

**FY2016**

**FORT LEAVENWORTH**  
**Army Defense Environmental Restoration Program**  
**Installation Action Plan**

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## Statement of Purpose

The purpose of the Installation Action Plan (IAP) is to outline the total multiyear cleanup program for an installation. The plan identifies environmental cleanup requirements at each site or area of concern (AOC), and proposes a comprehensive, installation-wide approach, along with the costs and schedules associated with conducting investigations and taking the necessary remedial actions (RA).

In an effort to coordinate planning information between the restoration manager, the Installation Management Command (IMCOM)-West, the US Army Environmental Command (USAEC), Fort Leavenworth (FTL), the executing agencies, the regulatory agencies, and the public, an IAP was completed. The IAP is used to track requirements, schedules, and tentative budgets for all major Army installation cleanup programs.

All site-specific funding and schedule information has been prepared according to projected overall Army funding levels and is, therefore, subject to change.

## Acronyms

AEDB-CC	Army Environmental Database-Compliance-Related Cleanup
AEDB-R	Army Environmental Database - Restoration
AOC	Area of Concern
AST	Aboveground Storage Tank
bgs	below ground surface
C&GSC	Command and General Staff College
CAP	Corrective Action Plan
CC	Compliance-related Cleanup
CERCLA	Comprehensive, Environmental Response, Compensation and Liability Act of 1980
CMI	Corrective Measures Implementation
CMI(C)	Corrective Measures Implementation - Construction
CMI(O)	Corrective Measures Implementation - Operation
CMS	Corrective Measures Study
COC	Chemical of Concern
COPC	Chemicals of Potential Concern
CR	Compliance Restoration
CS	Confirmatory Sampling
DD	Decision Document
DEH	Directorate of Engineering and Housing
DERP	Defense Environmental Restoration Program
DES	Design
DNF	Document Not Finalized
DoD	Department of Defense
DPW	Directorate of Public Works
DRMO	Defense Reutilization and Marketing Office
E&E	Ecology and Environment, Inc.
e2M	Engineering Environmental Management, Inc.
ECAS	Environmental Compliance Assessment Survey
ECC	Environmental Chemical Corporation
EE/CA	Engineering Evaluation/Cost Analysis
ESD	Explanation of Significant Difference
FAWQC	Federal Ambient Water Quality Criteria
FRA	Final Remedial Action
FS	Feasibility Study
FTL	AEDB-R Designation for Fort Leavenworth
FY	Fiscal Year
GBA	George Butler Associates
GFPR	Guaranteed Fixed Price Remediation
GRO	Gasoline Range Organics
HGL	HydroGeoLogic, Inc.
HHRA	Human Health Risk Assessment
HQDA	Headquarters Department of the Army
HRR	Historical Record Review
IAP	Installation Action Plan
ID	Identification

## Acronyms

IMCOM	Installation Management Command
IMP(C)	Implementation- Construction
INV	Investigation
IR	Installation Restoration
IRA	Interim Remedial Action
IRP	Installation Restoration Program
ISC	Initial Site Characterization
ITS	Intertek Testing Services
KDHE	Kansas Department of Health and Environment
kg	kilogram
LF	Landfill
LTM	Long-Term Management
LTO	Long Term Operation
LUC	Land Use Controls
MC	Munitions Constituents
MCL	Maximum Contaminant Levels
MEC	Munitions and Explosives of Concern
mg	milligram
mg/L	milligrams per liter
mm	millimeter
MMRP	Military Munitions Response Program
MNA	Monitored Natural Attenuation
MR	Munitions Response
MRS	Munitions Response Site
N/A	Not Applicable
NFA	No Further Action
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
OMA	Operations and Maintenance, Army
PA	Preliminary Assessment
PAH	Polycyclic Aromatic Hydrocarbons
PBC	Performance-Based Contract
PCB	Polychlorinated Byphenyls
PCE	Tetrachloroethylene
POL	Petroleum, Oil and Lubricants
PRG	Preliminary Remediation Goal
RA	Remedial Action
RA(C)	Remedial Action - Construction
RAB	Restoration Advisory Board
RC	Response Complete
RCF	Regional Correctional Facility
RCI	Residential Construction Initiative
RCRA	Resource Conservation and Recovery Act
RD	Remedial Design
RFA	RCRA Facility Assessment

## Acronyms

RFI	RCRA Facility Investigation
RI	Remedial Investigation
RIP	Remedy-in-Place
ROD	Record of Decision
RR Cut	Railroad Cut Area
RRSE	Relative Risk Site Evaluation
RSK	Risk-Based Standards of Kansas
RSL	Regional Screening Levels
SI	Site Inspection
SoB	Statement of Basis
SVOC	Semi-Volatile Organic Compound
SWMU	Solid Waste Management Unit
TAL	Target Analyte List
TAPP	Technical Assistance for Public Participation
TPH	Total Petroleum Hydrocarbons
TRADOC	US Training and Doctrine Command
TRC	Technical Review Committee
USACE	US Army Corps of Engineers
USAEC	US Army Environmental Command (formerly called USATHAMA)
USAEHA	US Army Environmental Hygiene Agency (now called US Public Health Command)
USATHAMA	US Army Toxic and Hazardous Materials Agency
USDB	US Disciplinary Barracks
USEPA	United States Environmental Protection Agency
UST	Underground Storage Tank
UTL	Upper Tolerance Level
UXO	Unexploded Ordnance
VI	Vapor Intrusion
VOC	Volatile Organic Compound

# Installation Information

## Installation Locale

**Installation Size (Acreage):** 5643

**City:** Kansas City

**County:** Leavenworth

**State:** Kansas

## Other Locale Information

The official name of this facility is the United States Army Combined Arms Center and FTL. Located in northern Leavenworth County, Kansas, on the west bank of the Missouri River, it is approximately 25 miles northwest of the edge of the Kansas City metropolitan area, which has a combined population of approximately 2 million. The fort serves as home for the Command and General Staff College (C&GSC), National Simulation Center, the US Army Training and Doctrine Command (TRADOC) Analysis Center and the US Disciplinary Barracks (USDB). The installation was established in 1827 and is the oldest continuously operating Army installation west of the Mississippi River.

## Installation Mission

The mission of FTL is to support the TRADOC, whose primary mission on the fort is to train officers for command and staff work. This is done at the C&GSC and battle command training program. Another large mission is the long-term confinement of military prisoners in the USDB. Other significant activities on the fort include coordination of combined arms, collective training, and the National Simulation Center.

## Lead Organization

IMCOM

## Lead Executing Agencies for Installation

US Army Corps of Engineers (USACE) Northwest Region

## Regulator Participation

<b>Federal</b>	US Environmental Protection Agency (USEPA), Region VII, Air and Waste Management Division
<b>State</b>	Kansas Department of Health and Environment (KDHE), Bureau of Environmental Remediation

## National Priorities List (NPL) Status

FORT LEAVENWORTH is not on the NPL

## Installation Restoration Advisory Board (RAB)/Technical Review Committee (TRC)/Technical Assistance for Public Participation (TAPP) Status

The community has expressed no sufficient, sustained interest in a RAB.

## Installation Program Summaries

### IRP

**Primary Contaminants of Concern:** Herbicides, Metals, Pesticides, Polychlorinated Biphenyls (PCB), Polycyclic Aromatic Hydrocarbons (PAH), Semi-volatiles (SVOC), Volatiles (VOC)

**Affected Media of Concern:** Groundwater, Other (indoor air), Sediment, Soil, Surface Water

### MMRP

**Primary Contaminants of Concern:** Explosives, Metals

**Affected Media of Concern:** Soil



# 5-Year / Periodic Review Summary

## 5-Year / Periodic Review Summary

Status	Start Date	End Date	End FY
Complete	201103	201210	2013
Complete	200411	200503	2005
Planned	201610	201809	2018

## Last Completed 5-Year / Periodic Review Details

Associated ROD/DD Name	Sites
FTL-02 FRA/Capping	FTL-02
FTL-03 FRA/Capping	FTL-03
FTL-04 FRA/Capping	FTL-04
FTL-05 FRA/Capping	FTL-05
FTL-06 FRA/Capping	FTL-06
FTL-07 FRA/Capping	FTL-07
FTL-08 FRA/Capping	FTL-08
FTL-10 FRA/In-situ Soil Treatment	FTL-10
FTL-11/closed fire training area	FTL-11
FTL-15 FRA/In-Situ Soil Treatment	FTL-15
FTL-20/Septic tank nr B.398	FTL-20
FTL-24/pesticide area nr B. 227	FTL-24
FTL-30/past pesticide area nr. B.412	FTL-30
FTL-57 FRA/Removal	FTL-57
FTL-60/USDB greenhouse	FTL-11, FTL-20, FTL-24, FTL-30, FTL-60, FTL-65
FTL-65/pond in family housing	FTL-65
FTL-69 Institutional Controls	FTL-69
FTL-70 Institutional Controls	FTL-70
FTL-71 Institutional Controls	FTL-71

**Results** FTLs 02-08,10,11,15,20,24,30,57,60,65,69-71 remedies are protect. of human health & environ.; remedies are effective & function. as intended except FTL-65. Remedy effectiveness at FTL-65 cannot be determined due to current residential use.

**Actions** FTL-02: Labels for MW's are missing or illegible.  
 FTL-03: Erosion of one-mile creek along SW edge of site.  
 FTL-65: Additional investigation needed to determine remedy is protective under residential exposure scenario.

**Plans** FTL-02: Labels on MW's will be replaced.  
 FTL-03: Perform erosion maintenance on creek bank.  
 FTL-65: Site risk should be re-evaluated to determine current contaminant levels.

### Recommendations and Implementation Plans:

Benzo(a)anthracene, indeno(1,2,3-cd)pyrene, benzo(b)fluoranthene, dibenz(a,h)anthracene, cobalt and chromium in sediments and soils were not considered chemicals of potential concern (COPC) in the human health risk assessment (HHRA) at FTL-65, but have had measured concentrations that exceed the current screening criteria. Because the inclusion of these constituents could potentially indicate a risk greater than that allowable for a residential area, the site risks were reevaluated. The evaluation included re-sampling the site to determine current contaminant levels, including chromium (vapor intrusion (VI)), and the HHRA should be revised if necessary. This evaluation was contracted in FY14 and completed in FY15 and FY16. The final report found COPCs to be within the acceptable USEPA target risk range and the report was transmitted to USEPA and KDHE and received regulatory approvals. Therefore, no change to the original statement of basis (SoB) from 2005 was necessary (i.e. NFA).

## Land Use Control (LUC) Summary

**LUC Title:** FTL-02

**Site(s):** FTL-02

**ROD/DD Title:** FTL-02 FRA/Capping

**Location of LUC**

FTL-02 Inactive Landfill

**Land Use Restriction:** Landfill restriction - Prohibit activities that would impact the LF cap (or cover system) and drainage system, Landfill restriction - Prohibit excavation on LF cap or cover system, Landfill restriction - Restrict vehicular traffic, Media specific restriction - prohibit use of groundwater for consumption or domestic purposes, Media specific restriction - restrict drinking water well installation, Restrict land use - No residential use

**Types of Engineering Controls:** Signs

**Types of Institutional Controls:** Dig Permits, Notations in Master Plan, Restrictions on Groundwater Withdrawal, Restrictions on land use, Zoning

**Date in Place:** 200506

**Modification Date:** N/A

**Date Terminated:** N/A

**Inspecting Organization:** Installation

**Record of LUC:** Master Plan or Equivalent

**Documentation Date:** 200508

**LUC Enforcement:** Annual Inspections, Other

**Contaminants:** METALS, PCBs, PESTICIDES, VOC

**Additional Information**

N/A

**LUC Title:** FTL-03

**Site(s):** FTL-03

**ROD/DD Title:** FTL-03 FRA/Capping

**Location of LUC**

FTL-03 Inactive Landfill

**Land Use Restriction:** Landfill restriction - Prohibit activities that would impact the LF cap (or cover system) and drainage system, Landfill restriction - Prohibit excavation on LF cap or cover system, Landfill restriction - Restrict vehicular traffic, Media specific restriction - prohibit use of groundwater for consumption or domestic purposes, Media specific restriction - restrict drinking water well installation, Restrict land use - No residential use

**Types of Engineering Controls:** Signs

**Types of Institutional Controls:** Dig Permits, Notations in Master Plan, Restrictions on Groundwater Withdrawal, Restrictions on land use, Zoning

**Date in Place:** 200506

**Modification Date:** N/A

**Date Terminated:** N/A

**Inspecting Organization:** Installation

**Record of LUC:** Master Plan or Equivalent

**Documentation Date:** 200508

**LUC Enforcement:** Annual Inspections, Other

**Contaminants:** METALS, PCBs, PESTICIDES, VOC

## Land Use Control (LUC) Summary

### Additional Information

N/A

**LUC Title:** FTL-05

**Site(s):** FTL-05

**ROD/DD Title:** FTL-05 FRA/Capping

### Location of LUC

FTL-05 Inactive Sanitary Landfill

**Land Use Restriction:** Landfill restriction - Prohibit activities that would impact the LF cap (or cover system) and drainage system, Landfill restriction - Prohibit excavation on LF cap or cover system, Landfill restriction - Restrict vehicular traffic, Media specific restriction - prohibit use of groundwater for consumption or domestic purposes, Media specific restriction - restrict drinking water well installation, Restrict land use - No residential use

**Types of Engineering Controls:** Signs

**Types of Institutional Controls:** Dig Permits, Notations in Master Plan, Restrictions on Groundwater Withdrawal, Restrictions on land use, Zoning

**Date in Place:** 200506

**Modification Date:** N/A

**Date Terminated:** N/A

**Inspecting Organization:** Installation

**Record of LUC:** Master Plan or Equivalent

**Documentation Date:** 200508

**LUC Enforcement:** Annual Inspections, Other

**Contaminants:** METALS, PAH, VOC

### Additional Information

N/A

**LUC Title:** FTL-06

**Site(s):** FTL-06

**ROD/DD Title:** FTL-06 FRA/Capping

### Location of LUC

FTL-06 Inactive Landfill

**Land Use Restriction:** Landfill restriction - Prohibit activities that would impact the LF cap (or cover system) and drainage system, Landfill restriction - Prohibit excavation on LF cap or cover system, Landfill restriction - Restrict vehicular traffic, Media specific restriction - prohibit use of groundwater for consumption or domestic purposes, Media specific restriction - restrict drinking water well installation, Restrict land use - No residential use

**Types of Engineering Controls:** Signs

**Types of Institutional Controls:** Dig Permits, Notations in Master Plan, Restrictions on Groundwater Withdrawal, Restrictions on land use, Zoning

**Date in Place:** 200506

**Modification Date:** N/A

**Date Terminated:** N/A

**Inspecting Organization:** Installation

**Record of LUC:** Master Plan or Equivalent

## Land Use Control (LUC) Summary

**Documentation Date:** 200508

**LUC Enforcement:** Annual Inspections, Other

**Contaminants:** METALS, PAH, VOC

**Additional Information**

N/A

**LUC Title:** FTL-07

**Site(s):** FTL-07

**ROD/DD Title:** FTL-07 FRA/Capping

**Location of LUC**

FTL-07 Inactive Sanitary Landfill

**Land Use Restriction:** Landfill restriction - Prohibit activities that would impact the LF cap (or cover system) and drainage system, Landfill restriction - Prohibit excavation on LF cap or cover system, Landfill restriction - Restrict vehicular traffic, Media specific restriction - prohibit use of groundwater for consumption or domestic purposes, Media specific restriction - restrict drinking water well installation, Restrict land use - No residential use

**Types of Engineering Controls:** Signs

**Types of Institutional Controls:** Dig Permits, Notations in Master Plan, Restrictions on Groundwater Withdrawal, Restrictions on land use, Zoning

**Date in Place:** 200609

**Modification Date:** N/A

**Date Terminated:** N/A

**Inspecting Organization:** Installation

**Record of LUC:** Master Plan or Equivalent

**Documentation Date:** 200708

**LUC Enforcement:** Annual Inspections, Other

**Contaminants:** METALS, VOC

**Additional Information**

N/A

**LUC Title:** FTL-08

**Site(s):** FTL-08

**ROD/DD Title:** FTL-08 FRA/Capping

**Location of LUC**

FTL-08 Inactive Sanitary Landfill

**Land Use Restriction:** Landfill restriction - Prohibit activities that would impact the LF cap (or cover system) and drainage system, Landfill restriction - Prohibit excavation on LF cap or cover system, Landfill restriction - Restrict vehicular traffic, Media specific restriction - prohibit use of groundwater for consumption or domestic purposes, Media specific restriction - restrict drinking water well installation, Restrict land use - No residential use

**Types of Engineering Controls:** Signs

**Types of Institutional Controls:** Dig Permits, Notations in Master Plan, Restrictions on Groundwater Withdrawal, Restrictions on land use, Zoning

**Date in Place:** 200803

**Modification Date:** N/A

## Land Use Control (LUC) Summary

**Date Terminated:** N/A

**Inspecting Organization:** Installation

**Record of LUC:** Master Plan or Equivalent

**Documentation Date:** 200811

**LUC Enforcement:** Annual Inspections, Other

**Contaminants:** METALS, PCBs, VOC

**Additional Information**

N/A

**LUC Title:** FTL-10

**Site(s):** FTL-10

**ROD/DD Title:** FTL-10 FRA/In-situ Soil Treatment

**Location of LUC**

FTL-10 Old Fire Training Area / Burn Pit

**Land Use Restriction:** Media specific restriction - Prohibit, or otherwise manage excavation below a specified depth, Media specific restriction - prohibit use of groundwater for consumption or domestic purposes, Media specific restriction - restrict drinking water well installation, Media specific restriction - restrict withdrawal or use of groundwater w/out treatment, Restrict land use - No residential use

**Types of Engineering Controls:** Fences

**Types of Institutional Controls:** Notations in Master Plan, Restrictions on Groundwater Withdrawal, Restrictions on land use, Zoning

**Date in Place:** 200609

**Modification Date:** N/A

**Date Terminated:** N/A

**Inspecting Organization:** Installation

**Record of LUC:** Master Plan or Equivalent

**Documentation Date:** 200708

**LUC Enforcement:** Annual Inspections, Other

**Contaminants:** METALS, VOC

**Additional Information**

N/A

**LUC Title:** FTL-15

**Site(s):** FTL-15

**ROD/DD Title:** FTL-15 FRA/In-Situ Soil Treatment

**Location of LUC**

FTL-15 Used Solvent Tank UST Near Building 487-1

**Land Use Restriction:** Media specific restriction - Prohibit, or otherwise manage excavation, Media specific restriction - prohibit use of groundwater for consumption or domestic purposes, Media specific restriction - restrict drinking water well installation, Media specific restriction - restrict withdrawal or use of groundwater w/out treatment, Restrict land use - No residential use

**Types of Engineering Controls:** None

**Types of Institutional Controls:** Notations in Master Plan, Restrictions on Groundwater Withdrawal, Restrictions on land use, Zoning

## Land Use Control (LUC) Summary

**Date in Place:** 200609

**Modification Date:** N/A

**Date Terminated:** N/A

**Inspecting Organization:** Installation

**Record of LUC:** Master Plan or Equivalent

**Documentation Date:** 200708

**LUC Enforcement:** Annual Inspections, Other

**Contaminants:** VOC

**Additional Information**

N/A

**LUC Title:** FTL-57

**Site(s):** FTL-57

**ROD/DD Title:** FTL-57 FRA/Removal

**Location of LUC**

FTL-57 Skeet Range (Inactive)

**Land Use Restriction:** Media specific restriction - Prohibit, or otherwise manage excavation, Restrict land use - No residential use

**Types of Engineering Controls:** None

**Types of Institutional Controls:** Notations in Master Plan, Restrictions on land use, Zoning

**Date in Place:** 200803

**Modification Date:** N/A

**Date Terminated:** N/A

**Inspecting Organization:** Installation

**Record of LUC:** Master Plan or Equivalent

**Documentation Date:** 200811

**LUC Enforcement:** Annual Inspections, Other

**Contaminants:** METALS, PAH, VOC

**Additional Information**

N/A

**LUC Title:** FTL-69

**Site(s):** FTL-69

**ROD/DD Title:** FTL-69 Institutional Controls

**Location of LUC**

FTL-69 Diesel Fuel Spill Area

**Land Use Restriction:** Media specific restriction - Prohibit, or otherwise manage excavation, Media specific restriction - prohibit use of groundwater for consumption or domestic purposes, Media specific restriction - restrict drinking water well installation, Restrict land use - No residential use

**Types of Engineering Controls:** None

**Types of Institutional Controls:** Dig Permits, Notations in Master Plan, Restrictions on Groundwater Withdrawal, Restrictions on land use

**Date in Place:** 200803

## Land Use Control (LUC) Summary

**Modification Date:** N/A

**Date Terminated:** N/A

**Inspecting Organization:** Installation

**Record of LUC:** Master Plan or Equivalent

**Documentation Date:** 200811

**LUC Enforcement:** Annual Inspections, Other

**Contaminants:** PAH

**Additional Information**

N/A

**LUC Title:** FTL-70

**Site(s):** FTL-70

**ROD/DD Title:** FTL-70 Institutional Controls

**Location of LUC**

FTL-70 Fuel Oil Leak Site at USDB

**Land Use Restriction:** Media specific restriction - Prohibit, or otherwise manage excavation, Media specific restriction - prohibit use of groundwater for consumption or domestic purposes, Media specific restriction - restrict drinking water well installation, Restrict land use - No residential use

**Types of Engineering Controls:** None

**Types of Institutional Controls:** Dig Permits, Notations in Master Plan, Restrictions on Groundwater Withdrawal, Restrictions on land use

**Date in Place:** 200803

**Modification Date:** N/A

**Date Terminated:** N/A

**Inspecting Organization:** Installation

**Record of LUC:** Master Plan or Equivalent

**Documentation Date:** 200811

**LUC Enforcement:** Annual Inspections, Other

**Contaminants:** PAH, VOC

**Additional Information**

N/A

**LUC Title:** FTL-71

**Site(s):** FTL-71

**ROD/DD Title:** FTL-71 Institutional Controls

**Location of LUC**

FTL-71 McClellan Avenue Maintenance Site

**Land Use Restriction:** Media specific restriction - Prohibit, or otherwise manage excavation, Media specific restriction - prohibit use of groundwater for consumption or domestic purposes, Media specific restriction - restrict drinking water well installation, Restrict land use - No residential use

**Types of Engineering Controls:** None

**Types of Institutional Controls:** Construction Permit, Notations in Master Plan, Restrictions on Groundwater Withdrawal, Restrictions on land use

## Land Use Control (LUC) Summary

**Date in Place:** 200803

**Modification Date:** N/A

**Date Terminated:** N/A

**Inspecting Organization:** Installation

**Record of LUC:** Master Plan or Equivalent

**Documentation Date:** 200811

**LUC Enforcement:** Annual Inspections, Other

**Contaminants:** VOC

**Additional Information**

N/A



# Cleanup Program Summary

## Installation Historic Activity

Colonel Henry Leavenworth established FTL in 1827 with his officers and men of the 3d Infantry Regiment. Its mission was to administer the land to the west belonging to the Native American tribes, maintain the peace between them, and protect travelers along the Santa Fe and Oregon Trails.

The fort was the outfitting post for the troops fighting the war with Mexico in 1848.

During the Civil War, FTL was an important depot as well as the major base of operations for Union forces in the west.

Because of its central location, FTL became the primary depot for supplies destined for western military posts. It was the primary base for two of the four US "Colored" Troop regiments that fought in the Native American conflicts.

In 1875, the USDB was established to house military prisoners. Today, it is the only long-term maximum security confinement facility for the Department of Defense (DoD).

The School of Application for Cavalry and Infantry, which later evolved into the C&GSC, was established by General William T. Sherman in 1881. Graduates of the school excelled in planning complex expeditionary forces operations in World War I.

In 1946, the school's name changed to the C&GSC.

In 1959, Bell Hall was constructed to house the college. The new college, known as Lewis and Clark Hall, was constructed and opened in 2007.

