Frank

WRIGHT-PATTERSON AFB

RECORD OF DECISION

FOR

21 NO ACTION SITES

DRAFT: 1 JULY 1996

RECORD OF DECISION
FOR 21 INSTALLATION RESTORATION PROGRAM SITES
AT WRIGHT-PATTERSON AFB

TABLE OF CONTENTS

RECORD OF DECISION
FOR 21 INSTALLATION RESTORATION PROGRAM SITES
AT WRIGHT-PATTERSON AFB

TABLE OF CONTENTS (CONT'D)

List of Figures

List of Tables

RECORD OF DECISION
FOR 21 INSTALLATION RESTORATION PROGRAM SITES AT WRIGHT-PATTERSON AFB

1.0. THE DECLARATION

1.1. Site Name and Location: Wright-Patterson AFB (WPAFB), Greene and Montgomery Counties, Ohio. WPAFB is listed on the National Priorities List (NPL) and is not scheduled for closure under the Base Realignment and Closure program. The following is a list of 21 individual sites within five OUs which are recommended for No Action:

OU2: Burial Site 1; Long-Term Coal Storage Area; Temporary Coal Storage Pile; Coal and Chemical Storage Area; and Bldg 89 Coal Storage Pile

OU3: Landfill 14; Fire Training Areas 2, 3, 4 and 5; Spill Site 1; Earthfill Disposal Zones 11 and 12.

OU5: Fire Training Area 1; Gravel Lake Tank; Burial Site 4

OU6: Earthfill Disposal Zone 1

OU10: Central Heating Plant 3 and associated Battery Burial Site; Landfill 13; Tank Farm 49A; Underground Storage Tanks at Building 119

1.2. Statement of Basis and Purpose: This decision document presents the selection of the No Action remedial alternative for twenty-one Installation Restoration Program (IRP) Sites at Wright-Patterson AFB. The selection process was conducted in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act (SARA), and the National Contingency Plan (NCP). This decision is based on the administrative record for all of the site. All documents, correspondence, and other resources which comprise the Administrative Record upon which this decision is based are identified in the attached index.

1.3. Description of Selected Rationale For No Action:
WPAFB, the United States Environmental Protection Agency (USEPA), and Ohio Environmental Protection Agency (OEPA) have selected No Action for the sites at WPAFB listed in section 1A above. Remedies for groundwater at the No Action sites will be addressed under the Basewide Monitoring Program. Under this program, WPAFB will study the types and movements of contaminants in groundwater, surface water, and sediment across the base. This study will examine all of the OUs and parts of the base that do not contain hazardous waste sites.

RECORD OF DECISION
FOR 21 INSTALLATION RESTORATION PROGRAM SITES AT WRIGHT-PATTERSON AFB

1.4.1. Declaration Statement: United States Air Force

It has been determined that no further remedial action is necessary at any of the following Operable Unit (OU) sites:

OU2: Burial Site 1; Long-Term Coal Storage Area; Temporary Coal Storage Pile; Coal and Chemical Storage Area; and Bldg 89 Coal Storage Pile

OU3: Landfill 14; Fire Training Areas 2, 3, 4 and 5; Spill Site 1; Earthfill Disposal Zones 11 and 12.

OU5: Fire Training Area 1; Gravel Lake Tank; Burial Site 4

OU6: Earthfill Disposal Zone 1

OU10: Central Heating Plant 3 and associated Battery Burial Site; Landfill 13; Tank Farm 49A; Underground Storage Tanks at Building 119

Based on the evaluation of analytical data and other information, the United States Air Force has determined that no remedial action is necessary to ensure protection of human health and the environment at these sites. In accordance with CERCLA Section 300.430 (f)(4)(ii), a review will be conducted within five years after finalization of this Record of Decision to ensure that this decision provides continued protection of human health and the environment.

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THOMAS W. L. McCALL, Jr.
Deputy Assistant Secretary
of the Air Force
(Environmental, Safety and
Occupational Health)

_____

Date

RECORD OF DECISION
FOR 21 INSTALLATION RESTORATION PROGRAM SITES AT WRIGHT-PATTERSON AFB

1.4.2. Declaration Statement:

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

It has been determined that no further remedial action is necessary at any of the following Operable Unit (OU) sites:

OU2: Burial Site 1; Long-Term Coal Storage Area; Temporary Coal Storage Pile; Coal and Chemical Storage Area; and Bldg 89 Coal Storage Pile

OU3: Landfill 14; Fire Training Areas 2, 3, 4 and 5; Spill Site 1; Earthfill Disposal Zones 11 and 12.

OU5: Fire Training Area 1; Gravel Lake Tank; Burial Site 4

OU6: Earthfill Disposal Zone 1

OU10: Central Heating Plant 3 and associated Battery Burial Site; Landfill 13; Tank Farm 49A; Underground Storage Tanks at Building 119

Based on the evaluation of analytical data and other information, the United States Air Force has determined that no remedial action is necessary to ensure protection of human health and the environment at these sites. In accordance with CERCLA Section 300.430 (f)(4)(ii), a review will be conducted within five years after finalization of this Record of Decision to ensure that this decision provides continued protection of human health and the environment.

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VALES V. ADAMS
Regional Administrator
U.S. Environmental Protection Agency Region V

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Date

1.4.3. Declaration Statement: Ohio Environmental Protection Agency

It has been determined that no further remedial action is necessary at any of the following Operable Unit (OU) sites:

OU2: Burial Site 1; Long-Term Coal Storage Area; Temporary Coal Storage Pile; Coal and Chemical Storage Area; and Bldg 89 Coal Storage Pile

OU3: Landfill 14; Fire Training Areas 2, 3, 4 and 5; Spill Site 1; Earthfill Disposal Zones 11 and 12.

OU5: Fire Training Area 1; Gravel Lake Tank; Burial Site 4

OU6: Earthfill Disposal Zone 1

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Based on the evaluation of analytical data and other information, the United States Air Force has determined that no remedial action is necessary to ensure protection of human health and the environment at these sites. In accordance with CERCLA Section 300.430 (f)(4)(ii), a review will be conducted within five years after finalization of this Record of Decision to ensure that this decision provides continued protection of human health and the environment.

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DONALD R. SCHREGARDUS
Director, Ohio Environmental Protection Agency

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Date

2.0. DECISION SUMMARY

2.1. Site Details

2.1.1. Name and Location: Wright-Patterson Air Force Base (WPAFB) is located in southwestern Ohio, east of the city of Dayton and adjacent to the city of Fairborn. The Base is approximately 60 miles north of Cincinnati and 50 miles west of Columbus. It lies in Montgomery and Greene counties. (Figure 1).

2.1.2. Size and Description: The installation is composed of Wright and Patterson Fields, which are separated by State Route 444. Wright Field comprises Area B, approximately 2,800 acres; and Patterson Field comprises Areas A and C, approximately 5,711 acres. The Base is the Headquarters to the Air Force Materiel Command and home to organizations such as the Air Force Wright Aeronautical Laboratories, Air Force Institute of Technology and the Aeronautical Systems Center. The Base has a significant proportion of its acreage devoted to logistical support/warehouse land uses, research and development land uses, and administrative and classroom space. Airfield functions constitute 24 percent of all on-base land uses. The base has more than 2,500 acres of undeveloped land, but much of that acreage is restricted from certain types of development by environmental constraints, such as flood plains, steep slopes, Indian burial mounds, and other cultural/natural features. Other constraints, such as a new national park, laser testing facilities, explosive safety zones and clear zones for runways, also restrict development in certain areas.

2.1.3. Geography/Topography: WPAFB lies within the Till Plains section of the Central Lowlands Physiographic Province. The regional land surface typically appears flat to gently rolling. Area streams and rivers have developed generally level flood plains, such as the Mad River flood plain on which much of WPAFB is situated. Where the airfields are located, the terrain is generally level. In the higher areas to the southeast where much of the Base housing and support facilities are located, the terrain is gently rolling.

The land surface altitude at WPAFB varies from 800 feet above the National Geodetic Vertical Datum of 1929 (NGVD) in Areas A and C, located within the Mad River flood plain, to 975 feet above NGVD in Area B. Surface drainage from WPAFB runs ultimately to the Mad River by way of Hebble and Trout Creeks and several small unnamed tributaries.

2.1.4. Climate: The climate in the area is temperate and humid with a mean annual temperature of 52.3 degrees Fahrenheit (°F) and a mean annual precipitation of 36.25 inches. Precipitation is evenly distributed throughout the year. In the spring, the average final occurrence of freezing temperatures is in mid-April, and in the autumn, the average initial occurrence of freezing temperatures is in late October. Temperatures of 0°F or below will be experienced in about four years out of five, while 100°F or higher will occur in about one year out of five.

2.1.5. Basewide Geology: The geology of the area consists of Ordovician and Silurian Age rocks overlain by unconsolidated deposits of Pleistocene and Recent Age materials. The Richmond Group of Ordovician Age is the bedrock unit underlying most of WPAFB. It consists of up to 265 feet of interbedded shales and limestones that outcrop in portions of eastern Montgomery and Western Greene Counties.

The Richmond Group is capped by thin, discontinuous erosion remnants of Brassfield Limestone of Silurian Age in some areas of WPAFB. The Brassfield Limestone is a relatively pure limestone up to 30 feet thick.

The bedrock reflects a preglacial drainage system which is masked by overlying unconsolidated Pleistocene Age glacial till and outwash deposits. These materials were deposited during the last period of Wisconsin glaciation, and are present throughout the area. Glacial till consists of a heterogeneous mixture of cobbles, gravel, sand, silt and clay that were deposited directly by the glacier as it moved over the region. These deposits, interbedded with water-bearing sand and gravel zones, locally may form confining aquifers or may limit recharge to underlying unconsolidated aquifers.

As the glacier retreated, melt streams flowing through the valleys and lowlands deposited large accumulations of sand and gravel identified as outwash deposits. These deposits attain a maximum thickness of 250 feet around Dayton and usually overlie till deposits. Outwash deposits form the most prolific aquifer of the Ohio region.

Recent Age alluvium deposited in relatively thin sequences by modern streams is present in the ground surface adjacent to all major streams. The alluvium consists of both sorted and unsorted accumulations of sand, silt, gravel, and clay.

2.1.6. Basewide Surface Water and Groundwater Resources: The majority of WPAFB lies within the flood plain of the Mad River Valley. The Mad River originates in western Ohio approximately 40 miles north of Springfield and flows generally south and southwest past WPAFB to its confluence with the Great Miami River in Dayton. The Mad River flows along the western boundary of Area C and passes to the north and northwest of Area B. The River generally follows the course of the Mad River Buried Valley Aquifer, an inconspicuous bedrock valley that has been filled with unconsolidated sediments consisting primarily of glacial outwash deposits with discontinuous zones of glacial till. The glacial outwash deposits are very permeable and exhibit high transmissivity and hydraulic conductivity, while the till deposits can act as aquitards with relatively low hydraulic conductivity. Vertical hydraulic gradients vary throughout the area, and both upward and downward gradients have been recorded in monitoring well clusters at WPAFB.

Water is present in the unconsolidated deposits and the underlying bedrock. Water occurs in intergranular pore spaces in the unconsolidated deposits. In bedrock, water occurs in fractures, joints, and solution openings in the shale and limestone. The unconsolidated alluvium, outwash, and till interact to form a complex aquifer system at

WPAFB. Outwash is locally separated from overlying alluvial materials by 2 to 7 feet of dense, unsorted till composed of clay, silt, gravel, and sand. In many areas, the till layer is thin or absent and alluvium directly overlays the outwash deposits. Also, in many areas two till layers occur within the glacial outwash, dividing it locally into separate hydraulic units. The till, wherever it occurs, can be described as a semiconfining layer with many holes, tears, and missing pieces.

Most of Area C, which lies behind Huffman Dam, is subject to flooding. The 10-year floodplain of the Mad River and WPAFB is 804.7 feet above mean sea level (MSL), while the 100-year flood plain, based on recent modeling studies conducted by the Army Corps of Engineers, is at an elevation of 814.3 feet above MSL.

Alluvial deposits may be locally productive, yielding 100 to 500 gallons per minute (gpm). Normal practice in the Dayton area, however, is to obtain water supplies from the more productive, underlying glacial outwash deposits. The alluvium, where present at WPAFB, is typically 40 to 60 feet thick and occurs under water-table conditions. The alluvial deposits provide base flow to streams during low flow periods.

Outwash deposits yield greater than 1,000 gpm. At WPAFB, the hydraulic conductivity of the outwash ranges from 1,000 to 3,000 gallons per day per square foot (gpd/ft^2). The buried valley aquifer, a Federally designated Sole Source Aquifer, is used by WPAFB for water supply and is also the primary unit from which municipal supplies are drawn at the nearby Dayton Municipal Wellfield on Rohrer's Island. The city of Fairborn's North Wellfield (adjacent to OU2) also draws water from this aquifer. Fairborn uses this wellfield only during periods of drought for emergency use and twice a year during hydrant flushing. Groundwater occurs in the outwash deposits under both water table and artesian conditions and locally may provide base flow to streams during low flow conditions in areas where it is at or near the ground surface. Total depth of the sole source aquifer varies between approximately 50-250 feet depending on position within the buried valley and also depending on water producing horizons within that range.

Groundwater contained in the scattered sand and gravel sequences of till provides domestic supplies on the order of 10 gpm. The till is generally more than 20 feet thick and may overlie units of greater productivity. The bedrock deposits are a minor source of groundwater. The shale and interbedded limestone of the Richmond Group yield water of sufficient quantity only for household use. The Brassfield Limestone generally yields greater quantities of water than the Richmond Group and is suitable for both farm and home use.

Water level measurements from across the base indicate that the Mad River Buried Valley Aquifer is unconfined within and around WPAFB except in some localized areas where perched water tables exist or in areas that are overlain by till. Good hydraulic connection exists between the aquifer and the river, as indicated by the high dry-weather flow index of the Mad River. The upland areas in this region serve in part as recharge areas for the buried valley aquifer. These upland areas, including a

groundwater mound in southeastern Fairborn, form groundwater divides which control groundwater flow in and around Areas A and C, much like the surface water drainage basin.

The city of Dayton conducted an assessment of water quality in the Mad River Wellfield, concluding that, with the exception of 15 of Dayton's wells that contain detectable levels of volatile organic compounds (VOCs), the Mad River Wellfield produces high quality drinking water. Low levels of VOCs have been found present in groundwater samples from some of the on-Base water supply wells.

There are four lakes on base: Upper Twin Lake (4.67 acres), Lower Twin Lake (3.17 acres), Gravel Lake (6.73 acres), and Bass Lake (42.0 acres). Twin and Gravel lakes are more properly classified as ponds because of their shallow depth. The lakes are used for fishing and recreational activities by base employees and their families.

2.1.7. Natural Resources: General land use classifications of terrestrial communities found on WPAFB include hardwood forest, characteristic of second growth oak/sugar maple. Black cherry and flowering dogwood, honeysuckle, autumn olive, and various herbaceous plant species are typical of the area. The most commonly observed species of fauna in the forested areas are white-tailed deer, raccoon, eastern chipmunk, eastern cottontail rabbit, and opossum.

The ruderal communities are characterized by areas of disturbance including residential housing complexes, commercial and industrial complexes, the Twin Base Golf Course, and other developed WPAFB areas. Commonly observed native vegetation associated with residential complexes includes sugar maple, cottonwood, and oak. Non-native ornamental trees and shrubs are also present. Mammals include eastern cottontail rabbit, chipmunk, opossum and grey squirrel. Birds include those seen in the forest along with pigeon, killdeer, English sparrow, mockingbird, and red-winged blackbird.

Huffman Prairie is a 109-acre remnant of a once much larger prairie. It is one of the largest remnants of native prairie in the state. The Ohio Natural Areas Council declared Huffman prairie a State Natural Landmark in 1985. Dominant native grass species of this prairie are Indian grass and big and little bluestem. Nesting bird species in Huffman Prairie include Bobolink, Henslow's sparrow, grasshopper sparrow, and Eastern meadowlark. There are at least 20 different species of grasses found in the prairie. The fauna includes many species commonly observed in the other communities. However, the more abundant species are the red-winged blackbird, Eastern meadowlard, and groundhogs.

To the north of Gravel Lake, there is a 5-acre tract of Type 3 Emergent Wetland, designated by Ohio Department of Natural Resources in September 1987. A seven acre riverine wetland is located on the east shore of the Mad River, just upstream of the mouth of Trout Creek. A wetlands delineation has recently been completed at the Base. Aquatic and wetland communities are found in several isolated wetlands on the

beds and banks of Hebble Creek, Trout Creek, and portions of the Mad River as well as the lakes on base.

The base has confirmed the presence of the Indiana bat, a federal endangered species, in the Mad River valley area. The base is home to several other endangered, potentially threatened, and special interest species of animal and plant, including but not limited to the Eastern Massasauga rattlesnake, upland sandpiper, and glade mallow.

2.1.8. Adjacent Land Use: Adjacent land uses include agricultural, residential, institutional, commercial, and industrial. Commercial strip development in Fairborn and Riverside are situated across from the installation on State Route 444 and Springfield Pike and adjacent to the Page Manor residential area to the southwest. Adjacent industrial activities are situated to the northeast and northwest. Wright State University is adjacent to the south central portion of the installation. Open space remains primarily along the northern/northwestern boundary (the Huffman Reserve) and to the east. Residential development is established all along the southern/southeastern boundary and occurs sporadically along other perimeter areas.

More detailed information regarding the previous topics may be found in the *Final Site-Wide Characterization Report* written for WPAFB by International Consultants Incorporated (ICI) and Science Applications International Corporation (SAIC), 3 March 1995. The report was written as a compilation of regional and Base-wide data to be used as a reference for all National Environmental Policy Act (NEPA) studies.

2.1.9. History of Operable Units (OUs): A description of each of the No Action sites is given below by OU. The No Action sites are bolded.

