

FY2016

FORT LEONARD WOOD

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, 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 US Army Environmental Command (USAEC), Fort Leonard Wood (FLW), the executing agencies, the regulatory agencies, and the public, an IAP was completed. The IAP is used to track requirements, schedules, and 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-R	Army Environmental Database - Restoration
AOC	Area of Concern
AST	Aboveground Storage Tank
Bldng	Building
BRAC	Base Realignment and Closure
BTEX	Benzene, Toluene, Ethylbenzene, and Xylenes
CBRN	Chemical, Biological, Radiological, and Nuclear School
CC	Compliance-related Cleanup
CDM	CDM Federal, Inc.
CERCLA	Comprehensive Environmental Response Compensation and Liability Act of 1980
CR	Compliance Restoration
DD	Decision Document
DERP	Defense Environmental Restoration Program
DLA	Defense Logistics Agency
DPW	Directorate of Public Works
DRMO	Defense Reutilization and Marketing Office
EOD	Explosive Ordnance Disposal
ER,A	Environmental Restoration, Army
ESI	Expanded Site Inspection
FLW	Fort Leonard Wood
FRA	Final Remedial Action
FS	Feasibility Study
ft	feet
FY	Fiscal Year
IAP	Installation Action Plan
ID	Identification
IMCOM	Installation Management Command
IR	Installation Restoration
IRA	Interim Remedial Action
IRP	Installation Restoration Program
K	thousand
LORA	Lake of the Ozarks Recreation Area
LTM	Long-Term Management
LUC	Land Use Control
MC	Munitions Constituents
MCL	Maximum Contaminant Level
MD	Munition Debris
MDNR	Missouri Department of Natural Resources
MEC	Munitions and Explosives of Concern
mg/kg	milligrams per kilogram
mm	millimeter
MMRP	Military Munitions Response Program
MO	Missouri
MR	Munitions Response
MRBCA	Missouri Risk Based Corrective Action

Acronyms

MRS	Munitions Response Site
MRSPP	Munitions Response Site Prioritization Protocol
MSCoE	Maneuver Support Center of Excellence
N/A	Not Applicable
NCO	Noncommissioned Officer
NFA	No Further Action
NPL	National Priorities List
O&M	Operations and Maintenance
OWS	Oil and Water Separator
PA	Preliminary Assessment
PAH	Polycyclic Aromatic Hydrocarbons
PBC	Performance-Based Contract
PCB	Polychlorinated Biphenyl
PCE	Tetrachloroethylene
POL	Petroleum, Oil and Lubricants
PP	Proposed Plan
ppb	parts per billion
RA	Remedial Action
RA(C)	Remedial Action - Construction
RA(O)	Remedial Action - Operation
RAB	Restoration Advisory Board
RAC	Risk Assessment Code
RC	Response Complete
RCRA	Resource Conservation and Recovery Act
RD	Remedial Design
RFA	Resource Recovery and Conservation Act Feasibility Assessment
RI	Remedial Investigation
RIP	Remedy-In-Place
ROD	Record of Decision
RRSE	Relative Risk Site Evaluation
SAR	Small Arms Range
SDZ	Safety Danger Zone
SI	Site Inspection
STP	Sewage Treatment Plant
SVOC	Semi-Volatile Organic Compound
SWMU	Solid Waste Management Unit
TA	Training Area
TAPP	Technical Assistance for Public Participation
TBD	To Be Determined
TCE	Trichloroethylene
TCLP	Toxicity Characteristic Leaching Procedure
TD	transferred
TRC	Technical Review Committee
ug/kg	micrograms per kilogram
USACE	US Army Corps of Engineers

Acronyms

USAEC	US Army Environmental Command
USAEHA	US Army Environmental Hygiene Agency
USEPA	US Environmental Protection Agency
USFS	US Forest Service
USGS	US Geological Survey
UST	Underground Storage Tank
UU/UE	Unrestricted Use/Unrestricted Exposure
UXO	Unexploded Ordnance
VC	Vinyl Chloride
VOC	Volatile Organic Compound

Acronym Translation Table

CERCLA

Preliminary Assessment(PA)
Site Inspection(SI)
Remedial Investigation/Feasibility Study(RI/FS)
Remedial Design(RD)
Remedial Action (Construction)(RA(C))
Remedial Action (Operation)(RA(O))
Long Term Management(LTM)
Interim Remedial Action(IRA)

RCRA

= RCRA Facility Assessment(RFA)
= Confirmation Sampling(CS)
= RCRA Facility Investigation/Corrective Measures Study(RFI/CMS)
= Design(DES)
= Corrective Measures Implementation (Construction)(CMI(C))
= Corrective Measures Implementation (Operation)(CMI(O))
= Long Term Management(LTM)
= Interim Measure(IM)

Installation Information

Installation Locale

Installation Size (Acreage): 61410.15

City:

County: Pulaski with small portions in Laclede and Texas

State: Missouri

Other Locale Information

FLW lies in Townships 33N to 36N and Ranges 10W to 13W and occupies 61,410.15 acres approximately 30 miles southwest of Rolla, Missouri. It is almost entirely in Pulaski County with small portions in Laclede and Texas Counties, all in the south central part of Missouri. The fort is bordered on the west by Roubidoux Creek and on the east by the Big Piney River. Two small towns, Waynesville and Saint Roberts, are located directly north of the facility.

The installation is located in the west-central part of the Salem Plateau of the Ozark Physiographic Province. Commonly referred to as the Ozark carbonate area, the regional geomorphology comprises karsts features (soluble rock) including permeable bedrock, permeable soils, springs, caves, sinkholes, and massive rock bluffs along streams. Three Ordovician carbonate formations crop out in the area of FLW: the Jefferson City Dolomite, the Roubidoux Formation, and the Gasconade Dolomite.

The Jefferson City Formation is the youngest formation remaining in the FLW area and is restricted to the top of the high ridge that separates the Big Piney River and Roubidoux Creek watersheds. In general, the Jefferson City Formation occurs only where ground elevation is greater than approximately 1,110 feet (ft) above mean sea level. The formation, which varies from 0 to 220 ft in thickness, is thin-bedded finely- to medium- crystalline dolomite interbedded with numerous massive, cherty dolomite beds, and rare, thin shale beds.

The Roubidoux Formation, which underlies the Jefferson City Formation, crops out over the extent of the post and has weathered to form extensive residual soils. When unweathered, the Roubidoux Formation is composed of tan to buff-colored, finely- to medium-crystalline, thin- to thick-bedded, vuggy dolomite with abundant chert and sandstone lenses. Roubidoux thickness varies from 0 to 180 ft.

The Gasconade Formation is the oldest strata to crop out at FLW. Surface exposure of the formation is limited to deeply eroded stream valley bottoms of Roubidoux Creek and Big Piney River. The Gasconade Formation is divided into two units: 1) the Upper Gasconade, which is the lowest stratigraphic unit to outcrop at FLW and is composed of finely to coarsely-crystalline, generally chert-free, vuggy dolomite; and 2) the Lower Gasconade, which is composed of finely- to medium-crystalline cherty dolomite with rare, thin beds of sandstone. Upper Gasconade thickness varies from 0 to 100 ft, and Lower Gasconade thickness ranges from 205 to 385 ft. A thin (10 to 45 ft) dolomite-cemented, medium-grained sandstone unit called the Gunter Sandstone Member occurs at the base of the lower Gasconade. The base of the Gunter Sandstone Member represents the contact between the Ordovician and Cambrian Systems.

Cambrian strata underlie the Gasconade Formation and are composed of the Eminence Dolomite and the underlying Potosi Dolomite. Both are medium-crystalline and massively bedded. The Potosi Dolomite contains abundant chert and quartz druse; whereas, in the Eminence Dolomite, chert occurs only in small amounts in the upper part of the formation.

Subsequent to their deposition, these sediments were deeply buried beneath younger Paleozoic and Mesozoic sediments. More recently, the rocks have been uplifted and subaerially exposed. The uplift of the area also produced numerous fractures and northwest trending faults in the region. At the surface, the rocks are exposed to fresh water, which preferentially flows through these fractures and results in the dissolution of the carbonate rocks and to the formation of caves and sinks. Erosion from surface water, creeks, and rivers has dissected the relatively flat strata producing the karst topography.

Installation Mission

The Maneuver Support Center of Excellence (MSCoE) develops competent leaders and warriors of character and delivers total Army Engineer; Chemical, Biological, Radiological, and Nuclear School; Military Police; and Maneuver Support capabilities to

Installation Information

enable mission success across the range of military operations.

Lead Organization

IMCOM

Lead Executing Agencies for Installation

US Army Corps of Engineers (USACE), Northwest Division, Kansas City District

USAEC

Regulator Participation

Federal US Environmental Protection Agency (USEPA), Region 7
State Missouri Department of Natural Resources (MDNR)

National Priorities List (NPL) Status

FORT LEONARD WOOD 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: Metals, Pesticides, Petroleum, Oil and Lubricants (POL), Semi-volatiles (SVOC), Volatiles (VOC)

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

MMRP

Primary Contaminants of Concern: Explosives, Metals, Munitions and explosives of concern (MEC), Munitions constituents (MC)

Affected Media of Concern: Groundwater, Soil

CR

Primary Contaminants of Concern: Petroleum, Oil and Lubricants (POL), Polychlorinated Biphenyls (PCB), Volatiles (VOC)

Affected Media of Concern: Sediment, Soil

5-Year / Periodic Review Summary

5-Year / Periodic Review Summary

Status	Start Date	End Date	End FY
Complete	201011	201201	2012
Planned	201604	201701	2017

Last Completed 5-Year / Periodic Review Details

Associated ROD/DD Name	Sites
FLW-056 RI/FS DD	FLW-056
Final Decision Document FLW-002 & 003	FLW-002, FLW-003

Results The remedies at 002, 003, and -056 currently protective because remedies prevent exposure of contamination in the short-term.

Actions Confirm downgradient delineation of the FLW-056 groundwater plume. Verify potential for migration of methane and VOCs outside of the Land Use Control buffer for FLW-002 and 003 before future construction.

Plans Install additional monitoring well downgradient of MW FLW-5609 by 12 Jan 2014. Complete additional monitoring of methane and VOC migration at FLW-002 and FLW-003 as new buildings are proposed near the two sites.

Recommendations and Implementation Plans:

To be determined (TBD).

Land Use Control (LUC) Summary

LUC Title: FLW-056 LUCIP

Site(s): FLW-056

ROD/DD Title: FLW-056 RI/FS DD

Location of LUC

Vicinity of FLW-056

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 for agricultural/irrigation purposes

Types of Engineering Controls: Markers

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

Date in Place: 200709

Modification Date: N/A

Date Terminated: N/A

Inspecting Organization: Installation

Record of LUC: Master Plan or Equivalent

Documentation Date: 201201

LUC Enforcement: Annual Inspections, 5 Year Reviews

Contaminants: VOC

Additional Information

N/A

LUC Title: LUCIP FLW-002 & FLW-003

Site(s): FLW-002, FLW-003

ROD/DD Title: Final Decision Document FLW-002 & 003

Location of LUC

FLW-002 and FLW-003

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 - Prohibit installation of utility system lines through the site, Landfill restriction - Restrict construction of buildings that may interfere with 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 daycare/hospital/school use, 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: 201011

Modification Date: N/A

Date Terminated: N/A

Inspecting Organization: Installation

Record of LUC: Master Plan or Equivalent

Documentation Date: 201201

LUC Enforcement: Annual Inspections, 5 Year Reviews

Land Use Control (LUC) Summary

Contaminants: METALS, VOC

Additional Information

N/A

Cleanup Program Summary

Installation Historic Activity

Fort Leonard Wood was established in 1940 as a basic training center. That center has evolved into the Maneuver Support Center of Excellence (MSCoE). The MSCoE's mission is to develop competent leaders and warriors of character and deliver total Army engineer; chemical, biological, radiological, and nuclear (CBRN); military police and maneuver support capabilities to enable mission success across the range of military operations. The installation accomplishes training through the United States Army CBRN School, the US Army Engineer School, and the US Army Military Police School.

The 1st Engineer Brigade provides advanced individual training in a variety of military specialties. In 1995 the brigade started training members of the Air Force, Navy and Marines in several military specialties. The different services are not in the brigade but work closely together, along with the Interservice Training Review Organization. The brigade also is responsible for teaching the Officer's Basic and Captain's Career Officer courses, Warrant Officer courses, and the Sapper Leader course.

The 3rd Chemical Brigade provides command, control, administration, supply, housing, and training for the 82nd Chemical Battalion, the 84th Chemical Battalion and the 58th Transportation Battalion. The 3rd Chemical Brigade also implements Military Occupational Specialty, professional development, and functional course training. The Chemical Defense Training Facility Department is under the control of the 3rd Chemical Brigade.

The 14th Military Police Brigade provides command, control, administration, supply, housing, and selected training for assigned cadre, basic trainees, professional and functional courses students, and military police students.

Additionally, the MSCoE Noncommissioned Officer (NCO) Academy hosts the Primary Leadership Development Course, Basic NCO Course, and Advanced NCO Course.

The installation was the owner of a portion of the Saint Louis Ordnance Plant in its role as the support installation for the reserve center located on this site. The Saint Louis Ordnance Plant was an industrial complex for the manufacture of propellants and primers. In September 1996 the ownership and remediation responsibility for the Saint Louis Ordnance Plant site was transferred to the 89th Reserve Support Command headquartered in Wichita, Kansas.

The Army retained control of 23 acres of the former 270-acre Saint Louis Ordnance Plant. This area is designated as the Former Saint Louis Army Ammunition Plant. On Jan. 29, 2003, FLW assumed ownership responsibility from the US Army Aviation and Missile Command. This parcel was declared excess to the Army's needs in 1989 and was being managed as a non-Base Realignment and Closure (BRAC) excess property until its transfer to the city of Saint Louis in 2006.