The fort continues to be on the leading edge of the Army's future. The community's pride in its history of service to the Army and the nation is matched by its readiness to meet the challenges of the future.

The fort is located on the west bank of the Missouri River about 25 miles northwest of downtown Kansas City, Missouri. The Missouri River marks the northern and eastern boundaries of the fort. The city of Leavenworth is located on the southern boundary of the fort. On the southwest side of the installation is the US Penitentiary Leavenworth that was built by prisoners from the fort. Open farmland is to the west.

Due to FTL providing a full range of services to its residents, much of the environmental contamination is similar to that of other civilian communities (i.e., landfills, pesticide mixing areas, underground storage tank (UST) sites, etc.)

Since the introduction of the guaranteed fixed price remediation (GFPR) contract in 2002, the following sites have moved through the statement of basis (SoB) phase: FTL-02 through FTL-09; FTL-10, -11, -15, -20, -22, -24, -30, -41, -44, -57, -60, -64, -65, -69, -70 and -71.

Of these sites, FTL-02, FTL-03, FTL-05, FTL-06, FTL-07, FTL-08 and FTL-09 are landfills and will require continuous long-term management (LTM).

Interim land use controls (LUC) were placed on-sites FTL-19, -22, -34, -35, -38, -41, -48, -56, -64, -67, -72 and -74.

FTL-01 was removed from the fort's 2010 Resource Conservation and Recovery Act (RCRA) permit as this site is owned by the Leavenworth US Penitentiary.

## Installation Program Cleanup Progress

### IRP

**Prior Year Progress:** Remediation of FTL-72 was completed. Nine (9) Sites are in the investigation phase. A RFI/CMS was awarded to investigate FTL-34,-35,-43,-56,-63 and FTL-67. Confirmation sampling for FTL-65 was completed in 2015. The COPC identified in the five-year review were reevaluated for human health risk under residential land use, and found to be within the USEPA target risk range which did not require a change to the original SoB from 2005. Repair of surface erosion at FTL-09 was completed.

**Future Plan of Action:** LUCs will continue at FTL-02 through FTL-09, -10,-15,-57,-69,-70,-71,-72 and -74. Fieldwork through the RCRA facility investigation (RFI)/corrective measures study (CMS) phase is underway

## Cleanup Program Summary

and will continue at FTL 34,-35,-43,-56,-63 and FTL-67.

The USEPA-required hexavalent chromium background study was completed in 2015. The final report was submitted in November 2015 and approved by USEPA on December 8, 2015. USEPA is currently developing a draft SoB for several sites.

### MMRP

- Prior Year Progress:** An unexploded ordnance (UXO) locate-and-remove in one step was completed at site FTL-003-R-01 (FTL-74). An additional site investigation at FTL-003-R-01 (FTL-74) to document surface soil constituents was completed. An interim remedial action (IRA) was completed in the railroad cuts area at site FTL-001-R-01 (FTL-66).
- Future Plan of Action:** The risk assessor currently believes that the CMS will result in an acceptable risk level for all soils at the site without remediation. For budgetary purposes, an estimate has been prepared for the remediation of the locations that exceeded the preliminary remediation goal (PRG) of 400 milligrams (mg)/kilogram (kg) for lead.

**FORT LEAVENWORTH**  
**Army Defense Environmental Restoration Program**  
**Installation Restoration Program**

# IRP Summary

**Installation Total Army Environmental Database-Restoration (AEDB-R) Sites/Closeout Sites Count:** 72/50

## Installation Site Types with Future and/or Underway Phases

1	Above Ground Storage Tank (FTL-70)
1	Burn Area (FTL-10)
1	Firing Range (FTL-57)
1	Incinerator (FTL-43)
6	Landfill (FTL-02, FTL-03, FTL-05, FTL-06, FTL-07, FTL-08)
1	Spill Site Area (FTL-56)
1	Storage Area (FTL-63)
2	Surface Disposal Area (FTL-71, FTL-72)
1	Surface Impoundment/Lagoon (FTL-19)
3	Underground Storage Tank (FTL-15, FTL-67, FTL-69)
3	Washrack (FTL-34, FTL-35, FTL-38)
1	Waste Treatment Plant (FTL-48)

## Most Widespread Contaminants of Concern

Herbicides, Metals, Pesticides, Polychlorinated Biphenyls (PCB), Polycyclic Aromatic Hydrocarbons (PAH), Semi-volatiles (SVOC), Volatiles (VOC)

## Media of Concern

Groundwater, Other (indoor air), Sediment, Soil, Surface Water

## Completed Remedial Actions (Interim Remedial Actions/ Final Remedial Actions (IRA/FRA))

Site ID	Site Name	Action	Remedy	FY
FTL-52	USED OIL TANK BUILDING 109	FRA	REMOVAL	1991
FTL-68	WEED CONTROL AREA, CITY AIRPORT OPER	FRA	WASTE REMOVAL - SOILS	1991
FTL-53	USED OIL TANK BUILDING 471	FRA	REMOVAL	1994
FTL-12	USED OIL TANK AST NEAR BUILDING 305	FRA	REMOVAL	1995
FTL-13	USED OIL TANK UST NEAR BUILDING 689-0	FRA	REMOVAL	1995
FTL-61	TANK REMOVAL, BLDG 431	FRA	WASTE REMOVAL - SLUDGES	1995
FTL-29	PAST PESTICIDE BUILDING 413	FRA	WASTE REMOVAL - SOILS	1996
FTL-01	INACTIVE SANITARY LANDFILL	FRA	NATURAL ATTENUATION	1997
FTL-04	INACTIVE SANITARY LANDFILL	IRA	CAPPING	1998

## IRP Summary

### Completed Remedial Actions (Interim Remedial Actions/ Final Remedial Actions (IRA/FRA))

Site ID	Site Name	Action	Remedy	FY
FTL-09	CLOSED ACTIVE SANITARY LANDFILL	FRA	CAPPING	1998
FTL-14	USED OIL TANK NEAR BUILDING 86	FRA	REMOVAL	2000
FTL-16	USED SOLVENT TANK UST NR BLDG 487-2	FRA	REMOVAL	2000
FTL-17	USED SOLVENT TANK UST NR BLDG 487-3	FRA	REMOVAL	2000
FTL-18	USED SOLVENT TANK UST NR BLDG 487-4	FRA	REMOVAL	2000
FTL-19	SEWAGE LAGOONS	FRA	CONTAINMENT	2000
FTL-22	SEPTIC TANK NR BLDG 425	FRA	REMOVAL	2000
FTL-33	WASH RACK BUILDING 262	FRA	REMOVAL	2000
FTL-36	WASH RACK BUILDING 132	FRA	FREE PRODUCT RECOVERY	2000
FTL-37	WASH RACK BUILDING 86	FRA	FREE PRODUCT RECOVERY	2000
FTL-39	WASH RACK BUILDING 496	FRA	REMOVAL	2000
FTL-41	INCINERATOR BUILDING 344	FRA	REMOVAL	2000
FTL-44	INCINERATOR BUILDING 632	FRA	REMOVAL	2000
FTL-45	INCINERATOR BUILDING 136	FRA	REMOVAL	2000
FTL-50	USED SOLVENT TANK NO 5 BUILDING 487	FRA	REMOVAL	2000
FTL-51	USED SOLVENT TANK NO 6 BUILDING 487	FRA	REMOVAL	2000
FTL-55	USED OIL STORAGE, CITY AIRPORT OPERATION	FRA	REMOVAL	2000
FTL-62	UNDERGROUND PROPANE TANK, USDB FARM	FRA	REMOVAL	2000
FTL-64	FTL-64: REMOVE UST BLDG 264	FRA	REMOVAL	2000
FTL-67	UNDERGROUND TANKS OLD PX SERVICE STATION	IRA	WASTE REMOVAL - DRUMS, TANKS, BULK CONTAINERS	2000
FTL-04	INACTIVE SANITARY LANDFILL	FRA	CAPPING	2005
FTL-05	INACTIVE SANITARY LANDFILL	FRA	CAPPING	2005
FTL-06	INACTIVE LANDFILL	FRA	CAPPING	2005
FTL-15	USED SOLVENT TANK UST NR BLDG 487-1	IRA	IN-SITU SOIL TREATMENT	2005
FTL-30	PAST PESTICIDE BUILDING 412	FRA	WASTE REMOVAL - SOILS	2005
FTL-10	OLD FIRE TRAINING AREA/BURN PIT	FRA	IN-SITU SOIL TREATMENT	2006
FTL-10	OLD FIRE TRAINING AREA/BURN PIT	IRA	WASTE REMOVAL - SOILS	2006
FTL-10	OLD FIRE TRAINING AREA/BURN PIT	IRA	IN-SITU SOIL TREATMENT	2006
FTL-15	USED SOLVENT TANK UST NR BLDG 487-1	FRA	IN-SITU SOIL TREATMENT	2006
FTL-02	INACTIVE LANDFILL	FRA	CAPPING	2007
FTL-03	INACTIVE LANDFILL	FRA	CAPPING	2007

## IRP Summary

### Completed Remedial Actions (Interim Remedial Actions/ Final Remedial Actions (IRA/FRA))

Site ID	Site Name	Action	Remedy	FY
FTL-07	INACTIVE SANITARY LANDFILL	FRA	CAPPING	2007
FTL-08	INACTIVE SANITARY LANDFILL	FRA	CAPPING	2008
FTL-57	SKEET RANGE (INACTIVE)	FRA	REMOVAL	2009
FTL-72	Quarry Creek	IRA	REMOVAL	2010
PBC at Leaven.	PBC	FRA	OTHER	2011

### Duration of IRP

Date of IRP Inception: 197001

Estimated Date for Remedy-In-Place (RIP)/Response Complete (RC): 201806/202110

Date of IRP completion including Long Term Management (LTM): 203810

# IRP Contamination Assessment

## Contamination Assessment Overview

There are 75 sites currently being tracked by the Defense Environmental Restoration Program (DERP). There are 72 Installation Restoration Program (IRP) sites (26 are underway), three Military Munitions Response Program (MMRP) sites (two are underway: FTL-001-R-01 and FTL-003-R-01) and six Compliance Restoration (CR) sites (one is underway: FTL-09). The solid waste management sites addressed in this IAP include old landfills, contaminated sites, contaminated buildings, incinerators, and other activities that have or had the potential for a significant impact on the environment. This section discusses those sites which have a significant impact on the environment and future installation activities.

Sites that have been investigated for soil and/or groundwater contamination are FTL-02 through FTL-08; FTL-10, -11, -15, -20, -24, -30, -57, -60, -65, -69, -70 and -71.

Surface water and/or sediment concerns are located at FTL-02, -05, -06, -63, -65 and -72.

Metals, semi-volatile organic compounds (SVOC), volatile organic compounds (VOC), herbicides, and pesticide contaminants are located in the groundwater, the surface water, the soil, and the sediments. Polychlorinated biphenyl (PCB), PAH, and total petroleum hydrocarbon (TPH) contaminants have been investigated and identified in the soil.

Due to groundwater contamination, FTL-10, a burn pit which is on the RCRA permit, is a high priority site. It was used for many years to train firefighters. Used solvents were dumped on the ground and ignited. The surface area of this site is not large; however, the soil below has significant contamination, with an associated groundwater plume below it. FTL and other communities use the aquifer for potable water; however, the extent of the groundwater contamination appears to be limited and does not appear to pose an imminent threat to the users of this water. The current investigations have located the plume and have generally determined the extent of the soil contamination. The source area was removed in 2006. This is expected to significantly reduce the amount of contamination in the groundwater.

Landfills make up almost half of the active sites on the installation. This includes both sanitary and construction debris landfills. Remediation of the landfills has required the majority of the restoration program funds and efforts to date. All of the landfills are part of the RCRA permit. Seven of these landfills are DERP-funded and another one (FTL-09) is in the CR program, which is funded under Operation and Maintenance, Army (OMA). All of these landfills have been covered and have moved into the LTM phase.

There are five sites identified in the RCRA permit that are addressed in the Compliance-related Cleanup (CC) IAP. They are:

- FTL-09: closed active sanitary landfill,
- FTL-12: used oil tank aboveground storage tank (AST) near Bldg. 305 no further action (NFA),
- FTL-13: used oil tank UST near Bldg. 689 (NFA),
- FTL-23: mineral settling lagoons (NFA),
- FTL-68: weed control area, city of Leavenworth, Airport Operations (NFA).

During FY08, the RFI/CMS phase was completed for the following sites:

- FTL-08: inactive sanitary landfill, Chief Joseph Loop,
- FTL-57: former skeet range,
- FTL-69: diesel fuel spill area,
- FTL-70: fuel oil leak site at the USDB
- FTL-71: McClellan Avenue maintenance shop.

An NFA was determined for FTL-23 and FTL-24. Well abandonment occurred at FTL-11 and FTL-24 with partial well abandonment at FTL-10. The following sites FTL-08, -24, -57, -69, -70 and FTL-71 reached the SoB phase.

The following sites reached response complete (RC): FTL-02 through FTL-08; FTL-11, -20, -24, -30, -60, -65, -69, -70 and -71.

Sites FTL-10 and FTL-15 will remain remedy-in-place (RIP).

In 2011, site FTL-04 received NFA status and has been redeveloped. LUCs continue for sites FTL-02 through -08, -10, -15, -57, -69, and -71.

Interim LUCs were placed at the following sites: FTL-19, -22, -34, -35, -38, -41, -48, -56, -64, -67, -72, -74, and -75.

## IRP Contamination Assessment

### Cleanup Exit Strategy

There are 23 remaining sites in the IRP. The GFPR contract with ARCADIS addressed 19 sites. All LTM/long-term operation (LTO) landfill sites should be either RIP or NFA by 2038.



## IRP Previous Studies

Year	Title	Author	Date
1975	Water Quality Monitoring Consulting No.24-L06-75/76	US Army Environmental Hygiene (USAEHA)	SEP-1975
1980	Landfill Design and Permit Application	USAEHA	JUL-1980
1983	Installation Assessment of Combined Arms Center Report No. 327	Environmental Science and Engineering, Inc.	MAR-1983
1984	Evaluation of Solid Waste Disposal Practices and Facilities, June 4-8, 1984	USAEHA	NOV-1984
1986	Letter Report Certifying Facility Closure (FTL-49)	Fort Leavenworth Directorate of Engineering and Housing	FEB-1986
	Groundwater Potential Contamination Survey No. 38-26-0916-86	USAEHA	MAR-1986
1987	Interim Final Report, Hazardous Waste Consultation No. 37-26-1386-88, Evaluation of Solid Waste Management Units	USAEHA	FEB-1987
1989	Site Health and Safety Plan Old Burn Pit Area, Site FTL-10	Hunter/ESE, Inc.	MAY-1989
	Site Sampling Plan for Old Burn Pit Area Site FTL-10	Hunter/ESE, Inc.	MAY-1989
1990	Contamination Evaluation of Specific Solid Waste Management Units / Site Specific Sampling/Analysis/Quality Control/Quality Assurance Plan	O'Brien & Gere	JAN-1990
	Contamination Evaluation of Specific Solid Waste Management Units-Exhibit II Laboratory Report Volume 1 - 5 & Appendices	O'Brien & Gere	JAN-1990
	Contamination Evaluation of Specific Solid Waste Management Units - Site Safety and Health Plan	O'Brien & Gere	JAN-1990
	Sherman Army Airfield Solid Waste Management Unit 8 Field Sampling Plan	B&V Waste Science and Technology Corporation (Black & Veatch)	MAY-1990
	Transmitting Solid Waste Management Unit 8 Contamination Assessment	Black & Veatch	SEP-1990
	Transmitting Solid Waste Management Unit 8 Contamination Assessment	Black & Veatch	OCT-1990
1991	Volume I Task 1 Report-Preliminary Site Investigation Hazardous Waste Site Remedial Investigation U.S.P.	Geosystems Engineering & George Butler Associates,	AUG-1991
1992	Golf Course Maintenance Building No. 84 Hazardous Materials Building USDB Greenhouse Buildings No. 398 & 399, Construction Solicitation and Specifications	Army Corps of Engineers Kansas City District (USACE-KC)	AUG-1992
1993			

## IRP Previous Studies

1993	Title	Author	Date
	Fort Leavenworth Sanitary Landfill Closure Sherman Site	USACE-KC	MAY-1993
	Sanitary Landfill Closure Plan Sherman Site	USACE-KC	MAY-1993
	Sanitary Landfill Closure Construction Solicitation and Specifications	USACE-KC	JUN-1993
1994	Contamination Evaluation of Specific Solid Waste Management Units-Final Report Volume 1 - 7	O'Brien & Gere	JAN-1994
	Environmental Operations, Inc. Project #4654 Project Close-Out Report Stoddard Solvent Tank Removal	Environmental Remediation and Consulting	FEB-1994
	Final Work Plans Volumes I & II for Contamination Evaluation for Old Skeet Range	Law	OCT-1994
	Site Safety and Health Plan Groundwater Sampling Program	Burns & McDonnell Engineers-Architects-Consultants (Burns & McDonnell)	OCT-1994
	Chemical Data Acquisition Plan Groundwater Sampling Program	Burns & McDonnell Engineers-Architects-Consultants (Burns & McDonnell)	OCT-1994
	Work Plan Removal Action Design Old Pesticide Area	Burns & McDonnell	OCT-1994
1995	Groundwater Monitoring Report October 1994 Sampling Event	Burns & McDonnell	APR-1995
	Final Design Specifications Removal Action Old Pesticide Area Fiscal Year 1995	Burns & McDonnell	MAY-1995
	Closure Report Building 431 US Army Corps of Engineers UST Removal Fort Leavenworth, Kansas USACE	HDB Construction, Inc	MAY-1995
	Final Design Analysis Removal Action Old Pesticide Area Fiscal Year 1995	Burns & McDonnell	MAY-1995
	Chemical Data Acquisition Plan for the Groundwater and Surface Water Sampling Program 1995, 1996 and 1997	Burns & McDonnell	DEC-1995
1996	Groundwater Potential Contamination Survey No. 38-26-0916-86	USAEHA	MAR-1996
	Site Assessment Work Plan for the United States Disciplinary Barracks	Burns & McDonnell	MAR-1996
	Quality Control Summary Report Groundwater and Surface Water Monitoring Report December 1995 Sampling Event	Burns & McDonnell	APR-1996
	Site Assessment Work Plan for the United States Disciplinary Barracks	Burns & McDonnell	APR-1996
	Work Plan Hancock Landfill Site Investigation	Burns & McDonnell	APR-1996
	Final Contamination Evaluation Report for Old Skeet Range	Law	SEP-1996
	(Final) Groundwater and Surface Water Monitoring Report December 1995 Sampling Event	Burns & McDonnell	SEP-1996
	Groundwater and Surface Water Monitoring Report October 1996 Sampling Event	Burns & McDonnell	DEC-1996
1997			

## IRP Previous Studies

1997

Title	Author	Date
Quality Control Summary Report for Fort Leavenworth Investigations at Solid Waste Management Unit FTL-02	Ecology and Environment, Inc. (E&E)	JAN-1997
Final Site Investigation Report Hancock Landfill	Burns & McDonnell	JAN-1997
Final Quality Control Summary Report Hancock Landfill Volume I & II	Burns & McDonnell	JAN-1997
Final Site Assessment Report for the United States Disciplinary Barracks	Burns & McDonnell	FEB-1997
Final Quality Control Summary Report for Site Assessment at the United States Disciplinary Barracks Volume I & 2	Burns & McDonnell	FEB-1997
Work plan for Engineering Evaluation/Cost Analysis (4) Site Investigations (2) Six Sites Attachments A - D	Burns & McDonnell	FEB-1997
Radiological Survey Work plan Hancock Landfill	NAVSEADET RASO	JUL-1997
Quality Control Summary Report for Engineering Evaluation/Cost Analysis (4) Site Investigations (2) Six Sites Background Samples	Burns & McDonnell	SEP-1997
Radiological Survey Report Hancock Landfill	NAVSEADET RASO	OCT-1997
Quality Control Plan Annual Monitoring Program	Burns & McDonnell	NOV-1997
Site Health and Safety Plan Annual Monitoring Program	Burns & McDonnell	NOV-1997

1998

Final Site Investigation Report for FTL-10 Closed Firefighting Practice Area	Burns & McDonnell	FEB-1998
Quality Control Plan Annual Monitoring Program	Burns & McDonnell	FEB-1998
Final Quality Control Plan for Phase II Site Investigation Report for the United States Disciplinary Barracks	Burns & McDonnell	FEB-1998
Final Draft Laboratory Investigation of Physical Separation and Chemical Extraction Treatment Alternatives for Soils Collected from the Old Skeet Range (DNF)	Waterways Experiment Station	FEB-1998
Final Work plan Addendum for the Phase II Site Investigation at the United States Disciplinary Barracks	Burns & McDonnell	FEB-1998
Chemical Data Acquisition Plan Addendum for the 1997, 1998 and 1999 Groundwater and Surface Water Sampling Program	Burns & McDonnell	FEB-1998
Remove Above Ground Storage Tank USDB, Fort Leavenworth, Kansas Project NO. EN70093-7P Report of Second Subsurface Site Investigation	Gossen Livingston	APR-1998
Draft Work Plan/Quality Assurance Project Plan/Health and Safety Plan FTL-8 Site, Inactive Sanitary/Demolition Landfill (DNF)	USACE-KC	JUN-1998
Draft Preliminary Assessment Report FTL-2 and FTL-3 Demolition Landfills (DNF)	USACE-KCD	JUN-1998
Final Site Investigation Report for FTL-65 Pond and Drainages	Tech Law, Inc.	AUG-1998
Draft Quality Control Plan Addendum to Work Plan for Engineering Evaluation/Cost Analysis (4) Site Investigation (2) Six Sites at Fort Leavenworth, Kansas Attachment D Quality Control Plan for Site Investigation (DNF)	Burns & McDonnell	DEC-1998
KDHE UST Removal Project Code No. U4052 for KDHE Tank ID#29962U56 Closed Status w/ NFA in	KDHE	DEC-1998

## IRP Previous Studies

Year	Title	Author	Date
1998	KDHE letter (FTL-52)		
1999	Final GW and Surface Water Monitoring Report and Quality Control Summary Report March 1998 Sampling	Burns & McDonnell	JAN-1999
	Draft Phase II Site Investigation Report for the United States Disciplinary Barracks (DNF)	Burns & McDonnell	JAN-1999
	Draft Site Characterization and Penetrometer System (SCAPS) Supplemental Investigation FTL-10/11 Former Fire Training Areas (DNF)	USACE-KCD	FEB-1999
	Draft Preliminary Assessment Report Inactive Landfill FTL-8 (DNF)	USACE-KCD	MAR-1999
	Final Technical Memorandum Chemical Data Acquisition Plan Addendum for the 1999 Groundwater and Surface Water Sampling Event	Burns & McDonnell	AUG-1999
	Final Technical Memorandum Chemical Data Acquisition Plan Addendum for the 1999 Groundwater and Surface Water Sampling Event	Burns & McDonnell	AUG-1999
	Directorate of Contracting DABT19-99-R-0002 Remove and Dispose of AST	USACE-KCD	AUG-1999
2000	Field Sampling Plan, Health and Safety Plan, and Quality Assurance Project Plan Installation Restoration Program Support	Burns & McDonnell	JUN-2000
	(Final) Quality Control Plan Installation Restoration Program Support	E&E	JUN-2000
	United States Penitentiary - Leavenworth, Project L7U - Monitoring Program	GBA	AUG-2000
	Work plan Addendum for the Risk Assessment for the Pond in Family Housing (FTL-65)	Burns & McDonnell	SEP-2000
	Technical Memorandum Chemical Data Acquisition Plan Addendum No.3 for the 2000 Groundwater and Surface Water Sampling Event	Burns & McDonnell	NOV-2000
	Final Groundwater and Surface Water Monitoring Report September 1999 Sampling Event	Burns & McDonnell	NOV-2000
	Final Quality Control Summary Report 1999 Groundwater and Surface Water Monitoring Event	Burns & McDonnell	NOV-2000
	Final Engineering Evaluation/Cost Analysis for FTL-5 Inactive Sanitary Landfill	Burns & McDonnell	NOV-2000
	Raw Water and Sediment Laboratory Results for FTL-65 Pond and Drainages, October 2000	Burns & McDonnell Engineers-Architects-Consultants	NOV-2000
2001	United States Penitentiary - Leavenworth, Project L7U - Monitoring Program	GBA	JAN-2001
	United States Penitentiary - Leavenworth, KS - Permit No. F-MO12-P006	GBA	JAN-2001
	FTL-10 Data Summary	E&E	JAN-2001
	Final Quality Control Summary Report 2000 Groundwater and Surface Water Monitoring Event	Burns & McDonnell	FEB-2001
	FTL-06 Inactive Incinerator Landfill Additional Field Activities	E&E	APR-2001
	Quality Control Summary Report 2000 Risk Assessment for the Pond in Family Housing (FTL-65)	Burns & McDonnell	MAY-2001

