

JEFFERSON PROVING GROUND

Army Cleanup Program

Installation Action Plan Final

June 2024

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STATEMENT OF PURPOSE

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

INSTALLATION OVERVIEW

Installation Name: JEFFERSON PROVING GROUND

Installation City: MADISON

Installation County: JEFFERSON

Installation State: IN

Regulatory Participation - Federal: Nuclear Regulatory Commission (NRC)

Regulatory Participation - State: Indiana Department of Environmental Management

ACRONYMS

Acronym	Definition
1,1,1-TCA	1,1,1-Trichloroethane
AEDB-R	Army Environmental Database - Restoration
BRAC	Base Realignment and Closure
CC	Compliance-Related Cleanup
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act of 1980
COC	Contaminant of Concern
CRL	Cleanup Restoration & Liabilities
DD	Decision Document
DU	Depleted Uranium
EIS	Environmental Impact Statement
ENV	Environmental
ERM	Environmental Radiation Monitoring
ERMP	Environmental Radiation Monitoring Plan
FS	Feasibility Study
FYR	Five-Year Review
IDEM	Indiana Department of Environmental Management
RISC	Risk Integrated System of Closure
IAP	Installation Action Plan
ID	Identification
IDW	Investigation Derived Waste
INANG	Indiana Air National Guard
IR	Installation Restoration
IRA	Interim Remedial Action
JPG	Jefferson Proving Ground
LTM	Long-Term Management
LUC	Land Use Control
LUCIP	Land Use Control Implementation Plan
MCL	Maximum Contaminant Level
MNA	Monitored Natural Attenuation
MOA	Memorandum of Agreement
MR	Munitions Response
MRSP	Munitions Response Site Prioritization Protocol
NPL	National Priorities List
NRC	Nuclear Regulatory Commission
NWR	National Wildlife Refuge
PA	Preliminary Assessment

Acronym	Definition
PPB	Parts Per Billion
PR	Periodic Review
RAB	Restoration Advisory Board
RA(C)	Remedial Action (Construction)
RA(O)	Remedial Action (Operations)
RC	Response Complete
RCRA	Resource Conservation and Recovery Act
RD	Remedial Design
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
TCE	Trichloroethylene
TECOM	US Army Test and Evaluation Command
UE	Unrestricted Exposure
USAEC	US Army Environmental Command
USFWS	US Fish and Wildlife Service
UST	Underground Storage Tank
UU	Unrestricted Use
UXO	Unexploded Ordinance

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: 0/3

Number of Open Sites with Response Complete/Total Open MR Sites: 0/1

Number of Open Sites with Response Complete/Total Open CC Sites: 0/1

SITE-LEVEL INFORMATION

18255.1005_JPG-05_LANDFILL ABANDONED (REVEGATED) (S)

Env Site ID: JPG-05

Cleanup Site: LANDFILL ABANDONED (REVEGATED) (S)

Alias: JPG-05

Regulatory Driver: CERCLA

RIP Date: 3/31/2005

RC Date: 9/30/2054

RC Reason: Not assigned

SC Date: 9/30/2054

Program: ENV Restoration, Army

Subprogram: IR

NPL Status: No

Hazardous Ranking Score: 0

RRSE:

MRSPP: N/A

Phase	Start	End
PA:	11/30/1989	11/30/1990
SI:	3/31/1991	3/31/1992
RI/FS:	9/30/1991	8/31/2003
RD:	3/31/2003	12/31/2004
IRA:	--	--
RA(C):	9/30/2003	2/28/2005
RA(O):	3/31/2005	9/30/2054
LTM:	--	--

