
RECORD OF DECISION FOR FTMM-22 AT FORT MONMOUTH

OCEANPORT, MONMOUTH COUNTY, NEW JERSEY

September 2018



U.S. Corps of Engineers, New York District
and
U.S. Army Engineering and Support Center, Huntsville, Alabama



New Jersey Department of Environmental Protection

Site Remediation Program

Report Certifications for RCRA GPRA 2020, CERCLA, and Federal Facility Sites

These certifications are to be used for reports submitted for RCRA GPRA 2020, CERCLA, and Federal Facility Sites. The Department has developed guidance for report certifications for RCRA GPRA 2020, CERCLA, and Federal Facility Sites under traditional oversight. The "Person Responsible for Conducting the Remediation Information and Certification" is required to be submitted with each report. For those sites that are required or opt to use a Licensed Site Remediation Professional (LSRP) the report must also be certified by the LSRP using the "Licensed Site Remediation Professional Information and Statement". For additional guidance regarding the requirement for LSRPs at RCRA GPRA 2020, CERCLA and Federal Facility Sites see http://www.nj.gov/dep/srp/srra/training/matrix/quick_ref/rcra_cercla_fed_facility_sites.pdf.

Document: Final Record of Decision (ROD) for FTMM-22 at Fort Monmouth

PERSON RESPONSIBLE FOR CONDUCTING THE REMEDIATION INFORMATION AND CERTIFICATION

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This certification shall be signed by the person responsible for conducting the remediation who is submitting this notification in accordance with Administrative Requirements for the Remediation of Contaminated Sites rule at N.J.A.C. 7:26C-1.5(a).

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein, including all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, to the best of my knowledge, I believe that the submitted information is true, accurate and complete. I am aware that there are significant civil penalties for knowingly submitting false, inaccurate or incomplete information and that I am committing a crime of the fourth degree if I make a written false statement which I do not believe to be true. I am also aware that if I knowingly direct or authorize the violation of any statute, I am personally liable for the penalties.

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11 September 2018

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LIST OF ACRONYMS

ACRONYM	DEFINITION
μg/kg	micrograms per kilograms
°F	°Fahrenheit
amsl	above mean sea level
ARAR	Applicable or Relevant and Appropriate Requirement
Army	the U.S. Army
bgs	below ground surface
BRAC	Base Realignment and Closure
BEE	Baseline Ecological Evaluation
CEA	Classification Exception Area
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
<i>cis</i> -1,2-DCE	<i>cis</i> -1,2-dichloroethene
COC	Contaminants of concern
COPC	Contaminants of potential concern
COPEC	Constituents of Potential Ecological Concern
CSM	Conceptual Site Model
CWA	Charles Wood Area
EA	Evans Area
EC	engineering controls
FS	Feasibility Study
FTMM	Fort Monmouth
GES	Groundwater & Environmental Services
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
MNA	Monitored natural attenuation
MP	Main Post
NCP	National Contingency Plan
N.J.A.C.	New Jersey Administrative Code
NJDEP	New Jersey Department of Environmental Protection
NPW	net present worth

ACRONYM	DEFINITION
NRDCSRS	Non-Residential Direct Contact Soil Remediation Standard
O&M	operation and maintenance
ORC	Oxygen Release Compound
PCB	polychlorinated biphenyls
RAOs	remedial action objectives
RAWP	Remedial Action Workplan
RDCSRS	Residential Direct Contact Soil Remediation Standard
R&D	Research and Development
RI	remedial investigation
ROD	Record of Decision
RSL	Regional Screening Level
SL	screening level
SVOC	semivolatile organic compound
TCE	trichloroethene
TRSR	Technical Requirements for Site Remediation
TMV	Total mobility or volume
USACE	U.S. Army Corps of Engineers
USAEHA	U.S. Army Environmental Hygiene Agency
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
UU/UE	Unlimited use and unlimited exposure
VC	vinyl chloride
VOC	volatile organic compound
WRA	Well Restriction Area

SECTION 1 - DECLARATION

1.1 SITE NAME AND LOCATION

This Record of Decision (ROD) presents the remedy for Site FTMM-22 located at Former Fort Monmouth (FTMM) in Tinton Falls, Monmouth County, New Jersey. FTMM was comprised of the Main Post (MP), 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. FTMM-22 is located in the CWA in the Eatontown and Tinton Falls Boroughs.

1.2 STATEMENT OF BASIS AND PURPOSE

The Army has selected a remedy 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 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. The Army has selected the remedy for FTMM-22. The NJDEP is the state support agency under the NCP for FTMM and concurs with the remedy as indicated in their October 31, 2017 acceptance letter of the January 2017 Remedial Investigation/Feasibility Study (RI/FS) Report for the site. The decision documented in this ROD is based on and relies on the Administrative Record file for FTMM.

The Army held a public meeting on 14 June 2018 to present the Proposed Plan for FTMM-22; however, no one from the public was in attendance. No public comments on the Proposed Plan for the FTMM-22 site were received during the Public Comment Period (31 May through 29 June 2018).

1.3 ASSESSMENT OF THE SITE

The response action selected in this ROD is necessary to protect public health and welfare by preventing exposure to groundwater containing volatile organic compounds (VOCs) at concentrations posing a risk to human health.

1.4 DESCRIPTION OF THE SELECTED REMEDY

The preferred alternative for FTMM-22 is source removal through direct excavation of the remaining portions of the concrete lime pit structure. Any potentially impacted soil beneath the concrete structure and debris will be removed from the excavation. Land use controls (LUCs) will be prepared to control exposure to contaminants of concern (COC) in groundwater where unacceptable risk or hazard is possible and monitored natural attenuation (MNA) to document the natural degradation of VOCs in groundwater.

LUCs will be used to prevent uncontrolled exposure of potential receptors to contaminated media. A groundwater use restriction, in the form of a groundwater Classification Exception Area

(CEA)/Well Restriction Area (WRA), will be implemented and will remain in place until NJDEP Groundwater Quality Standards (GWQS) for the identified COCs are achieved at the site. The CEA/WRA will include sampling every other year and two sampling rounds during the final year. The Army will prepare a land use control implementation plan (LUCIP) to document the institutional controls (ICs) and identify procedural responsibilities including groundwater monitoring and MNA reporting, and long-term stewardship responsibilities.

