MILAN ARMY AMMUNITION PLANT

Army Cleanup Program

Installation Action Plan Final

June 2024

TABLE OF CONTENTS

STATEMENT OF PURPOSE

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

INSTALLATION OVERVIEW

Installation Name: MILAN ARMY AMMUNITION PLANT

Installation City: MILAN

Installation County: CARROLL, GIBSON

Installation State: TN

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

Regulatory Participation - State: Tennessee Department of Environment and Conservation (TDEC)

ACRONYMS

Acronym	Definition
AOPI	Areas of Potential Concern
CC	Compliance-Related Cleanup
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act of 1980
CFR	Code of Federal Regulations
COC	Contaminants of Concern
CRL	Cleanup Restoration & Liabilities
ENV	Environmental
FS	Feasibility Study
FY	Fiscal Year
FYR	Five-Year Review
GWTP	Groundwater Treatment Plant
HRS	Hazard Ranking System
IAP	Installation Action Plan
ID	Identification
IR	Installation Restoration
IRA	Interim Remedial Action
LAP	Load, Ammunition, and Pack
LTM	Long-Term Management
LUC	Land Use Control
MAAP	Milan Army Ammunition Plant
MLAAP	Milan Army Ammunition Plant
MNA	Monitored Natural Attenuation
MR	Munitions Response
MRSPP	Munitions Response Site Prioritization Protocol
NI	Northern Industrial
NPL	National Priorities List
OBG	Open Burning Ground
OU	Operable Unit
PA	Preliminary Assessment
PFAS	Per- and Polyfluoroalkyl Substances
PFHxS	perfluorohexane sulfonate
PFOA	Perfluorooctanoic Acid
PFBS	Perfluorobutanesulfonic Acid
PFOS	Perfluorooctane Sulfonate
PR	Periodic Review
RAB	Restoration Advisory Board
RA(C)	Remedial Action (Construction)
RA(O)	Remedial Action (Operations)
RC	Response Complete

Acronym	Definition
RCRA	Resource Conservation and Recovery Act
RD	Remedial Design
RDX	Hexahydro-1,3,5-Trinitro-5-Triazine
RI	Remedial Investigation
RIP	Remedy-In-Place
ROD	Record of Decision
RRSE	Relative Risk Site Evaluation
SC	Site Closeout
SI	Site Inspection
TAPP	Technical Assistance for Public Participation
TDEC	Tennessee Department of Environment and Conservation
TNT	Trinitrotoluene
UE	Unrestricted Exposure
USACE	US Army Corps of Engineers
USEPA	US Environmental Protection Agency
UU	Unlimited Use

PHASE TRANSLATION TABLE

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

PROGRAM SUMMARY

Number of Open Sites with Response Complete/Total Open IR Sites: 2/6

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

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

SITE-LEVEL INFORMATION

47475.1001_MAAP 014A_OU2 O-LINE LAGOON (SOILS)

Env Site ID: MAAP 014A

Cleanup Site: OU2 O-LINE LAGOON (SOILS)

Alias: MAAP 014A

Regulatory Driver: CERCLA

RIP Date: 7/31/1997

RC Date: 7/31/1997

RC Reason: All Required Cleanup(s) Completed

SC Date: 9/30/2054

Program: ENV Restoration, Army

Subprogram: IR

NPL Status: Yes

Hazardous Ranking Score: 58

RRSE:

MRSPP: N/A

Phase	Start	End
PA:	3/31/1978	6/30/1978
SI:	3/31/1978	6/30/1978
RI/FS:	9/30/1987	6/30/1993
RD:	11/30/1993	7/31/1994
IRA:	- -	- -
RA(C):	2/28/1995	7/31/1997
RA(O):	- -	- -
LTM:	10/15/1997	9/30/2054

