action Plan (IRAP) was released to the public for review and comment on June 12, 1992. This date marked the opening of the public comment period on the alternatives detailed in the Proposed Plan. A public notice was published June 12, 1992 which identified Alternative 3 as the preferred remedial alternative. This alternative is described on Page 12 of the proposed IRAP. It includes the pumping and/or bailing of the floating free product from the ground and recycling of recovered fuel and disposal of other recovered products.

The limited comments received from the public suggest that area residents do not object to the preferred alternative. However, there is concern that the preferred interim remedial action does not address the possibility of contaminated groundwater or surface water migrating offsite. The Air Force conducts quarterly monitoring of surface water and is continuing an investigation of base-wide groundwater to address this concern.

B. Background of Community Involvement and Concerns

Sites WP14 (D-4) and LF18 (D-10) were trenches which were used for the disposal of waste solvents, waste petroleum, and other shop wastes during the 1950's. After disposal activities ceased at these sites they were filled with local soil and seeded with grass. LF18 is now part of the base golf course. The hydrant fueling system for refueling of the jet aircraft at the base was installed at the site ST05 (JP-4) in 1957 and at the XYZ fuel pumping station (site SS27) in 1960. Those systems are still in use and are planned for replacement starting in 1993.

In 1982 the United States Department of Defense (DOD) implemented the Installation Restoration Program (IRP) to identify and evaluate environmental contamination and associated public health hazards at DOD facilities resulting from past operations and waste handling/disposal. An Installation Assessment (Phase I - Records Search) was completed for Dover AFB in 1983. This study indicated a potential for contamination from past and/or current facility operations at a number of sites, including the four sites of concern in this interim remedial action. Two successive Remedial Investigation (RI) Studies were completed in 1986 and 1989 by Science Applications International Corporation (SAIC) and E. C. Jordan. These RI's confirmed the presence of contamination in the soil and groundwater.

The interim remedial action was proposed to reduce the current contamination level and prevent the spread of the contamination. A proposed interim remedial action plan was developed which recommended selection of Alternative 3 (See Overview, Paragraph A, above).

In addition, a public meeting was conducted on June 25, 1992 and a public comment period was established from June 12, 1992 through July 27, 1992.

The Public Affairs Office at Dover AFB issued press releases detailing IRP progress. Coverage in the two daily newspapers serving the Dover area has usually been front page, but the issues tend to dissipate within a few days due to a relatively low level of community concern. The start of remedial activities at Dover AFB could increase community concern.

C. Summary of Public Comments and Air Force Responses

The majority of the comments revolved around surface water and groundwater conditions. Additional questions concerned efforts to identify all possible contamination sources on the base and the funding source used by the base for clean up. (See Public Meeting Minutes attached). No written comments were received.

D. Remedial Design/Remedial Action Concerns

The only comment regarding implementation of the remedial action was about the disposal of the recovered floating waste.

Air Force Response: The waste removed from the monitoring wells will be stored and analyzed to determine if the floating waste contains other toxic materials. If the floating waste contains other toxic materials, it would be disposed of as hazardous waste by Dover Air Force Base through a licensed contractor. If the floating waste does not contain hazardous wastes or constituents then it can be disposed of through recycling.

APPENDIX A

PUBLIC MEETING MINUTES

**Public Meeting Minutes on the
Interim Action Proposed Plan for
Free Product Recovery at Sites
WP14 (D4), LF18 (D10), ST05 (JP-4), and SS27 (XY2)
Dover Air Force Base, Delaware**

Date: 25 June 1992

Time: 1900

**Location: Richardson and Robbins Bldg Auditorium
89 Kings Highway
Dover DE 19903**

PUBLIC MEETING MINUTES

Capt Geisel: Chief of the 436th Airlift Wing Public Affairs office of Dover Air Force Base. I would like to welcome you all here tonight. Tonight we're here to discuss the Interim Action for four sites for the removal of free product and if that's not why you're here tonight your at the wrong meeting and we'll give you the chance to leave right now - what we'll do is --I'll introduce Col Capps in just a moment and we'll have a briefing we'll introduce our panel to answer - then we'll have a question and answer period. And that's pretty much how we'll do things...At this time I'd like to introduce Col Tom Capps who's the Base Civil Engineer, we'd like to have some welcoming comments from him.