The planned future use of FTMM-22 is Technical, Office, and Research and Design (R&D) Campus which, at the time the Human Health Risk Assessment (HHRA) was prepared, was considered open space. The Conceptual Site Model (CSM) and HHRA presented in the RI/FS Report were reviewed for applicability to the revised future land use. It was determined that the CSM did not explicitly consider indoor worker exposure to VOCs in groundwater through vapor intrusion into a hypothetical future building. However, risk associated with vapor intrusion was quantitatively evaluated under the Unlimited Use/Unlimited Exposure (UU/UE) scenario which considers long-term exposure of children and adults to potentially contaminated environmental media. Since the results of the vapor intrusion risk assessment for UU/UE can be used to represent the indoor worker scenario, the HHRA results were used to evaluate the potential risk to the indoor worker through vapor intrusion. Activity use restrictions will be required to prevent soil vapors from entering structures (e.g., installation of sub-slab vapor removal system) for any future building constructed at FTMM-22 as long as groundwater contaminant concentrations are above the NJDEP GWQS. When the property is transferred to private ownership out of federal control, the LUCs will be recorded against the property 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 will retain ultimate responsibility for remedy integrity until groundwater contaminant concentrations are in compliance with the NJDEP GWQS.

1.5 STATUTORY DETERMINATIONS

The selected remedy provides protection from exposure to COCs in groundwater 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.

CERCLA §121 requires 5-year 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) until groundwater contaminant concentrations are in compliance with the NJDEP GWQS.

1.6 DATA CERTIFICATION CHECKLIST

Table 1 provides the location of key remedy selection information contained in ROD Section 2, 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 source removal of the remaining concrete pit and potentially impacted soil beneath it, MNA for groundwater, and implementation of LUCIP until groundwater contaminant concentrations are in compliance with the NJDEP GWQS. In addition, the NJDEP acceptance of the ROD is documented in their October 2017 concurrence letter.



Thomas E. Lederle, Chief U.S. Army BRAC Division

5 September 2018

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 of FTMM. 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 Base Realignment and Closure (BRAC) Commission in 2005, and officially closed on 15 September 2011. The EA was closed under BRAC in 1998 and has since been transferred from FTMM.

This ROD only addresses FTMM-22. The location of FTMM-22 is shown on **Figure 2**. A summary description of the site is presented below. A detailed description of FTMM-22, as well as a compilation of previous investigations and an evaluation of available analytical data collected from the site, can be found in the approved RI/FS Report (Parsons, 2017).

2.2 FTMM-22 SITE BACKGROUND

FTMM-22 is located in the western part of the CWA within the courtyard of Building 2700 (**Figure 2**). The site encompasses a former lime pit that was used to pre-treat acidic liquid wastes produced in the laboratories and workshops in Building 2700 from 1952 to the late 1980s. The lime pit (10 feet wide x 20 feet long) was constructed in 1952 with a concrete bottom and concrete block and mortar walls that extended to approximately 12 feet bgs.

The United States Army Environmental Hygiene Agency (USAEHA, 1976) sampled the effluent from Building 2700 from 1974 to 1975 and identified contaminated wastewater discharges resulting from then-current industrial processes.

In October 1992, the pit was cleaned out, inspected, and the limestone chips replaced (Groundwater & Environmental Services, Inc. [GES], 2001). VOCs, semi-volatile organic compounds (SVOCs), and metals were detected in samples collected during the clean-out. As a result, numerous investigations were conducted at FTMM-22 over the past 25 years.

The lime pit was decommissioned in 2001. The remaining limestone chips were excavated and disposed off-site. A limited removal effort was conducted and part of the concrete lime pit sidewalls were removed and disposed off-site. The concrete bottom of the pit and about 3 feet of the adjacent surrounding sidewalls were left in place (Handex, 2004). The pit was subsequently backfilled with clean fill and approximately 174 cubic yards of concrete and soil were excavated and disposed off-site.

2.3 COMMUNITY PARTICIPATION

The final Proposed Plan for FTMM-22 was placed in the FTMM Environmental Restoration Program Public Information Repository on 30 May 2018. The repository is located at the Monmouth County Library, Eastern Branch, 101 Route 35, Shrewsbury, New Jersey 07702.

A newspaper notification was posted in the Asbury Park Press and on the FTMM Environmental Restoration Program website on 29 May 2018. These notifications informed the public of the start of the comment period, to solicit comments from the public, and to announce the public meeting. The public comment period was held from 31 May 2018 to 29 June 2018.

during which no comments from the public were received. A public meeting was held on 14 June 2018 to present the proposed remedy for FTMM-22 and seek public comments. At this meeting, representatives from the Army and U.S. Army Corps of Engineers (USACE) and FTMM were present to answer questions about FTMM-22 and the 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

The future use of FTMM-22 is planned to be Technical, Office, and R&D Campus. At the time the HHRA was performed, future use was considered open space. The CSM and HHRA presented in the RI/FS Report were reviewed for applicability to the planned future land use as Technical, Office, and R&D Campus. Based on this review, it was determined that evaluation of the UU/UE scenario would adequately evaluate exposure of indoor workers associated with future development to soil at FTMM-22. The UU/UE scenario, which considers long-term exposure of children and adults to potentially contaminated environmental media, was evaluated in the approved RI to allow risk management decisions to be made regarding restrictions on future use of the property.

The HHRA concluded that there was a potential risk to receptors exposed to groundwater, either directly (i.e., domestic use of groundwater) or through volatilization into buildings (i.e., vapor intrusion). A FS was conducted to address potential risks associated with exposure to contaminants in groundwater as identified in the HHRA.

This ROD describes the remedy to address groundwater contamination at FTMM-22. Since unlimited use of groundwater and vapor intrusion of volatile COCs from groundwater to indoor air poses a risk in the future use scenario, the site would not be eligible for unrestricted use without further remedial actions.

The remedy utilizes:

- Source removal, through direct excavation of the remnants of the concrete lime pit structure and any potentially impacted soil beneath it. The excavation will be backfilled up to grade with clean fill;
- LUCs in the form of CEA/WRA to control exposure to COC in groundwater where unacceptable risk or hazard is possible, and
- MNA to document the natural degradation of VOCs in groundwater.

2.5 DOCUMENTATION OF SIGNIFICANT CHANGES

The Proposed Plan for FTMM-22 was released for public comment on 30 May 2018. 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 FTMM CWA, as well as those of FTMM-22 (see Section 2.6.1.7). The RI/FS Report includes detailed descriptions of the physiography, topography, vegetation, geology, hydrogeology, and surface water at FTMM-22.

2.6.1.1 Physiography, Topography, and Vegetation

The FTMM MP and CWA are 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 of CWA 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 CWA consist of extensive areas of regularly mowed lawns and landscaped areas.