Site Narrative: JPG-05 (ROD Sites 3 /4) is the Old Abandoned Landfill located at the southeast corner of Engineering Road and Paper Mill Road which is located in the southern portion of Jefferson Proving Ground (JPG) south of the firing line road and is no longer owned by the Army. The landfill area was in use from 1941- 1970 and closed in the early 1970s. The current and reasonably anticipated future land use is commercial agricultural development. Film refuse from photography processing was dumped into this unlined landfill. It was also suspected that spent solvents pesticides containers ash from incineration and small arm munitions were likely disposed in the filled in trenches. The material disposed in the landfill was not well documented. Thus, during the Remedial Investigation/Feasibility Study (RI/FS) phase samples were analyzed for a wide range of contaminants. TCE is the primary contaminant of concern (COC) range from 10 parts per billion (ppb) to 230 ppb in various wells associated with JPG-05 area. The groundwater in the site area has been contaminated with trichloroethylene (TCE) above the maximum contaminant level (MCL). The approach for closure was to follow the Indiana Department of Environmental Management (IDEM) Risk Integrated System of Closure (RISC) Guidance for closure using plume stability which requires eight continuous quarters of sampling to gather trend analysis data and then 20 consecutive quarters of data to determine if the plume is stable and/or shrinking. A final record of decision (ROD) was signed in November 2004. The ROD called for soil removal which has been completed. The ROD also called for monitored natural attenuation (MNA) of the groundwater for this site which is underway. In 2004, a removal action was begun and completed in 2005. All confirmation sampling results indicate that soils are below Unrestricted Use / Unrestricted Exposure (UU/UE) (residential). Approximately 5,560 tons of soil were removed, and the site backfilled with #4 stone up to two feet below grade to act as an infiltration trench to help circulate clean water through the groundwater system. The top two feet were filled with clean soil. Results from quarterly and annual sampling since 2006 indicate the plume is decreasing in size and contaminant levels within the plume are decreasing. The groundwater monitoring sampling network has been reduced as well as frequency of sampling from quarterly to annually after the 2015 Annual report was reviewed by the regulatory

agency. Wells have been removed to reduce potential illegal dumping. Remedial Action (Operations) (RA(O)) is anticipated to continue until TCE levels are below MCL concentrations in groundwater. Cleanup and Exit Strategy is to continue annual sampling and five-year reviews until MCLs are reached. At the conclusion of RA(O) it is anticipated the site will be at UU/UE and will not require Land Use Control (LUC). The site was an unregulated dump site, not a permitted landfill. No waste left in place.

18255.1031_JPG-27_BLD 602 SOLVENT PIT (S)

Env Site ID: JPG-27

Cleanup Site: BLD 602 SOLVENT PIT (S)

Alias: JPG-27

Regulatory Driver: CERCLA

RIP Date: 2/28/2005

RC Date: 9/30/2054

RC Reason: Not assigned

SC Date: 9/30/2054

Program: ENV Restoration, Army

Subprogram: IR

NPL Status: No

Hazardous Ranking Score: 0

RRSE:

MRSPP: N/A

Phase	Start	End
PA:	11/30/1989	11/30/1990
SI:	3/31/1991	3/31/1992
RI/FS:	9/30/1991	11/23/2004
RD:	--	--
IRA:	6/30/2000	9/30/2000
RA(C):	3/31/2004	12/31/2004
RA(O):	2/28/2005	9/30/2054
LTM:	--	--

Site Narrative: JPG-27 (RI/FS Site 12a) is a solvent disposal pit associated with Bldg 602 located north of Woodfill Road and 1/3 mile east of Tokyo Road south of the firing line road. The heating plant operated from 1941- 1995. JPG-27 solvent disposal pit was used from 1970-1978. The reasonably anticipated future land use is commercial agricultural development. Solvent /degreaser were used to clean parts and disposed of in the unlined pit (no containment). An estimated 500 gallons of solvent 1,1,1-Trichloroethane (1,1,1-TCA) was disposed of in the pit. However, TCE is the primary COC in soil and groundwater. The groundwater in the site area has been contaminated with TCE above MCL levels in the overburden upper bedrock and deeper bedrock. Contamination levels range from 10 ppb to over 100,000 ppb in the vicinity of the disposal pit. The remedial investigation was able to determine the extent of the groundwater plumes and the source areas. The deeper bedrock plume covers more than an acre. The upper bedrock and overburden are confined to the pit area. Groundwater sampling started in 2006. A removal action was completed in 2000 and soil levels under the building foundation remained above residential risk. Soil was not excavated under the building foundation to ensure the building remained structurally intact. To help reduce these levels three tubes were inserted to the affected area and a nitrate solution was added. Approximately 140 tons of soils were removed. Soil vapor intrusion was investigated, and the soils did not pose an issue due to the high clay content and the openness of the building. A Final ROD was signed in November 2004. The ROD called for MNA of the groundwater for this site which is underway. The approach for closure was to do point source removal and follow the IDEM RISC Guidance for closure using plume stability which requires eight continuous quarters of sampling to gather trend analysis data and then 20 consecutive quarters of data to determine if the plume is stable and/or shrinking. The data can also show a reduction of contaminants levels and can be used to show plume stability. Results from quarterly and annual sampling indicate the plume is decreasing in size and contaminate levels within the plume are decreasing. However, contaminant levels at the site were extremely high and has impacted all three groundwater bearing zones overbearing zone the upper bedrock zone and the deeper zone. Levels were 100,000 ppb near the point source. The