2.1.9.1. OU2: OU2 consists of a group of eight sites located close together in the northeastern portion of Area C. (See Figure 2.) These sites are Spill Sites 2, 3, and 10, the **Coal and Chemical Storage Area, Temporary Coal Storage Pile, Long Term Coal Storage Area, Burial Site 1,** and the **Building 89 Coal Storage Pile**. Five of these eight sites, (Spill Sites 2, 3, and 10 being the exception) are being closed out in this ROD. (Spill Sites 2, 3, and 10 are being evaluated in a feasibility study to determine the appropriate remedial action for the fuel contamination). Each OU2 site is within 1,000 feet of an adjacent site and all fall within a rectangular area of approximately 105 acres (although the combined area of all the sites is significantly less). The Coal and Chemical Storage Area is an area of less than 1 acre located immediately south of the POL Storage Area. The Temporary Coal Storage Pile covers 3.7 acres and lies at the north end of the POL Storage Area. The Long Term Coal Storage Area, about 5.5 acres in size, is located in the northeastern portion of OU2 near the WPAFB east boundary and the city of Fairborn's North Well Field. Burial Site 1 is located in the northeastern corner of OU2 and is adjacent to the WPAFB east boundary and the city of Fairborn's North Well Field. The site encompasses approximately 5.5 acres. Building 89 Coal Storage Pile consists of approximately 6.2

acres located in the south end of OU2 and runs along the edge of the base just northeast of bldg 89.

OU2 is located near the city of Fairborn's West Park Well Field and North Well Field. The West Park Well Field has been taken out of service and abandoned. The North Well Field is an active well field on reserve status, used during periods of increased demand or in drought conditions. Private residences and a public recreational facility are located within a few hundred feet of some OU2 sites. Undeveloped areas of OU2 are occasionally used for training and storage activities. Some training activities are conducted within the area of Burial Site 1. The areas adjacent to the Building 89 Coal Storage Pile, the Coal and Chemical Storage Area, and Burial Site 1 are commonly used for materials storage.

2.1.9.2. OU3: OU3 consists of 10 IRP sites. (See Figure 2.) OU3 is located in Area C near the main runway, adjacent to the Mad River and within the Mad River floodplain. The area includes forests, open fields, and several gravel-covered sites used to conduct fire training exercises in support of flightline operations. There are no buildings within OU3, and the land use is restricted to recreational (hunting and camping) and light industrial (fire training exercises) activities. Three jurisdictional wetlands and two areas of wetland habitat have been identified within OU3. The presence of these wetlands, along with abundant vegetation and animal life, indicates the area supports native species commonly found in southwestern Ohio. OU3 lies within the Mad River floodplain, in and near the clear zone of an active runway complex, and its use is limited to occasional recreation and industrial activity. Thus, OU3 is expected to remain undeveloped for an indefinite period. Three landfills (**LFs 11, 12, and 14**), four fire training areas (**FTAs 2, 3, 4, and 5**), and one spill site (**SS 1**) are located within OU3. In addition, two former earthfill disposal zones (**EFDZs 11 and 12**), are located immediately north of OU3. Eight of these sites (all but Landfills 11 and 12) have been selected for No Action.

The land at OU3 is nearly flat, with some elevated soil areas within FTAs 2 and 5, and at Landfill 11 (due to consolidation/mounding of the buried waste). OU3 lies against the eastern bank of the Mad River and within the floodplain behind Huffman Dam. Most of OU3 lies within the 10-year Mad River floodplain. Surface water at OU3 either drains directly into the Mad River or into small unnamed tributaries that carry runoff from the flightline and other areas into the Mad River. Boreholes drilled at seven locations within OU3 encountered bedrock at depths ranging from 58 feet (north of Landfill 11) to 163 feet below the ground surface (east of Landfill 12). Groundwater was encountered at depths ranging from 4 feet (at Landfill 12) to nearly 20 feet (at Landfill 11), with an average depth of about 10 feet beneath the ground surface.

2.1.9.3. OU5: OU5, located in the southwest corner of Area C, is a collection of discrete sites that have, or may have been used for handling or disposal of hazardous chemical materials in the past, and areas located adjacent to these sites. (See Figure 3.) OU5 IRP sites include Landfill 5 (LF5), (not part of this ROD) and **Landfill 5 Extension (LFE), Fire Training Area 1 (FTA 1), the Gravel Lake Tanks Site (GLTS), and Burial Site 4 (BS4).** Within OU5 are three lakes (East Twin Lake, West Twin

Lake, and Gravel Lake) and two wetlands. Other areas included in OU5 are the area south of LF5 to Hebble Creek and the area north of FTA 1 to Hebble Creek. These areas, along with the Lakes, are referred to as the area south of LF5. They are located within OU5 but are not IRP sites.

LF5 is a 23-acre site located north of the Twin Lakes between Riverview and Prairie Roads. Access to LF5 is generally restricted from the public by a fence. General refuse from Areas A and C was reportedly disposed of at this landfill during the period of 1945 to 1991. LF5 is currently undergoing a Removal Action and is not part of this ROD. As part of the Removal Action, a fence is being constructed at the perimeter of LF5, which will further restrict public access to the landfill. A second Removal Action is also being conducted at Landfill 5; a groundwater pump and treat system has been operating at the site since December 1991. The purpose of the pump and treat system is to contain, to the extent practicable, the off-site migration of groundwater contaminated with trichloroethylene and tetrachloroethylene.

Portions of OU5 extend beyond the WPAFB boundaries onto adjacent property owned by the Miami Conservancy District (MCD). (See Figure 3). MCD maintains the area between the WPAFB boundary and Huffman Dam as a nature preserve. Immediately adjacent and downgradient from OU5, west of Huffman Dam, the city of Dayton maintains two wellfields collectively referred to as the Mad River Wellfield (MRWF). The first, known as Rohrer's Island, provides drinking water to the city of Dayton. The second, known as the Huffman Dam Wellfield, serves as a hydrologic barrier between Rohrer's Island and sources of existing and potential groundwater contamination located to the east by capturing groundwater that passes beyond WPAFB boundary before it reaches Rohrer's Island.

The area south of LF5 and Twin Lakes is used as a family campground. Base personnel and USAF retirees and their families use the area for fishing, picnicking, and camping. The lakes are stocked with catfish and trout periodically throughout the year.

2.1.9.4. OU6: Earthfill Disposal Zone 1 (EFDZ1) encompasses 23 acres and lies in the northwestern portion of Area B of the Base, within the Mad River floodplain. (See Figure 3). EFDZ1 consists of both on-base (EFDZ1A and EFDZ1B) and off-base (EFDZ1C) areas separated by Harshman Road. EFDZ1 also lies entirely upon a portion of the Miami Valley Aquifer, a federally designated sole source aquifer.

The off-base portion of EFDZ1 (EFDZ1C, located west of Harshman Road) is currently used as a community park maintained by the city of Riverside. This area is approximately 4 acres and consists of a playground, recreational areas, open fields, and a few asphalt covered areas used as walking paths, parking areas, and access roads. The on-base portion of EFDZ1 is located approximately 600 yards from the U.S. Air Force Museum, and is very close to the flight line in the clear zone of an active, though seldom-used runway complex. There are no buildings located at EFDZ1, and the land is not used for commercial or residential purposes. Because of these restrictions,

EFDZ1 is likely to remain undeveloped and unpopulated, except for the community and recreational activities.

2.1.9.5. OU10: OU10 is a wedge-shaped section of land lying between Wright and Skeel Avenues in the northeastern portion of the Base and bordering the city of Fairborn. (See Figure 3). OU10 consists of a group of four IRP sites including **Landfill 13 (LF13), Tank Farm 49A (TF49A), Underground Storage Tanks at Building 30119 (UST Bldg 30119), and Central Heating Plant 3** at Building **170 (CHP-3) and the associated battery burial site.** Three other areas of potential contamination were also investigated under the RI. These areas, though not IRP sites, include the Building 13 sump pit area, an area with minor soil contamination near the Base Headquarters (Building 10) flagpole, and a former dry cleaning operation in Building 89. OU10 land use is currently, and is expected to remain, a light industrial/office complex unlikely to be used for recreational or residential purposes in the future.

2.2. IRP History and Enforcement Activities: In 1981 the Installation Restoration Program (IRP) was initiated at WPAFB and began with a Phase I, Problem Identification and Records Search. Phase II, Stages 1 and 2 were subsequently conducted for the 33 sites initially identified. WPAFB entered into the Administrative Orders on Consent (also referred to as The Consent Order or CO) with OEPA in February 1988. The CO specifies requirements for conducting Preliminary Assessments (PA), Site Investigations (SI), Remedial Investigations (RI) and Feasibility Studies (FS), Remedial Designs (RD), and Remedial Actions (RA) on base.

WPAFB was placed on the National Priorities List by the USEPA in 1989. WPAFB entered into a Federal Facilities Agreement (also referred to as the Interagency Agreement or IAG) with USEPA, signed in March 1991, that establishes a procedural framework and schedule for implementing and monitoring response actions at the Base.

As part of the IRP, an RI/FS Work Plan was developed for 39 potential waste disposal sites. Twenty-five other sites were also identified and have undergone PAs and SIs. All of these remaining sites, along with the original 39, were grouped into 11 OUs across the base. All of the sites were addressed in the RI/FS by OU for additional investigation or for longterm groundwater monitoring. The sites proposed for No Action in this document are from five of these OUs, namely OUs 2, 3, 5, 6, and 10. Table 1 shows a list of these sites, as well as the approval dates of the Proposed Plans that were used to document the decisions of No Action required at these 21 sites.

Remedial Investigations (RIs) were performed at all five OUs. The RIs included soil, groundwater, surface water, and sediment sampling. Soil gas sampling and geophysical surveys were also conducted to help delineate areas of contamination and buried waste. The results of this investigation were used to: (1) characterize the nature and extent of contamination at these OU sites; (2) to evaluate the potential for contaminant transport through surface water runoff, wind erosion, and infiltration of rainwater; and (3) to assess the associated risk to human health and the environment, if

any, posed by these sites. RI Reports were written for each of the five OUs discussed in this ROD, which document the investigation results. The reports have all been reviewed and approved by regulatory agencies and have also been made available for public review in the Administrative Record and Information Repository. (See section 2.3.).

Histories of each of the No Action sites is given below by OU. No Action sites are bolded.

2.2.1. OU2: Historically, the OU2 No Action sites were used for storage. The **Coal and Chemical Storage Area** was maintained in the area from the late 1940s to the early 1970s. Twenty-five gallon containers of muriatic acid and sulfuric acid were stored on the site along with 2.5 gallon containers of carbon tetrachloride. The site is currently a flat, grass-covered field.

Coal storage activities began at the **Temporary Coal Storage Pile** site between 1946 and 1948 and ended between 1954 and 1956. All coal remnants were removed in September 1960. The northeast portion of this site is currently a flat, grassy area and the southeast portion is paved with asphalt. Railroad tracks and a fence separate the northeast and southeast portions.

Coal storage activities began at the **Long Term Coal Storage Area** in 1953 and ended in 1988. Prior to coal storage, the site was used for open storage. The site is currently a grassy area and was used in 1995 for a staging and treatment site for a soil remediation project as part of the UST program.

Burial Site 1 contains remnants of old abandoned garden plot areas that were once suspected to be waste burial trenches and two possible pits where sludge from fuel storage tanks may have been buried. The area is now a grass covered field. A concrete pad exists on the site where a truck trailer for the civil engineering activities was stored. Utility poles and road salt have also been stored on the site.

Building 89 Coal Storage Pile was used for coal storage activities from 1940 or 1942 and ended about 1974. Some coal remains in the southern portion of the site while most of the rest of the site is either paved or covered with grass. There are no current coal storage activities on the site.

These five No-Action sites within OU2, (along with Spill Sites 2, 3, and 10) have been the focus of an IRP investigation since 1991. The Field Sampling Plan was approved by OEPA and USEPA in June 1992 and remedial investigation activities were conducted between July 1992 and December 1994. The OU2 Remedial Investigation Report was approved by OEPA and USEPA in August 1995.

2.2.2. OU3: The eight sites recommended for No Action were historically used for the disposal of construction debris or to conduct fire training exercises using petroleum-based fuels (jet fuels). The selection of the no-action remedy is based upon the results of a series of investigations, including a remedial investigation that was completed in 1994. These investigations identified low concentrations of contaminants that consist primarily of petroleum fuels and their combustion and decomposition products.

EFDZs 11 and 12 were reportedly used to contain construction debris from a runway improvement project completed in the 1940s.

Landfill 14 is believed to have been used as a construction rubble and earthfill site during the late 1950s and the early 1960s.

Spill Site 1, located just west of FTAs 3 and 4, is a small area where a quantity of jet fuel, estimated at 1,000 to 2,000 gallons, was accidentally released in 1972. The fuel was reportedly intercepted before it reached the Mad River, but no record of the amount of fuel recovered during the cleanup is available.

FTAs 2 through 4 include a number of small, gravel-covered burn pits that were used to conduct fire training exercises from the mid-1950s to the early 1980s. FTAs 2 through 4 have been inactive since that time.

FTA 5, the only active fire training area at WPAFB, is used to train Base fire department personnel on the fire suppression, rescue, and recovery techniques needed to effectively

respond to aircraft crashes at the Base. Until recently, jet fuel (principally JP-4) was applied to a simulated aircraft structure and ignited to conduct fire training exercises at the Base. A new fire training facility was constructed at FTA 5 that uses a propane-based fire control system to simulate aircraft fires. Because petroleum-based fuels will no longer be used, the existing underground jet fuel storage tank, oil/water separator, piping systems, 25,000 gallon waste water tank, and any contaminated soil at FTA 5 have been removed according to the Bureau of Underground Storage Tank Regulations (BUSTR) program for the State of Ohio. Obtaining "Clean Closure" from the State Fire Marshal is currently in progress.

The most extensive investigation was conducted during the period from 1992 through 1994, when a remedial investigation was performed at OU3. This investigation included: (1) sampling and analysis of surface and subsurface soils; (2) the installation of groundwater monitoring wells and two rounds of groundwater sampling and analysis; and (3) sampling and analysis of sediment and surface water in local drainage channels and the Mad River.

In addition to the extensive investigation of the eight sites addressed in this ROD, bioremediation activities have been performed in FTA 5 to degrade jet fuel that was accidentally released in 1986. This spill involved approximately 2,700 gallons from a 3,000-gallon tank at FTA 5 that was used to support fire training exercises at that facility. Some of the jet fuel was recovered using a scavenger pump system installed in one of six shallow wells in the spill area. In-situ biological treatment was used to biodegrade the fuel that was not recovered. A bioventing program was recently conducted at FTA 5 to further degrade remaining fuel in the soils at FTA 5 that was not recovered/degraded by prior actions. These actions, the pending removal of the jet fuel storage tank, piping systems, and associated soils at FTA 5, and the elimination of petroleum-based fuels from future fire training exercises provide an adequate response to the petroleum contamination at this facility. No further response or enforcement actions are anticipated at FTA 5 or the other seven sites addressed by this ROD.

2.2.3. OU5: The sites within OU5 have been the focus of IRP investigation since 1982. The Site-Specific Work Plan for a Remedial Investigation was approved by Ohio EPA and USEPA in March 1993. The RI was conducted between April 1993 and August 1994.

An area immediately adjacent to LF5 is known as the **LF5 Extension (LFE).** The LFE was included as an IRP site because of markings on a set of historical records; however, field data indicate that the LFE was not used for waste disposal.

FTA 1 was in operation from 1950 to 1955 and is currently used as a civil engineering training site for airfield repair exercises. During its operation, fuels were burned and extinguished in pits surrounded by earthen dikes after first saturating the ground with water to reduce infiltration. The typical fuels and contaminants used for fire training exercises included, but may not be limited to, oily wastes, hydrocarbons, halogenated solvents, and leaded gasoline.

BS4 is located along a narrow, wooded stretch of Marl Road. The site is approximately 2,000 feet long and 30 to 40 feet wide. The period of use or types of wastes disposed of at BS4 are not known. Approximately 10 to 15 scattered drums that were visible on the ground surface throughout the site were removed as part of a drum removal action in 1990. Access to BS4 is not controlled for on-Base personnel.

The **GLTS** is located at the southeast corner of Gravel Lake. The site was reported to contain a sludge burning vat and four tanks from the 1940's. Access to the site is not controlled for on-Base personnel.

2.2.4. OU6: Historically, **EFDZ1** is one of eight disposal sites used by WPAFB in the 1940s for disposal of earthfill. Earthfill material is typically characterized by soil and rock waste, but may include materials from demolition of buildings and other structures. Review of available historical aerial photographs indicates that earthfill activities were conducted during the 1940s and ceased by 1949. At that time, the site was vegetated and a concrete pad had been constructed for use as a parking area for aircraft. A historical drawing was used to estimate that 80,000 cubic yards of earthfill material may have been deposited in the 1940s. There is no indication that EFDZ1 ever received hazardous materials.

2.2.5. OU10: Historically, the OU10 IRP sites, two underground storage tank locations, and other areas of concern investigated during the RI were used for Base support activities such as aircraft storage and maintenance, utility and laundry services, warehousing, and administrative activities. The IRP sites listed for No Action in this ROD are bolded.

Landfill 13 was filled with aircraft parts and construction and demolition debris in the 1940s and is currently used as a paved parking area.

CHP-3 (Building 170) was in operation from 1939 to 1980. The associated areas of concern include a former coal storage area, a former compressor oil sump, and a battery burial site.

PCE anomaly at corner of Bldg 89: From 1971 to 1980 Building 89 housed a laundry and dry-cleaning operation as part of the Base Exchange system. PCE is a commonly used dry-cleaning solvent and was found in shallow soil gas at the northeast corner of Building 89 during a survey conducted in 1993.

Building 13 Sump Pit Area: The Building 13 sump pit was used to store waste oils until 1985. The sump has since been removed, and the area associated with the sump has undergone investigation and remediation under the BUSTR program. The site was carried forward into the OU10 RI for further groundwater investigation.

Flagpole Anomaly: A volatile organic compound (VOC) anomaly was discovered near the Base Headquarters flagpole during a 1993 soil gas investigation conducted under the OU2 RI. The source of this soil gas anomaly is unknown.