2.6.1.2 Geology

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 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 underlies the northern portion of the CWA, 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 and CWA 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 at the CWA is typically encountered at shallow depths (6 to 10 feet bgs). Shallow groundwater in the CWA area is locally influenced by the following factors:

- Topography;
- Nature of the fill material within the CWA 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, Groundwater Quality Standards, establishes groundwater 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 FTMM. The primary designated use for Class II-A groundwater is potable water; secondary uses include agricultural and industrial water.

2.6.1.4 Surface Water

Wampum Brook is located to the south of the CWA, and Shrewsbury Creek traverses the CWA from west to east. Shrewsbury Creek and Wampum Brook merge approximately 300 feet east of the CWA to form Mill Creek. No other surface water bodies were identified within one mile of the CWA. The closest surface water body to FTMM-22 is Shrewsbury Creek, located approximately 700 feet southeast of the site.

Several CWA wetland areas are identified on the U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory. Most of Shrewsbury Creek and Wampum Brook are classified as fresh water forested/shrub wetland, and the open water in the golf course in the eastern portion of the CWA is classified as a fresh water pond.

2.6.1.5 Soils

According to the Monmouth County Soil Survey (U.S. Department of Agriculture [USDA], 2008), the CWA is covered by less urban land complexes than the MP. Surface soils near the CWA 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 CWA are covered by impermeable surfaces such as roads, parking lots, and buildings.

2.6.1.6 Climate

The climate in the FTMM 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, 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 FTMM-22

The ground surface topography at FTMM-22 is relatively flat with a gentle slope to the southeast toward Shrewsbury Creek. Much of the ground surface at the site is grass-covered and mowed.

FTMM-22 overlies the unconsolidated unit of the Vincentown Formation, according to the Bedrock Geologic Map of the Long Branch Quadrangle (Stanford and Sugarman, 2010). Naturally deposited surficial soils also exist above the unconsolidated unit (Stanford, 2000). GES (2001) stated that subsurface materials in the area of the former lime pit consist of generally well compacted, stratified, glauconitic silty sand with laterally discontinuous, alternating clay and silt lenses. The stratigraphy from approximately 17 to 25 ft bgs consists of silty, clayey, fine sand that potentially represents a semi-confining unit, separating predominantly sand units above 17 feet and below 25 feet.

The depth to groundwater in the FTMM-22 area is approximately 8 ft bgs. Groundwater flow in the shallow (water table to approximately 18 ft bgs) and deep (approximately 25 to 40 ft bgs, below the potential semi-confining unit described above) water-bearing zones is typically to the east towards Shrewsbury Creek.

2.6.2 Summary and Findings of Site Investigations

The following subsections describe environmental investigation activities for soil and groundwater for FTMM-22 covered by this ROD.

2.6.2.1 Soil

One soil sample was collected from each of four monitoring well boreholes in December 1994 as part of the SI (Weston, 1995), and analyzed for VOCs, SVOCs, pesticides, polychlorinated biphenyls (PCBs), and metals. The samples were collected between 7 and 9 inches bgs.

A total of 6 subsurface soil samples were collected and analyzed for VOCs in 1996 as part of a supplemental SI (Weston, 1996). Samples were collected from two depth intervals during the installation of wells CW1MW281 (18.8-19.4 and 38.0-39.2 ft bgs), CW1MW282 (6-8 and 38-40 ft bgs), and CW1MW291 (6-7.3 and 32-32.4 ft bgs).

From July to December 1999, 63 soil borings were advanced and a total of 63 soil samples were collected for laboratory analysis of VOCs. Samples were collected continuously from the ground surface to just below the groundwater table, 9 feet bgs.

Three soil borings were advanced around the former Lime Pit during the January 2014 RI sampling event, with two soil samples collected and analyzed at each location. Soil samples were analyzed for VOCs. Analytical results showed no exceedances of NJDEP or U.S. Environmental Protection Agency (USEPA) direct contact or impact to groundwater/ groundwater protection comparison criteria.

Based on comparison to USEPA Residential Regional Screening levels (RSLs) and (in the case of metals) maximum background concentrations presented in Weston (1995), the only contaminants of potential concern (COPC) identified in soil that were evaluated in the HHRA included benzo(a)pyrene and hexavalent chromium.

2.6.2.2 Groundwater

Between 1994 and 2000, 21 groundwater monitoring wells were installed at FTMM-22 to investigate and monitor contaminants in groundwater. Quarterly groundwater sampling was performed at the site from April 1997 to August 2011 using a network of up to 19 monitoring wells. An additional sampling event was performed in August 2013 to reestablish baseline conditions after the FTMM closed in September 2011. Groundwater samples were also collected from January 2014 through June 2015 as part of quarterly monitoring events. Quarterly groundwater monitoring was temporarily suspended during the RI/FS process as agreed to by NJDEP in their March 2016 letter. Future groundwater monitoring is planned once the lime pit is removed.

Groundwater monitoring data for January 2010 through June 2015 were evaluated as being representative of recent aquifer conditions. Detected analyte concentrations were compared to NJDEP GWQS and USEPA Tapwater Regional Screening Levels (RSL) as well as FTMM-specific background concentrations for metals to identify COPCs. Concentrations of seven VOCs and 16 metals exceeded the NJDEP GWQS and/or USEPA Tapwater RSL in at least one sample during this 5.5-year time period. COPCs in groundwater evaluated in the HHRA included the VOCs *cis*-1,2-dichloroethene (DCE), 1,2,4-trichlorobenzene, trichloroethene (TCE), and vinyl chloride (VC); and the metal, hexavalent chromium.

Injections of RegenOx, a chemical oxidant, were performed in the vicinity of recovery well CW1RW01 where elevated concentrations of VOC were detected in the groundwater. A Permit By Rule for the injections was submitted to the NJDEP by the Army. Three injections events were performed from December 2010 through September 2011 (FTMM, 2010) to reduce the TCE concentrations detected in one groundwater monitoring well which consistently exceeded the NJDEP GWQS.

2.6.2.3 Soil Gas/Indoor Air

Near-slab soil gas samples and indoor air samples were collected adjacent to and within Building 2700, respectively, in 2007. A subsequent sampling event in 2012 included collection of sub-slab soil gas samples and indoor air samples beneath and within Building 2700, respectively. Comparison of sampling results to current NJDEP screening levels for soil gas and indoor air did not reveal exceedances that indicate a current vapor intrusion threat or risk to Building 2700 related to FTMM-22. The NJDEP approved the Final Vapor Intrusion SI Report for the MP and CWA in their July 22, 2013 letter (NJDEP, 2013).