The Weldon Springs Ordnance Works is a 17,000 acre former trinitrotoluene and dinitrotoluene manufacturing plant. After excessing most of the 17,000 acres, the Army retained the contaminated production area, which now makes up the Weldon Springs Training Area (TA). The installation was responsible for accountability, security, facilities engineering support, and logistic support, for this facility until transfer to the 89th Regional Support Command in December 2004.

Installation Program Cleanup Progress

IRP

Prior Year Progress: Contracts awarded to move open IR sites to the next phase.

Decision documents (DD) are complete for FLW-006, FLW-008, FLW-010, FLW-012, FLW-017, FLW-059, and FLW-060.

Solicitation for Restoration Advisory Board (RAB) interest is complete.

RIs are complete at FLW-007 and FLW-009.

Future Plan of Action: Continue to progress on RI/FS phase of IR sites.

Scheduled for an installation-wide five-year review in fiscal year (FY)17.

Commence RD/RA for landfill sites.

Commence RI/FS phase for FLW-028 and FLW-035.

Cleanup Program Summary

Complete RI/FS phase for FLW-007/009.

Complete RI at FLW-037.

MMRP

Prior Year Progress: Continue with RI/FS phase for FTLWD-001-R-01, FTLWD-003-R-01, FTLWD-004-R-01, FTLWD-005-R-01, FTLWD-010-R-01, and FTLWD-013-R-01.

Complete a surface clearance at FTLWD-003-R-01, which is on United State Forest Service (USFS) lands that are open to the public.

Implement interim land use controls (LUC) on all sites in the RI/FS phase.

Completed ESI (no further action finding) at FTLWD-008-R-01 and FTLWD-011-R-01.

Award a new contract for the RI/FS phase at FTLWD-006-R-01.

Future Plan of Action: Complete RI/FS phase at all Military Munitions Response Program (MMRP) sites.

CR

Prior Year Progress: The RI fieldwork will be complete for CCFLW-001, CCFLW-003, and CCFLW-007.

Commence Missouri Risk Based Corrective Action (MRBCA) investigation for CCFLW-006.

Commence MRBCA response complete (RC) for CCFLW-004 and CCFLW-008.

Complete SI at CCFLW-011.

RC at CCFLW-002.

Future Plan of Action: Begin RI fieldwork at CCFLW-010 and CCFLW-011.

RC for CCFLW-004 and CCFLW-008.

Complete RI at CCFLW-001, CCFLW-006, and CCFLW-010, and CCFLW-011.

FORT LEONARD WOOD
Army Defense Environmental Restoration Program
Installation Restoration Program

IRP Summary

Installation Total Army Environmental Database-Restoration (AEDB-R) Sites/Closeout Sites Count: 69/53

Installation Site Types with Future and/or Underway Phases

1	Fire/Crash Training Area (FLW-028)
12	Landfill (FLW-002, FLW-003, FLW-006, FLW-007, FLW-008, FLW-009, FLW-010, FLW-012, FLW-017, FLW-019, FLW-059, FLW-060)
1	Pesticide Shop (FLW-037)
1	Spill Site Area (FLW-056)
1	Storage Area (FLW-035)

Most Widespread Contaminants of Concern

Metals, Pesticides, Petroleum, Oil and Lubricants (POL), Semi-volatiles (SVOC), Volatiles (VOC)

Media of Concern

Groundwater, Sediment, Soil, Surface Water

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

Site ID	Site Name	Action	Remedy	FY
FLW-033F	UST BLDG 2502,5069,5053,950 WASTE OIL	FRA	WASTE REMOVAL - DRUMS, TANKS, BULK CONTAINERS	1989
FLW-033G	UST BUILD 2553 WASTE OIL TANK 500 GAL	FRA	WASTE REMOVAL - DRUMS, TANKS, BULK CONTAINERS	1990
FLW-033I	UST BUILD 5071 WASTE OIL TANK 1000 GAL	FRA	WASTE REMOVAL - DRUMS, TANKS, BULK CONTAINERS	1990
FLW-033B	AST BLDG 777,170,1390 WASTE OIL	FRA	WASTE REMOVAL - DRUMS, TANKS, BULK CONTAINERS	1992
FLW-033C	AST BLDG 875, WASTE OIL	FRA	WASTE REMOVAL - DRUMS, TANKS, BULK CONTAINERS	1992
FLW-033D	AST BLDG 1383,2581,2250,2212 WASTE OIL	FRA	WASTE REMOVAL - DRUMS, TANKS, BULK CONTAINERS	1993
FLW-033H	UST BLDG 4050,4060 WASTE OIL	FRA	WASTE REMOVAL - DRUMS, TANKS, BULK CONTAINERS	1993
FLW-033J	UST BUILD 5071 WASTE OIL TANK 500 GAL	FRA	WASTE REMOVAL - DRUMS, TANKS, BULK CONTAINERS	1993
FLW-033K	UST BUILDING 5074 (4 TANKS)	FRA	WASTE REMOVAL - DRUMS, TANKS, BULK CONTAINERS	1993
FLW-035	DEH USED TRANSFORMER AREA 2222,2221	IRA	WASTE REMOVAL - DRUMS, TANKS, BULK CONTAINERS	1993
FLW-033A	UST BLDG 663,601,2502,2550 WASTE OIL	FRA	WASTE REMOVAL - DRUMS, TANKS, BULK CONTAINERS	1994
FLW-044	Old Battery Shop, Bldg 2563	FRA	WASTE REMOVAL - DRUMS, TANKS, BULK CONTAINERS	1994
FLW-046	BLDG 2291 - SOIL ASPHALT STORAGE AREA	FRA	BIOREMEDIATION	1995
FLW-048	BOILER UST @ 311, 745, 1021, 675	FRA	WASTE REMOVAL - DRUMS, TANKS, BULK CONTAINERS	1995
FLW-037	DEH OLD PESTICIDE STORAGE AREA BLDG 2206	IRA	WASTE REMOVAL - SOILS	1999
FLW-056	FLW DRY CLEANING SHOP	IRA	EX SITU SOIL TREATMENT	2005

IRP Summary

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

Site ID	Site Name	Action	Remedy	FY
FLW-056	FLW DRY CLEANING SHOP	FRA	INSTITUTIONAL CONTROLS	2007
FLW-056	FLW DRY CLEANING SHOP	FRA	WASTE REMOVAL - SOILS	2007
FLW-002	LANDFILL 2	FRA	CAPPING	2010
FLW-002	LANDFILL 2	FRA	CONTAINMENT	2010
FLW-002	LANDFILL 2	FRA	INSTITUTIONAL CONTROLS	2010
FLW-003	LANDFILL 3	FRA	INSTITUTIONAL CONTROLS	2010
FLW-003	LANDFILL 3	FRA	CONTAINMENT	2010
FLW-003	LANDFILL 3	FRA	CAPPING	2010
PBC at FLW	Performance Based Contract at FLW	FRA	OTHER	2011

Duration of IRP

Date of IRP Inception: 198712

Estimated Date for Remedy-In-Place (RIP)/Response Complete (RC): 202109/202109

Date of IRP completion including Long Term Management (LTM): 204908

IRP Contamination Assessment

Contamination Assessment Overview

The installation is following a non-National Priorities List (NPL) Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) process at all of the sites. The post has been the subject of numerous studies (listed in 'Previous Studies') to determine the extent and occurrence of possible contamination. These studies have been conducted by both the Army and the USEPA Region 7 and have encompassed the whole of the FLW installation. These studies to date have not resulted in the issuance of notices of violations or consent of orders/agreements. Contaminants at these sites include solvents, metals, pesticides, petroleum, oil, and lubricants (POL), explosives, and pentachlorophenol.

Based on the numerous studies, FLW has identified 68 Installation Restoration Program (IRP) sites as having the possibility to cause contamination. Sixteen sites (FLW-002, FLW-003, FLW-006, FLW-007, FLW-008, FLW-009, FLW-010, FLW-012, FLW-017, FLW-019, FLW-028, FLW-035, FLW-037, FLW-056, FLW-059, and FLW-060) had been identified for further investigation and/or remediation. The RIs have been completed at all sites with the exception of FLW-037, FLW-028, FLW-035, and FLW-019 (underway). The proposed plans (PP) and DDs are being drafted for the sites with completed investigations. Fifty-six sites (see 'Response Complete' and 'No Further Action' (NFA) list in the schedule section) have been tentatively identified for closure.

Cleanup Exit Strategy

The RI/FS phase is underway at the following sites: FLW-007, FLW-009, FLW-019, FLW-028, FLW-035, and FLW-037. Appropriate response actions will be determined for these sites after completion of the DD for each site. The remedy for landfill sites is anticipated to be cover characterization and improvements, LUCs, groundwater monitoring, and containment and landfill cap maintenance during the LTM phase.

FLW-002, FLW-003, and FLW-056 are in the LTM phase and will remain so until contaminant levels are below those required for unlimited use and unrestricted exposure.

IRP Previous Studies

Year	Title	Author	Date
1982	Installation Assessment of the US Army Training Center Report No. 322 1982 DRXTH-AS-82322	Environmental Science and Engineering	JAN-1982
1988	Hazardous Waste Consultation No. 37-26-1646-88 Evaluation of Solid Waste Management Units	USAEHA	JUN-1988
	Geohydrologic Study	USAEHA	JUL-1988
	Investigation of Closed Sanitary Landfills	USAEHA	SEP-1988
1990	Sampling Visit	USAEHA	JUL-1990
1992	Final RCRA Facility Assessment Report	PRC Environmental Management Inc.	SEP-1992
1993	Groundwater Quality Consultation NO 38-26-KV44-93 RCRA Facility Assessment Sampling Visit	USAEHA	MAR-1993
1994	Geohydrologic and Water Quality Assessment Report 96-4270	US Geological Survey Water Resources Investigations	JAN-1994
1995	Geohydrology and Water Quality at Shanghai Spring and Solid Waste Management Units Report 00-4178	US Geological Survey Water Resources Investigations	JAN-1995
	Baseline Contaminant Study for Fort Leonard Wood, Missouri	Burns & McDonnell	JAN-1995
1996	Geology of the Fort Leonard Wood Military Reservation and Adjacent Areas, South Central Missouri	US Geological Survey Water Resources Investigations	JAN-1996
2003	Geohydrologic Framework, Groundwater Hydrology, and Water Use in the Gasconade River Basin Upstream from Jerome, Missouri, including the Fort Leonard Wood Military Reservation	US Geological Survey Water Resources Investigations	JAN-2003
2005	FLW-056 Final RI Report	CDM	DEC-2005
2006	Final FS for FLW-056	CDM	JAN-2006
	Final field investigation report for FLW-037	Bhate	MAR-2006
2007	FLW-003 RI	CH2M Hill	OCT-2007
	FLW-002 RI	CH2M Hill	NOV-2007
	FLW-012 Final RI report	Conti/CH2M Hill	DEC-2007
2008			

IRP Previous Studies

Year	Title	Author	Date
2008	RACR for FLW-056	Conti	JAN-2008
	Final Community Involvement Plan	Conti/CH2M Hill	APR-2008
	FLW-002 and FLW-003 Final FS	Conti/CH2M Hill	JUN-2008
2009	Final investigation report for FLW-053, -054, -055	Conti/CH2M Hill	JUL-2009
	Final LTM Plan for FLW-002 and FLW-003	Conti/ CH2M Hill	JUL-2009
	Final LUCIP for FLW-056	Conti	AUG-2009
	FLW-006,-008, -028, -059, and -060 Final RI report	Conti/CH2M Hill	NOV-2009
	Final FFS for FLW-012	ECC	NOV-2009
2010	Final FFS report for FLW-008, -059 and -060	Conti/CH2M Hill	FEB-2010
	RACR for FLW-002 and FLW-003	Conti	JUN-2010
	Final investigation report for FLW-017	Conti/CH2M Hill	OCT-2010
	Final Investigation Report for FLW-007, -009, -010, -019	Conti/CH2M Hill	NOV-2010
2011	FLW-006 Final FFS	Conti/CH2M Hill	JUN-2011
	Final LTM Plan for FLW-008, FLW-059 and FLW-060	Conti/CH2M Hill	JUL-2011
	Final 2010 RAB survey	Conti/CH2M Hill	JUL-2011
	RACR for FLW-008	Conti/CH2M Hill	AUG-2011
	Comparison of Passive diffusion bag and low-flow groundwater sampling at FLW-056	Conti/CH2M Hill	AUG-2011
	FLW-006 Final Investigation Report	Conti/CH2M Hill	SEP-2011
	Final LTM Plan for FLW-006	Conti/ CH2M Hill	SEP-2011
2013	Final FFS for FLW-010 and FLW-017	CH2M Hill	DEC-2013
2014	Final Community Involvement plan	USAEC	FEB-2014
	FLW-001 Final SI Report	USACE KC	OCT-2014
	Final Phase 1 Focused RI and FFS for FLW-019	ECC	OCT-2014
2015	Final RI report for FLW-009	CH2M Hill	JAN-2015
	FLW-012 Final Decision Document	USACE	APR-2015
	Final RI Report for FLW-007	CH2M Hill	JUN-2015
	FLW-010 Final Decision Document	CH2M Hill	DEC-2015
	FLW-017 Final Decision Document	CH2M Hill	DEC-2015

IRP Previous Studies

2016

Title	Author	Date
CCFLW-002 Final MRBCA Investigation Report	USACE	JAN-2016
Final MMRP ESI Report	FPM Remediations	JAN-2016
FLW-006/008/059/060 Final Decision Documents	USACE	MAR-2016

FORT LEONARD WOOD
Installation Restoration Program
Site Descriptions

Site ID: FLW-002
Site Name: LANDFILL 2

STATUS

Regulatory Driver: CERCLA

RRSE: MEDIUM

Contaminants of Concern: Volatiles (VOC)

Media of Concern: Groundwater, Soil, Surface Water

Phases	Start	End
PA.....	198712.....	198807
SI.....	199410.....	199511
RI/FS.....	199701.....	200904
RD.....	200709.....	200906
RA(C).....	200709.....	201002
LTM.....	201003.....	204603

RIP Date: N/A

RC Date: 201002

SITE DESCRIPTION

Site FLW-002, also known as Landfill No. 02 [Solid Waste Management Unit (SWMU) 32], is a 34.4-acre inactive soil-covered sanitary landfill that operated between 1981 and 1985. It is in the west-central portion of FLW, 2.5 miles south of Forney Army Airfield and 0.5 miles west of road FLW 1. FLW-002 was permitted by the MDNR in 1978 for disposal of wastes excluding industrial wastes (US Army Environmental Hygiene Agency (USAEHA), 1987). These wastes included sanitary wastes and sludge from the print shop and dry cleaning wastes. This landfill was required to close early due to the discovery of bedrock high encountered during operation. There has not been any exposed waste since the landfill became inactive. The primary concern at this site is potential groundwater contamination.