Col Capps: Let me just echo Capt Geisel's welcome to everyone who is here tonight. As the Base Civil Engineer, Col Mike Moffitt the Commander of the Airlift Wing of Dover has invited me to come and represent him. And tonight we want to make the public presentation of the plan the base has for four of the sites on the base that we want to clean up and to give everyone an opportunity to ask questions and to make inputs. Dover is taken the lead in environmental cleanup and we're really proud of what we've accomplished in the last year or so. About a year and a half ago we had one maybe two people in the Environmental Office and now we have seven and we look to have close to thirteen people working in our Environmental Engineering Office within a year. So we take it very seriously. We've been identified as the Model Environmental Installation for the Air Mobility Command, and as the model installation we are taking efforts to do things right and teach other Bases throughout the Air Force how to do things right. So it is my pleasure to be here and represent Col Moffitt. We'd really like to encourage your inputs and your questions. Thank you.

Capt Geisel: At this time I'd like to introduce Matt Parker who is the Chief of the Environmental Planning Branch at Dover Air Force Base who'll brief us on the proposed site.

Matt Parker: Good Evening my name is Matt Parker, I'm Chief of Environmental Planning at Dover Air Force Base. This evening I'd like to take about fifteen minutes to give you a brief introduction and to explain the proposed plan we have initiated for an interim remedial action at four sites on the base. This evening I'll be going through these subjects: Base History-cover some of the contaminant sources that have resulted in what we're cleaning up; Environmental History-we'll go through the proposed plan and the reason we're here this evening and we'll also introduce the third alternative of this project and finally I'll discuss future environmental issues that will be undertaken at Dover. Just a little bit about the Base, in Dec 1941 the Base was initiated from the Dover Municipal Airport. It was initiated because of the war and coastal defense. From 1943 till the end of the war it was P47 training base and also used to develop air launch rockets and most of these over the course of time have contributed to some of our contamination sources that you'll see later in the program. In 1946 the Base was deactivated and then reactivated in 1950. Since 1952 the Base has been primarily a cargo Air Force Base.

A lot of the acronyms have changed - what the base was called, and since 1 June we are Air Mobility Command so if you hear MAC or MATS we are Air Mobility Command.

Our contaminated sources have resulted from aircraft operations and maintenance. Everybody at the base is there for one reason and that is to support the aircraft in the Mission that those aircraft support. We had landfills throughout the course of time, in the early 50's 60's and even into the mid 70's landfills were a common disposal practice throughout the United States. We've also had spills and leaks and most of these have been in our jet fuel system. As you can see the next four items are the prime contaminant sources. Of these four, petroleum products are the major sources that we'll be addressing in our proposed plan. Jet fuel is the primary contaminant that we do have. We do about 60 million gallons per year of jet fuel business -- Most Businesses consider if they have 1% error rate, they have good error rate. 1% of 60 million gallons is a large problem. We don't even look at it work, we address a tenth of a percent. We have routine maintenance checks to make sure the integrity of the tightness of the fuel lines and tanks is also tested. We've had some solvents that have been disposed of in some of the landfills as we discussed about in a few minutes. We also have several sites that have some heavy metals for plating operations. Our plating operation were closed in 1985 and we finally disposed of the last sources last year. We also had some pesticides and these were used to control insects on base.

A little bit about our environmental history: In October 1983 we began what was called a preliminary assessment through the Superfund process. In the Air Force we have our own acronym, it's called the Installation Restoration Program because it's funded separately and then is not subject to use of Superfund monies. In 1984 the Base was nominated for NPL status that was based on EPA's evaluation of our preliminary assessment. The next major items you see on the slide address studies that have been undertaken since then. We've had major site investigations and remedial investigations at a number of sites and compiled a fairly significant amount of analytical data. All of this data was rolled over into one product in June 1991 in a product we call the Current Situation Report. Since that was initiated we've identified data gaps in the data that we'd collected previously. We've initiated a final studybase a Basewide studybase and we'll be undertaking that within the next several months.