2.7 CURRENT AND POTENTIAL FUTURE LAND AND RESOURCE USES

2.7.1 Current and Potential Land Use

FTMM-22 has been inactive since the late 1980s. The anticipated land use for the site was identified as passive open space (EDAW, Inc., 2008) and was changed to Technical, Office, and R&D Campus per N.J.A.C. 19:31C-3.

2.7.2 Groundwater and Surface Water Uses

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

2.8 SUMMARY OF SITE RISKS

According to the Baseline Ecological Evaluation (BEE), Building 2700 which includes FTMM-22 has a low potential for ecological effects from Constituents of Potential Ecological Concern (COPEC) and recommended “No Additional Ecological Assessment.” Therefore, ecological risk evaluation was not performed at FTMM-22.

A HHRA, conducted as part of the RI, evaluated the potential risks to human health from exposure to contaminants in soil and groundwater. Based on the CSM, the HHRA quantitatively estimated the risk and hazard associated with exposure to contaminated soil and groundwater under an UU/UE scenario and a utility worker scenario. The UU/UE was evaluated as a receptor since it represents a worst-case exposure scenario, in that it looks at long-term exposure of children and adults to potentially contaminated environmental media. The UU/UE scenario is evaluated to allow risk management decisions to be made regarding restrictions on future use of the property. The utility worker scenario represents a worker involved in a short-term excavation project (such as installation of underground utilities) resulting in exposure to subsurface soil, as would be expected during redevelopment of a parcel of land.

The exposure pathways evaluated for each receptor are summarized below

UU/UE receptor

- Soil: incidental ingestion, dermal contact, and inhalation of ambient dust and vapors in ambient air;
- Groundwater (as potable water source): ingestion, dermal contact, and inhalation of volatiles;
- Vapor intrusion: inhalation of volatile compounds migrating from groundwater to indoor air

Utility Worker receptor

- Soil: incidental ingestion, dermal contact, and inhalation of ambient dust and vapors in ambient air;
- Groundwater: incidental ingestion, dermal contact, and inhalation of volatile contaminants

The HHRA quantifies the potential exposure of each receptor to COCs in soil and/or groundwater and uses the estimated exposure to estimate carcinogenic risks and noncarcinogenic hazard indices. Carcinogenic risks greater than 1×10^{-4} , and noncarcinogenic hazard indices greater than 1 may require remedial action, while carcinogenic risk less than or equal to 1×10^{-4} and hazard indices less than or equal to 1 do not require remedial actions to mitigate risks.

The HHRA concluded that there were no unacceptable risks or hazards associated with exposure to soil for either the UU/UE scenario or the utility worker. The estimated risks and hazards were:

- UU/UE Scenario:
 - Cumulative carcinogenic risk: 9×10^{-5}
 - Hazard index for a child: 0.05

- Hazard index for an adult: 0.06
- Utility Worker Scenario:
 - Cumulative carcinogenic risk: 5×10^{-8}
 - Hazard index: 0.001

The HHRA concluded that estimated risks and hazards associated with exposure to groundwater under the UU/UE scenario could pose an unacceptable risk and hazard. However, there are no unacceptable risks or hazards associated with exposure of the utility worker to groundwater. The estimated risks and hazards were (risks and hazards greater than acceptable levels are bolded):

- UU/UE Scenario:
 - Cumulative carcinogenic risk: **4×10^{-4}**
 - Hazard index for a child: **19**
 - Hazard index for an adult: **12**
- Utility Worker Scenario:
 - Cumulative carcinogenic risk: 1×10^{-7}
 - Hazard index: 0.7
- Vapor Intrusion (presented under UU/UE scenario)
 - Cumulative carcinogenic risk: **2×10^{-4}**
 - Hazard index: 0.2

There are carcinogenic risks and noncarcinogenic hazards associated with unrestricted use of groundwater at FTMM-22 that are greater than the risk goals and may require consideration of remedial actions to prevent health effects. There are also carcinogenic risks associated with vapor intrusion of volatile COPCs from groundwater to indoor air, should a future building be constructed on site. These risks are driven primarily by the presence of TCE in groundwater. Reduction of TCE concentrations in groundwater to the NJDEP GWQS would mitigate the risk to acceptable levels.

The planned future use of FTMM-22 is Technical, Office, and R&D Campus, which was previously considered open space. The CSM and HHRA presented in the RI/FS Report were reviewed for applicability to the planned future land use. It was determined that the CSM did not explicitly consider indoor worker exposure to VOCs in groundwater through vapor intrusion into a hypothetical future building. However, risk associated with vapor intrusion was quantitatively evaluated under the UU/UE scenario considers long-term exposure of children and adults to potentially contaminated environmental media. The models used by the USEPA and in the HHRA do not distinguish between child and adult receptors when calculating risks and hazards associated with vapor intrusion. Since the results of the vapor intrusion for the UU/UE are applicable to indoor worker scenarios, the HHRA results can be used to evaluate the potential risk to the indoor worker through vapor intrusion. Based on the results of the HHRA, there is a potential “unacceptable risk” to indoor workers associated with vapor intrusion of volatile COCs to indoor air.

2.9 REMEDIAL ACTION OBJECTIVES

The remedial action objective (RAO) for FTMM-22 addressed in this ROD is to protect public health by preventing exposure (inhalation, dermal contact, and ingestion) to groundwater containing VOCs, specifically TCE at concentrations in excess of the cleanup levels as shown on **Table 2**.

Table 2
Cleanup Levels for COCs in Groundwater at FTMM-22

COC	NJDEP GWQS (µg/L)
Trichloroethene (TCE)	1

2.10 DESCRIPTION OF REMEDIAL ALTERNATIVES

A range of general response actions were identified, evaluated, and screened to develop a list of possible remedial alternatives for FTMM-22. These general response actions were: (1) no action, (2) Land Use Controls (LUCs) with Monitored Natural Attenuation (MNA), and (3) source removal via direct excavation and backfill combined with LUCs and MNA. Various technology options for these general remedial alternatives were evaluated, and these evaluations are described in detail in Section 9 of the RI/FS Report.

The “no action” alternative (Alternative 1) was used as a baseline against which to compare the other alternatives. Under Alternative 1, no remedial action or monitoring would be conducted, and contamination would remain in place. Alternative 1 would not achieve the RAO as it is not protective of human health; does not meet the ARARs described in **Table 5**; provides little short- or long-term effectiveness and permanence.