## IRP Previous Studies

2001	Title	Author	Date
	ITS QA Data Comparison Report for the Site Investigation Report at the Disciplinary Barracks (FTL-15)	Burns & McDonnell	JUN-2001
	Final Engineering Evaluation/Cost Analysis for FLT-6 Inactive Incinerator Landfill	Burns & McDonnell	JUN-2001
	Final Initial RCRA Facility Investigation for Solid Waste Management Unit FTL-03	E&E	OCT-2001
	Final Initial RCRA Facility Investigation for Solid Waste Management Unit FTL-24	E&E	OCT-2001
	Final Initial RCRA Facility Investigation for Solid Waste Management Unit FTL-69	E&E	OCT-2001
	Final Initial RCRA Facility Investigation for Solid Waste Management Unit FTL-08	E&E	OCT-2001
	Final Initial RCRA Facility Investigation for Solid Waste Management Unit FTL-02	E&E	OCT-2001
	Final Groundwater and Surface Water Monitoring Report November/December 2000 Sampling Event	Burns & McDonnell	NOV-2001
	Final Global Positioning System Survey and Geographical Information System Fort Leavenworth, Kansas	E&E	NOV-2001
	Final Quality Control Summary Report for Fort Leavenworth Investigations at Solid Waste Management Unit FTL-02	E&E	NOV-2001
	Final Quality Control Summary Report for Fort Leavenworth Investigations at Solid Waste Management Unit FTL-03	E&E	NOV-2001
	Final Quality Control Summary Report for Fort Leavenworth Investigations at Solid Waste Management Unit FTL-10/11	E&E	NOV-2001
	Final Quality Control Summary Report for Fort Leavenworth Investigations at Solid Waste Management Unit FTL-24	E&E	NOV-2001
	Final Initial RCRA Facility Investigation for Solid Waste Management Unit FTL-10	E&E	NOV-2001
	Final Quality Control Summary Report for Fort Leavenworth Investigations at Solid Waste Management Unit FTL-08	E&E	DEC-2001
2002	Final Report Engineering Evaluation/Cost Analysis for FTL-11 Closed Firefighting Practice Area	Burns & McDonnell	FEB-2002
	Final Engineering Evaluation/Cost Analysis for FTL-57 Former Skeet Range	Burns & McDonnell	MAR-2002
	Final Human Health Risk Assessment for the Pond in Family Housing (FTL-65)	Burns & McDonnell	MAR-2002
	Final Sampling and Analysis Plan Addendum	ECC	JUN-2002
	Final Fort Leavenworth Groundwater Monitoring Final Quality Control Summary Report Second Quarter 2002 Annual Sampling Event Volume 1 - 5	ECC	OCT-2002
	Final RCRA Corrective Action Work plan Part II: Site-Specific Work Plans	ARCADIS	DEC-2002
	Final RCRA Corrective Action Work plan Part I: Site-Wide Work Plans	ARCADIS	DEC-2002
2003			

## IRP Previous Studies

2003

Title	Author	Date
(Final) Quality Control Plan Supplement IRP and OMA Program Support	E&E	MAR-2003
Final Field Sampling Plan, Health & Safety Plan, & Quality Assurance Project Plan for IRP & OMA Program Support	E&E	MAR-2003
Firing Ranges and Associated Facilities	E&E	APR-2003
Final Annual Groundwater Monitoring Report 2002 Annual Sampling Event	ECC	APR-2003
Biological Characterization FTL-02, Inactive Demolition Landfill, Bundel Avenue	ARCADIS	MAY-2003
Final Pilot Test Work plans FTL-10, Old Firefighting Training Area and FTL-15, Stoddard Solvent Tanks	ARCADIS	MAY-2003
Background Soil Sampling Work plan	ARCADIS	MAY-2003
Final Sampling and Analysis Plan and Site Safety and Health Plan Long-Term Groundwater Monitoring	ECC	JUN-2003
Draft Corrective Measures Study Report FTL-02, Inactive Demolition Landfill, Bundel Road (DNF)	ARCADIS	JUL-2003
Groundwater Monitoring Report, March/April 2003	ARCADIS	JUL-2003
Confirmatory Sampling Work plan FTL-30, Past Pesticide Area	ARCADIS	AUG-2003
Final (Revision 1) RFI Addendum FTL-65, Pond in Family Housing Area	ARCADIS	OCT-2003
Final Closed, Transferring and Transferred Range Site Inventory Report,	Engineering-Environmental Management, Inc.	OCT-2003
Groundwater Monitoring Report-March/April 2003 Analytical Data (Attachment 1) and Final Data Quality Assessment (Attachment 2)	ARCADIS	OCT-2003
Groundwater Monitoring Report -June/July 2003 Analytical Data (Attachment 1) and Final Data Quality Assessment (Attachment 2)	ARCADIS	OCT-2003
Final Characterization of Background Levels of Metals in Soil and Groundwater Technical Memorandum	ARCADIS	OCT-2003
Final (Revision 1) RFI Addendum FTL-04, Inactive Sanitary Landfill, Hancock Avenue	ARCADIS	OCT-2003
Final (Revision 1) Corrective Measures Study Report FTL-05, Inactive Sanitary Landfill, Hunt Kennels	ARCADIS	DEC-2003
Final (Revision 1) Corrective Measures Study Report FTL-06, Inactive Incinerator Landfill, Girl Scout Area	ARCADIS	DEC-2003

2004

Final Field Sampling Plan, Health and Safety Plan, and Quality Assurance Project Plan Supplement IRP and OMA Program Support	E&E	JAN-2004
Groundwater Monitoring Report-September/October 2003 Analytical Data (Attachment 1) and Final Data Quality Assessment (Attachment 2)	ARCADIS	FEB-2004
Final (Revision 1) Closure Report FTL-30, Past Pesticide Area	ARCADIS	FEB-2004
Final RFI Work plan Addendum FTL-07, Inactive Sanitary Landfill, Behind Girl Scout Area, Fort Leavenworth, Kansas	ARCADIS	JUN-2004
Final RCRA Corrective Action Work Plan Part II: Site-Specific Work Plans, Fort Leavenworth, Kansas	ARCADIS	JUN-2004

## IRP Previous Studies

**2004**

Title	Author	Date
Final Construction Documents for FTL-06, Inactive Incinerator Landfill, Girl Scout Area - Revision 1, Fort Leavenworth, Kansas	ARCADIS	JUL-2004
Final Corrective Measures Study (CMS) Work Plan Addendum Draft Supplemental Soil Investigation FTL-15, Stoddard Solvent Tanks Area, Fort Leavenworth, KS	ARCADIS	JUL-2004
Final Remedial Closure Construction Drawings FTL-06	ARCADIS	JUL-2004
Revised Final Remedial Closure Construction Drawings FTL-05	ARCADIS	AUG-2004
Final Construction Documents for FTL-05, Inactive Sanitary Landfill, Hunt Kennels-Revision 1, Fort Leavenworth, Kansas	ARCADIS	AUG-2004
Final Corrective Measures Study Report, FTL-02 and FTL-03, Inactive Demolition Landfills, Bundel Road and Wint Avenue, Leavenworth, Kansas	ARCADIS	AUG-2004
Revised Final Remedial Closure Construction Drawings FTL-06	ARCADIS	AUG-2004

**2005**

Simulation of Groundwater Flow, Contributing Recharge Area, and Groundwater Travel Time in the Missouri River Alluvial Aquifer near Fort Leavenworth, Kansas	US Geological Survey	FEB-2005
Final (Revision 1) Site-Specific Health and Safety Plan FTL-02 and FTL-03, Inactive Demolition Landfills Bundel Road and Wint Avenue, Fort Leavenworth, Kansas	ARCADIS	APR-2005
Final Construction Certification and Closure Report, FTL-05 Inactive Sanitary Landfill Hunt Kennels and FTL-06 Inactive Incinerator Landfill Girl Scout Area, US Army Combined Arms Center and Fort Leavenworth	ARCADIS	JUN-2005
Final Statement of Basis United States, Environmental Protection Agency Region 7, US Army Combined Arms Center and Fort Leavenworth, RCRA ID No. KS4213720499, FTL-02 Inactive Demolition Landfill, Bundel Road	USEPA Region VII	JUN-2005
Final Statement of Basis United States, Environmental Protection Agency Region 7, US Army Combined Arms Center and Fort Leavenworth, RCRA ID No. KS4213720499, FTL-03 Inactive Demolition Landfill, Wint Avenue	USEPA Region VII	JUN-2005
Final Statement of Basis United States, Environmental Protection Agency Region 7, US Army Combined Arms Center and Fort Leavenworth, RCRA ID No. KS4213720499, FTL-04 Inactive Sanitary Landfill, Hancock Avenue	USEPA Region VII	JUN-2005
Final Statement of Basis United States, Environmental Protection Agency Region 7, US Army Combined Arms Center and Fort Leavenworth, RCRA ID No. KS4213720499, FTL-05 Inactive Sanitary Landfill, Hunt Kennels	USEPA Region VII	JUN-2005
Final Statement of Basis United States, Environmental Protection Agency Region 7, US Army Combined Arms Center and Fort Leavenworth, RCRA ID No. KS4213720499, FTL-06 Inactive Incinerator Landfill,	USEPA Region VII	JUN-2005



## IRP Previous Studies

2005

Title	Author	Date
Girl Scout Area		
Final Remedial Closure Record Drawings FTL-05 Inactive Sanitary Landfill Hunt Kennels	ARCADIS	JUN-2005
Final Remedial Closure Record Drawings, FTL-06 Inactive Incinerator Landfill Girl Scout Area	ARCADIS	JUN-2005
Final Corrective Measures Study Report FTL-15, Stoddard Solvent Tanks Area, Fort Leavenworth, Kansas	ARCADIS	JUL-2005
Final Construction Documents FTL-02 and FTL-03, Inactive Demolition Landfills, Bundel Road and Wint Avenue, Fort Leavenworth, Kansas	ARCADIS	SEP-2005
Final Remedial Closure Construction Drawings FTL-02 & FTL-03	ARCADIS	SEP-2005
Replaced Final Remedial Closure Construction Drawings FTL-02 & FTL-03	ARCADIS	OCT-2005
Final Supplemental Investigation Report for FTL-10, Burn Pit, Old Firefighting Training Area	ARCADIS	NOV-2005
Supplemental Investigation Work plan for FTL-71, Fort Leavenworth, Kansas	ARCADIS	NOV-2005
Supplemental Investigation Work plan for FTL-70, Fort Leavenworth, Kansas	ARCADIS	NOV-2005
Final Corrective Measures Study Report FTL-10, Burn Pit, Old Firefighting Training Area, Fort Leavenworth	ARCADIS	NOV-2005
Final RFI Report FTL-11, Closed Fire Training Area, Fort Leavenworth, Kansas	ARCADIS	NOV-2005
Final RFI Report FTL-07, Inactive Sanitary Landfill, Behind Girl Scout Area, Fort Leavenworth, Kansas	ARCADIS	DEC-2005

2006

Final RFI Report, Closed Fire Training Area, Fort Leavenworth, KS	ARCADIS	FEB-2006
Final Corrective Measures Study Investigation Work plan for FTL-08 Fort Leavenworth, Kansas	ARCADIS	APR-2006
Final Groundwater Sampling Work plan for FTL-57, Fort Leavenworth, Kansas	ARCADIS	MAY-2006
Final Supplemental Investigation Work plan for FTL-69, Fort Leavenworth, Kansas	ARCADIS	MAY-2006
Final RFI Report FTL-20, Septic Tank, USDB Greenhouse, Fort Leavenworth, Kansas (Appendix A - Final Closure Report FTL-60, Stripped Paint Area)	ARCADIS	JUN-2006
Final Construction Certification and Closure Report, FTL-02 and FTL-03 Inactive Demolition Landfills, Bundel Road and Wint Avenue Fort Leavenworth, Kansas	ARCADIS	JUL-2006
Final Remedial Closure Record Drawings FTL-02 and FTL-03 Inactive Demolition Landfills, Bundel Road and Wint Avenue Fort Leavenworth, Kansas	ARCADIS	JUL-2006
(Revised) Final Corrective Measures Implementation (CMI) Work Plan: FTL-15, Stoddard Solvent Tanks, Fort Leavenworth, Kansas	ARCADIS	JUL-2006
Final Supplemental Groundwater Investigation Work plan for FTL-24, Fort Leavenworth, Kansas	ARCADIS	JUL-2006
(Revised) Final Corrective Measures Implementation Work plan: FTL-10, Burn Pit, Old Firefighting Training Area, Fort Leavenworth, Kansas	ARCADIS	JUL-2006



## IRP Previous Studies

**2006**

Title	Author	Date
Final Construction Specific Health and Safety Plan Fort Leavenworth, Kansas	ARCADIS	SEP-2006
Final Corrective Measures Study Report FTL-07, Inactive Sanitary Landfill Behind Girl Scout Area Fort Leavenworth, Kansas	ARCADIS	SEP-2006
Site-Wide Work Plan, Appendix B, Quality Assurance Project Plan, Version 3 Fort Leavenworth, Kansas	ARCADIS	OCT-2006
Final Construction Documents FTL-07, Inactive Sanitary Landfill Behind Girl Scout Area Fort Leavenworth, Kansas	ARCADIS	OCT-2006
Final Statement of Basis United States, Environmental Protection Agency Region 7, US Army Combined Arms Center and Fort Leavenworth, RCRA ID No. KS4213720499, FTL-07 Inactive Sanitary Landfill Behind Girl Scout Area	USEPA Region VII	NOV-2006
Final Statement of Basis United States, Environmental Protection Agency Region 7, US Army Combined Arms Center and Fort Leavenworth, RCRA ID No. KS4213720499, FTL-10 Burn Pit, Old Firefighting Training Area	USEPA Region VII	NOV-2006
Final Statement of Basis United States, Environmental Protection Agency Region 7, US Army Combined Arms Center and Fort Leavenworth, RCRA ID No. KS4213720499, FTL-11 Closed Fire Training Area	USEPA Region VII	NOV-2006
Final Statement of Basis United States, Environmental Protection Agency Region 7, US Army Combined Arms Center and Fort Leavenworth, RCRA ID No. KS4213720499, FTL-15 Stoddard Solvent Tanks Area	USEPA Region VII	NOV-2006
Final Statement of Basis United States, Environmental Protection Agency Region 7, US Army Combined Arms Center and Fort Leavenworth, RCRA ID No. KS4213720499, FTL-20 Septic Tank, USDB Greenhouse	USEPA Region VII	NOV-2006
Final Statement of Basis United States, Environmental Protection Agency Region 7, US Army Combined Arms Center and Fort Leavenworth, RCRA ID No. KS4213720499, FTL-60 Stripped Paint Area	USEPA Region VII	NOV-2006

**2007**

Final Expanded Supplemental Investigation Work Plan for FTL-69 Fort Leavenworth, Kansas	ARCADIS	JAN-2007
Final RFI Report FTL-70, Fuel Tank Leak, USDB Fort Leavenworth, Kansas	ARCADIS	MAR-2007
Final Soil Excavation Certification Report for FTL-10, Burn Pit, Old Firefighter Training Area	ARCADIS	APR-2007
Final RFI Report Addendum FTL-24, Building 227, Entomology Shop	ARCADIS	MAY-2007
Final Site-Wide Post Closure Groundwater Monitoring Plan	ARCADIS	MAY-2007
Final Corrective Measures Study Report FTL-08, Inactive Sanitary Landfill, Chief Joseph Loop	ARCADIS	JUN-2007
CMI Annual Report Revised FTL-15, Stoddard Solvent Tanks Area	ARCADIS	JUN-2007
CMI Annual Report Revised FTL-10, Burn Pit, Old Firefighting Training Area	ARCADIS	JUN-2007

## IRP Previous Studies

2007

Title	Author	Date
Final RFI Report FTL-71, McClellan Avenue	ARCADIS	JUN-2007
Final Construction Certification and Closure Report for FTL-07, Inactive Sanitary Landfill Behind Girl Scout Area	ARCADIS	JUN-2007
Work Plan for Land Use Control Installation at FTL-02, FTL-03 and FTL-07, Fort Leavenworth, Kansas	ARCADIS	JUN-2007
(Revised) FTL-15 Corrective Measure Certification Report: Venting System Installation	ARCADIS	JUN-2007
Final Corrective Measures Study Report FTL-57, Former Skeet Range	ARCADIS	JUL-2007
Final Corrective Measures Implementation Work plan FTL-57, Former Skeet Range	ARCADIS	AUG-2007
Final Construction Specific Health and Safety Plan (HASP) addendum for FTL- 57	ARCADIS	OCT-2007
Final RFI Report Addendum, FTL-69, Building 139, Diesel Tank Leak Area	ARCADIS	OCT-2007
Final Site-Wide Post-Closure 2006 Annual Report	ARCADIS	NOV-2007
Final Corrective Measures Implementation Work Plan for FTL-08, Inactive Sanitary Landfill Chief Joseph Loop	ARCADIS	DEC-2007

2008

Final Statement of Basis United States, Environmental Protection Agency Region 7, US Army Combined Arms Center and Fort Leavenworth, RCRA ID No. KS4213720499, FTL-08 Inactive Sanitary Landfill, Chief Joseph Loop	USEPA Region VII	MAR-2008
Final Statement of Basis United States, Environmental Protection Agency Region 7, US Army Combined Arms Center and Fort Leavenworth, RCRA ID No. KS4213720499, FTL-57 Former Skeet Range	USEPA Region VII	MAR-2008
Final Statement of Basis United States, Environmental Protection Agency Region 7, US Army Combined Arms Center and Fort Leavenworth, RCRA ID No. KS4213720499, FTL-69 Diesel Tank Area at Building 139	USEPA Region VII	MAR-2008
Final Statement of Basis United States, Environmental Protection Agency Region 7, US Army Combined Arms Center and Fort Leavenworth, RCRA ID No. KS4213720499, FTL-70 USDB Fuel Tank Leak Area	USEPA Region VII	MAR-2008
Final Statement of Basis United States, Environmental Protection Agency Region 7, US Army Combined Arms Center and Fort Leavenworth, RCRA ID No. KS4213720499, FTL-71 Solvent Spill Area on McClellan Avenue	USEPA Region VII	MAR-2008
Final Site-Wide Post-Closure Groundwater Monitoring Plan: Fort Leavenworth	ARCADIS	APR-2008
Final Site-Wide Post-Closure 2007 Annual Report, Fort Leavenworth, Kansas	ARCADIS	MAY-2008
Final CMI Annual Report - 2007 FTL-15, Stoddard Solvent Tanks Area, Fort Leavenworth, Kansas	ARCADIS	JUL-2008
Final Construction Certification and Closure Report for FTL-08, Inactive Sanitary Landfill Chief Joseph Loop	ARCADIS	OCT-2008
Final Construction Certification and Closure Report for	ARCADIS	NOV-2008

## IRP Previous Studies

2008	Title	Author	Date
	FTL-57, Former Skeet Range		
	Final Landfill Removal Preliminary Design Work plan for FTL-04	ARCADIS	DEC-2008
2009			
	Final Landfill Removal Investigation Summary FTL-04, Fort Leavenworth, Kansas	ARCADIS	APR-2009
	Final RFI Work plan for FTL-72, Quarry Creek Archaeological Site, Fort Leavenworth, Kansas	ARCADIS	APR-2009
	Final Site-Wide Post-Closure 2008 Annual Report, Fort Leavenworth, Kansas	ARCADIS	MAY-2009
	Draft Final RFI Report - FTL-66, Fort Leavenworth, KS	ARCADIS	DEC-2009
	Final Corrective Measures Study Implementation Plan FTL-04, Fort Leavenworth, KS	ECC	DEC-2009
2010			
	RCRA Permit Application, Fort Leavenworth, KS	Fort Leavenworth	JAN-2010
	Final Site-Wide Post Closure Annual Report, Fort Leavenworth, KS	ARCADIS	FEB-2010
	Final Interim Removal Work plan FTL-72, Fort Leavenworth, KS	ARCADIS	MAY-2010
	Revised RCRA Permit Application, Fort Leavenworth, KS	Fort Leavenworth	JUN-2010
	Final Interim Removal Action Completion Report, Fort Leavenworth, KS	ARCADIS	NOV-2010
	Preliminary Facility Assessment Report FTL-75	Fort Leavenworth, KS	NOV-2010
	Fort Leavenworth's RCRA 2010 Permit	USEPA Region VII	DEC-2010
2011			
	Final Certified Construction Closure Report - FTL-04	ECC	FEB-2011
	Final Site-Wide Post Closure Report (2010 Annual Report)	ARCADIS	MAR-2011
	Final Work Plan and UFP-QAPP FTL-75	HDR	JUL-2011
	Final Work Plan and UFP-QAPP for Select RCRA Sites	USACE KCD	AUG-2011
2012			
	Expanded Site Assessment FTL-67	USACE KCD	JAN-2012
	Final RCRA Facility Investigation Report, FTL-75 Iowa Avenue Sanitary Landfill	HDR	FEB-2012
	Final Contractors Construction Management Plan for FTL-66 (HA 22B)	Coastal Environmental Group, Inc.	FEB-2012
	Final RCRA Corrective Measures Study, FTL-75, Iowa Avenue Sanitary Landfill	HDR	MAR-2012
	Final RCRA Facility Investigation Report, FTL-72 Quarry Creek Archeological Site	HDR	APR-2012
	Final Interim Removal Action Report, Kinder Grenade Range (FTL-003-R-01/FTL-74)	Bay West	JUN-2012
	Final Confirmation Sampling Report, FTL-09 Inactive Landfill (2006-2007)	USACE-KC	JUL-2012
	Final Site-Wide Post-Closure Report 2011 Annual Report	ARCADIS G&M Inc.	JUL-2012