Prior to August 2000, the landfill surface was irregular, vegetated with brush and small trees, and contained a bedrock outcrop on the west central portion of the landfill. Leachate was observed on the surface of the eastern edge of the outcrop and along the northeastern face of the landfill. This leachate drained north through a culvert beneath a bordering gravel road. To repair the landfill surface in accordance with MDNR permit closure requirements (2-ft thick soil cover), woody vegetation was removed from the landfill and the existing soil cover repaired. The depth to groundwater at this site is about 150 to 220 ft in the bedrock.

The preliminary assessment (PA)/SI for this site was conducted between 1987 and 1995. Five shallow wells (less than 30 ft) were installed in the overburden at FLW-002 (USAEHA, 1988). Initially, these wells were dry; however, four months later, two wells had small amounts of water. Water from these two wells and one seep in the north central part of the site were sampled in 1988. Samples were analyzed for inorganic constituents, VOCs, SVOCs, pesticides, PCBs. Results showed inorganic constituents exceeded background concentrations.

In 1990 three bedrock-monitoring wells were installed at depths ranging from 83 to 100 ft (USAEHA 1990). Samples were analyzed for inorganic constituents, VOCs, SVOCs, pesticides, and PCBs. Results did not exceed background concentrations of inorganics.

The RI at this site began in 1997. Four monitoring wells were completed to water table, and one monitoring well was completed in a perched water zone. There were traces of Tetrachloroethylene (PCE) and vinyl chloride (VC) below maximum contaminant level (MCL) in the water table wells. Sampling of the perched water indicated VC above MCL and trace amounts of other chlorinated solvents. Soil and sediment samples were collected from the surface of the landfill and from the dry streambeds near the landfill. No significant concentrations of inorganic constituents or organic compounds were detected. Soil gas samples from the surface of the landfill indicated the presence of PCE and other chlorinated solvents in the southeastern part of the site.

Since 1997 additional monitoring wells were installed to determine extent of contamination and groundwater flow direction at the site.

A draft RI/FS was submitted to MDNR in July 2004. Review of the draft RI/FS indicated additional fieldwork was needed to satisfy comments and complete the RI/FS. The additional field investigation included an evaluation of cover material, one round of groundwater sampling, and necessary sediment and surface soil sampling. With this additional work the RI was completed. The

Site ID: FLW-002
Site Name: LANDFILL 2

Army signed the DD in 2009.

Site is included in the regional LTM contract for LTM through summer 2018.

CLEANUP/EXIT STRATEGY

The LTM has begun and consists of a groundwater monitoring program, landfill cover maintenance and LUC inspections. Site is in LTM for a rolling 30-year period.

Site ID: FLW-003
Site Name: LANDFILL 3

STATUS

Regulatory Driver: CERCLA

RRSE: MEDIUM

Contaminants of Concern: Volatiles (VOC)

Media of Concern: Groundwater, Soil, Surface Water

Phases	Start	End
PA.....	198712.....	198807
SI.....	199411.....	199509
RI/FS.....	199803.....	200903
RD.....	200709.....	200906
RA(C).....	200709.....	201002
LTM.....	201003.....	204603

RIP Date: N/A

RC Date: 201002

SITE DESCRIPTION

FLW-003 is an 82-acre, inactive trench and fill sanitary landfill that operated between 1965 and 1978. It is located north of road FLW 30 and east of road FLW 1. The landfill was divided into a northern section (approximately 52 acres) and a southern section (approximately 30 acres) separated by an intermittent stream. The landfill was used to dispose of municipal waste generated at FLW. The surface of the landfill is vegetated with grass and brush. The northern section generally slopes north to south. The southern section slopes south to north. The landfill shows some surface subsidence and surface leachate seeps. The seeps are primarily on the slopes. Sludge from the sewage treatment plant (STP) is applied to the surface to encourage vegetation. Leachate from the landfill appears to have impacted the groundwater quality. Clean fill is being spread on the landfill to make the site more accessible for land application of wastewater treatment plant sludge under an MDNR permit and to improve drainage.

The depth to groundwater at this site is approximately 200 to 280 ft in the bedrock. Water-bearing zones are locally present above the water table (perched water). The PA/SI for this site was conducted between 1987 and 1995. Twelve shallow wells (less than 50 ft deep) were installed at FLW-003 during 1987 (USAEHA, 1988). Initially all of these wells were dry; however, four months later one well had small amounts of water. A water sample from this well was analyzed for inorganic constituents, VOCs, SVOCs, pesticides, and PCBs. Inorganic constituents did not exceed background concentrations, and no organic compounds were detected.

During 1990, four bedrock-monitoring wells were installed at depths ranging from 58 to 102 ft (USAEHA 1990). One well contained perched water. A water sample from this well was analyzed for inorganic constituents, VOCs, SVOCs, pesticides, and PCBs. This sample contained inorganic constituents (chloride and barium) that exceeded background. No organic compounds were detected.

In 1995, soil, streambed sediments, and leachate seeps were sampled. Soil and streambed sediments were analyzed for inorganic constituents, pesticides, and PCBs. No significant concentrations of inorganic constituents or organic compounds were detected. Leachate seeps and groundwater samples from two shallow wells were analyzed for inorganic constituents, VOCs, SVOCs, and pesticides. VC and benzene were detected above MCL in the leachate samples. Organic compounds were not detected in the groundwater samples.

The RI at this site began in 1998. During 1998 and 1999, 12 monitoring wells were completed to the water table, and five monitoring wells were completed in perched water zones. At some locations, large voids; in excess of 10 ft in vertical extent and undetermined horizontal extent, were encountered during drilling. Groundwater samples from these wells were analyzed for inorganic constituents, VOCs, SVOCs, and pesticides. These samples contained larger than background inorganic constituents. The sample analyses also included PCE and VC in concentrations greater than MCL and trace amounts of other chlorinated solvents.

In 2001, six additional wells were added to the site. In 2002, a phytoremediation study was conducted on an approximately a 5-acre area of 'volunteer trees' in the landfill area and concluded that there was minimal uptake into the tree. During FY04, one additional groundwater monitoring well was installed to further investigate perched groundwater and a dye trace was conducted to

Site ID: FLW-003
Site Name: LANDFILL 3

evaluate a void found while drilling this well. The RI has been completed and approved by MDNR. Completion of the FS, PP, DD, RD, and RA were awarded on the Phase II PBC. The Army signed the DD in 2009.

Site is included in the regional LTM contract for LTM through summer 2018.

FLW-003 incorporates sites FLW-004 and FLW-005. All three sites were combined during the 2000 IAP Workshop.

CLEANUP/EXIT STRATEGY

The DD was signed by the Army in March 2009 and the remedial work has been completed. The LTM has begun and consists of a groundwater monitoring program, landfill cover maintenance and LUC inspections. Site is in LTM for a rolling 30-year period.

Site ID: FLW-006

Site Name: LANDFILL 4 Ballfield/Running Trail

STATUS

Regulatory Driver: CERCLA

RRSE: LOW

Contaminants of Concern: Metals, Volatiles (VOC)

Media of Concern: Groundwater, Sediment, Soil

Phases	Start	End
PA.....	198712.....	198807
SI.....	199712.....	200309
RI/FS.....	200609.....	201603
RD.....	201610.....	201809
IRA.....	200609.....	201809
RA(C).....	201809.....	201909
LTM.....	201909.....	204908

RIP Date: N/A

RC Date: 201909

SITE DESCRIPTION

Site FLW-006 (SWMU 36) is a closed sanitary landfill that operated from an unknown initial date until 1950. It is located northeast of the intersection of Constitution and Kansas Roads in the cantonment. The landfill occupied 7.3 acres. Presently, the landfill is completely covered with vegetation, and no exposed trash is evident.

The installation conducted sampling of three leachate seeps, stream sediments, and surface water up and downgradient of the landfill during FY2002 using non-IRP funding. VC was detected (1.2 parts per billion [ppb]) in only one of the leachate samples from a wet weather seep. No groundwater samples were taken. A data summary report that summarized investigation results was prepared in FY05.

An RI, including a groundwater investigation, and FS/PP are complete. The DD was signed on March 9, 2016. RD/RA will be consolidated with other landfill sites. Operations and maintenance (O&M) is ongoing for maintenance in the IRA phase.

CLEANUP/EXIT STRATEGY

The DD was approved in March 2016. Remedy includes landfill maintenance, cover improvements, (to minimize infiltration), LUCs, and groundwater monitoring.

STATUS

Regulatory Driver: CERCLA

RRSE: LOW

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

Media of Concern: Soil

Phases	Start	End
PA.....	198712.....	198807
SI.....	198712.....	198807
RI/FS.....	201203.....	201709
RD.....	201610.....	201809
RA(C).....	201809.....	201909
LTM.....	201909.....	204908
RIP Date:	N/A	
RC Date:	201909	

SITE DESCRIPTION

Landfill number 5 is a former construction and demolition debris landfill that operated between 1942 and 1950. It is located south of First Street in the east central cantonment. The landfill occupied 6.9 acres. Presently, the landfill is partially covered with asphalt and serves as a parking lot. The unpaved portions are completely vegetated.

The RI/FS phase is underway. Cleanup strategy is dependent upon the outcome of the RI/FS phase.

CLEANUP/EXIT STRATEGY

The RI/FS phase is underway. Presumptive remedy is the proposed cleanup strategy.

Site ID: FLW-008

Site Name: LANDFILL 6 - Rose Bowl

STATUS

Regulatory Driver: CERCLA

RRSE: LOW

Contaminants of Concern: Metals, Volatiles (VOC)

Media of Concern: Groundwater, Sediment, Soil

Phases	Start	End
PA.....	198712.....	198807
SI.....	198712.....	198807
RI/FS.....	200609.....	201603
RD.....	201610.....	201809
IRA.....	200609.....	201809
RA(C).....	201809.....	201909
LTM.....	201909.....	204908

RIP Date: N/A

RC Date: 201909

SITE DESCRIPTION

Landfill 6 (SWMU 38) is a closed sanitary landfill that operated between 1942 and 1950. The landfill is southeast of the veterinary office and southeast of the intersection of Minnesota Avenue and Gas Street. It occupies 7.5 acres. The area is now completely covered with vegetation. The installation also open burned waste and buried the residue in this landfill. USAEHA 1987-1988 recommended NFA for this site. The 1992 Resource Conservation and Recovery Act (RCRA) facility assessment (RFA) noted no known contamination and noted the site was regulated by MDNR. Based on the USAEHA recommendations, no data collection was conducted for this site.

During the FY05 IAP, MDNR indicated that an evaluation would be necessary for this site prior to being declared RC.

An RI/FS and PP have been completed. The DD was approved on March 9, 2016. RD/RA will be consolidated with other landfill sites. O&M is underway in the IRA phase.

CLEANUP/EXIT STRATEGY

The DD was approved in March 2016. Remedy includes landfill maintenance, cover improvements to minimize infiltration, LUCs, and groundwater monitoring.

Site ID: FLW-009
Site Name: LANDFILL 7

STATUS

Regulatory Driver: CERCLA

RRSE: MEDIUM

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

Media of Concern: Soil

Phases	Start	End
PA.....	198712.....	198807
SI.....	198712.....	198807
RI/FS.....	201209.....	201709
RD.....	201610.....	201809
RA(C).....	201809.....	201909
LTM.....	201909.....	204908
RIP Date:	N/A	
RC Date:	201909	

SITE DESCRIPTION

Landfill 7 is a closed demolition landfill that was operated between 1942 and 1950. It is located southeast of Landfill 5 and south of First Street, and occupies 0.9 acres. It was used to dispose of construction debris and some household wastes. USAEHA 1987-1988 recommended additional capping for this site. A 1992 RFA noted no known contamination and noted the site was regulated by MDNR. Based on the USAEHA recommendations no data collection was conducted for this site. The area is now covered with vegetation.

The RI/FS phase is underway. Cleanup strategy is dependent upon the outcome of the RI/FS phase.

CLEANUP/EXIT STRATEGY

The RI/FS phase is underway. Presumptive remedy is the proposed cleanup strategy.

Site ID: FLW-010

Site Name: LANDFILL 8 - Horse Stables I

STATUS

Regulatory Driver: CERCLA

RRSE: MEDIUM

Contaminants of Concern: Metals

Media of Concern: Soil

Phases	Start	End
PA.....	198712.....	198807
SI.....	198712.....	198807
RI/FS.....	201112.....	201512
RD.....	201610.....	201809
IRA.....	201308.....	201809
RA(C).....	201809.....	201909
LTM.....	201909.....	204908

RIP Date: N/A

RC Date: 201909

SITE DESCRIPTION

Landfill 8 is a closed demolition landfill that was operated between 1942 and 1980. It was used for open burning with the residue being buried in this landfill. It is southeast of the intersection of roads FLW 8 and EE and occupies 11.4 acres. USAEHA 1987-1988 recommended additional capping for this site. A 1992 RFA noted no known contamination and noted the site was regulated by MDNR. Based on the USAEHA recommendations, no data collection was conducted for this site. This site is completely vegetated.

The RI/FS phase is complete. The DD was signed on Dec. 11, 2015. RD/RA is a future phase. O&M is underway in the IRA phase.

CLEANUP/EXIT STRATEGY

The DD has been approved. Remedy includes landfill maintenance, cover improvements (to minimize infiltration), LUCs, and groundwater monitoring.