Actions at Underground Storage Tank Sites: Two underground storage tank farm sites, namely **Tank Farm 49A and Building 30119,** were originally on the list of IRP sites to be investigated according to CERCLA regulations. However, because the sites involve underground storage tanks (USTs), they have been investigated and remediated under the Bureau of Underground Storage Tanks (BUSTR) regulations (Ohio Administrative Code [OAC] 1301: 7-9-13). These sites were not included in the OU10 RI to avoid overlap with and duplication of measures completed under the BUSTR regulations. However, the sites were included in the OU10 Proposed Plan and are included in this ROD in order to close out the sites from the IRP. The BUSTR cleanup requirements of these two sites are acceptable for closure under the IRP.

Tank Farm 49A was UST farm used for storing various liquids including aviation gasoline, JP-4, JP-5, Stoddard solvent, and plane deicing fluids.

Building 30119 was a Base Exchange Service Station with five USTs used to store gasoline and waste oils.

2.3. Highlights of Community Participation: WPAFB currently has an Environmental Advisory Board which consists of representatives from local government agencies, businesses, and the community groups which actively play a role in the IRP process. The group meets quarterly to discuss and concur on a variety of topics with regard to the environmental program at WPAFB. The group has the opportunity to review and comment on all documents used to determine how to address IRP sites.

WPAFB offered opportunities for public input and community participation during the RIs and the Proposed Plans for all of the sites in this ROD. The Proposed Plans were made available to the public in both the Administrative Record and the Information Repository. The notice of availability for the Proposed Plans was published in the Dayton Daily News (local paper) on 17 and 19 May 96, and in The Skywrighter (Base newspaper) on 17 May 96. A public comment period was held from 17 May 96 through 17 Jun 96. The public comment period was not extended as there were no requests for an extension. The Base held a public meeting on 21 May 96 at Fairborn High School to discuss the investigatory activities that took place at the sites. Representatives from the USEPA, OEPA and WPAFB were all present and answered questions about the Base and the 21 sites recommended for No Action. Information was provided which was used as the foundation for proposing No Action for each of the individual sites.

A summary of the questions and responses from the public meeting is included in the Responsiveness Summary (Section 3.0.). These community participation activities fulfill the requirements of Sections 113(k)(2)(B)(i-v) and 117(a)(2) of CERCLA. A listing of community relations activities is contained in Attachment 1 of this ROD.

2.4. Scope and Role of OUs within Base Strategy: As discussed above, the IRP at WPAFB has divided the Base into eleven OUs. Each OU includes a group of sites that is located in close proximity to one another in different portions of the base. All the sites in this ROD have been potentially or actually contaminated through historic waste disposal practices. Contamination has been identified at landfills, chemical disposal sites, burn pits, earthfill disposal zones, construction debris staging areas, coal storage areas and other waste disposal operations. These activities have contributed to soil, sediment, surface water, and groundwater contamination at the Base.

The Base has undertaken a Streamlined Risk Assessment approach, which involves addressing the most contaminated sites first for consideration of a remedial action, while closing out sites that do not require remedial action. This ROD is part of this process. The strategy is to accelerate actions at operable units which require remediation, while identifying and closing out sites which do not require action. This strategy allows resources to be concentrated on the OUs needing remediation. The remedies selected for sites at WPAFB range from No Action to engineered caps, leachate collection and treatment systems, and landfill gas collection systems. Two RODs have already been signed for the base, namely, the "On-Source" and "Off-Source" RODs at OU1. This ROD will be the third one for WPAFB.

Remedial actions for several IRP sites are being addressed in a streamlined method. Landfills located in several OUs with similar types of contamination (e.g. Landfill 11) are identified in the Base-wide Removal Action Plan for Landfill Capping. This Base-wide program speeds up the process of cleaning up a landfill site by using remedies already approved by USEPA. These remedies have been proven to reduce risks to human health and the environment from contaminants that are commonly identified at CERCLA sites. USEPA refers to these actions as presumptive remedies. For example, as a result of the Site-Specific Removal Action Plan (SSRAP), LF5 has been designated for an early action landfill cap as a presumptive remedy. Soil contaminants will be, effectively, removed from potential exposure by the cap.

The sites that are the subject of this ROD have been grouped together because, based on the assessment information collected to date, no remedial actions are necessary to protect human health and the environment at any of these No Action sites. The base has divided the RI process into two parts, namely Source Area investigations done by OU, and the Basewide Monitoring Plan (BMP, formerly called the Groundwater Operable Unit). In most cases, the RIs that occurred at the sites in this ROD addressed only the source areas. Groundwater flowing from these sites will be addressed and monitored under the BMP which is discussed in more detail in section 2.7 of this ROD.

2.5. Summary of Site Characteristics: The following is a summary of each of the No Action sites' characteristics, listed by OU.

2.5.1. OU2: The RI performed at OU2 showed that no remedial action is needed because soil contamination is all below action levels at the OU2 No Action sites. The sites do not pose a danger to human health or the environment. Additionally, these

sites are located within the boundaries of WPAFB (a restricted military installation) and institutional controls are in place. WPAFB will remain an active Air Force base for the foreseeable future.

Contaminants detected during the investigations at the No Action sites were primarily polycyclic aromatic hydrocarbons (PAHs), metals, and petroleum hydrocarbons. Both PAHs and metals are constituents of coal and are commonly found in the soils as a result of leaching from coal piles. PAHs also result from the degradation of petroleum products that may have been disposed of on the ground. Other contaminants found at these sites include sporadic identification of pesticides from application to grassy areas and some perchloroethylene (PCE) found in the soil near the Building 89 Coal Storage Pile. There were no discernible plumes of metals, pesticides, petroleum hydrocarbons, or PAHs seen migrating to the groundwater as a result of contamination at these No Action sites. Site-specific summaries of the investigation results at the No Action sites are presented below. A detailed discussion of the types and behaviors of chemicals at the OU2 No Action sites is presented in the OU2 RI Report.

Coal and Chemical Storage Area: During the 1991 site investigation, three soil borings were completed at the Coal and Chemical Storage Area. No organic contaminants were positively identified in these samples. A soil sample collected at the surface showed elevated metals that exceeded background criteria. These metals may reflect residual coal or trace metals from fertilizers used to maintain the grassy area where the sample was taken. Deeper soil samples did not show elevated metal contamination and there was no evidence of migration to groundwater.

Temporary Coal Storage Pile: Samples taken to characterize the Temporary Coal Storage Pile include one boring taken during the 1991 site investigation, and three soil borings and one monitoring well taken during the remedial investigation. In the 1991 surface soil sample the metals that exceeded background levels include aluminum, chromium, potassium, and vanadium. The SI showed no migration of coal related contaminants to the groundwater; however, it indicated that petroleum related contamination from the nearby POL Storage Area may be affecting groundwater contamination. In the remedial investigation, the soil borings did show elevated levels of beryllium and mercury over background values as well as PAHs and pesticides in the shallow samples.

Burial Site 1: During the remedial investigation at Burial Site 1, only very low levels of the organic contaminants benzene, toluene, ethylbenzene, and xylene were found. Low levels of PAHs were detected, with the greatest number and highest concentration at one location in the northwest corner of the site. Pesticides were widespread across the site but their concentrations were very low. The metals aluminum, arsenic, vanadium, and zinc were more common and occurred at higher concentrations in surface soils than at depth. Antimony concentrations appeared to increase with depth.

Long Term Coal Storage Area: Low levels of benzene, toluene, ethylbenzene, and xylene were also found at the Long Term Coal Storage Area. Only one PAH,

benzo(a)pyrene, was elevated at one location. Pesticides were widespread across the site but their concentrations were very low. The metals aluminum, arsenic, barium, beryllium, chromium, cobalt, iron, lead, nickel, thallium, vanadium, and zinc were more common and occurred at higher concentrations in surface soils than at depth. Antimony concentrations appeared to increase with depth. Metals concentrations were generally higher near the east and south sides of the site.

Building 89 Coal Storage Pile: At the Building 89 Coal Storage Pile, low levels of benzene, toluene, xylene and carbon disulfide were detected in the surface soil. In the soil samples at greater depths PCE was also detected. Benzo(a)pyrene was the only noteworthy PAH. Soil contamination near Building 89 Coal Storage Pile also contained 22 of 23 target metals. Antimony, barium, beryllium, cadmium, calcium, copper, magnesium, mercury, selenium, silver, and sodium each had at least one exceedence of the OU2 background value.

A detailed discussion of the types and behaviors of chemicals at OU2 is presented in the *Final RI Report for Operable Unit 2.*

2.5.2. OU3: Previous environmental studies at OU3, including the remedial investigation completed in 1994, identified organic (petroleum products and solvents) and inorganic (metals and salts) chemicals in soil, sediment, surface water, and groundwater. Most of the chemicals detected in soil consisted of petroleum hydrocarbons and metals. Fewer chemicals were detected in sediment, surface water, and groundwater within the OU. Of the chemicals identified in these media, polycyclic aromatic hydrocarbons (PAHs) in sediment, pesticides in surface water, and metals in groundwater were the most commonly detected constituents. Most of the petroleum hydrocarbons detected at OU3 originated from fire training exercises that were conducted in the **FTAs**. PAHs are among the principal combustion products of petroleum-based fuels. The pesticides detected at OU3 resulted from the use of insecticides and herbicides both within and upgradient of the OU. Many of the metals probably originated from land disposal activities within the OU; however, some metals were involved in fire training exercises (from aircraft fuselages used to simulate crash/fire scenarios) and others, particularly those detected in groundwater (for example, arsenic and manganese) are naturally occurring substances.

The most prevalent chemical constituents detected at OU3 were petroleum hydrocarbons (for example, jet fuels), their combustion products (PAHs), metals (aluminum, arsenic, manganese, and zinc), and pesticides (DDT and dieldrin). These substances were most often identified in surface soils (0 - 2 ft). Under most conditions, they remain stable for long periods in the environment. The organic compounds evaporate slowly, all tend to bind tightly with soils, and with the exception of some of the metals, these substances are only slightly soluble in water. Consequently, these substances tend to remain in a fixed location in the environment (except for the water soluble metals). They are not likely to move except through soil erosion and/or surface water transport during periods of heavy rain (for example, severe rain storms and associated floods).

No chemical "hot spots" were identified within OU3 and no groundwater plumes were detected. A detailed discussion of the types and behaviors of chemicals at OU3 is presented in the *Final RI Report for Operable Unit 3.*

2.5.4. OU5: The RI identified low levels of volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), pesticides, polychlorinated biphenyls (PCBs), and metals in soil from the **LF5 Extension**. The contaminants were all detected below action levels and pose minimal risk to human health. VOCs, SVOCs, and pesticides were detected at generally low levels. Because the LFE is situated adjacent to LF5 and below the extension of the Patterson Field runway and in line with prevailing wind directions, the SVOCs may be associated with surface deposits of windblown coal ash or combustion products from jet engine exhaust. Various metals were also detected in the LFE that exceeded the representative background value.

Fire Training Areas: Potential contamination from past fire training exercises was found during the RI. WPAFB identified VOCs, SVOCs, and metals. The contaminants were all detected below action levels and pose minimal risk to human health. In general, all VOCs were detected at very low concentrations. Various SVOCs were detected in soil samples at concentrations of up to 98,000 µg/kg for an individual compound. In at least one sample, many of the metals were present at concentrations exceeding the representative background value.

Gravel Lake Tank Site: The GLTS soil was characterized during the SI and was not investigated during the RI because of the general absence of site-related soil contamination. Low levels of toluene were detected. No SVOCs were detected, although low levels of SVOC tentatively identified compounds (TICs) were detected at total concentrations ranging from 1,510 to 13,900 µg/kg. Lead exceeded the SI representative background concentration in only one sample. Other inorganic compounds were not analyzed. The contaminants were all detected below action levels and pose minimal risk to human health.

Burial Site 4: BS4 soil was also characterized during the SI and was not investigated during the RI because of the general absence of site-related soil contamination. Various VOCs were detected at low concentrations. Pyrene was the only SVOC detected in BS4 soil and has been shown to exist naturally in soils. SVOC TICs were also detected in BS4 soil, and may be related to the same natural source as the pyrene or may be decay products of pyrene. Lead exceeded the SI representative background concentration in only one sample. Other inorganic compounds were not analyzed. Soil and sediment samples were also measured for alpha and beta particle radioactivity; only two samples exhibited a higher alpha activity than the background samples. One sample exhibited a higher beta activity than the background samples; four samples exhibited similar beta activity as the background samples. The contaminants were all detected below action levels and pose minimal risk to human health.

Area South of LF5: The area south of LF5 between East Twin Lake and Gravel Lake contains a zone of petroleum hydrocarbon contamination in soil, as determined by a soil

gas investigation. Contaminants detected during the RI include VOCs, SVOCs, pesticides, PCBs, and metals. The contaminants were all detected below action levels and pose minimal risk to human health. Low levels of VOCs and SVOCs were detected within the zone of petroleum hydrocarbon contamination. SVOCs were also detected in near surface samples (0 to 2 ft depth) and are likely representative of small amounts of paving material from the roadway or small amounts of coal ash. Low levels of three pesticide compounds were detected in the area south of LF5. Low levels of two PCB compounds were also detected. Various metals were detected in the area south of LF5 that exceeded the representative background value.

A detailed discussion of the types and behaviors of chemicals at OU5 is presented in the *Final RI Report for Operable Unit 5.*

2.5.4. OU6: Potential contamination from past waste disposal activities was found during a series of investigations. The OU6 RI identified organic and inorganic chemicals, consisting primarily of petroleum hydrocarbons and metals, in the surface (0 - 3 inches deep) and subsurface (> 3 inches deep) soils at **EFDZ1**. Herbicide and pesticide residue from the regional use of insecticides were also identified. No buried waste was encountered during drilling activities at the EFDZ1 site.

The majority of petroleum hydrocarbons, their by-products, and the metals detected at EFDZ1 do not dissolve readily in water and bind tightly to the soils. One type of petroleum hydrocarbon detected at EFDZ1 is known as a Polyaromatic Hydrocarbon (PAH). The presence of PAHs in the surface soils is likely influenced by the asphalt walking path in the community park and automobile exhaust and road runoff from Harshman Road, a heavily traveled thoroughfare adjacent to EFDZ1. It is unlikely these chemicals will migrate to other areas through natural processes (i.e., rain infiltration and percolation through soils, surface water runoff, and erosion).

Petroleum hydrocarbons, which are the most commonly detected contaminants at No Action sites, are biodegradable. In the presence of oxygen, petroleum hydrocarbons in surface soils degrade rapidly. Even where oxygen is not present, such as in certain subsurface soils, biodegradation is rapid enough to significantly reduce contamination after a few years of normal biological activity when certain conditions exist. As such, biodegradation of the petroleum hydrocarbon within the EFDZ1 site will continue, with or without any engineered remedy.

A detailed discussion of the types and behaviors of chemicals at the EFDZ1 site is presented in the *Final RI Report for Operable Unit 6.*

2.5.5. OU10: The OU10 RI identified organic and inorganic chemicals consisting primarily of VOCs and metals. Other contaminants detected at the No Action sites included chemicals that are byproducts of the burning or natural decomposition of petroleum hydrocarbons. These chemicals are now common in the environment from sources such as automobile exhaust. Chemicals were found in the surface (0 - 2 feet deep) and subsurface (> 2 feet deep) soils at the sites. The VOCs, their byproducts,

and the metals detected within the sites often do not dissolve readily in water and may bind tightly to the soils. It is unlikely that they will migrate to areas outside the Base through natural processes (such as rain infiltration and percolation through soil, surface water runoff, or wind erosion). Organic compounds are biodegradable. In the presence of oxygen, organic compounds in surface soils may degrade rapidly. Even where oxygen is not present, such as in certain subsurface soils, biodegradation is rapid enough to significantly reduce contamination after a few years of normal biological activity. Site-specific information is listed below. The IRP sites are listed in bold.

The BUSTR investigations for **Tank Farm 49A and Building 30119** indicated that the soil and groundwater at each site had been contaminated as a result of tank (or associated piping) leaks. The tanks and the contaminated soil were removed in accordance with the BUSTR regulations. The groundwater contamination at Tank Farm 49A was below the BUSTR action levels, whereas the groundwater contamination by benzene at Building 30119 was slightly above the action levels. However, a qualitative evaluation of the routes of exposure to Building 30119 groundwater indicated that it would not pose a significant risk to human health, welfare, or the environment.

Landfill 13: Groundwater samples were collected from within and downgradient of the landfill. In general, concentrations of organic and inorganic compounds and conventional groundwater parameter results indicate that Landfill 13 is not a significant source of contaminants to groundwater. Arsenic levels were elevated compared to local background wells (i.e., immediately upgradient of Landfill 13) but were not elevated with respect to general background wells (i.e., background wells from other portions of the Base).

CHP-3: CHP-3 is divided into three separate study areas: the former coal storage area, the former compressor oil sump, and the battery burial site. Seventeen semivolatile organic compounds (SVOCs) were identified and eight metals were detected at slightly elevated levels in a surficial soil/material sample collected from the former coal storage area. A native clay deposit underlies the surficial material, and none of the analytes found to be elevated in the surficial sample appear to be leaching through the clay deposit. Sixteen SVOCs were detected in a composite soil sample from the former compressor oil sump area. Of these, only three were found at concentrations greater than the OU10 background soil sample concentrations. No VOCs were detected in the soil samples collected from this area whereas concentrations of antimony, calcium, magnesium, and sodium were slightly greater than background soil concentrations.

The concentrations of eight metals were found to be elevated in a near-surface soil sample from the battery burial site. As at the former coal storage area, the battery burial site is underlain by a native clay deposit and the metals contamination does not appear to be leaching through the clay deposit.

Other areas of investigation at OU10: Soil and groundwater samples were collected from the vicinity of the Former Dry Cleaning Operation in Building 89. The soil contaminant (PCE) distribution observed may indicate that contamination may originate

from the groundwater plume in the area as opposed to a source of contamination in the soil. For this reason, the soil in this area is not believed to be a significant source of contamination to the groundwater. In addition, the groundwater PCE distribution may indicate an undocumented contaminant release near or possibly beyond the Base property line. The BMP will be the vehicle for monitoring the groundwater contamination in this area.

Building 13 Sump Pit: Groundwater samples were collected from wells in this area. VOCs were detected in these samples, but concentrations are similar to concentrations observed in marginally upgradient monitoring wells. The area does not appear to be a source of VOC contamination. Sixteen metals were present at concentrations greater than the background concentrations, but these concentrations appear to be attributable to the sampling technique and the well construction.