deeper bedrock zone concentrations levels are below MCLs, so reduction is occurring. The groundwater monitoring sampling network has been reduced as well as frequency of sampling from quarterly to annually after 2015 Annual Report was reviewed by the regulatory agency. To further reduce cost a comparison study of low flow sampling versus passive sampling was conducted and the site was approved for passive sampling. This reduces time in the field and Investigation Derived Waste (IDW) disposal requirements. Monitoring is anticipated to continue until TCE levels reach MCL concentrations in groundwater. To enhance natural attenuation the Army will conduct pilot studies to determine the best path forward to enhance natural attenuation and reduce the level of contaminants. The pilot study will be conducted in FY23, and the Army will look to implement the path forward in FY24/FY25.

Cleanup and Exit Strategy is to continue annual sampling and five-year reviews until MCLs are reached. At the conclusion of RA(O) it is anticipated the site will be at UU/UE and will not require LUCs.

18255.1032_JPG-28_BLD 617 SOLVENT PIT (S)

Env Site ID: JPG-28

Cleanup Site: BLD 617 SOLVENT PIT (S)

Alias: JPG-28

Regulatory Driver: CERCLA

RIP Date: 2/28/2005

RC Date: 9/30/2054

RC Reason: Not assigned

SC Date: 9/30/2054

Program: ENV Restoration, Army

Subprogram: IR

NPL Status: No

Hazardous Ranking Score: 0

RRSE:

MRSPP: N/A

Phase	Start	End
PA:	11/30/1989	11/30/1990
SI:	3/31/1991	3/31/1992
RI/FS:	9/30/1991	11/23/2004
RD:	--	--
IRA:	6/30/2000	9/30/2000
RA(C):	5/31/2004	12/31/2004
RA(O):	2/28/2005	9/30/2054
LTM:	--	--

Site Narrative: JPG -28 (RI/FS Site 12B) is a solvent disposal pit associated with Bldg 617 north of Woodfill Road and 1/3 mile east of Tokyo Road. A former heating plant operated from 1941- 1995. JPG 28 solvent disposal pit was used from 1970-1978. The reasonably anticipated future land use is commercial agricultural development. Solvent/degreaser was used to clean parts and the spent solvent disposed of in unlined pits (no containment). It is estimated that 500 gallons of the solvent 1,1,1-TCA was disposed of in the pit. TCE is the primary COC in soil and groundwater. The groundwater in the site area has been contaminated with TCE above MCL levels in the overburden upper bedrock and deeper bedrock. Contamination levels range from 10 ppb to over 100,000 ppb in the vicinity of the disposal pit. These pits were unlined. The remedial investigation determined the extent of the groundwater plumes and the source areas. The deeper bedrock plume covers more than an acre. The upper bedrock and overburden are confined to the pit area. The approach for closure was to do point source removal and follow the IDEM RISC Guidance for closure using plume stability which requires eight continuous quarters of sampling to gather trend analysis data and then 20 consecutive quarters of data to determine if the plume is stable and/or shrinking. The data can also show a reduction of contaminate levels and can be used to show plume stability. A removal action was completed in 2000 and soil levels under the building foundation remained above residential risk. Soil was not excavated under the building foundation to ensure the building remained structurally intact. To help reduce these levels three tubes were inserted to the affected area and a nitrate solution was added. Approximately 130 tons of soils were removed. Soil vapor was investigated and did not pose an issue due to the high clay content and the openness of the building. Quarterly groundwater sampling began in 2006. A Final ROD was signed in November 2004. The ROD called for MNA of the groundwater for this site which is underway. Results from quarterly and annual sampling indicate the plume is decreasing in size and contaminant levels within the plume are decreasing. Contaminant levels at the site were extremely high and has impacted all three groundwater bearing zones overbearing zone the upper bedrock zone and the deeper zone. Levels were 100,000 ppb near the point source. Over the past levels have begun to reduce and the