Site ID: FLW-012
Site Name: LANDFILL 10A

STATUS

Regulatory Driver: CERCLA

RRSE: LOW

Contaminants of Concern: Metals, Volatiles (VOC)

Media of Concern: Groundwater, Sediment, Soil

Phases	Start	End
PA.....	198712.....	198807
SI.....	199712.....	199812
RI/FS.....	200609.....	201504
RD.....	201610.....	201809
IRA.....	200910.....	201809
RA(C).....	201809.....	201909
LTM.....	201909.....	204908

RIP Date: N/A

RC Date: 201909

SITE DESCRIPTION

FLW-012 comprises five STP landfills formerly administered as five separate IRP sites; including Landfills 10A, 10B, 11A, 11B, and 11C. The landfills are now managed as a single IRP site (FLW-012) because of their proximity and similarities.

The landfills are located within an intermittent stream valley. In 2010 and 2013, IRA were completed for streambank stabilization, drainage controls, and cover maintenance along the landfill slopes.

The RI/FS phase is complete and the DD was approved on April 15, 2015. RD/RA will be a future phase and consolidated with other landfill sites. O&M is underway in the IRA phase.

CLEANUP/EXIT STRATEGY

The DD has been approved. Remedy includes landfill maintenance, cover improvements (to minimize infiltration), LUCs, and groundwater monitoring.

STATUS

Regulatory Driver: CERCLA

RRSE: NOT EVALUATED

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

Media of Concern: Groundwater, Soil

Phases	Start	End
PA.....	198712.....	198807
SI.....	198712.....	198807
RI/FS.....	201109.....	201512
RD.....	201610.....	201809
IRA.....	201308.....	201809
RA(C).....	201809.....	201909
LTM.....	201909.....	204908

RIP Date: N/A

RC Date: 201909

SITE DESCRIPTION

Landfill No. 12 is a former sanitary landfill that operated between 1958 and 1961. It is in the northwest portion of FLW, near Roubidoux Creek and occupies 7 acres. The landfill is adequately covered with vegetation and has no exposed debris. New road construction adjacent to and over the landfill covered the landfill with approximately 50 feet of soil on one end tapering to 5 feet of cover on the other.

The RI/FS phase is complete. The DD was signed on Dec. 22, 2015. O&M is underway in the IRA phase.

CLEANUP/EXIT STRATEGY

The DD has been approved. Remedy includes landfill maintenance, cover improvements (to minimize infiltration), LUCs, and groundwater monitoring.

Site ID: FLW-019
Site Name: LANDFILL 14

STATUS

Regulatory Driver: CERCLA

RRSE: LOW

Contaminants of Concern: Metals

Media of Concern: Soil

Phases	Start	End
PA.....	198712.....	198807
SI.....	198712.....	198807
RI/FS.....	200803.....	201909
IRA.....	200910.....	201809

RIP Date: N/A

RC Date: 202109

SITE DESCRIPTION

Landfill 14 is a former construction and demolition landfill operated from an unknown initial date to the late-1950s. It is east of Gas Street in the present Defense Logistics Agency (DLA) operational area and occupies 9.5 acres. The area is now used for a salvage yard and storage area.

Scrap metal had been disposed of on the face of the landfill.

Landfill cover maintenance and slope stabilization was completed in 2010 in the IRA phase.

The RI/FS phase is underway. O&M is underway in the IRA phase.

CLEANUP/EXIT STRATEGY

The RI/FS phase is underway. The presumptive remedy is proposed as the cleanup strategy.

Site ID: FLW-028

Site Name: DPW OLD FIRE TRAINING AREA

STATUS

Regulatory Driver: CERCLA

RRSE: LOW

Contaminants of Concern: Petroleum, Oil and Lubricants (POL), Volatiles (VOC)

Media of Concern: Groundwater, Soil, Surface Water

Phases	Start	End
PA.....	198712.....	198807
SI.....	199410.....	199509
RI/FS.....	200609.....	201909

RIP Date: N/A

RC Date: 201909

SITE DESCRIPTION

This fire TA was used to train FLW fire fighters between 1972 and 1988. The area is located in the central part of the facility, south of Forney Airfield and is roughly 100 ft by 400 ft. Training occurred twice a year and involved the ignition of approximately 150 gallons of aviation fuel for each exercise. A concrete pad with containment berms was used to contain the burning fuel. The pad has since been removed leaving a flat vegetated area. The area is bermed on three sides with earth berms 6 ft high and 10 ft wide.

The fire TA was investigated in the sampling visit (USAEHA, 1990). Samples were taken at to 3.5, 5 to 6.5, and 8 to 9.5 ft below the ground surface. All samples were analyzed for toxicity characteristic leachate procedure metals, total petroleum hydrocarbon, VOCs, and SVOCs (USAEHA, 1990). The VOC analytical results indicated values reported for methylene chloride and acetone were 6 to 31 milligrams per kilogram (mg/kg) and 13 to 75 mg/kg, respectively. Analysis for SVOCs determined that isophorone was detected in one borehole at 850 micrograms per kilogram (ug/kg) (2 to 3.5 ft), 2,130 ug/kg (5 to 6.5 ft), and 250 ug/kg (8 to 9.5 ft). The United States Geological Survey (USGS) collected 25 samples within the bermed area in 1995; sample analyses show low levels of benzene, toluene, ethylbenzene, and xylenes (BTEX) present. The area was partially paved in the late-1990s and is currently used as a vehicle skid pad for military police training. It is located within the boundaries of an active TA, TA 210. Sampling has indicated that there are low levels of BTEX contamination present.

The RI/FS phase is underway.

CLEANUP/EXIT STRATEGY

The RI/FS phase is underway. A Supplemental RI will determine nature and extent of contamination, and the cleanup/exit strategy.

Site ID: FLW-035

Site Name: DEH USED TRANSFORMER AREA 2222,2221

STATUS

Regulatory Driver: CERCLA

RRSE: NOT EVALUATED

Contaminants of Concern: Polychlorinated Biphenyls (PCB)

Media of Concern: Building Decontamination, Soil

Phases	Start	End
PA.....	198712.....	198807
SI.....	198712.....	198807
RI/FS.....	200610.....	201909
IRA.....	199305.....	201809

RIP Date: N/A

RC Date: 201909

SITE DESCRIPTION

The Directorate of Public Works (DPW) Used Transformer Storage Area was between Buildings 2221 and 2222. This area was used for storage of transformers undergoing analysis for PCBs. Transformers that contain PCB transformer oil are stored in Building 2229, SWMU No. 11. Currently, transformers awaiting analysis to determine if they contain PCBs are also stored in Building 2229. Transformers are ultimately disposed of through the FLW hazardous waste disposal contractor.

LUC inspections are underway in the IRA phase. RI/FS phase is underway.

CLEANUP/EXIT STRATEGY

The RI/FS phase is underway. A supplemental RI will determine nature and extent of contamination, and the cleanup/exit strategy.

Site Name: DEH OLD PESTICIDE STORAGE AREA BLDG 2206

STATUS

Regulatory Driver: CERCLA

RRSE: MEDIUM

Contaminants of Concern: Pesticides

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

Phases	Start	End
PA.....	198712.....	198807
SI.....	199410.....	199509
RI/FS.....	199610.....	201809
IRA.....	199810.....	201809

RIP Date: N/A

RC Date: 201809

SITE DESCRIPTION

Site FLW-037, also known as the DEH Old Pesticide Storage Area, was formerly used for pesticide storage and mixing. The building floor slab and underlying soils were removed in August 1999. A limited pesticide investigation was completed in 2006 to delineate pesticide concentrations in the area. An engineering evaluation/cost analysis and action memorandum was completed for the site in 2008 which outlined a proposed non time critical removal action but was never approved due to site constraints. The footprint of Building 2206 was roughly 73 by 21 feet. The building consisted of a storage room, a mixing room, and two loading docks located along the eastern side of the building. Floor drains were connected to a sanitary sewer that ran along the building's western side. The building has been demolished, and the concrete floor slab and floor drains have been removed. The site is paved and is used as a parking lot.

Surface runoff from FLW-037 flows into a storm drain located southeast of the site. The storm drain discharges into an ephemeral streambed that flows southeast.

The RI/FS phase is underway. LUC inspections are underway in the IRA phase.

CLEANUP/EXIT STRATEGY

Supplemental RI is in progress. Final site strategy will be based on RI results and finalized in the DD.

Site ID: FLW-056
Site Name: FLW DRY CLEANING SHOP

STATUS

Regulatory Driver: CERCLA

RRSE: HIGH

Contaminants of Concern: Volatiles (VOC)

Media of Concern: Groundwater, Soil, Surface Water

Phases	Start	End
PA.....	199202.....	199209
SI.....	199804.....	199908
RI/FS.....	199908.....	200609
RD.....	200609.....	200702
IRA.....	200109.....	200506
RA(C).....	200609.....	200709
LTM.....	200709.....	204609

RIP Date: N/A

RC Date: 200709

SITE DESCRIPTION

Site FLW-056 is the site of a former dry cleaning and laundry facility (Building 2300) that was in operation from the mid-1940s until 1981. The site is approximately 1 acre and is located at the southeast corner of the intersection of First Street and Louisiana Avenue. The building was demolished in 1987. The site is covered with grass and slopes slightly to the north. The soil and underlying groundwater is contaminated with chlorinated solvents. The former facility was used only as a dry cleaning facility, using first Trichloroethylene (TCE) and then PCE.

A PBC was awarded to CDM Federal (CDM) in late FY04 for the completion of the RI/FS. The RI/FS has been completed. The DD has been signed by both the Army and the state. The site has achieved RIP.

A separate investigation of the adjacent post laundry facility, building 2352, began in January 2005, indicates that the dry cleaning operations in building 2352 may be a contributory source. This site is being managed separately as CCFLW-001.

LTM is underway.

CLEANUP/EXIT STRATEGY

The remedy of groundwater monitoring of 18 wells and LUC inspections will continue.

Site ID: FLW-059

Site Name: MUNICIPAL LANDFILL SO OF ROUBIDOUX

STATUS

Regulatory Driver: CERCLA

RRSE: MEDIUM

Contaminants of Concern: Volatiles (VOC)

Media of Concern: Groundwater, Soil, Surface Water

Phases	Start	End
PA.....	199410.....	199509
SI.....	199712.....	200403
RI/FS.....	200404.....	201603
RD.....	201610.....	201809
IRA.....	201308.....	201809
RA(C).....	201809.....	201909
LTM.....	201909.....	204908

RIP Date: N/A

RC Date: 201909

SITE DESCRIPTION

Site FLW-059 is a combination of three inactive municipal solid waste trench and fill landfills that were operated from 1958 until 1961. It is located in the northwestern corner of the fort between Roubidoux Creek and Road FLW 8 on the Roubidoux Creek flood plain. The site is heavily vegetated with small trees and brush. The surface area is uneven and has standing water in the low areas. There is no exposed trash. The approximate boundaries of the landfill have been fenced; however, the actual boundaries of the landfill may extend beyond the fenced area. Signs have been placed around what is thought to be the boundaries to keep training activities from impacting landfill cover.

A 1982 US Army Toxic and Hazardous Materials Agency report identified three landfills: Landfills 15, 16, and 17. The MDNR requested further investigation of these landfills because of their proximity to Roubidoux Creek.

The PA/SI at this site began in 1982. In 1995, USGS collected soil and sediment samples which were tested for inorganic constituents, pesticides, and PCBs. The results indicated no significant contaminants; however, one sample contained elevated concentrations of zinc. In 1997 four temporary shallow (less than 20 ft) monitoring wells were installed. The results indicated inorganic constituents above background and VOCs were also detected. Groundwater flow was determined to be west-northwest towards Roubidoux Creek. In FY04 five groundwater monitoring wells were installed. Initial groundwater sampling indicates there may be elevated concentrations of metals in one well.

The RI/FS/PP and the DD are complete. The DD was approved on March 9, 2016. RD/RA will be consolidated with other landfill sites. O&M is underway in the IRA phase.

CLEANUP/EXIT STRATEGY

The DD was approved in March 2016. Remedy includes landfill maintenance, cover improvements to minimize infiltration, LUCs, and groundwater monitoring.

Site ID: FLW-060

Site Name: LANDFILL ON A BRANCH TO BIG PINEY

STATUS

Regulatory Driver: CERCLA

RRSE: LOW

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

Media of Concern: Groundwater, Soil, Surface Water

Phases	Start	End
PA.....	199410.....	199509
SI.....	199510.....	200403
RI/FS.....	200609.....	201603
RD.....	201610.....	201809
IRA.....	201308.....	201809
RA(C).....	201809.....	201909
LTM.....	201909.....	204908

RIP Date: N/A

RC Date: 201909

SITE DESCRIPTION

Site FLW-060 is an inactive municipal solid waste landfill with unknown dates of operation. It consists of approximately 10.5 acres, located on a side drainage to the Big Piney River, off of the East Gate Road. The landfill was not mentioned in the 1982 installation assessment report number 322. It was not identified in the subsequent USAEHA studies. The MDNR has requested further investigation because of its proximity to the Big Piney River.

The RI/FS/PP and the DD are complete. The DD was approved on March 9, 2016. RD/RA will be consolidated with other landfill sites. O&M is underway in the IRA phase.

CLEANUP/EXIT STRATEGY

The DD was approved in March 2016. Remedy includes landfill maintenance, cover improvements to minimize infiltration, LUCs, and groundwater monitoring.