Alternative 2 consists of implementing LUCs to control exposure of VOCs (i.e., TCE) in groundwater in the form of a groundwater Classification Exception Area/Well Restriction Area (CEA/WRA). MNA would be used to document the natural degradation of VOCs over time by conducting groundwater sampling to document reduction in concentrations through MNA processes until NJDEP GWQS are met. Reporting would be conducted to document the continuing effectiveness of the remedy. Alternative 2 provides short-term effectiveness and ease of implementation, although it does not provide active treatment of the groundwater contamination, it would achieve the RAO.

Alternative 3 implements the LUCs and MNA previously discussed for Alternative 2 with Lime Pit excavation and soil source removal. This alternative addresses source removal through direct excavation, backfill, and off-site disposal of the remaining concrete lime pit vault structure (bottom and remaining partial sidewalls) and any potential contaminated soils encountered beneath it. Alternative 3 would provide a higher degree of long-term effectiveness and permanence and reduces remediation time since the source would have been removed. It would achieve the RAO.

2.10.1 Comparative Analysis of Alternatives

The proposed remedial alternatives for FTMM-22 were evaluated against the nine criteria defined by CERCLA and provided below in **Table 3**. The criteria falls into three groups: threshold criteria; primary balancing criteria; and modifying criteria (i.e., State and community acceptance).

Table 3
Evaluation Criteria for Remedial Alternatives

Threshold Criteria	Overall Protectiveness of Human Health and the Environment determines whether an alternative adequately protects human health and the environment from unacceptable risks.
	Compliance with Applicable or Relevant and Appropriate Requirements (ARARs) evaluates whether the alternative meets Federal and State environmental regulations and requirements that pertain to the site.
Primary Balancing Criteria	Long-term Effectiveness and Permanence considers the ability of an alternative to maintain protection of human health and the environment over time.
	Reduction of Toxicity, Mobility, and Volume (TMV) of Contaminants through Treatment evaluates use of treatment to reduce harmful effects of principal contaminants, their ability to move in the environment, and the amount of contamination present.
	Short-term Effectiveness considers the length of time needed to implement an alternative and the risks the alternative poses to workers, residents, and the environment during implementation.
	Implementability considers the technical and administrative feasibility of implementing the alternative, including factors such as the availability of goods and services.
	Cost includes estimated capital and annual operations and maintenance costs for a specific time period.
Modifying Criteria	State/Support Agency Acceptance considers whether the State agrees with the Army's analyses and recommendations, as described in the RI/FS and Proposed Plan.
	Community Acceptance considers whether the local community agrees with the Army's analyses and preferred alternative. Comments received on the Proposed Plan are an important indicator of community acceptance.

The criteria used to evaluate the remedial alternatives individually and against each other to select a preferred alternative for FTMM-22 are summarized in **Table 4**.

Table 4
Comparison of Remedial Alternatives to Threshold and Balancing Criteria

Criteria		Alternative		
		1 – No Action	2 – LUCs and MNA	3 - Source Removal via Direct Excavation and Backfill with Alternative 2
Threshold Criteria	Overall Protection of Human Health and the Environment	No No treatment and no control of exposure pathways.	Yes Restricts future use of impacted groundwater and effectively eliminates the exposure pathway.	Yes Restricts future use of impacted groundwater and effectively eliminates the exposure pathway.
	Compliance with ARARs	No Does not restrict groundwater usage nor monitors groundwater migration.	Yes Groundwater use restricted through CEA until GWQS is achieved through natural attenuation processes. Includes sampling and monitoring to verify that contamination is not migrating offsite and complies state groundwater monitoring requirements.	Yes Groundwater use restricted through CEA until GWQS is achieved through natural attenuation processes. Includes sampling and monitoring to verify that contamination is not migrating offsite and complies state groundwater monitoring requirements.
Balancing Criteria	Long-Term Effectiveness and Permanence	Low No actions or controls to reduce the existing contaminant levels or risks to human health and the environment.	Moderate Risks to human health and the environment mitigated through LUCs; LTM reduces the potential for exposure by periodically assessing the extent of contamination and the degree of plume reduction. RAO assumed to be achieved in 30 years.	High Excavation of source materials provides permanent solution for protecting human receptors and results in an adequate and reliable reduction of exposure pathways. Removal and offsite disposal of source materials results in minimal residual COC mass left behind after excavation and this mass would be further addressed by MNA and LTM for 20 years.
	Reduction of Toxicity, Mobility, or Volume by Treatment	Low No active treatment and does not monitor for any reduction of TMV through of the contaminated groundwater.	Low to Moderate Does not include active treatment of contaminated groundwater. However, remediation via natural attenuation expected to reduce groundwater contaminant levels to RAOs over time.	High Source mass reduction since source materials would be removed and disposed off-site and LUC and MNA would be in place.
	Short-Term Effectiveness	Low No remedial actions would be implemented.	Low to Moderate Short implementation timeframe since this alternative is limited to groundwater sampling and monitoring.	Moderate to High Slightly longer implementation timeframe than Alternative 2 in order to mobilize heavy equipment and implement additional field health and safety measures.

Criteria		Alternative		
		1 – No Action	2 – LUCs and MNA	3 - Source Removal via Direct Excavation and Backfill with Alternative 2
	Implementability	Not Rated No action would be implemented.	High LUCs limiting groundwater access/use is an administrative process that is readily implementable. A monitoring network already exist at the site. New wells can be installed quickly.	High Excavation and disposal of contaminated concrete and soil at an off-site disposal facility are readily implementable. A monitoring network already exist at the site. New wells can be installed quickly; equipment and services are readily available.
	Cost	\$30,000 Includes planning, project execution, and reporting for groundwater well abandonment.	\$742,000 Includes preparation of LTM plan (sampling and analysis plan, quality assurance project plan, health and safety plan, etc.). O&M costs include labor, maintenance, material, shipping, analysis, waste disposal, data validation, report preparation, and well abandonment in final year.	\$700,000 Includes preparation of RAWP, equipment, materials, and labor to perform site preparation, construction of the stockpile area; excavation, backfilling with clean soil; confirmation sampling and laboratory analysis; waste characterization; transportation and disposal of excavated material; surveying; and site restoration and the preparation of a completion report. Includes Alternative 2 O&M costs for 20 years.
Optional Evaluation Criteria	Remedial Timeframe	0	30 years	20 years

2.11 SELECTED REMEDY

The selected alternative for FTMM-22 is source removal through direct excavation of the remaining portions of the concrete lime pit structure. Any potentially impacted soil beneath the concrete structure, clean fill previously placed in the former excavation, and debris will be removed. LUCs will be prepared to control exposure to VOCs in groundwater where unacceptable risk or hazard is possible and MNA will be evaluated to document the natural degradation of VOCs in groundwater.

