
RECORD OF DECISION FOR LANDFILL SITES FTMM-02 and FTMM-08 AT FORT MONMOUTH

OCEANPORT, MONMOUTH COUNTY, NEW JERSEY

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U.S. Corps of Engineers, New York District

and

U.S. Army Engineering and Support Center, Huntsville, Alabama

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LIST OF ACRONYMS

ACRONYM	DEFINITION
µg/kg	micrograms per kilograms
°F	°Fahrenheit
amsl	above mean sea level
BEE	Baseline Ecological Evaluation
ARAR	Applicable or Relevant and Appropriate Requirement
Army	the U.S. Army
ASE	Annual Sampling Event
bgs	below ground surface
BRAC	Base Realignment and Closure
BSE	Baseline Sampling Event
CEA	Classification Exception Area
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
cis-1,2-DCE	cis-1,2-dichloroethene
COC	constituent of concern
COPC	constituent of potential concern
CWA	Charles Wood Area
EA	Evans Area
EC	engineering controls
FFSRA	Federal Facility Site Remediation Agreement
FS	Feasibility Study
FTMM	Fort Monmouth
GWQS	Ground Water Quality Standards
HHRA	human health risk assessment
HRC	Hydrogen Releasing Compound
IC	Institutional control
IGW	Impact to Groundwater
LTM	long-term monitoring
LUC	land use controls
LUCIP	land use control implementation plan
mg/kg	milligram per kilogram
MP	Main Post
NCP	National Contingency Plan
NFA	no further action
N.J.A.C.	New Jersey Administrative Code
NJDEP	New Jersey Department of Environmental Protection
NPW	net present worth
NRDCSRS	Non-Residential Direct Contact Soil Remediation Standard
O&M	operation and maintenance

ACRONYM	DEFINITION
ORC	Oxygen Release Compound
PCB	polychlorinated biphenyl
PCE	tetrachloroethene
PDI	pre-design investigation
RAOs	remedial action objectives
RDCSRS	Residential Direct Contact Soil Remediation Standard
RI	remedial investigation
ROD	Record of Decision
RSL	Regional Screening Level
SI	site investigation
SL	screening level
SVOCs	Semi-volatile organic compounds
SWQS	Surface Water Quality Standard
TCE	trichloroethene
TRSR	Technical Requirements for Site Remediation
TSCA	Toxic Substance Control Act
USACE	U.S. Army Corps of Engineers
USATHAMA	U.S. Army Toxic and Hazardous Materials Agency
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
VOCs	volatile organic compounds

SECTION 1 - DECLARATION

1.1 SITE NAME AND LOCATION

This Record of Decision (ROD) presents the presumptive remedy for two former landfills located at Fort Monmouth (FTMM) in Oceanport, Monmouth County, New Jersey. FTMM was comprised of the Main Post (MP) and Charles Wood Area (CWA) and the Evans Area (EA). FTMM falls within the Boroughs of Eatontown, Oceanport, and Tinton Falls. The MP is located in the Eatontown and Oceanport Boroughs. The CWA is located in the Eatontown and Tinton Falls Boroughs. Landfills FTMM-02 and FTMM-08 are located on the MP.

1.2 STATEMENT OF BASIS AND PURPOSE

The presumptive remedy was selected in accordance with the requirements of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980, as amended by the Superfund Amendments and Reauthorization Act of 1986 (Title 42 United States Code Section § 9601, et seq.) and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), as amended, Title 40 CFR Part 300. The presumptive remedy is consistent with the New Jersey Department of Environmental Protection (NJDEP) regulations (New Jersey Administrative Code [N.J.A.C.] 7:26). FTMM has not been placed on the CERCLA National Priorities List. The Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) identification number for FTMM is NJD980529762.

The U.S. Army (Army) is the lead federal agency under CERCLA and Executive Order 12580, and has selected the presumptive remedy for the two former landfills. The NJDEP is the state support agency under the NCP for FTMM and concurs with the remedy. The decision documented in this ROD is based on and relies on the Administrative Record file for FTMM.

The Army was prepared to present the Proposed Plan for the two former landfills at a public meeting scheduled on April 12, 2017, however no one from the public was in attendance. No public comments on the Proposed Plan for the landfills were submitted or received.

1.3 ASSESSMENT OF THE SITE

The response action selected in this ROD is necessary to protect public health and welfare and will provide safety protection from exposure to solid waste at the landfills for future use and it complies with the presumptive remedy of containment to address historic landfills.

1.4 DESCRIPTION OF THE SELECTED REMEDY

The major components of the presumptive remedy for the two former landfills consist of limited soil excavations of hot-spot isolated areas with concentrations of polychlorinated biphenyl (PCBs) exceeding 25 milligrams per kilogram (mg/kg), followed by the installation of a vegetated soil cover, and implementation of land use controls (LUCs).

Since there are areas where PCBs were detected in soils at both sites, the Army considered both the NJDEP Guidance on Coordination of NJDEP and U.S. Environmental Protection Agency (USEPA) PCB Remediation Policies (NJDEP, 2013) in evaluating the remedial alternatives. The USEPA considers sites to be remediated if PCB concentrations in soil do not exceed 1 mg/kg or if the final remedial levels are greater than 1 mg/kg and less than or equal to 25 mg/kg and the site is covered with an appropriate cap. Therefore, limited soil excavations of isolated areas will be conducted to remove soils with PCB concentrations in excess of the Toxic Substance and Control

Act (TSCA) self-implementing cleanup level of 25 mg/kg. A pre-design investigation (PDI) was conducted at each site in September 2016 to support the limited PCB hot-spot removal and the lateral and vertical extent of PCB concentrations greater than 25 mg/kg were defined.

After removal and off-site disposal of isolated hot-spot soil areas, a vegetated soil cover will be placed over each landfill. At FTMM-02, the soil cover will be installed to provide safety protection for non-residential use from future exposure to solid waste at the landfill. At FTMM-08, the soil cover will be installed to provide public health protection due to potential direct contact with constituents of potential concern (COPC) in soils. The vegetated soil cover will be placed consistent with the NJDEP regulations (N.J.A.C. 7:26E-5.2(d)). Additional soil will be added to the existing soil cover to provide a minimum of two feet of clean soil between the ground surface and landfilled debris. The use of a vegetated soil cover will offer safety protection for future use from exposure to solid waste (e.g.; construction/demolition debris) at the landfills and will also control surface water runoff and erosion. A passive methane mitigation system will be installed to address potential safety concerns at the FTMM-02 landfill. Two 100-foot-long trench systems will be located within the landfill boundary and vented to the surface in 25 foot centers. The location of the venting system will be installed along the south-eastern edge of the landfill to correspond with sampling points M2SG12 and M2SG22. The intent of this passive venting system is in lieu of continued methane monitoring at the landfill after the installation of the vegetative soil cover.

LUCs to maintain the soil cap and prevent residential land use will also be implemented at the landfills. The Army will prepare a Land Use Control Implementation Plan (LUCIP) to set forth the manner in which the institutional controls (ICs) will be implemented, document the location of the engineering controls (EC), and identify the procedural responsibilities including landfill cover inspections, monitoring and reporting, and long-term management requirements.

The Army will be responsible for documenting and implementing the LUCs, which is expected to occur through the filing of a deed notice at the time of property transfer, and would also be responsible to conduct reviews to ensure that the LUCs remain protective of human health and the environment. When the property is transferred out of federal control, the LUCs would be incorporated into the title and the new owner would be responsible for complying with the LUCs. Although the Army may later transfer its procedural responsibilities to another party by contract, property transfer agreement, or through other means, the Army would retain ultimate responsibility for remedy integrity.

In addition, the existing Classification Exception Area (CEA) and a Well Restriction Area (WRA) at FTMM-02 will be revised and a CEA/WRA will be established at FTMM-08 to restrict groundwater use or installation of drinking water wells at FTMM-02 and FTMM-08 landfills. ICs in the form of CEA/WRA which restrict the use of groundwater will be implemented and will remain in place until NJDEP Groundwater Quality Standards (GWQS) for the identified constituents of concern (COCs) are achieved at the sites.

1.5 STATUTORY DETERMINATIONS

The selected remedy provides safety protection from exposure to solid waste at the landfills for future use, complies with Federal and State laws and regulations that are applicable or relevant and appropriate to the remedy, and is cost effective. The remedy uses permanent solutions to the maximum extent practicable. The remedy does not satisfy the statutory preference for treatment.

CERCLA §121 requires 5-year review (statutory reviews) of sites where the remedial action does not achieve concentrations of hazardous substances acceptable for unrestricted use. Five-year reviews will be conducted in compliance with CERCLA § 121(c) and the 40 CFR § 300.430(f)(4)(ii).

1.6 DATA CERTIFICATION CHECKLIST

Table 1 provides the location of key remedy selection information contained in ROD Section II, Decision Summary. Additional information can be found in the FTMM Administrative Record file at the Environmental Restoration Program Information Repository located at the Monmouth County Library, Eastern Branch, 1001 Route 35, Shrewsbury, New Jersey 07702.

Table 1
ROD Certification Checklist

Criterion	Discussion
COPCs and their respective concentrations	Included in Section 2.6.2
Baseline risk represented by the COPCs	Included in Section 2.8
Cleanup levels established for COCs and the basis for these levels	Included in Section 2.9
How source materials constituting principal threats are addressed	Included in Section 2.10
Current and reasonably anticipated future land use assumptions and current and potential future beneficial uses of groundwater used in the risk assessment	Included in Section 2.4
Potential land and groundwater uses that will be available at the site as a result of the Selected Remedy	Included in Section 2.8
Estimated capital, operation and maintenance (O&M), and total net present worth (NPW) costs; discount rate; and number of years over which the remedy costs are projected	Included in Section 2.10.3
Key factors that led to the selection of the remedy	Included in Section 2.10

1.7 AUTHORIZING SIGNATURES

Under Executive Order 12580, the Army is the lead agency responsible for implementation of the selected remedy, with support from the NJDEP. This signature page documents the Army's selected remedy, consisting of limited PCB hot-spot removal in soil, a vegetated soil cover, and implementation of LUCIP. In addition, NJDEP concurrence with the ROD is through their concurrence letter.