Flagpole Anomaly: PCE was detected in the soil gas from this area during a pre-OU10 RI investigation. Soil and groundwater samples were collected from this area during the OU10 RI, and PCE was detected in samples from both media. Given the low concentrations observed and the distribution of PCE, the area does not appear to be a major source of groundwater contamination.

A detailed discussion of the types and behaviors of chemicals at OU10 is presented in the *Final RI Report for Operable Unit 10.*

2.6. Summary of Site Risks: As part of the RIs, baseline risk assessments were performed to identify contaminated soil and sediment which may pose an unacceptable risk through both the ingestion and dermal exposure (direct contact) routes. Tables 2-4 show the risks associated with the No Action sites from each of the OUs in this ROD except for OU6 (EFDZ1). These Tables are taken from the No Action Propsed Plans for each of the OUs.

The format for the risk assessments (with the exception of OU2) was a result of the Consensus Statement for Streamlining the RI/FS Process (Consensus Statement). This document provides a conceptual framework for streamlining the RI/FS process as it applies to the IRP at WPAFB. The conceptual framework identified in the Consensus Statement includes a tiered approach for performing risk assessments. The first tier is a semi-quantitative risk assessment that determines if site contaminant concentrations are greater than, less than, or within the USEPA's target risk range (i.e., carcinogenic risk range of 10^{-6} (one additional death in one million) to 10^{-4} (one additional death in ten thousand) or a hazard index of 1 for non-carcinogens). Under this framework, sites that fall below the target risk range may be proposed for "No Action".

OU2: WPAFB conducted a baseline human health and ecological risk assessment as part of the remedial investigation, using USEPA-approved risk assessment methods. The OU2 sites were grouped into **exposure units**, by **environmental media** (such as soil and groundwater) based on the likelihood of people, plants and animals coming in contact with these media. These exposure units included (1) the POL Storage Area

vicinity sites (Spill Sites 2, 3, and 10, Coal and Chemical Storage Area, and Temporary Coal Storage Pile); (2) Burial Site 1 and the Long Term Coal Storage Area; and (3) Building 89 Coal Storage Area. Results of the risk assessment are summarized in Table 2.

Human health risks or hazards are defined for two classes of chemical contaminants, **carcinogens** and **non-carcinogens**. Exposure to carcinogenic chemicals may result in an increased risk of a specific type of cancer. The risk of cancer calculated in a baseline risk assessment is expressed as the chance of the occurrence of that type of cancer per numbers of the population. These cancers are over and above the background rate of cancer in the United States which is about one in every four people (that is, they represent an **excess cancer risk**). A risk level of one in a million (1×10^{-6}) means that one additional person out of 1 million people could develop cancer as a result of exposure to the environmental contaminant. The USEPA has established that an excess cancer rate of one in a million people to one in ten thousand (1×10^{-6} to 1×10^{-4}) people as the **target risk range** for determining the effectiveness and health protectiveness of an environmental remedial action. Cancer risks greater than one in ten thousand generally require a remedial action to reduce the risks to the population.

For non-carcinogenic contaminants the likelihood of adverse health effects is expressed as a numerical ratio called the **Hazard Quotient (HQ)**. Values for the HQ of greater than 1.0 indicate that non-carcinogenic adverse health effects may be likely to occur.

Two sets of exposure assumptions were used for each exposure scenario and risk calculation. The first was the **reasonable maximum exposure** or RME. The RME utilizes exposure assumptions that are intended to represent the high end of the range of possible exposures to provide a conservative overestimate of risk. The second set of exposure assumptions used was the **central tendency** (CT) estimate. The CT represents the average exposure. The exposure scenarios chosen were representative of the exposures possible or likely to occur at the OU2 sites and included an adolescent recreator, a commercial industrial worker exposed to the surface soil, and a construction worker exposed to subsurface soil. A full discussion of the assumptions and calculations are provided in the OU2 RI Report. Both the RME and the CT results are shown in Table 2.

The human health baseline risk assessment concluded that there was only a minimal human health risk posed by the soils at the OU2 sites. The primary contaminants of concern identified were PAHs and metals common to coal and urban pollution. Carcinogenic risk was contributed by the PAHs benzo(a)pyrene and dibenz(a,h)anthracene and the metals beryllium and arsenic. While the total risk for the RME commercial/industrial worker at the Long Term Coal Storage Area/Burial Site 1 was two in ten thousand, no single carcinogenic risks for these contaminants exceeded the risk level of one in ten thousand for the RME assumptions and the CT assumptions were all less than the USEPA target value. The non-carcinogenic hazard quotients exceeded one for commercial/industrial and construction workers for the RME but not for the CT. Manganese and antimony were the primary contributors to the elevated

hazard quotients. Manganese was found in every sample taken at OU2 and at levels comparable to background. Antimony was found very spordically at OU2 and the levels found are in agreement with other soil investigations conducted at WPAFB.

An Ecological Risk Assessment (ERA) was performed for OU2 and a one-mile zone surrounding OU2. The ERA was performed for terrestrial receptors including plant and animal species, surface water and sediment species. There are no permanent resident species on OU2 or the one-mile zone that are listed or proposed federally threatened and endangered species. One state listed endangered species, the upland sandpiper, may nest in the grassy areas of the Temporary Coal Storage Pile, Long Term Coal Storage Pile and Burial Site 1. These birds are not permanent residents of the areas and their occurrence is sporadic.

Hebble Creek flows through a culvert near OU2. Aquatic life samples and sediments were evaluated more than two miles downstream of OU2. Hebble Creek was determined to not have a detrimental effect on the fisheries or aquatic conditions of the Mad River. The contaminants evaluated in the ERA were from a large area. It is difficult to isolate the effects of the smaller No Action sites on the ecology of the area. The Coal and Chemical Storage Area and the Temporary Coal Storage Pile are in the vicinity of the highly industrialized POL Storage Area. This area is not a suitable area for plant or animal species other than groundhogs or rodents. Metals, PAHs, and pesticides were identified to possibly contribute to the detriment of the plant and animal species in the OU2 area. The uncertainties associated with the ERA , the conservative safety factors used for the upland sandpiper, and the estimation that upland sandpipers are not expected to spend more than 10 percent of their time in the OU2 area resulted in the conclusion that no significant ecological harm is likely to occur due to contaminants at OU2.

OU3: A baseline human health and ecological risk assessment was conducted using the results of the remedial investigation at OU3. This risk assessment evaluates threats to people, plants, and animals when the site is left in its current condition (that is, when no site cleanup is done). This assessment identified two PAHs [benzo(a)pyrene and dibenzo(a,h)anthracene], one metal (beryllium), and one dioxin (2,3,7,8-TCDD) in soil within U.S. EPA's cancer risk range [increased lifetime cancer risk of 1 in 10,000 to 1 in 1,000,000 for an individual]; two metals in sediment (arsenic and beryllium) within the risk range; and two metals in groundwater (arsenic and manganese) above the risk range.

The risk assessment calculated the potential excess lifetime cancer risks for current and future recreational visitors and trespassers at OU3. The risk assessment also calculated the potential excess lifetime cancer risk from the ingestion of groundwater. This was accomplished by calculating the exposures resulting from installing a hypothetical drinking water well at OU3 in the same location where the highest overall concentration of contaminants was detected in the groundwater during the remedial investigation. These calculations provided estimated upper limits of additional cancer cases that could occur as a result of repeated exposures to site related contaminants under current conditions and future land use situations. Because current and future land use restrictions will limit

exposure to site related contaminants, and will preclude exposure to groundwater (which represents the greatest risk), the actual human health risks at OU3 will be less than the risk estimates derived from the baseline risk assessment.

The risk to plants and animals from site related contaminants at OU3 was calculated in the baseline risk assessment. Results indicate that zinc concentrations in soil at OU3 pose an increased risk to indicator species that are considered most likely maximally exposed ecological receptors (the shrew and robin). The Indiana bat, a threatened and endangered species that may feed within OU3, is also at increased risk due to zinc. DDT was identified as an ecological contaminant of concern (COC) in the Mad River, because it poses risk to the kingfisher, a predator of aquatic animals. In addition, dieldrin (an insecticide) in the Mad River and metals (cadmium, chromium, mercury, selenium, vanadium, and zinc) in soils at OU3 may pose risk to the Indiana bat. However, most of the risk from zinc contamination in soil at OU3 is the result of a single elevated detection within Landfill 11. Pesticide risk from DDT and dieldrin in the Mad River is most likely the result of agricultural activities upstream of OU3. Consequently, there is no apparent remedy that could be implemented at OU3 to mitigate this ecological risk.

In summary, the baseline risk assessment shows that there may be increased risks from exposure to soil, sediment, surface water, and groundwater at OU3. However, actual risks (now and in the future) from No Action site soils are likely to be lower than the calculated risks. Restrictions on land use are already in place and reduce the probability of real human exposure situations matching the assumptions used in the risk assessment calculations. For example, groundwater is the medium that presents the greatest potential for cancer risk. But groundwater causes no risk to human health at OU3 because no drinking water wells are installed there. There is no evidence that OU3 threatens drinking water quality downgradient in municipal wells in the Miami Valley Aquifer, a federally designated sole source aquifer. In addition, most of the risk to plants and animals at OU3 comes from chemicals that are not linked with the No Action sites. The top half of Table 3 shows a summary of the Baseline Risk Assessment Results at OU3.

OU5: WPAFB conducted a baseline risk assessment including an ecological risk assessment as part of the OU5 RI, using USEPA-approved risk assessment methods. The semi-quantitative risk assessment for OU5 utilizes a structured, sequential analytical process that:

Identifies the chemicals of potential concern (CPCs) for OU5;
Estimates acceptable levels of CPCs under particular land-use scenarios; and
Compares OU5 contaminant concentrations with estimated acceptable levels of CPCs.

The risk assessment is intended to evaluate health risks from exposure to chemical sources under a no-action alternative. This process utilized in this semi-quantitative risk assessment is based on evaluation criteria for each media (i.e., risk-based preliminary remediation goals [PRGs] for soil, surface water and sediment, and ambient water

TITLE: Remedial Investigation/Feasibility Study Work Plan for 39 Sites (with Amendments)

MICROFICHE #: M-I1 **SITE CODE:** Multiple **FILE STRUCTURE:** I1

AUTHOR: Engineering-Science

DOCUMENT DATE: 30 Jun 90 **DATE ENTERED:** 3 Mar 93

TITLE: Fact Sheets

MICROFICHE #: M-N2,5,6 **SITE CODE:** Multiple **FILE STRUCTURE:** N2,5,6

AUTHOR: WPAFB

DOCUMENT DATE: As of 24 Apr 96 **DATE ENTERED:** 24 Apr 96

TITLE: Enforcement - Correspondence with Regulatory Agencies

MICROFICHE #: M-L4 **SITE CODE:** Multiple **FILE STRUCTURE:** L4

AUTHOR: Air Force and EPA

DOCUMENT DATE: As of 24 Apr 96 **DATE ENTERED:** 24 Apr 96

TITLE: Public Participation

MICROFICHE #: M-N2,5,6 **SITE CODE:** Multiple **FILE STRUCTURE:** N2,5,6

AUTHOR: Public/Air Force

DOCUMENT DATE: As of 24 Apr 96 **DATE ENTERED:** 24 Apr 96

TITLE: Presentation Charts/Handouts for Public Meeting held 21 May 1996 on No Action Proposed Plans for Selected Sites within Operable Units 2, 3, 5, 6, and 10

MICROFICHE #: M-N4 **SITE CODE:** Multiple **FILE STRUCTURE:** N4

AUTHOR: DOE/HAZWRAP, International Technology, CH2M Hill

DOCUMENT DATE: 21 May 96 **DATE ENTERED:**

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quality criteria for surface water. PRGs were developed to evaluate reasonable maximum exposures [RME] as well as average exposures [AVE]).

The OU5 sites were grouped into exposure units, by environmental media (such as soil, sediment, surface water, and groundwater) based on the likelihood of people and aquatic animals coming in contact with these media. The exposure units evaluated in the risk assessment included (1) LFE, (2) area south of LF5, (3) FTA 1, (4) BS4, (5) GLTS, (6) West Twin Lake, (7) East Twin Lake, (8) Gravel Lake, (9) Trout Creek, (10) Hebble Creek, and (11) Mad River. Because LF5 is in the process of being closed under the IRP, it is not included in the OU5 baseline risk assessment.

Land use classification for the OU5 sites is commercial/ industrial. Soils from LFE, area south of LF5, FTA 1, BS4 and GLTS will be available for worker exposures. The typical worker exposed to OU5 surface soil is a maintenance worker that cuts the grass during the spring, summer and fall months of the year.

The remainder of OU5 is classified as recreational/open. Recreational use of the surface water bodies were evaluated semi-quantitatively through evaluation of CPC concentrations with appropriate aquatic water quality criteria and relevant PRGs. There is also a small section of soils south of the landfill that is subject to recreational use. Exposures to the surface water bodies and surrounding land areas are usually limited to the warmer months.

Groundwater within WPAFB boundaries and beneath OU5 is currently not used for human consumption. However, according to USEPA policies for risk assessment, it is assumed that the OU5 groundwater will be available for future residential use. Although future residential exposures to OU5 groundwater was evaluated in the OU5 risk assessment, groundwater throughout WPAFB will be evaluated as part of the BMP. Results of the BMP will help to determine the need for remediation of any groundwater contaminants to reduce the potential for future risk due to groundwater exposures.

The top half of Table 4 shows the results of the comparisons of site-related CPCs to the health-based criteria, e.g. RME and AVE PRGs for industrial exposures. CPC levels below the RME PRG indicates contamination that is acceptable for more extensive (higher) industrial exposures. For most sites, with the exception of LFE, West Twin Lake and the small wetland, exposures were below the RME PRG. CPC levels below AVE PRGs indicate contamination that is acceptable for average industrial exposures. Exposures at the remaining sites (LFE, West Twin Lake and the small wetland) were all below the AVE PRG. Therefore, the typical types of industrial exposures assumed to be associated with OU5 (ground maintenance) are not thought to be associated with any health risks beyond the target risk range.

The bottom half of Table 4 shows the results of the comparisons of site-related CPCs to health-based criteria for recreational exposures to surface water and sediment. Detected CPCs in surface soil and sediment are safe for all types of recreational exposures. Because of the potential for recreational fishing in some surface water

bodies associated with OU5, recreational exposures to surface water in West Twin Lake, East Twin Lake, Gravel Lake and Mad River were also evaluated. Detected levels of CPCs in West Twin Lake, East Twin Lake and Gravel Lake were acceptable for average recreational exposures, which includes consumption of fish. Mad River appears to be associated with risk from longer-term recreational exposures. However, this result was associated with one detection of the chemical pentachlorophenol. Repeated sampling of Mad River did not indicate other detections of this chemical. In addition, no source of pentachlorophenol could be detected in OU5. Therefore, the typical types of recreational exposures assumed to be associated with OU5 (recreational fishing and occasional ingestion) are not thought to be associated with any health risks beyond the target risk range.

The ecological risk assessment was limited to species living in the surface water and sediment. The evaluation of surface water indicated that surface water criteria were exceeded in Hebble Creek for lead and zinc; in Mad River for silver; in the large wetland for pentachlorophenol, copper, and lead; and in the small wetland for lead. In addition, to comparisons with surface water quality criteria, the Rapid Bioassessment Protocol II was used to investigate potential impacts to surface water habitats. Using this method, habitat quality at most site-related stations was rated as good.

OU6: The human health risks presented by chemicals at the EFDZ1 site were determined by evaluating the risk posed by the specific exposure route and environmental media. The environmental media evaluated in the risk assessment for EFDZ1 were soils and groundwater. Exposure routes include incidental ingestion (eating), dermal (skin) contact, and inhalation. Potential receptors evaluated for the EFDZ1 soils included a lawn maintenance worker, an excavation worker, and an adolescent recreational receptor; potential receptors evaluated for the EFDZ1 groundwater included an adult and child resident.

Five compounds, including benzo(b)fluoranthene, benzo(a)pyrene, endrin ketone, aluminum, and thallium, were identified as chemicals of potential concern (CPCs) in soils. One compound, antimony, was identified as a CPC in groundwater.

Risks for each CPC were calculated assuming an individual would be exposed to a contaminant through all the exposure routes. None of these values exceed USEPA's target risk range for cancer causing substances of one additional incidence of cancer in ten thousand (1×10^{-4}) to one additional incidence of cancer in one million (1×10^{-6}). Risks for non-cancer related health effects were below USEPA's hazard index of 1.0 for all of the exposure units, which means the potential for adverse health effects to occur are low; the hazard index is derived by summing the chemical-specific hazard quotients for all environmental media and exposure pathways.

Ecological Risk Assessment: The ecological risks posed by chemicals present in EFDZ1 soils were evaluated by comparing the conditions and chemicals detected during the RI to the conditions of the other OU6 sites, LF1 and LF2. The EFDZ1 chemicals were evaluated in terms of three criteria: 1) whether the EFDZ1 chemical exposure

concentrations exceeded the maximum exposure concentration at LF1 or LF2; 2) whether the chemicals present at EFDZ1 exceeded National Oceanic and Atmospheric Administration (NOAA) guidelines; and 3) whether the chemicals were present only at EFDZ1 and not at LF1 or LF2.

Cobalt in EFDZ1 subsurface soils exceeded LF1 and LF2 exposure concentrations; manganese in EFDZ1 surface and subsurface soils exceeded LF1 and LF2 exposure concentrations. Fluoranthene and manganese in EFDZ1 surface soils exceeded NOAA guidelines; magnesium, sodium, cobalt, manganese, and zinc in EFDZ1 subsurface soils exceeded NOAA guidelines. Compounds present only in EFDZ1 surface soils included di-n-butyl phthalate, MCPA, and MCPP; compounds present only in EFDZ1 subsurface soils included ethylbenzene, total xylenes, diethyl phthalate, di-n-butyl phthalate, MCPA and MCPP.

Cobalt presented a potential ecological risk for LF1 and LF2; as such, it is expected to present a potential risk at EFDZ1. Ecological risk is not commonly associated with magnesium, manganese, and sodium and no toxicological benchmarks were found in the literature for these compounds. Based on a comparison to LF1 and LF2 exposure concentrations, the remaining compounds do not pose a risk at EFDZ1. For those compounds that were detected only at EFDZ1, all exposure concentrations fell below their respective NOAELs (where available), indicating no risk from these chemicals.