LUCs will be used to prevent uncontrolled exposure of potential receptors to contaminated media. A groundwater use restriction in the form of a groundwater CEA/WRA will be implemented and will remain in place until NJDEP GWQS for the identified VOCs are achieved at the site. The CEA/WRA will include sampling every other year and two sampling rounds will be performed during the final year. The Army will prepare a LUCIP to document the ICs and identify procedural responsibilities including groundwater monitoring and MNA reporting, and long-term stewardship responsibilities.

In conjunction with the source removal described above, the Army may pilot test an in-situ treatment technology such as chemical oxidation or bioremediation, on a pilot test basis as recommended by NJDEP in their 31 October 31 2017 RI/FS Report acceptance letter (NJDEP, 2017).

Activity use restrictions (such as the installation of a sub-slab vapor removal system) will be required to prevent vapors from entering structures for any future building constructed at the site as long as groundwater contaminant concentrations exceed the NJDEP GWQS. When the property is transferred to private ownership out of federal control, the LUCs will be recorded against the property 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 until groundwater contaminant concentrations are in compliance with NJDEP GWQS.

2.11.1 Summary of the Rationale for the Selected Response Action

The establishment of a CEA/WRA, groundwater sampling to document MNA, source removal, and implementation of LUCs are appropriate responses for FTMM-22.

The conclusions of the FTMM-22 RI were that:

- there are noncarcinogenic hazards and carcinogenic risks associated with exposure to groundwater evaluated under the UU/UE scenario.
- risks to human health and the environment from soil are within acceptable ranges for the current and future intended land use.

The UU/UE scenario, which considers long-term exposure of children and adults to potentially contaminated environmental media, was evaluated to allow risk management decisions to be made regarding restrictions on future use of the property. The UU/UE scenario was evaluated in the absence of ICs, including any restrictions on the use of groundwater.

Uncertainties may result in overestimated current risks/hazards. Most notably, onsite groundwater is not currently used as a potable drinking water source, so the risk/hazard estimates herein may be overestimated. The estimated risks/hazards associated with potable groundwater would apply only if a well was installed for potable water. Similarly, the estimated risks/hazards associated with vapor intrusion of volatile COPCs from groundwater to indoor air would only occur if a building was constructed on the site.

Source removal would achieve mass reduction and potentially reduce long-term operation and maintenance (O&M). Since direct excavation alone will not achieve the RAO throughout the site, it will be combined with LUC and MNA until groundwater contaminant concentrations are in compliance with NJDEP GWQS.

2.11.2 Detailed Description of the Implementation of Selected Remedy

The FTMM-22 remedy includes source removal through direct excavation, backfilling with clean fill, and off-site disposal of the remaining concrete lime pit vault structure and any potential contaminated soils encountered beneath it. The following elements are associated with the source removal activities:

- Identification and evaluation of sanitary sewer line reportedly installed in the excavation cavity during the 2001 decommissioning event;
- Excavation of remaining concrete lime pit structure (bottom and partial sidewalls) and any impacted soil beneath it;
- Segregation of excavated clean backfill from the 2001 decommissioning event;
- Segregation and temporary storage of excavated concrete and potentially impacted soil stockpiles;
- Sampling and analysis of concrete and any impacted soil stockpiles for waste characterization;
- Transportation of the excavated material to an off-site disposal facility;
- Confirmation sampling of the 2001 backfill material for re-use;
- Confirmation soil sampling and analysis of excavation;
- Import and compaction of clean backfill material;
- Site restoration including revegetation;
- LUCIP to document the ICs and identify procedural responsibilities for groundwater monitoring and reporting; and
- MNA of groundwater until the concentrations are below the GWQS.

Once the excavation has been completed, confirmation samples of the side walls and excavation bottom will be collected and compared to NJDEP soil cleanup criteria to ensure all contaminated soil has been removed. After excavation and confirmation sampling have been completed, placement of backfill, compaction, regrading, and revegetation will be conducted to restore to pre-excavation conditions.

In conjunction with the source removal, the Army may pilot test an in-situ treatment technology such as chemical oxidation or bioremediation, on a pilot test basis as recommended by NJDEP in their October 31, 2017 RI/FS Report acceptance letter (NJDEP, 2017).

LUCs will be implemented to prevent uncontrolled exposure of potential receptors to contaminated media (groundwater). A groundwater use restriction in the form of a CEA/WRA will be implemented and remain in place until NJDEP GWQS are achieved at the site, with sampling occurring every other year and two sampling rounds during the final year. MNA of the groundwater through existing wells will be used to track and evaluate natural reduction of contaminant concentrations in groundwater over time at the site until NJDEP GWQS are met. Activity use restrictions will be required for the prevention of soil vapors from entering structures (e.g., installation of a vapor barrier or sub-slab vapor removal system) for any buildings constructed at FTMM-22 as long as groundwater contaminant concentrations exceed the NJDEP GWQS.

The Army will prepare a LUCIP to document the IC and identify necessary inspections, monitoring and reporting and long-term management responsibilities. The LUCIP would be subject to a five-year review process to assess the effectiveness of meeting the RAO. LUCs will consist of a CEA/WRA and when the property is transferred to private ownership, the LUCs will be recorded against the property 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 until groundwater contaminant concentrations are in compliance with NJDEP GWQS.

2.11.3 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 CEA/WRA 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 recorded against the property 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 until groundwater contaminant concentrations are in compliance with NJDEP GWQS.

The costs associated with the source removal, implementation and O&M of LUCs including the CEA/WRA are summarized in **Table 6**.

2.12 STATUTORY DETERMINATIONS

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

2.12.1 Protection of Human Health and the Environment

The LUCs would adequately protect human health and the environment by restricting future use of the impacted groundwater and effectively eliminating the exposure pathway and would achieve the RAO. LTM will provide for a periodic assessment of the groundwater quality improvement through MNA, verify plume location, and evaluate the effectiveness of MNA. Source removal will protect human and the environment by reducing contaminant mass through physical removal of source material and disposal of impacted source material off-site. Residual contamination would meet the RAO and would therefore be protective of human health and the environment. Implementation of this remedy would not have any adverse environmental or health impacts. Long-term risk would be reduced as the contaminant concentrations naturally attenuate over time. While no risk was identified with soil at the site, excavation of source area soil will be conducted to mass reduction and potentially reduce long-term O&M.