Tom Lederle, Chief U.S. Army BRAC Division

18 October 2017

Date

SECTION 2 - DECISION SUMMARY

2.1 SITE NAME, LOCATION, AND DESCRIPTION

FTMM is located in the central-eastern portion of New Jersey in Monmouth County, approximately 45 miles south of New York City, New York, 70 miles northeast of Philadelphia, Pennsylvania, and 40 miles east of Trenton, New Jersey. The Atlantic Ocean is approximately 3 miles to the east. FTMM was comprised of three areas: the MP, the CWA, shown on **Figure 1**, and the EA (not shown). FTMM's MP and CWA were selected for closure by the BRAC Commission in 2005, and officially closed on September 15, 2011. (The EA was closed under BRAC in 1998 and has since been transferred from FTMM.)

This ROD addresses landfills FTMM-02 and FTMM-08. The locations of the landfills are shown on **Figure 2**. Summary descriptions of the individual landfill sites are presented in the following subsections. Detailed descriptions of each landfill, as well as a compilation of previous investigations and an evaluation of available analytical data collected from each site, can be found in the individual Remedial Investigation (RI) Reports (**Table 2**). In addition, at FTMM-08, a Feasibility Study (FS) was conducted since there were unacceptable risk and hazards to human health associated with direct contact with COPCs in soil.

Table 2
Report Submittal Dates

Landfill	Report	Submitted to NJDEP
FTMM-02	Final RI	January 2016
FTMM-08	Final RI/FS	April 2016

2.2 SITE HISTORY AND ENFORCEMENT ACTIVITIES

2.2.1 FTMM Landfill Site Background

A study was conducted in 1980 (U.S. Army Toxic and Hazardous Materials Agency [USATHAMA], 1980), with a follow-up evaluation completed in 1988 (USATHAMA, 1988), at locations that were considered major landfill areas. A timeline of significant events, including the years of operation since FTMM opened nearly 100 years ago is provided on **Figure 3**. During the 1980 study, groundwater and surface water samples were collected and analyzed for compliance with National Primary and Secondary Drinking Water Standards. The study concluded that the targeted chemicals were not found at high enough concentrations to cause degradation to ground or surface water. Following the 1988 evaluation, it was recommended that FTMM submit a landfill registration statement to the NJDEP (USATHAMA, 1988).

The follow-up evaluation was completed in 1988 by USATHAMA to determine if environmental/hazardous waste disposal conditions at FTMM (including the landfills) had changed since the 1980 study. Based on an assessment of available data, it was recommended that USATHAMA not conduct a site investigation (SI), but that surface water and groundwater sampling at the landfills continue (USATHAMA, 1988). Numerous investigations were conducted at FTMM including the landfills over the past 30 years. The most recent RI or RI/FS report for

each landfill includes a compilation of previous investigations and an evaluation of available analytical data collected from each site.

No enforcement activities have been conducted at the two landfill sites included in this ROD.

2.2.2 FTMM-02

FTMM-02 is located in the southwest corner of the MP and is bordered by Mill Creek to the north, former Building 1122 to the east, an open grassed area to the west, and an abandoned railroad track bed to the south (**Figure 4**). FTMM-02 was in operation from approximately 1964 to 1968 and was reportedly used for the general disposal of domestic and industrial wastes. The landfill soil cover material ranges in thickness from 0 to 10 feet below the ground surface (bgs) and averages 2.4 feet thick.

2.2.3 FTMM-08

FTMM-08 is located in the northern portion of the MP and is bounded by Parkers Creek to the north, west, and east, and by Sherrill Avenue to the south (**Figure 5**). FTMM-08 was in use as a landfill between 1962 and 1981, and was reportedly used for the disposal of domestic and industrial waste. The landfill soil cover material ranges in thickness from 0 to 4 feet bgs and averages 2.4 feet thick.

2.3 COMMUNITY PARTICIPATION

A final Proposed Plan for FTMM-02 and FTMM-08 was completed and released to the public in March 2017 at the Eatontown Public Library, 33 Broad Street, Eatontown, New Jersey 07724.

A newspaper notification was posted in the Asbury Park Press on March 29 and 30, 2017 to inform the public of the start of the comment period, to solicit comments from the public, and to announce the public meeting. A public comment period was held from Tuesday, March 28, 2017 to Thursday, April 27, 2017 during which no comments from the public were received. A public meeting was held on Wednesday, April 12, 2017 to present the proposed remedy for the two landfills and seek public comments. At this meeting, representatives from the Army and U.S. Army Corps of Engineers (USACE) were present and prepared to answer questions about the sites and the presumptive remedy under consideration; however, no one from the public was in attendance and therefore no comments were received at the public meeting.

2.4 SCOPE AND ROLE OF REMEDY

This ROD describes the remedy to address safety concerns at two former landfills at FTMM. Results from the RI for FTMM-02 concluded that risks to human health and the environment from soil and groundwater at the landfill are within acceptable ranges for the current and future intended land use which consists of passive open spaces, and therefore, no further action (NFA) is required under CERCLA. Although risks from soil, which included an assessment of PCBs in soil were within acceptable ranges, there are areas at FTMM-02 where PCBs were detected and due to their presence require further consideration based on NJDEP Guidance on Coordination of NJDEP and USEPA PCB Remediation Policies (NJDEP, 2013). Results from the RI for FTMM-08 concluded that there were unacceptable risks and hazards to human health and the environment and therefore a FS was conducted at FTMM-08 associated with direct contact with COCPs in soil.

Since there are areas where PCBs were detected at concentrations greater than 25 mg/kg in soil at both (FTMM -02 and FTMM-08) sites, limited hot-spot removal will be conducted at both

landfills in localized areas where PCB concentrations are in excess of 25 mg/kg. Following hot-spot removal, the selected alternative is to place a vegetated soil cover over the landfills. LUCs to maintain the soil cap and prevent residential land use will be implemented at the landfills. In addition, CEA/WRAs will be in effect until NJDEP GWQS are achieved at the sites.

Containment is considered by USEPA to be a highly effective way to remediate historic landfills in many cases. USEPA has identified containment as a presumptive remedy for historic landfills because it repeatedly has been shown to be effective at treating similar wastes at other CERCLA sites. USEPA developed presumptive remedies to streamline the selection of cleanup methods for certain categories of sites by narrowing the consideration of cleanup methods to treatment technologies or remediation approaches that have a proven track record in the Superfund program. The Army, as lead agency, has determined that it is appropriate to apply the presumptive remedy of capping for these two landfills based on the soil and contaminant characteristics found at the sites, and the guidance provided in the directive, Presumptive Remedy for CERCLA Municipal Landfill Sites, USEPA OSWER Directive No. 9355.0-49FS (September 1993). Further information on the selection of presumptive remedies for landfills at military installations is presented in the directive, *Application of the CERCLA Municipal Landfill Presumptive Remedy to Military Landfills*, USEPA OSWER Directive No. 9355.0-67FS.

2.5 DOCUMENTATION OF SIGNIFICANT CHANGES

The Proposed Plan for the two landfill sites was released for public comment in March 2017. No changes occurred to the proposed remedy following the public comment period.

2.6 SITE CHARACTERISTICS

2.6.1 Physical Characteristics

The following subsections describe the general physical characteristics of the MP at FTMM, as well as the two landfills individually (see Section 2.6.1.7). The RI and RI/FS Reports cited in Table 2.1 include further detailed descriptions of the physiography, topography, vegetation, geology, hydrogeology, and surface water at each of the landfill sites.

2.6.1.1 Physiography, Topography, and Vegetation

The MP is located within New Jersey's Atlantic Coastal Plains Physiographic Province, which is comprised of sedimentary beds that gently dip to the southeast. The Coastal Plains Physiographic Province sedimentary beds are dissected by meandering rivers that drain to the Raritan or Delaware River. The topography at FTMM is relatively flat, and has an elevation of 20 to 25 feet above mean sea level (amsl).

Major vegetation zones at FTMM consist of landscaped areas, estuarine and fresh water wetlands, riparian areas, upland forests, and old field habitats. Much of the upland areas of the MP consist of extensive areas of regularly mowed lawns and landscaped areas.

2.6.1.2 Geology

The MP is situated on New Jersey Coastal Plain deposits that thicken to the southeast. The unconsolidated material in the Coastal Plain deposits date from Cretaceous through the Quaternary Periods and consists of sand, silt, clay, and glauconitic clay. The depth to crystalline bedrock at FTMM is approximately 1,000 feet. The geology of the Long Branch Quadrangle indicates that the Hornerstown, Vincentown, and Tinton Formations are the unconsolidated units that outcrop or

occur close to the ground surface in the area of FTMM and are summarized below.

Hornerstown Formation

The Hornerstown Formation underlies much of the MP, consists of glauconitic (>50%) clay and silty clay. This unstratified formation is approximately 25 to 30 feet thick and is olive, dark green, and black where unweathered; and olive-brown with brown to reddish-brown mottles where weathered.

Vincentown Formation

The Vincentown Formation unconformably overlies the Hornerstown Formation and consists of glauconitic (5-20%), silty, medium-to-coarse, quartz sand; some fine-to-medium sand; and some very coarse sand to very fine pebbles. This formation is yellow, reddish-yellow, olive-yellow, or olive-brown in color and has a total thickness of 180 feet.

Tinton Formation

The Tinton Formation unconformably underlies the Hornerstown Formation and consists of glauconitic (5-30%), silty, medium-to-coarse and fine-to-medium, quartz sand. The color is reddish-brown, reddish-yellow, or yellowish-brown where weathered, and grayish-brown, brown, and olive-brown where unweathered. It is commonly iron-cemented into beds and masses as much as 15 feet thick. The uppermost 4 to 6 feet, just below the contact with the Hornerstown Formation, is a brown to olive-gray, glauconitic, clayey silt to sandy or silty clay.

2.6.1.3 Groundwater

FTMM lies in the Atlantic and Eastern Gulf Coastal Plain groundwater region. This groundwater region is underlain by unconsolidated to semi-consolidated sedimentary deposits. The chemistry of the water near the surface is variable with low dissolved solids and high iron concentrations. The water chemistry in areas underlain by glauconitic sediments (such as Tinton and Hornerstown Sands) is dominated by calcium, magnesium, manganese, aluminum and iron.