Site Narrative: The O-Line area at MLAAP was built in 1941 as part of the initial plant construction activity. The current and reasonably anticipated future land use is industrial. Operations began at O-Line in 1942 as an ordnance demilitarization facility. The types of explosives that were handled in the facility included trinitrotoluene (TNT) and hexahydro-1,3,5-trinitro-5-triazine (RDX). From the start the major function of the line was to remove explosives from bombs and projectiles by injecting a high-pressure stream of hot water and steam into the shells. From about 1942 until 1978 wastewater contaminated with explosives was discharged from the O-Line washout operations through a series of baffled concrete sumps where cooling caused significant amounts of explosives to precipitate out of the waste stream. The collected explosives were periodically removed from the sumps and burned at the burning ground. The wastewater then ran through a series of 11 ponds prior to being discharged to a drainage ditch. In 1984 with the concurrence of the Tennessee Department of Public Health and US Environmental Protection Agency (USEPA) the O-Line ponds were closed by in-place containment. Containment was accomplished using a clay cap with overlying layers of gravel and soil with grass cover. The containment was carried out pursuant to Resource Conservation and Recovery Act (RCRA) closure requirements (40 Code of Federal Regulations [CFR] part 265). In October 1984, the level of contamination in the groundwater from the O-Line ponds the installation was proposed for listing on the National Priorities List (NPL). Final listing of the installation on the NPL became effective on July 22, 1987. The location of the former O-Line Ponds is the most contaminated site on MLAAP. The O-Line ponds have been separated into two operable units (OU) (OU1 & OU2) to facilitate the response action at the site. OU1 includes the groundwater beneath and directly downgradient of the O-Line ponds designated as Site MAAP-014. OU2 (MLAAP-14A) is comprised of the soils, sediments, and surface water beneath and around the former 11 ponds and shallow sediments in the drainage ditch that flows along the east and north side of the former ponds. The previous September 1993 record of decision (ROD) for OU1 Site MAAP-14 has been superseded by the MLAAP April 2014 Site-Wide Groundwater ROD; therefore, groundwater from OU1 Site MAAP-14 is managed with site-wide groundwater as Site MAAP-003. Through sampling and consideration of former site activities the area of OU2 has been defined as

consisting of the area that has been impacted by use and/or closure of the former ponds at O-Line. The boundary of this area has been identified as the fence that encircles the capped area exclusive of the area south of the access road to the O-Line Industrial Wastewater Treatment Facility. The area of the boundary fence around OU2 is approximately 25 acres. The OU2 cap is approximately 582,000 square feet. The tributary of the drainage ditch (Ditch 5) that flows along the east and north sides of the O-Line cap received pond effluent while the ponds were in use and is included within the boundary of the OU2 land use control area. Levels of explosives exceeding the risk to groundwater action levels derived by modeling the contaminant concentrations in the vadose zone indicated the need for an action in the area surrounding the former O-Line ponds. The selected alternative was to extend the existing cap to include these surrounding soils and provide for long-term management (LTM) of the cap. This was completed in the third quarter of Fiscal Year 94 per the September 1993 ROD. Construction to extend the cap and install a geosynthetic liner was completed in 1997. LTM began at the site in 1997 when the extension of the cap was completed. LTM is required at this site until concentrations of contaminants in groundwater are reduced to below remedial goals. Land use controls (LUC) pertaining to the site include a requirement to 1) maintain the integrity of the cap drainage and fencing; 2) to prevent unauthorized disturbance of contaminated soil areas covered with engineered caps (Dig Restrictions); 3) implement access restrictions/fence with signage along the LUC boundary; 4) monitoring and testing the groundwater to ensure the cap is working and 5) to prevent residential use or other child-occupied facilities. This site is required to be inspected semi-annually and special inspections are required to be conducted following severe weather events. A certification that LUCs are being performed is required by ROD to be submitted annually to the USEPA. LUCs pertaining to monitoring and testing the groundwater have been implemented under the Site-Wide Groundwater Site MAAP-003. LTM at the site will continue indefinitely. The 2020 five-year review determined that the OU2 soils remedy is protective. However, persistent contaminant levels in groundwater have necessitated a study to evaluate site conditions including cap integrity and performance and to determine if there are additional sources of RDX. Because hazardous substances pollutants or contaminants will remain at the site at concentrations exceeding levels that allow for unlimited use (UU)/unrestricted exposure (UE) five-year remedy reviews will continue until UU/UE is achieved.