## IRP Previous Studies

2012	Title	Author	Date
	Final Work Plan Addendum, Groundwater Sampling CC-FTL-09, Closed Sanitary Landfill	USACE-KCD	SEP-2012
	Revised Final Fort Leavenworth Kansas First RCRA Five-Year Review	USACE-Tulsa District	OCT-2012
	Final Work Plan Addendum, Temporary Well Installation and Sampling FTL-75, Iowa Avenue Landfill	USACE KCD	OCT-2012
	Final Preliminary Investigations at Select RCRA Part II Permit Sites	USACE KCD	NOV-2012
	Final Contractor Construction Management Plan Removal Action, FTL-75 Iowa Avenue Sanitary Landfill	HGL	DEC-2012
2013	Final Site-Wide Post-Closure 2012 Annual Report	ARCADIS	JAN-2013
	Final Work Plan Addendum and UFP-QAPP Addendum Confirmation Sampling at Six RCRA Part II Permit Sites	USACE KCD	FEB-2013
	Final Non-Time Critical Removal Action	URS Group Inc.	MAR-2013
	Final Interim Corrective Measures Implementation Work Plan, FTL-75 Iowa Avenue landfill	HGL Inc.	APR-2013
	Statement of Basis for 17 SWMUs (FTL-14, 21, 25, 26, 28, 29, 31, 32, 39, 42, 44, 45, 47, 49, 52, 53, 62)	USEPA Region VII	APR-2013
	Supplemental Preliminary Investigation/Well Installation and Confirmation at FTL-34, Wash Rack, Building 431	USACE KCD	MAY-2013
	Draft Final Supplemental Hexavalent Chromim Investigation Report, FTL-75 Iowa Avenue Landfill	USACE KCD	MAY-2013
	Final RCRA Corrective Measures Study, FTL-72 Quarry Creek Archeological Site	HGL Inc.	MAY-2013
	2013 Part II RCRA Permit Modification and Final Remedy Selection for Seventeen (17) Sites	USEPA Region VII	MAY-2013
	Final Supplemental Preliminary Investigation Well Installation and Confirmation Sampling at FTL-34 Wash Rack, Building 431	USACE KCD	JUN-2013
	Final Contractor Project Management Plan Phase 2 Corrective Measures Study/Corrective Measures Implementation, FTL-72 Quarry Creek Site	HGL Inc.	JUL-2013
	Final Groundwater Monitoring Report, FTL-09	USACE KCD	SEP-2013
	Final Certified Construction Completion Report, FTL-75	HGL Inc.	DEC-2013
2014	Final (Revision 1) Site-Specific Work Plan, Long Term Operation/Long Term Maintenance at 7 SWMUs	HGL	MAY-2014
	Final Interim Corrective Measures Implementation Work Plan, FTL-72 Quarry Creek Site	HGL	JUL-2014
	Final 2013 Annual Landfill Inspection Report, Fort Leavenworth	HGL	AUG-2014
	Final Letter Work Plan for FTL-09 Landfill Cover Repairs	HGL	AUG-2014
	Final Community Involvement Plan	Fort Leavenworth Restoration Program	SEP-2014
	Final FTL-65 Additional Investigative Soil Sampling Work Plan	HGL	NOV-2014
	Final Hexavalent Chromium Background Study Work Plan	HGL	NOV-2014
	Final Site-Wide Post-Closure 2014 Annual Report	ARCADIS G&M	DEC-2014

## IRP Previous Studies

2015

Title	Author	Date
Final RCRA Facility Investigation Work Plan for SWMUs FTL-34, FTL-35, FTL-43, FTL-56, FTL-63 and FTL-67	TriEcoTT	JAN-2015
Final Certified Construction Completion Report, FTL-72	HGL	MAR-2015
Final FTL-65 Additional Investigative Soil Sampling Report	HGL	APR-2015
Final 2015 Annual Report for LTO/LTM (FTL-02, FTL-03, FTL-05, FTL-06, FTL-07, FTL-08, FTL-09)	HGL	JUL-2015
Final FTL-15, Stoddard Tanks Area, Building 487 Indoor Air Sampling Work Plan Addendum	ARCADIS	AUG-2015
Final Hexavalent Background Study Report	HGL	NOV-2015
Final FTL-15, Stoddard Tanks Area, Building 487 Indoor Air Sampling Report	ARCADIS	DEC-2015

**FORT LEAVENWORTH**  
**Installation Restoration Program**  
**Site Descriptions**

**Site ID: FTL-02**  
**Site Name: INACTIVE LANDFILL**

**STATUS**

**Regulatory Driver:** RCRA

**RRSE:** LOW

Contaminants of Concern: Metals, Polychlorinated Biphenyls (PCB), Semi-volatiles (SVOC)

Media of Concern: Groundwater, Sediment, Soil, Surface Water

Phases	Start	End
RFA.....	198702.....	199906
CS.....	199907.....	199912
RFI/CMS.....	200001.....	200411
DES.....	200409.....	200502
CMI(C).....	200504.....	200610
LTM.....	200610.....	203608

**RIP Date:** N/A

**RC Date:** 200610

**SITE DESCRIPTION**

Site FTL-02 is an old construction and demolition landfill located on the southeast end of the fort. The 2000 RFI determined that the site is approximately 4.6 acres. The northern site boundary is One Mile Creek, which originates in the Normandy family housing area and flows east to the Missouri River. The site is also bordered to the north by FTL-03, which starts on the north side of the creek. The eastern site boundary is an old government railroad right-of-way that is now a hiking trail. The southern boundary follows the hiking trail as it curves to the west. The western boundary is Bundel Road. Family housing and a school are to the west.

The 1984 US Army Environmental Hygiene Agency (USAEHA) report stated that the landfill received demolition waste in 1982 and 1983, but indications are that it received wastes before then. The report recommended that it be permitted with the KDHE, but there is no information that a permit was ever requested or received. The USAEHA report estimated the site at about 3 acres, but subsequent investigations found it to be much larger at 4.6 acres. The site is fairly level, with much of the area covered with trees.

The site was a water-filled depression prior to filling. The area may have been used as a borrow area for soil to build Bundel Road, the government railroad track, and the Union Pacific railroad tracks. The resulting depression held stagnant water that was a breeding ground for mosquitoes. The report states that 28,000 cubic meters of construction demolition waste was placed in the site in 1983. The debris at that time was coming from a group of concrete block buildings, located on the southwest corner of the intersection of Cody and Grant, but could have originated from anywhere on the fort. The site supports many trees, but very little grass.

During a 1987 inspection, concerns about lead resulted in an assessment of the site. A USACE site investigation performed in 1998 found some metals in the soil exceeding several of the Kansas interim remedial guidelines for residential use. Ecology and Environment, Inc. (E&E, Inc.) performed an RFI on the site in 2000. Their report was issued in spring 2001. They found that the site is much larger than originally reported. The contamination levels were consistent with the preliminary assessments (PA). PAHs and PCBs were detected in soil at concentrations exceeding screening criteria.

This site became part of the GFPR contract with ARCADIS in 2002. ARCADIS has completed a habitat evaluation for a risk assessment, cover evaluation, groundwater sampling, surface water sampling and sediment sampling, and prepared a final CMS in August 2004, the USEPA regulatory approval of the final remedial design (RD) came in September 2005. The landfill cover installation was completed in August 2006.

The GFPR contract funded all work on this site through the warranty period. The SoB [i.e., decision document (DD)] was finalized in June 2005. The site was closed under the USEPA corrective action complete with LUC classification in 2006; however, the KDHE Statutes and Administrative Regulations require long-term care of the site for 30 years after closure. Actions during post-closure care include groundwater monitoring and landfill inspection/maintenance every five years beginning in FY14. The cost for landfill cover maintenance is based on contract costs for LTM/LTO for Fort Leavenworth (U.S Army Corps of Engineers Kansas City District Contract dated Aug. 6, 2013).

**Site ID: FTL-02**  
**Site Name: INACTIVE LANDFILL**

## **CLEANUP/EXIT STRATEGY**

The LTM includes periodic groundwater monitoring, five-year reviews, landfill maintenance and LUCs. The FTL has programmed funds for maintenance and compliance sampling to continue post-closure efforts.

The site is included in the FTL LUC action plan dated Aug. 1, 2005. Future use of this site is limited to activities that do not disturb the materials contained in the landfill or the cover materials.

The KDHE Statutes and Administrative Regulations require long-term care of the site for 30 years which began in 2006 when the landfill closed (Kansas Administrative Regulations, Article 29-Solid Waste, 65-3406(a)(18)).



**Site ID: FTL-03**  
**Site Name: INACTIVE LANDFILL**

**STATUS**

**Regulatory Driver:** RCRA

**RRSE:** LOW

Contaminants of Concern: Metals, Pesticides, Polychlorinated Biphenyls (PCB), Semi-volatiles (SVOC), Volatiles (VOC)

Media of Concern: Groundwater, Soil

Phases	Start	End
RFA.....	198702.....	199806
CS.....	199807.....	199906
RFI/CMS.....	199907.....	200411
DES.....	200409.....	200502
CMI(C).....	200504.....	200610
LTM.....	200610.....	203608

**RIP Date:** N/A

**RC Date:** 200610

**SITE DESCRIPTION**

Site FTL-03 is a construction demolition landfill of approximately 2 acres that has some large pieces of concrete at the surface. The northern site boundary is about 50 meters north of the intersection of Wint and Stimson Avenues. Further to the north is a steep embankment, which slopes to the east until it reaches the Missouri River. The eastern site boundary is the abandoned government railroad right-of-way, which comes from FTL-02 from the south, and is now a hiking trail. An active Union Pacific railroad track and the Missouri River are past the trail. The southern boundary, One Mile Creek, forms the boundary between this site and FTL-02. The western boundary is Stimson Avenue. The closest development is family housing, about 100 meters from the northwest corner and Bell Hall, which houses the C&GSC. Features of note include a large abandoned natural gas pipeline running across the south side of the site and along the west side. The site has numerous steep slopes trending downhill to the river, on the east, and the creek, on the south.

The history of this site is unclear. The 1983 USAEHA study found that the site received waste in 1975 which consisted of clean fill comprised of soil, rocks, and concrete. There are locations where large pieces of concrete extend above the surface. The study reported that FTL had requested a permit for this site in May 1984; however, no records have been located to show that a permit was requested or issued.

The 1988 USAEHA report indicated that this site had a low hazard potential and did not require investigation. The 1997 Environmental Compliance Assessment Survey (ECAS) inspection recommended that this site be investigated, based on a concern that construction waste could contaminate the stream or river. The USACE performed and completed the site investigation in 1998. The investigation found levels of PCBs in the soil that were above the USEPA accepted screening levels. VOCs and SVOCs have been a concern with all of the restoration landfills and the regulators required testing for VOCs and SVOCs in soil and groundwater.

In 2000, E&E performed an RFI and in October 2001 submitted their final report, recommending further investigation of FTL-03. The investigation reported that even though the extent of the landfill material appears to have been delineated, the extent of the contamination has not.

The perimeter of the landfill was defined by the geophysical survey during the RFI; however, high PCB detections at the north edge of the landfill indicate that the extent of PCB contamination may extend further north and possibly west. The investigation also reported that aside from the fill material in the landfill, the abandoned natural gas pipeline, located north of the target landfill, might also be the source of PCBs.

In 2002 this site became part of the GFPR contract with ARCADIS. They have completed a habitat evaluation for a risk assessment, cover evaluation, groundwater sampling, surface water sampling, and sediment sampling, and in August 2004 they prepared a final CMS. Final USEPA regulatory approval of the RD came in September 2005. The landfill cover installation was completed in August 2006.

The GFPR contract funded all work on this site through the warranty period. The SoB (i.e., DD) was finalized in June 2005. The

**Site ID: FTL-03**  
**Site Name: INACTIVE LANDFILL**

site was closed under the USEPA corrective action complete with LUC classification in 2006; however, the KDHE Statutes and Administrative Regulations require long-term care of the site for 30 years. Post-closure actions include groundwater monitoring and landfill inspection/maintenance. The cost for landfill cover maintenance is based on contract costs for LTM/LTO for Fort Leavenworth (U.S Army Corps of Engineers Kansas City District Contract dated Aug. 6, 2013).

## **CLEANUP/EXIT STRATEGY**

The LTM includes periodic groundwater monitoring, five-year reviews, landfill maintenance and LUCs. Fort Leavenworth has programmed funds for maintenance and compliance sampling to continue post-closure efforts.

This site is included in the FTL LUC action plan dated Aug. 1, 2005. Future use of this site is limited to activities that do not disturb the materials contained in the landfill or the cover materials.

The KDHE Statutes and Administrative Regulations require long-term care of the site for 30 years which began in 2006 when the landfill closed (Kansas Administrative Regulations, Article 29-Solid Waste, 65-3406(a)(18)).

**Site ID: FTL-05**

**Site Name: INACTIVE SANITARY LANDFILL**

**STATUS**

**Regulatory Driver:** RCRA

**RRSE:** HIGH

Contaminants of Concern: Metals, Polycyclic Aromatic Hydrocarbons (PAH), Semi-volatiles (SVOC), Volatiles (VOC)

Media of Concern: Groundwater, Sediment, Soil, Surface Water

Phases	Start	End
RFA.....	198702.....	198806
CS.....	198806.....	199506
RFI/CMS.....	199608.....	200310
DES.....	200311.....	200408
CMI(C).....	200409.....	200506
LTM.....	200507.....	203507

**RIP Date:** N/A

**RC Date:** 200506

**SITE DESCRIPTION**

This landfill of about 8 acres received sanitary solid waste. The north edge of the site is about 120 meters south of McPherson Avenue along a barbed wire fence. The kennel for the hunting dogs occupies the area located between the road and the site. The east boundary is a barbed wire fence that is about 200 meters west of West Warehouse Road. The south boundary of the site is Quarry Creek. The west boundary is a barbed wire fence that runs primarily north and south from the Hunt Club riding arena. Access to the site is from McPherson Avenue down the road leading past the ammunition bunker and the riding arena.

This sanitary landfill was used from 1970 to 1977. A new sanitary landfill replaced this landfill (see FTL-09). The site was covered with soil when it was closed. The 1983 USAEHA report indicated the site was covered with shallow gullies that had cut into the top of the refuse. Additional cover was being placed on the site at the time the report was written.

The 1988 USAEHA solid waste management unit (SWMU) report recommended investigation of this site. O'Brien and Gere Engineers, Inc. performed a site inspection (SI) that started in 1990 and was completed in 1993. SVOCs and metals were detected in the groundwater. Cadmium and lead above maximum contaminant levels (MCL) were detected in one groundwater monitoring well. Annual groundwater and surface water sampling of the monitoring wells at this site was started in 1994. The groundwater and surface water samples were analyzed for VOCs, SVOCs, and target analyte list (TAL) metals. None of the groundwater or surface water results exceeded the MCLs for tested analytes. In October 2000 Burns and McDonnell, Inc. completed an engineering evaluation/cost analysis (EE/CA) for the site.

In 2002 this site became part of the GFPR contract with ARCADIS. In 2003 ARCADIS completed a CMS that recommended repairing the landfill cover to comply with the prescriptive remedy for the landfill covers. The recommended IRA was approved by the USEPA and the KDHE.

The work was performed as part of the completion of the corrective measures implementation-construction (CMI(C)). The IRA cover was installed in fall 2004.

The GFPR contract funded all work on this site through the warranty period. The SoB (i.e., DD) was finalized in June 2005. The site was closed under the USEPA corrective action complete with LUC classification in 2005; however, the KDHE Statutes and Administrative Regulations require long-term care of the site for 30 years. Post-closure actions include landfill inspection/maintenance. The cost for landfill cover maintenance is based on contract costs for LTM/LTO for Fort Leavenworth (U.S Army Corps of Engineers Kansas City District Contract dated Aug. 6, 2013).

**CLEANUP/EXIT STRATEGY**

The LTM includes five-year reviews, landfill maintenance and LUCs. This site is included in the FTL LUC action plan dated Aug. 1, 2005. Future use of this site is limited to activities that do not disturb the materials contained in the landfill or the cover materials.

**Site ID: FTL-05**  
**Site Name: INACTIVE SANITARY LANDFILL**

The KDHE Statutes and Administrative Regulations require long-term care of the site for 30 years which began in 2005 when the landfill closed (Kansas Administrative Regulations, Article 29-Solid Waste, 65-3406(a)(18)).

**Site ID: FTL-06**  
**Site Name: INACTIVE LANDFILL**

**STATUS**

**Regulatory Driver:** RCRA

**RRSE:** HIGH

Contaminants of Concern: Metals, Polycyclic Aromatic Hydrocarbons (PAH), Semi-volatiles (SVOC)

Media of Concern: Groundwater, Sediment, Soil, Surface Water

Phases	Start	End
RFA.....	198702.....	198806
CS.....	198806.....	199506
RFI/CMS.....	199608.....	200310
DES.....	200311.....	200408
CMI(C).....	200409.....	200506
LTM.....	200507.....	203507

**RIP Date:** N/A

**RC Date:** 200506

**SITE DESCRIPTION**

This landfill of approximately 2 acres received incinerator ash. It is located across an intermittent creek north of McPherson Avenue. The east side of the site extends on to Sylvan Trail Road and is heavily wooded. The west side is forested.

Prior to the remediation, the stream ran west to east through a pipe across the site. The 30-inch concrete culvert was constructed in the creek channel with ash and other debris filled in around it. The depth of the fill over the culvert was six to eight feet.

The 1983 USAEHA report states that a large refuse incinerator was active at this site in the 1940s until sometime into the 1950s. The ash from the incinerator was reportedly deposited in the surrounding area. The materials incinerated included household refuse, office wastes, and maintenance shop wastes.

The 1988 USAEHA SWMU report recommended that this site be investigated due to the potential of contamination caused by toxic metals in the fill material.

The SI started in 1990 and was completed in 1993 by O'Brien and Gere Engineers, Inc. One SVOC (benzo(a)pyrene) was detected in soil at a level above the USEPA Region IX PRG. One metal (chromium) was detected in groundwater at a level above surface water criteria and/or MCLs. Two metals (lead and zinc) were detected in surface water at levels above the Federal ambient water quality criteria (FAWQC). Annual sampling of the monitoring wells at this site started in 1994. The groundwater and surface water samples were analyzed for VOCs, SVOCs, and TAL metals. None of the groundwater or surface water results exceeded the MCLs for analytes that were tested, with the exception during the 1994 sampling event of an exceedance of lead and cadmium from monitoring well 6W2 and in the rinsate blank associated with this sample. The surface water samples collected from 1994 through 2000 had no exceedances for VOCs or SVOCs. Lead and zinc were detected at levels that exceeded the FAWQC during this period, although zinc was detected in the rinsate blanks also associated with these samples. E&E completed a study in 2001 that detected lead in the fill material above regulatory standards. Burns and McDonnell, Inc. completed an EE/CA report for the site in 2002.

This site became part of the GFPR contract with ARCADIS in 2002. ARCADIS prepared a CMS that recommended grouting the culvert in place, rerouting the stream through a channel constructed east of the landfill along Sylvan Trail Road, and repairing the landfill cover (including placing contaminated stream sediments under the landfill cover) to comply with the prescriptive remedy for landfills. The recommended IRA was approved by the USEPA and the KDHE. The work was performed as part of the CMI(C) and the IRA was completed in April 2005.

The GFPR contract funded all work on this site through the warranty period. The SoB (i.e., DD) was finalized in June 2005. The site was closed under the USEPA corrective action complete with LUC classification in 2005; however, the KDHE Statutes and Administrative Regulations require long-term care of the site for 30 years. Post-closure actions include landfill inspection/maintenance. The cost for landfill cover maintenance is based on contract costs for LTM/LTO for Fort Leavenworth (U.S Army Corps of Engineers Kansas City District contract dated Aug. 6, 2013).

**Site ID: FTL-06**  
**Site Name: INACTIVE LANDFILL**

## **CLEANUP/EXIT STRATEGY**

The LTM includes five-year reviews, landfill maintenance and LUCs. This site is included in the FTL LUC action plan dated Aug. 1, 2005. Future use of this site is limited to activities that do not disturb the materials contained in the landfill or the cover materials.

The KDHE Statutes and Administrative Regulations require long-term care of the site for 30 years which began in 2005 when the landfill closed (Kansas Administrative Regulations, Article 29-Solid Waste, 65-3406(a)(18)).

**Site ID: FTL-07**

**Site Name: INACTIVE SANITARY LANDFILL**

**STATUS**

**Regulatory Driver:** RCRA

**RRSE:** MEDIUM

Contaminants of Concern: Metals, Semi-volatiles (SVOC), Volatiles (VOC)

Media of Concern: Groundwater, Soil

<b>Phases</b>	<b>Start</b>	<b>End</b>
RFA.....	198702.....	199806
RFI/CMS.....	200110.....	200604
DES.....	200203.....	200608
CMI(C).....	200203.....	200612
LTM.....	200701.....	203701

**RIP Date:** N/A

**RC Date:** 200612

**SITE DESCRIPTION**

This landfill of approximately 3.5 acres is located northeast of FTL-06, the Girl Scout area. The northern boundary of the site and the area to the east and southwest is forest. A gravel road marks the western boundary of the site with forest beyond it.

Currently, the site is covered with waste lime sludge from the fort's lime sludge lagoons. This area was used as a sanitary landfill between 1967 and 1970. The 1988 USAEHA report lists petroleum, oils, and lubricants (POL), wood waste, ash from incinerated material, and other types of solid waste as being disposed of in FTL-07. In 1990 the site was used as a disposal site for lime sludge from FTL-23. The 1989 USAEHA report indicated that this site had a low hazard potential and did not require investigation; however, this assessment was made before the site was covered with lime sludge. Regulatory agencies have requested investigation of the site to characterize the nature and extent of contamination.

In 2002 this site became part of the GFPR contract with ARCADIS. ARCADIS completed the initial site characterization and prepared a draft RFI report in 2003. Site characterization activities included soil boring sampling, surface soil sampling, monitoring well installation, groundwater sampling, lime sludge sampling, waste delineation via geophysical surveys, and cover evaluation. Based on the review of the draft RFI report, additional site characterization was conducted in winter 2004.

In August 2006, the GFPR contract funded all work on this site through the warranty period. ARCADIS prepared CMS and RD documents. In November 2006, the landfill cover installation was completed. The SoB (i.e., DD) was completed in December 2006. The site was closed under the USEPA corrective action complete with LUC classification in 2006; however, the KDHE Statutes and Administrative Regulations require long-term care of the site for 30 years. The cost for landfill cover maintenance is based on contract costs for LTM/LTO for Fort Leavenworth (U.S Army Corps of Engineers Kansas City District Contract dated Aug. 6, 2013). Five-year review costs for all sites on the installation are tracked under site FTL-02.

**CLEANUP/EXIT STRATEGY**

The LTM includes periodic groundwater monitoring, five-year reviews, landfill maintenance and LUCs.

This site is included in the FTL LUC action plan dated Aug. 1, 2005, revised Aug. 24, 2007. Future use of this site is limited to activities that do not disturb the materials contained in the landfill or the cover materials.

The KDHE Statutes and Administrative Regulations required long-term care of the site for 30 years which began in 2006 when the landfill closed (Kansas Administrative Regulations, Article 29-Solid Waste, 65-3406(a)(18)).

# Site Name: INACTIVE SANITARY LANDFILL

## STATUS

Regulatory Driver: RCRA

RRSE: LOW

Contaminants of Concern: Metals, Pesticides, Polychlorinated Biphenyls (PCB), Semi-volatiles (SVOC), Volatiles (VOC)

Media of Concern: Groundwater, Soil

Phases	Start	End
RFA.....	198702.....	199806
CS.....	199807.....	199906
RFI/CMS.....	199907.....	200710
DES.....	200711.....	200712
CMI(C).....	200801.....	200809
LTM.....	200810.....	203801

RIP Date: N/A

RC Date: 200809

## SITE DESCRIPTION

The Inactive Sanitary Landfill, comprising approximately 7.5 acres is located in the northwest corner of the flood plain area of the fort. The site is bounded on the north by flood plain forest and then by the Missouri River. The area to the east is farmland that has been leased to a private individual. The area to the south starts with the levee protecting the airfield and a wetland. The west side is bounded by the Union Pacific railroad tracks.

The 1983 USAEHA report indicates that this site was used from the 1950s to 1967 as a wood recycling area, where tree trimmings and other wooden debris were sent. Wood that was not recycled was burned and/or buried on the site.

The 1988 USAEHA report indicates this landfill received construction and demolition wastes, residential wastes, and bulk wastes. Bulk wastes consisted of appliances, mattresses and springs, and wood waste. The 1988 report lists this site as a sanitary landfill. In 1998 several employees reported that this site was used as a burn area to reduce the debris coming from the numerous wooden barracks that FTL demolished in 1975 and 1976.

The July 1997 FTL ECAS inspection recommended that this site be investigated. Headquarters TRADOC provided FY98 funds for investigation. The PA, performed in summer 1998, found sufficient contamination to allow the site to be placed into the Army restoration program. The primary concerns are lead in the soil and benzene in the groundwater above regulatory limits. Several other SVOCs, PCBs, and pesticides also were detected in the soil at low levels.

In 2001, E&E performed an RFI on the site. Due to anomalies found during a previous geophysical investigation that indicated possible contamination, E&E also investigated a 3.5-acre area to the east of the site as part of the RFI at FTL-08. In October 2001, the final report was issued. E&E advanced a total of eight soil borings at the site and installed six observation wells.