plumes are very stable and reducing in size. The groundwater monitoring sampling network has been reduced as well as frequency of sampling from quarterly to annually after 2015 Annual report was reviewed by the regulatory agency. To further reduce cost a comparison study of low flow sampling versus passive sample was conducted and the site was approved for passive sampling. This reduces time in the field and IDW disposal requirements. Monitoring is anticipated to continue until TCE levels reach MCL concentrations in groundwater. The pilot study was conducted in FY23, and the Army will look to implement the path forward in FY24/FY25.

Cleanup and Exit Strategy is to continue annual sampling and five-year reviews until MCLs are reached. At the conclusion of RA(O) it is anticipated the site will be at UU/UE and will not require LUCs.

18255.1104_JPG-001-R-01_NORTH RANGE GROUP

Env Site ID: JPG-001-R-01

Cleanup Site: NORTH RANGE GROUP

Alias: #

Regulatory Driver: CERCLA

RIP Date: 11/15/2027

RC Date: 11/15/2027

RC Reason: Not assigned

SC Date: 9/30/2057

Program: ENV Restoration, Army

Subprogram: MR

NPL Status: No

Hazardous Ranking Score: 0

RRSE: N/A

MRSPP: 9

Phase	Start	End
PA:	1/31/2003	6/30/2003
SI:	--	--
RI/FS:	9/15/2014	10/15/2027
RD:	--	--
IRA:	9/15/2014	11/15/2027
RA(C):	10/16/2027	11/15/2027
RA(O):	--	--
LTM:	11/16/2027	9/30/2057

Site Narrative: JPG was established in 1941 as a proving ground for the test firing of a wide variety of conventional munitions. JPG is located in Jefferson, Jennings and Ripley Counties in southeastern Indiana. A firing line with 268 fixed-gun positions used to test munitions separates the 55,264 acres (ac) (224 square kilometers [km²]) of real property at JPG into two areas - a southern portion with property that has been or will be transferred from US Army control to a private individual and a northern portion that the US Army will continue to own. The current and reasonably anticipated use is a national wildlife refuge. The US Army used JPG as a proving ground from 1941 to 1995. During this time more than 24 million rounds of conventional explosive ammunition were fired. Approximately 1.5 million rounds did not detonate upon impact remaining as unexploded ordnance (UXO) either on or beneath the ground surface. An additional three to five million rounds with live detonators primers or fuses remain within the installation north of the firing line due to Army munitions testing between 1941 and 1994 (US Army 1995).

Cleanup/Exit Strategy - A Remedial Investigation/Feasibility Study (RI/FS) will be completed followed by development of a Land Use Control Implementation Plan (LUCIP). Long-Term Management (LTM) based on the LUCIP will be conducted indefinitely to include five-year reviews.