47475.1003_MAAP-003_Overall Groundwater (Central Pl

Env Site ID: MAAP-003

Cleanup Site: Overall Groundwater (Central Pl

Alias: MAAP-003

Regulatory Driver: CERCLA

RIP Date: 1/15/2015

RC Date: 12/15/2074

RC Reason: Not assigned

SC Date: 12/16/2074

Program: ENV Restoration, Army

Subprogram: IR

NPL Status: Yes

Hazardous Ranking Score: 58

RRSE:

MRSPP: N/A

Phase	Start	End
PA:	3/31/1978	6/30/1978
SI:	3/31/1978	6/30/1978
RI/FS:	9/30/1987	3/15/2014
RD:	3/15/2014	4/15/2014
IRA:	- -	- -
RA(C):	1/15/2014	5/15/2014
RA(O):	1/15/2015	12/15/2074
LTM:	- -	- -

Site Narrative: The site-wide groundwater restoration strategy has historically been grouped into three separate and distinct groundwater plume areas. They are the northern boundary area (MAAP-034), western boundary area (MAAP-011), and the central plume area (MAAP-003). One of these areas identified as the central plume area consists of groundwater in the vicinity of MAAP-003 (Line A), MAAP-004 (Line B), MAAP-005 (Line C), MAAP-006 (Line D), MAAP-007 (Line E), MAAP-008 (Line F), MAAP-009 (Line H), MAAP-017 (Open Burning Ground (OBG)), and MAAP-035 (Area M/Drainage Ditches). Past activities at these sites included renovating artillery mortar rounds and rocket components loading mortar rounds and rockets and disassembling and assembling howitzer shells as well as the destruction and disposal of munitions. Past practices at these areas have caused groundwater contamination resulting in what is now called the central plume area. The northern boundary area is comprised of MAAP-014 (OU1), MAAP-034 (OU3), MAAP-010 (Line K), and MAAP-013 (Line O). These units consist of groundwater located directly under and immediately downgradient of the O-Line Ponds. The northern boundary area plume is primarily contaminated with the explosives TNT and RDX and has migrated offsite to the north. The western boundary area (OU4) of site-wide groundwater consists of groundwater emanating from MAAP-011 (Line X), MAAP-003 (Line A), and MAAP-012 (Line Z). The western boundary area groundwater plume has migrated off the western and northwestern boundary of MLAAP. All groundwater sites both on-post and those that have migrated off-post have been grouped together into one site-wide groundwater remedy composed of active remediation (pump & treat) and monitored natural attenuation (MNA) and LUCs. Management associated with the site-wide groundwater and monitoring and land use controls is captured in MAAP-003. The estimated duration of the remedial action is based upon the groundwater model presented in the feasibility study (FS). The ROD was signed in July 2014 by the Army USEPA and the state. Post-ROD actions and costs have been identified and are associated with long-term monitoring through 2074. Facility contractor support is utilized to provide materials labor sample collection and analysis and/or equipment and survey services as necessary to support the government administration of the IR program. US Army Corps of Engineers (USACE) support