OU10: The two Underground Storage Tank sites were remediated under BUSTR and pose minimal risk to human health, welfare, and the environment. The closure for Tank Farm 49A is documented in the report by Four Seasons Environmental, Inc., May 1994, (*UST Closure Report*). The closure for Building 30119 USTs is documented in the reports by 1) Petro Environmental Technologies, Inc., August 1993, *Underground Storage Tank Closure Assessment Report for Wright-Patterson Air Force Base;* and 2) TolTest, Inc., September 1994, *Closure Report Wright-Patterson Air Force Base Tank 57*).

WPAFB conducted a baseline human health and ecological risk assessment as part of the RI, using U.S. EPA-approved risk assessment methods. Observed contamination within each area was evaluated with respect to levels of contamination present in background samples (samples believed to be unaffected by activity at OU10). Contaminants found to be present at elevated concentrations in onsite samples (that are not considered essential nutrients) are called COCs. Ten organic contaminants (including PCE) and twelve metals were found to be COCs in soil from OU10.

Currently, exposure to contaminated soil within OU10 is limited, and minimal risk results. Most of a commercial/industrial worker's potential excess lifetime cancer risk estimated for OU10 soils is attributable to the presence of arsenic. However, onsite concentrations of arsenic were similar to concentrations observed in samples collected from an urban/industrial area outside OU10 and a relatively pristine off-base location (Sand Hill Park in Fairborn). Although arsenic does not appear to be related to OU10

activity, a conservative approach was taken and it is included in risk assessment calculations.

Because of the commercial/industrial nature of OU10, most of the identified potential source areas are covered and exposure pathways do not currently exist. The only areas with potential current exposures are soils associated with the former drycleaning operation in Building 89 and the Base Headquarters flagpole. Increased lifetime cancer risk associated with exposure to COCs in soils from these areas is less than $1x10^{-6}$ (less than 1 additional cancer case in 1,000,000 due to exposure), and non-cancer exposure risks result in a Hazard Index less than 1. These levels are below U.S. EPA limits for all exposure units. If at some point in the future the asphalt or other material covering contaminated soil at CHP-3 and the associated battery burial site is removed, potential risk at the site would increase. Potential future risks due to ingestion, dermal contact, and inhalation of subsurface soil contaminants from these No Action areas range from $1x10^{-5}$ to $6x10^{-6}$. These levels are within the U.S. EPA target risk range of one additional cancer case in ten thousand ($1x10^{-4}$) to one additional cancer case in one million ($1x10^{-6}$). However, it should also be noted that risk estimated for background soils due to naturally occurring arsenic was $3x10^{-5}$. The bottom of Table 3 summarizes the results of the human health risk assessment for OU10.

The baseline ecological risk assessment evaluated risks to plants and animals from exposure to soil contamination. Species studied include native plants, small mammals, and birds. The risk assessment was based on general assumptions about how much contamination the animals and plants would be exposed to and how toxic the contaminants are. Terrestrial habitat at OU10 is limited. Existing land use influences habitat quality. The land use consists of a mixture of typical urban/industrial development with widely scattered areas of ornamental or planted trees, shrubs, and grass. Thus the number of wildlife species that may be potentially affected is limited. The natural habitat at OU10 appears to support only common bird and mammal species. Only four common bird species and one mammal species were observed onsite, namely the American robin, cardinal, house sparrow, European starling, and gray squirrel. Recent surveys have confirmed the presence of two types of threatened and endangered species at the Base. These species include the Indiana bat and the eastern massasauga snake. Neither of these species have been observed and, due to habitat, are not reasonably expected to be present within OU10.

2.7. Description of the No Action Alternative and Long-Term Monitoring under the Basewide Monitoring Program: Selection of the No Action alternative for these twenty-one sites is based on several factors. No pathways of exposure presenting a risk were identified in the Remedial Investigations for these sites, precluding the need for any feasibility studies. The No Action alternative for these sites is the preferred remedy presented in the Proposed Plan, released for public review and comment on 21 May 96.

Because no contaminants will be left in place which exceed risk-based levels, the need for a five-year review of the selected remedial alternative of No Action, in accordance

with CERCLA Section 300.430 (f)(4)(ii), is not necessary. The BMP is in place at WPAFB to monitor groundwater quality and the types and movements of contaminants in groundwater at key locations throughout the base. Under the BMP, WPAFB will examine groundwater from all of the OUs as well as from parts of the Base that do not contain hazardous waste sites. It will be the vehicle used to assure that no releases of contaminants occur from any of these No Action sites.

2.7.1. OU2: The reasoning to support the no remedial action alternative for soils at the No Action sites is summarized as follows:

Coal and Chemical Storage Area: No organic contaminants were positively identified in this area. Metal contaminants were found in surface soil only and there is no evidence of migration to deep soil or groundwater. The Coal and Chemical Storage Area is in the vicinity of the highly industrialized POL Storage Area and Institutional controls are already in place to limit access and or use the area

Temporary Coal Storage Pile: The soil contaminants found at this site, PAHs and metals, have an affinity to soil and there is no evidence of migration to deep soil or groundwater from these coal constituents.

Burial Site 1: The baseline risk assessment concluded that there was only minimal risk to humans and non-threatened and endangered species. The primary contaminants were PAHs and metals common to coal and urban pollution. No carcinogens in the soil exceeded a risk level of one in ten thousand, even with the reasonable maximum exposure. While some of the non-carcinogenic Hazard Quotients were greater than one for the reasonable maximum exposure, none of the central tendency values were greater than one. Additionally, Burial Site 1 was determined not to be a landfill but rather a garden plot area.

Long Term Coal Storage Area: The baseline risk assessment concluded that there was only minimal risk to humans and non-threatened and endangered species. The primary contaminants were PAHs and metals common to coal and urban pollution. No carcinogens in the soil exceeded a risk level of one in ten thousand, even with the reasonable maximum exposure. While some of the non-carcinogenic Hazard Quotients were greater than one for the reasonable maximum exposure, none of the central tendency values were greater than one. The soil contaminants found at this site, PAHs and metals, have an affinity to soil and there is no evidence of migration to deep soil or groundwater from these coal constituents.

Building 89 Coal Storage Pile: The baseline risk assessment concluded that there was only minimal risk to humans and non-threatened and endangered species. The primary contaminants were PAHs and metals common to coal and urban pollution. No carcinogens in the soil exceeded a risk level of one in ten thousand, even with the reasonable maximum exposure. While some of the non-carcinogenic Hazard Quotients were greater than one for the reasonable maximum exposure, none of the central tendency values were greater than one. The soil contaminants found at this site, PAHs

and metals, have an affinity to soil and there is no evidence of migration to deep soil or groundwater from these coal constituents.

Based on these considerations, WPAFB has concluded that no remedial action is necessary to protect industrial workers, recreational users, construction workers, or animal and plant life from contaminants at the OU2 No Action sites. Institutional controls are already in place at all of the sites to limit access to or use of the sites. Such restrictions and institutional controls are legal (not remedial) actions.

The physical disturbance associated with remedial action at any of these OU2 sites will be detrimental to the upland sandpiper nesting areas and may cause more damage to the environment and greater risk to the upland sandpiper than the contamination in the soils at the OU2 No Action sites.

The preferred alternative to protect human health, welfare, and the environment at the OU2 No Action sites is no remedial action. Recreational and industrial use of the land at these sites reduces the risk to people, plants, and animals by limiting exposure to these areas. Contamination in the soils at the OU2 No Action sites and the risk it causes does not create any danger. Therefore, the No Action alternative is adequate to protect human health and the environment, and meets the requirements for both short-term and long-term effectiveness and permanence set forth in the National Contingency Plan (NCP).

The No Action alternative does not lessen the toxicity, movement, or amounts of contamination. However, the contaminants found in the soils are not sufficiently toxic, mobile, or concentrated to warrant another remedy.

The No Action alternative meets applicable or relevant and appropriate requirements (ARARs) established by federal, state, or local environmental laws. In other words, contamination at the No Action sites does not require a response under the Clean Air Act, Clean Water Act, Resource Conservation and Recovery Act, Toxic Substances Control Act, or other environmental regulations.

The No Action alternative is easy to implement. There are no operations, maintenance, or property costs associated with this remedy at OU2.

2.7.2. OU3: The reasoning to support the No Action alternative for soil contamination at all of the OU3 No Action sites is summarized as follows:

The risk assessments concluded there was only minimal risk to humans and non-threatened and endangered species.

The NFA sites are mostly unused. Future development, other than the limited industrial development at FTA 5, is unlikely because these sites are located on an Air Force reservation, in the clear zone of an active runway complex, and on the floodplain of the Mad River. Institutional controls are already in place to limit access to or use of the

sites. Deed restrictions can be established to ensure that no further excavation will occur. Such restrictions and institutional controls are legal (not remedial) actions.

The environmental impact of any remedy may cause more damage to the environment and greater risk to the Indiana bat than the contamination in NFA site soils.

Based on these considerations, WPAFB has concluded that no further remedial action is necessary to ensure protection of human health and the environment under current and future land use.

The preferred alternative to protect public health and the environment at the OU3 sites is no action. Recreational and limited industrial use of the land at these sites reduces the risk to people, plants, and animals who visit/reside in these areas. Contamination in the soils at the NFA sites and the risk it causes does not create any danger. Therefore, the no action alternative is adequate to protect human health and the environment, and meets the requirements for both short-term and long-term effectiveness and permanence set forth in the NCP.

The no action alternative does not lessen the toxicity, movement, or amounts of contamination. However, the contaminants found in the soils are not sufficiently toxic, mobile, or concentrated to warrant another remedy.

The no action alternative meets applicable or relevant and appropriate requirements (ARARs) established by federal, state, or local environmental laws. In other words, contamination at the No Action sites does not require a response under the Clean Air Act, Clean Water Act, Resource Conservation and Recovery Act, Toxic Substances Control Act, or other environmental regulations.

The no action alternative is easy to put in place. There are no operations, maintenance, or property costs associated with this remedy.

2.7.3. OU5: The reasoning to support no further remedial action alternative for soil contamination at the OU5 No Action sites is summarized as follows:

LF5 Extension: The risk assessment concluded there was only minimal risk to human health. Although arsenic in surface soil was found to exceed the reasonable maximum exposure PRG for an occupational exposure, it did not exceed the average exposure PRG. Neither the reasonable maximum or average exposure PRGs were exceeded for recreational exposures.

Area South of LF5, , Fire Training Area 1, Gravel Lake Tank Site, Burial Site 4: The risk assessment concluded there was only minimal risk to human health, with no CPCs exceeding the reasonable maximum exposure PRG for either occupational or recreational exposures at any of these sites.

Based on these considerations, WPAFB has concluded that no further remedial action is required to protect maintenance workers, trespassers, recreational users or animal and plant life from contaminants at the OU5 No Action sites. This alternative protects human health and the environment because exposure of people, plants and animals to contaminants in environmental media at the No Action sites is likely to be rare. Concentrations of chemicals in media are not high enough to justify a different remedy.

The No Action alternative meets applicable or relevant and appropriate requirements (ARARs) established by federal state, or local environmental laws. In other words, contamination at the No Action sites does not require a response under the Clean Air Act, Clean Water Act, Resource Conservation and Recovery Act, Toxic Substances Control Act, or other environmental laws and regulations.

Recreational and limited industrial use, versus residential use, of the land at these sites reduces the risk to people, plants, and animals by reducing the duration and frequency of exposure to these areas. Therefore, the No Action alternative is adequate to protect human health and the environment, and meets the requirements for long-term effectiveness and permanence set forth in the NCP.

The No Action alternative does not lessen the toxicity, movement, or amounts of contamination. However, the contaminants found in the media are not sufficiently toxic, mobile, or concentrated to warrant another remedy.

Contamination in the media at the No Action sites and the risks they cause do not create any danger to public health or the environment. Therefore, the No Action alternative meets the requirement for short-term effectiveness specified in the NCP. The No Action alternative is also easy to put in place. There are no operation, maintenance, or property costs with this remedy.

2.7.4. OU6: The preferred alternative to protect human health, welfare and the environment at the **EFDZ1** site is No Action. Recreational and limited industrial use of the land at these sites reduces the risk to people, plants and animals who visit/reside in this area. Contamination in the soils at the EFDZ1 site and the risk it causes does not create any danger. Therefore, the No Action alternative is adequate to protect human health and the environment, and meets the requirements for both short-term and long-term effectiveness and permanence as set forth in the National Contingency Plan (NCP).

The No Action alternative does not lessen the toxicity, movement, or amounts of contamination. However, the contaminants found in the soils are not sufficiently toxic, mobile, or concentrated to warrant another remedy. The No Action alternative meets Applicable or Relevant and Appropriate Requirements (ARARs) established by federal, state, or local environmental laws. As such, contamination at the EFDZ1 site does not require a response under the Clean Air Act, Clean Water Act, Resource Conservation and Recovery Act, Toxic Substances Control Act, or other environmental regulations.

The No Action alternative is easy to put in place. There are no operations, maintenance, or property costs associated with this remedy.

2.7.5. OU10: The reasoning to support the no further remedial action alternative for soil contamination at the No Action sites is summarized as follows:

BUSTR Sites: Tank Farm 49A has been remediated in accordance with the State of Ohio BUSTR (OAC 1301: 7). The remediation included the removal of tanks and contaminated soil from the site, and thus the risk of exposure to contaminated soil at that site was eliminated. The removal action is documented in a report completed by Four Seasons Environmental, Inc. in May 1994 (*UST Closure Report*).

Soil contaminated by fuel and waste oil from USTs at **Building 30119** has been remediated in accordance with the State of Ohio BUSTR (OAC 1301: 7). This included removal of tanks and contaminated soil from two areas at the site, and thus the risk of exposure to contaminated soil at that site was eliminated. The removal actions are documented in reports completed by Petro Environmental Technologies, Inc. (in August 1993, *Underground Storage Tank Closure Assessment Report for Wright-Patterson Air Force Base*) and by TolTest, Inc. (in September 1994, *Closure Report Wright-Patterson Air Force Base Tank 57*).

RI Sites/Areas: Since **Landfill 13** is covered, exposure pathways to landfill materials are incomplete and the resulting risk is minimal. Also, the Base land use is not expected to change from industrial/commercial to a less restrictive land use, so the potential for exposure to soil contaminants will not increase.

Current exposure to soils at **CHP-3** is considered unlikely because of the partial concrete and asphalt cover, so the resulting current risk is minimal. Also, even under future exposure scenarios, the resulting risks from exposure to the soils in this area are minimal. Finally, since the Base land use is not expected to change from industrial/commercial to a less restrictive land use, the potential for exposure to soil contaminants will not increase.

Even though there is currently the potential for exposure to soils at the Former Dry Cleaning Operation in Building 89, this site, the resulting risk is minimal. Also, the Base land use is not expected to change from industrial/commercial to a less restrictive land use, so the potential for exposure to soil contaminants will not increase.

Even though there is currently the potential for exposure to soils at the Flagpole Anomaly site, the resulting risk is minimal. Also, the Base land use is not expected to change from industrial/commercial to a less restrictive land use, so the potential for exposure to soil contaminants will not increase.

Soil contaminated by fuel and waste oil at the former Building 13 Sump Pit Area has been remediated in accordance with the State of Ohio BUSTR (OAC 1301: 7). The remediation included removal of the sump pit and soil vapor extraction at the site, and

thus the risk of exposure to contaminated soil at that site was eliminated. The remedial actions are documented in a report completed by Kelchner Environmental, Inc. in February 1993 (*Vapor Extraction/Groundwater Recovery System, Task 5005 Sump Pit Area, Building 30013*).

Based on these considerations, WPAFB has concluded that no further remedial action is necessary to ensure protection of human health and the environment under current and future land use.

The preferred alternative to protect public health and the environment at the No Action sites/areas at OU10 is No Action. This alternative is discussed relative to eight of the nine criteria for alternative evaluation discussed in 40 CFR 300.430. This alternative protects human health and the environment because exposure of people, plants, and animals to contaminants in soils at the No Action sites is likely to be rare. Further, concentrations of chemicals in the soils are not high enough to justify a different remedy.

This alternative provides long-term effectiveness and permanence. Given the magnitude of the soil contamination at the sites/areas, the risk was determined to be minimal based on the likely current and future exposure scenarios for OU10. Because WPAFB will continue to operate into the future, the likelihood of a higher degree of exposure (such as that corresponding to a residential or recreational setting) is also minimal.

A treatment remedy to reduce the toxicity, mobility, or volume of the soil contaminants at the sites/areas does not appear to be warranted. Three of the sites— Tank Farm 49A, Building 30119, and the Building 13 sump pit area— have already undergone soil removal actions that satisfy this criterion. For the other sites/areas, the data collected during the RI do not indicate that the soil contaminants are mobile (CHP-3) or that the concentrations are high enough to result in groundwater contaminant concentrations greater than ARARs; (flagpole anomaly, former drycleaning operation in Building 89, and Landfill 13). Finally, as mentioned above, the concentrations of soil contaminants at the No Action sites are not high enough to cause a significant risk under reasonable exposure scenarios.

The No Action alternative satisfies the short-term effectiveness criterion. Because there is no active remediation, there are no short-term impacts.

The preferred alternative meets the four statutory mandates of CERCLA Section 121:
1) It is protective of public health because there is no current exposure of people, plants, and animals to the subsurface contamination and future exposure is considered extremely unlikely. WPAFB will continue to operate far into the future, and uses for these areas will continue to be industrial. Residential or recreational exposure settings are not reasonably expected.

2) It complies with ARARs. No waivers from ARAR requirements are necessary.

3) It is cost effective. The alternative is the least costly alternative while still being protective of public health and the environment.

4) While it does not include permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable, previous soil removal actions taken at Tank Farm 49A, Building 30119, and the Building 13 sump pit area meet this mandate. Additional remedial actions to meet this mandate are not warranted because risks to public health and the environment are not occurring and are not anticipated in the future.