The final item on here is an action we're undertaking right now this is a remedial design that has been completed and remedial action is underway in Fire Training Area 3 and if I could just take a few minutes to put through some slides I can show you some of what we're doing out there. This is what the site looked like originally. There were dumpsters that were set up in the shape of a cross used to simulate an aircraft burning. That's a close up you see that's a bermed - burned area that fuel was introduced to and an ignition source was provided and it was set on fire. The fire department practiced putting it out. This is some of the contamination that over the course of about fifteen years leached into the soil and this is what we have removed. This is where the soil had been stockpiled on plastic before it

was transported to the industrial incinerator in Virginia. All the time that we were excavating we were continually sampling to make sure that we adhered to the criteria that had been established in the same kind of document that we're presenting today and a proposed plan and a ROD. This is a picture of a underground storage tank that had been on site, used to store the fuel. This is after we tested the soil and found out that we'd removed all contamination. ... The backfill ... compacted the soil ... and finally got back to established grade. We'll end up putting a cover of topsoil on it, reseeding it, and then we will have cleaned up the soil at the site.

The proposed plan is really why we are here this evening this is an issue for public comment. The public comment period is 12 June through 27 July. That's why we're here tonight, to see if there is any inputs from you and the community. This will remove floating products from four sites and I'll discuss this in just a second. This is the interim remedial action and that is something I want to make clear. This is not a final action this is just a first step. We're going to remove the product and once we've done that we're going to look at remediation of soil and remediation of ground water. The four sites that we're looking at are: WP14 we'll call D-4, this was a landfill that was developed in the 1950's for liquid waste disposal material. You can see there is nothing obnoxious there, no drums sticking up out of the ground, this was covered up and landfilled. We've have about forty wells in that area that we use to characterize the groundwater. We have reported product in less than two wells there. The next site D-10 is also a 1950's landfill, as you can see now it's a golf course, it's number 9 fairway at Dover Air Force Base. This was used for municipal refuse and also industrial shop waste. It was generated through the maintenance and operational activities of the aircraft, C-5's and 141's. Again we have a number of wells on this site to characterize the product. We've detected the product from 3 to 4 inches to about a foot and a half.

The third site is called JP-4 site is the result of jet fuel leaks in the hydrant system and valve failures. That is we've a jet fuel delivery system so the aircraft can be refueled on site and they've been a number of leaks and breaks in there and as I get into the future initiatives one of the things that we have right now is an approved product, project for 15 million dollars to replace the hydrant fuel system. The site is just off the parking apron as you can see the aircraft. They're large enough that you have to take the fuel to them, you can't move them to the pump. The final site is XYZ and again this is a site of jet fuel leaks during the 1960's through the 1980's. This is the pump station, it has eight (8) 50 thousand gallon tanks in the ground and a number of valves in here, several of which have failed over the course of 20 years at various times.

The objective of this project is to remove floating product and to remove the potential for migration of this product thereby contaminating additional soil and groundwater. We will sample and analyze the product that is removed, and will also use the data to evaluate and select future groundwater and soil cleanup technologies. This is a site map of the Base that shows you where the four sites are. You see that ST 5 and SS 27 are at or near the aircraft parking apron those are where the general fuel leaks were. WP 14 and LP 18 were landfills. LP 18 is off the golf course and the other one's at the hammer head.

we looked at three different alternatives for selecting one for the proposal. The first alternative we looked at was no action. This alternative is required by law to be evaluated and was not selected because there is free product there and some action had to be taken. The next alternative we looked at was Bio-remediation, this is where we introduce microorganisms that will destroy the hydrocarbons. This was not selected again because floating product was not the ideal situation where you want to remove the floating product before you introduce the microorganisms or bacteria. The third area we looked at was to pump or hand bail the monitoring wells, this is the area we've selected to present as our proposed plan for removal of hydrocarbon product. The reason we know the hydrocarbon product is there is because we detected it by our monitoring wells.