The water table aquifer in the MP area is identified as part of the “Navesink-Hornerstown Confining Units,” or minor aquifers. The minor aquifers that underlie FTMM include the Tinton Sand, Hornerstown Sand, and Vincentown Formation.

Groundwater is typically encountered at the MP and in the surrounding areas at shallow depths (2 to 9 feet below ground surface [bgs]); groundwater elevations fluctuate with the tidal action in area creeks. Shallow groundwater in the MP area is locally influenced by the following factors:

- Tides (due to proximity to the Atlantic Ocean);
- Topography;
- Nature of the fill material within the MP area;
- Presence of clay and silt lenses in the natural overburden deposits; and
- Local groundwater recharge areas (e.g., streams, lakes).

N.J.A.C. 7:9-6, GWQS establishes quality criteria for different classes of groundwater. Class II-A, which is defined as all groundwater that is not classified as one of the other special classes, is the appropriate class for groundwater at Fort Monmouth. The primary designated use for Class II-A groundwater is potable water; secondary uses include agricultural and industrial water. However, groundwater at FTMM is not used for potable purposes since a municipal water supply

is currently used at FTMM.

2.6.1.4 Surface Water

The northeastern and southeastern portions of the MP are bordered by Parkers Creek and Oceanport Creek, respectively, and the southern portion of the MP is bordered by Husky Brook Lake. The Shrewsbury River is located within one mile to the east of the MP.

The U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory indicates the presence of wetlands at the MP. Parkers and Oceanport Creeks are classified as estuarine and marine deep water with estuarine and marine wetland areas. Husky Brook Lake is classified as a fresh water pond.

Surface water bodies in the vicinities of the two landfill sites include:

- FTMM-02: Bordered by Mill Creek to the north; and
- FTMM-08: Bounded by Parkers Creek to the north, west, and east.

2.6.1.5 Soils

Per the Monmouth County Soil Survey (U.S. Department of Agriculture [USDA], 2008), much of the MP is covered by urban, developed land with disturbed soils. Surface soils near the MP generally consist of sandy loams ranging in depth from 9 to 12 inches. The surface soils are underlain by sandy loam, sandy clay loam, or loam that may grade to loamy sand at a depth of approximately 5 feet bgs. Some areas at the MP are covered by impermeable surfaces such as roads, parking lots, and buildings.

2.6.1.6 Climate

The climate in the Fort Monmouth area is typically humid subtropical and is impacted by continental and oceanic influences. The proximity to the Atlantic Ocean tends to minimize seasonal temperature fluctuations as compared to interior regions of the state. Based on data obtained from the National Weather Service, the temperature at FTMM ranges from 20 degrees Fahrenheit (°F) to 90°F (average of 57°F), and precipitation averages 42 inches per year. Winter is typically cold with occasional nor'easters (storms that mainly affects the northeastern part of the United States), resulting in rain along the coast; springs are mild, with the average temperature in the 50's and common thunderstorms; summers are hot and humid, with rare hurricanes; and autumns are similar to spring in terms of temperature and precipitation, although unpredictable weather is common.

2.6.1.7 Topography, Geology, and Hydrogeology of the Two Sites

FTMM-02

FTMM-02 is located adjacent to Mill Creek to the north. The ground surface topography is flat, with ground surface elevations of less than 20 feet amsl. The landfill soil cover material ranges in thickness from 0 to 10 feet bgs with an average of 2.4 feet thick. Soil to a depth of at least 8 feet bgs at FTMM-02 is comprised of grey, black, and brown silty clay, tan and grey or brown silty sand with some gravel and clay, or brown and tan sand with some gravel. Shallow soil is comprised of brown silty sand, sometimes underlain by peat. Deeper soil is comprised of silt or silty sand (encountered at approximately 10 to 15 feet bgs) underlain by glauconitic soil (encountered at

approximately 15 to 20 feet bgs). The depth to groundwater typically is approximately 8 feet bgs. Groundwater consistently migrates towards the north-northwest, toward Mill Creek.

FTMM-08

FTMM-08 is located adjacent to Parkers Creek, bounding the site along the north, west, and east. The ground surface topography is flat, with ground surface elevations ranging from 5 to 13.5 feet amsl. The landfill soil cover material ranges in thickness from 0 to 4 feet bgs with an average of 2.4 feet thick. The soil cover is composed primarily of sand and silty sand. Shallow soil to a depth of 16 feet bgs is composed of brown silty sand underlain by gray/brown sandy silt. Deeper soil to a depth of 40 feet bgs is composed of orange/brown to dark green, poorly graded sand with silt. The depth to groundwater at FTMM-08 ranges from 1 to 19 feet bgs. Groundwater migrates northwest, north, and northeast (i.e., toward Parkers Creek).

2.6.2 Summary and Findings of Site Investigations

The following subsections describe environmental investigation activities for soil, groundwater, surface water, and sediments for both landfills covered by this ROD.

2.6.2.1 FTMM-02 Environmental Investigations

Soil

A total of 390 near-surface soil samples were collected from 193 borings from November 1998 to June 1999. The samples were collected between 6 and 12 inches bgs except for the volatile organic compound (VOC) samples, which were collected at approximately 24 inches bgs.

A total of 622 soil samples were collected and analyzed for total PCBs from 73 Geoprobe® borings in the eastern and western portions of FTMM-02 in February 1999 for a focused PCB soil investigation. Samples were collected continuously every six inches from the ground surface to the groundwater table, approximately 8 feet bgs.

A total of 208 soil samples were collected from Geoprobe® borings from March 1999 through January 2000 to delineate VOC (benzene and chlorobenzene) concentrations in the soil and shallow groundwater. Samples were collected continuously from the ground surface (1 foot bgs) to just below the groundwater table to 9 feet bgs.

Concentrations of one VOC, six semi-volatile organic compounds (SVOCs), three pesticides, five PCBs plus total PCBs, and 14 metals exceeded their current NJDEP Residential Direct Contact Soil Remediation Standard (RDCSRS) and/or USEPA Regional Screening Level (RSL) in at least one soil sample. VOCs, SVOCs, metals, pesticides, and PCBs were evaluated as COPCs in soil in the human health risk assessment (HHRA), and none were identified as COCs. However, the presence of PCBs in soil required further consideration based on the NJDEP Guidance on Coordination of NJDEP and USEPA PCB Remediation Policies (NJDEP, 2013).

A total of 37 soil samples were collected from 18 borings in September 2016 for the PDI. Samples were collected in two areas (central-west and central-east) at depths ranging from 3.3 to 8.5 feet bgs depending on historical concentrations and were analyzed for PCBs. Soil samples were collected until PCB concentrations were less than 25 mg/kg to determine the horizontal and vertical extent of the areas to be excavated.

Groundwater

Between 1995 and 2000, 24 groundwater monitoring wells were installed at FTMM-02 to investigate and monitor contaminants in groundwater. Groundwater sampling was conducted quarterly from May 1997 through 2013. Groundwater samples were analyzed for metals, VOCs, pesticides, PCBs, and SVOCs until June 2004 when the groundwater long-term monitoring (LTM) program was reduced to 16 wells and samples were analyzed only for VOCs based upon approval from the NJDEP. The sampling data from the most recent eight quarters (November 2009 to August 2011), the August 2013 Baseline Sampling Event (BSE) (Parsons, 2014), and the 2014 Annual Sampling Event (ASE) were evaluated as being representative of recent conditions. Following the recommendations in the August 2013 BSE report (Parsons, 2014), NJDEP subsequently agreed to the continuation of annual groundwater sampling for VOCs at select monitoring wells (NJDEP, 2014). VOCs and one metal were evaluated as COPCs for groundwater in the HHRA.

Injections of Oxygen Release Compounds (ORC) were performed at six distinct areas in and around FTMM-02 where elevated concentrations of VOCs (benzene and chlorobenzene) were detected in shallow groundwater. The NJDEP approved the implementation of an Enzyme-Enhanced Bioremediation program, supplemented by ORC. Four ORC injections events were performed at the landfill from March 2001 through July 2005 (U.S. Army, 2012).

Surface Water

To determine whether site-related contamination had impacted nearby surface waters, quarterly sampling was performed from October 1996 to September 2010. During the most recent eight quarters of surface water sampling (December 2008 to September 2010), two VOCs (tetrachloroethene [PCE] and trichloroethene [TCE]) were the only VOCs that exceeded NJDEP Surface Water Quality Standard (SWQS). However, it was determined that the PCE and TCE concentrations exceeding the SWQS originated from an offsite source and upstream of FTMM-02. No COPC were identified in the surface water for evaluation in the HHRA.

Sediment

Sediment sampling was conducted in April 2000 along Mill Creek to evaluate PCB-related impacts to stream sediments associated with FTMM-02. No PCBs were detected in the 26 samples above the NJDEP and USEPA criteria. No COPCs were identified in sediment for evaluation in the HHRA.

As part of the 2010 Baseline Ecological Evaluation (BEE) (Shaw, 2012), 12 sediment samples were collected from Mill Creek adjacent to FTMM-02. Samples were analyzed for VOCs, SVOCs, pesticides, PCBs, and metals. The BEE concluded that constituents in sediment at FTMM-02 were unlikely to have a deleterious effect on sensitive ecological receptors or habitats and additional assessments are not warranted or recommended.

2.6.2.2 FTMM-08 Environmental Investigations

Soil

A total of 614 near-surface soil samples were collected from 291 borings from November 1998 through June 1999. Samples collected at approximately 2 feet bgs were analyzed for VOCs, and samples collected between 0.5 and 1 foot bgs were analyzed for metals, SVOCs, pesticides, and PCBs. Concentrations of one VOC, 18 SVOCs, eight pesticides, three PCBs, and 17 metals

exceeded their current NJDEP RDCSRS and/or USEPA Residential Soil RSL in at least one near-surface soil sample (0 to 2 feet bgs). Concentrations of 14 SVOCs, six pesticides, three PCBs, and eight metals exceeded their NJDEP NRDCSRS and/or USEPA Industrial Soil RSL in at least one near-surface soil sample. Concentrations of 11 VOCs, 30 SVOCs, 10 pesticides, four PCBs, and 18 metals exceeded their NJDEP Impact to Groundwater (IGW) Screening Level (SL) and/or USEPA Protection of Groundwater RSL in at least one near-surface soil sample. The maximum-detected concentrations of all the metals targeted for analysis exceeded their maximum background concentrations for the MP. PCB concentrations exceeding NJDEP and USEPA screening criteria were also detected to a depth of 15.5 feet bgs in deeper borings. VOCs, SVOCs, metals, and PCBs were evaluated as COPCs in soil in the HHRA, and 6 SVOCs, one PCB, and one metal were identified as COCs.