from the Center of Expertise is utilized for review of technical documents and the USACE Real Estate Division is responsible for maintaining leases for monitoring wells and extraction system components that are located outside the boundary of MLAAP and on private property. The site-wide groundwater remedy includes a period of combined extraction and treatment with MNA in current areas of low concentrations followed by a period of MNA once all extraction and treatment systems are shut down. The extraction and treatment systems in each plume area will be continually optimized to provide efficient contaminants of concern (COC) mass reduction and/or hydraulic control to maximize the use of the existing treatment plants at OU3 and OU4 and to shorten the overall life cycle of active remediation. Optimization activities will be triggered by a remedy management framework (including a prioritization process and a decision tree process) developed to evaluate remedy performance and guide optimization decisions. The remedial action objectives developed for the site-wide groundwater remedy include restoring groundwater to cleanup levels (i.e., beneficial use) preventing and/or minimizing future migration of plumes protecting receptors from exposure to groundwater containing COCs at concentrations above acceptable risk-based cleanup levels and protection of surface water. The LUC objectives for site-wide groundwater are to prevent access or use of the groundwater until cleanup levels are achieved and to maintain the integrity of the remedy. The LUC implementation actions include restrictions on groundwater withdrawal on MLAAP and maintaining land leases prohibiting access withdrawal invasion or use of groundwater on areas offsite where groundwater plumes have migrated. Because plumes have migrated offsite within the city of Milan LUCs include ensuring the city of Milan Code of Ordinances related to restrictions on groundwater use within the city of Milan are sustained by holding annual meetings with city of Milan officials. Annual facts sheets concerning remedy progress are published in the local paper and annual meetings are conducted for public education and outreach. The site-wide groundwater LUCs include monthly monitoring of MLAAP drinking water wells and annual monitoring of surface water at the Rutherford Fork of the Obion River. A “Site-Wide Groundwater Report” comprised of proof of drinking water monitoring maintenance of LUCs, and verification of recorded notices is completed annually by the IR Program Manager and reported to the USEPA. In accordance with the 2014 land use control implementation plan the LUCs are expected to remain in place until the COCs in the groundwater have been reduced to concentrations that allow for unlimited exposure and unrestricted use (i.e., restoration of groundwater to beneficial use). Five-year reviews are required for this site. The remedy management framework was developed to provide optimization recommendations throughout the duration of the remedy and include exit strategy end points such as shutting down extraction wells transitioning to MNA-only and finally removing monitoring wells from the long-term monitoring program. To achieve cleanup levels (i.e., beneficial use) the remedy is estimated to take 60 years from the implementation of the remedy beginning January 2015. The 2020 Five-Year Review found that sitewide groundwater was short-term protective in part because remedial timeframes may not be adequate. A solute transport model was completed in 2023 to aid in the review and possible modification of the conceptual site model. Based on the solute transport model and current remediation status annual review, active treatment will be necessary for more than the fifteen years projected in the Sitewide Groundwater Feasibility Study.

47475.1004_MAAP-003A_NI Soils OU

Env Site ID: MAAP-003A

Cleanup Site: NI Soils OU

Alias: SWMU 9

Regulatory Driver: CERCLA

RIP Date: 9/30/2009

RC Date: 9/30/2009

RC Reason: All Required Cleanup(s) Completed

SC Date: 9/30/2054

Program: ENV Restoration, Army

Subprogram: IR

NPL Status: Yes

Hazardous Ranking Score: 58

RRSE:

MRSPP: N/A

Phase	Start	End
PA:	3/31/1978	6/30/1978
SI:	3/31/1978	6/30/1978
RI/FS:	9/30/1987	4/30/1995
RD:	10/31/1996	1/31/1998
IRA:	- -	- -
RA(C):	4/30/1998	9/30/2009
RA(O):	5/31/1995	9/30/2009
LTM:	9/30/2009	9/30/2054

Site Narrative: Site 003A consists of the Northern Industrial (NI) area soils identified at OU3 and OU4. The current and reasonably anticipated future land use is industrial. Contamination of soils at Site MAAP-003A resulted from the discharge of explosive laden wastewater associated with historical production activities. Wastewater was discharged into open ditches resulting in the contamination of surface and subsurface soils. Contamination included TNT, RDX, and Tetryl. Sites MAAP-003A, MAAP-004A, MAAP-005A, MAAP-006A, MAAP-011A, MAAP-013A, MAAP-018A, and MAAP-032A have been consolidated into MAAP-003A as part of the NI Soils OU. A ROD for the NI Soils OU was signed in 1995. The remedy addressed the explosives-contaminated soil within both OU3 and OU4. OU3 consists of the northeast sector of the facility and OU4 the northwest sector of the facility. The NI area consists of all areas north of Route 54 in which industrial operations have been performed. These include load ammunition and pack (LAP) lines storage areas maintenance/fabrication areas and disposal areas. Based on the focused FS report the remedy selected included excavation of contaminated soils and in some instances where soil could not be remediated through excavation; engineered caps were installed as the remedy. Excavated soil was treated by composting. As part of the remedy 48 engineered caps were installed at six production lines. Upon approval of a decommissioning plan by the USEPA and Tennessee Department of Environment and Conservation (TDEC) the bioremediation (composting) facility was subsequently decommissioned from January through March 2009. The Final Remedial Action Completion Report for OU3/4 Soils was published on July 29, 2009. On Aug. 29, 2009, the TDEC Division of Solid Waste Management conducted a final closure inspection of the TDEC in accordance with the Rules Governing Solid Waste Processing and Disposal in Tennessee 1200-1-7-.11(2)(o). Inspection and LTM and monitoring are required as part of the LUC agreement for the caps and the OU3 Closed Sanitary Landfill southeast of Line H. LUCs include access restrictions and fencing at areas with caps prevention of unauthorized disturbance of contaminated soil areas covered with engineered caps (dig restrictions) and maintenance of the integrity of the caps and drainage. Quarterly inspections with quarterly reporting and an annual certification report are required to be submitted to the USEPA. Historical records lacked

