US Army Garrison Stuttgart

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.

ACRONYMS

Acronym	Definition
AFFF	Aqueous Film-Forming Foam
AHC	Aminohydrocinnamic Acid
ARLOC	Area Location
AST	Aboverground Storage Tank
BBodschG	Bundes-Bodenschutz-Gesetz Federal Soil Protection Act
BBodschV	Bundes-Bodenschutz-Verordnung Federal Soil Protection Ordinance
BGS	Below Ground Surface
BIMA	Bundesanstalt für Immobilienaufgaben
BTEX	Benzene, Toluene, Ethylbenzene, and Xylenes
CC	Compliance-related Cleanup
CHC	Chlorinated hydrocarbon
CRL	Cleanup Restoration & Liabilities
DODI	Department of Defense Instruction
DUCS	Database of USAREUR Contaminated Sites
ENV	Environmental
FS	Feasibility Study
FY	Fiscal Year
HN	Host Nation
HRS	Hazard Ranking System
HWAP	Hazardous Waste Accumulation Point
IAW	In Accordance With
ID	Identification
IR	Installation Restoration
IRA	Interim Remedial Action
LEC	Lead Environmental Component
LNAPL	Light Non-Aqueous Phase Liquid
LTA	Local Training Area
LTM	Long-Term Management
m	meter
m^2	square meter
m^3	cubic meter
mg/kg	milligram per kilogram
mg/L	milligram per liter
MR	Munitions Response
MRSPP	Munitions Response Site Prioritization Protocol

Acronym	Definition
NATO	North Atlantic Treaty Organization
NFA	No Further Action
NPL	National Priorities List
PA	Preliminary Assessment
PAH	Polycyclic Aromatic Hydrocarbon
PFC	Perfluorocarbon
PFHxS	Perfluorohexanesulfonic Acid
PFOS	Perfluorooctane Sulfonic Acid
POL	Petroleum, Oil, & Lubricants
POL	Petroleum, Oil, and Lubricants
RA(C)	Remedial Action (Construction)
RA(O)	Remedial Action (Operations)
RAB	Restoration Advisory Board
RC	Response Complete
RD	Remedial Design
RI	Remedial Investigation
RIP	Remedy-in-Place
RRSE	Relative Risk Site Evaluation
SAAF	Stuttgart Army Airfield
SC	Site Closeout
SI	Site Inspection
SOFA	Status of Forces Agreement
t	ton
TPH	Total Petroleum Hydrocarbons
ug/L	microgram per liter
US	United States
UST	Underground Storage Tank

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: 0/0

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

Number of Open Sites with Response Complete/Total Open Sites: 1/4

SITE-LEVEL INFORMATION

GE09C - Boeblingen Tng Area

Installation Name: US Army Garrison Stuttgart

Installation City: Stuttgart

5585A.1001_CCST109_GE09C_Race Track Dump Area

Env Site ID: CCST109

Cleanup Site: GE09C_Race Track Dump Area

Alias: STST109

Regulatory Driver: DODI

RIP Date: 11/30/2008

RC Date: 10/31/2011

RC Reason: All Required Cleanup(s) Completed

SC Date: 9/30/2054

Program: Compliance-related Cleanup

Subprogram: CC

NPL Status: No

Hazardous Ranking Score: 0

RRSE: N/A

MRSPP: N/A

Phase	Start	End
PA:	4/15/2001	11/30/2002
SI:	4/30/2001	11/30/2002
RI/FS:	11/30/2002	12/31/2007
RD:	- -	- -
IRA:	- -	- -
RA(C):	1/31/2008	11/30/2008
RA(O):	11/30/2008	10/31/2011
LTM:	10/31/2011	9/30/2054

Site Narrative: SITE LOCATION AND DESCRIPTION

1. Location- The site is located in the western portion of Boeblingen Training Area (ARLOC GE09C) immediately adjacent to the western boundary of the ARLOC.

2. Physical Layout/Site Use- The site was used as a landfill from 1951 - 1976 and then a stockcar racetrack from 1976 - 1991. The site currently is used as AMC (Advanced Mobility Course) with reduced maintenance. It consists of vegetated and forested land that contains several wetland areas and no pavement.

CONCEPTUAL SITE MODEL

1. Release Description- The site was used as landfill between 1951 and 1976. The source of contaminants is the landfill body.

