

FORT KNOX

Army Cleanup Program

Installation Action Plan Final

June 2024

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STATEMENT OF PURPOSE

The Installation Action Plan (IAP) provides evidence that the Army is firmly committed to expeditious identification and cleanup of environmental contamination, and that the installation has a credible, organized program to carry out that commitment. The IAP provides an outline of the total multi-year environmental cleanup program for each site with ongoing or future planned restoration activity and includes the (1) environmental restoration requirements, (2) the rationale for the selected technical approach, and (3) foundation to develop corresponding financial needs for each cleanup site.

INSTALLATION OVERVIEW

Installation Name: FORT KNOX

Installation City: FORT KNOX

Installation County: HARDIN

Installation State: KENTUCKY

Regulatory Participation - Federal: US Environmental Protection Agency (USEPA) Region IV

Regulatory Participation - State: Kentucky Department of Environmental Protection (KDEP)

ACRONYMS

Acronym	Definition
AOPI	Area of Potential Interest
BTEX	Benzene, Toluene, Ethylbenzene, Xylenes
CC	Compliance-Related Cleanup
C/DD	Construction/Demolition Debris
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act of 1980
CLF	Closed Landfill
cis-1,2-DCE	Cis-1,2-Dichloroethylene
CMI(C)	Corrective Measures Implementation-Construction
CMI(O)	Corrective Measures Implementation-Operation
CMS	Corrective Measures Study
COC	Contaminant of Concern
CRL	Cleanup Restoration & Liabilities
CS	Confirmation Sampling
cy	cubic yards
1,2-DCA	1,2-Dichloroethane
DD	Decision Document
DES	Design
DRMO	Defense Reutilization and Marketing Office
EMD	Environmental Management Division
ENV	Environmental
FS	Feasibility Study
FSL	Former Sludge Lagoon
FTK	Fort Knox
FY	Fiscal Year
FYR	Five-Year Review
GIS	Geographic Information System
GWAR	Groundwater Assessment Report
IAP	Installation Action Plan
IC	Institutional Control
IM	Interim Measure
IR	Installation Restoration
IRA	Interim Remedial Action
IRP	Installation Restoration Program

Acronym	Definition
KDEP	Kentucky Department for Environmental Protection
LiDAR	Light Detection and Ranging
LTM	Long-Term Management
LUC	Land Use Control
LUCIP	Land Use Control Implementation Plan
MCL	Maximum Contaminant Level
MNA	Monitored Natural Attenuation
MR	Munitions Response
MRSP	Munitions Response Site Prioritization Protocol
MW	Monitoring Well
NFA	No Further Action
NPL	National Priorities List
OWS	Oil Water Separator
PA	Preliminary Assessment
PAH	Polycyclic Aromatic Hydrocarbon
PCB	Polychlorinated Biphenyl
PCE	Tetrachlorethene
PFAS	Per- and Polyfluoroalkyl Substances
PFBS	Perfluorobutanesulfonic Acid
PFOA	Perfluorooctanoic Acid
PFOS	Perfluorooctane Sulfonate
PR	Periodic Review
RA	Remedial Action
RAB	Restoration Advisory Board
RA(C)	Remedial Action (Construction)
RA(O)	Remedial Action (Operations)
RC	Response Complete
RCRA	Resource Conservation and Recovery Act
RD	Remedial Design
RFA	Resource Conservation and Recovery Act Facility Assessment
RFI	Resource Conservation and Recovery Act Facility Investigation
RI	Remedial Investigation
RIP	Remedy-In-Place
RRSE	Relative Risk Site Evaluation
SC	Site Closeout

Acronym	Definition
SDB	Sludge Drying Bed
SI	Site Inspection
SIR	Site Investigation Report
SVOC	Semi Volatile Organic Compound
SWMU	Solid Waste Management Unit
TAPP	Technical Assistance for Public Participation
TCE	Trichloroethene
TNFA	Tentative No Further Action
UFP-QAPP	Uniform Federal Policy – Quality Assurance Project Plan
UST	Underground Storage Tank
VC	Vinyl Chloride
VOC	Volatile Organic Compound
WWTP	Waste Water Treatment Plant

PHASE TRANSLATION TABLE

CERCLA Phase	RCRA Phase	RCRA UST Phase
Preliminary Assessment (PA)	RCRA Facility Assessment (RFA)	Initial Site Characterization (ISC)
Site Inspection (SI)	Confirmation Sampling (CS)	Investigation (INV)
Remedial Investigation/ Feasibility Study (RI/FS)	RCRA Facility Investigation/Corrective Measures Study (RFI/CMS)	Corrective Action Plan (CAP)
Remedial Design (RD)	Design (DES)	Design (DES)
Interim Remedial Action (IRA)	Interim Measure (IM)	Interim Remedial Action (IRA)
Remedial Action (Construction) (RA(C))	Corrective Measures Implementation (Construction) (CMI(C))	Implementation (Construction) (IMP(C))
Remedial Action (Operations) (RA(O))	Corrective Measures Implementation (Operations) (CMI(O))	Implementation (Operations) (IMP(O))
Long-Term Management (LTM)	Long-Term Management (LTM)	Long-Term Management (LTM)

PROGRAM SUMMARY

Number of Open Sites with Response Complete/Total Open IR Sites: 5/13

Number of Open Sites with Response Complete/Total Open MR Sites: 0/0

Number of Open Sites with Response Complete/Total Open CC Sites: 0/0

SITE-LEVEL INFORMATION

21405.1002_FTK-011_17 WWTP SLUDGE DRYING BEDS

Env Site ID: FTK-011

Cleanup Site: 17 WWTP SLUDGE DRYING BEDS

Alias: #

Regulatory Driver: RCRA-C

RIP Date: 3/15/2009

RC Date: 6/15/2009

RC Reason: All Required Cleanup(s) Completed

SC Date: 6/16/2054

Program: ENV Restoration, Army

Subprogram: IR

NPL Status: No

Hazardous Ranking Score: 0

RRSE:

MRSPP: N/A

Phase	Start	End
RFA:	8/15/1986	2/28/1989
CS:	3/15/1989	4/15/1989
RFI/CMS:	5/15/1989	11/28/2007
DES:	11/28/2007	3/31/2008
IRA:	--	--
CMI(C):	3/31/2008	3/15/2009
CMI(O):	3/15/2009	6/15/2009
LTM:	6/15/2009	6/15/2054

Site Narrative: FTK-011 the 17 Wastewater Treatment Plant (WWTP) Sludge Drying Beds (SDB) are located off of Ninth Avenue. The 17 SDBs have a total area of approximately 34,000 square feet. They were constructed in 1960 to dewater domestic sludge generated at the former WWTP. The site was listed as FTK-011A-Q as a solid waste management unit (SWMU) in the Resource Conservation and Recovery Act (RCRA) facility assessment (RFA). The RFA reported that sludge from the beds overflowed on occasion and the liquid previously drained to surface water drainage systems. The beds were rebuilt and updated in 1987. This update also included a pumping station designed to collect the liquid from the drain tiles and transfer the liquid back to the plant for further treatment. A new WWTP was built in 1995 and the SDBs were utilized. The site has not received sludge from the current WWTP since at least 2009. The former WWTP SDB (FTK-011) and the WWTP Former Sludge Lagoons (FSL) (FTKX-10) were investigated and cleaned up concurrently. Historical data and the results of three phases of RCRA facility investigations (RFI) have provided information on the nature and extent of soil contamination. The RFIs indicated potential risk to human health from elevated metals, pesticides, and semi-volatile organic compounds (SVOC) in surface and subsurface soil. The corrective measures study (CMS) was completed in fiscal year (FY)07 and the selected alternative consisted of arsenic hot-spot removal, site regrading, and land use controls (LUC). Kentucky Department for Environmental Protection (KDEP) approved the CMS Nov. 28, 2007. The selected remedial action (RA) for the beds and lagoons site included - excavating surface soil hot-spots with elevated arsenic concentrations, off-site disposal of excavated soil, collecting confirmatory samples from hot-spot areas, grading the beds and lagoons to eliminate future use, restricting land use (by industrial designation), posting warning signs, as well as inspection and maintenance of the site. RAs were completed in FY08 and presented in a RA Report in FY09. Warning signs were installed around the perimeter of the site. KDEP issued a tentative no further action (TNFA) letter June 4, 2009. The LUC signs were renumbered in December 2023. The area is designated as industrial use, and the land use is anticipated to remain unchanged in the future. The site is on the installation's RCRA corrective action permit as SWMU FTKX-10 and FTK-011. Periodic reviews are

performed at the site. LUCs are the ongoing corrective action which are performed and documented in the Fort Knox annual reports. The cleanup/exit strategy at the site is to continue LUC, monitoring, reporting, and periodic reviews indefinitely.