The preferred alternative does not meet the statutory preference for treatment that permanently reduces the toxicity, mobility, or volume of hazardous substances as its principal element because there is no need for treatment. First, as discussed above, past actions at three of the sites/areas have included soil remediation. Finally, additional remedial actions employing treatment are not necessary because risks to public health and the environment are not occurring and are not expected in the future.

2.8. Explanation of Significant Changes from No Action Proposed Plans: The Proposed Plans for the subject sites were released for public comment on 17 May 96. The Proposed Plans identified No Action as the preferred alternative for all of the 21 sites. No written or verbal public comments were received outside of those from the public meeting. As a result, no significant changes to the proposed remedies of No Action, as they were originally identified in the Proposed Plans, are necessary.

2.9. Statutory Findings: USEPA, OEPA, and WPAFB have determined that conditions at these No Action sites addressed in this ROD pose no current or potential threats to human health or the environment at levels that warrant any further remedial action. While some of the sites may exhibit amounts of contaminants that may pose slightly elevated human health and ecological risk, no further cleanup action is warranted because of the low frequency of human exposure, and the likelihood that any attempt to reduce ecological risk will result in more harm than good to the environment.

USEPA and OEPA require that groundwater, surface water, and sediment at these No Action sites be monitored under the BMP. If, after conducting such a review, all parties determine that the No Action remedy is no longer protective, alternatives for addressing the risk posed by contaminants at these sites will be evaluated. At a minimum, if monitoring indicates that contaminant concentrations have increased, alternatives such as additional institutional controls, and/or treatment will be evaluated to reduce the risk to acceptable levels.

As this is a decision for "No Action," the statutory requirements of CERCLA Section 121 for remedial actions are not applicable. A review of conditions at these 21 No Action sites will be conducted in accordance with the agreed-upon BMP, including review of the groundwater, surface water, and sediment monitoring data obtained under the BMP.

3.0. RESPONSIVENESS SUMMARY

3.1. Overview: Wright-Patterson Air Force Base has presented the preferred alternative of No Action at twenty-one IRP sites across the base. Judging from the comments received during the public meeting, the surrounding community, the USEPA and the OEPA agree with WPAFB's recommended alternative. Below is a summary of public comments received at the 21 May 96 Public Meeting:

Comment Summary and Response to Local Community Concerns:

1) **Question:** A citizen asked for a further explanation of risk assessment, and the judgment that is made for an area depending on its future use. Is the base assuming that the land will be used for industrial activity or residential homes, and if it is for private use, would that mean that additional cleanup would be required?

Answer: Each OU is considered separately based on site-specific considerations. One consideration would be the current situation at the site and the degree of human exposure. A commercial industrial site would pose daily exposure for the workers. This would be the case scenario for OU2. As for OU3, that would be considered as a recreational scenario, in that the area is used in hunting season three months out of the year. The other consideration is the future use of the site. The base used the commercial-industrial scenario for soils; however, in order to be conservative, a residential scenario was determined when looking at future groundwater usage. The base has received approval from the regulatory agencies to assume that there will not be residential development at some of the more industrialized areas of the base. However, where appropriate, for example, around OU6 where there is residential land use adjacent to the site, the base assumed actual current residential use. All of the assumptions used are very conservative as to be the most health protective.

2) **Question:** Have any of the landfills become wider than they were originally thought to have been?

Answer: Using geophysics we are able to determine what lies beneath the surface of the landfills without being intrusive. We also have excellent historical photos of the pits located just off of Glendean. As a result, the base feels very confident that the landfill boundaries have been adequately delineated and investigated.

3) **Question:** Is there any record of any wildlife being poisoned on the base?

Answer: No. The ecological assessments we do in conjunction with the human health risk assessments are very exhaustive. We have a pretty good size deer, fox, and woodchuck population to name a few of the wildlife inhabiting the Base. Based on the number of wildlife, we evidently have a very healthy ecosystem on Wright-Patterson. When we find contamination, we discover the particular type and whether it produces a danger to the wildlife. Based on a situation where there may be an ecological effect,

we would decide to undertake a cleanup. We also consider the effects of the investigations and remedial actions on the wildlife inhabitants.

4) **Question:** With the aquifer located so close to the surface, how can you physically say the soil is all right but the water which comes from that same soil may later show contamination? Is this based on science or a legal determination that you can separate the two?

Answer: It is primarily a scientific rationale. Soil contamination is confined to a specific area and is more easily remedied. Groundwater contamination is much more difficult to address because it is at very low levels, is constantly moving, and is often difficult to determine the exact source of the groundwater contamination. The base is dealing with contaminants in the very low part-per-billion range, which is, for the most part, barely above drinking water standards. The base is addressing the groundwater contamination on a regional scale.

In addition, the levels of contamination found in the soils pose very little, if any, risk. The levels are not high enough to provide a continued source of contamination. The soils would have been addressed if there was evidence to indicate that they would cause groundwater contamination.

5) **Question:** What is the allowable level of benzene compared to what is present at the base?

Answer: Five-parts-per-billion is the maximum contaminant level. Most of the benzene contamination is located right around Operable Unit 2, and it's associated more with the fuel spills, which are being evaluated under a separate document for potential remedial actions. For the No Action sites, the levels of benzene found were just above 5 parts-per-billion. In Operable Unit 3, the level was 6 or 7 parts-per-billion.

6) **Question:** A resident on Glendean, which is still on well water, asked if the chemicals derived from debris deposited in Pit A contaminate his drinking water.

Answer: The base has tested the well water at the Glendean residents' homes twice for any contamination, and has not found any contamination in their water. The Base will continue to monitor the water in that area to assure that no contamination migrates from the landfill to residential wells. The base will continue to sample the monitoring wells at the downgradient edge of the landfill and perform long-term monitoring of the groundwater at that site. If there appears to be any potential threat to the residential well water supply, the Air Force will immediately take steps to take care of the problem.

7) **Question:** A resident on Glendean asked why the soil taken from the monitoring well borings in front of his house was containerized in 55-gallon drums.

Answer: In technical terms, the soil is investigative derived waste. Until it is analyzed, it is considered a hazardous material. Until the soil is proven to be clean, the base is

cautious and takes protective measures in dealing with the waste by drumming it and sampling it to assure that it is not contaminated. Once it is determined that the soil is not contaminated, it is usually spread back out at the drilling site.

Attachment 1

Comprehensive List of Community Relations Activities Conducted for the No Action Sites

WPAFB conducted community interviews with the mayors and other local officials in the cities of Dayton and Fairborn (1986).

WPAFB published the Community Relations Plan (1986).

WPAFB issued news release announcing the Consent Order between Ohio and WPAFB (February 1988).

WPAFB established the Information Repository at the Fairborn Branch of the Greene County Library (1988).

WPAFB established the Administrative Record at Wright State University Library, Archives Section (1988).

WPAFB updated the Community Relations Plan (1989).

WPAFB issued news release announcing interagency agreement between USEPA and WPAFB (March 1991).

WPAFB issued a paid public notice advising the Base and surrounding local communities of the 21 May 96 public meeting and the public comment period on the Proposed Plans. Notices were placed in the Dayton Daily News on 17 and 19 May 96 and in the Skywrighter on 17 May 96.

WPAFB held a public meeting at Fairborn High School in Fairborn, OH to discuss the Proposed Plan on 21 May 96 and respond to citizen's questions and concerns about the Proposed Plans.

Attachment 2

Administrative Record Index for No Action Sites

Provided is a listing of all the documents pertaining to the No Action sites by OU. These documents are available for Review in the Administrative Record. The documents pertaining to all sites are listed at the end. "Enforcement" contains regulatory approval letters and "Public Participation" contains news articles and public releases.

OPERABLE UNIT 2

TITLE: Preliminary Assessment - Burial Site 1

MICROFICHE #: BURIAL1-E1 **SITE CODE:** BURIAL 1 **FILE STRUCTURE:** E1

AUTHOR: Engineering-Science

DOCUMENT DATE: 16 May 88 **DATE ENTERED:** 8 Nov 89

TITLE: Preliminary Assessment - Long-Term Coal Storage Pile

MICROFICHE #: LTCSP-E1 **SITE CODE:** LTCSP **FILE STRUCTURE:** E1

AUTHOR: Engineering-Science

DOCUMENT DATE: 16 May 88 **DATE ENTERED:** 8 Nov 89

TITLE: Preliminary Assessment - Coal and Chemical Storage Area

MICROFICHE #: CCSA-E1 **SITE CODE:** CCSA **FILE STRUCTURE:** E1

AUTHOR: 2750 ABW/EM WPAFB

DOCUMENT DATE: 22 Aug 88 **DATE ENTERED:** 8 Nov 89

TITLE: Preliminary Assessment - Coal Storage (Building 89)

MICROFICHE #: CS89-E1 **SITE CODE:** CS 89 **FILE STRUCTURE:** E1

AUTHOR: 2750 ABW/EM WPAFB

DOCUMENT DATE: 26 Apr 89 **DATE ENTERED**: 14 Dec 90

TITLE: Preliminary Assessment - Temporary Coal Storage Pile

MICROFICHE #: TCSP-E1 **SITE CODE**: TCSP **FILE STRUCTURE**: E1

AUTHOR: 2750 ABW/EM WPAFB

DOCUMENT DATE: 26 Apr 89 **DATE ENTERED**: 14 Dec 89

TITLE: Preliminary Assessment - Spill Site 1

MICROFICHE #: SPILL1-E1 **SITE CODE**: SPILL 1 **FILE STRUCTURE**: E1

AUTHOR: Engineering-Science

DOCUMENT DATE: 16 May 88 **DATE ENTERED**: 8 Nov 89

TITLE: Field Sampling Plan for the Remedial Investigation/Feasibility Study at Operable Unit 2 (Northeastern Area)

MICROFICHE #: M-I4 (OU2) **SITE CODE**: Multiple **FILE STRUCTURE**: I4 (OU2)

AUTHOR: Engineering-Science

DOCUMENT DATE: 30 Jun 92 **DATE ENTERED**: 3 Mar 93

TITLE: Final Remedial Investigation Report for Operable Unit 2 (Referenced Sites: Spill Sites 2, 3, 10; Burial Site 1; Coal and Chemical Storage; Temporary Coal Storage; Long-Term Coal Storage Pile; Building 89 Coal Storage Pile)

MICROFICHE #: SPILL2,3-I5 **SITE CODE**: SPILL 2,3 **FILE STRUCTURE**: I5

AUTHOR: Engineering-Science

DOCUMENT DATE: 31 Aug 95 **DATE ENTERED**: 31 Jan 96

TITLE: No Action Proposed Plan for Sites within Operable Unit 2 (Coal and Chemical Storage Area, Temporary Coal Storage Pile, Long-Term Coal Storage Area, Burial Site 1, Bldg 89 Coal Storage Pile)

MICROFICHE #: M-H3 **SITE CODE**: Multiple **FILE STRUCTURE**: H3

AUTHOR: Department of Energy Hazardous Waste Remedial Actions Program (HAZWRAP)

DOCUMENT DATE: 1 May 96 **DATE ENTERED**: 15 May 96

OPERABLE UNIT 3

TITLE: Preliminary Assessment - Fire Training Area 2

MICROFICHE #: FTA2-E1 **SITE CODE**: FTA 2 **FILE STRUCTURE**: E1

AUTHOR: Engineering-Science

DOCUMENT DATE: 16 May 88 **DATE ENTERED**: 8 Nov 89

TITLE: Preliminary Assessment - Fire Training Area 3

MICROFICHE #: FTA3-E1 **SITE CODE**: FTA 3 **FILE STRUCTURE**: E1

AUTHOR: Engineering-Science

DOCUMENT DATE: 16 May 88 **DATE ENTERED**: 8 Nov 89

TITLE: Preliminary Assessment - Fire Training Area 4

MICROFICHE #: FTA4-E1 **SITE CODE**: FTA 4 **FILE STRUCTURE**: E1

AUTHOR: Engineering-Science

DOCUMENT DATE: 16 May 88 **DATE ENTERED**: 8 Nov 89

TITLE: Preliminary Assessment - Fire Training Area 5

MICROFICHE #: FTA5-E1 **SITE CODE**: FTA 5 **FILE STRUCTURE**: E1

AUTHOR: Engineering-Science

DOCUMENT DATE: 16 May 88 **DATE ENTERED**: 8 Nov 89

TITLE: Preliminary Assessment - Earthfill Disposal Zone 11

MICROFICHE #: EFDZ11-E1 **SITE CODE**: EFDZ11 **FILE STRUCTURE**: E1

AUTHOR: 2750 ABW/EM WPAFB

DOCUMENT DATE: 31 Jan 89 **DATE ENTERED:** 8 Nov 89

TITLE: Preliminary Assessment - Earthfill Disposal Zone 12

MICROFICHE #: EFDZ12-E1 **SITE CODE:** EFDZ 12 **FILE STRUCTURE:** E1

AUTHOR: 2750 ABW/EM WPAFB

DOCUMENT DATE: 1 Feb 89 **DATE ENTERED:** 8 Nov 89

TITLE: Preliminary Assessment - Landfill 14

MICROFICHE #: LF14-E1 **SITE CODE:** LF 14 **FILE STRUCTURE:** E1

AUTHOR: 2750 ABW/EM WPAFB

DOCUMENT DATE: 30 Oct 89 **DATE ENTERED:** 14 Dec 90

TITLE: Final Report, Groundwater Quality Restoration Program (Oct 87-Jan 90)

MICROFICHE #: FTA5-D1 **SITE CODE:** FTA 5 **FILE STRUCTURE:** D1

AUTHOR: Biosystems

DOCUMENT DATE: 1 Aug 90 **DATE ENTERED:** 4 Jun 91

TITLE: Analysis of Soil Gas Survey Results for Fire Training Areas 2 and 5

MICROFICHE #: FTA2,5-I2a **SITE CODE:** FTA 2, 5 **FILE STRUCTURE:** I2a

AUTHOR: Engineering-Science

DOCUMENT DATE: 1 Jan 92 **DATE ENTERED:** 25 Mar 92

TITLE: Analysis of Soil Gas Survey Results for Fire Training Areas 3 and 4 and Spill Site 1, Landfills 11 and 12

MICROFICHE #: M-I2a(1) **SITE CODE:** Multiple **FILE STRUCTURE:** I2a(1)

AUTHOR: Engineering-Science

DOCUMENT DATE: 1 Jan 92 **DATE ENTERED:** 25 Mar 92

TITLE: Site Specific Work Plan for Remedial Investigation/Feasibility Study at Operable Unit 3 (Landfills 11,12,14; Spill Site 1; Fire Training Areas 2, 3, 4, 5)

MICROFICHE #: M-I4(OU3) **SITE CODE:** Multiple **FILE STRUCTURE:** I4(OU3)

AUTHOR: SAIC

DOCUMENT DATE: 1 Dec 92 **DATE ENTERED:** 16 Aug 93

TITLE: Final Remedial Investigation Report for Operable Unit 3 (Referenced Sites: Landfills 11, 12, 14; Fire Training Areas 2, 3, 4, 5; Spill Site 1)

MICROFICHE #: LF11,12-I5 **SITE CODE:** LF 11,12 **FILE STRUCTURE:** I5

AUTHOR: SAIC

DOCUMENT DATE: 31 Jul 95 **DATE ENTERED:** 31 Jan 96

TITLE: No Action Proposed Plan for Sites within or near Operable Unit 3 (Landfill 14; Fire Training Areas 2, 3, 4, 5; Spill Site 1; Earthfill Disposal Zones 11, 12)

MICROFICHE #: M-H3 **SITE CODE:** Multiple **FILE STRUCTURE:** H3

AUTHOR: Department of Energy Hazardous Waste Remedial Actions Program (HAZWRAP)

DOCUMENT DATE: 31 Oct 95 **DATE ENTERED:** 15 May 96

OPERABLE UNIT 5

TITLE: Preliminary Assessment - Fire Training Area 1

MICROFICHE #: FTA1-E1 **SITE CODE:** FTA 1 **FILE STRUCTURE:** E1

AUTHOR: Engineering-Science

DOCUMENT DATE: 16 May 88 **DATE ENTERED:** 8 Nov 89

TITLE: Preliminary Assessment - Burial Site 4

MICROFICHE #: BURIAL4-E1 **SITE CODE:** BURIAL 4 **FILE STRUCTURE:** E1

AUTHOR: 2750 ABW/EM WPAFB

DOCUMENT DATE: 17 Mar 89 **DATE ENTERED:** 8 Nov 89

TITLE: Preliminary Assessment - Gravel Lake Tanks

MICROFICHE #: GLT-E1 **SITE CODE:** GLT **FILE STRUCTURE:** E1

AUTHOR: 2750 ABW/EM WPAFB

DOCUMENT DATE: 17 Apr 89 **DATE ENTERED:** 8 Nov 89

TITLE: Analysis of Soil Gas Survey Result for Fire Training Area 1

MICROFICHE #: FTA1-I2a **SITE CODE:** FTA 1 **FILE STRUCTURE:** I2a

AUTHOR: Engineering-Science

DOCUMENT DATE: 1 Jan 92 **DATE ENTERED:** 25 Mar 92

TITLE: Site Specific Work Plan for the Remedial Investigation/Feasibility Study at Operable Unit 5
(Landfill 5; Fire Training Area 1)

MICROFICHE #: LF5,FTA1-I4 **SITE CODE:** LF5, FTA1 **FILE STRUCTURE:** I4

AUTHOR: International Technology

DOCUMENT DATE: 3 Mar 93 **DATE ENTERED:** 16 Aug 93

TITLE: Final Remedial Investigation Report for Operable Unit 5 (Referenced Sites: Landfill 5, Fire Training Area 1, Burial Site 4, Gravel Lake Tanks)

MICROFICHE #: LF5-I5 **SITE CODE:** LF 5 **FILE STRUCTURE:** I5

AUTHOR: IT Corp

DOCUMENT DATE: 4 Aug 95 **DATE ENTERED:** 31 Jan 96

TITLE: No Action Proposed Plan for Sites within or near Operable Unit 5 (Fire Training Area 1, Gravel Lake Tanks, Burial Site 4)