2. Media Impacted- Phenol, BTEX, PAH, metals, chloride, and ammonium in soil and groundwater. Methane in soil vapor.

3. Nature and Extent of Contamination- The May 2023 maximum groundwater contaminant concentrations along with their remediation target values in parentheses are as follows- Total CHC 14.5 ug/L (10 ug/L) PAH 6.306 ug/L (0.15 ug/L), BTEX 30 ug/L (10 ug/L), ammonia 40 mg/L (0.5 mg/L), arsenic 0.034 mg/L (0.01 mg/L). In December 2022, maximum concentrations are as follows - Total CHC 9 ug/L, PAH 2.406 ug/L, BTEX 13 ug/L, ammonia 44 mg/L, arsenic 0.028 mg/L. Two aquifers exist at the site. The shallow aquifer is assumed not to represent a coherent aquifer but rather a perched aquifer where groundwater is present in local patches. Elevated and inconsistent groundwater levels in deep wells may be a result of infiltrating perched water due to well effects. The local groundwater flow direction in the bedrock (deep aquifer) is assumed to be towards the southeast. The depth to groundwater in the deep aquifer ranges from 10 - 15 m bgs.

4. Receptors- The site is not located within a groundwater protection zone. However, a mineral spring protection area is located directly to the north and west and is the primary receptor of concern.

REMEDIAL OBJECTIVE

1. Long-Term Closeout Strategy- To demonstrate that CHC contaminants and other COC do not pose a significant risk to receptors.

2. Achievable Remedial Action Objective- Since 2016, groundwater has been monitored annually to ensure that contaminants are not migrating off-site. The requirement to monitor was removed in 2019 only site inspections are performed. However, in 2021, the HN has required the Garrison to sample for CHCs on 17 wells. These 17 wells are sampled biannually.

3. Specific Regulatory Standards and Legal Drivers- Baden-Wuerttemberg state assessment criteria (P-W for groundwater), the Federal Soil Act (BBodSchG) and the related Federal Soil Protection- and Contaminated Site Ordinance (Bundes Bodenschutz und Altlastenverordnung (BBodSchV).

4. Remediation Methods Planned or Being Conducted- No active remediation has been conducted at the site.

5. Response Complete- Was achieved on October 31, 2011, when the site transitioned into LTM.

6. Site Closure- The site will be closed following receipt of a Host Nation Closure letter.

7. Host Nation Involvement- The HN environmental regulatory authority is the Landkreis Böblingen Wasserwirtschaftsamt. The HN is kept informed of LTM results and will be the agency that eventually grants NFA and site closure. In 2021, the HN required the Garrison to sample for CHCs on 17 wells.

PHASE SCHEDULE

1. Current Phase Objective- The primary goal of the ongoing LTM is to ensure no off-site contaminant migration occurs. The requirement for monitoring was removed in 2019 as the site is on the advisory board list to evaluate closure. In 2021, the HN required the Garrison to sample for CHCs on 17 wells. These 17 wells are sampled biannually. 30 years LTM has been forecasted in the cost to complete as there is uncertainty about whether or not the HN will require monitoring in the future. During the FY24 datacall it was discovered that a hydrogeological investigation has been recommended to be conducted. It is expected that the hydrogeological investigation will be conducted in FY24.

2. Milestones- RIP (11/30/2008), RC (10/31/2011), Site Closeout (09/30/2054)

SCHEDULE & BUDGET CHANGES

1. Schedule- During the Spring 2024 datacall one year was added to the LTM phase to account for the indefinite 30-year duration.

2. Budget- The CTC for this site in Spring 2024 is TBD.

HISTORICAL SITE ACTIVITIES

Although the exact time frame is unknown, it is suspected based on historical investigations that the U.S. Army used this site as an open dump from c.1951 to 1976. Around 1976, U.S. Army personnel reportedly covered the dump site with approximately 2-4 meters of unsealed clay fill material and began using it as an unofficial stock car racetrack. The U.S. Army 1/10 Special Forces Group modified the surface of the former stock car racetrack to develop a training area for tracked vehicles. The site was used by U.S. personnel as a racetrack until approximately 1991 when the U.S. performed an historical site investigation. The former gravel oval stock car racetrack is still existent and is currently used by US Army personnel for off-road military vehicle training. The investigation discovered that domestic waste (tin, cans, glass, paper, ash, etc.) containing POL material had been dumped at the site. The former landfill measures approximately 75,000 m^2 with a depth of deposited material of 8 m. Approximately 600,000