Supplemental soil samples were collected from 22 soil borings in August and October 1999 near a well located in the center of the landfill for PCB-impacted soil delineation and to confirm that site soil was the source of PCB groundwater contamination. A total of 293 samples were collected from the surface to 0.5 feet bgs and then at alternating half foot intervals (1 to 1.5 feet, 2 to 2.5 feet, etc.) to depths of 7.5 to 16.5 feet bgs.

A total of 50 soil samples were collected from 27 borings in September 2016 for the PDI. Samples were collected in three areas (northeast, northwest, and central) at depths ranging from 1 to 15.5 feet bgs depending on historical concentrations and were analyzed for PCBs. Soil samples were collected until PCB concentrations were less than 25 mg/kg to determine the horizontal and vertical extent of the areas to be excavated.

Groundwater

In 1994, 1995, 1998, 1999, and in 2010, a total of 16 groundwater monitoring wells were installed at FTMM-08 to investigate and monitor contaminants in groundwater and to determine if leachate from the landfill was impacting groundwater quality. Quarterly groundwater monitoring occurred from June 1997 to August 2011. The sampling data from the most recent eight quarters (December 2009 to August 2011), the August 2013 BSE, and the 2014 ASE were evaluated as being representative of recent conditions. Following the recommendations in the August 2013 BSE report (Parsons, 2014), NJDEP subsequently agreed to the continuation of annual groundwater sampling for VOCs at select monitoring wells (NJDEP, 2014).

Injections of Hydrogen Releasing Compound (HRC[®]) were performed at two areas at FTMM-08 to enhance the degradation of PCE concentrations detected in shallow groundwater at adjacent landfill site FTMM-05 using naturally occurring microorganisms already present in the subsurface. The injections were performed over multiple 3- to 6-month time periods in 2000, 2002, 2003, 2004, and 2005 to facilitate the enhanced anaerobic degradation of PCE in groundwater.

Detected analyte concentrations were compared to Federal and State screening criteria for potable water, as well as MP-specific background concentrations for metals to identify COPCs. During this period, concentrations of 11 VOCs, one pesticide, and 19 metals exceeded their NJDEP GWQS and/or the USEPA Tapwater RSL in at least one sample. Concentrations of 13 of these 19 metals also exceeded the maximum background concentration for the MP. VOCs and one metal were evaluated as COPCs for groundwater in the HHRA.

Surface Water

To determine whether site-related contamination had impacted nearby surface waters, quarterly sampling was performed from October 1996 to September 2010. During the most recent eight quarters of surface water sampling (December 2008 to September 2010), two VOCs (PCE and cis-1,2-dichloroethene [cis-1,2-DCE]) and four metals (arsenic, mercury, thallium, lead) were detected at concentrations exceeding NJDEP SWQS. However, it was determined that PCE, cis-1,2-DCE, arsenic, mercury, and thallium concentrations exceeding the SWQS originated from an offsite source upstream of FTMM-08. The single exceedance of lead in downstream surface water was determined to be an anomaly and unrepresentative. No COPCs were identified in the surface water for evaluation in the HHRA.

Sediment

Sampling was conducted in Parkers Creek in April 2000 to evaluate PCB-related impacts to stream sediments associated with FTMM-08. One PCB (Aroclor 1254) was detected in two of 21 samples at concentrations that exceeded the NJDEP RDCSRS, Non-Residential Direct Contact Soil Remediation Standard (NRDCSRS), and the USEPA Residential and Non-Residential Soil RSL. Although PCBs were detected in near-surface soils at isolated locations at FTMM-08, Aroclor 1254 was not detected in the soil samples. Therefore, it is likely that one or more sources upstream or otherwise outside of FTMM-08 have contributed PCBs to the sediments in Parkers Creek and therefore there are no sediment COPCs.

A total of 10 sediment samples were also collected from Parkers Creek adjacent to FTMM-08 as part of the 2010 BEE (Shaw, 2012). Samples were analyzed for VOCs, SVOCs, pesticides, PCBs and metals. The BEE concluded that constituents in sediment at FTMM-08 were unlikely to have a deleterious effect on sensitive ecological receptors or habitats and additional assessments are not warranted or recommended.

2.7 CURRENT AND POTENTIAL FUTURE LAND AND RESOURCE USES

2.7.1 Current and Potential Land Use

The two sites have been inactive landfills since their respective closure dates (see Figure 3). The anticipated land use for the two landfills is passive open space (EDAW, Inc., 2008). Land planned for use as “open space” is expected to remain undeveloped, with only occasional maintenance activities (e.g., grounds keeping), utility work associated with underground or overhead utilities that may be present within the site boundary, and recreational activity (e.g., hiking and biking on established trails).

2.7.2 Groundwater and Surface Water Uses

Neither groundwater nor surface water are used as a drinking water source by current outdoor workers or indoor workers at FTMM, because municipal water is provided for use. Surface water at FTMM is not currently used for recreational purposes.

2.8 SUMMARY OF SITE RISKS

An HHRA evaluation of the potential risk from human exposure to contaminants in soil, surface water, sediment, and groundwater was conducted as part of the RI at each of the two landfills. The HHRA evaluated exposure of current/future outdoor workers, future utility workers, and future recreational users to COPCs in soil and groundwater through dermal contact, incidental

ingestion, and inhalation of particulates.

No COPCs were identified in surface water or sediment at either of the landfill sites. Therefore, further evaluation of surface water or sediment in the HHRA was not conducted and no unacceptable risks were expected from human exposure to surface water or sediment. Groundwater at FTMM is not used as a drinking water source, because municipal water is provided for use. Therefore, there are no current exposures to groundwater. The following sections summarize the HHRA results for each site.

2.8.1 FTMM-02 Summary of Site Risks

No COPCs were identified for surface water or sediment at FTMM-02; these media were not further evaluated in the HHRA. Site risk based on current and future land use as passive open space for current/future outdoor workers, utility workers, or future recreational users were less than the risk ranges of 1×10^{-4} to 1×10^{-6} for carcinogenic and non-carcinogenic hazard goal of 1 and when above these ranges remedial actions may be required. The results are summarized as follows:

- For outdoor workers exposed to soil at FTMM-02, the cumulative carcinogenic risk of 9×10^{-5} is less than 1×10^{-4} . The cumulative non-carcinogenic hazard is 0.8, which is less than the cumulative hazard goal of 1.
- For utility workers exposed to soil at FTMM-02, the cumulative carcinogenic risk of 1×10^{-6} is less than 1×10^{-4} . The cumulative non-carcinogenic hazard is 0.3, which is less than the cumulative hazard goal of 1.
- For recreational users exposed to soil at FTMM-02, the cumulative carcinogenic risk of 3×10^{-5} is less than 1×10^{-4} . The cumulative non-carcinogenic hazard is 0.1, which is less than the cumulative hazard goal of 1.
- Lead in soil was evaluated separately from the other constituents. The calculated non-carcinogenic hazards are 0.08, 0.05, and 0.02 for outdoor workers, utility workers, and recreational users, respectively. Lead hazards at FTMM-02 are less than the hazard goal of 1.
- For utility workers exposed to groundwater through dermal contact and incidental ingestion, the cumulative carcinogenic risks for all wells is 7×10^{-9} , which is less than 1×10^{-4} . The cumulative non-carcinogenic hazard for all wells is 0.02, which is less than the cumulative hazard goal of 1.

2.8.2 FTMM-08 Summary of Site Risks

No COPCs were identified for surface water or sediment at FTMM-08; these media were not further evaluated in the HHRA. Site risk based on current and future land use as passive open space for current/future outdoor workers, utility workers, or future recreational users were less than the risk ranges of 1×10^{-4} to 1×10^{-6} for the carcinogenic and non-carcinogenic hazard goal of 1 and when above these ranges remedial actions may be required. The results are summarized as follows:

- For outdoor workers exposed to soil at FTMM-08, the cumulative carcinogenic risk of 9×10^{-4} is greater than 1×10^{-4} , which is the cancer risk above which a remedial action

may be required. The cumulative non-carcinogenic hazard index is 2, which is greater than the cumulative hazard goal of 1.

- For utility workers exposed to soil at FTMM-08, the cumulative carcinogenic risk of 1×10^{-5} is less than 1×10^{-4} . The cumulative non-carcinogenic hazard is 0.6, which is less than the cumulative hazard goal of 1.
- For recreational users exposed to soil at FTMM-08, the cumulative carcinogenic risk of 3×10^{-4} is greater than 1×10^{-4} , which is the cancer risk above which a remedial action may be required. The cumulative hazard index is 0.3, which is less than the cumulative hazard goal of 1.
- Lead in soil was evaluated separately from the other constituents. The calculated non-carcinogenic hazards are 0.3, 0.2, and 0.1 for outdoor workers, utility workers, and recreational users, respectively. Lead hazards at FTMM-08 are less than the hazard goal of 1.
- For utility worker exposed to groundwater, the cumulative carcinogenic risks for all wells is 7×10^{-10} , which is less than 1×10^{-4} , which is the cancer risk above which a remedial action may be required. The cumulative non-carcinogenic hazard index for all wells is 0.04, which is less than the hazard goal of 1.

2.8.3 Ecological Risks

A BEE (Shaw, 2012) was performed at the MP and CWA to fulfill requirements set forth in NJDEP's TRSR (N.J.A.C. 7:26E-5.3). The objective of the BEE was to determine whether potential ecological impacts were negligible or whether more site-specific ecological evaluation was warranted. The BEE concluded that exceedances of ecological screening criteria have been sufficiently evaluated and addressed for ecological consideration and that no additional ecological evaluation was necessary. In an August 27, 2012 letter, the NJDEP accepted the 2012 BEE report's recommendations and conclusions and concurred that no further evaluation of ecological risk is required at either of the landfills.