the necessary data to determine if soil levels at MAAP-003A met the new cleanup goals. A data gap investigation was performed in 2023, which determined a field investigation would be required. Once the information from the field investigation is complete, the relevant decision document will be updated with the new Provisional Revised Cleanup Level.

It is anticipated that hazardous substances, pollutants, or contaminants will remain at the site at concentrations exceeding levels that allow for UU/UE, annual inspections and periodic remedy reviews will continue indefinitely. Based on the 2020 Five Year Review, remedial goals for soils need to be updated because of changes in toxicity data for RDX and Tetryl.

47475.1018_MAAP-011_OU4 Western Plume Area Groundwater

Env Site ID: MAAP-011

Cleanup Site: OU4 Western Plume Area Groundwater

Alias: MAAP-011

Regulatory Driver: CERCLA

RIP Date: 6/15/2014

RC Date: 12/15/2074

RC Reason: Not assigned

SC Date: 12/16/2074

Program: ENV Restoration, Army

Subprogram: IR

NPL Status: Yes

Hazardous Ranking Score: 58

RRSE:

MRSPP: N/A

Phase	Start	End
PA:	3/31/1978	6/30/1978
SI:	3/31/1978	6/30/1978
RI/FS:	9/30/1987	10/15/2013
RD:	9/30/2001	2/15/2014
IRA:	- -	- -
RA(C):	10/31/2000	6/15/2014
RA(O):	9/30/2005	12/15/2074
LTM:	- -	- -

Site Narrative: The site-wide groundwater restoration strategy has been grouped into three separate and distinct groundwater plume areas. They are the northern boundary area (MAAP-034), western boundary area (MAAP-011), and the central plume area (MAAP-003). One of these areas identified as the western plume area or OU4 consists of MAAP-011 (Line X) and MAAP-003 (Line A). Past activities associated with these production areas included renovating artillery mortar rounds and rocket components locating mortar rounds and rockets and disassembling and assembling howitzer shells. Past practices have resulted in explosive-contaminated groundwater. Two separate groundwater plumes in MAAP-011 were identified in previous studies as Region 1 and Region 2 plumes. Portions of these plumes have migrated off-post resulting in the shutdown and relocation of the city of Milan's drinking water system. In the mid-1990s the Army provided funds to the city of Milan to construct an alternative drinking water source upgradient of the contamination thereby eliminating the city's exposure to contaminated groundwater. In July 2002, a groundwater treatment plant (GWTP) was put into operation which used eight extraction wells with four of the wells located outside the boundaries of MLAAP. Because this system did not effectively capture the leading edge of the plume an off-post site characterization study was conducted. The study was finalized in December 2005 to further refine the extent of the plume's leading edge and further evaluate the need for additional extraction well placements for capture of the Region 1 (OU4) plume. In addition to the first eight extraction wells three additional wells were installed and became operational at the end of December 2008. Based on modeling documented in the 2013 FS for site-wide Groundwater additional extraction wells would be necessary to reduce concentrations in the plume down to levels that could be managed by MNA. In 2014 another extraction well was installed and piped into the groundwater collection system. To keep the system optimized more extraction wells are expected to be installed in the future as the groundwater plume configuration changes in response to pumping. An additional area of groundwater contamination at the western boundary area is Region 2 (OU4). This is a region of groundwater that has considerably lower contamination levels than Region 1 groundwater. In 2000 a pilot study using an in situ method (Fenton's Reagent) was completed to