Site Closeout (No Further Action) Summary

Site ID	Site Name	NFA Date	Documentation
FLW-001	LANDFILL 1	201410	At end of the SI, it was determined that there was no release; therefore no further actions were required.
FLW-004	LANDFILL 3B	200010	This landfill site was redesignated as part of FLW-003 (Landfill No. 3A) during the SI phase. It was determined that this landfill was originally part of FLW-003 and should not have been designated as a separate site.
FLW-005	LANDFILL 3C	200010	This landfill site was redesignated as part of FLW-003 (Landfill No. 3A) during the SI phase. It was determined that this landfill was originally part of FLW-003 and should not have been designated as a separate site.
FLW-011	LANDFILL 9	198807	Permitted landfill currently under post closure and annual inspection. Not eligible for ER,A
FLW-013	LANDFILL 10B	199812	This site was redesignated as part of the FLW-012 site during the SI.
FLW-014	LANDFILL 11A	199812	This site was redesignated as part of the FLW-012 site during the SI.
FLW-015	LANDFILL 11B	199812	This site was redesignated as part of the FLW-012 site during the SI.
FLW-016	LANDFILL 11C	199812	This site was redesignated as part of the FLW-012 site during the SI.
FLW-018	LANDFILL 13	198807	Site was closed in AEDB-R in 1988. A 2008 SI documented the site did not exist and therefore was not eligible for ER,A funds.
FLW-020	LANDFILL 15	198807	Not eligible for DERA funding. Closure Plan approved by MDNR.
FLW-021	MEDICAL WASTE INCINERATOR	198807	Permitted unit therefore not eligible for ER,A funds. Closure documentation was completed in April 2011.
FLW-022	VET LAB INCINERATOR	198807	Permitted unit therefore not eligible for ER,A funds. Closure documentation was completed in April 2011.
FLW-023	BOILER PLANT BUILDING 663	198807	Permitted unit therefore not eligible for ER,A funds. Closure documentation was completed in April 2011.
FLW-024	SEWAGE TREATMENT PLANT	198807	This site is still in operation, has no known releases, and therefore is not eligible for ER,A funds.
FLW-025	WATER TREATMENT PLANT LAGOON	198807	This site is still in operation, has no known releases, and therefore is not eligible for ER,A funds.
FLW-026	SEWAGE TREATMENT PLANT LAGOON SITE	198807	The lagoon was part of a permitted unit and therefore not eligible for ER,A funds. Closure documentation was completed in April 2011.
FLW-027	TRAINING AREA 244 SEWAGE LAGOONS	198807	The lagoons were part of a permitted unit and therefore not eligible for ER,A funds. Closure documentation was completed in April 2011.

Site Closeout (No Further Action) Summary

Site ID	Site Name	NFA Date	Documentation
FLW-029	NEW FIRE TRAINING AREA	198807	This site is on an operational range, and therefore is not eligible for ER,A funds.
FLW-030	OLD EOD OB/OD AREA RANGE 24	199509	Is site is located on an operational range and was used as an OB/OD site, therefore not eligible for ER,A funds.
FLW-031	CURRENT EOD OD/OB AREA RANGE 36	198807	Is site is located on an operational range and was used as an OB/OD site, therefore not eligible for ER,A funds. A final RCRA closure of the site has been granted by MDNR. Range 36 will continue to be used for training.
FLW-032	CANNON ANG OB AND BURIAL SITE	199509	Closure documentation was completed in April 2011.
FLW-033A	UST BLDG 663,601,2502,2550 WASTE OIL	199310	A NFA Decision Document was completed in April 2011.
FLW-033B	AST BLDG 777,170,1390 WASTE OIL	199203	A NFA Decision Document was completed in April 2011.
FLW-033C	AST BLDG 875, WASTE OIL	199203	A NFA Decision Document was completed in April 2011.
FLW-033D	AST BLDG 1383,2581,2250,2212 WASTE OIL	199304	A NFA Decision Document was completed in April 2011.
FLW-033F	UST BLDG 2502,5069,5053,950 WASTE OIL	198812	A NFA Decision Document was completed in April 2011.
FLW-033G	UST BUILD 2553 WASTE OIL TANK 500 GAL	198911	A NFA Decision Document was completed in April 2011.
FLW-033H	UST BLDG 4050,4060 WASTE OIL	199309	A NFA Decision Document was completed in April 2011.
FLW-033I	UST BUILD 5071 WASTE OIL TANK 1000 GAL	199208	A NFA Decision Document was completed in April 2011.
FLW-033J	UST BUILD 5071 WASTE OIL TANK 500 GAL	199306	A NFA Decision Document was completed in April 2011.
FLW-033K	UST BUILDING 5074 (4 TANKS)	199306	A NFA Decision Document was completed in April 2011.
FLW-034	ASTS@ 600MP,900MP,1390	198807	A NFA Decision Document was completed in April 2011.
FLW-036	DEH HAZERDOUS WASTE STGE AREA BLDG 2229	198807	This site is still in operation, has no known releases, and therefore is not eligible for ER,A funds.
FLW-038	DOL WASTE BATTERY ELECTROLYTE STGE AREA	199710	This site was a permitted unit and not eligible for ER, A funds. A RCRA closure was completed and approved by the state.
FLW-039	DRMO SCRAP YARD	198807	This site is still operational, and therefore was not eligible for ER,A funds. It was tracked in AEDB-CC until it migrated back to AEDB-R as CCFLW-002 sampling did not demonstrate an unacceptable risk. MRBCA closure documentation and non PCB summary memo was completed in January 2016.
FLW-040	AMMUNITION CONTAINER STORAGE AREA	199509	A NFA Decision Document was completed in April 2011.
FLW-042	60 ABANDONED UST'S	199310	Location or existence of tanks is unknown, therefore no evidence of a release to the environment and not eligible for ER,A

Site Closeout (No Further Action) Summary

Site ID	Site Name	NFA Date	Documentation
			funds.
FLW-043	WWII BUILDINGS (152)	199309	Location or existence of buildings is unknown and not eligible for ER,A funds.
FLW-044	Old Battery Shop, Bldg 2563	199311	This site was a permitted unit and not eligible for ER, A funds. A RCRA closure was completed and approved by the state.
FLW-045	6 UST NEAR BUILDING 810	199211	A NFA Decision Document was completed in April 2011.
FLW-046	BLDG 2291 - SOIL ASPHALT STORAGE AREA	199507	A NFA Decision Document was completed in April 2011.
FLW-047	FLW Device Shop - Bldng 1448	199404	Site was operation and not eligible for ER,A funds.
FLW-048	BOILER UST @ 311, 745, 1021, 675	199501	A NFA Decision Document was completed in April 2011.
FLW-049	DOL MAINTENANCE SHOP	199209	This site has no known releases, is still in operation, and therefore is not eligible for ER,A funds.
FLW-050	ROLL DENTAL CLINIC	199209	This site has no known releases, is still in operation, and therefore is not eligible for ER,A funds.
FLW-051	FLW COMMUNITY HOSPITAL	199209	This site has no known releases, is still in operation, and therefore is not eligible for ER,A funds.
FLW-052	WATER TREATMENT PLANT	199209	This site is still in operation, has no known releases, and therefore is not eligible for IRP funds.
FLW-053	OLD FIRE TRAINING AREA AT LANDFILL 3	199304	A NFA determination was made in the SI dated August 2009.
FLW-054	OLD FIRE TRAINING AREA RUNWAY END	199304	A NFA determination was made in the SI dated August 2009.
FLW-055	OLD FIRE TRAINING AREA BALL FIELD	199304	A NFA determination was made in the SI dated August 2009.
FLW-057	Entymology Laboratory	199209	This site is still in operation, has no known releases, and therefore is not eligible for ER,A funds.
FLW-058	USTs 990 Motor Pool	199209	Site was operational and not eligible for ER,A funds. Closure letters from MDNR were received on April 1994 and October 2003. Site closure documentation was completed in April 2011.
PBC at FLW	Performance Based Contract at FLW	201103	All CLINs awarded.

IRP Schedule

Date of IRP Inception: 198712

Past Phase Completion Milestones

1988

SI (FLW-007 - LANDFILL 5, FLW-008 - LANDFILL 6 - Rose Bowl, FLW-009 - LANDFILL 7, FLW-010 - LANDFILL 8 - Horse Stables I, FLW-011 - LANDFILL 9, FLW-017 - LANDFILL 12, FLW-018 - LANDFILL 13, FLW-019 - LANDFILL 14, FLW-020 - LANDFILL 15, FLW-023 - BOILER PLANT BUILDING 663, FLW-024 - SEWAGE TREATMENT PLANT, FLW-025 - WATER TREATMENT PLANT LAGOON, FLW-026 - SEWAGE TREATMENT PLANT LAGOON SITE, FLW-027 - TRAINING AREA 244 SEWAGE LAGOONS, FLW-029 - NEW FIRE TRAINING AREA, FLW-034 - ASTS@ 600MP,900MP,1390, FLW-035 - DEH USED TRANSFORMER AREA 2222,2221, FLW-039 - DRMO SCRAP YARD)

RFA (FLW-021 - MEDICAL WASTE INCINERATOR, FLW-022 - VET LAB INCINERATOR, FLW-031 - CURRENT EOD OD/OB AREA RANGE 36, FLW-032 - CANNON ANG OB AND BURIAL SITE, FLW-036 - DEH HAZERDOUS WASTE STGE AREA BLDG 2229, FLW-038 - DOL WASTE BATTERY ELECTROLYTE STGE AREA)

INV (FLW-033A - UST BLDG 663,601,2502,2550 WASTE OIL, FLW-033B - AST BLDG 777,170,1390 WASTE OIL, FLW-033C - AST BLDG 875, WASTE OIL, FLW-033D - AST BLDG 1383,2581,2250,2212 WASTE OIL, FLW-033F - UST BLDG 2502,5069,5053,950 WASTE OIL, FLW-033G - UST BUILD 2553 WASTE OIL TANK 500 GAL, FLW-033H - UST BLDG 4050,4060 WASTE OIL, FLW-033I - UST BUILD 5071 WASTE OIL TANK 1000 GAL, FLW-033J - UST BUILD 5071 WASTE OIL TANK 500 GAL, FLW-033K - UST BUILDING 5074 (4 TANKS))

ISC (FLW-033A - UST BLDG 663,601,2502,2550 WASTE OIL, FLW-033B - AST BLDG 777,170,1390 WASTE OIL, FLW-033C - AST BLDG 875, WASTE OIL, FLW-033D - AST BLDG 1383,2581,2250,2212 WASTE OIL, FLW-033F - UST BLDG 2502,5069,5053,950 WASTE OIL, FLW-033G - UST BUILD 2553 WASTE OIL TANK 500 GAL, FLW-033H - UST BLDG 4050,4060 WASTE OIL, FLW-033I - UST BUILD 5071 WASTE OIL TANK 1000 GAL, FLW-033J - UST BUILD 5071 WASTE OIL TANK 500 GAL, FLW-033K - UST BUILDING 5074 (4 TANKS))

CS (FLW-021 - MEDICAL WASTE INCINERATOR, FLW-022 - VET LAB INCINERATOR, FLW-031 - CURRENT EOD OD/OB AREA RANGE 36, FLW-036 - DEH HAZERDOUS WASTE STGE AREA BLDG 2229)

PA (FLW-001 - LANDFILL 1, FLW-002 - LANDFILL 2, FLW-003 - LANDFILL 3, FLW-004 - LANDFILL 3B, FLW-005 - LANDFILL 3C, FLW-006 - LANDFILL 4 Ballfield/Running Trail, FLW-007 - LANDFILL 5, FLW-008 - LANDFILL 6 - Rose Bowl, FLW-009 - LANDFILL 7, FLW-010 - LANDFILL 8 - Horse Stables I, FLW-011 - LANDFILL 9, FLW-012 - LANDFILL 10A, FLW-013 - LANDFILL 10B, FLW-014 - LANDFILL 11A, FLW-015 - LANDFILL 11B, FLW-016 - LANDFILL 11C, FLW-017 - LANDFILL 12, FLW-018 - LANDFILL 13, FLW-019 - LANDFILL 14, FLW-020 - LANDFILL 15, FLW-023 - BOILER PLANT BUILDING 663, FLW-024 - SEWAGE TREATMENT PLANT, FLW-025 - WATER TREATMENT PLANT LAGOON, FLW-026 - SEWAGE TREATMENT PLANT LAGOON SITE, FLW-027 - TRAINING AREA 244 SEWAGE LAGOONS, FLW-028 - DPW OLD FIRE TRAINING AREA, FLW-029 - NEW FIRE TRAINING AREA, FLW-030 - OLD EOD OB/OD AREA RANGE 24, FLW-034 - ASTS@ 600MP,900MP,1390, FLW-035 - DEH USED TRANSFORMER AREA 2222,2221, FLW-037 - DEH OLD PESTICIDE STORAGE AREA BLDG 2206, FLW-039 - DRMO SCRAP YARD, FLW-040 - AMMUNITION CONTAINER STORAGE AREA)

1989

IMP(C) (FLW-033F - UST BLDG 2502,5069,5053,950 WASTE OIL)

1990

IMP(C) (FLW-033G - UST BUILD 2553 WASTE OIL TANK 500 GAL, FLW-033I - UST BUILD 5071 WASTE OIL TANK 1000 GAL)

1992

RFA (FLW-044 - Old Battery Shop, Bldg 2563, FLW-049 - DOL MAINTENANCE SHOP, FLW-050 - ROLL DENTAL CLINIC, FLW-051 - FLW COMMUNITY HOSPITAL, FLW-057 - Entomology Laboratory)

PA (FLW-042 - 60 ABANDONED UST'S, FLW-045 - 6 UST NEAR BUILDING 810, FLW-052 - WATER TREATMENT PLANT, FLW-056 - FLW DRY CLEANING SHOP)

IMP(C) (FLW-033B - AST BLDG 777,170,1390 WASTE OIL, FLW-033C - AST BLDG 875, WASTE OIL)

SI (FLW-052 - WATER TREATMENT PLANT)

ISC (FLW-058 - USTs 990 Motor Pool)