I'd like to cover a few future environmental initiatives. As I said before we're getting ready to undertake a base wide remedial investigations and feasibility study. We hope to be underway by August of this year. In addition to that we're doing quarterly monitoring well surveys to determine elevations of water over a period of time that will tell us the direction the ground water is flowing, we're doing ecological assessments, archaeological assessments, and a number of other activities. This is all leading to remediation -- culmination of a number of projects some of those are listed below here. We're looking at groundwater remediation program at a site called T1. We expect to be started on that in September of 1992 and continue at a steady pace. Looking at a soil remediation project for a drainage ditch at DD-1. We have the 2 million dollar- the approved 2 million dollar Underground Storage Tank Replacement project which will also have a contaminated soil project associated with it in case there is any encountered. The jet-fuel hydrant system I told you about earlier that's an approved project for 15 million dollars to replace that hydrant system. And we're working on a landfill remediation at an additional four sites and this is to cap and remove contamination at other landfills. That concludes my briefing and at this time I'm going to turn back over to Capt Geisel who'll introduce the panel and open it up to questions.

Capt Geisel: Before I ask the panel to come up let me just explain how we do this; we'll have a panel...who'll answer your questions and so forth on the remediation of these other sites. If you could if you have a question I'd like to hear you state your name and if you're representing an organization please also state that organization and if you could we'd like you to go to the mike we need to provide a public record of this meeting and we are recording it will enable us to make sure we have an accurate record of the meeting. So if I could ask you to do that - state your name, the organization if in fact you are representing an organization, and go ahead and ask your question. Additionally I'd like to also have you limit it to one question at a time based on the number of people in here you can probably ask if you have a several questions stay at the mike and ask those questions. At this time I'd like the panel to come forward please. Take your seats. At this time I'll introduce the panel - to my far right is Dr Milton Beck he is the Dover Air Force Base Project Manager, we have Mr Bruce Beach he is the EPA project officer and we have Mr Robert Allen who is the Dept of Natural Resources and Environmental Control DNREC officer here tonight and I guess Matt you will be also able to ask questions - if you have specific questions about the briefing or something Matt Parker brought up he will also be available to answer. So at this time we'll open it up to questions and if uh we'll start.

Chris Zimmerman: My name is Chris Zimmerman I live near Magnolia and you spoke of the pumping or bailing out of the monitoring wells. Where does the water go from there?

Capt Geisel: You mean the bailed out product?

Chris Zimmerman: Right.

Capt Geisel: Okay.

Dr Milton Beck: The product when it is removed from the monitoring wells will be stored and analyzed to determine if the product contains other toxic materials. If the free product contains other toxic materials, which is a possibility especially at the two landfills, if indeed it does contain toxic materials it would be disposed of as hazardous waste by Dover Air Force Base through a licensed contractor. If the petroleum product does not contain hazardous materials then it can be disposed of, through a contractor, for recycling and we anticipate that the majority of the product which will come from the two sites near the hydrant fueling system will be primarily jet fuel. And we do not believe that it will contain hazardous materials but it will be analyzed also to make sure. If it is not considered hazardous it will be sold - uh - disposed of through a contractor for recycling.

Capt Geisel: Any further questions?

Chris Zimmerman: Yes. Of course as you know there is a large gravel pit across the highway. Has there any contamination been detected in that large lake of George & Lynch?

Dr. Milton Beck: We have not sampled the water in that gravel pit. But we do have monitoring wells between the gravel pit on the East side of Rt 113 and we would be able to detect if materials are migrating from the Base towards that highway.

Chris Zimmerman: Any contamination detected in the - I guess it's the first major aquifer below the base?

Dr. Milton Beck: That would be the unconfined aquifer, the Columbia aquifer and in some areas on the Base yes, we have found contamination.

Chris Zimmerman: I guess my last question for now is the contamination, has any of it reached any of the tributaries, wetlands of the St Jones or the St Jones River itself?

Dr. Milton Beck: We have detected low levels of some solvents in the small tributary on the golf course which empties into the St Jones River. The levels as I recall that were detected are well below levels that are within the Surface Water Standards for the State of Delaware. There's probably been some discharge to the North drainage ditch which in turn empties into Little Creek or Pipe Elm Branch of the Little Creek. I don't think that the levels that have been found there exceed any surface water standards.

Chris Zimmerman: I can think of a few more, but I'll ...

Capt Gaisel: Okay well then please come back up here then.

Chris Zimmerman: You mentioned several landfilled sites. To the best of your knowledge has an effort been made to identify every conceivable site on the Base?