2.9 REMEDIAL ACTION OBJECTIVES

The remedial action objective (RAO) for the FTMM-08 landfill site addressed in this ROD is to protect public health by preventing future workers and recreational users' exposure to COCs in soil and potential safety hazards that could pose an excessive carcinogenic risk or non-carcinogenic (non-cancer) hazard; and for FTMM-02 to protect future users from potential safety hazards associated with surficial construction/demolition debris and potential safety concerns associated with methane gas.

The cleanup levels and basis for the COCs at FTMM-08 are listed in **Table 3**.

Table 3
Cleanup Levels for COCs in Soil at FTMM-08

COC	Cleanup Level	Basis
SVOC		
Benzidine	700 micrograms per kilogram (µg/kg)	NJDEP NRDCSRS
Benzo(a)anthracene; Benzo(b)fluoranthene	2 mg/kg	NJDEP NRDCSRS
Benzo(k)fluoranthene	23 mg/kg	NJDEP NRDCSRS
Benzo(a)pyrene; Dibenz(a,h)anthracene	200 µg/kg	NJDEP NRDCSRS
PCB		
Aroclor 1242	25 mg/kg	TSCA
Metal		
Arsenic	19 mg/kg	NJDEP NRDCSRS

2.10 SELECTED REMEDY

This ROD represents the selected remedy for landfills FTMM-02 and FTMM-08 located at FTMM. A limited hot-spot PCB soil removal will be conducted at localized areas defined at each landfill where the PCB concentrations exceed 25 mg/kg. Following excavation and re-grading, a vegetated soil cover will be placed over the landfills. LUCs to maintain the soil cover and prevent residential land use will be implemented at the landfills. A passive methane mitigation system will be installed at FTMM-02 to address potential safety concerns. Two 100-foot-long trench systems will be located within the landfill boundary and vented to the surface in 25 foot centers. The location of the venting system will be installed along the south-eastern edge of the landfill to correspond with sampling points M2SG12 and M2SG22. The intent of this passive venting system is in lieu of continued methane monitoring at the landfill after the installation of the vegetative soil cover.

Containment is considered by USEPA to be a highly effective way to remediate historic landfills in many cases. USEPA has identified containment as a presumptive remedy for historic landfills because it repeatedly has been shown to be effective at treating similar wastes at other CERCLA sites. USEPA developed presumptive remedies to streamline the selection of cleanup methods for certain categories of sites by narrowing the consideration of cleanup methods to treatment technologies or remediation approaches that have a proven track record in the Superfund program. The Army, as lead agency, has determined that it is appropriate to apply the presumptive remedy of capping for these two landfills based on the soil and contaminant characteristics found at the site, and the guidance provided in the directive, Presumptive Remedy for CERCLA Municipal Landfill Sites, USEPA OSWER Directive No. 9355.0-49FS (September 1993). Further information on the selection of presumptive remedies for landfills at military installations is presented in the directive, *Application of the CERCLA Municipal Landfill Presumptive Remedy to Military Landfills*, EPA OSWER Directive No. 9355.0-67FS.

Restrictions on groundwater use will be placed on the groundwater at FTMM-02 and FTMM-08 to address exceedances of water quality standards at these landfills.

2.10.1 Summary of the Rationale for the Selected Response Action

The limited hot-spot PCB excavation, placement of a vegetative cover, and implementation of LUCs are appropriate responses for these two landfill sites. The USEPA considers sites to be remediated if PCB concentrations in soil do not exceed 1 mg/kg or if the final remedial levels are greater than 1 mg/kg and less than or equal to 25 mg/kg and the site is covered with an appropriate cap. Therefore, soils with PCB concentrations in excess of 25 mg/kg will be excavated from both FTMM-02 and FTMM-08, consistent with the coordination of NJDEP and USEPA PCB Remediation Policies (NJDEP, 2013). Excavated soils containing PCB concentrations less than 25 mg/kg will remain onsite and will be used to backfill the excavated areas at the landfills; and the excavated soils with concentrations greater than 25 mg/kg will be disposed of off-site at an approved TSCA facility.

The RI at FTMM-02 concluded that risks to human health and the environment from soil are within acceptable ranges. Although risks from soil, which included an assessment of PCBs in soil were within acceptable ranges, there are areas at FTMM-02 where PCBs were detected and due to their presence require further consideration based on NJDEP Guidance on Coordination of NJDEP and USEPA PCB Remediation Policies. The response action is to provide safety protection for non-residential use from future exposure to solid waste and potential safety concerns associated with methane gas at the landfill. At FTMM-08, the response action is to prevent chemical exposure and provide public health protection due to potential direct contact with COCs specifically polynuclear aromatic hydrocarbons (PAHs) and arsenic in near surface soils.

2.10.2 Detailed Description of the Implementation of Selected Remedy

A limited hot-spot PCB soil removal will be conducted at localized areas defined at each landfill where the PCB concentrations exceed 25 mg/kg. Excavation will be conducted at FTMM-02 in two areas (central-east and central-west) and at FTMM-08 in three areas (northeast, northwest, and central). A PDI was conducted at each site to determine lateral and vertical extent of PCB concentrations greater than TSCA cleanup level of 25 mg/kg. Based on historical data and the PDI results, areas to be excavated and disposed of off-site have been estimated. At FTMM-02, a total of 210 cubic yards of soil is expected to be excavated and at FTMM-08, a total of 60 cubic yards of soil is to be excavated.

Following excavation and re-grading, a vegetated soil cover will be placed over the landfills. To address safety concerns at FTMM-02 and to prevent chemical exposure at FTMM-08, a vegetated soil cover will be placed over the landfill area after the landfill is regraded. The conceptual design for the vegetated soil cover is shown on **Figure 6**. The vegetated soil cover will be placed consistent with the applicable NJDEP regulations. Additional soil will be added to the existing soil cover to provide a minimum of two feet of clean soil between the ground surface and landfilled debris. The use of a vegetated soil cover will offer safety protection to future users from exposure to landfill debris, to provide public health protection due to potential direct contact with COCs in near surface soils at FTMM-08, and will also control surface water runoff and erosion.

LUCs to maintain the soil cap and prevent residential land use will also be implemented at the landfills. The Army will prepare a LUCIP to set forth the manner in which the ICs will be implemented, document the location of the ECs, and identify the procedural responsibilities including landfill cover inspections, monitoring and reporting, and long-term management requirements.

The Army will be responsible for documenting and implementing the LUCs, which is expected to occur through the filing of a deed notice at the time of property transfer. The Army will also be responsible to conduct reviews to ensure that the LUCs remain protective of human health and the environment. When the property is transferred out of federal control, the LUCs will be incorporated into the title and the new owner will be responsible for complying with the LUCs. Although the Army may later transfer its procedural responsibilities to another party by contract, property transfer agreement, or through other means, the Army retains ultimate responsibility for remedy integrity.

In addition, the CEA/WRA at FTMM-02 will be revised and a CEA/WRA will be established at FTMM-08 to prevent access to and use of the groundwater underlying these landfills. ICs in the form of CEA/WRA will be implemented and will remain in place until NJDEP GWQS are achieved at the sites. CEA/WRA ensures groundwater in the area is restricted until standards are achieved.

2.10.3 Summary of the Estimated Costs for the Selected Remedy

The Army will be responsible for documenting and implementing the LUCs, through the filing of a deed notice and will also be responsible to conduct reviews to ensure that the LUCs remain protective of human health and the environment. When the property is transferred to private ownership, the LUCs will be incorporated into the title and the new owner will be responsible for complying with the LUCs. Although the Army may later transfer its procedural responsibilities to another party by contract, property transfer agreement, or through other means, the Army shall retain ultimate responsibility for remedy integrity.

The costs associated with the limited hot-spot soil removal, installation of the landfill covers, and the implementation and O&M of LUCs and CEA/WRA are summarized in **Table 4**.

2.11 STATUTORY DETERMINATIONS

The selected remedy satisfies the statutory requirements of CERCLA §121 and the NCP, as described below.

2.11.1 Protection of Human Health and the Environment

There were no unacceptable risks to human health and the environment at FTMM-02 but there were at FTMM-08 (specifically PAHs and arsenic), as defined by CERCLA, for the current and reasonably anticipated future use of the landfill sites which is passive open space at FTMM. Although risks from soil, which included an assessment of PCBs in soil were within acceptable ranges, there are areas at FTMM-02 where PCBs were detected and due to their presence required further consideration based on NJDEP Guidance on Coordination of NJDEP and USEPA PCB Remediation Policies. Human exposure to site soils will be controlled by the placement and maintenance of a vegetative soil cap and maintenance of LUCs at the sites. In addition, IC in the form of a CEA/WRA will be implemented for FTMM-02 and FTMM-08 and will remain in place until NJDEP GWQS are achieved at the sites. The RAOs would be achieved and selected remedy is considered protective of human health and the environment.

2.11.2 Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)

The selected remedy complies with the chemical- and action-specific ARARs described below.

Chemical-Specific ARARs

The GWQS (N.J.A.C. 7:9C-1.7(c), Appendix Table 1) are chemical-specific ARARs applicable to this ROD, and only apply to groundwater at FTMM-02 and FTMM-08. Groundwater at these two sites will be monitored biennially until such time it is determined that the following GWQS have been attained through natural attenuation:

Compound	Medium	USEPA Maximum Contaminant Level (µg/L)	NJDEP GWQS (µg/L)
<i>Landfill FTMM-02</i>			
Benzene	Groundwater	5	1
Methyl Tertbutyl Ether	Groundwater	No Level Established (NLE)	70
Tert Butyl Alcohol	Groundwater	NLE	100
<i>Landfill FTMM-08</i>			
Tetrachloroethene	Groundwater	5	1
4,4-DDD	Groundwater	NLE	0.1
Lead	Groundwater	15	5

The New Jersey Soil Remediation Standard (N.J.A.C. 7:26D-4.2) for PCBs is an applicable chemical-specific ARAR for the cleanup of PCBs in soil and, at 1.0 mg/kg for non-residential use, is more stringent than the federal standard of 25 mg/kg. However, where the remediated area will be covered, as the selected remedy for FTMM-02 and FTMM-08 requires, the residual risk from using a higher cleanup standard is addressed. Accordingly, the NJDEP has waived the soil remediation requirement of N.J.A.C 7:26D-4.2 because the soil cover and LUC components of the selected remedy address risk and protect human health and the environment.