determine if such treatment would reduce contaminant levels such that potential exposures beyond city limits would be below acceptable risk levels. The Region 2 site is identified as an MNA site; however, groundwater treatment is a possibility. The Site-Wide Groundwater FS (Final) signed in September 2013 provides a flexible management approach to determine whether groundwater treatment is needed in addition to MNA. Based on the selected remedy, active treatment will be utilized to reduce concentrations of contaminants to a point where the GWTPs can be shut down and MNA can complete the remedial process within the allotted timeframe. In accordance with the proposed plan all groundwater sites have been rolled into one site-wide groundwater ROD. The ROD was signed in July 2014. Since all groundwater plumes on MLAAP have been consolidated into one site-wide remedy management of the sites associated with the site-wide groundwater and monitoring and land use controls have been transitioned to site MAAP-003. Site MAAP-011 now includes only the costs for the operation of the OU4 GWTP and extraction systems and demolition of the OU4 GWTP at the end of its useful life. Projected long-term operation of the OU4 GWTP system may be extended based upon the solute transport model and annual remedial action status report. Five-year reviews are required for this site. Once concentrations of contaminants in groundwater are reduced enough to meet remedial action objectives the GWTP and associated extraction systems will be decommissioned. No LUCs are associated with operation of the OU4 GWTP extraction systems or the demolition of the GWTP.

47475.1036_MAAP-034_Northern Boundary Area OU1 & 3

Env Site ID: MAAP-034

Cleanup Site: Northern Boundary Area OU1 & 3

Alias: MAAP-034

Regulatory Driver: CERCLA

RIP Date: 6/15/2014

RC Date: 12/15/2074

RC Reason: Not assigned

SC Date: 12/16/2074

Program: ENV Restoration, Army

Subprogram: IR

NPL Status: Yes

Hazardous Ranking Score: 58

RRSE:

MRSPP: N/A

Phase	Start	End
PA:	3/31/1978	6/30/1978
SI:	3/31/1978	6/30/1978
RI/FS:	9/30/1987	9/15/2013
RD:	10/31/2004	2/15/2014
IRA:	1/31/1997	6/15/2014
RA(C):	9/15/1998	6/15/2014
RA(O):	9/30/1999	12/15/2074
LTM:	- -	- -

Site Narrative: The site-wide groundwater strategy has been grouped into three separate and distinct groundwater plume areas. They are the northern boundary area (MAAP-034), western boundary area (MAAP-011), and the central plume area (MAAP-003). One of the three areas includes the northern boundary area comprised of MAAP-014 (OU1), MAAP-034 (OU3), MAAP-010 (Line K), and MAAP-013 (Line O). These units consist of explosive-contaminated groundwater located directly under and immediately downgradient of the O-Line Ponds. In September 1992 interim RODs were signed for OU1 and in September 1994 for OU3. These established the implementation of groundwater extraction and treatment systems for each of these areas that make up the northern boundary area. Both groundwater treatment systems utilized activated carbon as the primary treatment media that reduced explosives from extracted groundwater through the treatment process. The OU1 GWTP originally used three extraction wells and six reinjection wells as its primary method of groundwater transport. In 2010 a technical memorandum approved by the regulatory community allowed the reconfiguration of flows from the OU1 GWTP to the OU3 GWTP. The OU1 GWTP was shut down in 2010 and the extraction wells were piped to OU3. The OU1 GWTP was decontaminated and demolished in the calendar years 2012-2013. The Site-Wide Groundwater FS (Final) signed in September 2013 provided a flexible management approach to determine whether groundwater treatment is needed in addition to MNA. In accordance with the proposed plan all groundwater plume areas were rolled into one site-wide groundwater ROD. The Site-Wide Groundwater ROD was signed in July 2014. The selected remedy for site-wide groundwater included a combination of active remediation (pump and treat) MNA and LUCs. Based on the selected remedy, active treatment will be utilized to reduce concentrations of contaminants to a point where the GWTPs can be shut down and MNA can complete the remedial process within the allotted timeframe. As part of the selected remedy the groundwater extraction systems are evaluated and optimized on an annual basis to determine whether the remedy is on track. Based on modeling documented in the 2013 FS for site-wide Groundwater additional extraction wells would be necessary to reduce concentrations in the plume down to levels that could be managed by MNA. In 2014 five