m^3 of landfill materials were deposited at the site. The former landfill contains no liner and no cover. The U.S. identified the site as a restoration site in 2001. In 2001-2002 an initial SI detected high concentrations of TPH as well as elevated levels of BTEX and PAH compounds and ammonia in the groundwater, and high levels of methane gas in the soils. In a 2004-05 RI/FS, six groundwater monitoring wells were installed to an average depth of 9.0 m below ground surface, as well as three deeper wells to an average depth of 19.5 m. Of particular note from the groundwater analysis, were detections of ammonium, phenols, benzene, naphthalene, PAHs, calcium, iron, potassium, sodium, and magnesium. Phenol, benzene, BTEX, naphthalene, and PAHs were above their respective regulatory limits established by the Federal Ordinance for Soils Protection and Contaminated Sites and the guidance of the Administrative Regulation of Baden-Wuerttemberg. The source appeared to be related to the dumped materials below the racetrack. Although most of the contaminants analyzed exceeded regulatory limits requiring further investigation, they did not exceed remediation action values. The initial RI/FS therefore recommended landfill capping to prevent further contaminant migration which was however not performed based on the results of subsequent studies. Although groundwater contamination was mostly confined to the shallow aquifer, the deep aquifer seemed to be impacted by leachate from this area, based on a wide variety of parameters found in the groundwater. A second phase of the RI/FS was performed in 2006 and included installation of three additional deep aquifer groundwater monitoring wells, groundwater sampling and emissions testing. The RI/FS was finalized in a May 2007 report, and concluded that the contaminants are readily degradable, and that the groundwater contamination plume does not pose a threat to receptors. The Host Nation Authority accepted that no remediation measures are necessary but did require groundwater monitoring (LTM) for 3 years. Based on the monitoring results from 2008-2011, the permit to conduct only LTM was extended for 3 more years in 2012 and again in 2016. The April 2017 maximum groundwater contaminant concentrations along with their remediation target values in parentheses are as follows- PAH 3.56 ug/L (0.15 ug/L), BTEX 7.6 ug/L (10 ug/L), Phenols not detected (0.02 mg/L), ammonia 44 mg/L (0.5 mg/L), arsenic 0.045 mg/L (0.01 mg/L). In April 2015 methane has been detected in soil gas at a concentration of 35.5 Vol%. In 2019, the requirement for monitoring was removed only site inspections are performed. In 2021, the HN has required the Garrison to sample for CHCs on 17 wells biannually. The Garrison expects that LTM will continue at the site for an indefinite 30 years. This site was previously included in DUCs database under DUCS number STST109.

PROJECT APPROVAL

The project is required IAW DoDI 4715.08 (1 Nov 13), Encl. 3, Par 1e (international agreement). The requirements are imposed by the BBodSchG (Bundes-Bodenschutz-Gesetz/ Federal Soil Protection Act) and the BBodSchV (Bundes-Bodenschutz-Verordnung/ Federal Soil Protection Ordinance. Pursuant to Art 53 of the Supplementary Agreement to the NATOSOFA [a binding international agreement within the meaning of DODI 4715.08, Encl. 3, par 1e (2)(b)], the US is to apply the provisions of these laws where applicable. A Decision Document was prepared and LEC consultation conducted prior to the start of RA(C).

GE19B - Stuttgart Army Airfield

Installation Name: GE19B - Stuttgart Army Airfield

Installation City: Stuttgart

5604A.1001_CCST117_GE19B_PFAS SAAF/Katzenbach

Env Site ID: CCST117

Cleanup Site: GE19B_PFAS SAAF/Katzenbach

Alias: #

Regulatory Driver: DODI

RIP Date: 10/16/2029

RC Date: 9/30/2059

RC Reason: Not assigned

SC Date: 9/30/2059

Program: Compliance-related Cleanup

Subprogram: CC

NPL Status: Not assigned

Hazardous Ranking Score: 0

RRSE: N/A

MRSPP: N/A

Phase	Start	End
PA:	8/17/2015	1/31/2016
SI:	2/1/2016	7/17/2019
RI/FS:	7/18/2019	10/15/2028
RD:	4/15/2028	10/15/2028
IRA:	7/18/2019	10/15/2028
RA(C):	10/16/2028	10/15/2029
RA(O):	10/16/2029	9/30/2059
LTM:	- -	- -

Site Narrative: SITE LOCATION AND DESCRIPTION

1. Location- The site is located in the southern part of the Stuttgart Army Airfield (SAAF, ARLOC GE19B in.70629) Filderstadt, located approximately 1.5 kilometers west of the city center of Filderstadt in the German state of Baden-Württemberg.