21405.1005_FTK-020_DRMO FORMER WASTE OIL TANK SITE

Env Site ID: FTK-020

Cleanup Site: DRMO FORMER WASTE OIL TANK SITE

Alias: FTKX-44

Regulatory Driver: RCRA-C

RIP Date: 9/15/2008

RC Date: 9/15/2054

RC Reason: Not assigned

SC Date: 9/16/2054

Program: ENV Restoration, Army

Subprogram: IR

NPL Status: No

Hazardous Ranking Score: 0

RRSE:

MRSPP: N/A

Phase	Start	End
RFA:	2/29/1988	2/28/1989
CS:	3/15/1989	4/15/1989
RFI/CMS:	6/30/1992	1/11/2008
DES:	1/11/2008	1/11/2008
IRA:	--	--
CMI(C):	1/11/2008	9/15/2008
CMI(O):	9/15/2008	9/15/2054
LTM:	--	--

Site Narrative: FTK-020 the former Defense Reutilization and Marketing Office (DRMO) Waste Oil Tank site is near Building 2952 off of Frazier Road. Aerial photographs indicate that the site was used as early as 1964 as a storage yard for Army vehicles, scrap metals, shell casings, and drums. The site formerly contained a 12,000-gallon underground storage tank (UST) that stored waste oil. The site was identified in the RFA for the installation as a SWMU. The RFA recommended that the tank be removed, and the site cleaned up. Historical documentation indicates that from 1978 to 1985 the unit was used to store waste oil collected from smaller tanks on the post until removed by a contractor. Beginning in 1987 the unit was used by a waste oil contractor that was allowed to drain water from his load before leaving post. Within the DRMO storage area, which is approximately 16 acres, there were five formerly identified SMWUs that were potential source areas of contamination. These SWMUs were SMWU FTK-019 (Former DRMO Hazardous Waste Storage Area Buildings 2947 and 2949), FTK-020 (also designated FTK-015C Former DRMO Waste Oil Tank Site which was temporarily replaced by FTK-044), FTK-017N (an oil/water separator (OWS)), FTK-017BD (another OWS), and FTK-032 (Transformer Storage Building 2953). The tank and associated OWS (FTKX-017BD) were removed in July 1990. Due to the types of contamination, the site was removed from UST regulatory requirements, transferred to a RCRA regulated SWMU in FY99, and assigned SWMU number FTKX-44. It was grouped into SWMU Group #6 in the 1997 RCRA permit. Multiple investigations were completed at the site and was included in a Sitewide Karst Monitoring Program. Investigations suggest that surface drainage flows into a karst window southwest of the site. Elevated levels of grease and oil persist in the soil at depths greater than 30 feet. Soil samples collected from the site indicated the presence of petroleum, hydrocarbons, metals, and Polycyclic Aromatic Hydrocarbons (PAH). No single definitive source for contamination has ever been identified. The CMS was completed in FY07, and the selected alternative consisted of LUC, maintenance of the gravel cover, long-term inspections, and maintenance as well as spring and groundwater monitoring. KDEP tentatively approved the CMS Jan. 11, 2008, and was made final after public notice. In the 2009 RCRA permit the former waste storage area FTK-044 was granted a TNFA and certified closed with long-

term monitoring required. All monitoring activities take place under compiled site name FTK-020. Periodic reviews are performed at the site along with spring monitoring, groundwater monitoring, and annual LUC inspections which are the ongoing corrective actions and are documented in the Fort Knox annual reports. Current monitoring details are captured in the Final 2023 Uniform Federal Policy-Quality Assurance Project Plan (UFP-QAPP) Addendum and Field Sampling Plan LTM and CMI(O) at sites FTKX-01, FTKX-02, FTKX-10, FTK-011, FTK-020, FTKX-21, FTKX-22, and FTKX-40 that was conditionally approved by KDEP on March 4, 2021. The cleanup/exit strategy at the site is to continue monitoring, reporting, LUCs, and periodic reviews indefinitely. Fort Knox may request discontinuation of monitoring if site contaminants of concern (COC) remain at or below cleanup levels for three consecutive years in conjunction with analytical detection levels that are at or below Maximum Contaminant Levels (MCLs)/Regional Screening Levels, as applicable.

21405.1009_FTKX-01_CLOSED LANDFILL (9TH AND WILSON)

Env Site ID: FTKX-01

Cleanup Site: CLOSED LANDFILL (9TH AND WILSON)

Alias: #

Regulatory Driver: RCRA-C

RIP Date: 9/30/2005

RC Date: 9/30/2054

RC Reason: Not assigned

SC Date: 9/30/2054

Program: ENV Restoration, Army

Subprogram: IR

NPL Status: No

Hazardous Ranking Score: 0

RRSE:

MRSPP: N/A

Phase	Start	End
RFA:	8/31/1986	2/28/1989
CS:	3/15/1989	4/15/1989
RFI/CMS:	5/31/1989	8/24/2004
DES:	8/24/2004	3/7/2005
IRA:	--	--
CMI(C):	3/7/2005	9/30/2005
CMI(O):	9/30/2005	9/30/2054
LTM:	--	--

Site Narrative: The Closed Landfill (CLF) is in the southeastern quadrant of the cantonment area southwest of the intersection of 9th Avenue and Wilson Road. Available historical information including aerial photographs and topographic map records indicate that the landfill was active from the 1940s until 1950. Information from source-characterization activities confirmed that the landfill contents consist of primarily inert industrial and sanitary wastes, including paper/cardboard, wood, construction debris, metal (including automotive parts), and household debris (cans, bottles). Coal fines slag and flash were confirmed in some of the trenches. The landfill is located over a broad sinkhole. Some leachate has been noted in a spring near the southeast corner of the landfill (Satan's Cave); however, groundwater has been traced to Rushing Spring. The CLF was identified as a SWMU in the RFA and in the Installation's RCRA permit. The results of three phases of the RFI indicated potential risk to human health from contaminants in surface soil, subsurface soil, groundwater and surface water, sediment, and to the environment from contaminants in surface soil and sediment. Remedial levels were developed for all human health COCs. The CMS was completed in FY03, and the selected alternative consisted of surface soil and sediment consolidation, LUCs, 12-inch landfill-gas-collection layer, a 12-inch clay cap, a 12-inch topsoil/vegetated cover, and monitoring of downgradient springs, groundwater, landfill gas, surface water, and sediment. KDEP approved the CMS Aug. 24, 2004. RAs were completed in FY05 and presented in a RA Report. While monitoring results demonstrate that the landfill cap is effective there are still contaminants that are above cleanup goals in the groundwater and sediment. Ramp down measures at the site include the discontinuation of Polychlorinated Biphenyls (PCB) and herbicide analysis as approved by KDEP in 2014, as well as a reduction in monitoring frequency to annual, which was approved by KDEP in 2016. A site optimization measure for the implementation of landfill gas compliance monitoring points surrounding the CLF was recommended by Fort Knox, approved by KDEP, and implemented in 2019. In prior years the site was reported as beginning the LTM phase in FY06 but due to cleanup goals not being achieved, the site is currently in the CMI(O) phase in accordance with the Defense Environmental Restoration Program Manual Number 4715.20 March 9, 2012, Sec. 4.b.(12).