Action-Specific ARARs

At the landfill sites, the vegetated soil cover will be placed consistent with N.J.A.C. 7:26E-5.2(d).

2.11.3 Cost-Effectiveness

The selected remedy meets the statutory requirement for a cost-effective remedy. The costs are presented Table 4.

Table 4
Estimated Costs for Selected Remedy

Cost	FTMM-02	FTMM-08
<i>Capital Costs</i>		
Limited PCB Removal	\$386,000	\$159,000
Land Use Controls	\$68,800	\$68,800
• LUC Implementation Plan	\$30,000	\$30,000
• Update Master Planning Maps	\$25,000	\$25,000
• Contingency (25%)	\$13,800	\$13,800
Landfill Cover	\$1,559,900	\$1,549,900
• Design and Construction	\$288,000	\$288,000
• Methane Mitigation System	\$10,000	\$0
• Soil Cover Installation	\$945,500	\$945,500
• Geotechnical Borings	\$6,400	\$6,400
• Contingency (25%)	\$310,000	\$310,000
<i>Total Capital Costs</i>	\$2,014,700	\$1,777,700
<i>Periodic Costs</i>		
Total Present Value Periodic Costs ^{a/}	\$330,000	\$345,000
<i>O&M Costs</i>		
Total Present Value O&M Costs ^{a/}	\$120,000	\$120,000
TOTAL PRESENT VALUE BY SITE ^{b/}	\$2,464,700	\$2,242,700
TOTAL PRESENT VALUE BOTH SITES	\$4,707,400	

^{a/} Discounted rate of 1.90% has not been applied to these values.

^{b/} Discounted rate of 1.90% has been applied; 30-Year, Real Discount Rate from White House Office of Management and Budget, Circular A-94 Appendix C, Revised December 2013

2.11.4 Utilization of Permanent Solutions and Alternative Treatment (or Resource Recovery) Technologies to the Maximum Extent Practicable

Active remediation is required to achieve the safety goals developed for these two sites. The selected remedy does not employ treatment to eliminate contaminants present at the site; however, the selected remedy satisfies the criteria for long-term effectiveness by preventing unacceptable exposures to site soil through maintenance of a vegetative cover. Permanent reduction of constituents will be accomplished through a limited PCB hot-spot soil removal of concentrations in excess of the TSCA self-implementing cleanup level of 25 mg/kg, installation of a vegetated soil cover, and enforcement of LUCs at the sites. The Army will be responsible for documenting

and implementing the LUCs, which is expected to occur through the filing of a deed notice at the time of property transfer, and would also be responsible to conduct reviews to ensure that the LUCs remain protective of human health and the environment. When the property is transferred out of federal control, the LUCs would be incorporated into the title and the new owner would be responsible for complying with the LUCs. Although the Army may later transfer its procedural responsibilities to another party by contract, property transfer agreement, or through other means, the Army would retain ultimate responsibility for remedy integrity.

2.11.5 Preference for Treatment as a Principal Element

The selected remedy does address principal threats posed by the sites through the use of treatment technologies of removal, containment, risk and hazard management whereas a limited PCB hot-spot removal and subsequent vegetated soil cover will be implemented and RAOs will be achieved. The selected response action is protective of human health and the environment. In addition, chemical concentrations of PCBs present in site media will be reduced via excavation and off-site disposal.

2.11.6 Five-Year Review Requirements

Because this response action will result in hazardous substances, pollutants, or contaminants remaining on site above levels that allow for unrestricted exposure, statutory reviews will be conducted every five years after initiation of the remedy to ensure it is, or will be, protective of human health and the environment, until such time it may be determined that the sites qualify for unrestricted use. Five-year reviews will be conducted in compliance with CERCLA §121(c) and the NCP §300.430(f)(5)(iii).

SECTION 3 - RESPONSIVENESS SUMMARY

3.1 PUBLIC ISSUES AND LEAD AGENCY RESPONSES

The final component of the ROD is the Responsiveness Summary. The purpose of the Responsiveness Summary is to provide a summary of the stakeholders' comments, concerns, and questions about the selected response action for the two sites and the Army's responses to these concerns.

Based on the lack of public comments, the community appears to be in support of the selected response action.

A newspaper notification inviting public comment on the Proposed Plan appeared in the Asbury Park Press on March 29 and 30, 2017. The public notice summarized the Proposed Plan and the preferred alternative. The notice also identified the time and location of the public meeting and specified a public comment period as well as the address to which written comments could be sent. Public comments were accepted from March 28, 2017 to April 27, 2017. The newspaper notification identified the Monmouth County Library, Eastern Branch, 1001 Route 35, Shrewsbury, New Jersey 07702 as the location of the FTMM Environmental Restoration Public Information Repository. The public notice and Proposed Plan were also posted on the FTMM Environmental Restoration website.

The public meeting was held on April 12, 2017 at Eatontown Public Library, 33 Broad Street, Eatontown, New Jersey. At this meeting, representatives from FTMM and the USACE were present with the Proposed Plan and were available to answer questions concerning the two landfills and the preferred remedy. There was no one in attendance from the public. The newspaper notification is included in Attachment 2.

3.1.1 Summary of Comments Received During the Public Meeting on the Proposed Plan and Agency Responses

There were no comments received during the public meeting, as there was no one present from the public.

3.1.2 Summary of Comments Received During the Public Comment Period on the Proposed Plan and Agency Responses

No written comments were received during the public comment period.

SECTION 4 - REFERENCES

- EDAW, 2008. Fort Monmouth Reuse and Redevelopment Plan. Prepared for Fort Monmouth Economic Revitalization Planning Authority, September.
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Attachment 1

Figure 1 – Fort Monmouth Location.....	A 1-1
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Figure 1 – Fort Monmouth Location

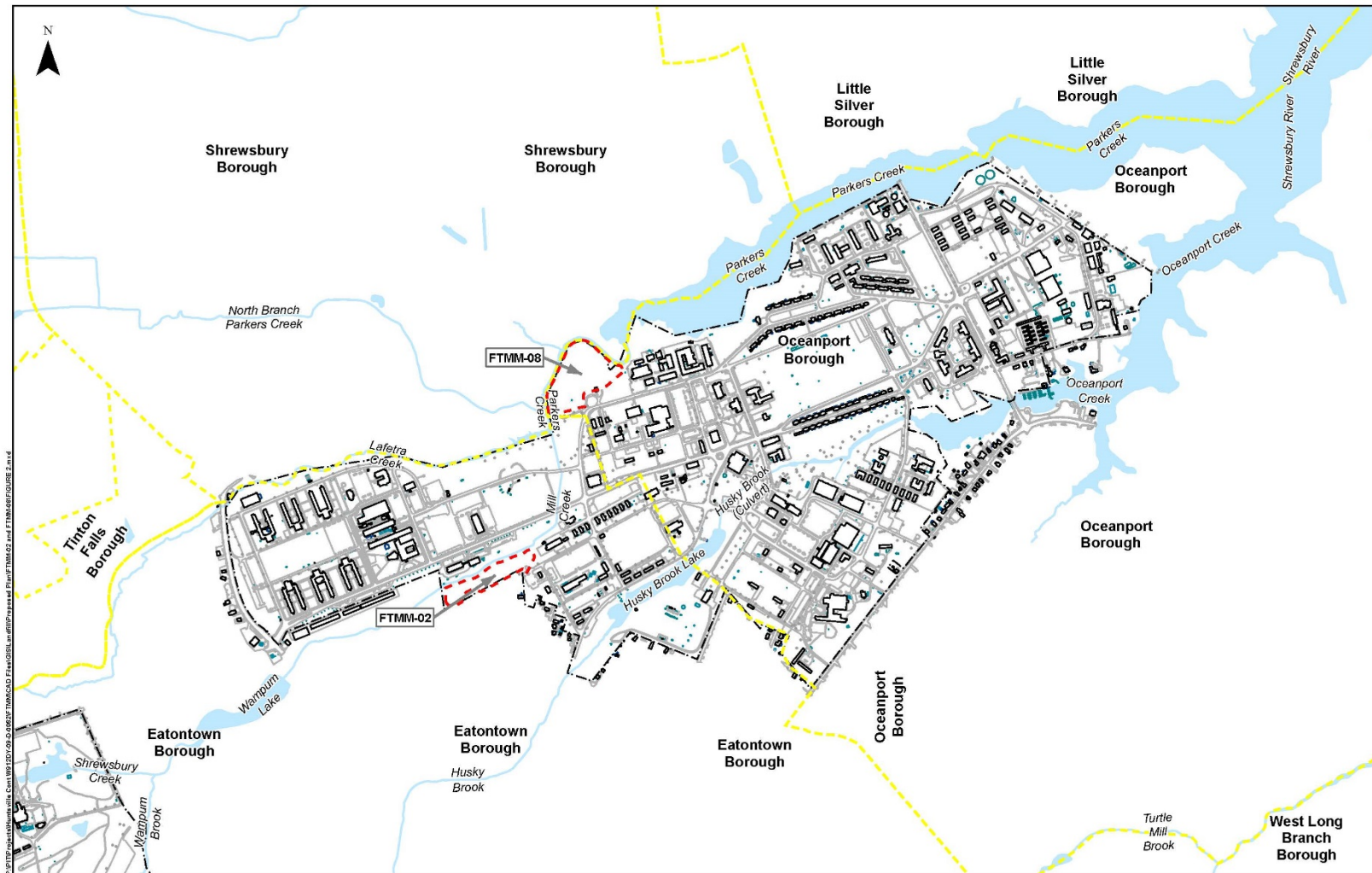
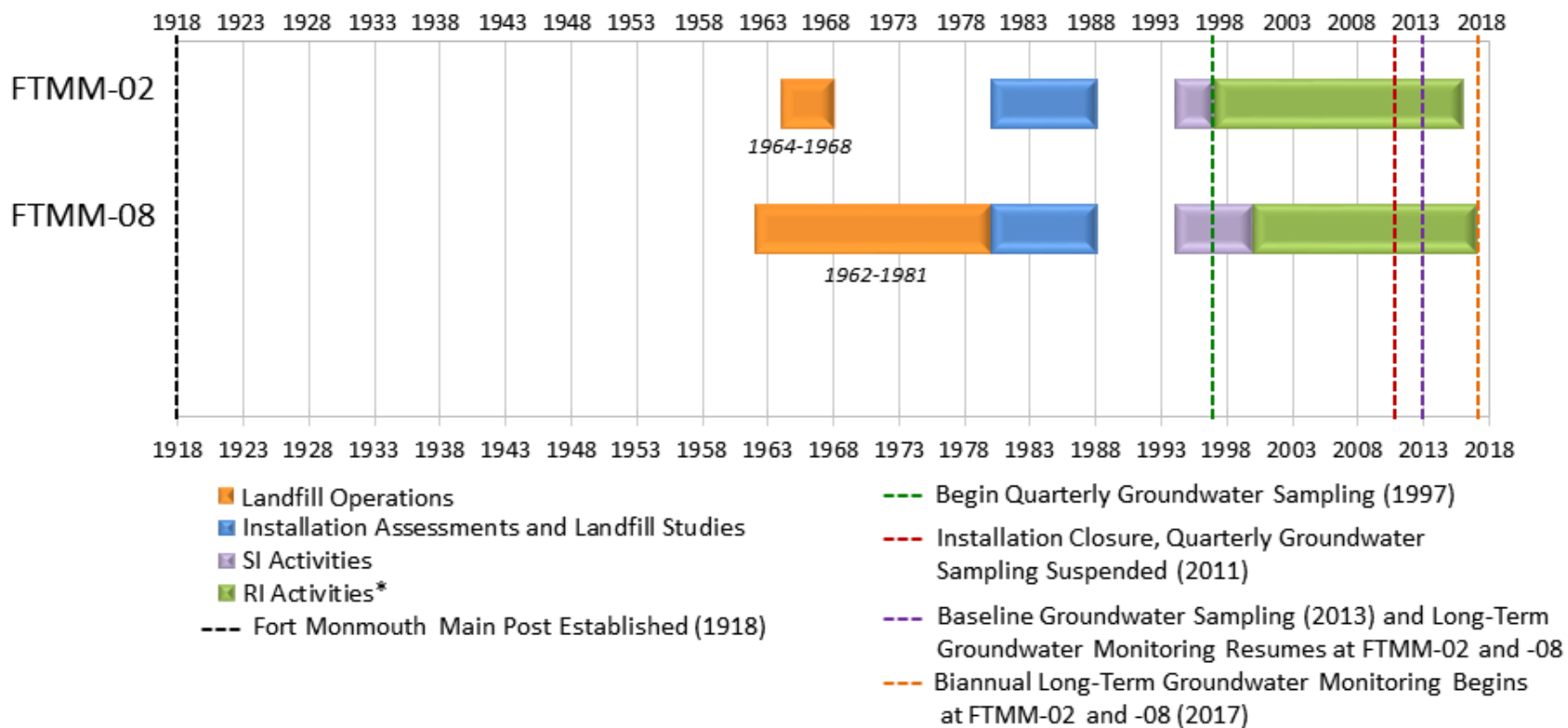