Contamination levels, consistent with the PA, were found. Numerous VOCs, SVOCs, PCBs, and pesticides were detected in surface and subsurface soil within the landfill; only benzo(a)pyrene exceeded human health screening criteria. Arsenic, iron, and lead were detected in soil at levels exceeding human health screening criteria. Two VOCs were detected in the groundwater, but neither exceeded human health screening criteria. SVOCs, PCBs, and pesticides were not detected in the groundwater, but arsenic, iron, and manganese exceeding human health screening criteria were detected. PCBs were not detected by the testing. ARCADIS started groundwater testing in May 2005 to support finalization of the RFI/CMS.

This site is part of the FY06 option to the ARCADIS contract. The option has been executed and ARCADIS personnel have completed an evaluation of the site; the results of the RFI were used to complete a risk assessment. The risk assessment results were incorporated into a CMS for the site that was used for selecting a remedy. The CMS completed in June 2007 included the selection of landfill cover as the remedy. ARCADIS proceeded with the design and implementation; this was completed in December 2007. Remediation work was substantially completed in May 2008. The GFPR contract funded all work on this site through the warranty period. The SoB (i.e., DD) was finalized in March 2008.

In October 2008 a final construction completion and closure report was submitted. The site was closed under the USEPA



**Site ID: FTL-08**

**Site Name: INACTIVE SANITARY LANDFILL**

corrective action complete with LUC classification in 2008; however, the KDHE Statutes and Administrative Regulations require long-term care of the site for 30 years. Post-closure care actions include groundwater monitoring and landfill inspection/maintenance. The cost of installation-wide five-year reviews is tracked under site FTL-02.

## **CLEANUP/EXIT STRATEGY**

The LTM includes periodic groundwater monitoring, five-year reviews, landfill maintenance and LUCs.

This site is included in the FTL LUC action plan dated Aug. 1, 2005 and revised Nov. 24, 2008. Future use of this site is limited to activities that do not disturb the materials contained in the landfill or the cover materials. The KDHE Statutes and Administrative Regulations require long-term care of the site for 30 years which began in 2008 when the landfill closed (Kansas Administrative Regulations, Article 29-Solid Waste, 65-3406(a)(18)).

**Site ID: FTL-10**

**Site Name: OLD FIRE TRAINING AREA/BURN PIT**

**STATUS**

**Regulatory Driver:** RCRA

**RRSE:** LOW

Contaminants of Concern: Metals, Semi-volatiles (SVOC), Volatiles (VOC)

Media of Concern: Groundwater, Soil

Phases	Start	End
RFA.....	198702.....	198806
CS.....	198807.....	199506
RFI/CMS.....	199608.....	200601
DES.....	200203.....	200601
IRA.....	200510.....	200609
CMI(C).....	200203.....	200609
CMI(O).....	200610.....	201810

**RIP Date:** 200610

**RC Date:** 201810

**SITE DESCRIPTION**

Site FTL-10 is located on the Missouri River floodplain at the north end of the levee area, towards the northeast corner of the area. The surface area is approximately 0.80 acre (60 by 60 meters) and is primarily an open field with a few trees. A levee road borders the north side of the site. The east, south, and west sides are bounded by leased agricultural areas.

The site was used for firefighting training. These activities probably started in the 1950s and continued until 1980. The flammable materials used for firefighting training are reported to have been POL wastes, solvents, paint thinners, paint sludge, and other flammable materials. These materials were placed directly on the ground and ignited.

In 1981, FTL requested that the USAEHA analyze four samples of soil from the area for PCBs. The request stated that the area was contaminated with organic solvents, paint sludges, and thinners that had been placed in the area and ignited semiannually for use in firefighting training.

In June 1981, approximately 40 drums and 10 five-gallon cans of various ignitable solvents were removed from the site and taken to a shed located at FTL-09. The 1983 USAEHA inspection found 30 drums at the site. These drums were believed to contain POL and/or other solvents. The USAEHA found oily residue materials adjacent to the drum storage area. The drums were properly disposed of in accordance with regulatory requirements. The assessment did not find records identifying the type or quantities of wastes that had been disposed at this site.

After their site visit in the early-1980s, shortly after the site ceased to be used as a fire training area, the USEPA directed FTL to perform a time critical removal action. Discussions indicated that FTL personnel performed surface remediation of contaminated soil in the early-1980s and that the material was buried in the FTL sanitary landfill, FTL-09.

An SI began in October 1988 when Hunter Environmental Services, Inc. started an examination of the site. Contractual problems caused the work to stop and it was never restarted. The 1989 USAEHA report recommended that this study continue and appropriate corrective measures be determined.

In 1997, Burns and McDonnell, Inc. conducted an SI that included installation of four additional monitoring wells and subsurface soil and groundwater sampling. Traces of free-phase hydrocarbons at the soil/groundwater interface and stained soil were observed at several locations during the SI. VOCs were detected throughout much of FTL-10; however, there was only one location where VOC concentrations in the soil exceeded the screening criteria. SVOCs were also detected in the soil in only one location, but none of the concentrations reported exceeded screening criteria. The only metal in the soil that exceeded screening criteria was arsenic; however, the concentrations are believed to be naturally occurring. Ten VOCs were detected at levels that exceeded criteria in various samples at FTL-10. SVOCs exceeded screening criteria in the groundwater at two locations.

Investigation of the site continued in fall 1998 when the USACE site characterization and penetrometer system truck was brought to the site. Groundwater contaminated with VOCs was found at depths ranging from 40 to 65 feet below ground surface (bgs).

**Site ID: FTL-10**

**Site Name: OLD FIRE TRAINING AREA/BURN PIT**

Soil excavation was conducted from September through November 2006 in accordance with the corrective measures investigation (CMI) work plan. The excavation was performed in the area around monitoring well FTL-10W5, and included the removal of nearly 550 tons of soil from an area 30 feet by 30 feet by 14 feet deep. A granular whey carbon source was added to the surface of the excavation floor to enhance chemical of concern (COC) degradation prior to backfilling the excavation. Current and ongoing site activities at FTL-10 include LUCs and groundwater monitoring.

In November 2001 E&E completed an RFI at the site. Twelve VOCs in monitoring well 10W5 exceeded the residential risk-based standards of Kansas (RSK) established by KDHE and/or USEPA Region IX PRGs. Wells were drilled to help model the groundwater flow in the area, in addition to a line of sentinel wells between the site and FTL drinking water wells. The US Geological Survey has produced a groundwater flow model for this area of the installation. The site has been monitored annually under the installation-wide groundwater monitoring program.

In 2002 this site became part of the GFPR contract with ARCADIS. Additional monitoring and injection wells were installed in June 2003. An enhanced bioremediation pilot test began in August 2003 and was successfully completed with a draft CMS submitted in December 2004. In March 2005 additional source delineation was conducted and a final CMS was submitted in November 2005. The CMI work plan was finalized in June 2006. The initial excavation was cut 20 feet by 20 feet and extended to a depth of approximately 14 feet bgs. Upon further evaluation and coordination with FTL personnel, the USACE, the USEPA, and the KDHE, the extent of the excavation was ultimately increased by five feet in all directions. In September 2006 the source soil removal was completed. In November 2006 a new well, MW-20, was installed adjacent to the former location of MW-3. The SoB was completed in December 2006.

The GFPR contract funded all work on this site through RIP.

## **CLEANUP/EXIT STRATEGY**

The CMI (O) phase includes annual groundwater monitoring, five-year reviews, and LUCs. Monitored natural attenuation (MNA) has been implemented. Access to the site will be restricted until the site is closed. No alterations to the site will be planned until clean closure is obtained. As part of the GFPR contract option award, ARCADIS began a five-year warranty period on Dec. 14, 2006. The warranty was extended in 2012 through 2017 for additional groundwater monitoring.

This site is included in the FTL LUC action plan dated Aug. 1, 2005 and revised Aug. 24, 2007. Future use of this site is limited solely to commercial and/or industrial purposes and not for residential purposes. There is a groundwater restriction: no access or use of the groundwater underlying the site is allowed. No activities are allowed that would disturb remaining contaminated materials until it has been demonstrated that natural attenuation has removed the threat to human health.

Site Name: USED SOLVENT TANK UST NR BLDG 487-1

STATUS

Regulatory Driver: RCRA

RRSE: LOW

Contaminants of Concern: Volatiles (VOC)

Media of Concern: Groundwater, Other (Indoor Air), Soil

Phases	Start	End
RFA.....	198702.....	198806
CS.....	198807.....	199410
RFI/CMS.....	199411.....	200510
DES.....	200511.....	200601
IRA.....	200303.....	200503
CMI(C).....	200602.....	200603
CMI(O).....	200203.....	202110

RIP Date: 200603

RC Date: 202110

SITE DESCRIPTION

This site is located at a former dry cleaning shop that was inside the old USDB located on McPherson Avenue along the west side of the prison about 100 meters north of the south wall. The source for the contamination at this site was underground tanks containing tetrachloroethylene (PCE) and other solvents. The tanks were located in the grass-covered area between the dry cleaning shop, Building 487, and the maintenance shop, Building 468.

The site is normally referred to as FTL-15 for convenience, since each of the six tanks at this location was assigned a tracking number. The tank location was on the east side of the dry cleaning shop, in a grass-covered area about 50 feet wide and 250 feet long. There is an eight-foot wide and eight-foot deep below ground steam tunnel, running north to south along the entire distance of the site, which makes work at the site difficult.

The FTL numbers and KDHE tank registration numbers for each tank were:

- FTL-15 = 23462U036
- FTL-16 = 23462U037
- FTL-17 = 23462U038
- FTL-18 = 23462U039
- FTL-50 = 23462U043
- FTL-51 = 23462U044.

Prior to 1988 the KDHE issued an order directing that four tanks at the site be removed (FTL-15, FTL-16, FTL-17, and FTL-18). Records show that a removal contract for the four tanks was issued in 1988 and documentation of the removal was filed with the KDHE. No other information about this contract has been located. During the removal action, two more tanks (FTL-50 and FTL-51) were found and in September 1993 were removed under a second contract.

Based on the results of the sampling conducted at the time of the removal of the first four tanks, the 1989 USAEHA report documented that additional testing was required. The test results were forwarded to regulatory agencies for their review and determination of the necessary corrective actions. After the last two tanks were removed, KDHE issued an administrative order, based on RCRA UST regulations, directing the fort to test and determine the extent of the solvent contamination. In April 1996 Burns and McDonnell, Inc. performed the first round of testing. Significant contamination was found in three borings and in each of the three wells that were installed. The sampling indicated contamination had reached the water table and was migrating along it. Subsequent testing in 1997 and 1998 by Burns and McDonnell, Inc., provided a better characterization of the site. Groundwater contamination from the site is moving primarily west and north.

The 1997 final site assessment and 1999 Phase II site investigation, performed by Burns and McDonnell, Inc., included analytical data from Intertek Testing Services (ITS), which the USEPA later determined to be unreliable, due to fraudulent manipulation of organic data on projects not related to FTL.

**Site ID: FTL-15**

**Site Name: USED SOLVENT TANK UST NR BLDG 487-1**

In 2002, this site became part of the GFPR contract with ARCADIS. Additional monitoring and injection wells were installed in June 2003. An enhanced bioremediation pilot test began in August 2003 and was successfully completed with a final CMS submitted in July 2005.

The GFPR contract funded all work on this site through RIP. The results of the investigations, pilot study, and risk assessment were used in development of the final corrective action plan (CAP) for remedy selection. ARCADIS is proceeding with the design and implementation of natural attenuation. Additional GFPR contract options are available to address implementation-operation. ARCADIS developed a plan for a venting system at the former dry cleaning building. The SoB (i.e., DD) was finalized in December 2006. Current and ongoing activities at FTL-15 include LUCs and groundwater monitoring.

## **CLEANUP/EXIT STRATEGY**

Building ventilation and MNA have been implemented. The use of this site will be restricted until the completion of the natural attenuation. Ventilation of Building 487 was required until it was shown that there is no unacceptable risk to occupants. As part of the GFPR contract option award, ARCADIS began a five-year warranty period on Dec. 14, 2006. The warranty was extended in 2012 through 2017 for additional groundwater monitoring.

This site is included in the FTL LUC action plan dated Aug. 1, 2005 and revised Aug. 24, 2007. Future use of this site is limited to commercial and/or industrial purposes and not for residential purposes. There is a groundwater restriction: access or use of the groundwater underlying the site is not allowed. These restrictions will be left in place until the MNA has reduced groundwater contamination to levels below Safe Drinking Water Act standards. The ventilation system in Building 487 was removed in 2015 after testing determined that the airborne risk has decreased below screening levels.

**Site ID: FTL-19**  
**Site Name: SEWAGE LAGOONS**

**STATUS**

**Regulatory Driver:** CWA

**RRSE:**

Contaminants of Concern: Metals

Media of Concern: Soil

<b>Phases</b>	<b>Start</b>	<b>End</b>
PA.....	198702.....	198806
RD.....	199201.....	199206
RA(C).....	199209.....	200007
LTM.....	201102.....	201606

**RIP Date:** N/A

**RC Date:** 200007

**SITE DESCRIPTION**

These sewage lagoons were located in the northwest corner of the fort where the boundary shifts approximately one-half mile to the east. They were located in a draw adjacent to the county road that marks the northern boundary of the fort at this point. This area is now a parking lot on the northeast corner of the Regional Correctional Facility (RCF) which was completed in 2010.

The lagoons were constructed in 1980 to contain and treat sewage from the USDB Farm pig raising operations. They were regulated under a National Pollutant Discharge Elimination System (NPDES) permit issued by KDHE. The facility consisted of an upper lagoon (No. 1), 75 by 120 by 17 feet deep and a lower lagoon (No. 2), 150 by 350 by 8 feet deep. The lagoons, historically classified as agricultural waste lagoons by KDHE, were used to treat livestock waste and waste from inmate living facilities. The lagoons were required to remain non-discharging.

The lagoons were upgraded in 1993 by sealing the bottoms of the lagoons with bentonite and installing irrigation equipment. The irrigation equipment was used to apply water from the lower lagoon to pastureland to the west. The purpose of the equipment was to increase evaporation and to maintain the non-discharge status.

In 1996, the USDB Farm closed and the lagoons were re-permitted to use only Lagoon No. 1 for sewage treatment of human wastes. The second lagoon still contained water. The lagoon was used until 2008 when construction started on the Regional Correctional Facility. The lagoons were closed as part of the Residential Construction Initiative (RCI) construction project under KDHE guidance based on the NPDES permit. The wastes from the lagoons were placed into the sanitary sewer collection system, the earthen structures removed and the site filled in.

The facility received sewage from agricultural operations and sewage from humans.

In 2008, the site was remediated under KDHE NPDES regulatory oversight and it was identified in the 1984 RCRA permit application as an AOC. The USEPA elected not to upgrade the site to a SWMU at that time. The permit modification signed on May 30, 2008, declared this site a SWMU and placed it on the 2000 permit. The site evaluation including collection of analytical data occurred during FY12 and tracked under long-term monitoring. Preliminary data warranted additional confirmatory sampling, and the USEPA required soil samples for hexavalent chromium.

The Kansas City USACE completed additional confirmatory sampling. The report was completed in November 2015 and approved by USEPA in December 2015.

**CLEANUP/EXIT STRATEGY**

USEPA now has sufficient data to develop the SoB for this site.

**Site ID: FTL-34**  
**Site Name: WASH RACK BUILDING 431**

**STATUS**

**Regulatory Driver:** RCRA  
**RRSE:** NOT EVALUATED  
Contaminants of Concern: Metals  
Media of Concern: Groundwater

<b>Phases</b>	<b>Start</b>	<b>End</b>
RFA.....	198702.....	198806
RFI/CMS.....	201306.....	201803
<b>RIP Date:</b>	N/A	
<b>RC Date:</b>	201803	

**SITE DESCRIPTION**

This indoor washrack located at 316 McPherson Avenue was in a facility known as the USDB Car Wash. The building was located at the intersection of McPherson Avenue and Bluntville Loop Road. The building is approximately 20 feet wide and 60 feet long. The washrack is indoors and discharges into the sanitary sewer.

Building 431 was originally constructed as a Post Exchange Service Station in 1927. The building served as a service station until 1955, when Building 350 (FTL-67) replaced it. Building 431 then became a car wash staffed by USDB prisoners. The discharge from this building reportedly went into the storm sewer, but it had been changed to the sanitary sewer by 1988. An oil/water separator was installed in 1993. The building used detergents to aid the washing process. There is no record of hazardous materials usage at the site. The car washing operation ceased in 2001. The building is currently being used as a storage facility for the Fort Leavenworth Fire Department.

The washrack stopped being used in 2001. The site was identified in the 1984 RCRA permit application as an AOC. The USEPA elected not to upgrade the site to a SWMU at that time. The permit modification signed on May 30, 2008, declared this site a SWMU and placed it on the 2000 permit and required additional site evaluation. The site evaluation including collection of analytical data occurred during FY12 and tracked under long term monitoring. Preliminary data warrants additional confirmatory sampling and the USEPA is requiring groundwater samples for lead and benzene.

**CLEANUP/EXIT STRATEGY**

An interim land use restriction to prevent construction on this site is required. A RCRA RFI was programmed in FY13 and awarded in May 2014. Field activities for the RFI were completed in 2015 which showed elevated COCs above regional screening levels (RSL). A CMS was funded in FY15 and the analytical data is currently being evaluated to determine if further actions are warranted.

**Site ID: FTL-35**  
**Site Name: WASH RACK BUILDING 571**

**STATUS**

**Regulatory Driver:** RCRA  
**RRSE:** LOW  
Contaminants of Concern: Metals, Volatiles (VOC)  
Media of Concern: Groundwater

<b>Phases</b>	<b>Start</b>	<b>End</b>
RFA.....	198302.....	198306
RFI/CMS.....	201205.....	201803
<b>RIP Date:</b>	N/A	
<b>RC Date:</b>	201803	

**SITE DESCRIPTION**

This facility was located east of the Post Exchange Shoppette in the area now occupied by a Burger King. The washrack was a hand wash covered facility with no grit chamber or oil/water separator and discharged to the storm sewer system. The size of the building is unknown, but was probably 40- to 60-feet wide and 20 feet long.

The building used detergents to aid the washing process. There is no record of hazardous materials usage at the site. The exact construction date of the facility is unknown, but probably was not before 1975 when the Post Exchange Service Station located to the west was constructed. This facility was demolished in 1982 due to high maintenance costs.

The 1988 US Army Toxic and Hazardous Materials Agency (USATHAMA) SWMU study lists the site and expressed a concern that it discharged directly into Corral Creek. The 1989 draft RCRA USEPA facilities assessment indicated that this site had a low hazard potential and did not require investigation.

The washrack was demolished in 1982. A Burger King was built on the site in 1987. The site was identified in the 1984 RCRA permit application as an AOC. The USEPA elected not to upgrade the site to a SWMU at that time. The permit modification signed on May 30, 2008, declared this site a SWMU and placed it on the 2000 permit and required additional site evaluation. The site evaluation including collection of analytical data occurred during FY12 and is tracked under long-term monitoring. Preliminary data warrants additional confirmatory sampling and the USEPA is requiring groundwater samples for VOCs, TPH-gasoline range organics (GRO), and metals.

**CLEANUP/EXIT STRATEGY**

An interim land use restriction to prevent construction on this site is required. A RCRA RFI was programmed in FY13 and awarded in May 2014. Field activities for the RFI were completed in 2015 which showed elevated COCs above RSLs. A CMS was funded in FY15 and the analytical data is currently being evaluated to determine if further actions are warranted.



**Site ID: FTL-38**  
**Site Name: WASH RACK BUILDING 305**

**STATUS**

**Regulatory Driver:** RCRA

**RRSE:**

Contaminants of Concern: Metals, Volatiles (VOC)

Media of Concern: Groundwater, Soil

<b>Phases</b>	<b>Start</b>	<b>End</b>
RFA.....	198702.....	200007
LTM.....	201102.....	201606

**RIP Date:** N/A

**RC Date:** 200007

**SITE DESCRIPTION**

This outdoor wash located at 755 West Warehouse Road is located at the northeast corner of Building 305. The washrack is located on the northeast side of the building. This outdoor washrack has a grit chamber, an oil/water separator, and discharges into sanitary sewer system.

Building 305 was constructed in 1908. The washrack was probably constructed in the 1950s or 1960s. It was used to wash equipment before it went into the maintenance shop formerly located in this building. It may have also been used to wash out trash trucks in accordance with Army regulations. The 1983 and 1988 studies both discuss this site. The rack met all applicable regulations and was well maintained. This washrack was used until 1990 when the Directorate of Engineering and Housing (DEH) maintenance shop ceased operation. The washrack is not currently used.

The washrack is approximately 20 feet wide and 40 feet long. The majority of the washing was done with just water. However, it is likely detergents were used to aid the washing process. There is no record of hazardous materials usage at this location.

The site was identified in the 1984 RCRA permit application as an AOC. The USEPA elected not to upgrade the site to a SWMU at that time. The permit modification signed on May 30, 2008, declared this site a SWMU and placed it on the 2000 permit. The site evaluation including collection of analytical data occurred during FY12 and is tracked under long term monitoring. Preliminary data warrants additional confirmatory sampling and the USEPA is requiring soil and groundwater samples for hexavalent chromium and metals. A background study was awarded under the LTO/LTM contract in 2013 to establish the background for hexavalent chromium. The report was completed in November 2015 and approved by USEPA in December 2015. USEPA now has sufficient data to develop an SoB.

**CLEANUP/EXIT STRATEGY**

This site is anticipated to receive NFA.

**Site ID: FTL-43**

**Site Name: INCINERATOR BUILDING 111**

**STATUS**

**Regulatory Driver:** RCRA

**RRSE:** LOW

Contaminants of Concern: Metals, Volatiles (VOC)

Media of Concern: Groundwater, Soil

<b>Phases</b>	<b>Start</b>	<b>End</b>
RFA.....	198702.....	200007
RFI/CMS.....	201205.....	201803

**RIP Date:** N/A

**RC Date:** 201803

**SITE DESCRIPTION**

The incinerator located in Building 111, Bell Hall, in Room 310 was manufactured by Joseph Goder, Inc., and was a Model 150-1-N. It occupied an area about 10 feet by 10 feet. It was installed in 1959 when the building was constructed, and operated until the early-1980s when it was removed from service. The 1988 study documented this unit still existed. The 1989 draft RCRA USEPA Facilities Assessment indicated this site had a low hazard potential and did not require investigation.

A search of the building in 2005 was not able to locate this incinerator. The building was demolished in 2009. There are no records to document the types of materials or the quantity that were incinerated in this unit. Experience from other incinerators would indicate that the ash probably contained metals in excess of the PRGs.

The RCRA permit modification signed on May 30, 2008, declared this site a SWMU and placed it on the 2000 permit and required additional site evaluation. The site evaluation including collection of analytical data occurred during FY12 and tracked under long term-monitoring. Preliminary data warrants additional confirmatory sampling and the USEPA is requiring additional investigations of dioxins and PCE in groundwater.

**CLEANUP/EXIT STRATEGY**

An interim land use restriction to prevent construction on this site is required. A RCRA RFI was programmed in FY13 and awarded in May 2014. Field activities for the RFI were completed in 2015 which showed elevated COCs above RSLs. A CMS was funded in FY15 and the analytical data is currently being evaluated to determine if further actions are warranted.

Site Name: SEWAGE TREATMENT SYSTEM BUILDING 138

STATUS

Regulatory Driver: RCRA

RRSE:

Contaminants of Concern: Metals

Media of Concern: Groundwater

Phases	Start	End
RFA.....	198702.....	198806
CS.....	198806.....	200007
LTM.....	201102.....	201606

RIP Date: N/A

RC Date: 200007

SITE DESCRIPTION

Building 138 was located on Chief Joseph Loop Road on the northeast side of the levee that surrounds Sherman Army Airfield. The plant, which was approximately 20 feet wide, 8 feet across and 4 feet deep, was located at the southeast corner of the site. The aerobic plant was designed to treat 5,000 gallons of sewage per day. Wastewater was discharged onto the floodplain to the east.