MICROFICHE #: M-H3 **SITE CODE:** Multiple **FILE STRUCTURE:** H3

AUTHOR: International Technology

DOCUMENT DATE: 1 May 96 **DATE ENTERED:** 15 May 96

OPERABLE UNIT 6

TITLE: Preliminary Assessment - Earthfill Disposal Zone 1

MICROFICHE #: EFDZ1-E1 **SITE CODE:** EFDZ 1 **FILE STRUCTURE:** E1

AUTHOR: Engineering-Science

DOCUMENT DATE: 16 May 88 **DATE ENTERED:** 8 Nov 89

TITLE: Remedial Investigation/Feasibility Study Site-Specific Work Plan at Operable Unit 6

MICROFICHE #: LF1,2-I4 **SITE CODE:** LF 1, 2 **FILE STRUCTURE:** I4

AUTHOR: Metcalf and Eddy

DOCUMENT DATE: 30 Aug 93 **DATE ENTERED:** 20 Apr 94

TITLE: Remedial Investigation Report Operable Unit 6 (Landfills 1 and 2 and Earthfill Disposal Zone 1), including Addendum to Section 6.0 (dated May 96)

MICROFICHE #: LF1,2-I5 **SITE CODE:** LF 1, 2 **FILE STRUCTURE:** I5

AUTHOR: Metcalf & Eddy

DOCUMENT DATE: 31 Dec 95 **DATE ENTERED:** 15 May 96

TITLE: No Action Proposed Plan for the Earthfill Disposal Zone 1 Site Within Operable Unit 6

MICROFICHE #: EFDZ1-H2 **SITE CODE:** EFDZ1 **FILE STRUCTURE:** H2

AUTHOR: International Technology

DOCUMENT DATE: 30 Apr 96 **DATE ENTERED:** 15 May 96

OPERABLE UNIT 10

TITLE: Preliminary Assessment - Landfill 13

MICROFICHE #: LF13-E1 **SITE CODE:** LF 13 **FILE STRUCTURE:** E1

AUTHOR: Engineering-Science

DOCUMENT DATE: 16 May 88 **DATE ENTERED:** 8 Nov 89

TITLE: Preliminary Assessment - Central Heating Plant 3 (Building 170)

MICROFICHE #: CHP3-E1 **SITE CODE:** CHP 3 **FILE STRUCTURE:** E1

AUTHOR: Engineering-Science

DOCUMENT DATE: 16 May 88 **DATE ENTERED:** 8 Nov 89

TITLE: Site Investigation/Site Assessment at Tank Farm 49A

MICROFICHE #: TF49A-F1 **SITE CODE:** TF 49A **FILE STRUCTURE:** F1

AUTHOR: PEI Associates

DOCUMENT DATE: 6 Dec 88 **DATE ENTERED:** 3 Mar 93

TITLE: Preliminary Assessment - Tank Farm 49A

MICROFICHE #: TF49A-E1 **SITE CODE:** TF 49A **FILE STRUCTURE:** E1

AUTHOR: 2750 ABW/EM WPAFB

DOCUMENT DATE: 19 Dec 88 **DATE ENTERED:** 8 Nov 89

TITLE: Preliminary Assessment - Underground Storage Tank (Building 30119)

MICROFICHE #: UST119-E1 **SITE CODE:** UST119 **FILE STRUCTURE:** E1

AUTHOR: 2750 ABW/EM WPAFB

DOCUMENT DATE: 12 Jul 90 **DATE ENTERED:** 14 Dec 90

TITLE: Remedial Investigation/Feasibility Study Site-Specific Work Plan at Operable Unit 10

MICROFICHE #: LF13,CHP3-I4 **SITE CODE:** LF 13, CHP3 **FILE STRUCTURE:** I4

AUTHOR: CH2M Hill

DOCUMENT DATE: 31 Jan 94 **DATE ENTERED:** 15 Jul 94

TITLE: Remedial Investigation Report Operable Unit 10 (Landfill 13, Central Heating Plant 3 and Associated Battery Burial Site, TCE/PCE Groundwater Plume, and Related Potential Source Areas)

MICROFICHE #: LF13,CHP3-I5 **SITE CODE:** LF 13, CHP 3 **FILE STRUCTURE:** I5

AUTHOR: CH2M Hill

DOCUMENT DATE: 31 Dec 95 **DATE ENTERED:** 24 Apr 96

TITLE: No Action Proposed Plan for Sites within or near Operable Unit 10 (Landfill 13, Central Heating Plant 3, Tank Farm 49A, Underground Storage Tank Bldg 30119)

MICROFICHE #: M-H3 **SITE CODE:** Multiple **FILE STRUCTURE:** H3

AUTHOR: CH2M Hill

DOCUMENT DATE: 1 May 96 **DATE ENTERED:** 15 May 96

TITLE: Remedial Investigation/Feasibility Study Work Plan for 39 Sites (with Amendments)

MICROFICHE #: M-I1 **SITE CODE:** Multiple **FILE STRUCTURE:** I1

AUTHOR: Engineering-Science

DOCUMENT DATE: 30 Jun 90 **DATE ENTERED:** 3 Mar 93

TITLE: Fact Sheets

MICROFICHE #: M-N2,5,6 **SITE CODE:** Multiple **FILE STRUCTURE:** N2,5,6

AUTHOR: WPAFB

DOCUMENT DATE: As of 24 Apr 96 **DATE ENTERED:** 24 Apr 96

TITLE: Enforcement - Correspondence with Regulatory Agencies

MICROFICHE #: M-L4 **SITE CODE:** Multiple **FILE STRUCTURE:** L4

AUTHOR: Air Force and EPA

DOCUMENT DATE: As of 24 Apr 96 **DATE ENTERED:** 24 Apr 96

TITLE: Public Participation

MICROFICHE #: M-N2,5,6 **SITE CODE:** Multiple **FILE STRUCTURE:** N2,5,6

AUTHOR: Public/Air Force

DOCUMENT DATE: As of 24 Apr 96 **DATE ENTERED:** 24 Apr 96

TITLE: Presentation Charts/Handouts for Public Meeting held 21 May 1996 on No Action Proposed Plans for Selected Sites within Operable Units 2, 3, 5, 6, and 10

MICROFICHE #: M-N4 **SITE CODE:** Multiple **FILE STRUCTURE:** N4

AUTHOR: DOE/HAZWRAP, International Technology, CH2M Hill

DOCUMENT DATE: 21 May 96 **DATE ENTERED:**

WRIGHT-PATTERSON AFB

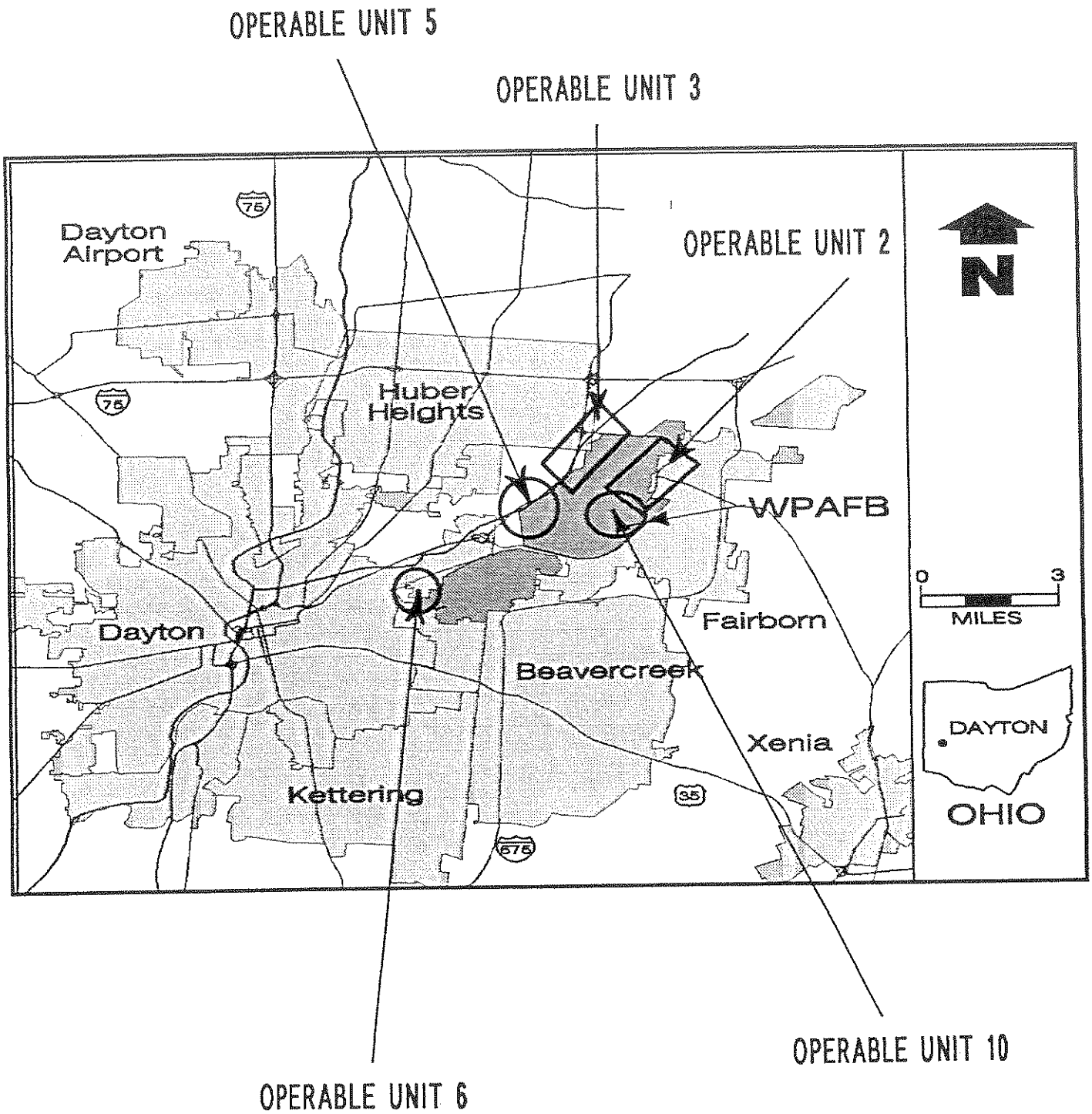
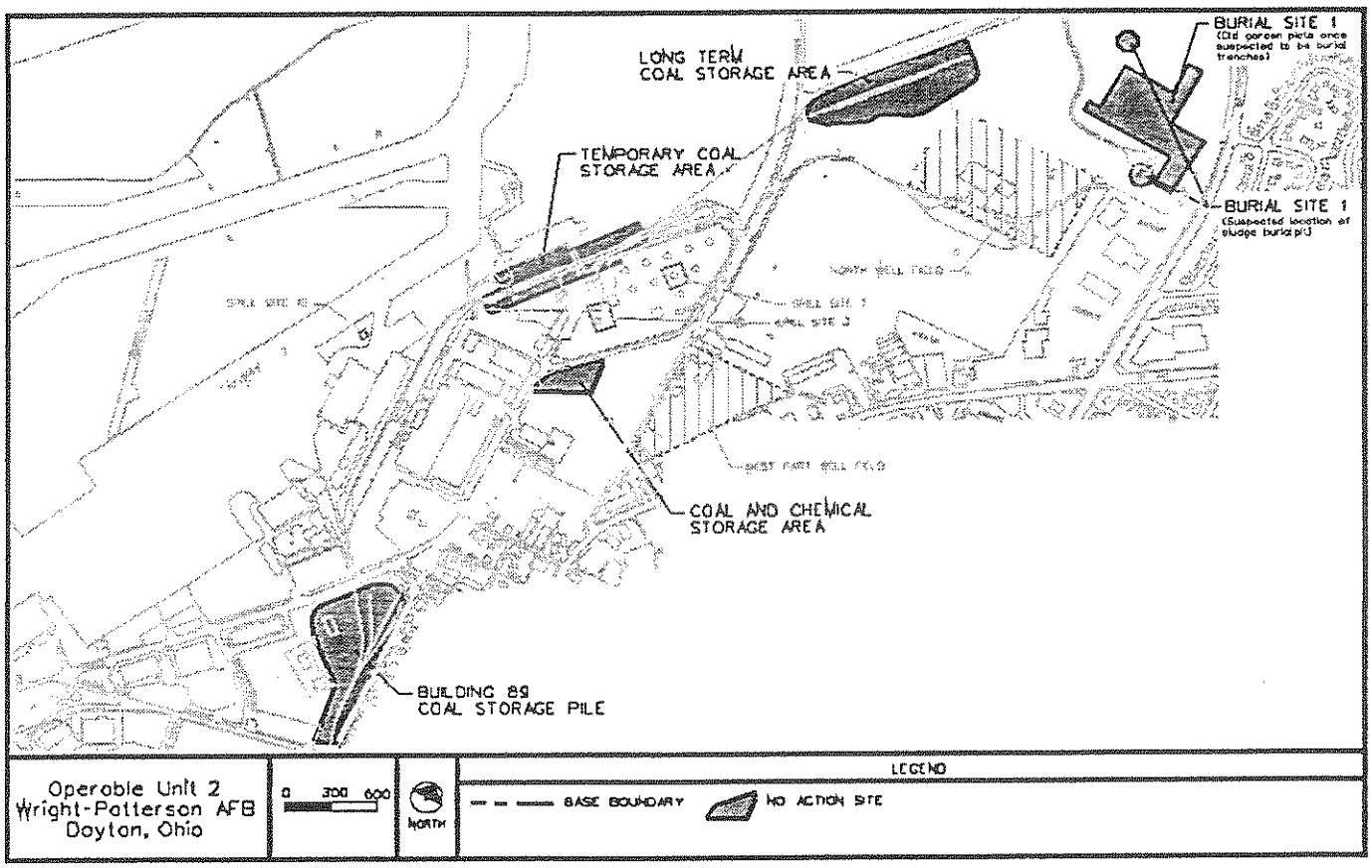
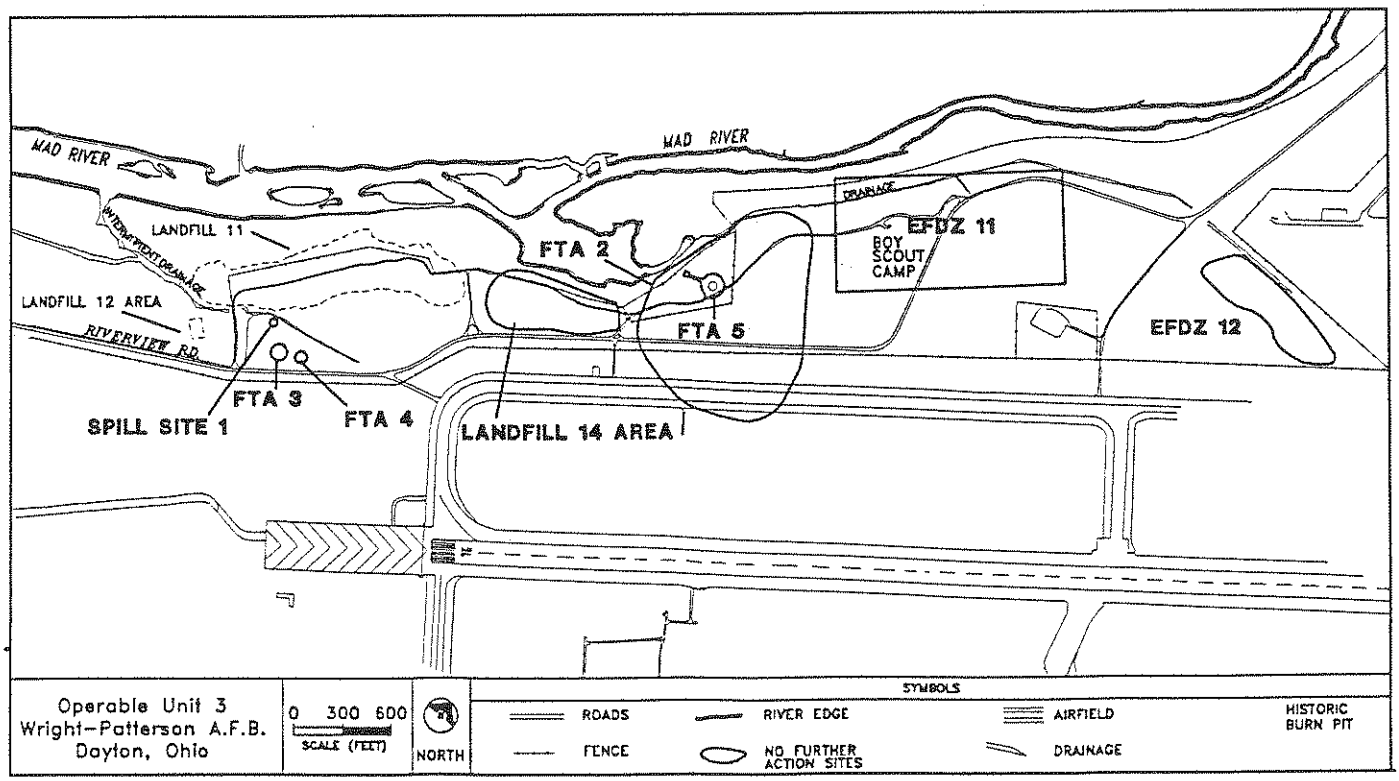