Periodic reviews are performed at the site. Ongoing corrective action included annual monitoring of down gradient springs, groundwater, surface water, sediment, and quarterly landfill gas, as well as annual LUC inspections. These activities are documented in the Fort Knox Annual Reports on LTM and CMI(O). The Periodic Review dated Sept. 28 2022, identified changes in toxicity data for manganese impacting the protectiveness of the groundwater remedial goal. Current toxicity data included in the Periodic Review indicate that the manganese groundwater remedial level presents noncarcinogenic risk greater than a Hazard Quotient of 1 for both child and adult receptors. However, FTKX-01 LUCs are effectively restricting access to groundwater; therefore, the human health exposure pathway is incomplete. Fort Knox is coordinating with KDEP to amend the UFP-QAPP and if approved, modify the annual sampling contract to include field filtration of groundwater samples at FTKX-01 due to the potential for elevated metals in unfiltered samples. If manganese concentrations in filtered groundwater samples continue to exceed the remedial level, Fort Knox will consider development of a background groundwater manganese concentration for comparison. There are multiple depressions present and appear to be increasing in size. These observations have been noted in long-term monitoring/LUC reviews and Third Periodic Review. Future efforts will potentially include conducting an investigation and cap repair work. The cleanup/exit strategy at the site is to continue monitoring, reporting, LUCs, and periodic reviews indefinitely.

21405.1010_FTKX-02_RESIDENTIAL LANDFILL

Env Site ID: FTKX-02

Cleanup Site: RESIDENTIAL LANDFILL

Alias: #

Regulatory Driver: RCRA-D

RIP Date: 5/31/2001

RC Date: 5/31/2001

RC Reason: Study Completed, No Cleanup Required

SC Date: 9/16/2054

Program: ENV Restoration, Army

Subprogram: IR

NPL Status: No

Hazardous Ranking Score: 0

RRSE:

MRSPP: N/A

Phase	Start	End
RFA:	8/31/1986	2/28/1989
CS:	3/15/1989	4/15/1989
RFI/CMS:	10/31/1994	5/31/2001
DES:	--	--
IRA:	--	--
CMI(C):	--	--
CMI(O):	--	--
LTM:	9/30/2001	9/15/2054

Site Narrative: FTKX-02, the closed Residential and active Construction/Demolition Debris (C/DD) Landfill, is located north of the cantonment area bounded by Baker Road on the north and by Brandenburg Station Road on the west. It has two components. FTKX-02 is regulated by the KDEP Division of Waste Management Solid Waste Branch under permits SW04700058, SW04700054, and SW04700008 effective as of the permit renewal date of Jan. 29, 2019. The lower landfill comprises the entire residential landfill footprint and was utilized from 1953 until November 1984; it is trench and fill construction. The overlying area-type lined landfill was used from 1984 until 1992; it covered approximately two-thirds of the lower trench and fill landfill. Both landfills were designated for disposal of residential and installation solid waste consisting of asbestos, construction debris, large inert objects, petroleum oil and lubricant, contaminated soil, grit and grease, rinsed empty pesticide containers, and infectious/pathological waste (bandages, dressings, glass, metal, dead animals, sewage treatment plant sludge, and pentachlorophenol treated wood). The residential landfill is overlain by a newly constructed C/DD landfill in the northeastern portion of the residential landfill. The combined landfills occupy approximately 285 acres of permitted area with 42 acres of residential waste and 27.4 acres of C/DD waste. The site was investigated to assess the potential for groundwater contamination from the underlying pre-1984 trench-type landfill. This site was identified as a SWMU in the RFA and was listed in RCRA Part B permit signed Jan. 21, 1997. The initial groundwater monitoring system consisted of five monitoring wells installed around the landfill. A first quarter sample analysis in 1993 indicated Lead and Benzene contamination in one of the five wells. A groundwater assessment plan including a dye trace study and construction of new wells was implemented. Dye trace work plans were approved and KDEP issued a permit to allow placement of a C/DD landfill over a portion of the old landfill. In FY98 the state approved the final conduit flow study (dye tracing) report and reviewed the draft diffuse flow study (monitoring well) report. In FY99 six new wells were installed, the five old wells were decommissioned, and a conduit mapping report was completed and submitted. In FY00 the final groundwater monitoring plan was submitted, and baseline groundwater characterization was initiated. In FY01 the final well

installation and decommissioning report was submitted, as well as the first through fifth quarterly monitoring letters. In FY02 KDEP approved the groundwater monitoring plan with the stipulation that monitoring be increased to bi-quarterly to accommodate high and low flow conditions each quarter. The evaluation of eight baseline monitoring events indicated no significant issues with organic constituents but did identify significant background issues with metals and indicator parameters. Consequently, Fort Knox requested an extension of the baseline period by eight events to characterize those influences. Six monitoring events were conducted in FY02 and eight events in FY03. Activities accomplished in FY04 included two baseline monitoring events (and associated quarterly reporting to KDEP), a baseline summary report, and six detection-mode monitoring events. Monitoring continued and in FY11, KDEP put the facility into assessment. In FY12 a Groundwater Assessment Plan was submitted to KDEP. In FY13 the Groundwater Assessment Report (GWAR) was submitted to KDEP, deficiencies were addressed, and the GWAR was approved Jan. 28, 2019. The KDEP Solid Waste Branch Permit, SW04700058, SW04700054, SW04700008 effective Nov. 13, 2010, requires quarterly monitoring of six wells and one spring. Solid Waste Branch permit renewal with the same permit numbers was issued Jan. 29, 2019, approved on Nov. 10, 2020. Fort Knox anticipates a GW Assessment placement by KDEP in 2024 in response to systemic GW exceedances at MW MW-04S and Sycamore Spring. Assessment plan and report to follow. The cleanup/exit strategy at the site is to continue monitoring, reporting, LUCs, and periodic reviews indefinitely.

21405.1017_FTKX-10_WWTP SLUDGE LAGOONS (2)

Env Site ID: FTKX-10

Cleanup Site: WWTP SLUDGE LAGOONS (2)

Alias: #

Regulatory Driver: RCRA-C

RIP Date: 3/15/2009

RC Date: 6/15/2009

RC Reason: All Required Cleanup(s) Completed

SC Date: 6/16/2054

Program: ENV Restoration, Army

Subprogram: IR

NPL Status: No

Hazardous Ranking Score: 0

RRSE:

MRSPP: N/A

Phase	Start	End
RFA:	8/31/1986	2/28/1989
CS:	3/15/1989	4/15/1989
RFI/CMS:	5/31/1989	11/28/2007
DES:	11/28/2007	3/31/2008
IRA:	- -	- -
CMI(C):	3/31/2008	3/15/2009
CMI(O):	3/15/2009	6/15/2009
LTM:	6/15/2009	6/15/2054

Site Narrative: FTKX-10, WWTPFSLs, were part of the former WWTP located in the south-central portion and along the eastern perimeter of the cantonment area. The FSLs were in use from 1942 to 1960 and received partially treated sewage and other wastes from the WWTP allowing the sludge waste to dry. Use of the FSLs were discontinued in 1960 when 17 SDBs (FTK-011) were placed into operation. In 1980 sludge was removed from the western lagoon and the lagoon was backfilled using construction debris and soil. The lagoons are not lined. Improper disposal of petroleum chemicals solvents pesticides and other compounds directly into the lagoons via sewer outfalls or direct discharge into the lagoons is suspected to have resulted in the release of contaminants into the lagoon surface waters and sediments. The FSLs were included in FTK-010A & B with the description of the releases being openings were cut into the southwest dike of these lagoons which allowed the contents of the lagoons to drain out towards Mill Creek. Both the FSLs and WWTP SDBs were investigated concurrently. Historical data and the results of three phases of RFIs provided information on the nature and extent of soil contamination. The RFIs indicated potential risk to human health from elevated metals, pesticides, and SVOCs in surface and subsurface soil. The CMS was completed in FY07, and the selected alternative consisted of arsenic hot-spot removal, site regrading and LUCs. KDEP approved the CMS Nov. 28, 2007. The selected RA for the SDB and FSL site included the following elements - excavating surface soil hot-spots with elevated arsenic concentrations and disposing off-site, collecting confirmatory samples from hot-spot areas, grading the beds and lagoons to eliminate future use, restricting land use (by industrial designation), posting warning signs, and inspection/maintenance of the site. RAs were completed in FY08 and presented in a RA report in FY09. Warning signs were installed around the perimeter of the site. KDEP issued a TNFA letter on June 4, 2009. The area is designated as industrial use, and the land use is anticipated to remain unchanged in the future. The site is on the installation's RCRA corrective action permit as SWMU FTKX-10 and FTK-011. Periodic reviews are performed at the site. LUC signs were renumbered to match the permit in December 2023. LUCs are the ongoing corrective action which are performed and documented

in the Fort Knox annual reports. The cleanup/exit strategy at the site is continued LUCs, monitoring, reporting, and periodic reviews indefinitely.