Figure 2 – Main Post Landfill Locations



*End date denotes NJDEP acceptance or anticipated acceptance of Final RI Report for FTMM-02 and Final RI/FS Report for FTMM-08.

Figure 3 – Timeline of Significant Events

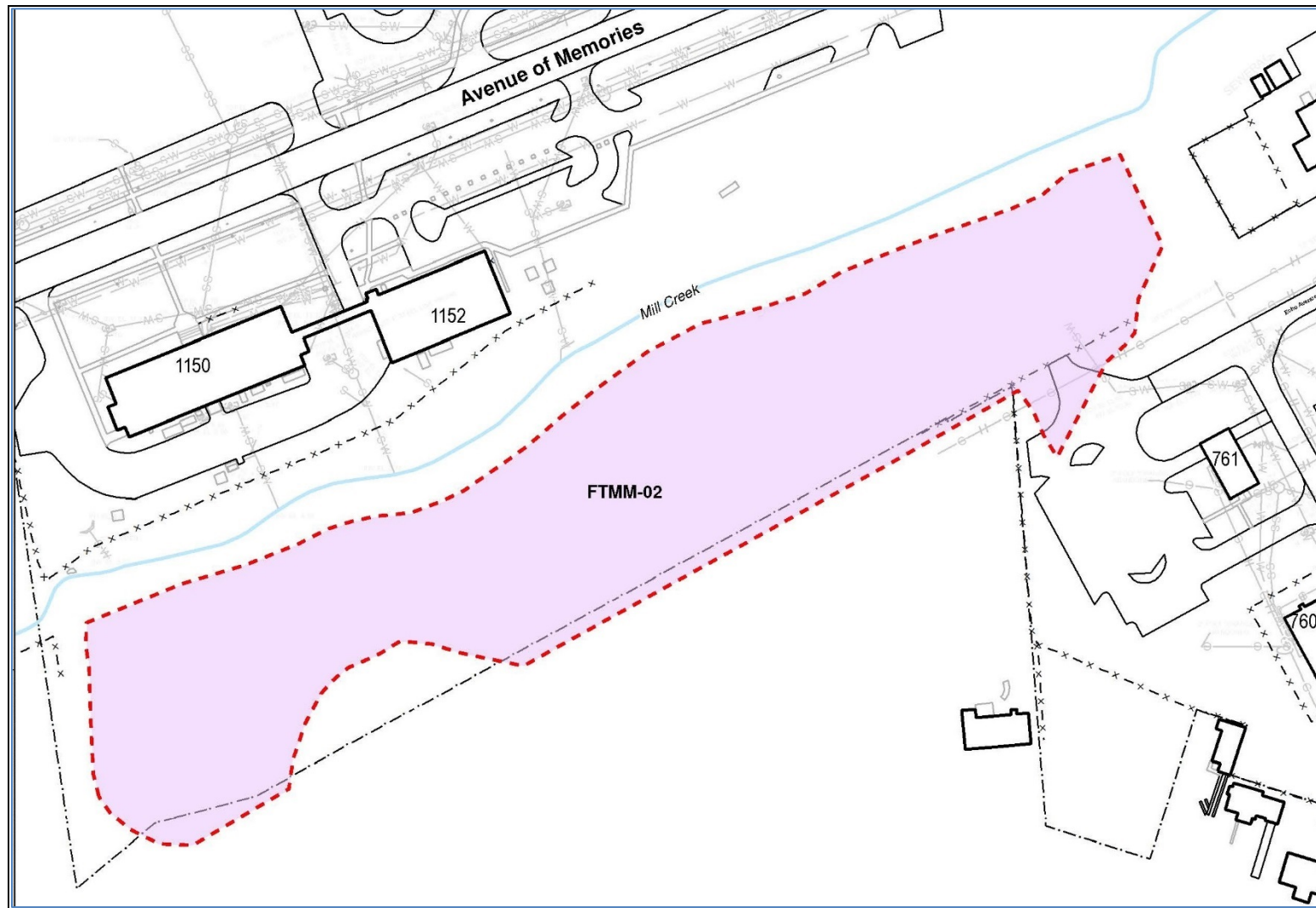


Figure 4 – FTMM-02 Site Boundary and Layout

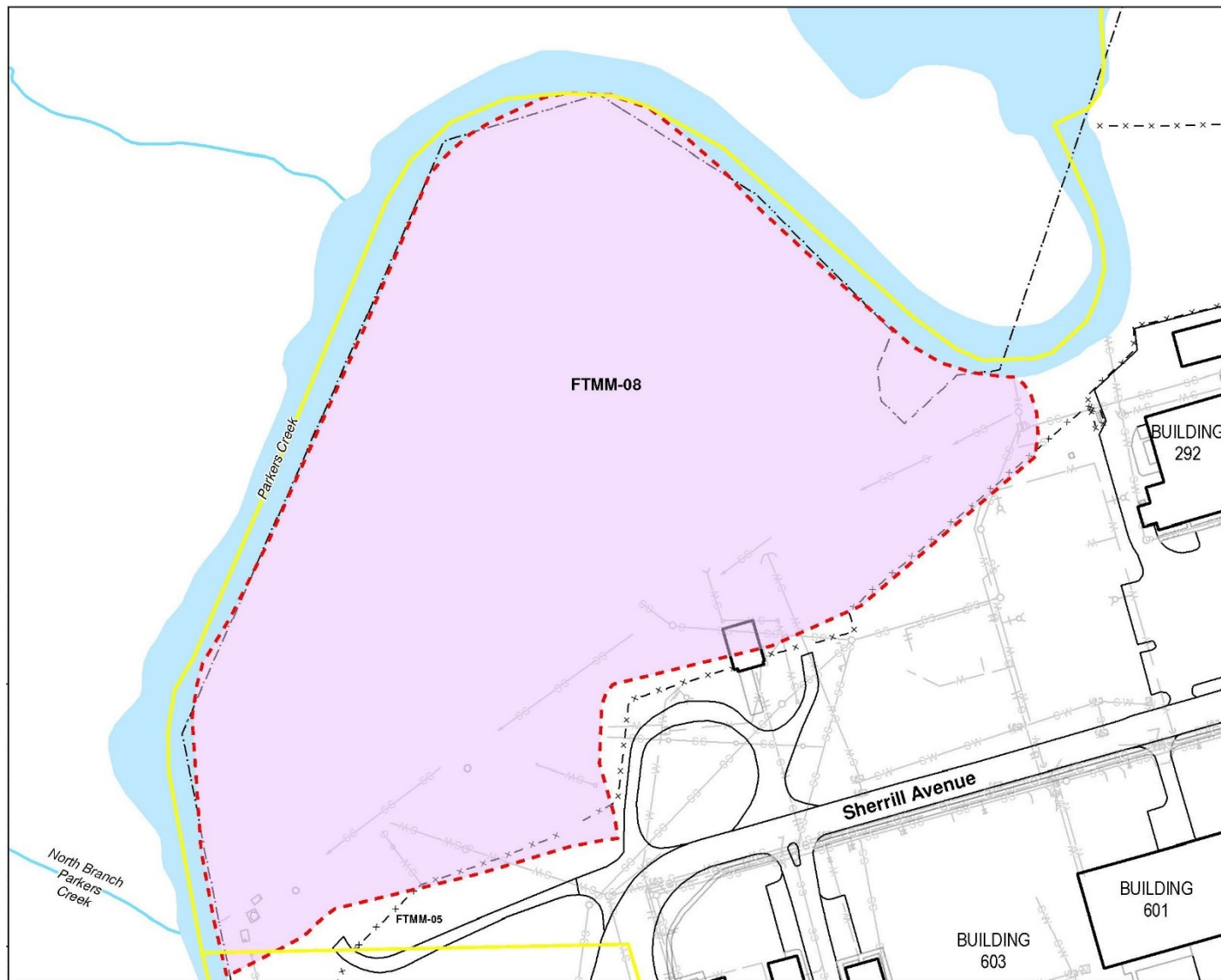


Figure 5 – FTMM-08 Site Boundary and Layout

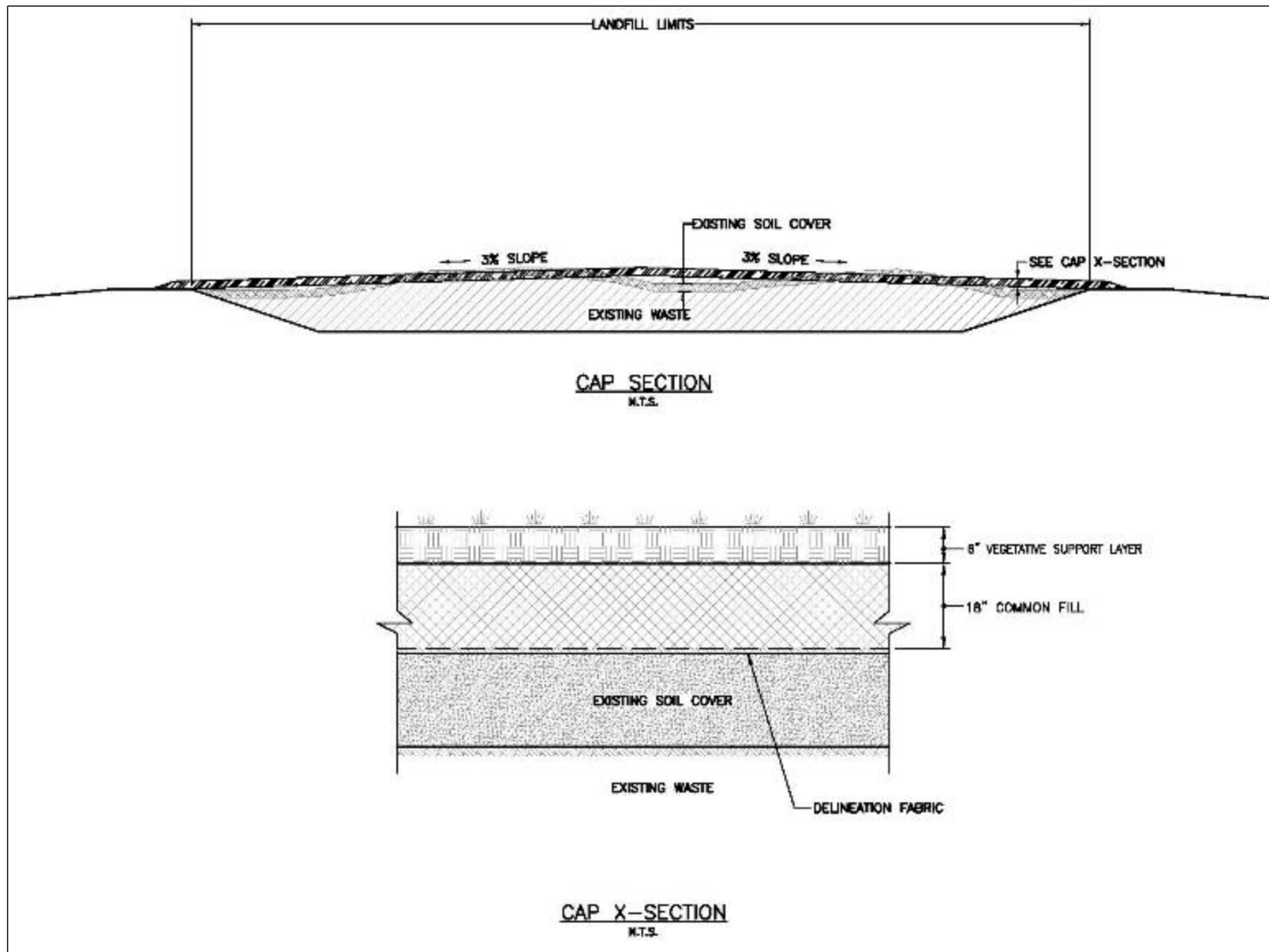


Figure 6 – Landfill Cover System Design

Attachment 2

Certificate of Publication for Public Notice and Public Meeting Record

AFFIDAVIT OF PUBLICATION

Publisher's Fee \$127.60 Affidavit \$35.00

State of New Jersey } SS.
Monmouth/Ocean Counties

Personally appeared Anastasia Sktsun

Of the **Asbury Park Press**, a newspaper printed in Freehold, New Jersey and published in Neptune, in said County and State, and of general circulation in said county, who being duly sworn, deposeth and saith that the advertisement of which the annexed is a true copy, has been published in the said newspaper 2 times, once in each issue as follows:

03/29/17, 03/30/17 A.D 2017



Ad Number: 0002025637

Melanie C Altz
Sworn and subscribed before me, this 10 day of April, 2017



MONMOUTH COUNTY

PUBLIC NOTICE

U.S. Army Corps of Engineers, NY District, Releases Proposed Plan for Landfill Sites FTMM-02 and FTMM-08

The U.S. Army Corps of Engineers New York District and the U.S. Army Engineering and Support Center, Huntsville (USAESCH), has prepared a Proposed Plan for two former landfills at Fort Monmouth (FTMM) in Oceanport, Monmouth County, New Jersey. The U.S. Army is the lead agency for FTMM in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and Executive Order 12580. New Jersey Department of Environmental Protection (NJDEP) is the state support agency under the National Contingency Plan for FTMM.

The Proposed Plan describes the preferred alternative of: limited excavations of polychlorinated biphenyl (PCB) contaminated soil in isolated areas at both landfills where PCB concentrations exceed the self-implementing clean-up level of 25 milligrams per kilogram; vegetated soil cover at FTMM-02 to provide safety protection for non-residential use from future exposure to solid waste; vegetative soil cover or functional equivalent (e.g., open field with porous pavement) at FTMM-08 to provide public health protection from constituents of concern in soils; and placement of institutional controls at both landfills.

Results from the remedial investigations (RIs) for FTMM-02 concluded that risks to human health and the environment from soil and groundwater at the landfills are within acceptable ranges for the current and future intended land use of passive open space. A Feasibility Study (FS) was conducted at FTMM-08, since there were unacceptable risks and hazards to human health associated with direct contact with constituents of potential concern in soil.

The Proposed Plan, the RI reports, the FS (at FTMM-08), and the full public record for the Sites, are available for review at the Monmouth County Library, Eastern Branch, 1001 Route 35, Shrewsbury NJ 07702. The Proposed Plan is also posted on the FTMM Environmental Restoration Program website (<http://www.pica.army.mil/ftmonmouth/>).