CS (FLW-049 - DOL MAINTENANCE SHOP, FLW-050 - ROLL DENTAL CLINIC, FLW-051 - FLW COMMUNITY

	HOSPITAL, FLW-057 - Entymology Laboratory)
INV	(FLW-058 - USTs 990 Motor Pool)
1993	
SI	(FLW-053 - OLD FIRE TRAINING AREA AT LANDFILL 3, FLW-054 - OLD FIRE TRAINING AREA RUNWAY END, FLW-055 - OLD FIRE TRAINING AREA BALL FIELD)
CS	(FLW-038 - DOL WASTE BATTERY ELECTROLYTE STGE AREA)
PA	(FLW-043 - WWII BUILDINGS (152), FLW-047 - FLW Device Shop - Bldng 1448, FLW-053 - OLD FIRE TRAINING AREA AT LANDFILL 3, FLW-054 - OLD FIRE TRAINING AREA RUNWAY END, FLW-055 - OLD FIRE TRAINING AREA BALL FIELD)
IMP(C)	(FLW-033D - AST BLDG 1383,2581,2250,2212 WASTE OIL, FLW-033H - UST BLDG 4050,4060 WASTE OIL, FLW-033J - UST BUILD 5071 WASTE OIL TANK 500 GAL, FLW-033K - UST BUILDING 5074 (4 TANKS))
1994	
PA	(FLW-046 - BLDG 2291 - SOIL ASPHALT STORAGE AREA)
SI	(FLW-046 - BLDG 2291 - SOIL ASPHALT STORAGE AREA, FLW-047 - FLW Device Shop - Bldng 1448)
CMI(C)	(FLW-044 - Old Battery Shop, Bldg 2563)
ISC	(FLW-048 - BOILER UST @ 311, 745, 1021, 675)
INV	(FLW-048 - BOILER UST @ 311, 745, 1021, 675)
IMP(C)	(FLW-033A - UST BLDG 663,601,2502,2550 WASTE OIL)
1995	
IMP(C)	(FLW-048 - BOILER UST @ 311, 745, 1021, 675)
RA(C)	(FLW-046 - BLDG 2291 - SOIL ASPHALT STORAGE AREA)
PA	(FLW-059 - MUNICIPAL LANDFILL SO OF ROUBIDOUX, FLW-060 - LANDFILL ON A BRANCH TO BIG PINEY)
CS	(FLW-032 - CANNON ANG OB AND BURIAL SITE)
SI	(FLW-003 - LANDFILL 3, FLW-005 - LANDFILL 3C, FLW-028 - DPW OLD FIRE TRAINING AREA, FLW-030 - OLD EOD OB/OD AREA RANGE 24, FLW-037 - DEH OLD PESTICIDE STORAGE AREA BLDG 2206, FLW-040 - AMMUNITION CONTAINER STORAGE AREA)
1996	
SI	(FLW-002 - LANDFILL 2, FLW-004 - LANDFILL 3B)
1999	
SI	(FLW-012 - LANDFILL 10A, FLW-013 - LANDFILL 10B, FLW-014 - LANDFILL 11A, FLW-015 - LANDFILL 11B, FLW-016 - LANDFILL 11C, FLW-056 - FLW DRY CLEANING SHOP)
2003	
SI	(FLW-006 - LANDFILL 4 Ballfield/Running Trail)
2004	
SI	(FLW-059 - MUNICIPAL LANDFILL SO OF ROUBIDOUX, FLW-060 - LANDFILL ON A BRANCH TO BIG PINEY)
2005	
IRA	(FLW-056 - FLW DRY CLEANING SHOP)
2006	
SI	(PBC at FLW - Performance Based Contract at FLW)
RI/FS	(FLW-056 - FLW DRY CLEANING SHOP)
PA	(PBC at FLW - Performance Based Contract at FLW)
2007	
RD	(FLW-056 - FLW DRY CLEANING SHOP)
RA(C)	(FLW-056 - FLW DRY CLEANING SHOP)

IRP Schedule

2009

RD (FLW-002 - LANDFILL 2, FLW-003 - LANDFILL 3)

RI/FS (FLW-002 - LANDFILL 2, FLW-003 - LANDFILL 3)

2010

RA(C) (FLW-002 - LANDFILL 2, FLW-003 - LANDFILL 3)

2011

RD (PBC at FLW - Performance Based Contract at FLW)

RA(O) (PBC at FLW - Performance Based Contract at FLW)

RI/FS (PBC at FLW - Performance Based Contract at FLW)

RA(C) (PBC at FLW - Performance Based Contract at FLW)

2015

SI (FLW-001 - LANDFILL 1)

RI/FS (FLW-012 - LANDFILL 10A)

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: 201909

Schedule for Next Five-Year Review: 2017

Estimated Completion Date of IRP at Installation (including LTM phase): 204908

FORT LEONARD WOOD IRP Schedule

 = phase underway

SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
FLW-002	LANDFILL 2	LTM						
SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
FLW-003	LANDFILL 3	LTM						
SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
FLW-006	LANDFILL 4 Ballfield/Running Trail	RD						
		IRA						
		RA(C)						
		LTM						
SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
FLW-007	LANDFILL 5	RI/FS						
		RD						
		RA(C)						
		LTM						
SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
FLW-008	LANDFILL 6 - Rose Bowl	RD						
		IRA						
		RA(C)						
		LTM						
SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
FLW-009	LANDFILL 7	RI/FS						
		RD						
		RA(C)						
		LTM						
SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
FLW-010	LANDFILL 8 - Horse Stables I	RD						
		IRA						
		RA(C)						
		LTM						
SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
FLW-012	LANDFILL 10A	RD						
		IRA						
		RA(C)						
		LTM						
SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
FLW-017	LANDFILL 12	RD						
		IRA						
		RA(C)						
		LTM						
SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
FLW-019	LANDFILL 14	RI/FS						
		IRA						

FORT LEONARD WOOD IRP Schedule

SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
FLW-028	DPW OLD FIRE TRAINING AREA	RI/FS						
SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
FLW-035	DEH USED TRANSFORMER AREA 2222,2221	RI/FS						
		IRA						
SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
FLW-037	DEH OLD PESTICIDE STORAGE AREA BLDG 2206	RI/FS						
		IRA						
SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
FLW-056	FLW DRY CLEANING SHOP	LTM						
SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
FLW-059	MUNICIPAL LANDFILL SO OF ROUBIDOUX	RD						
		IRA						
		RA(C)						
		LTM						
SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
FLW-060	LANDFILL ON A BRANCH TO BIG PINEY	RD						
		IRA						
		RA(C)						
		LTM						

FORT LEONARD WOOD
Army Defense Environmental Restoration Program
Military Munitions Response Program

MMRP Summary

Installation Total Army Environmental Database-Restoration (AEDB-R) Sites/Closeout Sites Count: 13/6

Installation Site Types with Future and/or Underway Phases

- 3 Small Arms Range
(FTLWD-003-R-01, FTLWD-005-R-01, FTLWD-006-R-01)
- 1 Training and Maneuver Area
(FTLWD-013-R-01)
- 3 Unexploded Munitions/Ordnance
(FTLWD-001-R-01, FTLWD-004-R-01, FTLWD-010-R-01)

Most Widespread Contaminants of Concern

Explosives, Metals, Munitions and explosives of concern (MEC), Munitions constituents (MC)

Media of Concern

Groundwater, Soil

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

Site ID	Site Name	Action	Remedy	FY
FTLWD-001-R-01	50-ACRE SITE - PARCEL 8	IRA	INSTITUTIONAL CONTROLS	2016
FTLWD-004-R-01	NORTH GRENADE RANGE	IRA	INSTITUTIONAL CONTROLS	2016
FTLWD-005-R-01	Northeast Small Arms Range Complex	IRA	INSTITUTIONAL CONTROLS	2016
FTLWD-010-R-01	Range 66-Live Mine Demo and Grenade	IRA	INSTITUTIONAL CONTROLS	2016
FTLWD-013-R-01	Mock Village Range (Vietnam Era)	IRA	INSTITUTIONAL CONTROLS	2016

Duration of MMRP

Date of MMRP Inception 200306

Estimated Date for Remedy-In-Place (RIP)/Response Complete (RC): 202109/202109

Date of MMRP completion including Long Term Management (LTM): 202109

MMRP Contamination Assessment

Contamination Assessment Overview

The cost-to-complete estimates for all Military Munitions Response Program (MMRP) sites at FLW were prepared using available information for each MMRP site. Closure strategies are taken from the munitions response sites (MRS) SI, and cost elements are derived from a government cost estimate. A total of nine out of the 13 MR sites required additional investigation and/or cleanup following the SI. Four sites are being investigated in an expanded site inspection (ESI).

Cleanup Exit Strategy

The SI phase has been completed for all 13 MMRP sites. Six of these sites (FTLWD-002-R-01, FTLWD-007-R-01, FTLWD-008-R-01, FTLWD-009-R-01, FTLWD-011-R-01, FTLWD-012-R-01) received an NFA determination after completion of the SI.

The remaining seven sites (FTLWD-001-R-01, FTLWD-003-R-01, FTLWD-004-R-01, FTLWD-005-R-01, FTLWD-006-R-01, FTLWD-010-R-01, FTLWD-013-R-01) are in the RI/FS phase currently. Appropriate response actions will be determined after completion of the DD for each site.

MMRP Previous Studies

	Title	Author	Date
2003	Final US Army Closed, Transferring, and Transferred Range/Site Inventory for Fort Leonard Wood, Missouri	Engineering-Environmental Management, Inc.	DEC-2003
2007	Final Military Munitions Response Program Historical Records Review	e2M	MAR-2007
2008	Final SI report	e2M	NOV-2008
	PA at Mock Village Range	Fort Leonard Wood	NOV-2008
2009	Army Final Site Inspection Report: MMRP Fort Leonard Wood	e2M	JAN-2009
	Final Addendum to HRR	HDR, e2M	AUG-2009
2010	Final Addendum to SI Report	HDR, e2M	JUL-2010
2014	Final SI report for Machine Gun Range	FPM Remediation	JUL-2014
2016	Final Expanded Site Inspection Report	FPM Remediation	JAN-2016

FORT LEONARD WOOD
Military Munitions Response Program
Site Descriptions

Site ID: FTLWD-001-R-01
Site Name: 50-ACRE SITE - PARCEL 8

STATUS

Regulatory Driver: CERCLA

MRSPP Score: 03

Contaminants of Concern: Explosives, Metals, Munitions and explosives of concern (MEC), Munitions constituents (MC)

Media of Concern: Groundwater, Soil

Phases	Start	End
PA.....	200306.....	200312
SI.....	200602.....	200811
RI/FS.....	201405.....	202009
IRA.....	201405.....	201603

RIP Date: N/A

RC Date: 202009

SITE DESCRIPTION

The Parcel 8 MRS is located outside the installation boundary; however, FLW currently has administrative and management responsibility for the 50.68 acre MRS, and the MRS is considered closed as opposed to transferred. Approximately 50 acres were slated for transfer to the USFS along with an additional 1,230 acres; however, the USFS refused ownership of the Parcel 8 MRS area as it was suspected to contain potential munitions and explosives of concern (MEC) and/or munitions debris (MD). Parcel 8 is still owned by the US Army.

Parcel 8 overlaps the western portion of a historic impact area and bombing range located in the southern end of FLW. All known firing points, target locations, and locations of impact areas are situated within operational range areas on FLW and are, therefore, not within the MRS boundary. Military maneuver training with M16 blank ammunition was conducted at Parcel 8; however, the specific locations and usage dates for training in this area are unknown. Parcel 8 also overlaps the safety danger zone (SDZ) of an attack helicopter training area that was used for five years during the 1980s. The SI indicates that the direction of fire was from west to east, with the target area and most of the range being located within the installation boundary. The portion of the SDZ where Parcel 8 is located was under fire and ricochet.

During previous surveys, potential MEC and/or MD was discovered within the current boundary of the MRS, including spent illumination rounds (flares), inert bombs, 2.75-inch rockets, and fragments from 37mm and 105mm rounds. These surveys were conducted in 2000 and 2001. According to FLW Explosive Ordnance Disposal (EOD) interviews during completion of the SI, the potential MEC and MD was removed. No evidence of MEC or MD was found in the neighboring 1,230-acre area that was transferred to the USFS. Additionally, no evidence of MEC or MD was detected during a visual survey conducted in November 2007 as part of the SI. The SI tested for metals and explosives in soil, but MC has not been detected in any investigations conducted to date. The Military Response Site Prioritization Protocol score is 3. Based on the results of the SI, the Parcel 8 MRS was recommended for further characterization for both MEC and munitions constituents (MC).

An RI/FS phase is underway. LUCs are underway in the IRA phase.

CLEANUP/EXIT STRATEGY

An RI/FS is underway. The site exit strategy will be based on the findings of the RI.

Site ID: FTLWD-003-R-01
Site Name: MACHINE GUN RANGE

STATUS

Regulatory Driver: CERCLA
MRSPP Score: Evaluation pending
Contaminants of Concern: Munitions and explosives of concern (MEC), Munitions constituents (MC)
Media of Concern: Soil, Surface Water

Phases	Start	End
PA.....	200306.....	200312
SI.....	201011.....	201408
RI/FS.....	201407.....	202106
RIP Date:	N/A	
RC Date:	202106	

SITE DESCRIPTION

The Machine Gun Range MRS (FTLWD-003-R-01) is located off of the northeastern boundary of the post, east of the central section of the cantonment area. Two firing points appear to be located on the southern portion of the range with the firing direction towards the northwest based on historic maps that identify the former range. No impact berm was identified for these firing points from historical aerial photographs or maps.

FLW personnel have indicated the site was active during the installation's first period of use from 1941 to 1946 and that only small arms ammunition was used at the site. Historic maps indicate one of the firing points was used only infrequently by 1959, and was no longer used by 1962. Historic maps specify the other firing point was not used between 1954 and 1962, and after that it was used as a skeet range. The latest map showing the skeet range is dated 1968; it is not known how long it was used as a skeet range after 1968. The area is currently undeveloped and covered with thick vegetation and woods.