The buildings were constructed in 1960 to house high-powered radio equipment. The original sewage disposal system was a septic tank. The waste going into the tank was sewage from the occupants of the building. The building was used for office space. The mission of the buildings was expanded in 1980 when a second floor was added and offices constructed. This required additional sewage treatment capacity. The site was found to be unsatisfactory for additional septic tank capability so a package aeration system was installed. The system had an NPDES discharge permit.

The erratic operating schedule of the facility made compliance with the terms of the NPDES permit impossible. The problems were resolved in 1992 by converting the system into a holding tank and stopping all discharges. The wastes were pumped into a tank truck and disposed to the sanitary sewer system for treatment by the city of Leavenworth. This continued until 1998 when all operations at the building ceased. The site was reported in a 1988 study. The 1989 draft RCRA USEPA facilities assessment indicated this site had a low hazard potential and did not require investigation.

The building and sewage treatment facility were demolished in February 1999.

The site was identified in the 1984 RCRA permit application as an AOC. The USEPA elected not to upgrade the site to a SWMU at that time. The permit modification signed on May 30, 2008, declared this site a SWMU and placed it on the 2000 permit and required additional site evaluation. The site evaluation including collection of analytical data occurred during FY12 and tracked under long-term monitoring. Preliminary data warrants additional confirmatory sampling and the USEPA is requiring groundwater sampling for hexavalent chromium. A background study was awarded under the LTO/LTM contract to establish the background for hexavalent chromium. The report was completed in November 2015 and approved by USEPA in December 2015. USEPA now has sufficient data to develop an SoB.

CLEANUP/EXIT STRATEGY

This site is anticipated to receive NFA.

Site Name: USED OIL CONTAMINATED FUEL STORAGE AREA

STATUS

Regulatory Driver: RCRA

RRSE: LOW

Contaminants of Concern: Metals, Volatiles (VOC)

Media of Concern: Groundwater

Phases	Start	End
RFA.....	198702.....	200007
RFI/CMS.....	201205.....	201803

RIP Date: N/A

RC Date: 201803

SITE DESCRIPTION

Building 132, an aircraft hangar, is located at Sherman Army Airfield at the intersection of Chief Joseph Loop Road and Sheridan Drive. The storage area measured about 10 feet wide and 15 feet long. The facility stored used oil and off specification aviation fuel. The total storage capacity of the site was probably two drums.

The Flying Club has been in operation since the 1950s. They used the north hangar as their base of operations until the early-1980s when handball courts were built in the hangar and locker rooms were built in the north wing. Waste/used materials were probably stored in the hangar until that time. The storage location found by a 1988 study was probably opened in the 1980s and closed in the mid-1990s. The 1989 draft RCRA USEPA Facilities Assessment indicated this site had a low hazard potential and did not require investigation. The used oil was stored in 55-gallon drums and was picked up by a used oil contractor.

The site was identified in the 1984 RCRA permit application as an AOC. The USEPA elected not to upgrade the site to a SWMU at that time. The permit modification signed on May 30, 2008, declared this site a SWMU and placed it on the 2000 permit and required additional site evaluation. The site evaluation including collection of analytical data occurred during FY12 and tracked under long-term monitoring. Preliminary data warrants additional confirmatory sampling and the USEPA is requiring groundwater samples for VOCs, TPH-GRO, and lead.

CLEANUP/EXIT STRATEGY

An interim land use restriction to prevent construction on this site is required. A RCRA RFI was programmed in FY13 and awarded in May 2014. Field activities for the RFI were completed in 2015 which showed elevated COCs above RSLs. A CMS was funded in FY15 and the analytical data is currently being evaluated to determine if further actions are warranted.

**Site ID: FTL-57**  
**Site Name: SKEET RANGE (INACTIVE)**

**STATUS**

**Regulatory Driver:** RCRA

**RRSE:** MEDIUM

Contaminants of Concern: Metals, Polycyclic Aromatic Hydrocarbons (PAH), Semi-volatiles (SVOC)

Media of Concern: Groundwater, Soil

<b>Phases</b>	<b>Start</b>	<b>End</b>
RFA.....	199007.....	199007
CS.....	199307.....	199608
RFI/CMS.....	199609.....	200707
DES.....	200203.....	200709
CMI(C).....	200710.....	200810
LTM.....	200810.....	203810

**RIP Date:** N/A

**RC Date:** 200810

**SITE DESCRIPTION**

This site of approximately 800 by 560 feet is located inside the levee north of the aircraft parking ramp. The site is bounded by Chief Joseph Loop Road on the west, an open field and the levee on the north, and a runway on the east. The site is now a grass field.

The site was not reported in the 1988 USAEHA study, but it was identified in 1992 as eligible for the IRP and was added to the action plan. The range opened in 1942 and closed in August 1988, when the skeet club moved to their new facility. OMA funds were programmed and received for the 1993 site investigation work. Law Engineering and Environmental Services submitted the final contamination evaluation report in 1996. The investigation found lead and PAHs at concentrations significantly exceeding the Kansas Action Levels and risk-based screening levels in the soils. IRP funds were used for the EE/CA which was performed by Burns & McDonnell, Inc. The final EE/CA report was issued in March 2002.

Both the KDHE and the USEPA conditionally approved the Burns and McDonnell, Inc. EE/CA report in their comment letter dated April 23, 2002. The EE/CA identified six alternative remedial technologies: soil cover, compacted cap, excavation and off-site disposal, waste minimization and off-site disposal, waste minimization and on-site disposal, and no action. The chosen remedy in the EE/CA is waste minimization and off-site disposal.

This site is part of the FY06 option to the ARCADIS contract. This option has been executed and ARCADIS personnel completed an evaluation of the site in July 2007. Through the CMS process, the selected remedy chosen was excavation, stabilization, and off-site disposal of surface soils above industrial PRGs for lead that was treated in place after the application of a stabilizing agent that was mixed into the soil. ARCADIS produced a CMI plan in August 2007 and completed soil removal in October 2008. The GFPR contract funded all work on this site through the warranty period. The SoB (i.e., DD) was finalized in March 2008. LUCs were required to prevent future construction on the site.

A final construction completion and closure report was submitted in November 2008.

**CLEANUP/EXIT STRATEGY**

The LTM includes LUCs. This site is included in the FTL LUC action plan dated Aug. 1, 2005, revised Nov. 24, 2008. Future use of this site is limited to use solely for commercial and/or industrial purposes and not for residential purposes. No activities are allowed that would disturb remaining contaminated soil until it has been demonstrated that contaminant concentrations no longer pose unacceptable human health risks to potential future on-site residents.

**Site ID: FTL-63**  
**Site Name: DRMO SCRAP YARD**

**STATUS**

**Regulatory Driver:** RCRA  
**RRSE:** HIGH

<b>Phases</b>	<b>Start</b>	<b>End</b>
RFA.....	199309.....	199309
CS.....	200001.....	200002
RFI/CMS.....	200003.....	201803
<b>RIP Date:</b>	N/A	
<b>RC Date:</b>	201803	

**SITE DESCRIPTION**

This site was created in 1907 when a number of storage buildings were constructed. The site eventually became the Defense Reutilization and Marketing Office (DRMO) Scrap Yard until 1998 when DRMO left Fort Leavenworth and moved to Fort Riley. FTL-63 is the former location of the DRMO Scrap Yard which is located at the north end of West Warehouse Road. The scrap yard is in the fenced area on the north side of Building 280 and is approximately 0.6 acres in size. The year the area started receiving scrap is unknown, but official operations ceased in 1998. FTL-63 is currently used for temporary storage of metal barriers and trailers. Future use of the site is expected to remain commercial or industrial.

The ground surface of the scrap yard is covered with approximately 0.5 foot to 7 feet of fill consisting primarily of gravel and crushed limestone with small quantities of demolition debris (brick and concrete) and coal cinders. Surface drainage at the site flows primarily to the north and east toward an intermittent stream and surface water impoundment. Water from the impoundment continues northward in the intermittent stream towards Quarry Creek.

The IAP workshop in August 2000 determined this to be an OMA site and all DERP work should stop and the site transferred to the CC Program. FTL-63 was moved back from Compliance Cleanup to Installation Restoration (IR) during the spring FY14 data call. OPOD 10-149 (dated May 2010) tasks regions to direct garrisons to review the information in the AEDB-CC database to ensure all sites eligible for DERP were transferred to the AEDB-R database, and subsequently update the associated IAP tool.

Remediation/additional investigations at FTL-63 had been placed on hold awaiting regulatory guidance as the USEPA and KDHE disagreed with previous NFA recommendations from E&E Inc. (2004) and the USACE (2007) reports.

During the Nov. 29, 2011 restoration program review meeting, the USEPA, KDHE, Fort Leavenworth and the USACE began reviewing strategies to move this site towards RC. The USACE included FTL-63 in a multisite draft performance work statement to address any and all environmental, safety, scheduling, and regulatory issues; and, assuming contractual liability and responsibility for the achievement of the performance objectives for the site.

**CLEANUP/EXIT STRATEGY**

An interim land use restriction to prevent construction on this site is required. A RCRA RFI was programmed in FY13 and awarded in May 2014. Field activities for the RFI were completed in 2015 which showed elevated COCs above RSLs. A CMS was funded in FY15 and the analytical data is currently being evaluated to determine if further actions are warranted.

Site Name: UNDERGROUND TANKS OLD PX SERVICE STATION

STATUS

Regulatory Driver: RCRA

RRSE: LOW

Contaminants of Concern: Volatiles (VOC)

Media of Concern: Groundwater, Soil

Phases	Start	End
RFA.....	197001.....	197012
CS.....	201102.....	201212
RFI/CMS.....	201205.....	201803
IRA.....	198506.....	200007

RIP Date: N/A

RC Date: 201803

SITE DESCRIPTION

This location was associated with the storage tanks at the old PX Service Station, Building 350, that was located on the south side of Sedgwick Avenue just east of Building 314. The site was about 15 feet wide and 30 feet long. The area is now a parking lot.

The service station was built in 1955, ceased operations in 1975, and was demolished in March 1986. There were two steel tanks at the site. The tanks, which were 8,000 and 12,000 gallons in capacity contained gasoline. They were removed, probably in 1985, and went to DRMO for disposal. The purpose of this record was to help provide a comprehensive record of contaminated or potentially contaminated sites for future construction purposes.

The site was identified in the 1984 RCRA permit application as an AOC. The USEPA elected not to upgrade the site to a SWMU at that time. The permit modification signed on May 30, 2008, declared this site a SWMU and placed it on the 2000 permit. The Kansas City USACE completed initial confirmatory sampling in 2011 which identified contaminants in soil and groundwater above RSLs. Supplemental investigations are currently scheduled.

CLEANUP/EXIT STRATEGY

An expanded investigation to determine the horizontal and vertical extent of contamination followed by remediation is planned to return this site to RC. An interim land use restriction to prevent construction on this site is required. A RCRA RFI was programmed in FY13 and awarded in May 2014. Field activities for the RFI were completed in 2015 which showed elevated COCs above RSLs. A CMS was funded in FY15 and the analytical data is currently being evaluated to determine if further actions are warranted.

**Site ID: FTL-69**  
**Site Name: DIESEL FUEL SPILL AREA**

**STATUS**

**Regulatory Driver:** RCRA

**RRSE:** LOW

Contaminants of Concern: Polycyclic Aromatic Hydrocarbons (PAH)

Media of Concern: Groundwater, Soil

<b>Phases</b>	<b>Start</b>	<b>End</b>
ISC.....	199811.....	199812
INV.....	199901.....	200110
CAP.....	200111.....	200806
LTM.....	200807.....	203803

**RIP Date:** N/A

**RC Date:** 200806

**SITE DESCRIPTION**

Site FTL-69 is to the south and under former Building 139. Building 139 was located on elevated ground on the northeast corner of the levee. Chief Joseph Loop Road is used to access the site. The entire site is approximately 4 acres. The AOC was approximately 60 square meters.

Building 139 was constructed in the late-1950s to house diesel generators that supplied backup power to Building 138, a radio transmitter facility. A 30,000-gallon underground diesel storage tank was installed when the facility was built. The facility was used until the early-1970s, when the tank was abandoned in place. In 1982, the generators were removed and the building converted to a computer development center. The tank was removed in July 1991 as part of a UST removal contract. Clean closure of the tank site was obtained. The facility served as an Army reserve center until 1998.

The building was demolished in February 1999. During the demolition, the contractor found soil that demonstrated a diesel fuel odor. Subsequent testing confirmed that selected soils had a detectable TPH content.

In October 2001, E&E performed and reported a final facilities investigation at the site as part of the FTL-10 investigation. They found PAHs in deep soils beneath the area of the former Building 139 floor slab. No groundwater samples have been collected in the immediate area of either the floor slab or the former UST location to the south of it.

This site is part of the FY06 options to the ARCADIS contract. This option was exercised in August 2005. ARCADIS conducted supplemental sampling of the soil and groundwater in August 2006 and issued a final RFI addendum report of the site in October 2007. Through the corrective measures evaluation performed in February 2008, the selected remedies chosen were LUCs to limit future use of the site to nonresidential, restrict activities which would disturb the soil, and prevent domestic use of the groundwater in the area. The GFPR contract funded all work on this site through the warranty period. The SoB (i.e., DD) was finalized in March 2008.

**CLEANUP/EXIT STRATEGY**

The LTM includes LUCs. This site is included in the FTL LUC action plan dated Aug. 1, 2005 and revised Nov. 24, 2008. Future use of this site is limited to commercial and/or industrial purposes and not for residential purposes. There is a groundwater restriction: access or use of the groundwater underlying the site is not allowed. Digging or excavation is not allowed without approval. The LUCs will remain in effect until it has been demonstrated that contaminant concentrations no longer pose unacceptable human health risks to potential on-site residents.



**Site ID: FTL-70**

**Site Name: FUEL OIL LEAK SITE AT USDB**

**STATUS**

**Regulatory Driver:** RCRA

**RRSE:** LOW

Contaminants of Concern: Semi-volatiles (SVOC), Volatiles (VOC)

Media of Concern: Groundwater, Soil

<b>Phases</b>	<b>Start</b>	<b>End</b>
RFA.....	199910.....	200002
RFI/CMS.....	200110.....	200806
LTM.....	200807.....	203803
<b>RIP Date:</b>	N/A	
<b>RC Date:</b>	200806	

**SITE DESCRIPTION**

This site of approximately 1.4 acres is located north of the USDB boiler plant. The boiler plant is located on the northwest corner of the facility. The north end of this site, which is north of the confinement wall, was the outdoor recreation area for the prisoners. The area immediately around the boiler plant building is a paved driveway.

The area of this site north of the wall was used for fuel oil storage until the late-1980s. Numerous tanks have been sited at this location, including a wooden staved oil tank (removed in the 1930s), six 20,000-gallon ASTs (removed by 1970), and a 168,000-gallon aboveground oil tank (its operation was stopped in the late-1980s and it was removed in 1999). All tanks stored No. 6 fuel oil that was the backup fuel for the boiler plant. During removal of the 168,000-gallon tank, contamination was found under the slab supporting the tank.

The piping between the tanks and boiler plant was replaced in 1979. Due to the number of tanks on the site and the problems with the broken piping, there is the potential for fuel oil contamination at this site.

There were also three 20,000-gallon USTs at this site. They were installed in 1979 to add additional storage capacity. These tanks also stored No. 6 fuel oil that was the backup fuel for the boiler plant. The USTs ceased operations in the late-1980s and were removed about 1995. These three tanks were closed clean.

ARCADIS submitted a final work plan in August 2004 and conducted investigations in January 2005 for site characterization to support the development of an RFI for the site to determine the extent of fuel contamination.

This site was part of the FY06 option to the ARCADIS contract. The site was funded in March 2004 due to the early availability of funds. An RFI was performed and completed by ARCADIS in January 2005.

ARCADIS prepared a draft RFI report for this site dated Sept. 19, 2005. Based upon the results, the determination was made that ARCADIS would install two additional temporary groundwater monitoring wells, located near existing soil boring No. 19 as referenced in the draft RFI report. Results from this sampling effort were captured in the final RFI report issued March 28, 2007. Through the corrective measures evaluation performed in February 2008, the selected remedies chosen were LUCs to prevent residential use of the site, prevention of groundwater use, and restriction of activities on the site which could disturb the soil. The GFPR contract funded all work on this site through the warranty period. The SoB (i.e., DD) was finalized in March 2008.

**CLEANUP/EXIT STRATEGY**

The LTM includes LUCs. This site is included in the FTL LUC action plan dated Aug. 1, 2005 and revised Nov. 24, 2008. Future use of this site is limited to commercial and/or industrial purposes and not for residential purposes. There is a groundwater restriction: access or use of the groundwater underlying the site is not allowed. No digging or excavation is allowed without approval. The LUCs will remain in effect until it has been demonstrated that contaminant concentrations no longer pose unacceptable human health risks to potential on-site residents.

Site Name: MCCLELLAN AVENUE MAINTENANCE SITE

STATUS

Regulatory Driver: RCRA

RRSE: LOW

Contaminants of Concern: Semi-volatiles (SVOC), Volatiles (VOC)

Media of Concern: Groundwater, Soil

Phases	Start	End
RFA.....	199801.....	199912
CS.....	200110.....	200112
RFI/CMS.....	200201.....	200806
LTM.....	200807.....	202110

RIP Date: N/A

RC Date: 200806

SITE DESCRIPTION

This site is comprised of the hill and valleys on either side of McClellan Avenue on the north end of the installation. The site centers around Building 89 which is a former typewriter repair shop.

The site was placed into the program after carbon tetrachloride was found at the west edge of FTL-15, which is just east of the site. Since the carbon tetrachloride had not been found in any other samples from FTL-15, this material was assumed to have come from a different source. The source is expected to be found somewhere along McClellan Avenue, which is hydraulically upgradient from the location where the carbon tetrachloride was detected. Past activities in this area include a maintenance shop, a vehicle maintenance facility, and a veterinary clinic. Building 85, which is currently the main administrative building for the Directorate of Installation Support, is reported to have been a vehicle maintenance shop at one time. Building 86, which was a riding arena, is currently a vehicle maintenance facility. Building 88 has been a veterinarian clinic since it was built in the early 1900s. Fire Station No. 1 is located at the south end of this area. Carbon tetrachloride was used in early chemical fire extinguishers.

In 2004 ARCADIS prepared and submitted a work plan and conducted a Phase I SI which started in October 2004 and ran through December 2004 to determine the potential source(s) and extent of carbon tetrachloride in the vicinity of McClellan Avenue. A Phase II site investigation work plan was submitted in November 2005.

This site is part of the FY04 option to the ARCADIS contract, which was funded in January 2004. A Phase I remedial field investigation was performed and completed by ARCADIS in December 2004. ARCADIS has prepared an additional work plan to address groundwater impacts in the vicinity of well 15MW15. The initial investigation showed that groundwater impacts appeared to be limited to this area. Two additional temporary well points were installed and sampled. The results were captured in the final RFI report issued June 1, 2007. Through the corrective measures evaluation performed in February 2008, the selected remedy chosen was LUCs to limit current and future uses of the site to nonresidential, prohibit the use of groundwater at the site for domestic purposes, and require vapor intrusion (VI) mitigation measures in any new construction over the groundwater plume. The GFPR contract funded all work on this site through the warranty period. The SoB (i.e., DD) was finalized in March 2008.

Current ongoing site activities at FTL-71 included LUCs and groundwater monitoring. In accordance with the Site-Wide Post-Closure Groundwater Monitoring Plan (ARCADIS, 2007a), two monitoring wells FTL71MW001 and FTL71MW002 were sampled during June 30, 2012 and Aug. 10, 2012; respectively. These wells were analyzed for VOCs. Groundwater data was evaluated to ensure that the selected remedial alternative, MNA, continues to be effective.

None of the concentrations of COCs observed exceeded their respective MCLs. Levels of VOCs within groundwater have been below the MCL for the previous four sampling events. The last exceedence of carbon tetrachloride occurred during 2006 in monitoring well FTL15W15 (the source location). Furthermore, the concentrations of VOCs within the remaining wells have been below the MCLs since 2006. Consistent with the SoB, it was recommended that groundwater sampling for VOCs cease at wells FTL71MW001 and FTL71MW002. The USEPA concurred with the recommendation in their Nov. 16, 2012 correspondence.

**Site ID: FTL-71**

**Site Name: MCCLELLAN AVENUE MAINTENANCE SITE**

## **CLEANUP/EXIT STRATEGY**

The LTM includes five-year reviews and LUCs. This site is included in the FTL LUC action plan dated Aug. 1, 2005 and revised Nov. 24, 2008. Future use of this site is limited to commercial and/or industrial purposes and not for residential purposes. There is a groundwater restriction: access or use of the groundwater underlying the site is not allowed. Vapor intrusion mitigation measures are required in any new construction over the groundwater plume. The LUCs will remain in effect until it has been demonstrated that contaminant concentrations no longer pose unacceptable human health risks to potential on-site residents.

**Site ID: FTL-72**  
**Site Name: Quarry Creek**

**STATUS**

**Regulatory Driver:** RCRA

**RRSE:** HIGH

**Contaminants of Concern:** Polychlorinated Biphenyls (PCB)

**Media of Concern:** Soil

<b>Phases</b>	<b>Start</b>	<b>End</b>
RFA.....	200702.....	200703
RFI/CMS.....	200808.....	201306
DES.....	201209.....	201312
IRA.....	201003.....	201008
CMI(C).....	201411.....	201806

**RIP Date:** N/A

**RC Date:** 201806

**SITE DESCRIPTION**

The FTL-72 Quarry Creek restoration site is located to the west of Building 260. Building 260 was constructed to shelter and maintain the FTL government railroad locomotives. The area to the north is undeveloped woods. McPherson Avenue is the southern boundary. Quarry Creek borders on the west, and the old FTL Railroad right-of-way is on the east. This archeological site was one of the first landfills on FTL.

In March 2007, over a dozen steel drums were found in a ravine in the woods at this site. All of the drums were empty. The soil beneath the drums was a dark color. The dark soil was sampled and found to be contaminated with PCBs. A toxicity characteristic leaching procedure result found lead at 87 milligram per liter (mg/L), which exceeds the 5 mg/L hazardous waste cutoff level.

This site was part of the GFPR contract modification effective Sept. 30, 2008. ARCADIS has prepared a draft RFI work plan for this site; it was submitted on Jan. 6, 2009. Under this modification, action completion is to produce a CMI work plan. A final RFI work plan was completed on April 3, 2009. ARCADIS completed the removal action and submitted the Final Interim Removal Action Completion Report in November 2010 which included excavation and off-site disposal of soils contaminated with polychlorinated biphenyls.

A RCRA RFI was completed in 2011. It estimated the areal extent of the waste and dumping areas to be less than 3 acres, and indicated that much of the waste was placed within the disposal area in the form of ash intermingled with soil, brick, glass, and miscellaneous debris. During FY12, procurement of the contract to perform work through the design and remediation was through the Kansas City USACE with the award issued in FY13. A CMI was completed in 2015 and USEPA now has sufficient data to develop a SoB. The SoB is anticipated to require a future groundwater monitoring component.

**CLEANUP/EXIT STRATEGY**

Remediation efforts will start with an investigation to determine the extent of the contamination. The contaminated material will be removed and sent to a hazardous waste disposal facility. HGL has been retained to complete the CMS.

This site was placed in the FTL LUC action plan dated Aug. 1, 2005, revised Nov. 24, 2008 and under revision for FY13 to include FTL-72. Future use of this site is limited to activities that do not disturb the materials contained in the former dump site. The KDHE Statutes and Administrative Regulations required long-term care of the site for 30 years (Kansas Administrative Regulations, Article 29-Solid Waste, 65-3406(a)(18) which will begin after RAs are complete.

An LTM phase will be opened when the CMI(C) has been completed and the LTM phase will be implemented.