18255.1106_JPG-32_DU Firing Range (CC)

Env Site ID: JPG-32

Cleanup Site: DU Firing Range (CC)

Alias: #

Regulatory Driver: OTHER

RIP Date: 9/30/2014

RC Date: 9/30/2054

RC Reason: Not assigned

SC Date: 9/30/2054

Program: Compliance-related Cleanup

Subprogram: CC

NPL Status: No

Hazardous Ranking Score: 0

RRSE: N/A

MRSPP:

Phase	Start	End
PA:	3/31/1989	3/31/1990
SI:	3/31/1991	3/31/1992
RI/FS:	6/30/1998	8/31/2013
RD:	--	--
IRA:	--	--
RA(C):	--	--
RA(O):	9/30/2014	9/30/2054
LTM:	--	--

Site Narrative: JPG-32 is the Depleted Uranium (DU) impact area (approximately 2000 acres) which is located west of Wonju Road east of Morgantown Road north of C Road and south of F Road in the center of the 51,000-acre Big Oaks National Wildlife Refuge. The reasonably anticipated future land is a national wildlife refuge. The US Army has received a license amendment (#20 - issued September 2019) from the Nuclear Regulatory Commission (NRC) which approved a possession-only license for the Army. From 1984-1994, JPG test fired tank penetrator rounds containing DU under NRC Materials License SUB-1435. In September 1995, the US Army requested to transfer the NRC license from JPG to the US Army Test and Evaluation Command (TECOM) Aberdeen Proving Ground, Maryland. In 1996, the NRC approved the license transfer amended the license to possession-only of DU north of the firing line. These referenced documents began the site characterization of the DU site in 2008- a) United States of America Nuclear Regulatory Commission (NRC) Atomic Safety and Licensing Board Docket IV. 40-8838-MLA dated February 28, 2008, Notice; and b) United States of America Nuclear Regulatory Commission Atomic Safety and Licensing Board Docket No. 40-8838 MLA dated February 28, 2008, Initial Decision by administrative judges. The site characterization acquired additional site-specific data for groundwater surface water soil sediment and DU penetrator corrosion/erosion studies within the DU area (located within a JPG impact/UXO area) in accordance with the Decommissioning Plan and Environmental Reports issued by the Army in August 2013. In September 2014, the NRC began the process of developing an environmental impact statement (EIS) to determine the fate of the NRC license. In December 2014, the NRC held public meetings to develop the EIS. Based on NRC comments the US Army determined to maintain the Materials License SUB-1435 under restricted conditions. The current Environmental Radiation Monitoring Plan (ERMP) requires semiannual environmental radiation monitoring (ERM) that consists of four sediment samples four groundwater wells and four surface water samples and associated reporting. All samples are analyzed for Uranium 234/238.

Cleanup and Exit Strategy is to continue monitoring/sampling the DU Range indefinitely as required under the NRC license.

SITE SUMMARY

SITE CLOSEOUT SUMMARY

CRL ID	Site Name	Site Closeout Date
18255.1009	JPG-09 DISPOSAL AREA (BEHIND 211) (S)	6/30/2018
18255.1033	JPG-29_BLD 279 SOLVENT PIT (S)	9/30/2019
18255.1036	JPG-32_DU FIRING RANGE (N)	4/28/2021
18255.1048	JPG-44_SULFUR DUMP (S)	8/30/2018

COMMUNITY INVOLVEMENT

Community Involvement Plan (Date Last Reviewed):	2014
Technical Review Committee Establishment Date:	N/A
Restoration Advisory Board (RAB) Establishment Date:	4/30/1994
RAB Adjournment Date:	12/31/2010
RAB Adjournment Reason:	All environmental restoration remedies are in place and are operating properly and successfully.
Reasons for Not Establishing RAB:	Will solicit in September 2024
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:	Building 125, 125 West Niblo Madison, Indiana
Information Repository Location:	Building 125, 125 West Niblo Madison, Indiana

FIVE-YEAR / PERIODIC REVIEW SUMMARY

Status	Review Type	Start Date	End Date	Plans Narrative	Actions Narrative	Results Narrative
Completed	FYR	2/5/2018	2/5/2019	N/A	N/A	Remedies remain protective.
Underway	FYR	2/5/2023	2/5/2024	Continue Groundwater Monitoring.	Continue Groundwater Monitoring.	TBD
Planned	FYR	2/5/2028	2/5/2029	TBD	TBD	TBD