The New York District invites public comment on the Proposed Plan. Written comments will be accepted during a 30-day comment period starting March 28, 2017 and ending April 27, 2017. All comments must be postmarked by April 27 and mailed to the address below (or emailed by April 27 to william.r.colvin18.civ@mail.mil):

BRAC Environmental Coordinator
OACSIM - U.S. Army Fort Monmouth
Attn: Mr. William Colvin
P.O. Box 148, Oceanport, NJ 08641
(732) 380-7064

A public meeting on the Proposed Plan will be held on April 12, 2017 at 7 p.m. at Eatontown Public Library, 33 Broad Street, Eatontown, New Jersey 07724. The public is invited to attend and provide oral comments on the Proposed Plan at that time.
(\$127.60)

0002025637-01

U.S. ARMY FORT MONMOUTH
RESTORATION ADVISORY BOARD (RAB)

IN RE: FORT MONMOUTH)
RESTORATION ADVISORY BOARD)
MEETING)
)
) TRANSCRIPT OF:
)
) PROCEEDINGS
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_____)

TRANSCRIPT of the stenographic notes of
the proceedings in the above-entitled matter, as
taken by and before Colleen A. Brown, a Registered
Professional Reporter, Certified Court Reporter of
the State of New Jersey, held at the EATONTOWN PUBLIC
LIBRARY, 33 Broad Street, Eatontown, New Jersey, on
Wednesday, April 12, 2017, commencing at 7:00 p.m.

Job No. NJ2583298

A P P E A R A N C E S:

CHRISTINA L. GRILL, P.G.

FRANK ACCORSI, P.G.

JAMES T. MOORE, Project Manager

WILLIAM COLVIN, BRAC Environmental Coordinator

1 MR. COLVIN: Good evening. My name is
2 William Colvin and I am the BRAC environmental
3 coordinator for Fort Monmouth. At 7 o'clock we
4 opened our public meeting. The public notice was
5 properly placed in the newspaper with the appropriate
6 time and date cited, as well as that information
7 provided on our Picatinney website.

8 At 7:30, with no public participants
9 arriving, we officially closed the meeting. Thank
10 you very much. That's the end of our public meeting.

11 (The meeting concluded at 7:34 p.m.)
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CERTIFICATE

I, Colleen A. Brown, a Registered Professional Reporter and Certified Court Reporter of the State of New Jersey, authorized to administer oaths pursuant to R.S. 41:2-2, do hereby certify that prior to the commencement of the examination, the foregoing is a true and accurate transcript of the testimony as taken stenographically by and before me at the time, place and on the date hereinbefore set forth.

I DO FURTHER CERTIFY that I am neither a relative nor employee nor attorney nor counsel of any of the parties to this action, and that I am neither a relative nor employee of such attorney or counsel, and that I am not financially interested in the action.



Certified Court Reporter, State of New Jersey
CCR License No. 30X100214500
Registered Professional Reporter, ID No. 830937
Dated: April 24, 2017

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