2. Physical Layout/Site Use- The site consists of a green area west of bldg. 3217, which is used as a temporary storage area for air freight goods from the Stuttgart Army Airfield (SAAF) and the area around bldgs. 3214 and 3215 to include the hardstand and green areas. A small pumping station of the wastewater sewer system is located in the middle part of the site. The site is part of a larger parcel with the German parcel number 5560. The property is owned by the Federal Agency for Real Property Administration (Bundesanstalt für Immobilienaufgaben - BIMA). Site facilities include hardstands, a wash rack, maintenance buildings, aircraft maintenance hangars, fuel storage facilities, warehouses, administrative buildings, and personnel support facilities.

CONCEPTUAL SITE MODEL

1. Release Description- PFC containing extinguishing foams were used for many years to conduct firefighter training at the firefighting basin on the premises north of the SAAF and have caused PFC contamination of the adjacent Katzenbach. This is not the source of the PFCs in the south as the creek is in between. There are indications of a former AST used for storage of Aqueous Film-Forming Foams (AFFF).

2. Media Impacted- Perched groundwater is contaminated with PFCs. Soil is contaminated with PFOS.

3. Nature and Extent of Contamination- In February 2016, PFCs were detected in the drained storm water at concentrations ranging between 0.072 g/L (SAAF-7) and 14 g/L (SAAF-2). In January 2018, PFCs were detected at both temporary piezometers at similar concentrations (0.41 g/l at TP1 and 0.6 g/l at TP2). The quotient sums of the total PFC concentrations exceed the applicable assessment criteria of (Cn / SWn) 1 where Cn is the concentration of select constituent parameters and SWn is the guideline

threshold value of the same constituent parameter. In addition, concentrations of the PFC constituent compound Perfluorhexansulfonsäure (PFHxS), exceeded the applicable screening value of 0.1 g/l at both sampling locations (0.3 g/l at TP1 and 0.4 g/l at TP2). The area and volume of PFC contaminated soil and groundwater is currently unknown but will be refined during the planned future RI/FS. There are two aquifers present at the site. A deeper aquifer is presumably located within the deeper Mesozoic sediments, with its base at 25 m bgs and presumed flow direction of southeast. The shallow perched aquifer is located between 1.0 -3.0 m bgs with no consistent flow direction and is slightly pressurized (confined) due to the very cohesive and less permeable Quaternary silt and clay.

4. Receptors- The primary receptor of concern is the Katzenbach Creek located north of the site, flowing northwest to southeast. The site is not located within a groundwater protection zone. The nearest groundwater protection zone is located approximately 4.0 kilometers east of the site.

REMEDIAL OBJECTIVE

1. Long-Term Closeout Strategy- Reduce PFC concentrations in groundwater below regulatory values and get HN concurrence of site closure.

2. Achievable Remedial Action Objective- Reduce the PFC concentrations of collected surface waters that are discharged into the Katzenbach Creek.

3. Specific Regulatory Standards and Legal Drivers- Baden-Wuerttemberg state assessment criteria (P-W for groundwater), the Federal Soil Act (BBodSchG), the related Federal Soil Protection- and Contaminated Site Ordinance (Bundes Bodenschutz und Altlastenverordnung (BbodSchV) and 21 August 2018 Ministry for the Environment Climate, and Energy of Baden-Wuerttemberg decree concerning trigger values for PFC Contamination in soil and groundwater.

4. Remediation Methods Planned or Being Conducted- The implementation of a pump and treat system as an IRA is planned in FY24 through FY28. The final remedial action will be determined during the RI/FS. In the interim, it is assumed that the IRA pump and treat system will continue to operate for 30 years as RAC and RAO.

5. Response Complete- The RC will be dependent upon RI/FS findings. At this point the RC is being set as the RAC completion date.

6. Site Closure- The site will be closed following receipt of a HN closure letter.

7. Host Nation Involvement- The HN environmental regulatory authority is the County Office Landratsamt Esslingen who will be closely involved with deciding the site strategy.