21405.1027_FTKX-21_BW MAINT AREA NR BLDG 2775/SSSA

Env Site ID: FTKX-21

Cleanup Site: BW MAINT AREA NR BLDG 2775/SSSA

Alias: #

Regulatory Driver: RCRA-C

RIP Date: 12/7/2007

RC Date: 12/7/2054

RC Reason: Not assigned

SC Date: 12/8/2054

Program: ENV Restoration, Army

Subprogram: IR

NPL Status: No

Hazardous Ranking Score: 0

RRSE:

MRSPP: N/A

Phase	Start	End
RFA:	9/30/1986	1/31/1987
CS:	2/15/1987	3/15/1987
RFI/CMS:	5/31/1989	4/17/2007
DES:	4/17/2007	4/17/2007
IRA:	4/17/2007	4/17/2007
CMI(C):	12/7/2007	12/7/2007
CMI(O):	12/7/2007	12/7/2054
LTM:	--	--

Site Narrative: FTKX-21, the former Spent Solvent Storage Area, is located within the Boatwright Maintenance Area near Frazier Road at the northern boundary of the cantonment area. This area was used for the storage of chlorinated solvents, caustics, petroleum-based fluids and acids and is currently used for the storage of lubricants. The site consists of a fenced bermed 2,500 square foot concrete pad. Surface runoff from the site is directed to a catch basin connected to an OWS. In the past immiscible-phase liquids were directed to an UST and aqueous discharge was directed to a storm drain that passes beneath Frazier Road to the north. The UST is no longer present, and records of its removal are not available. The OWS is still present and functional. Materials were typically stored in 55-gallon drums. Leaks and spills may have occurred, but records are not available. Presently the site is used to store various petroleum-based materials associated with the Boatwright Maintenance Area. The site was identified in the RFA and listed as SWMU FTK-021. Spent solvent storage was discontinued at this site in 1987. Historical data and the results of three phases of RFIs provided information on the nature and extent of soil contamination. Tetrachloroethylene (PCE) and trichloroethylene (TCE) were identified as COCs in groundwater. In 2007 the CMS and Decision Document (DD) selected a corrective action of biostimulation and bioaugmentation in the high-concentration portions of the plume, monitored natural attenuation (MNA) for the low-concentration portions of the plume, and institutional controls (IC) to maintain industrial land use. Groundwater monitoring was specified to evaluate the effectiveness of the remedial efforts. PCE and TCE concentrations in groundwater have decreased to concentrations near or below RA levels at most monitoring wells on site and the interim measure (IM) of biostimulation and bioaugmentation has been largely effective for groundwater at those wells. However, the IM has not been effective at well MW-BW13 located within the contaminant plume downgradient of the former source area. TCE concentrations at that well fluctuate above and below the RA level and have not changed significantly since 2003. In the 2017 Annual Report additional injections were recommended as an optimization effort in accordance with the IM Work Plan targeting groundwater at well MW-BW13. This recommendation was approved by KDEP in February 2019 and injections activities were completed

by Oct. 22, 2019. The site is on the installation's RCRA corrective action permit as SWMU FTKX-21. Vinyl chloride (VC) concentrations exceeded the MCL at MW-BW2 from 2018 through 2020 and has demonstrated an increasing trend, indicating that chlorinated solvent biodegradation continues. Cis-1,2-Dichloroethylene (cis-1,2-DCE) has been detected in groundwater below the MCL (2017, 2019) in MW-BW2. Based on the presence of VC and cis-1,2-DCE, biodegradation of PCE/TCE continues to occur in FTKX-21. With increased trends in both contaminants, Fort Knox proposed a RCRA Correction Action permit Class I modification to add VC and cis-1,2-DCE to the list of COCs in February 2023. KDEP approved the Class I permit modification on Feb. 7, 2023, to add VC and cis-1,2-DCE to the COCs. Periodic reviews are performed at the site. Administrative record documentation is pending modification in 2024. Annual LUC inspections and monitoring are performed and documented in the Fort Knox annual reports. The cleanup/exit strategy at the site is to continue groundwater monitoring, reporting, LUCs, and periodic reviews indefinitely.

21405.1028_FTKX-22_BLDG 112 UST PEST. RINSE TANK

Env Site ID: FTKX-22

Cleanup Site: BLDG 112 UST PEST. RINSE TANK

Alias: #

Regulatory Driver: RCRA-C

RIP Date: 3/14/2013

RC Date: 9/15/2054

RC Reason: Not assigned

SC Date: 9/16/2054

Program: ENV Restoration, Army

Subprogram: IR

NPL Status: No

Hazardous Ranking Score: 0

RRSE:

MRSPP: N/A

Phase	Start	End
RFA:	9/30/1986	2/28/1989
CS:	3/15/1989	4/15/1989
RFI/CMS:	5/15/1989	9/30/2027
DES:	--	--
IRA:	8/2/2007	3/14/2013
CMI(C):	3/14/2013	3/14/2013
CMI(O):	3/14/2013	9/15/2054
LTM:	--	--

Site Narrative: FTKX-22 is a former pesticide rinse tank site located behind Building 112 in the southern part of the cantonment area. Building 112 was used as an automotive maintenance facility and later was used for mixing and formulation of insecticide and rodenticide solutions. The site was identified in the RFA and listed as SWMU FTK-022. UST that collected the pesticide rinseate and associated piping was removed in 1988. Excavated soil from the tank pit contained elevated concentrations of chlordane which prompted the removal and off-site disposal of 180 cubic yards (cy) of contaminated soil. Historical data and the results of three phases of RFIs have provided information on the nature and extent of soil contamination. The identified site related COCs in groundwater are primarily PCE and TCE and their degradation products. The presence of TCE in high concentrations cannot be directly attributable to past practices associated with FTKX-22. It is possible that past use as an automotive maintenance facility or historical management practices in the area contributed to the contamination of the soil and groundwater at the site. The residuum TCE in deep subsurface soil is contributing to the contamination in the groundwater through migration to groundwater. The observed soil concentrations are not suggestive of the former pesticide rinse tank site being the source of contamination. Groundwater flow has been determined through multiple dye trace tests from the site. COCs were detected at Gold Vault Spring (SP-250). A CMS and DD were both finalized in 2007. The CMS recommended biostimulation, bioaugmentation, MNA, and interim ICs to address contamination in groundwater. The biostimulation and bioaugmentation IM were implemented in 2007. Groundwater and spring monitoring was included in the remedy to evaluate the effectiveness of remedial efforts and MNA. Since 2007 groundwater samples have been collected from monitoring wells and Gold Vault Spring. Sampling data suggest that although geochemical indicators suggest reductive dechlorination is occurring at the site concentrations of TCE and its degradation products in groundwater have rebounded above RA levels suggesting that MNA processes are not occurring completely. Ramp down measures include the reduction in analysis and frequency at Gold Vault Spring and the discontinuation of monitoring at Leaning Cedar Spring. Site optimization measures include monitoring well rehabilitation in 2014 the installation of additional

compliance monitoring well locations upgradient and downgradient of the site (2016-2019) as well as an additional future remedial injection based upon an updated conceptual site model. The FY22 Periodic Review determined corrective action is not functioning as intended. Biostimulation and bioaugmentation initially decreased groundwater volatile organic compounds (VOC) concentrations but levels have rebounded to baseline conditions indicating a continuing source. However, FTKX-22 interim ICs continue to prevent exposure to groundwater contamination, control access, and limit land use. Fort Knox is acting on recommendation from long-term monitoring and Third Periodic Review by reopening RFI/CMS phase to identify the source, nature, and extent of contamination to develop a remedy that is protective of human health and the environment. Additionally, Fort Knox will evaluate alternative corrective actions to achieve objectives. The RFI is scheduled to begin early 2024. The site is on the installation's RCRA corrective action permit as FTKX-22. Periodic reviews are performed at the site. Annual LUC inspections are performed and documented in the Fort Knox annual reports. The cleanup/exit strategy at the site is to continue groundwater and spring monitoring, reporting, LUCs, as well as periodic reviews indefinitely.