Dr. Milton Beck: Yes, efforts have been made by going through records, interviews of employees that worked on base in years past, there has been a rather extensive effort to try and locate every possible source of contamination that could be identified on the Base. Have we identified everything? That remains to be seen. In the course of the remedial investigation that is going to be undergoing or starting this summer. We will be looking at ground water throughout the entire Base. And one of the big efforts is looking at the ground water that would be migrating off the Base to make sure contamination is not leaving the Base. In the course of this investigation, it is possible that we would locate or identify additional sources of contamination. If we find contamination that seems to be coming from an area that we are unaware of, we will investigate that further to see if there is or what the source might be.

Chris Zimmerman: Initially you mentioned that the funding for this project is a separate line item from your operations.

Dr. Milton Beck: That is correct.

Chris Zimmerman: Is the funding for this cleanup - can the funds be utilized by either the County or other Superfund cleanups for instance Wildcat Landfill or the Landfill at Houston?

Dr. Milton Beck: No. The funds that are being used to clean up Dover Air Force Base are funds that have been appropriated by Congress to the Department of Defense under what is called The Defense Environmental Restoration Account. DERA money is used only for cleanup of past contamination problems or contamination problems that originated prior to 1984 and it will be used only on active Military Bases, Air Force, Army, Navy, whatever.

Chris Zimmerman: Some of you have been named as a contributor to a hazardous waste site on private property or county property. Is there a mechanism that Congress has set aside funding for that cleanup?

Dr. Milton Beck: Yes. As a matter of fact I think there's two there may be more but I know that there's two sites that Dover Air Force Base is considered third party PRP. Which Dover Air Force Base through the Air Force is contributing to the investigation and cleanup of those sites. Now as to the exact mechanism of that funding I don't know. I'm not aware of it because someone else handles that. It isn't even handled at Dover Air Force Base.

Matt Parker: That's a special pot of money, it is also DERA money. That comes off and is handled, in our case by Airstaff, and as Air Force Bases, whether it is Dover or any other Air Force Base, are identified as PRPs, those funds are allocated for the investigation and cleanup of those sites.

Capt Geisel: Are there any other questions?

Capt Geisel: For those of you who are more bashful and chose not to go to the mike but might have some questions to ask on a personal note, the panel will be available as well as Matt Parker following the meeting for 15-20 minutes or whatever is required to maybe answer some questions that you might have that you didn't want to bring up in the public forum. If there are no further questions, and again I'll ask again I don't want to - we're not trying to cut this short by any means. We're here to answer the questions that you might have, but if there are no questions, it's still daylight outside and go outside and enjoy the evening. We'll go ahead and adjourn this public meeting and like I said the panel will be available to answer some questions you might have. No further questions?

Dr. Milton Beck: It might be mentioned that if you have comments that you wish to make in writing they can be accepted by Dover Air Force Base up until July 27.

Capt Geisel: And they can be directed to either Dr. Milton Beck that is in the Environmental Planning Office of Dover Air Force Base and the zip code for that is 19901...02 -I'm sorry 19902. And that was in the public notice will appear in the newspaper and a record of this meeting will be placed in our depository. No further questions? This public meeting is adjourned.

APPENDIX B

STATE OF DELAWARE CONCURRENCE LETTER



STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES
& ENVIRONMENTAL CONTROL
DIVISION OF AIR & WASTE MANAGEMENT
89 KINGS HIGHWAY
P.O. BOX 1401
DOVER, DELAWARE 19903

OFFICE OF THE
DIRECTOR

TELEPHONE: (302) 739-4764

September 30, 1992

Mr. Edwin B. Erickson (3RA00)
Regional Administrator
U.S EPA Region III
841 Chestnut Building
Philadelphia, PA 19107

Dear Mr. Erickson:

This letter is to officially express DNREC's concurrence with the Record of Decision for recovery of floating waste at sites WP 14 (D-4) and LF 18 (D-10) at Dover Air Force Base. As you know, DNREC has provided review and comment on the drafts of this document.

We look forward to the implementation of this interim remedial action, which we believe is an important first step in remediating the ground water problems at the base, and in providing effective protection of human health and the environment.

Sincerely,


Phillip G. Retallick
Director, Division of Air and Waste Management

PGR:RJA:rja
RJA2202

pc: N.V. Raman
Robert Allen
Bruce Beach
Milton Beck

Delaware's good nature depends on you!