PHASE SCHEDULE

1. Current Phase Objective- The current phase objective is to identify the plume hot spots and develop measures to avoid contamination of the creek and determine further measures/approach. Additionally, a remediation system is planned to be installed as an interim remedial measure to filter collected surface water that is directed into the Katzenbach Creek from FY24-FY28.

2. Milestones- RIP (10/16/2029), RC (09/30/2059), Site Closeout (09/30/2059)

SCHEDULE & BUDGET CHANGES

1. Schedule- Construction of the pump and treat system and preparation of the decision document will take place in FY24. The IRA pump and treat system operations began March 5, 2024, and will continue through FY28.

2. Budget- The CTC for this site in Spring 2024 is TBD.

HISTORICAL SITE ACTIVITIES

The U. S. Army first acquired the Stuttgart Army Airfield (formerly called Echterdingen Airfield) in 1945. Prior to U.S. occupancy, the site was used by the German Force since its construction in 1937. Parts of the site were returned to the Host Nation in 1994. Some facilities are still used by the U.S Army. Some portions of the returned area belong to the Federal Republic of Germany and other portions belong to the state of Baden-Württemberg. The Airfield facilities include aircraft maintenance hangars, fuel storage facilities, warehouses, administrative buildings, and personnel support facilities. In February 2016, PFCs were detected in the drained storm water at concentrations ranging between 0.072 g/L (SAAF-7) and 14 g/L (SAAF-2). In January 2018, perched groundwater at the site was found to be impacted with PFCs. PFHxS was detected at an elevated concentration in perched groundwater. The sum quotient for PFCs exceeded regulatory values in perched groundwater. PFOS was detected at a low concentration in groundwater and in soil. The soil has slightly elevated concentrations of certain metals of geogenic origin particularly arsenic, nickel, zinc, and chromium with no environmental implication besides having a reuse/disposal class of Z1.1 in the HN state of Baden-Württemberg. An abandoned and backfilled UST located approximately 20 meters from the eastern site boundary. The perched groundwater at the UST is slightly impacted with fuels-derived contaminants. Benzene and Total PAH are just slightly above the respective applicable groundwater guideline criteria. Concentrations of these contaminant parameters were below the respective applicable groundwater screening values onsite. The impact is therefore localized around the UST and is not impacting the site itself. This sort of impact is typical of a residual impact related to historically minor contamination due to fuels tank use and was to be expected. The soil at the UST is slightly impacted with fuels derived contaminants however, detected contaminant concentrations are below the applicable soil guideline value. This sort of impact is typical of a residual impact related to historically minor contamination due to fuels-tank use and was to be expected. The localized findings related to the UST do not indicate the need for remediation within the site. The HN required further investigation to delineate the nature and extent of PFC impacted soil and groundwater and has also requested the treatment of PFC impacted surface water that is collected and discharged to the nearby Katzenbach Creek. The investigation took place inFY22. The site was not previously included in the DUCs program.

PROJECT APPROVAL

The project is required IAW DoDI 4715.08 (1 Nov 13), Encl. 3, Par 1e (international agreement). The requirements are imposed by the BBodSchG (Bundes-Bodenschutz-Gesetz/ Federal Soil Protection Act), the BBodSchV (Bundes-Bodenschutz-Verordnung/ Federal Soil Protection Ordinance and the Ministry for the Environment, Climate and Energy of Baden-Wuerttemberg („Ministerium für Umwelt, Klima und Energiewirtschaft Baden-Württemberg“) issued a decree concerning trigger values for PFC Contamination in soil and groundwater to determine harmful soil and groundwater changes, of 21 August 2018. Pursuant to Art 53 of the Supplementary Agreement to the NATOSOFA [a binding international agreement within the meaning of DODI 4715.08, Encl. 3, par 1e (2)(b)] the US is to apply the provisions of these laws where applicable. A Decision Document will be prepared prior to remediation and LEC consultation will be conducted.