21405.1044_FTKX-39_SITE 4 & 6 AIP GAS DIST SYS

Env Site ID: FTKX-39

Cleanup Site: SITE 4 & 6 AIP GAS DIST SYS

Alias: #

Regulatory Driver: RCRA-C

RIP Date: 9/30/2027

RC Date: 9/30/2027

RC Reason: Not assigned

SC Date: 9/30/2027

Program: ENV Restoration, Army

Subprogram: IR

NPL Status: No

Hazardous Ranking Score: 0

RRSE:

MRSPP: N/A

Phase	Start	End
RFA:	1/31/1992	5/31/1993
CS:	1/31/1992	5/31/1993
RFI/CMS:	5/31/1993	9/30/2027
DES:	--	--
IRA:	--	--
CMI(C):	--	--
CMI(O):	--	--
LTM:	--	--

Site Narrative: The Abandoned Gasoline Line Distribution System was a series of six sites, referred to as Sites 1-6, of independent underground pipelines used to distribute gasoline throughout the installation. This system was abandoned in the 1940s. An assessment was done to determine the location and extent of the distribution system. The system consisted of more than 50,000 lineal feet of 2.5 to 6.5-inch steel pipe. Removal of accessible sections of the pipelines occurred in FY99. Accessible piping (i.e., present along roads) has been removed; piping that crossed roadways was closed/abandoned in place. Simultaneous with some accessible sections of the piping removal, 220 cy of contaminated soil was removed and disposed offsite. Sites 1, 2, 3, and 5 are closed. RA reports were submitted to the State in 1999. Groundwater is not a media of concern based on KDEP UST site scoring procedures in closed sites. The DD was signed March 31, 1999. Most of the pipeline was excavated except in a few areas where it could not be excavated. Groundwater could possibly be a media of concern for Sites 4 and 6. The proposed plan was to conduct risk assessment using residential and industrial scenarios at the two hot spot locations where further excavation is impractical. In FY08 this site was still under KDEP review. In two locations, Sites 4 & 6, specifically, impacted soil remains for future action because continued excavation would have been cost prohibitive. That is, roads and building foundations would have been impacted by the up to 30-foot-deep excavations. These areas will either be eliminated via risk assessment (following RCRA guidance) or be subject to long-term monitoring. While Sites 4 & 6 were part of RCRA Part B Permit signed Jan. 21, 1997, closure activities were conducted in February 2004 following KDEP UST guidance with the closure reports submitted to KDEP. KDEP issued Notices of Technical Inadequacies on Oct. 15, 2004, for Site No. 6 and Sept. 21, 2005, requiring clarifications, improved sample spacing, IAW KDEP UST regulations, and assessment of the pipeline under the concrete/paved areas. Installation Restoration Program (IRP) expected to receive No Further Action (NFA) with LUC based on likely industrial scenario. However, the expected NFA was not received from KDEP and subsequent Installation Action Plans indicated that Sites 4 & 6 were under UST regulations. Recent investigation by IRP in 2022 confirmed that KDEP UST Branch did not have Sites 4 & 6 under UST

regulation; however, Sites 4 & 6 were included on the RCRA Part B Corrective Action Permit dated Feb. 13, 2019, with LUCs implemented in the land use controls implementation plan (LUCIP). IRP has determined that the previous RC was not documented properly and that the site was declared RIP/SC resulting in data entry errors. IRP has reopened this site in HQAES in the RFI/CMS phase. Investigation efforts are pending. The final strategy is for RFI/CMS work with expected site closeout. An NFA will be requested from KDEP following RFI/CMS and any possible removal actions, if needed.

21405.1045_FTKX-40_UST 1473-A SITE CLOSURE

Env Site ID: FTKX-40

Cleanup Site: UST 1473-A SITE CLOSURE

Alias: #

Regulatory Driver: RCRA-C

RIP Date: 3/13/2006

RC Date: 3/13/2054

RC Reason: Not assigned

SC Date: 3/14/2054

Program: ENV Restoration, Army

Subprogram: IR

NPL Status: No

Hazardous Ranking Score: 0

RRSE:

MRSPP: N/A

Phase	Start	End
RFA:	4/30/1993	6/30/1993
CS:	7/15/1993	8/15/1993
RFI/CMS:	1/31/1994	9/30/2027
DES:	--	--
IRA:	--	--
CMI(C):	3/13/2006	3/13/2006
CMI(O):	3/13/2006	3/13/2054
LTM:	--	--

Site Narrative: Site FTKX-40 (UST 1473A) is the location of a former 10,000-gallon gasoline UST. The site is a former gasoline fueling station and is located between Chaffee Avenue and Knox Street in the main cantonment area. The UST was installed in 1947 and was used until 1986. A nearby 2,000-gallon diesel UST (UST 1473B) was used to store diesel fuel. Both USTs were removed in 1992, and the tanks appeared to be in good condition. The tank excavation went 16 feet below ground surface. A UST closure was performed in 1992 in accordance with KDEP UST regulations. Several previous site investigations have been conducted. The UST contained low levels of chlorinated solvents. Site FTKX-40 was investigated under the Fort Knox RCRA corrective action permit and regulated by the KDEP Hazardous Waste Branch rather than the KDEP UST program. However, KDEP UST classification guidelines were used as guidance in assessing the nature and extent of contamination. Benzene, toluene, ethylbenzene, xylenes (BTEX), TCE, and 1,2-dichloroethane (1,2-DCA) were identified as COCs for groundwater. BTEX, TCE and 1,2-DCA were not detected in groundwater in a deep bedrock (MW-07). A DD for Site FTKX-40 selected an IM of MNA and interim ICs with semiannual groundwater monitoring (USAEC 2007d). LUCs for Site FTKX-40 include categorical land use restrictions on groundwater use and installation of wells and access controls (warning signs). Groundwater sampling has been conducted semiannually at three wells (MW-01, MW-06, and MW-07). MW-05 was sampled semiannually in 2016, 2017, and 2018. Groundwater samples were collected and analyzed for VOCs. The 2014 Annual Report noted that benzene in groundwater had not decreased below remediation goals in all wells; therefore, optimization modification recommendations included the addition of analyses water quality parameters for nitrate, nitrite, sulfate, manganese, and field measurement of ferrous iron. The data will support an evaluation of whether aerobic biodegradation of benzene is occurring in the plume. Groundwater sampling at MW-05 was also recommended to assess if at this location is a downgradient well and if groundwater flow direction is radially away from the location of the former UST. These recommendations were approved by KDEP in a letter dated March 7, 2016 (KDEP 2016) and were implemented beginning in the first quarter of 2016. The 2016 Annual Report found that benzene concentrations remained elevated in downgradient MW-06

demonstrating that the downgradient edge of the benzene plume was not being monitored. The 2016 Annual Report recommended the following optimization modification; installation of one additional groundwater monitoring well southwest of downgradient from MW-06 to evaluate the downgradient extent of benzene contamination in groundwater. This recommendation was approved by KDEP in a letter dated Jan. 10, 2018. The monitoring well was installed in 2019. The following optimization modification was recommended in the 2017 Annual Report; The remedial decision should be reevaluated, and a new IM should be performed to be in accordance with RCRA permit condition IV.F. The modification was approved by KDEP in a letter dated Feb. 11, 2019. Per the approved modification, a new IM will be developed using the data obtained from the new well installed in 2019 and the revised conceptual site model. It is anticipated that a minimum of eight sampling events will be needed to update the conceptual site model. The site is on the installation's RCRA corrective action permit as SWMU-40 within Appendix 1.1 as requiring further action. Periodic reviews are performed at the site. Third Periodic Review-FY22 surmised that based on groundwater monitoring data, FTKX-40 corrective action is not functioning as intended by the DD. MNA has not achieved the FTKX-40 objective within the estimated two-year timeframe. While ICs prevent direct contact with groundwater, benzene is persisting at concentrations unlikely to be reduced by natural attenuation and aquifer conditions are anaerobic and not favorable for biodegradation of benzene and other hydrocarbons. Lower concentrations of benzene detected at other FTKX-40 monitoring wells are likely to be reduced via natural attenuation but the hydrocarbon "hot spot" around MW-01 is indicative of a residual light non-aqueous phase liquid mass. IRP has reopened this site in the RFI/CMS phase. Investigation efforts are pending. Annual LUC inspections are performed and documented in the Fort Knox annual reports. The cleanup/exit strategy at the site is to continue monitoring, reporting, LUCs to include groundwater restriction, and periodic reviews indefinitely.