During the SI survey, MEC and/or MD discovered within the current boundary of the MRS included two M20 practice anti-tank landmines and a M8A1 practice bounding anti-personnel mine with a live M10A2 fuse. The SI survey was conducted in April 2013. The MEC and MD were removed by the FLW EOD team. No additional MEC or MD was detected during a visual survey conducted in April 2013 as part of the SI. However, a variety of cultural debris/trash and civilian small arms casings and shotgun shells were observed along the SI survey transect. The SI tested for metals and polycyclic aromatic hydrocarbons (PAH) in soil. Metals were detected above Missouri and/or USEPA criteria in all seven soil samples. Metals detected above criteria included antimony, arsenic, and lead. PAHs were detected above criteria in all five soil samples analyzed for PAHs. PAHs that were detected above criteria included: benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene. Based on the results of the SI, the MRS was recommended for further characterization for both MEC and MC.

The RI/FS and surface clearance is underway.

CLEANUP/EXIT STRATEGY

The site is currently in the RI/FS phase. Appropriate response actions will be determined after completion of the DD.

Site ID: FTLWD-004-R-01
Site Name: NORTH GRENADE RANGE

STATUS

Regulatory Driver: CERCLA

MRSPP Score: 03

Contaminants of Concern: Explosives, Metals, Munitions and explosives of concern (MEC), Munitions constituents (MC)

Media of Concern: Soil

Phases	Start	End
PA.....	200306.....	200312
SI.....	200601.....	200811
RI/FS.....	201405.....	202003
IRA.....	201405.....	201603

RIP Date: N/A

RC Date: 202109

SITE DESCRIPTION

This site is located east of the cantonment area and was used for live grenade practice and is approximately 34 acres. The range was not in existence based on a 1955 aerial photograph of the site; however, it is present in a 1967 aerial photograph. Installation personnel speculate that the range was constructed during the late-1950s and are not sure when the range was taken out of use. The site is currently undeveloped.

An unexploded ordnance (UXO) response for a live grenade was required during the SI; however, the grenade was determined to be just off of the MRS.

An installation-wide SI was completed in November 2008 to determine if further action is needed to address MEC and/or MC. The SI determined that an RI was necessary.

The RI/FS is underway. LUCs are underway in the IRA phase.

CLEANUP/EXIT STRATEGY

The site is currently in the RI/FS phase. Appropriate response actions will be determined after completion of the DD.

Site ID: FTLWD-005-R-01

Site Name: Northeast Small Arms Range Complex

STATUS

Regulatory Driver: CERCLA

MRSPP Score: 03

Contaminants of Concern: Metals, Munitions constituents (MC)

Media of Concern: Groundwater, Soil

Phases	Start	End
PA.....	200306.....	200312
SI.....	200602.....	200811
RI/FS.....	201405.....	202003
IRA.....	201405.....	201603

RIP Date: N/A

RC Date: 202003

SITE DESCRIPTION

This 68.85-acre range is located on the northeast edge of the cantonment area. This site contains only the small, on-post portion of the range where the firing points were located. The target area of the range is off-post. Installation personnel could not provide specific times of use; however, they speculate that the range was active during the first use of the post from 1941 to 1946. This site is currently undeveloped. UXO responses are not known to have been conducted at this range.

An installation-wide SI was completed in November 2008 to determine if further action is needed to address MEC and/or MC. The SI determined that an RI was necessary.

The RI/FS is underway. LUCs are underway in the IRA phase.

CLEANUP/EXIT STRATEGY

Complete the RI/FS and determine if additional actions are required.

Site ID: FTLWD-006-R-01
Site Name: Northeast SAR Complex-TD

STATUS

Regulatory Driver: CERCLA
MRSPP Score: Evaluation pending
Contaminants of Concern: Explosives, Metals, Munitions and explosives of concern (MEC), Munitions constituents (MC)
Media of Concern: Groundwater, Soil

Phases	Start	End
PA.....	200306.....	200312
SI.....	200602.....	201409
RI/FS.....	201510.....	202109
RIP Date:	N/A	
RC Date:	202109	

SITE DESCRIPTION

This 3561.08-acre site is the target area and the majority of the SDZ for the qualifying rifle range that was transferred to the USFS. The area is located off the northeast edge of the cantonment area. Firing points were located on current FLW property, and firing occurred in a south to north direction. Installation personnel could not provide specific times of use; however, they speculate that the range was active during the first use of the post from 1941 to 1946. The land was Army-owned until 1975 when it was transferred in fee title to the USFS. Installation personnel state that trees in the area still contain bullets. This site is currently undeveloped.

An installation-wide SI was completed in November 2008 to determine if further action is needed to address MEC and/or MC.

An ESI was completed and recommended that an RI be conducted. An RI/FS phase is underway.

CLEANUP/EXIT STRATEGY

The site is currently in the RI/FS phase. Appropriate response actions will be determined after completion of the DD.

Site ID: FTLWD-010-R-01

Site Name: Range 66-Live Mine Demo and Grenade

STATUS

Regulatory Driver: CERCLA

MRSPP Score: 05

Contaminants of Concern: Munitions and explosives of concern (MEC), Munitions constituents (MC)

Media of Concern: Soil, Surface Water

Phases	Start	End
PA.....	200306.....	200312
SI.....	200602.....	200811
RI/FS.....	201405.....	202003
IRA.....	201405.....	201603

RIP Date: N/A

RC Date: 202109

SITE DESCRIPTION

The Range 66-Live Mine Demo and Grenade MRS is 35.68 acres. The exact time of use is unknown; however, based on the 1954 and 1956 historical maps, the MRS was likely used during the Korean War. The only information regarding this MRS was based upon the name of the range as identified on the 1954 and 1956 historical maps. While no documentation was discovered indicating what types of munitions were used at the MRS, rifle grenades and hand grenades used after World War II and during the 1950s include the following; M9A, M11, M19, M22, M29, M31, Practice MK II, and high explosive anti-tank. Practice land mines used may have included; M-14, M-15, M-16, M2A4, British Dingbat, and Mark VII.

An installation-wide SI was completed in November 2008 to determine if further action is needed to address MEC and/or MC. The SI determined that an RI was necessary.

The RI/FS is underway. LUCs are underway in the IRA phase.

CLEANUP/EXIT STRATEGY

The site is currently in the RI/FS phase. Appropriate response actions will be determined after completion of the DD.

Site ID: FTLWD-013-R-01
Site Name: Mock Village Range (Vietnam Era)

STATUS

Regulatory Driver: CERCLA

MRSPP Score: 07

Contaminants of Concern: Munitions and explosives of concern (MEC), Munitions constituents (MC)

Media of Concern: Soil, Surface Water

Phases	Start	End
PA.....	200811.....	200811
SI.....	200904.....	201009
RI/FS.....	201405.....	202003
IRA.....	201405.....	201603

RIP Date: N/A

RC Date: 202109

SITE DESCRIPTION

This site is located to the east of FLW Road 20 and to the west of the northern section of Forney Field (active airfield). The site is within a restricted area controlled by the Chemical, Biological, Radiological, and Nuclear School.

This site is listed as a Mock Village Range (Vietnam era) on a 1964 facility map and contains possible demolition pits. It does not appear to be within a range or TA and is not listed within the January 2008 Army Draft SI Report, MMRP for FLW, Missouri.

Numerous practice munitions were found during the SI conducted in 2010, and it was determined that an RI was necessary.

An RI/FS is underway. LUCs are underway in the IRA phase.

CLEANUP/EXIT STRATEGY

The need for additional actions will be determined when the RI/FS is complete.

Site Closeout (No Further Action) Summary

Site ID	Site Name	NFA Date	Documentation
FTLWD-002-R-01	CENTRAL GRENADE RANGE	200811	Final Site Inspection Report, November 2008, recommended no further action for MEC and MC at the site.
FTLWD-007-R-01	Range 3 - Rifle Grenade	200811	Final Site Inspection Report, November 2008, recommended no further action for MEC and MC at the site.
FTLWD-008-R-01	Ranges 20/21 - Partial Downrange	201409	Results of the January 2016 ESI indicate an absence of contamination.
FTLWD-009-R-01	Range 34 - SE Corner Safety Fan	200811	Final Site Inspection Report, November 2008, recommended no further action for MEC and MC at the site.
FTLWD-011-R-01	Range 68A - NE Corner Safety Fan	201409	Results of the January 2016 ESI indicate an absence of contamination.
FTLWD-012-R-01	West Range Fan Complex	200811	Final Site Inspection Report, November 2008, recommended no further action for MEC and MC at the site.

MMRP Schedule

Date of MMRP Inception 200306

Past Phase Completion Milestones

2004

PA (FTLWD-001-R-01 - 50-ACRE SITE - PARCEL 8, FTLWD-002-R-01 - CENTRAL GRENADE RANGE, FTLWD-003-R-01 - MACHINE GUN RANGE, FTLWD-004-R-01 - NORTH GRENADE RANGE, FTLWD-005-R-01 - Northeast Small Arms Range Complex, FTLWD-006-R-01 - Northeast SAR Complex-TD, FTLWD-007-R-01 - Range 3 - Rifle Grenade, FTLWD-008-R-01 - Ranges 20/21 - Partial Downrange, FTLWD-009-R-01 - Range 34 - SE Corner Safety Fan, FTLWD-010-R-01 - Range 66-Live Mine Demo and Grenade, FTLWD-011-R-01 - Range 68A - NE Corner Safety Fan, FTLWD-012-R-01 - West Range Fan Complex)

2009

SI (FTLWD-001-R-01 - 50-ACRE SITE - PARCEL 8, FTLWD-002-R-01 - CENTRAL GRENADE RANGE, FTLWD-004-R-01 - NORTH GRENADE RANGE, FTLWD-005-R-01 - Northeast Small Arms Range Complex, FTLWD-007-R-01 - Range 3 - Rifle Grenade, FTLWD-009-R-01 - Range 34 - SE Corner Safety Fan, FTLWD-010-R-01 - Range 66-Live Mine Demo and Grenade, FTLWD-012-R-01 - West Range Fan Complex)

PA (FTLWD-013-R-01 - Mock Village Range (Vietnam Era))

2010

SI (FTLWD-013-R-01 - Mock Village Range (Vietnam Era))

2014

SI (FTLWD-003-R-01 - MACHINE GUN RANGE, FTLWD-006-R-01 - Northeast SAR Complex-TD, FTLWD-008-R-01 - Ranges 20/21 - Partial Downrange, FTLWD-011-R-01 - Range 68A - NE Corner Safety Fan)

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: 2017

Estimated Completion Date of MMRP at Installation (including LTM phase): 202109

FORT LEONARD WOOD MMRP Schedule

= phase underway

SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
FTLWD-001-R-01	50-ACRE SITE - PARCEL 8	RI/FS						
SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
FTLWD-003-R-01	MACHINE GUN RANGE	RI/FS						
SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
FTLWD-004-R-01	NORTH GRENADE RANGE	RI/FS						
SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
FTLWD-005-R-01	Northeast Small Arms Range Complex	RI/FS						
SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
FTLWD-006-R-01	Northeast SAR Complex-TD	RI/FS						
SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
FTLWD-010-R-01	Range 66-Live Mine Demo and Grenade	RI/FS						
SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
FTLWD-013-R-01	Mock Village Range (Vietnam Era)	RI/FS						

FORT LEONARD WOOD
Army Defense Environmental Restoration Program
Compliance Restoration

CR Summary

Installation Total Army Environmental Database-Restoration (AEDB-R) Sites/Closeout Sites Count: 11/3

Installation Site Types with Future and/or Underway Phases

- 2 Industrial Discharge
(CCFLW-001, CCFLW-003)
- 1 Landfill
(CCFLW-011)
- 3 Soil Contamination After Tank Removal
(CCFLW-004, CCFLW-006, CCFLW-007)
- 2 Underground Storage Tank
(CCFLW-008, CCFLW-010)

Most Widespread Contaminants of Concern

Petroleum, Oil and Lubricants (POL), Polychlorinated Biphenyls (PCB), Volatiles (VOC)

Media of Concern

Sediment, Soil

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

Site ID	Site Name	Action	Remedy	FY
CCFLW-001	Post Laundry - Building 2352	IRA	DRAINAGE CONTROLS	2010

Duration of CR

Date of CR Inception: 199003

Estimated Date for Remedy-In-Place (RIP)/Response Complete (RC): 202009/202009

Date of CR completion including Long Term Management (LTM): 202009

CR Contamination Assessment

Contamination Assessment Overview

Environmental restoration activities include the IRP and MMRP. On Dec. 29, 2008, the Office of the Deputy Under Secretary of Defense for Installations and Environment issued an interim policy for DERP eligibility that rescinded the 1986 eligibility date for the IRP and the 2002 eligibility date for the MMRP. This made many sites previously addressed in the Army's CC program eligible for the DERP. Sites that are now eligible for the Munitions Response (MR) program have been migrated from AEDB-CC and given the naming convention of other MR sites. The newly eligible non-MR type sites are considered to be Installation Restoration (IR) sites; however, the newly eligible sites are being coded as Compliance Restoration (CR) in AEDB-R to distinguish them from the original IR sites and IR metrics.

Cleanup Exit Strategy

The SI phase is complete at CCFLW-011, and based on the results of the SI an RI/FS phase will be required. The need for future phases will be determined after completion of the DD.

The RI/FS phase at CCFLW-002 is underway. Based on the lack of site contaminants of concern concentrations above screening levels, it is anticipated that the DD will result in an NFA determination.

CCFLW-001, CCFLW-003, CCFLW-006, CCFLW-007, CCFLW-008, and CCFLW-010 are in the RI/FS phase. Future response actions will be determined after completion of the DD.

CCFLW-004 is currently scoped for a soil removal action to close out the site to unrestricted use/unrestricted exposure (UU/UE) levels and a future NFA determination.