5604A.1002_CCST118_GE19B_PFAS_SAAF North

Env Site ID: CCST118

Cleanup Site: GE19B_PFAS_SAAF North

Alias: #

Regulatory Driver: DODI

RIP Date: 10/15/2027

RC Date: 10/15/2027

RC Reason: Not assigned

SC Date: 10/16/2027

Program: Compliance-related Cleanup

Subprogram: CC

NPL Status: Not assigned

Hazardous Ranking Score: 0

RRSE: N/A

MRSPP: N/A

Phase	Start	End
PA:	10/1/2020	9/30/2021
SI:	10/1/2021	12/15/2022
RI/FS:	12/16/2022	10/15/2027
RD:	- -	- -
IRA:	- -	- -
RA(C):	- -	- -
RA(O):	- -	- -
LTM:	- -	- -

Site Narrative: SITE LOCATION AND DESCRIPTION

1. Location- The northern part of the USAG Stuttgart Army Airfield (SAAF) is located south of the commercial Stuttgart Airport, north of existing CCST117, and north of Katzenbach creek. The Army Airfield Fire Department Bldg. 3254/3259 is located west of BASE Ops Building 3255, about 1300 m northeast of main SAAF ACP.

2. Physical Layout/Site Use- The whole complex spans an area of about 11,5 hectare. 2,4 hectare is unpaved green area, and 9,1 hectare of the whole area is paved.

CONCEPTUAL SITE MODEL

1. Release Description- The most common source of PFAS impact on airports is the storage and use of fire-fighting foams. PFAS-containing aqueous foam forming film (AFFF) fire-fighting products were in widespread use from the mid 1960's until approximately 2009. The use and dealing with aqueous film forming foam around the area for decades has resulted in elevated PFAS eluate soil results. The exact date and quantity of release is unknown.

2. Media Impacted- Public creek impacted (Host Nation investigation from 2017) and soil eluate with PFAS concentrations exceeding HN threshold values (CLAIMS report 2019). A substantial threat to groundwater is likely based upon the results.

3. Nature and Extent of Contamination- See existing CLAIMS SAAF-Soil report from 2019. On 18 July 2019, the Landratsamt Esslingen wrote to the USAG Stuttgart DPW concerning the discharge of water impact by per- and polyfluoroalkyl substances (PFAS) from Stuttgart Army Airfield (SAAF) to the Katzenbach creek. The letter included results of a Host Nation investigation conducted in 2017 of stormwater lines that discharge stormwater from SAAF-North to a stormwater retention basin RKB-Süd located north of the Katzenbach creek. The Host Nation sampling results indicated that water impacted by PFAS is draining from the SAAF-North installation into the retention basin, from which it would impact the Katzenbach Creek. US Army Claims Service Europe (USACSEUR) conducted a CLAIMS investigation to

determine whether US Army activities are likely to have caused the elevated PFAS concentrations in stormwater detected by the Host Nation investigation. Stormwater sampling and a limited soil investigation in the vicinity of the Fire Department were conducted at the US Army installation north of the Katzenbach creek in September and November 2019. Soil results showed PFAS concentrations above threshold GFS values. With the letter from LRA Esslingen dated 18 July 2019 and based on the results of the CLAIMS report 2019 the Host Nation is likely to require a risk assessment/site investigation to determine the actual threat to groundwater. The exact area and volume of PFAS contaminated soil and groundwater is currently still unknown but shall be verified in a SI and subsequent RI/FS.

4. Receptors- In Germany, the groundwater itself is a protected receptor and the Katzenbach creek in the south of this area. In addition, the PFAS surface soil detections pose a potential health risk to future on site workers.

REMEDIAL OBJECTIVE

1. Identify and delineate PFAS contaminated soil and groundwater, prevent exposure to receptors and prevent groundwater contamination.

2. Achievable Remedial Action Objective- Prevent PFAS-discharge into groundwater and the Katzenbach creek.

3. Specific Regulatory Standards and Legal Drivers- Erlass-Beurteilungsgrundlage PFC Baden-Württemberg 21Aug18 published by the Baden-Württemberg Environmental State Department. PFAS impact to groundwater based on Geringfügigkeitsschwelle (GFS) values. The GFS is defined as the concentration of a substance which, although it exceeds the regional background concentration, has no significant toxicological effect and meets the requirements of the drinking water regulations or appropriately derived concentrations. There are GFS values for 13 individual PFAS compounds, 7 of which are based on human toxicological evaluations and 6 are provisional threshold values. The regulators require mitigation measures to be taken if any of the individual threshold values are exceeded in groundwater or in the case of the unsaturated zone, in soil leachate. Action is also required if the sum of the quotients of the 7 human toxicological threshold values exceeds 1.