## Site Closeout (No Further Action) Summary

Site ID	Site Name	NFA Date	Documentation
FTL-01	INACTIVE SANITARY LANDFILL	199701	Bureau of Prisons (DOJ Lead) USP Leavenworth owns and is responsible for this site.
FTL-04	INACTIVE SANITARY LANDFILL	201106	USEPA issued this Site a no further action in 2011.
FTL-09	CLOSED ACTIVE SANITARY LANDFILL	200009	Transferred to Compliance-Cleanup Program and tracked as CC FTL-09
FTL-11	CLOSED FIRE TRAINING AREA	200612	NFA Statement of Basis signed September 19, 2006
FTL-12	USED OIL TANK AST NEAR BUILDING 305	199506	Transferred to Compliance-Cleanup Program and tracked as CC FTL-12. NFA Statement of Basis signed September 19, 2006.
FTL-13	USED OIL TANK UST NEAR BUILDING 689-0	199506	Transferred to Compliance-Cleanup Program and tracked as CC FTL-13. NFA Statement of Basis signed June 20, 2005.
FTL-14	USED OIL TANK NEAR BUILDING 86	200007	This site is listed in AEDB-R as NFA based on the year 2000 RCRA Permit; however, USEPA directive required additional investigation. The site was investigated in 2012 and KDHE and USEPA approved the NFA status on November 20th and November 27th respectively.
FTL-16	USED SOLVENT TANK UST NR BLDG 487-2	200007	2000 RCRA Permit - Site has been closed out to FTL-15. All future actions will be tracked under FTL-15.
FTL-17	USED SOLVENT TANK UST NR BLDG 487-3	200007	2000 RCRA Permit - Site has been closed out to FTL-15. All future actions will be tracked under FTL-15.
FTL-18	USED SOLVENT TANK UST NR BLDG 487-4	200007	2000 RCRA Permit - Site has been closed out to FTL-15. All future actions will be tracked under FTL-15.
FTL-20	SEPTIC TANK NR BLDG 398	200612	NFA Statement of Basis signed September 19, 2006
FTL-21	SEPTIC TANK NR BLDG 428	200007	This site is listed in AEDB-R as NFA based on the year 2000 RCRA Permit; however, USEPA directive required additional investigation. The site was investigated in 2012 and KDHE and USEPA approved the NFA status on November 20th and November 27th respectively.
FTL-22	SEPTIC TANK NR BLDG 425	201409	NFA Statement of Basis, September 12, 2014
FTL-23	MINERAL SETTLING LAGOONS	199506	Transferred to Compliance-Cleanup Program and tracked as CC FTL-23. NFA Statement of Basis signed March 10, 2008.
FTL-24	PESTICIDE AREA NR BLDG 227	200808	NFA Statement of Basis signed March 10, 2008
FTL-25	OLD PESTICIDE BUILDING 234	200007	This site is listed in AEDB-R as NFA based on the year 2000 RCRA Permit; however, USEPA directive required

## Site Closeout (No Further Action) Summary

Site ID	Site Name	NFA Date	Documentation
			additional investigation. The site was investigated in 2012 and KDHE and USEPA approved the NFA status on November 20th and November 27th respectively.
FTL-26	OLD PESTICIDE BUILDING 234A	200007	This site is listed in AEDB-R as NFA based on the year 2000 RCRA Permit; however, USEPA directive required additional investigation. The site was investigated in 2012 and KDHE and USEPA approved the NFA status on November 20th and November 27th respectively.
FTL-27	PAST PESTICIDE BUILDING 237	200007	This site is listed in AEDB-R as NFA based on the year 2000 RCRA Permit; however, USEPA directive requiring additional investigation.
FTL-28	CURRENT PESTICIDE BUILDING 93	200007	This site is listed in AEDB-R as NFA based on the year 2000 RCRA Permit; however, USEPA directive required additional investigation. The site was investigated in 2012 and KDHE and USEPA approved the NFA status on November 20th and November 27th respectively.
FTL-29	PAST PESTICIDE BUILDING 413	199609	This site is listed in AEDB-R as NFA based on the year 2000 RCRA Permit; however, USEPA directive required additional investigation. The site was investigated in 2012 and KDHE and USEPA approved the NFA status on November 20th and November 27th respectively.
FTL-30	PAST PESTICIDE BUILDING 412	200507	NFA Statement of Basis signed June 20, 2005; included FTL-29.
FTL-31	CURRENT PESTICIDE BUILDING 399	200007	This site is listed in AEDB-R as NFA based on the year 2000 RCRA Permit; however, USEPA directive required additional investigation. The site was investigated in 2012 and KDHE and USEPA approved the NFA status on November 20th and November 27th respectively.
FTL-32	PESTICIDE BUILDING 84	200007	This site is listed in AEDB-R as NFA based on the year 2000 RCRA Permit; however, USEPA directive required additional investigation. The site was investigated in 2012 and KDHE and USEPA approved the NFA status on November 20th and November 27th respectively.
FTL-33	WASH RACK BUILDING 262	200007	This site is listed in AEDB-R as NFA based on the year 2000 RCRA Permit; however, USEPA directive requiring additional investigation.

## Site Closeout (No Further Action) Summary

Site ID	Site Name	NFA Date	Documentation
FTL-36	WASH RACK BUILDING 132	200007	This site is listed in AEDB-R as NFA based on the year 2000 RCRA Permit; however, USEPA directive requiring additional investigation.
FTL-37	WASH RACK BUILDING 86	200007	This site is listed in AEDB-R as NFA based on the year 2000 RCRA Permit; however, USEPA directive requiring additional investigation.
FTL-39	WASH RACK BUILDING 496	200007	This site is listed in AEDB-R as NFA based on the year 2000 RCRA Permit; however, USEPA directive required additional investigation. The site was investigated in 2012 and KDHE and USEPA approved the NFA status on November 20th and November 27th respectively.
FTL-40	WASH RACK BUILDING 237	200007	This site is listed in AEDB-R as NFA based on the year 2000 RCRA Permit; however, USEPA directive requiring additional investigation.
FTL-41	INCINERATOR BUILDING 344	201409	NFA Statement of Basis, September 12, 2014
FTL-42	INCINERATOR BUILDING 111	200007	This site is listed in AEDB-R as NFA based on the year 2000 RCRA Permit; however, USEPA directive required additional investigation. The site was investigated in 2012 and KDHE and USEPA approved the NFA status on November 20th and November 27th respectively.
FTL-44	INCINERATOR BUILDING 632	201211	Constituent levels were below regulatory standards and USEPA issued FTL-44 a no further action status on 27 November 2012 and June 4, 2013.
FTL-45	INCINERATOR BUILDING 136	200007	This site is listed in AEDB-R as NFA based on the year 2000 RCRA Permit; however, USEPA directive required additional investigation. The site was investigated in 2012 and KDHE and USEPA approved the NFA status on November 20th and November 27th respectively.
FTL-46	HAZARDOUS WASTE STG AT BLDING 279	200007	This site is listed in AEDB-R as NFA based on the year 2000 RCRA Permit; however, USEPA directive requiring additional investigation.
FTL-47	MEDIA SUPPORT AREA BUILDING 77	200007	This site is listed in AEDB-R as NFA based on the year 2000 RCRA Permit; however, USEPA directive required additional investigation. The site was investigated in 2012 and KDHE and USEPA approved the NFA status on November 20th and November 27th respectively.
FTL-49	HAZARDOUS WASTE STORAGE BUILDING 829	198912	This site is listed in AEDB-R as NFA



## Site Closeout (No Further Action) Summary

Site ID	Site Name	NFA Date	Documentation
			based on the year 2000 RCRA Permit; however, USEPA directive required additional investigation. The site was investigated in 2012 and KDHE and USEPA approved the NFA status on November 20th and November 27th respectively.
FTL-50	USED SOLVENT TANK NO 5 BUILDING 487	200007	2000 RCRA Permit - Site has been closed out to FTL-15. All future actions will be tracked under FTL-15.
FTL-51	USED SOLVENT TANK NO 6 BUILDING 487	200007	2000 RCRA Permit - Site has been closed out to FTL-15. All future actions will be tracked under FTL-15.
FTL-52	USED OIL TANK BUILDING 109	199109	This site is listed in AEDB-R as NFA based on the year 2000 RCRA Permit; however, USEPA directive requiring additional investigation.
FTL-53	USED OIL TANK BUILDING 471	199310	This site is listed in AEDB-R as NFA based on the year 2000 RCRA Permit; however, USEPA directive requiring additional investigation.
FTL-54	USED OIL STORAGE, BUILDING 132	200007	This site is listed in AEDB-R as NFA based on the year 2000 RCRA Permit; however, USEPA directive requiring additional investigation.
FTL-55	USED OIL STORAGE, CITY AIRPORT OPERATION	200007	This site is listed in AEDB-R as NFA based on the year 2000 RCRA Permit; however, USEPA directive requiring additional investigation.
FTL-58	SKEET RANGE (ACTIVE)	199307	This site is listed in AEDB-R as NFA based on the year 2000 RCRA Permit; however, USEPA directive requiring additional investigation when this range is closed.
FTL-59	KINDER RANGE	199704	This site is listed in AEDB-R as NFA based on the year 2000 RCRA Permit; however, USEPA directive requiring additional investigation when this range is closed.
FTL-60	USDB GREENHOUSE	200612	NFA Statement of Basis signed September 19, 2006
FTL-61	TANK REMOVAL, BLDG 431	199505	This site is listed in AEDB-R as NFA based on the year 2000 RCRA Permit; however, USEPA directive requiring additional investigation.
FTL-62	UNDERGROUND PROPANE TANK, USDB FARM	200007	This site is listed in AEDB-R as NFA based on the year 2000 RCRA Permit; however, USEPA directive required additional investigation. The site was investigated in 2012 and KDHE and USEPA approved the NFA status on November 20th and November 27th respectively.
FTL-64	FTL-64: REMOVE UST BLDG 264	201409	NFA Statement of Basis, September 12, 2014



## Site Closeout (No Further Action) Summary

Site ID	Site Name	NFA Date	Documentation
FTL-65	POND IN FAMILY HOUSING	201506	
FTL-68	WEED CONTROL AREA, CITY AIRPORT OPER	199012	Transferred to Compliance-Cleanup Program and tracked as CC FTL-68.
PBC at Leaven.	PBC	201101	Directed by USAEC to close this site.

# IRP Schedule

Date of IRP Inception: 197001

## Past Phase Completion Milestones

### 1971

RFA (FTL-67 - UNDERGROUND TANKS OLD PX SERVICE STATION)

### 1978

RFA (FTL-41 - INCINERATOR BUILDING 344, FTL-44 - INCINERATOR BUILDING 632)

### 1983

PA (FTL-59 - KINDER RANGE)

RFA (FTL-35 - WASH RACK BUILDING 571)

### 1988

INV (FTL-16 - USED SOLVENT TANK UST NR BLDG 487-2, FTL-17 - USED SOLVENT TANK UST NR BLDG 487-3, FTL-18 - USED SOLVENT TANK UST NR BLDG 487-4, FTL-50 - USED SOLVENT TANK NO 5 BUILDING 487, FTL-51 - USED SOLVENT TANK NO 6 BUILDING 487, FTL-53 - USED OIL TANK BUILDING 471)

ISC (FTL-12 - USED OIL TANK AST NEAR BUILDING 305, FTL-13 - USED OIL TANK UST NEAR BUILDING 689-0, FTL-16 - USED SOLVENT TANK UST NR BLDG 487-2, FTL-17 - USED SOLVENT TANK UST NR BLDG 487-3, FTL-18 - USED SOLVENT TANK UST NR BLDG 487-4, FTL-50 - USED SOLVENT TANK NO 5 BUILDING 487, FTL-51 - USED SOLVENT TANK NO 6 BUILDING 487, FTL-52 - USED OIL TANK BUILDING 109, FTL-53 - USED OIL TANK BUILDING 471, FTL-54 - USED OIL STORAGE, BUILDING 132)

RFA (FTL-04 - INACTIVE SANITARY LANDFILL, FTL-05 - INACTIVE SANITARY LANDFILL, FTL-06 - INACTIVE LANDFILL, FTL-09 - CLOSED ACTIVE SANITARY LANDFILL, FTL-10 - OLD FIRE TRAINING AREA/BURN PIT, FTL-11 - CLOSED FIRE TRAINING AREA, FTL-14 - USED OIL TANK NEAR BUILDING 86, FTL-15 - USED SOLVENT TANK UST NR BLDG 487-1, FTL-20 - SEPTIC TANK NR BLDG 398, FTL-22 - SEPTIC TANK NR BLDG 425, FTL-24 - PESTICIDE AREA NR BLDG 227, FTL-30 - PAST PESTICIDE BUILDING 412, FTL-34 - WASH RACK BUILDING 431, FTL-45 - INCINERATOR BUILDING 136, FTL-48 - SEWAGE TREATMENT SYSTEM BUILDING 138, FTL-49 - HAZARDOUS WASTE STORAGE BUILDING 829, FTL-55 - USED OIL STORAGE, CITY AIRPORT OPERATION, FTL-60 - USDB GREENHOUSE)

PA (FTL-01 - INACTIVE SANITARY LANDFILL, FTL-19 - SEWAGE LAGOONS, FTL-23 - MINERAL SETTLING LAGOONS, FTL-29 - PAST PESTICIDE BUILDING 413, FTL-33 - WASH RACK BUILDING 262, FTL-36 - WASH RACK BUILDING 132, FTL-37 - WASH RACK BUILDING 86, FTL-39 - WASH RACK BUILDING 496)

SI (FTL-39 - WASH RACK BUILDING 496)

### 1989

CAP (FTL-16 - USED SOLVENT TANK UST NR BLDG 487-2, FTL-17 - USED SOLVENT TANK UST NR BLDG 487-3, FTL-18 - USED SOLVENT TANK UST NR BLDG 487-4, FTL-50 - USED SOLVENT TANK NO 5 BUILDING 487, FTL-51 - USED SOLVENT TANK NO 6 BUILDING 487)

RFA (FTL-68 - WEED CONTROL AREA, CITY AIRPORT OPER)

### 1990

PA (FTL-62 - UNDERGROUND PROPANE TANK, USDB FARM)

RFA (FTL-57 - SKEET RANGE (INACTIVE))

DES (FTL-16 - USED SOLVENT TANK UST NR BLDG 487-2, FTL-17 - USED SOLVENT TANK UST NR BLDG 487-3, FTL-18 - USED SOLVENT TANK UST NR BLDG 487-4, FTL-22 - SEPTIC TANK NR BLDG 425, FTL-50 - USED SOLVENT TANK NO 5 BUILDING 487, FTL-51 - USED SOLVENT TANK NO 6 BUILDING 487, FTL-52 - USED OIL TANK BUILDING 109)

### 1991

CMI(C) (FTL-68 - WEED CONTROL AREA, CITY AIRPORT OPER)

RD (FTL-36 - WASH RACK BUILDING 132)

IMP(C) (FTL-52 - USED OIL TANK BUILDING 109)

### 1992

RD (FTL-19 - SEWAGE LAGOONS, FTL-33 - WASH RACK BUILDING 262)

SI (FTL-01 - INACTIVE SANITARY LANDFILL)

RFA (FTL-65 - POND IN FAMILY HOUSING)

## 1993

PA (FTL-58 - SKEET RANGE (ACTIVE))  
 ISC (FTL-61 - TANK REMOVAL, BLDG 431, FTL-64 - FTL-64: REMOVE UST BLDG 264)  
 CS (FTL-24 - PESTICIDE AREA NR BLDG 227)  
 RI/FS (FTL-01 - INACTIVE SANITARY LANDFILL)  
 DES (FTL-14 - USED OIL TANK NEAR BUILDING 86)  
 RFA (FTL-63 - DRMO SCRAP YARD)

## 1994

SI (FTL-29 - PAST PESTICIDE BUILDING 413)  
 RD (FTL-01 - INACTIVE SANITARY LANDFILL)  
 CS (FTL-30 - PAST PESTICIDE BUILDING 412, FTL-60 - USDB GREENHOUSE)  
 IMP(C) (FTL-53 - USED OIL TANK BUILDING 471)  
 DES (FTL-61 - TANK REMOVAL, BLDG 431)

## 1995

SI (FTL-23 - MINERAL SETTLING LAGOONS)  
 DES (FTL-30 - PAST PESTICIDE BUILDING 412)  
 CS (FTL-05 - INACTIVE SANITARY LANDFILL, FTL-06 - INACTIVE LANDFILL, FTL-09 - CLOSED ACTIVE SANITARY LANDFILL, FTL-10 - OLD FIRE TRAINING AREA/BURN PIT, FTL-11 - CLOSED FIRE TRAINING AREA, FTL-15 - USED SOLVENT TANK UST NR BLDG 487-1)  
 RD (FTL-29 - PAST PESTICIDE BUILDING 413, FTL-37 - WASH RACK BUILDING 86)  
 IMP(C) (FTL-12 - USED OIL TANK AST NEAR BUILDING 305, FTL-13 - USED OIL TANK UST NEAR BUILDING 689-0, FTL-61 - TANK REMOVAL, BLDG 431)  
 RI/FS (FTL-39 - WASH RACK BUILDING 496)

## 1996

RA(C) (FTL-29 - PAST PESTICIDE BUILDING 413)  
 CS (FTL-57 - SKEET RANGE (INACTIVE))

## 1997

CS (FTL-04 - INACTIVE SANITARY LANDFILL)  
 RA(C) (FTL-01 - INACTIVE SANITARY LANDFILL)

## 1998

CMI(C) (FTL-09 - CLOSED ACTIVE SANITARY LANDFILL)  
 DES (FTL-09 - CLOSED ACTIVE SANITARY LANDFILL)  
 RFA (FTL-03 - INACTIVE LANDFILL, FTL-07 - INACTIVE SANITARY LANDFILL, FTL-08 - INACTIVE SANITARY LANDFILL)  
 IRA (FTL-04 - INACTIVE SANITARY LANDFILL)

## 1999

ISC (FTL-69 - DIESEL FUEL SPILL AREA)  
 CS (FTL-03 - INACTIVE LANDFILL, FTL-08 - INACTIVE SANITARY LANDFILL)  
 RFA (FTL-02 - INACTIVE LANDFILL)

## 2000

LTM (FTL-09 - CLOSED ACTIVE SANITARY LANDFILL)  
 CS (FTL-02 - INACTIVE LANDFILL, FTL-48 - SEWAGE TREATMENT SYSTEM BUILDING 138, FTL-63 - DRMO SCRAP YARD)  
 RFA (FTL-38 - WASH RACK BUILDING 305, FTL-43 - INCINERATOR BUILDING 111, FTL-46 - HAZARDOUS WASTE STG AT BLDING 279, FTL-56 - USED OIL CONTAMINATED FUEL STORAGE AREA, FTL-70 - FUEL OIL LEAK SITE AT USDB, FTL-71 - MCCLELLAN AVENUE MAINTENANCE SITE)  
 CMI(C) (FTL-14 - USED OIL TANK NEAR BUILDING 86, FTL-22 - SEPTIC TANK NR BLDG 425, FTL-41 -

## IRP Schedule

IRA	INCINERATOR BUILDING 344, FTL-44 - INCINERATOR BUILDING 632, FTL-45 - INCINERATOR BUILDING 136, FTL-55 - USED OIL STORAGE, CITY AIRPORT OPERATION)
IMP(C)	(FTL-67 - UNDERGROUND TANKS OLD PX SERVICE STATION)
INV	(FTL-16 - USED SOLVENT TANK UST NR BLDG 487-2, FTL-17 - USED SOLVENT TANK UST NR BLDG 487-3, FTL-18 - USED SOLVENT TANK UST NR BLDG 487-4, FTL-50 - USED SOLVENT TANK NO 5 BUILDING 487, FTL-51 - USED SOLVENT TANK NO 6 BUILDING 487, FTL-64 - FTL-64: REMOVE UST BLDG 264)
RA(C)	(FTL-54 - USED OIL STORAGE, BUILDING 132)
PA	(FTL-19 - SEWAGE LAGOONS, FTL-33 - WASH RACK BUILDING 262, FTL-36 - WASH RACK BUILDING 132, FTL-37 - WASH RACK BUILDING 86, FTL-39 - WASH RACK BUILDING 496, FTL-62 - UNDERGROUND PROPANE TANK, USDB FARM)
	(FTL-21 - SEPTIC TANK NR BLDG 428, FTL-25 - OLD PESTICIDE BUILDING 234, FTL-26 - OLD PESTICIDE BUILDING 234A, FTL-27 - PAST PESTICIDE BUILDING 237, FTL-28 - CURRENT PESTICIDE BUILDING 93, FTL-31 - CURRENT PESTICIDE BUILDING 399, FTL-32 - PESTICIDE BUILDING 84, FTL-40 - WASH RACK BUILDING 237, FTL-42 - INCINERATOR BUILDING 111, FTL-47 - MEDIA SUPPORT AREA BUILDING 77)
<b>2001</b>	
RFA	(PBC at Leaven. - PBC)
<b>2002</b>	
CS	(FTL-20 - SEPTIC TANK NR BLDG 398, FTL-65 - POND IN FAMILY HOUSING, FTL-71 - MCCLELLAN AVENUE MAINTENANCE SITE)
INV	(FTL-69 - DIESEL FUEL SPILL AREA)
<b>2004</b>	
DES	(FTL-05 - INACTIVE SANITARY LANDFILL, FTL-06 - INACTIVE LANDFILL)
RFI/CMS	(FTL-05 - INACTIVE SANITARY LANDFILL, FTL-06 - INACTIVE LANDFILL)
<b>2005</b>	
RFI/CMS	(FTL-02 - INACTIVE LANDFILL, FTL-03 - INACTIVE LANDFILL, FTL-04 - INACTIVE SANITARY LANDFILL, FTL-65 - POND IN FAMILY HOUSING)
DES	(FTL-02 - INACTIVE LANDFILL, FTL-03 - INACTIVE LANDFILL, FTL-04 - INACTIVE SANITARY LANDFILL)
CMI(C)	(FTL-04 - INACTIVE SANITARY LANDFILL, FTL-05 - INACTIVE SANITARY LANDFILL, FTL-06 - INACTIVE LANDFILL, FTL-30 - PAST PESTICIDE BUILDING 412)
IRA	(FTL-15 - USED SOLVENT TANK UST NR BLDG 487-1)
<b>2006</b>	
CMI(C)	(FTL-10 - OLD FIRE TRAINING AREA/BURN PIT, FTL-15 - USED SOLVENT TANK UST NR BLDG 487-1)
IRA	(FTL-10 - OLD FIRE TRAINING AREA/BURN PIT)
DES	(FTL-07 - INACTIVE SANITARY LANDFILL, FTL-10 - OLD FIRE TRAINING AREA/BURN PIT, FTL-15 - USED SOLVENT TANK UST NR BLDG 487-1)
RFI/CMS	(FTL-07 - INACTIVE SANITARY LANDFILL, FTL-10 - OLD FIRE TRAINING AREA/BURN PIT, FTL-15 - USED SOLVENT TANK UST NR BLDG 487-1)
<b>2007</b>	
RFA	(FTL-72 - Quarry Creek)
CMI(C)	(FTL-02 - INACTIVE LANDFILL, FTL-03 - INACTIVE LANDFILL, FTL-07 - INACTIVE SANITARY LANDFILL)
DES	(FTL-57 - SKEET RANGE (INACTIVE))
RFI/CMS	(FTL-11 - CLOSED FIRE TRAINING AREA, FTL-20 - SEPTIC TANK NR BLDG 398, FTL-57 - SKEET RANGE (INACTIVE), FTL-60 - USDB GREENHOUSE)
<b>2008</b>	
CMI(C)	(FTL-08 - INACTIVE SANITARY LANDFILL)
CAP	(FTL-69 - DIESEL FUEL SPILL AREA)

# IRP Schedule

DES	(FTL-08 - INACTIVE SANITARY LANDFILL)
RFI/CMS	(FTL-08 - INACTIVE SANITARY LANDFILL, FTL-24 - PESTICIDE AREA NR BLDG 227, FTL-70 - FUEL OIL LEAK SITE AT USDB, FTL-71 - MCCLELLAN AVENUE MAINTENANCE SITE)
<b>2009</b>	
CMI(C)	(FTL-57 - SKEET RANGE (INACTIVE))
<b>2010</b>	
IRA	(FTL-72 - Quarry Creek)
<b>2011</b>	
LTM	(FTL-04 - INACTIVE SANITARY LANDFILL)
CMI(C)	(PBC at Leaven. - PBC)
<b>2013</b>	
LTM	(FTL-44 - INCINERATOR BUILDING 632)
RFI/CMS	(FTL-72 - Quarry Creek)
CS	(FTL-67 - UNDERGROUND TANKS OLD PX SERVICE STATION)
<b>2014</b>	
DES	(FTL-72 - Quarry Creek)
LTM	(FTL-22 - SEPTIC TANK NR BLDG 425, FTL-41 - INCINERATOR BUILDING 344, FTL-64 - FTL-64: REMOVE UST BLDG 264)
<b>2015</b>	
LTM	(FTL-65 - POND IN FAMILY HOUSING)