FIGURE 1

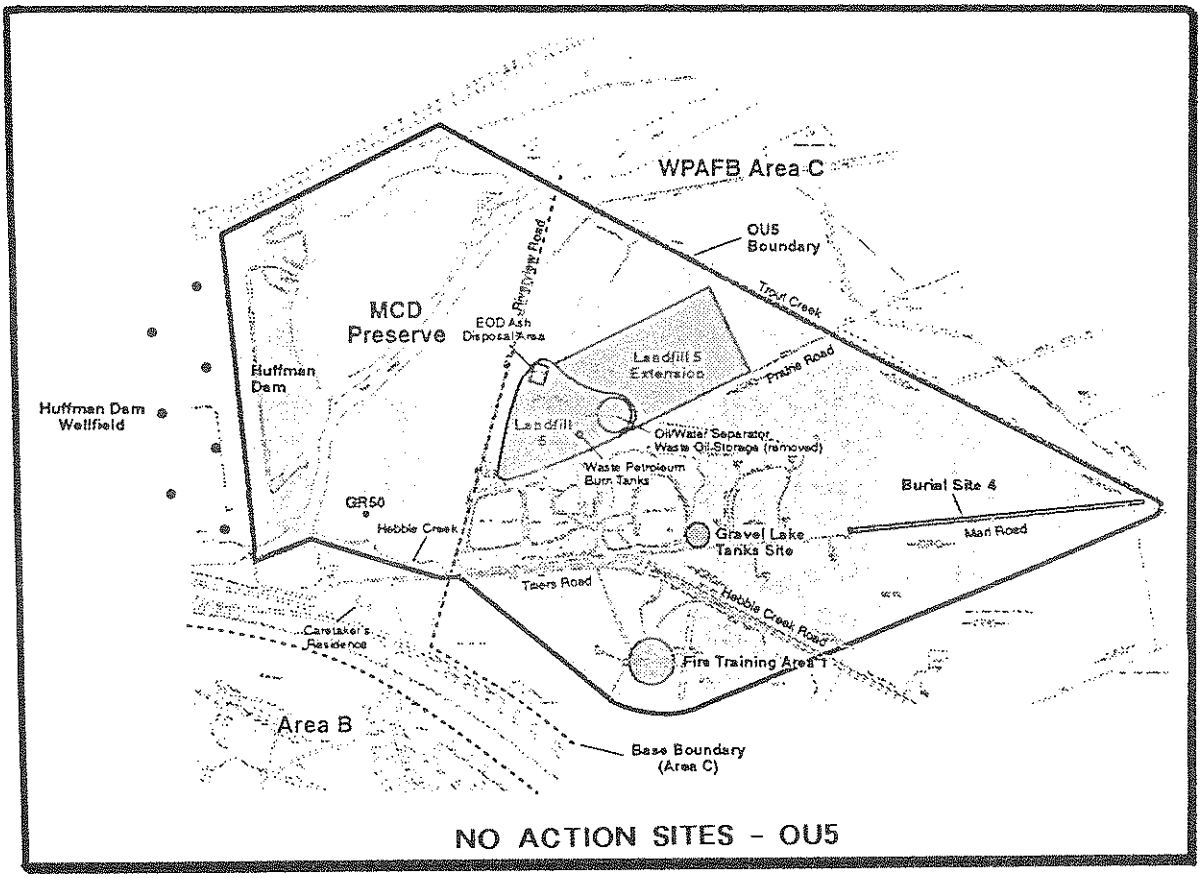


No Action Sites at Operable Unit 2

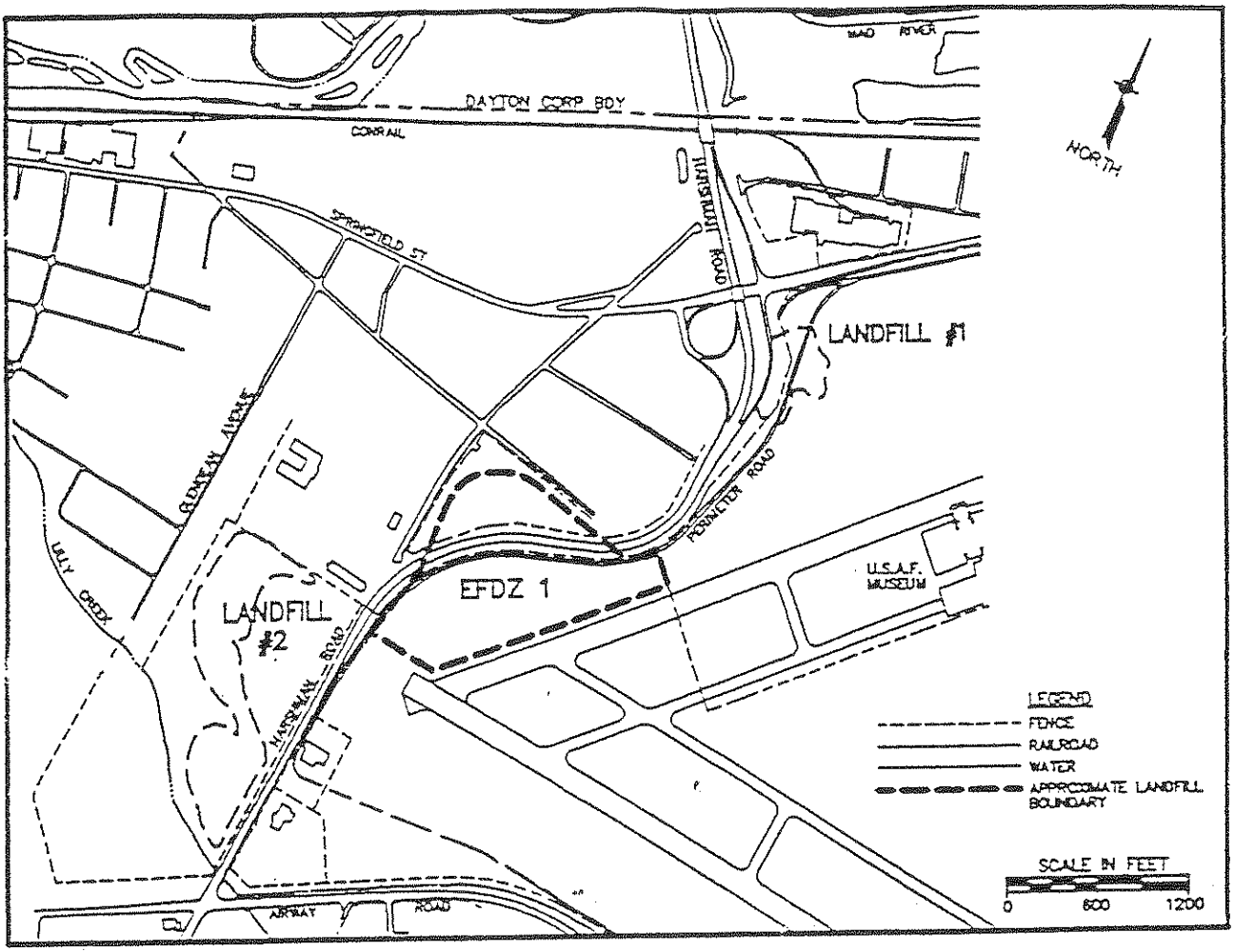


No Further Action Sites at Operable Unit 3

FIGURE 2

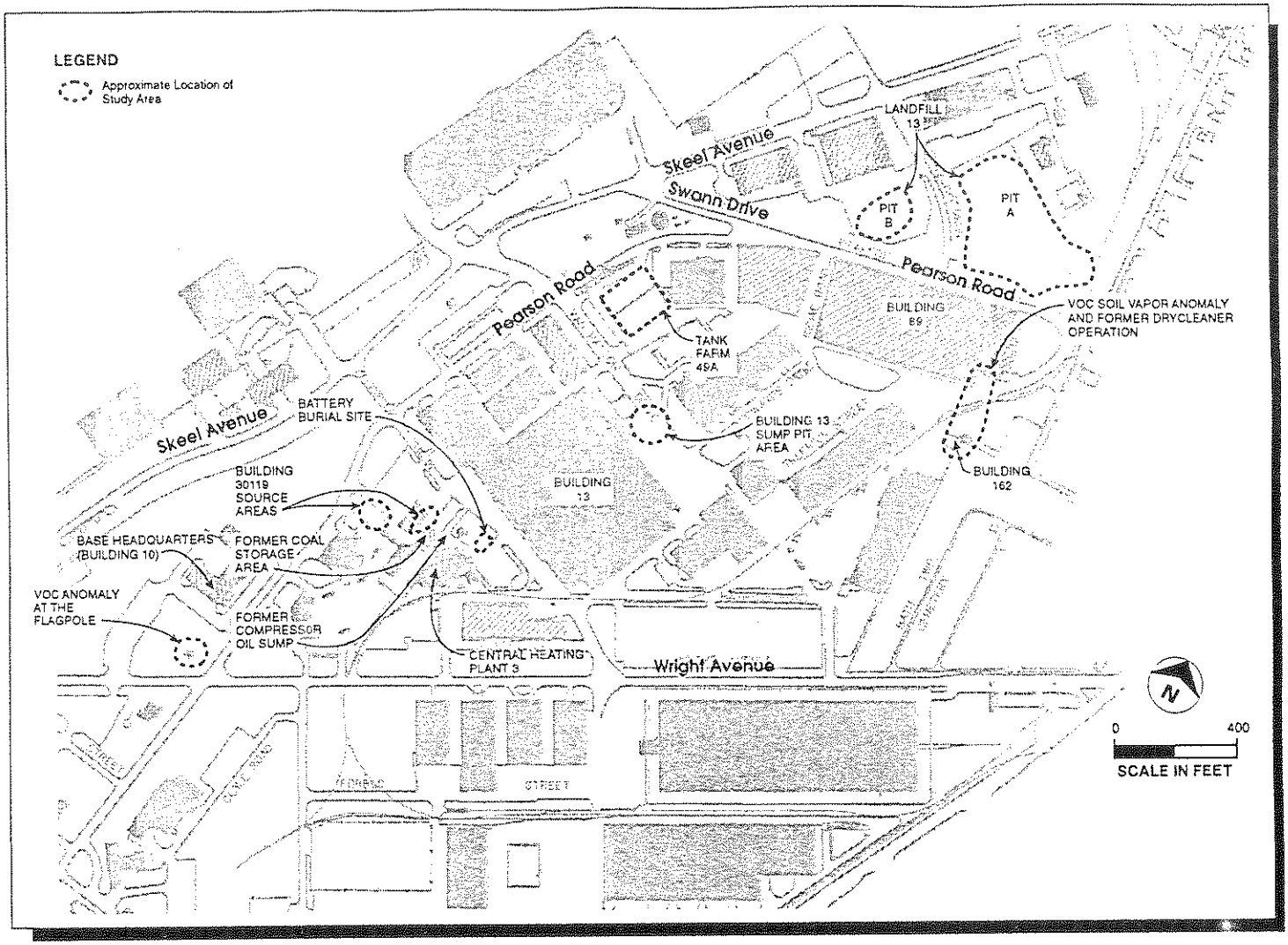


NO ACTION SITES - OU5



NO ACTION SITE - OU6

FIGURE 3



NO ACTION SITES – OU10

FIGURE 4

NO ACTION SITES
PROPOSED PLAN FINDINGS AND APPROVAL DATES

Document Type	Site WIMS-ES I.D. *	Site Name	Operable Unit	Selected Remedy	Threat/ Problem	NFRAP Category **	USEPA PP Approval Date	OEPA PP Approval Date
Proposed Plan	LF 14	Earthfill Disposal Zone 1	6	NFRAP	No threats identified	III	5/220/96	4/26/96
Proposed Plan	LF 24	Earthfill Disposal Zone 11	3	NFRAP	No threats identified	III	12/21/95	6/21/96
Proposed Plan	LF 25	Earthfill Disposal Zone 12	3	NFRAP	No threats identified	III	12/21/95	6/21/96
Proposed Plan	DP 48	Burial Site 4	5	NFRAP	No threats identified	III	6/4/96	5/7/96
Proposed Plan	ST 53	Gravel Lake Tanks	5	NFRAP	No threats identified	III	6/4/96	6/4/96
Proposed Plan	OT 55	Temporary Coal Storage Area	2	NFRAP	No threats identified	III	6/4/96	4/26/96
Proposed Plan	OT 56	Coal Storage Building 89	2	NFRAP	No threats identified	III	6/4/96	4/26/96
Proposed Plan	FT 38	Fire Training Area 4	3	NFRAP	No threats identified	III	12/21/95	6/21/96
Proposed Plan	LF 62	Landfill 14	3	NFRAP	No threats identified	III	12/21/95	6/21/96
Proposed Plan	OT42	Central Heating Plant 3 and Battery Burial Site	10	NFRAP	No threats identified	III	5/9/96	4/26/96
Proposed Plan	ST51	Tank Farm 49A	10	NFRAP	No threats identified	III	5/9/96	4/26/96
Proposed Plan	ST64	Underground Storage Tanks, Bldg 119	10	NFRAP	No threats identified	III	5/9/96	4/26/96
Proposed Plan	FT37	Fire Training Area 3	3	NFRAP	No threats identified	III	12/21/95	6/21/96
Proposed Plan	FT39	Fire Training Area 5	3	NFRAP	No threats identified	III	12/21/95	6/21/96
Proposed Plan	OT 57	Coal and Chemical Storage Area	2	NFRAP	No threats identified	III	6/4/96	4/26/96
Proposed Plan	DP 45	Burial Site 1	2	NFRAP	No threats identified	III	6/4/96	4/26/96
Proposed Plan	OT 54	Long-Term Coal Storage Pile	2	NFRAP	No threats identified	III	6/4/96	4/26/96
Proposed Plan	FT 35	Fire Training Area 1	5	NFRAP	No threats identified	III	6/4/96	5/7/96
Proposed Plan	FT 36	Fire Training Area 2	3	NFRAP	No threats identified	III	12/21/95	6/21/96
Proposed Plan	LF13	Landfill 13	10	NFRAP	No threats identified	III	5/9/96	4/26/96

* Wright-Patterson Air Force Base tracking system
** Air Force Category decisions based on results of an RI/FS (III)

TABLE 1

OU2 HUMAN HEALTH RISK SUMMARY FOR SOIL					
Site	Receptor	Carcinogenic* Risk		Non-Carcinogenic** Risk	
		Acceptable for All Exposures[1]	Acceptable for Average Exposures[2]	Acceptable for All Exposures[1]	Acceptable for Average Exposures[2]
Long Term Coal Storage/ Burial Site 1- Surface soil	Adolescent Recreator	●	●	●	●
Long Term Coal Storage/ Burial Site 1-Surface soil	Commercial/ Industrial worker		●		●
Long Term Coal Storage/ Burial Site 1- Subsurface soil	Construction Worker	●	●		●
Building 89 Coal Storage Pile- Surface soil	Commercial Industrial Worker	●	●		●
Building 89 Coal Storage Pile Subsurface Soil	Construction Worker	●	●		●

[1]Reasonable maximum exposure assumptions used.

[2] Central tendency or average exposure assumptions used.

*Risk for cancer causing chemicals is evaluated relative to the target risk range (1×10^{-6} to 1×10^{-4}). Risks greater than 1×10^{-4} (1 in 10,000) may require remedial actions.

**Risk for non-carcinogenic chemical is evaluated with the Hazard Quotient. A value greater than 1.0 indicates that adverse health effects may be likely to occur under the given exposure assumptions.

TABLE 2

OU3 Summary of Baseline Risk Assessment Results

Exposure Unit	Human Health		Ecological	
	COCs	Risk	ecoCOCs	Risk **
Landfill 14	benzo(a)pyrene(2) dibenzo(a,h)anthracene(2)	2×10^{-6} * 5×10^{-7}***	cadmium chromium mercury	18 10 27
FTAs 2 and 5	benzo(a)pyrene(2) dibenzo(a,h)anthracene(2)	5×10^{-7}*** 5×10^{-7}***	cadmium chromium mercury selenium vanadium	15 4 11 1 2
FTAs 3 and 4, and SS1	beryllium(1) benzo(a)pyrene(2) dibenzo(a,h)anthracene(2)	2×10^{-5} 8×10^{-7}*** 5×10^{-7}***	cadmium chromium mercury vanadium	24 5 14 2

COC contaminant of concern
ecoCOC ecological contaminants of concern
(1) skin contact pathway, adults (current land use)
(2) ingestion pathway, workers (current land use)
* indicates increased lifetime cancer risk of 2 in 1,000,000 for an individual
** indicates exposure quotient (XQ) for threatened and endangered (T&E) species (calculated as reasonable maximum exposure concentration of COC x exposure factor / toxicity threshold concentration)
*** indicates a value that is below the target risk range for cancer (in other words, less than 1 in 1,000,000 for an individual)

Risk from Commercial/Industrial Exposures to OU-10 Soil

Site[a]	Safe under Current Exposure Scenarios	Safe under Future Exposure Scenarios
Former Dry Cleaning Operation in Building 89	Yes	Yes
CHP-3	Yes[b]	Yes
Base Headquarters Flagpole Anomaly	Yes	Yes

[a] Exposures to contaminated soils at Landfill 13 and the Building 13 sump pit area are considered unlikely and so a risk assessment was not completed for these areas. Exposures to contaminated soils at Tank Farm 49A and Building 30119 are considered unlikely because these areas have been remediated in accordance with Ohio Underground Storage Tank Regulations (OAC 1301:7-9-13).

[b] Soil exposure under current conditions is considered unlikely because of the partial concrete and asphalt cover.

TABLE 3

Risk from Industrial Exposures to OU5 Soil

Site	Safe For All Industrial Exposures (RME PRG[A])	Safe For Average Industrial Exposures (AVE PRG[B])	Longer-term Exposure May Be Associated With Some Concern
Landfill 5 Extension		●	
Area South of LF5	●		
Fire Training Area 1	●		
Burial Site 4	●		
Gravel Lake Tank Site	●		
West Twin Lake		●	
East Twin Lake	●		
Gravel Lake	●		
Trout Creek	●		
Hebble Creek	●		
Large Wetland	●		
Small Wetland		●	
Mad River	●		
River Road Ditch	●		

A Reasonable Maximum Exposure Preliminary Remediation Goal for industrial exposures.
B Average Exposure Preliminary Remediation Goal for industrial exposures.

Risk from Recreational Exposures to OU5 Surface Soil, Sediment or Surface Water

Site	Safe For All Recreational Exposures (RME PRG[A])	Safe For Average Recreational Exposures (AVE PRG[B])	Longer-term Exposure May Be Associated With Some Concern
Area South of LF5	●		
Gravel Lake Tank Site	●		
West Twin Lake	●	▲	
East Twin Lake	●	▲	
Gravel Lake	●	▲	
Trout Creek	●		
Hebble Creek	●		
Large Wetland	●		
Small Wetland	●		
Mad River	●		▲[C]

● Exposures to soil or sediment
▲ Exposures to surface water
A Reasonable Maximum Exposure Preliminary Remediation Goal for recreational exposures
B Average Exposure Preliminary Remediation Goal for recreational exposures
C Mad River exceeded the AVE PRG because of one detection of pentachlorophenol; however, no source of pentachlorophenol was detected in OU5.

TABLE 4