CR Previous Studies

	Title	Author	Date
2011	CCFLW-001 Final Investigation Status Report	Conti/CH2M Hill	JUL-2011
	CCFLW-003 Final Investigation Report	Conti/CH2M Hill	JUL-2011
	CCFLW-004, -005, -006, -007 Final Investigation Report	Conti/CH2M Hill	SEP-2011
2013	CCFLW-006 Supplemental Site Investigation Report	CH2M Hill	MAR-2013
2014	CCFLW-010 Final Investigation Report	CH2M Hill	FEB-2014
	CCFLW-008 Final Investigation Report	CH2M Hill	AUG-2014
	CCFLW-005 MRBCA Response Completion document	USACE KC	SEP-2014
2015	CCFLW-011 Site Inspection Report	CH2M Hill	JUN-2015

FORT LEONARD WOOD
Compliance Restoration
Site Descriptions

Site ID: CCFLW-001
Site Name: Post Laundry - Building 2352

STATUS

Regulatory Driver: CERCLA

Contaminants of Concern: Volatiles (VOC)

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

Phases	Start	End
PA.....	200410.....	200503
SI.....	200502.....	200503
RI/FS.....	200608.....	201901
RD.....	201809.....	201909
IRA.....	200803.....	200910
RA(C).....	201909.....	202008

RIP Date: N/A

RC Date: 202008

SITE DESCRIPTION

Building 2352 was the Post Laundry facility which included a dry cleaning operation using PCE. It is located at the southern corner of 1st Street and Louisiana Avenue. The dry cleaning operation was moved to Building 2352 in the late-1970s or very early-1980s from the adjacent Building 2300 (removed) which is designated FLW-056. Contamination from FLW-056/Building 2300 is being managed under the IRP.

Investigation into FLW-056 has shown that the soils adjacent to an outdoor waste solvent storage area on the south side of building 2352 (not currently in use), and sediments and water in a storm water drain leading from the building are contaminated with PCE and degradation products.

The PCE releases from the dry cleaning operations in this building have been documented, with the most recent release occurring in 1997. Interviews conducted with laundry personnel indicate dry cleaning machines would boil over and discharge PCE through a floor drain connected to the storm drain. There was also a release approximately 12 to 15 years ago (1987-1990). The machines also had a condensate collection bucket that was emptied to the floor drain. Condensate was sampled and found to have 10,100 ppb of PCE and 23 ppb of TCE. This practice was discontinued in March 1997. The floor drain was sealed in 2002. An investigation of storm water and drain lines in the area found PCE in a drain line from building 2352. Sediments were contaminated at 4100 ppb of PCE and 110 ppb of TCE. A soil gas investigation detected soil contamination on the south side of the building in an area where drums of waste solvent were previously stored.

Both the MDNR and USEPA Region 7 have deferred RCRA cleanup action and are allowing the Army to proceed with cleanup under CERCLA in order to maintain consistency with the other ongoing IRP sites.

An RI is under way and was fully funded in FY13. The laundry facility was demolished in FY15.

CLEANUP/EXIT STRATEGY

The RI/FS phase is underway. Based on the results of the Phase I RI report and the similarity to site FLW-056, it is anticipated that the site remedy will include excavation of contaminated soil in the RD/RA phase and LUCs in the LTM phase.

Site ID: CCFLW-003

Site Name: Building 2350 - Former Print Shop

STATUS

Regulatory Driver: CERCLA

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

Media of Concern: Soil

Phases	Start	End
PA.....	199003.....	199209
SI.....	200902.....	201212
RI/FS.....	201408.....	201808
RD.....	201408.....	201903
RA(C).....	201408.....	201908

RIP Date: N/A

RC Date: 201908

SITE DESCRIPTION

Building 2350 was the former print shop at FLW. Hazardous substances used were possibly TCE and methylene chloride. An investigation at the adjacent laundry facility indicated the possibility of contamination at the former print shop. In March 2013 the building was demolished and slab removed.

In FY14, a contract was awarded and obligated for the RI/FS phase to the RD/RA phase. The contract is scoped to complete a soil removal action and achieve site closure to UU/UE.

CLEANUP/EXIT STRATEGY

The installation will complete the RI phase. An exit strategy to clean closure has been scoped due to low site complexity.

Site ID: CCFLW-004
Site Name: UST Building 772

STATUS

Regulatory Driver: OTHER
Contaminants of Concern: Petroleum, Oil and Lubricants (POL)
Media of Concern: Soil

Phases	Start	End
PA.....	200703.....	200705
SI.....	200902.....	201010
RI/FS.....	200903.....	201511
RA(C).....	201512.....	201709
RIP Date:	N/A	
RC Date:	201709	

SITE DESCRIPTION

The 6,000-gallon underground storage tank (UST) stored No. 2 heating oil for use in buildings 772 and 773. The buildings are part of the 700 area motor pool and remain in use. Propane is currently used as heating fuel.

An SI found low-level contamination above MRBCA default target levels. The MRBCA Corrective Action Work Plan was finalized in FY15 and the removal action is underway which will return the site to UU/UE.

CLEANUP/EXIT STRATEGY

Soil removal action will be followed by an MRBCA closure document.

Site ID: CCFLW-006
Site Name: UST - Building 745

STATUS

Regulatory Driver: CERCLA
Contaminants of Concern: Petroleum, Oil and Lubricants (POL), Polychlorinated Biphenyls (PCB), Polycyclic Aromatic Hydrocarbons (PAH), Volatiles (VOC)
Media of Concern: Groundwater, Soil

Phases	Start	End
PA.....	200603.....	200608
SI.....	201004.....	201304
RI/FS.....	201306.....	202009
RIP Date:	N/A	
RC Date:	202009	

SITE DESCRIPTION

Three USTs were located at building 745. The capacity of each tank was 40,000 gallons. These tanks stored No. 6 Fuel Oil and later No. 2 Fuel Oil. The heating oil tanks provided fuel for the boiler building serving the 700 area. The tanks were removed in 2006. Upon removal of the tanks, samples taken at building 745 showed contamination.
The RI/FS phase is underway.

CLEANUP/EXIT STRATEGY

The installation will complete the RI and determine if additional actions are required.

Site ID: CCFLW-007

Site Name: AST & OWS North of Bldg 2230

STATUS

Regulatory Driver: CERCLA

Contaminants of Concern: Petroleum, Oil and Lubricants (POL), Volatiles (VOC)

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

Phases	Start	End
PA.....	200707.....	200708
SI.....	201003.....	201212
RI/FS.....	201408.....	201808
RD.....	201408.....	201907
RA(C).....	201408.....	201908

RIP Date: N/A

RC Date: 201908

SITE DESCRIPTION

This site was the location of an above ground storage tank (AST) and oil and water separator (OWS) which was connected to a washrack. Contamination was found in vicinity of AST containment area as well as the washrack and OWS. The AST had been removed previously. The OWS and associated lines were dug up and reburied on-site during construction of the storage yard.

Contamination was found at the site during construction of a storage yard for the 94th Engineer Battalion. An SI was conducted and found contamination requiring an RI.

The RI is in progress. RD/RA phases have been contracted and funds obligated in FY14. The RA-C will be a soil removal action. The site is scoped to clean closure UU/UE.

CLEANUP/EXIT STRATEGY

The installation will complete the RI phase. An exit strategy to clean closure has been scoped due to low site complexity.

Site ID: CCFLW-008
Site Name: UST at LORA Bldg 560

STATUS

Regulatory Driver: OTHER
Contaminants of Concern: Petroleum, Oil and Lubricants (POL)
Media of Concern: Groundwater, Soil

Phases	Start	End
PA.....	200907.....	200908
SI.....	200907.....	201408
RI/FS.....	201403.....	201511
RA(C).....	201512.....	201709

RIP Date: N/A
RC Date: 201709

SITE DESCRIPTION

Contamination was found during tank removal. The underground heating oil tank was used to provide heating oil for the maintenance shed. It was replaced by an AST. The UST was located at the Lake of the Ozarks Recreation Area (LORA). LORA is leased from the state of Missouri, MDNR.

An MRBCA investigation was completed. MRBCA corrective action is underway, which will include soil removal and confirmation sampling in soil and groundwater media.

CLEANUP/EXIT STRATEGY

A soil removal action has been completed and will be followed by confirmatory soil and groundwater sampling and a closure document under MRBCA.

Site ID: CCFLW-010
Site Name: USTs at Building 5265

STATUS

Regulatory Driver: CERCLA

Contaminants of Concern: Petroleum, Oil and Lubricants (POL), Semi-volatiles (SVOC), Volatiles (VOC)

Media of Concern: Groundwater, Soil

Phases	Start	End
PA.....	201101.....	201108
SI.....	201203.....	201403
RI/FS.....	201403.....	202006

RIP Date: N/A

RC Date: 202006

SITE DESCRIPTION

Building 5265 is a vehicle maintenance facility. The wheeled vehicle maintenance shop used two oil USTs. During upgrade of these two USTs, free-product in the soil and trapped groundwater was observed.

Subsequent line/tank tightness tests of the two tank and associated lines indicate that only one of the tanks is tight. Neither set of associated piping passed the tightness test. One tank has been removed. Two OWS also exist, one associated with each tank.

An SI has been complete, and an RI is underway.

There is not enough information to make a projection beyond the study phase, and a decision will be made at the conclusion of the RI/FS.

CLEANUP/EXIT STRATEGY

The installation will complete the RI and determine if additional actions are required.

Site ID: CCFLW-011

Site Name: Landfill E. of Sportsmen's Center

STATUS

Regulatory Driver: CERCLA
Contaminants of Concern: Metals, Pesticides, Semi-volatiles (SVOC), Volatiles (VOC)
Media of Concern: Groundwater, Soil, Surface Water

Phases	Start	End
PA.....	201212.....	201212
SI.....	201303.....	201506
RI/FS.....	201509.....	201909
RIP Date:	N/A	
RC Date:	201909	

SITE DESCRIPTION

During installation of sewer/water lines between the Sportsmen's Center and TA74A, a previously unknown landfill was discovered.

Buried waste was discovered in a trench approximately 2 ft below ground surface. Extent of buried waste is not known. It is believed that this landfill received wastes in the late-1960s to early-1970s.

The SI is complete. Presence/absence has been determined and the RI/FS phase is underway.

CLEANUP/EXIT STRATEGY

The installation will complete the RI/FS phase and determine what additional actions are required. It is anticipated the site will be a presumptive remedy for military landfills, which includes landfill maintenance, cover improvements, groundwater monitoring, and LUCs.

Site Closeout (No Further Action) Summary

Site ID	Site Name	NFA Date	Documentation
CCFLW-002	DRMO Scrap Yard Transformer Pad	201602	Final MRBCA Investigation Report, dated January 2016.
CCFLW-005	ASTs at Building 2250	201410	A closure letter was received from MDNR on 10/2/14.
CCFLW-009	UST at Bldng 5074	201102	NFA closure letter from MDNR dated Feb. 3, 2011.

CR Schedule

Date of CR Inception: 199003

Past Phase Completion Milestones

1992

PA (CCFLW-002 - DRMO Scrap Yard Transformer Pad, CCFLW-003 - Building 2350 - Former Print Shop)

1994

ISC (CCFLW-009 - UST at Bldng 5074)

2005

PA (CCFLW-001 - Post Laundry - Building 2352)

SI (CCFLW-001 - Post Laundry - Building 2352)

2006

PA (CCFLW-006 - UST - Building 745)

2007

PA (CCFLW-004 - UST Building 772, CCFLW-005 - ASTs at Building 2250, CCFLW-007 - AST & OWS North of Bldng 2230)

2009

PA (CCFLW-008 - UST at LORA Bldng 560)

2010

IRA (CCFLW-001 - Post Laundry - Building 2352)

2011

INV (CCFLW-009 - UST at Bldng 5074)

PA (CCFLW-010 - USTs at Building 5265)

SI (CCFLW-004 - UST Building 772, CCFLW-005 - ASTs at Building 2250)

2013

PA (CCFLW-011 - Landfill E. of Sportsmen's Center)

SI (CCFLW-003 - Building 2350 - Former Print Shop, CCFLW-006 - UST - Building 745, CCFLW-007 - AST & OWS North of Bldng 2230)

2014

SI (CCFLW-008 - UST at LORA Bldng 560, CCFLW-010 - USTs at Building 5265)

2015

RI/FS (CCFLW-005 - ASTs at Building 2250)

SI (CCFLW-011 - Landfill E. of Sportsmen's Center)

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: 202008

Schedule for Next Five-Year Review: 2017

Estimated Completion Date of CR at Installation (including LTM phase): 202009

FORT LEONARD WOOD CR Schedule

= phase underway

SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
CCFLW-001	Post Laundry - Building 2352	RI/FS						
		RD						
		RA(C)						
SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
CCFLW-003	Building 2350 - Former Print Shop	RI/FS						
		RD						
		RA(C)						
SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
CCFLW-004	UST Building 772	RA(C)						
SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
CCFLW-006	UST - Building 745	RI/FS						
SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
CCFLW-007	AST & OWS North of Bldng 2230	RI/FS						
		RD						
		RA(C)						
SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
CCFLW-008	UST at LORA Bldng 560	RA(C)						
SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
CCFLW-010	USTs at Building 5265	RI/FS						
SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
CCFLW-011	Landfill E. of Sportsmen's Center	RI/FS						

Community Involvement

Technical Review Committee (TRC): None

Community Involvement Plan (Date Published): 201402

Restoration Advisory Board (RAB): No

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

Community Interest Solicited on: 201502

Efforts Taken to Determine Interest

A mail survey was conducted of random residents in the area in and around FLW in 2010. 2,531 surveys were mailed as well as a public notice published in the local paper. In February 2015, a public notice soliciting interest in the RAB was posted in five local newspapers. No responses were received to the Feb-2015 public notice.

Results

There has not been significant interest expressed by the public or regulators in establishing a RAB for FLW.

Follow-up Procedures

The installation is in process of reevaluating community interest. The next Community Involvement Plan will be completed in FY17.

Additional Community Involvement Information

In order to keep the public informed of ongoing IRP activities a website, http://www.wood.army.mil/newweb/garrison/dpw_environmental.html, has been developed where information is posted. Also, press releases are distributed through the FLW Public Affairs Office as appropriate.

Administrative Record is located at

15914 1st Street
Building 2222
Fort Leonard Wood, MO 65473

Phone: 573-596-0882

Information Repository is located at

15914 1st Street
Building 2222
Fort Leonard Wood, MO 65473

Phone: 573-596-0882

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

TAPP Title: N/A

Potential TAPP: N/A