## Projected Phase Completion Milestones

See attached schedule

## Projected Record of Decision (ROD)/Decision Document (DD) Approval Dates

Site ID	Site Name	ROD/DD Title	ROD/DD Date
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**Final RA(C) Completion Date:** 201806

**Schedule for Next Five-Year Review:** 2018

**Estimated Completion Date of IRP at Installation (including LTM phase):** 203810

## FORT LEAVENWORTH IRP Schedule

= phase underway

SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
FTL-02	INACTIVE LANDFILL	LTM						
SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
FTL-03	INACTIVE LANDFILL	LTM						
SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
FTL-05	INACTIVE SANITARY LANDFILL	LTM						
SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
FTL-06	INACTIVE LANDFILL	LTM						
SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
FTL-07	INACTIVE SANITARY LANDFILL	LTM						
SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
FTL-08	INACTIVE SANITARY LANDFILL	LTM						
SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
FTL-10	OLD FIRE TRAINING AREA/BURN PIT	CMI(O)						
SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
FTL-15	USED SOLVENT TANK UST NR BLDG 487-1	CMI(O)						
SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
FTL-34	WASH RACK BUILDING 431	RFI/CMS						
SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
FTL-35	WASH RACK BUILDING 571	RFI/CMS						
SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
FTL-43	INCINERATOR BUILDING 111	RFI/CMS						
SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
FTL-56	USED OIL CONTAMINATED FUEL STORAGE AREA	RFI/CMS						
SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
FTL-57	SKEET RANGE (INACTIVE)	LTM						
SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
FTL-63	DRMO SCRAP YARD	RFI/CMS						
SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
FTL-67	UNDERGROUND TANKS OLD PX SERVICE STATION	RFI/CMS						
SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
FTL-69	DIESEL FUEL SPILL AREA	LTM						
SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
FTL-70	FUEL OIL LEAK SITE AT USDB	LTM						
SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
FTL-71	MCCLELLAN AVENUE MAINTENANCE SITE	LTM						
SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
FTL-72	Quarry Creek	CMI(C)						

**FORT LEAVENWORTH**  
**Army Defense Environmental Restoration Program**  
**Military Munitions Response Program**

# MMRP Summary

**Installation Total Army Environmental Database-Restoration (AEDB-R) Sites/Closeout Sites Count:** 3/1

## Installation Site Types with Future and/or Underway Phases

- 1 Small Arms Range  
(FTL-001-R-01)
- 1 Unexploded Munitions/Ordnance  
(FTL-003-R-01)

## Most Widespread Contaminants of Concern

Explosives, Metals

## Media of Concern

Soil

## Completed Remedial Actions (Interim Remedial Actions/ Final Remedial Actions (IRA/FRA))

Site ID	Site Name	Action	Remedy	FY
FTL-003-R-01	Kinder Grenade Range	IRA	REMOVAL	2012
FTL-001-R-01	5TH ARTILLERY ROAD FIRING RANGE	IRA	INSTITUTIONAL CONTROLS	2013

## Duration of MMRP

**Date of MMRP Inception** 200303

**Estimated Date for Remedy-In-Place (RIP)/Response Complete (RC):** 201708/201708

**Date of MMRP completion including Long Term Management (LTM):** 201708



# MMRP Contamination Assessment

## Contamination Assessment Overview

Two sites currently are being tracked under the MMRP. One site was tracked as FTL-66, but is now known as FTL-001-R-01. This site is having a negative impact on the RCI. This makes it the most important restoration site on FTL.

This former range was established in 1880 and used for small arms training through 1960. The site extends to the south from 5th Artillery Road to just above Hunt Road and totals 374.86 acres. The area is now residential multi-family housing and undeveloped land. Munitions constituents (MC) were not found during construction of the family housing. The direction of fire on the rifle range was from south to north. The range fan overlaps portions of the current operational property. Therefore, only the portion of the rifle range and range fan south of Hatch Road that falls outside operational property is included. This range appears as four noncontiguous parcels of land.

When it was identified in the Army's phase III range inventory in 2003, FTL-001-R-01 consisted of four noncontiguous parcels of land totaling 375 acres; however, as of the end of the SI in 2007, only the most southern of the four parcels remains as part of the munitions response site (MRS) and the site's acreage has been reduced to 201 acres.

This site was identified in 1997, when the US Army requested information on all the old firing ranges on each installation. The site was identified in the 1998 IAP; however, it was rejected by the USAEC as an IRP site, since no chemical contamination had been identified. The site was placed into the OMA Program for FY02. The E&E completed a records search in 2003 to aid in identifying the location of historical firing ranges.

In November 2008, Engineering-Environmental Management, Inc. (e2M) performed and reported a final RFI at the site. Results of the RFI field activities conducted at the firing positions area indicated that MC, lead, and other metal constituents (antimony, arsenic, copper, mercury, nickel, and zinc) are generally not found at levels exceeding PRGs or at levels exceeding 95 percent upper tolerance limits (UTLs) across the majority of the site, with exception to grids found in the northwest corner of the firing positions area. Results of metal detection surveys did not indicate the presence of any significant quantities of lead slugs and fragments or empty brass cartridges. Additionally, no UXO was discovered during the surveying activities.

Additional results in the November 2008 final RFI conducted at the target berm/trench area indicated that MC (lead) is present at concentrations exceeding the PRG in a number of samples. Other metal constituents (antimony, arsenic, copper, mercury, nickel, and zinc) were detected occasionally at levels above the 95 percent UTLs. As a whole, metal concentrations exceeding the PRG for lead or above the 95 percent UTLs for the other metals are considered to be anthropogenic (above naturally occurring) in the target berm/trench area. Results of the metal detector survey indicated the greatest number of bullets recovered during the investigation were located on the northern half of the study area on the existing hillside; however, only one lead exceedance of the PRG was observed in this area. Although there appears to be a significant quantity of lead bullets in the shallow soil on the northern hillside of the target berm/trench area, the lead concentrations in the soil appear to be typical of lead deposited by the slowing or stopping of the bullets. Given the evidence from the rest of the site, there is no evidence of lead leaching into the soil from the bullets that have been lying at the site.

The other MMRP site recently identified is known as FTL-003-R-01 (alias FTL-74). A study of maps and historical records has determined that the Kinder Range area probably was used for grenade training. The records indicate that rifle-propelled grenades and 20 millimeter (mm) grenades were fired on the range. A number of the rounds did not explode, which creates a hazard to people in the area.

## Cleanup Exit Strategy

The next action for FTL-001-R-01 (FTL-66) is to execute a contract for a risk assessment to be performed by ARCADIS. This work has been contracted as part of an amendment to the GFPR contract dated Sept. 30, 2008. Funds are being programmed for a design and RA with the goal for the site to have unrestricted use.

The plan for FTL-003-R-01 (Grenade Range - alias FTL-74) was to perform and locate-and-remove munitions and explosives of concern (MEC). Prior to performing locate-and-remove, an SI, including a historical records review (HRR), was programmed for this MMRP site. Following the SI phase, MEC site characterization and removal assessment is to be performed with the expectation that NFA is required at this site. Confirmatory sampling for MEC constituents is required by the USEPA and is planned with anticipation of NFA.

## MMRP Previous Studies

Year	Title	Author	Date
2001	Final Global Positioning System Survey and Geographical Information System	Ecology and Environment, Inc. (E&E)	NOV-2001
2003	Firing Ranges and Associated Facilities	Ecology and Environment, Inc. (E&E)	APR-2003
	Final Closed, Transferring and Transferred Range Site Inventory	Engineering-Environmental Management, Inc.	OCT-2003
2006	Final Transfer/Closure Work plan for Bullet Containing Soils Housing Area 22B to Railroad Cuts (FTL-66) Fort Leavenworth, KS	Fort Leavenworth DIS Environmental Division	AUG-2006
	Final Fort Leavenworth Housing Area 22B Soil Testing Sampling Results Report (FTL-66) Fort Leavenworth, KS	Fort Leavenworth DIS Environmental Division	OCT-2006
	Final Military Munitions Response Program Historical Records Review Fort Leavenworth, Kansas	Engineering-Environmental Management, Inc.	NOV-2006
	Site Investigation Housing Area 23 (FTL-66) Search for Metallic Material Fort Leavenworth, KS	Fort Leavenworth DIS Environmental Division	DEC-2006
	Final Site Investigation Work plan for Bullet Containing Soils Housing Area 23 (FTL-66) Fort Leavenworth, KS	Fort Leavenworth DIS Environmental Division	DEC-2006
2007	Final Site Inspection Report	Engineering-Environmental Management, Inc.	MAY-2007
	Final Work Plan Military Munitions Response Program (MMRP) RCRA Facilities Investigation (RFI)/Corrective Measures Study (CMS)	Engineering-Environmental Management, Inc.	AUG-2007
	Stakeholder Draft Firing Positions Area RCRA Facility Investigation Report (DNF)	Engineering-Environmental Management, Inc.	DEC-2007
2008	Final Work plan Addendum MMRP Firing Positions Area RFI, Fort Leavenworth, Kansas	Engineering-Environmental Management, Inc.	MAR-2008
	Quality Assurance Summary Report Firing Positions Area Field Activities: 25 March - 2 April 2008, RCRA Facility Investigation (RFI) Military Munitions Response Sites Fort Leavenworth, Kansas	US Army Corps of Engineers Kansas City District and U.S. Army Combined Arms Center and Fort Leavenworth, Kansas	APR-2008
	Final Fort Leavenworth Housing Area 13 Soil Testing Sampling Results Report, Fort Leavenworth, Kansas	US Army Combined Arms Center and Fort Leavenworth	MAY-2008
	Final Work Plan Addendum Military Munitions Response Program Target Bench/Trench Area & Golf Course MRS RCRA Facility Investigation (RFI), Fort Leavenworth, Kansas	Engineering-Environmental Management, Inc.	MAY-2008
	Final Fort Leavenworth Housing Area 19 Soil Testing Sampling Results Report, Fort Leavenworth, Kansas	US Army Combined Arms Center and Fort Leavenworth	JUL-2008
	Final RCRA Facility Investigation Report 5th Artillery Road Firing Range MRS and Golf Course MRS MMRP Fort Leavenworth, KS	Engineering-Environmental Management, Inc.	NOV-2008
2009	Final CMS Work plan FTL-66, 5th Artillery Road Firing Range	ARCADIS	MAY-2009
2010			

## MMRP Previous Studies

	<b>Title</b>	<b>Author</b>	<b>Date</b>
<b>2010</b>	Final Corrective Measures Study Report FTL-66, Fort Leavenworth, KS	ARCADIS	OCT-2010
<b>2011</b>	Revised Contractor Construction Management Plan - FTL-66 (HA 22B)	Coastal Environmental	OCT-2011
	Final Interim Removal Action Work plan FTL-003-R-001 (FTL-74)	Bay West	OCT-2011
<b>2012</b>	Final Interim Removal Action Report, Kinder Grenade Range - FTL-74	Bay West	JUN-2012
	Final Certified Interim Action Report - FTL-66	Coastal Environmental	NOV-2012
<b>2014</b>	Final Abbreviated Work Plan, Small Arms Debris Removal from Clay Pipe, FTL-74	Bay West	OCT-2014
<b>2015</b>	Final RCRA Facility Investigation Report for FTL-003-R-01 (FTL-74)	Bay West	APR-2015
	Final RFI Work Plan Addendum, Kinder Grenade Range (FTL-003-R-01) FTL-74	Bay West	JUN-2015
	Final Letter Report, Small Arms Debris Removal from Clay Pipe (FTL-74)	Bay West	JUN-2015

**FORT LEAVENWORTH**  
**Military Munitions Response Program**  
**Site Descriptions**

**Site ID: FTL-001-R-01**

**Site Name: 5TH ARTILLERY ROAD FIRING RANGE**

**STATUS**

**Regulatory Driver:** RCRA  
**MRSPP Score:** 03  
**Contaminants of Concern:** Metals  
**Media of Concern:** Soil

<b>Phases</b>	<b>Start</b>	<b>End</b>
RFA.....	200303.....	200310
CS.....	200602.....	200705
RFI/CMS.....	200706.....	201708
IRA.....	201010.....	201212

**RIP Date:** N/A  
**RC Date:** 201708

**SITE DESCRIPTION**

This parcel is a former range that was established in 1880 and used through 1960 for small arms training. The site extends to the south from 5th Artillery Road to just above Hunt Road and is now residential multi-family housing and undeveloped land. No MEC are known to have been found during construction of the family housing. The direction of fire on the rifle range was from south to north. The historical range fan overlaps portions of the current operational ranges. Only the portion of the rifle range that falls outside operational ranges is included in the MRS. The 2000 RCRA permit identifies a portion of the Munitions Response (MR) site as FTL-001-R-01 (FTL-66). The FTL-66 parcel is included in the areas leased to the RCI for housing areas.

When it was identified in the Army's Phase III range inventory in 2003, FTL-001-R-01 consisted of four noncontiguous parcels of land totaling 375 acres; however, as of the end of the SI in 2007, only the most southern of the four parcels remains as part of the MR site and the site's acreage has been reduced to 201 acres. This site was initially identified in 1997 when the Army requested information on all the old firing ranges on each installation. The site was included in the 1998 IAP; however, it was rejected by the USAEC as an IRP site, since no chemical contamination had been identified. The site was placed into the OMA program for FY02. The E&E completed a records search in 2003 to aid in identifying the location of historical firing ranges.

In November 2008, an environmental consulting firm, e2M, performed and reported a final RFI at the site. Results of the RFI field activities conducted at the firing positions area indicated that MC, lead, and other metal constituents (antimony, arsenic, copper, mercury, nickel, and zinc) were not found at levels exceeding PRGs or at levels exceeding 95 percent UTLs across the majority of the site, with exception to grids found in the northwest corner of the firing positions area. Results of metal detection surveys did not indicate the presence of any significant quantities of lead slugs and fragments or empty brass cartridges. Additionally, no UXO were discovered during the surveying activities.

Additional results in the November 2008 final RFI conducted at the target berm/trench area indicated that MC (lead) is present at concentrations exceeding the PRG in a number of samples. Other metal constituents (antimony, arsenic, copper, mercury, nickel, and zinc) were detected occasionally at levels above the 95 percent UTLs. As a whole, metal concentrations exceeding the PRG for lead or above the 95 percent UTLs for the other metals are considered to be anthropogenic occurrences in the target berm/trench area. Results of the metal detector surveying indicated the greatest number of bullets recovered during the investigation were located on the northern half of the study area on the existing hillside; however, only one exceedance of the lead PRG was observed in this area. Although there appears to be a significant quantity of lead bullets in the shallow soil on the northern hillside of the target berm/trench area, the lead concentrations in the soil appear to be typical of lead deposited by the slowing or stopping of the bullets. Given the evidence from the rest of the site, there is no evidence of lead leaching into the soil from the bullets that have been lying at the site.

This site is currently in the CMS phase. During the first quarterly reporting period of 2011, the USEPA issued a letter dated Jan. 12, 2011 directing sampling pesticides/termiticides at old buildings in the footprint of FTL-66. Fort Leavenworth forwarded the request to USAEC for direction. The issue is currently under review at Headquarters Department of the Army (HQDA) and awaiting a legal decision on the termiticide sampling request.

**Site ID: FTL-001-R-01**

**Site Name: 5TH ARTILLERY ROAD FIRING RANGE**

## **CLEANUP/EXIT STRATEGY**

The Area 22B Railroad Cut (RR Cut) soils area within FTL-001-R-01 is a ravine-like topographic feature in which small arms firing range impacted soil has been deposited and provided an engineered cover consisting of a geotextile, clay cap, and topsoil. The firing range soil was relocated to the RR Cut as a result of a military housing project being sited on the former small arms firing range (FTL-001-R-01).

Placement of the soil in the FTL-001-R-01 RR Cut area occurred during FY06. Since that time, a decision was made that the location would become the future site for a new Fort Leavenworth School. An RFI conducted at the source area of the Area 22B soils firing range reported that MC, lead and other metals (antimony, arsenic, copper, mercury, nickel, and zinc), were not found at concentrations exceeding PRG or at concentrations exceeding 95 percent UTL across the majority of the firing range.

The soil from the RR Cut area was removed in FY12 according to residential cleanup standards for future construction of the new school. The Final Interim Action Report for Area 22-B Railroad Cut Soils at FTL-66 was approved by the USEPA on Dec. 13, 2012.

**Site ID: FTL-003-R-01**  
**Site Name: Kinder Grenade Range**

**STATUS**

**Regulatory Driver:** RCRA  
**MRSPP Score:** Evaluation pending  
**Contaminants of Concern:** Explosives  
**Media of Concern:** Soil

<b>Phases</b>	<b>Start</b>	<b>End</b>
RFA.....	200808.....	200812
RFI/CMS.....	201006.....	201703
IRA.....	201008.....	201204
<b>RIP Date:</b>	N/A	
<b>RC Date:</b>	201703	

**SITE DESCRIPTION**

The Kinder Range area covered approximately 20 acres on heavily rolling forested terrain. A study of maps and historical records has determined that the range area probably was used for grenade training from about 1945 to 1970. The records indicate that rifle-propelled grenades and 20mm grenades were fired on the range. A number of the rounds did not explode, which creates a hazard to people in the area. The plan to perform a locate-and-remove in one step was completed during the FY13 data call. An SI and a munitions and MEC site characterization are required by the USEPA. Additional metals contamination was discovered and the contract was modified in FY14 to determine the extent of contamination.

A RCRA RFI was completed in April 2015 and no evidence of MEC was discovered during the IRA or the RFI. A total of 20 MD items were recovered, predominantly training munitions typical of small tactical unit training activities. The removal action report concluded NFA was necessary with respect to potential explosive hazards. The RFI addendum concluded that based on the risk assessments, the site is not considered to pose a hazard to human health or ecological receptors and a no further action was recommended. Regulatory concurrence is awaiting review and approval of the report.

**CLEANUP/EXIT STRATEGY**

A MEC SI is programmed to be performed with this MMRP site and an NFA is anticipated. The new RI/FS report completion date has been postponed until end of FY16.

## Site Closeout (No Further Action) Summary

Site ID	Site Name	NFA Date	Documentation
FTL-002-R-01	Golf Course	200810	Final 5th Artillery Road Firing Range MRS and Golf Course MRS RCRA Facility Investigation Report



# MMRP Schedule

**Date of MMRP Inception** 200303

## **Past Phase Completion Milestones**

### **2004**

RFA (FTL-001-R-01 - 5TH ARTILLERY ROAD FIRING RANGE)  
PA (FTL-002-R-01 - Golf Course)

### **2007**

CS (FTL-001-R-01 - 5TH ARTILLERY ROAD FIRING RANGE)  
SI (FTL-002-R-01 - Golf Course)

### **2009**

RFA (FTL-003-R-01 - Kinder Grenade Range)  
RI/FS (FTL-002-R-01 - Golf Course)

### **2012**

IRA (FTL-003-R-01 - Kinder Grenade Range)

### **2013**

IRA (FTL-001-R-01 - 5TH ARTILLERY ROAD FIRING RANGE)

## **Projected Phase Completion Milestones**

**See attached schedule**

## **Projected Record of Decision (ROD)/Decision Document (DD) Approval Dates**

To Be Determined

## **Final RA(C) Completion Date:**

**Schedule for Next Five-Year Review:** 2018

**Estimated Completion Date of MMRP at Installation (including LTM phase):** 201708

## FORT LEAVENWORTH MMRP Schedule

= phase underway

SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
FTL-001-R-01	5TH ARTILLERY ROAD FIRING RANGE	RFI/CMS						
SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
FTL-003-R-01	Kinder Grenade Range	RFI/CMS						

## Community Involvement

**Technical Review Committee (TRC):** None

**Community Involvement Plan (Date Published):** 201409

**Restoration Advisory Board (RAB):** No

**Reason Not Established:** The community has expressed no sufficient, sustained interest in a RAB.

**Community Interest Solicited on:** 201406

### Efforts Taken to Determine Interest

Fort Leavenworth's attempts to establish a RAB resulted in less than a dozen people requesting information and only one participating in the meeting where the purpose of the RAB was discussed. Over the past few years, public participation at public meetings involving environmental issues has been sparse. On Nov. 2, 2006, the USEPA held a public availability session for the proposed cleanup plan for seven environmental restoration sites (FTL-07, -10, -11, -12, -15, -20, and -60). On April 8, 2008, the USEPA held another public availability session for the proposed cleanup plan for seven additional environmental restoration sites (FTL-08, -23, -24, -57, -69, -70, and -71). No one from the public attended these sessions. No significant comments are expected from the public review process. The lack of public interest during these public comment periods substantiates the decision by the stakeholder agencies not to pursue the establishment of a RAB at FTL.

Fort Leavenworth as a community has its own local newspaper (The Fort Leavenworth Lamp). It also has a cable television channel available for community interest items. The city of Leavenworth has a local newspaper (The Leavenworth Times) and a separate community television channel for public announcements. The Tonganoxie Mirror is the Leavenworth County newspaper of record. The regulatory agencies agreed that using these newspapers and television channels met the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) community relations requirements.

### Results

The fort operates under a RCRA permit (KS4213720499) issued by the USEPA in June 2000. Since that time, the USEPA has formed a regulatory partnership with the KDHE regarding issues related to the RCRA permit. Both regulatory agencies continue to work together on regulatory actions. The fort has always had and still maintains an excellent working relationship with both regulatory agencies. This has benefited all parties; close coordination has resulted in a team effort to move the program ahead with the goal of protecting human health and the environment.

### Follow-up Procedures

In late 2007, the USEPA was informed that the FTL Planning Division had made a determination that the planned future use for FTL-04 would be as a potential build site for an aquatic center and a parking lot for a new child development center.

In February 2008, FTL informed the USEPA that they had requested and received Army funding approval for revision of the remedy at FTL-04 to remediate the site by removal action to an NFA level. The removal of the landfill was deemed beneficial in regards to making land area available for construction of facilities supportive of the morale and welfare of Army families.

On Dec. 21, 2009, the USEPA issued an explanation of significant difference (ESD) for public review explaining the desired change in remedy and requesting comments for FTL-04. The public comment period concluded on Jan. 23, 2010 with no interest generated from the public.

Regulatory agencies have requested that FTL continue to place paid advertisements in the newspapers in lieu of legal notices. Advertisements were placed in a section of the Fort Leavenworth Lamp, Leavenworth Times, and the Tonganoxie Mirror newspapers on Aug. 19, 2010 during renewal of the fort's 2010 RCRA permit. In addition, representatives from FTL, USAEC, and USEPA Region VII were available to provide information and answer questions regarding the proposed Part II permit renewal at the Leavenworth Public Library.

Public interest was solicited for a RAB on Aug. 29 and 30, 2012 in the Fort Leavenworth Lamp, Tonganoxie Mirror and Leavenworth Times newspapers.

### Additional Community Involvement Information

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## Community Involvement

A final CMI community relations plan was developed for removal of FTL-04 landfill in December 2009.

The community relations plan was last updated in September 2014 and has been approved by the Public Affairs Office and signed by the Garrison Commander.

**Administrative Record is located at**

Fort Leavenworth DPW Environmental Division  
810 McClellan Avenue  
Building No. 80  
Fort Leavenworth, KS 66027-1360  
Telephone: (913) 684-8976

**Information Repository is located at**

Leavenworth Public Library  
417 Spruce Street  
Leavenworth, KS 66048  
Telephone: (913) 682-5666

**Current Technical Assistance for Public Participation (TAPP):**N/A

**TAPP Title:** N/A

**Potential TAPP:** N/A