21405.1076_CCFTK-103_Mult. Heating Fuel UST Remedy

Env Site ID: CCFTK-103

Cleanup Site: Mult. Heating Fuel UST Remedy

Alias: #

Regulatory Driver: RCRA-I

RIP Date: 9/15/2016

RC Date: 9/15/2016

RC Reason: Other

SC Date: 9/16/2054

Program: ENV Restoration, Army

Subprogram: IR

NPL Status: No

Hazardous Ranking Score: 0

RRSE: Not Evaluated

MRSPP: N/A

Phase	Start	End
ISC:	9/30/2007	12/31/2007
INV:	12/31/2008	7/31/2009
CAP:	12/31/2009	9/15/2016
DES:	--	--
IRA:	--	--
IMP(C):	--	--
IMP(O):	--	--
LTM:	9/15/2016	9/15/2054

Site Narrative: Part of the Fort Knox UST program in the past was to close numerous state exempt petroleum tank systems some of which were heating oil tanks. Many of these sites met the applicable soil limits during closure and received a NFA letter from the state; however, some of the sites required further remediation in order to meet applicable soil levels. Analytical tests of soil samples taken during the removal action indicated that the sampling results did not meet the preliminary remediation goals for PAHs at many of these sites. In FY08, the heating fuel UST cleanup program was created to investigate 55 UST sites. In 2009 additional sampling was conducted and analyzed. Based on analytical results of soil samples collected during this sampling event, over-excavation, confirmatory sampling, and submittal of a closure report were required to close out 26 of these 55 sites. The 55 sites are as follows- 17.1, 17.2, 17.3, 580.1, 608.1, 609.1, 889.1, 1118, 1173, 1468, 1475, 1479, 1483, 1486, 1535, 1537, 1797, 2001, 2010, 2373, 2723, 2730, 2763.1, 2766.2, 2780, 2786.1, 2959, 2963.1, 2974.1, 4238.1, 4769, 5222, 5542, 6117, 6544, 6548, 6553, 6577.1, 6590, 6901, 7238.1, 7342.1, 7342.2, 7342.3, 7423.1, 7425.1, 7474.1, 9189, 9244, 9261, 9297.2, 9297.3, 9298.1, 9298.4, and 9661. The 26 that needed additional work were 17, 1118, 1173, 1468, 1483, 1486, 1537, 1797, 2001, 2373, 2723, 2959, 4769, 5222, 6544, 6548, 6553, 6590, 6901, 9189, 9244, 9261, 9297.2, 9297.3, 9298.1, and 9298.4. Upon completion, NFA was achieved at all sites with the exception of sites 7342.1, 7342.2, 7342.3, 1118, 1483, 1486, and 6901. Regulated UST sites 7342.1, .2, and .3 required additional investigation to determine the extent of contamination; therefore, a new site was created; CCFTK-7342 (21405.1078) and will be addressed separately from 21405.1076. Four heating fuel USTs have not received clean closure due to the close proximity of buildings and utilities at sites 1118, 1483, 1486, and 6901. Complete closeout cannot be achieved due to the proximity of buildings and/or utilities to each site. These sites (1118, 1483, 1486, and 6901) will be included in the next periodic review and future periodic reviews. These former heating fuel USTs sites appear on the installation's environmental LUC geographic information system (GIS) layer. The site's underway work will be performed by government employees (e.g., maintaining/recording/reporting on

LUCs). The cleanup/exit strategy at sites 1118, 1483, 1486, and 6901 is to continue LUCs and periodic reviews indefinitely.

21405.1078_CCFTK-7342_UST 7342.1, .2, .3

Env Site ID: CCFTK-7342

Cleanup Site: UST 7342.1, .2, .3

Alias: #

Regulatory Driver: RCRA-I

RIP Date: 9/30/2019

RC Date: 9/30/2019

RC Reason: All Required Cleanup(s) Completed

SC Date: 9/30/2054

Program: ENV Restoration, Army

Subprogram: IR

NPL Status: No

Hazardous Ranking Score: 0

RRSE: Not Evaluated

MRSPP: N/A

Phase	Start	End
ISC:	10/15/1997	10/15/1998
INV:	7/15/2011	3/9/2016
CAP:	1/4/2017	9/12/2019
DES:	--	--
IRA:	--	--
IMP(C):	9/1/2019	9/30/2019
IMP(O):	--	--
LTM:	9/30/2019	9/30/2054

Site Narrative: The CCFTK-7342 Site is located at the southwest corner of Ninth Avenue and Wilson Road in the southeast quadrant of the Fort Knox cantonment area. The Site CCFTK-7342 fueling system used primarily for fueling military vehicles and equipment was originally installed in 1963 and consisted of two 12,000-gallon diesel USTs, one 12,000-gallon gasoline UST (designated 7342.1 7342.2 and 7342.3 respectively), and associated piping that serviced three pump islands. The CCFTK-7342 piping and pump islands were removed in 1997 and the USTs were removed in 1998 along with an unknown volume of soil over-excavated from the tank pit. Documentation from these activities demonstrated that some concentrations of BTEX and PAH remained in the surrounding soil after excavation. The former UST pit area was not closed in accordance with the UST closure guidance and Fort Knox Environmental Management Division (EMD) was not able to secure NFA status from KDEP Division of Waste Management UST Branch. Site CCFTK-7342 is located adjacent to the north boundary of the CLF FTKX -01 which is regulated per the Fort Knox RCRA corrective action permit (KY6-210- 020-479) as SMWU FTKX-01. Prior to the 2018 RFI, four previous investigations of Site CCFTK-7342 (2011, 2012, 2013, and 2014) were conducted. An approved UFP-QAPP was developed in accordance with the Hazardous Waste Branch RFI guidance. The implemented RFI delineated the vertical and lateral extent of site COCs in soil and the nature and extent of COC impacts to groundwater. The fieldwork and sampling were completed in 2018. Based on the RFI findings, Site CCFTK-7342 was transferred from the Hazardous Waste Branch back to the UST Branch in November 2018. One of the requests of the transfer was to leave the monitoring wells in place and exchange one of the CLF monitoring wells for one of the CCFTK-7342 wells to be included as part of the annual monitoring of the CLF. A site investigation report (SIR) was prepared in accordance with UST branch guidance. A draft report was submitted to Fort Knox EMD and US Army Corp of Engineers for review on April 11, 2019. A draft-final SIR was submitted on May 28, 2019, and the report was finalized in September 2019 following KDEP approval. The SIR recommended NFA status for Site CCFTK-7342 based on the following- No COC concentrations exceeding applicable screening levels were identified in groundwater, five soil investigations with a total of 115 soil borings were completed to

refusal. Soil samples were collected at multiple depth intervals (255 samples in total) and analyzed for respective COCs; the results were used in delineating the horizontal and vertical extent of contamination with the exception of the southern site boundary that is shared with the CLF. Delineation of impact further to the south was constrained by the presence of the CLF cap. Groundwater flow in the vicinity of CCFTK-7342 is to the northeast away from the CLF and monitoring results identified only trace site related compounds at concentrations less than the site screening levels. The CLF long-term remedy involves maintenance of the cap, monitoring of landfill gases, monitoring of groundwater and spring quality, as well as enforcement of LUCs. As such, the closure of Site CCFTK-7342 is not anticipated to alter either the soil or groundwater closure strategy for the CLF site or any other SWMU or area of contamination. On Sept. 12, 2019, KDEP issued an NFA determination for CCFTK-7342 whereby the site was formally closed under UST Branch guidelines. KDEP requires no additional actions by the Army with regard to Site CCFTK-7342. The site is catalogued in the Fort Knox LUCIP and is in the environmental land use control GIS layer. The GIS data input by Fort Knox EMD is one of the many resources the Base Master Planner will reference when developing future projects. If there is a change to the land use the risk will be re-evaluated. The cleanup/exit strategy at the site is to continue reporting, LUCs, and periodic reviews indefinitely.