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

The selected remedy complies with the chemical- and action-specific ARARs described in **Table 5**.

Table 5
Applicable or Relevant and Appropriate Requirements at FTMM-22

ARAR	Description
New Jersey Administrative Code (N.J.A.C.) 7:9C-2(c)	New Jersey has promulgated Groundwater Quality Standards (GWQS) to aid in the restoration or enhancement of groundwater quality in the State. NJ GWQS are considered to be relevant and appropriate because of the nature of the substances, the characteristics of the site, the circumstances of the release to groundwater, and the selected remedial action.

ARAR	Description
<i>Action-Specific:</i> RCRA, 40 CFR 262.11 (Hazardous Waste Identification), 264.175 (Container Management)	Remedial actions must appropriately identify and manage investigation derive wastes and remedial wastes (that are hazardous wastes) stored onsite, including waste characterization samples to classify waste as hazardous or non-hazardous. Potentially applicable for characterizing waste generated during the remedial action.
RCRA, 40 CFR 268 (Subpart D)	Excavation/Placement of Waste in Land Disposal Unit. Movement of excavated materials to new location and placement in or on land will trigger land disposal restrictions for the excavated waste at disposal facility. Materials containing RCRA hazardous wastes subject to land disposal restrictions are placed in an approved disposal facility.

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 for groundwater at FTMM-22. Groundwater will be monitored biennially until such time it is determined that the GWQS for TCE (1 ug/L) has been attained through natural attenuation.

Action-Specific ARARs

The action specific ARARs applicable to this ROD include RCRA 40 CFR 262.11 (Hazardous Waste Identification), 40 CFR 264.175 (Container Management) and 40 CFR 268 Subpart D (Land Disposal). Excavation material generated during source removal will be managed in accordance with these requirements and disposed at approved disposal facility.

2.12.3 Cost-Effectiveness

The selected remedy meets the statutory requirement for a cost-effective remedy. The costs are presented **Table 6**.

Table 6
Estimated Costs for Selected Remedy

	Cost
<i>Capital Costs</i>	
Source Removal	\$148,000
Monitored Natural Attenuation	\$43,000
Land Use Controls	\$38,000
<i>Total Capital Costs</i>	\$229,000
<i>Periodic Costs</i>	
Total Value Periodic Costs ^{a/}	\$480,000
<i>O&M Costs</i>	
Total Value O&M Costs ^{a/}	\$80,000
TOTAL PRESENT VALUE ^{b/}	\$700,000

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

^{b/} Discounted rate of 1.90% has been applied; 20-Year, Real Discount Rate from White House Office of Management and Budget, Circular A-94 Appendix C, Revised December 2013

2.12.4 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 this site. The selected remedy employs source removal to reduce contaminants present at the site. Permanent reduction of constituents will be accomplished through removal of the remaining concrete lime pit vault structure and any potential contaminated soils encountered beneath it, long term monitored of the

groundwater through natural attenuation, and enforcement of LUCs at the site. The Army will be responsible for documenting and implementing the LUCs, which is expected to occur through the filing of a CEA/WRA 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 will be recorded against the property 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 until groundwater contaminant concentrations are in compliance with NJDEP GWQS.

2.12.5 Preference for Treatment as a Principal Element

The selected remedy addresses principal threats by removal of the source, MNA, and risk and hazard management through source removal achieving mass reduction and potentially reducing long term monitoring. The selected remedy is protective of human health and the environment. In addition, chemical concentrations of VOCs present in site media will be reduced via excavation/off-site disposal, and MNA of groundwater.

2.12.6 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) until groundwater contaminant concentrations are in compliance with NJDEP GWQS.

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 FTMM-22 site 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 29 May 2018 (**Attachment 2**). 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 31 May 2018 to 29 June 2018. 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 Program Public Information Repository.

The public notice and Proposed Plan were also posted on the FTMM Environmental Restoration Program website. The Army held a public meeting on 14 June 2018 at West Long Branch Public Library, 95 Poplar Avenue, West Long Branch, New Jersey. At this meeting, representatives from FTMM and the USACE planned to present the Proposed Plan and answer questions concerning FTMM-22 and the selected remedy; however, no one from the public was in attendance. No public comments on the Proposed Plan for the FTMM-22 site were received during the Public Comment Period (31 May through 29 June 2018).

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

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Attachment 1

Figure 1 – Fort Monmouth Location.....	A 1-1
Figure 2 – FTMM-22 Site Location.....	A 1-2