additional extraction wells were installed and piped into the groundwater collection system. Four extraction wells were installed in the OU3 plume and one extraction well from the central plume was installed and piped to the OU3 GWTP. More extraction wells are expected to be installed as the groundwater plume configurations shift over time. The OU3 GWTP currently has 12 extraction wells available for use that are operated as determined based on an annual remedial action system evaluation. After treatment by pH adjustment filtering and activated carbon, the water is discharged in accordance with surface water requirements into the Rutherford Fork of the Obion River. Since all groundwater plumes on MLAAP have been consolidated into one site-wide groundwater remedy management of the sites associated with the long-term site-wide groundwater monitoring and land use controls have been transitioned to site MAAP-003. Site MAAP-034 now includes only the costs for the operation of the OU3 GWTP and extraction systems and demolition of the OU4 GWTP at the end of its useful life. Five-year reviews are required for this site. Projected long-term operation of the OU4 GWTP system may be extended based upon the solute transport model and annual remedial action status reports. Once concentrations of contaminants in groundwater are reduced enough for MNA to be implemented the GWTP and associated extraction systems will be decommissioned. No LUCs are associated with operation of the OU4 GWTP extraction systems or the demolition of the GWTP.

47475.1046_MAAP-038_PFAS

Env Site ID: MAAP-038

Cleanup Site: PFAS

Alias: #

Regulatory Driver: CERCLA

RIP Date: 1/15/2025

RC Date: 1/15/2025

RC Reason: Not assigned

SC Date: 1/16/2025

Program: ENV Restoration, Army

Subprogram: IR

NPL Status: Yes

Hazardous Ranking Score: 58

RRSE:

MRSPP: N/A

Phase	Start	End
PA:	5/21/2018	9/19/2019
SI:	9/20/2019	12/10/2021
RI/FS:	1/15/2023	1/15/2025
RD:	- -	- -
IRA:	- -	- -
RA(C):	- -	- -
RA(O):	- -	- -
LTM:	- -	- -

Site Narrative: Per direction from the Deputy Chief of Staff G-9, site was created to account for all per- and polyfluoroalkyl substances (PFAS) costs at the installation. The current and reasonably anticipated future land use at the installation is industrial. A preliminary assessment (PA) and site investigation (SI) were performed to identify all releases of PFAS to the environment. A PA site visit was conducted at the MLAAP on March 11 & 12, 2019. Based on relevant data and documents obtained and reviewed, twenty-one areas were visually surveyed during site reconnaissance. Visual surveying activities during the site visit at MLAAP were focused on known load, ammunition, and pack line (LAP) areas; fire station areas; wastewater treatment plants; OBG; pesticide mixing areas; car wash facilities; Teflon use areas; and suspected fire training areas. The PA identified twelve areas of potential interest (AOPI) where sampling of soil and groundwater was recommended. Field work for the SI was conducted in 2020 and a final PA/SI report completed in accordance with DERP M §4.b.(2)(b). The SI sampling results from the AOPIs were compared to risk-based screening levels calculated by the Office of the Secretary of Defense for perfluorooctane sulfonate (PFOS), perfluorooctanoic acid (PFOA), and perfluorobutanesulfonic acid (PFBS). PFOS, PFOA, and/or PFBS were detected in soil and/or groundwater at three AOPIs. Based on the updated Department of Army Technical Guidance dated July 6, 2022, the individual PFAS chemical perfluorohexane sulfonate (PFHxS) exceeded the action level of 39 ng/L in groundwater at one AOPI, former Fire Station. Concentration detected in groundwater samples were 170 ng/L and 190 ng/L. A contract to complete a RI was issued in 2023. Further actions will be determined after the RI/FS phase and will continue until the time that UU/UE is obtained.