21405.1088_FTKX-46_PFAS

Env Site ID: FTKX-46

Cleanup Site: PFAS

Alias: #

Regulatory Driver: CERCLA

RIP Date: 9/30/2028

RC Date: 9/30/2028

RC Reason: Not assigned

SC Date: 9/30/2028

Program: ENV Restoration, Army

Subprogram: IR

NPL Status: No

Hazardous Ranking Score: 0

RRSE:

MRSPP: N/A

Phase	Start	End
PA:	9/30/2017	6/24/2019
SI:	6/25/2019	9/30/2022
RI/FS:	2/1/2023	9/30/2028
RD:	--	--
IRA:	--	--
RA(C):	--	--
RA(O):	--	--
LTM:	--	--

Site Narrative: Per direction from Deputy Chief of Staff G9 site created to account for all per- and polyfluoroalkyl substances (PFAS), perfluorooctane sulfonate (PFOS), perfluorooctanoic acid (PFOA), and perfluorobutanesulfonic acid (PFBS) costs at the installation. Eight areas of potential interest (AOPI) were identified during SI, and subsequent sampling results were compared to risk-based screening levels calculated by the Office of the Secretary of Defense. PFOS, PFOA, and or PFBS were detected in soil/groundwater at all eight AOPIs. Only four AOPIs had concentrations greater than risk-based screening levels. Preliminary assessment/site inspection completed May 2022, assessed current and or potential historical use of PFAS and recommended further study in a Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) remedial investigation (RI). The RI began in February 2023 with field activities started in early 2024. Additional activities will be determined based on the RI findings.

21405.1089_FTKX-45_Camp Knox Dump Site

Env Site ID: FTKX-45

Cleanup Site: Camp Knox Dump Site

Alias: #

Regulatory Driver: RCRA-C

RIP Date: 8/24/2026

RC Date: 8/24/2026

RC Reason: Not assigned

SC Date: 8/25/2026

Program: ENV Restoration, Army

Subprogram: IR

NPL Status: Not assigned

Hazardous Ranking Score: 0

RRSE:

MRSPP: N/A

Phase	Start	End
RFA:	5/1/2021	6/1/2021
CS:	--	--
RFI/CMS:	8/25/2021	8/24/2026
DES:	--	--
IRA:	--	--
CMI(C):	--	--
CMI(O):	--	--
LTM:	--	--

Site Narrative: The dump site is located just outside the southeast portion of the cantonment boundary off of 7th Armored Division Cut-Off Road. This is slightly northeast of current Building 7224, which is utilized for K-9 training, and northwest of Buildings 7223 & 7226, that are utilized by the roads and grounds maintenance contractor. The dump site is located along a steep ravine above and alongside Compost Valley Spring (SP-190). The dump site is also located southeast from SWMU FTKX-01 (The Closed Landfill 21405.1009). Based on observations made during the initial site visit, the dump site was believed to encompass approximately 2.27 acres. This estimate was calculated using ArcMap 10.6.1 software and is based on an analysis of Light Detection and Ranging (LiDAR) data that portrays non-natural features in that area, as well as evidence from the initial site inspection on Nov. 8, 2019. Camp Knox Dump Site 2015 LiDAR Overlay Map illustrates the approximate boundary of the dump site and geographical features in the area with supporting 2015 LiDAR data. After a subsequent site inspection on Nov. 19, 2019, and the geo referencing of the 1945 aerial imagery, the site extent was updated to approximately 3.35 acres. The 1919 Camp Knox Completion Report documents disposal of sewage, garbage, and other wastes at this location during the construction of the camp. During the initial construction sewage and garbage were transported from the camp and buried in a field. A large ravine was later secured for use as an incinerating dump. This Camp Knox Completion Report indicates that the ravine drains into a tributary of Mill Creek. The site was also used for disposal of excreta. An improvised septic tank was formed by placing a timber dam across a small vine adjacent to the dump and a timber trough was constructed extending from the basin to a hopper in the unloading platform at the top of the ravine. Latrine cars were hauled by trucks and wagons to the unloading platform and were washed and steamed after being emptied. Historical drawings indicate there was an incinerator Building 7231 constructed in 1925 west of the 1920 location. According to the drawings the building was altered and modified throughout its history. Within the 1940s and 1950s it is uncertain when the incinerator at Building 7231 was discontinued. The landfill northwest of the dump site SWMU FTKX-01 (The Closed Landfill 21405.1009) on the corner of 9th and Wilson was reportedly used during the 1940s for disposal

of waste. Prior to 1940, solid waste was disposed of at an incinerator at 11th Ave. However, according to a 1990 report it is possible that some of the ash from the previous incinerator was placed in the landfill. A RFA was conducted in 1989, and neither the original Camp Knox Dump Site nor Building 7231 incinerator were identified. Confirmatory sampling was conducted in May 2020. Concentrations of VOCs, PAHs, PCBs, pesticides, and metals were detected above screening levels. The site was identified for additional investigation. The site began RFI to determine the nature and extent of contamination beginning in early 2022. Additional disposed materials (tar, sludge, and drums) found in early 2022 led to two interim measures being implemented to remove contaminants with the removal action conducted in early 2023. Subsequently, the area of concern was expanded and additional RFI measures were actioned. Two down gradient wells were installed early 2022, and one upgradient well in November 2022. The RFI recommended a human health risk assessment and screening-level ecological risk assessment to identify site-specific criteria for protection of human health and the environment. The output of the risk assessment step would be site-specific protective criteria that can be used to re-evaluate the limits of impact and the potential need for additional characterization. Upon completion of the re-evaluation, any additional characterization needs may be addressed through a characterization phase of the Corrective Measures Study. The RFI report was submitted to KDEP in January 2024. The site is on the installation's RCRA corrective action permit as SWMU-45. The cleanup/exit strategy at the site is unknown at this time and future actions will be determined upon the finalization of an RFI/CMS.

SITE SUMMARY

SITE CLOSEOUT SUMMARY

CRL ID	Site Name	Site Closeout Date
21405.1001	FTK-008_PATHOLOGICAL INCINERATOR BLDG. 8	2/28/1989
21405.1003	FTK-014_4 WATER TREAT. PLANT LIME SLUDGE	2/28/1989
21405.1004	FTK-018_2 CENTRAL WASH RACKS	2/28/1989
21405.1006	FTK-038_PCB TRANSFORMER STORAGE SITE BLD	9/30/2001
21405.1007	FTK-41A_ANDERSON GOLF COURSE	6/30/2000
21405.1008	FTK-41L_LINDSEY GOLF COURSE	6/30/2000
21405.1011	FTKX-03_STEAM GENERATOR INCINERATOR	2/28/1989
21405.1012	FTKX-04_BOILER USED TO BURN CLASSIFIED W	2/28/1989
21405.1013	FTKX-05_CLASSIFIED DOCUMENT INCINERATOR	2/28/1989
21405.1014	FTKX-06_PATHOLOGICAL INCINERATOR IRELAND	2/28/1989
21405.1015	FTKX-07_PATH INCINERATOR BLDG T-1068	2/28/1989
21405.1016	FTKX-09_WASTEWATER TREATMENT PLANT	2/28/1989
21405.1018	FTKX-12_WWTP FILTER PRESS BLDG	2/28/1989
21405.1019	FTKX-13_WWTP 3 LIME SLUDGE LAGOONS MULDR	2/28/1989
21405.1020	FTKX-15A_UST & PIPELINE REMOVALS BLDG 10	7/31/2003
21405.1021	FTKX-15B_UST'S BURK MOTOR PARK BLDG 2730	2/28/1989
21405.1022	FTKX-15C_UST SITE BUILDING 2952	2/28/1989
21405.1023	FTKX-15D_UST SITE 2823 INVESTIGATION/REM	11/8/2017
21405.1024	FTKX-16_MULTIPLE ABOVE GROUND STORAGE TA	2/28/1989
21405.1025	FTKX-17_MULTIPLE OIL WATER SEPARATORS	2/28/1989
21405.1026	FTKX-19_FORMER DRMO HW STG AREA	2/28/1989
21405.1029	FTKX-23_PCP TRANSFORMER STORAGE AREA T-6	2/28/1989
21405.1030	FTKX-24_FIRE FIGHTER TRNING AREA	9/30/2007
21405.1031	FTKX-25_RAD HOS WST STG AREA BNKER 1070	2/28/1989
21405.1032	FTKX-26_HOSPITAL SILVER RECOVERY OPERATI	2/28/1989
21405.1033	FTKX-27_DENTAL CLINIC SILVER RECOVERY OP	2/28/1989
21405.1034	FTKX-28_PHOTOGRAPHIC LAB SILVER RECOVERY	2/28/1989
21405.1035	FTKX-29_CRUMB RANGE EOD SITE	2/28/1989
21405.1036	FTKX-30_TIOGA SPRINGS EOD SITE	9/30/2007
21405.1037	FTKX-31_FORMER TRANSFORMER STG BLD 58,59	9/30/2003
21405.1038	FTKX-32_FORMER TRANSFORMER STG BLD 2953	3/31/1999
21405.1039	FTKX-33_FORMER TRANSFORMER STG PAINT SHO	9/30/2001
21405.1040	FTKX-34_FORMER TRANSFORMER STG BLD 4240	2/28/1989
21405.1041	FTKX-35_FORMER TRANSFORMER STG BLD 4019	9/30/2001
21405.1042	FTKX-36_PRINTING PLANT SILVER RECOVERY O	2/28/1989
21405.1043	FTKX-37_PARKERIZATION PROCESS AREA, BLG	1/31/1996
21405.1046	FTKX-41_SANDERS SPRING	6/30/1994
21405.1047	FTKX-42_TWO GOLF COURSES	2/28/1989
21405.1048	FTKX-43_OIL & GREASE PIT	7/31/1994
21405.1051	PBC at Knox_PBC	10/15/2012
21405.1053	CCFTK-1725_Heating Fuel UST Building 172	5/15/2010
21405.1054	CCFTK-5943_Heating Fuel UST Building 594	5/15/2010