Figure 1 – Fort Monmouth Location

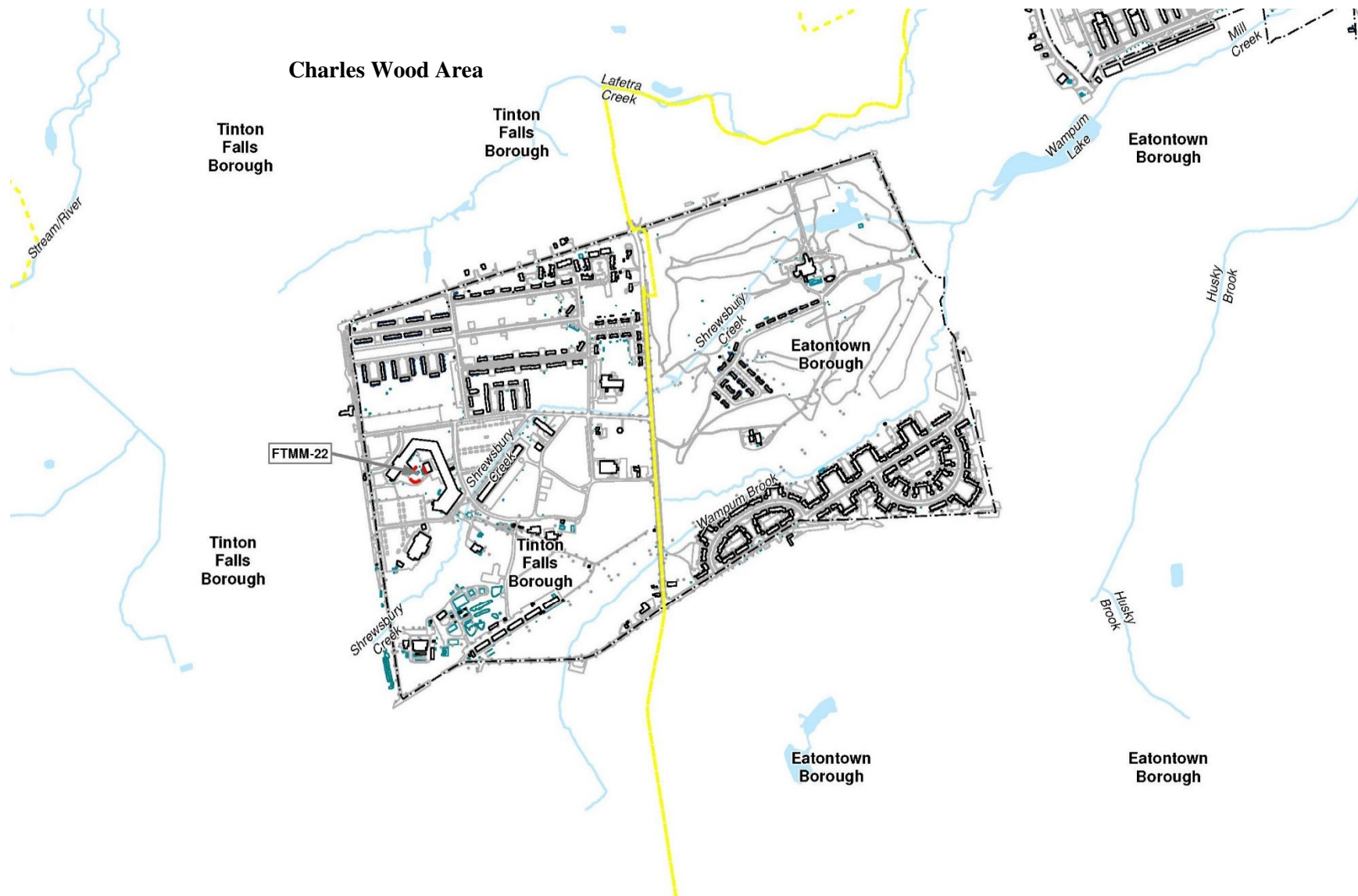


Figure 2 – FTMM-22 Site Location

Attachment 2
Certificate of Publication for Public Notice and Public Meeting Record

AFFIDAVIT OF PUBLICATION

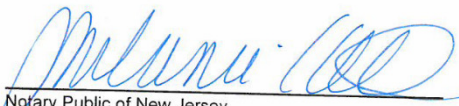
Publisher's Fee \$59.40 Affidavit \$35.00

State of New Jersey } SS.
Monmouth/Ocean Counties

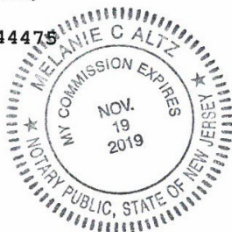
Personally appeared _____

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, depose and saith that the advertisement of which the annexed is a true copy, has been published in the said newspaper 1 times, once in each issue as follows:

05/29/18 A.D 2018


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Run Dates: 05/29/18

FORT MONMOUTH

PUBLIC NOTICE

U.S. Army Corps of Engineers, NY District, Releases Proposed Plan for FTMM-22

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 Site FTMM-22 at Fort Monmouth (FTMM) in Tinton Falls, 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 source removal through direct excavation and off-site disposal of the remaining concrete lime pit structure. Any potential contaminated soils encountered beneath the structure will be removed and disposed off-site. Land use controls to control exposure to trichloroethene (TCE) in groundwater will be established in the form of a Classification Exception Area (CEA)/Well Restriction Area (WRA). The CEA/WRA would remain in place until NJDEP Ground Water Quality Standards (GWQSS) are achieved at the site. Monitored Natural Attenuation (MNA) will be used to document the natural degradation of VOCs over time. The government may pilot test groundwater remedies at Site FTMM-22 if MNA proves to be ineffective over time.

Results of the FTMM-22 Remedial Investigation (RI), including a human health risk assessment, identified TCE as a constituent of concern in groundwater. Since there was a potential unacceptable risk and hazard to human health associated with direct contact with volatile organic compounds (specifically TCE in groundwater) a Feasibility Study (FS) was conducted.

The Proposed Plan, Final RI/FS Report (June 2017), and the full public record for the FTMM-22 Site, 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 31 May 2018 and ending 29 June 2018. All comments must be postmarked by 29 June and mailed to the address below (or emailed by 29 June 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 07757
(732) 380-7064

A public meeting on the Proposed Plan will be held on 14 June 2018 at 7 p.m. at West Long Branch Public Library, 95 Poplar Ave, West Long Branch, NJ 07764. The public is invited to attend and provide oral comments on the Proposed Plan at that time. (\$59.40)

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PUBLIC MEETING

IN RE:

PROPOSED PLAN - FTMM-22, FORT
MONMOUTH, TINTON FALLS, NJ

TRANSCRIPT OF:
PROCEEDINGS

Thursday, June 14, 2018
West Long Branch Public Library
95 Poplar Avenue
West Long Branch, New Jersey 07764
7:33 p.m.

P R E S E N T:

WILLIAM R. COLVIN - BRAC Environmental Coordinator
FRANK ACCRSI - Parsons
CRIS GRILL - Parsons

Job No. NJ 2937152

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800-227-8440

973-410-4040

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1 MR. COLVIN: All right. So this is for
2 the record. I'm William R. Colvin. I am the Base
3 Realignment and Closure Environmental Coordinator for
4 Fort Monmouth.

5 At 7 p.m. today, June 14, 2018, we were
6 prepared to present the proposed plan for IRP Site 22
7 at Fort Monmouth; however, it's now 7:33, and no
8 members of the public have arrived.

9 Due to the lack of community interest,
10 I've decided to adjourn the meeting. And please
11 document in the minutes of the meeting that no
12 comments from the public were received at this public
13 meeting.

14 And also in attendance were:

15 MR. ACCRSI: Frank Accrsi, A-c-c-r-s-i.

16 MS. GRILL: Cris Grill, G-r-i-l-l.

17 MR. COLVIN: And both are with Parsons.

18 Thank you.

19 (Proceedings concluded at 7:34 p.m.)
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CERTIFICATE

I, LYDIA F. McDONNELL, a Certified
Shorthand Reporter and Notary Public of the State of
New Jersey, do hereby certify that the foregoing is a
true and accurate transcript of the proceedings 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.



Notary Public of the State of New Jersey

License No. 30XI00155900

My Commission expires June 30, 2018

Dated: June 23, 2018

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[07764 - west]

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[william - william]

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