SITE SUMMARY

SITE CLOSEOUT SUMMARY

CRL ID	Site Name	Site Closeout Date
47475.1005	MAAP-004_OU4, Region 1 (LINE B (SWMU 9)	7/31/2004
47475.1006	MAAP-004A_LINE B (BIOREMEDIATION)	7/31/2004
47475.1007	MAAP-005_LINE C (SWMU 9)	7/31/2004
47475.1008	MAAP-005A_LINE C (BIOREMEDIATION)	7/31/2004
47475.1009	MAAP-006_LINE D (SWMU 9)	7/31/2004
47475.1010	MAAP-006A_LINE D (BIOREMEDIATION)	7/31/2004
47475.1011	MAAP-007_LINE E (SWMU 9)	9/30/2002
47475.1012	MAAP-007A_LINE E (BIOREMEDIATION)	9/30/2002
47475.1013	MAAP-008_LINE F (SWMU 9)	9/30/2002
47475.1014	MAAP-008A_LINE F (BIOREMEDIATION)	9/30/2001
47475.1015	MAAP-009_LINE H (SWMU 9)	9/30/2002
47475.1016	MAAP-009A_LINE H (BIOREMEDIATION)	9/30/2002
47475.1017	MAAP-010_LINE K (SWMU 9)	7/31/2004
47475.1019	MAAP-011A_LINE X (BIOREMEDIATION)	7/31/2004
47475.1020	MAAP-012_LINE Z (SWMU 9)	7/31/2004
47475.1021	MAAP-012A_LINE Z (BIOREMEDIATION)	9/30/2003
47475.1022	MAAP-013_LINE O (SWMU 9)	9/30/2002
47475.1023	MAAP-013A_LINE O (BIOREMEDIATION)	7/31/2004
47475.1024	MAAP-014_O LINE LAGOON GROUNDWATER (SWMU	7/31/2004
47475.1029	MAAP-018_CLOSED LANDFILL (SWMU 6)	1/31/2003
47475.1030	MAAP-018A_CLOSED LANDFILL (BIOREMEDIATIO	7/31/2004
47475.1032	MAAP-022_SALVAGE YARD (SWMU 11)	12/31/1991
47475.1033	MAAP-032_CONSTRUCTION DISPOSAL SITE and	10/31/2002
47475.1034	MAAP-032A_CONSTRUCTION DISPOSAL SITE	7/31/2004
47475.1037	MAAP-035_EFF DRAINAGE DITCHES (CENTRAL)	7/31/2004
47475.1040	PBC at Milan_PBC at Milan	1/15/2014
47475.1044	CCMLAAP05_LNAPL Removal At Line B	6/30/2010
47475.1045	CCMLAP06_AREA J TANK FARM	8/15/2015

COMMUNITY INVOLVEMENT

Community Involvement Plan (Date Last Reviewed):	3/15/2022
Technical Review Committee Establishment Date:	7/31/1987
Restoration Advisory Board (RAB) Establishment Date:	7/31/1994
RAB Adjournment Date:	8/15/2014
RAB Adjournment Reason:	All environmental restoration remedies are in place and are operating properly and successfully
Reasons for Not Establishing RAB:	N/A
RAB Date of Solicitation from Community:	N/A
RAB Results of Solicitation:	N/A
Current Technical Assistance for Public Participation (TAPP):	N/A
TAPP Title:	N/A
Potential TAPP:	N/A
Administrative Record Location:	Army Environmental Office, Milan Army Ammunition Plant, Suite 1, Milan Tenn
Information Repository Location:	Mildred G. Fields Library, 1075 East Van Hook Street, Milan, TN, 38358-2859

FIVE-YEAR / PERIODIC REVIEW SUMMARY

Status	Review Type	Start Date	End Date	Plans Narrative	Actions Narrative	Results Narrative
Completed	FYR	11/15/2019	9/27/2020	Prepare groundwater solute transport model. Implement recommendations for changes to ROD Decision Tree Matrix. Update remedial goals for groundwater, surface water and soils.	Prepare groundwater solute transport model. Implement recommendations for changes to ROD Decision Tree Matrix. Update remedial goals for groundwater, surface water and soils.	Remedies are in place but were found to be protective or short term protective for various reasons. Solute Transport Plan has been completed. Relic Source Area Investigation workplan prepared to address possible recalcitrant areas of contamination at OU3/4 soils sites and OU2 and OU5 caps.
Planned	FYR	9/24/2024	9/27/2025	TBD	TBD	TBD