CRL ID	Site Name	Site Closeout Date
21405.1055	CCFTK-6564_Heating Fuel UST Building 656	5/15/2010
21405.1056	CCFTK-2943_Waste Oil UST Building 2943	2/15/2010
21405.1057	CCFTK-1479_Heating Fuel UST Building 147	3/31/2009
21405.1058	CCFTK-127_Heating Fuel UST Building 127	9/30/2010
21405.1059	CCFTK-297_Heating Fuel UST Building 297	5/15/2010
21405.1060	CCFTK-1475_Heating Fuel UST Building 147	9/30/2010
21405.1061	CCFTK-2942_Waste Oil UST Building 2942	2/15/2010
21405.1062	CCFTK-2010_Heating Fuel UST Building 201	9/30/2010
21405.1063	CCFTK-1730_UST ID# 5631-047 (1730.1 and	9/30/2010
21405.1064	CCFTK-1395_UST ID# 5628-047 (1395.5)	3/15/2010
21405.1065	CCFTK-101_St John Motor Park	9/30/2009
21405.1066	CCFTK-6147_UST ID# 5991-047 (6147.1)	9/30/2008
21405.1067	CCFTK-9245_UST ID# 5720-047 (9245.2)	8/15/2008
21405.1068	CCFTK-5901_UST ID# 5978-047 (5901.1, .2,	6/15/2009
21405.1069	CCFTK-6143_UST ID# 5687-047 (6143.1)	8/15/2007
21405.1070	CCFTK-6146_UST ID# 5690-047 (6146.1)	9/30/2008
21405.1071	CCFTK-6142_UST ID# 5686-047 (6142.1)	2/15/2010
21405.1072	CCFTK-2754_UST ID#5634-047 (2754.1)	2/15/2010
21405.1073	CCFTK-2764_UST ID# 5641-047 (2764.1)	9/30/2008
21405.1074	CCFTK-479_UST ID# 5605-047 (479.1, 479.2	8/15/2008
21405.1075	CCFTKX-15B_UST'S BURK MOTOR PARK BUILDIN	12/31/2009
21405.1077	CCFTK-104_Warrior In Transition Complex	7/31/2011
21405.1079	CCFTKX-017_Removal of 2 Oil Water Separa	3/15/2013
21405.1083	CCFTKX-017AK_Removal of Oil Water Separ	2/15/2014
21405.1049	FTKX-002-R-01_CAMP CARLSON	10/31/2007
21405.1050	FTKX-001-R-01_1918 RIFLE RANGE	10/31/2007
21405.1052	FTKX-003-R-01_Munition Debris Crypts	10/31/2008
21405.1080	CCFTK-012_WWTP FILTER PRESS BLDG - RCRA	1/31/2008
21405.1081	CCFTK-016_MULTIPLE ASTS - RCRA CA	1/31/2008
21405.1082	CCFTK-029_CRUMB RANGE EOD SITE - RCRA CA	9/30/2002
21405.1084	CCFTK-018_TWO CENTRAL WASHRACK - RCRA CA	6/30/2002
21405.1085	CCFTK-017_MULTIPLE OIL/WATER SEPARATORS	2/28/2010
21405.1086	CCFTK-011_17 WWTP SLUDGE DRYING BEDS - R	6/30/2008
21405.1087	CCFTK-100_UST Program Cleanup	3/31/2007
21405.1096	CCFTK-2758_UST ID# 5638-047 (2758.1, 275	1/31/2010
21405.1099	CCFTK-102_Heating Fuel UST Cleanup Progr	9/30/2009

COMMUNITY INVOLVEMENT

Community Involvement Plan (Date Last Reviewed):	8/1/2018
Technical Review Committee Establishment Date:	N/A
Restoration Advisory Board (RAB) Establishment Date:	N/A
RAB Adjournment Date:	N/A
RAB Adjournment Reason:	N/A
Reasons for Not Establishing RAB:	N/A
RAB Date of Solicitation from Community:	8/01/2023
RAB Results of Solicitation:	Insufficient community interest in the past has indicated a lack of interest in establishing a RAB. In August 2023 a RAB solicitation was run in the local newspaper; Fort Knox received no comments.
Current Technical Assistance for Public Participation (TAPP):	N/A
TAPP Title:	N/A
Potential TAPP:	N/A
Administrative Record Location:	Environmental Management Division, Bldg 1110-B, Room 234, Fort Knox, KY 40121
Information Repository Location:	Environmental Management Division, Bldg 1110-B, Room 234, Fort Knox, KY 40121

FIVE-YEAR / PERIODIC REVIEW SUMMARY

Status	Review Type	Start Date	End Date	Plans Narrative	Actions Narrative	Results Narrative
Planned	PR	11/1/2026	9/30/2027	TBD	TBD	TBD
Completed	PR	11/1/2021	9/30/2022	<p>FTKX-01 - CLF CAP is planned to be repaired in FY23. Mn sampling will include FF samples for future total suspended solids and dissolved solids to develop background groundwater manganese concentration for comparison. FTKX-21 – Vinyl Chloride (VC) and Dichloroethane (DCE) was added to FTKX-21 COCs in FY22 via CL 1 Permit Mod Proposal. Sampling for VC and DCE will begin in FY23. FTKX-22 (1) - Efforts are underway and plan to start an RFI in FY23 IAW recommendations. (2) - BLDG 112 and 119 are scheduled for demolition and are vacant. FTKX-40 - Efforts are underway and plan to start an RFI in FY23 IAW recommendations.</p>	<p>FTKX-01, FTKX-21, FTKX-22, FTKX-40 - LTM monitoring, LUC inspections, and periodic reviews will continue.</p>	<p>FTKX-01 (1) - Develop a protective manganese groundwater remedial level using updated toxicity data. (2) - Localized repairs to the landfill cap should be performed to eliminate ponding and protect the integrity of the landfill cap. FTKX-21 - Add vinyl chloride to the list of COCs and identify an appropriate remedial goal. FTKX-22 (1) - Evaluate alternative corrective actions to achieve the corrective action objectives. (2) - Complete characterization of the source and nature and extent of potential unknown source of contamination. (3) - Perform a vapor intrusion study in accordance with Department of Defense Manual 4715.20(6)(4)(c) at FTKX-22 Buildings 112, 116, 117, and 119. FTKX-40 (1) - Evaluate alternate interim measures and prepare an Interim Measures. (2) - Develop site-specific COCs, remedial goals, and refine corrective action objectives.</p>