4. Remediation Methods Planned or Being Conducted- Remediation measurements will be determined after the RI/FS Phase.

5. Response Complete- The RC will be dependent upon RI/FS findings. At this point, the RC is being set as the RI/FS completion date.

6. Site Closure- Site closure will be achieved after either the RI/FS demonstrates no further action or the HN concurs no further action is appropriate following site remediation.

7. Host Nation Involvement- The Host Nation environmental authority for the site is the County Office Esslingen (Landratsamt) who is aware of the site. The owner of the site is BIMA.

PHASE SCHEDULE

1. Current Phase Objective- RI/FS shall be performed to verify the PFAS-contamination and to get more information about potential hot spots and the horizontal and vertical spread of PFC contamination in soil and groundwater.

2. Milestones- RIP (10/15/2027) RC (10/15/2027) Site Closeout (10/16/2027)

SCHEDULE & BUDGET CHANGES

1. Schedule- No changes were made to the schedule during the Spring 2024 datacall.

2. Budget- Investigation is to be funded in 2024. No future phases will be programmed until the results of the investigation become available.

HISTORICAL SITE ACTIVITIES

The site is located in the northern part of the Stuttgart Army Airfield (SAAF, ARLOC GE19B), located approximately 1.5 kilometers west of the city center of Filderstadt in the German state of Baden-Württemberg. The airfield was taken over by the allied forces in April 1945 which put the airfield back in operation as a helicopter and aircraft airfield in early summer 1945. Several United States (U.S.) Army units have used the installation for maintenance and deployment of aircrafts over the years until today. The SAAF was originally named “Echterdingen Airfield”. The current SAAF is divided into the Southern Entrance Area (= Southern SAAF) and the Northern Hangar and Flight Line Area. Divided by “Katzenbach” creek. Aircraft and storage hangars with associated facilities, the Fire Department of the USAG Stuttgart, administrative buildings (e.g. airfield operations), and other technical facilities and greens are located on the Northern SAAF. The property is owned by the Federal Agency for Real Property Administration (“Bundesanstalt für Immobilienaufgaben”, BImA).

PROJECT APPROVAL

The project is required IAW DoDI 4715.08 (1 Nov 13), Encl. 3, Par 1e (international agreement). The requirements are imposed by the BBodSchG (Bundes-Bodenschutz-Gesetz/ Federal Soil Protection Act) and the BBodSchV (Bundes-Bodenschutz-Verordnung/ Federal Soil Protection Ordinance. Pursuant to Art 53 of the Supplementary Agreement to the NATO SOFA [a binding international agreement within the meaning of DODI 4715.08, Encl. 3, par 1e (2)(b)], the US is to apply the provisions of these laws where applicable. A Decision Document will be prepared for this site as future phases progress. The EEA has not been consulted.

GE643 - Panzer Kaserne

Installation Name: GE643- Panzer Kaserne

Installation City: Stuttgart

5688A.1002_CCST018_GE643_Fmr Bldg 2982 Gas Station

Env Site ID: CCST018

Cleanup Site: GE643_Fmr Bldg 2982 Gas Station

Alias: STST018

Regulatory Driver: DODI

RIP Date: 4/16/2028

RC Date: 9/30/2057

RC Reason: Not assigned

SC Date: 9/30/2057

Program: Compliance-related Cleanup

Subprogram: CC

NPL Status: Not assigned

Hazardous Ranking Score: 0

RRSE: N/A

MRSPP: N/A

Phase	Start	End
PA:	1/16/1998	4/15/1998
SI:	4/16/1998	7/29/2001
RI/FS:	1/16/2018	10/15/2026
RD:	10/16/2026	4/15/2027
IRA:	7/30/2001	3/23/2003
RA(C):	4/16/2027	4/15/2028
RA(O):	4/16/2028	9/30/2057
LTM:	- -	- -

Site Narrative: SITE LOCATION AND DESCRIPTION

1. Location- The site is part of Panzer Kaserne, located at the eastern periphery of Boeblingen in Baden-Wuerttemberg, Germany.

2. Physical Layout/Site Use- Panzer Kaserne comprises an area of approximately 445,000 m2 and is used by Army and Marine special forces as well as administrative operative and maintenance units. The Local Training Area (LTA) Boeblingen with the Advanced Mobility Course (former Racecar Track) are located to the east the Boeblingen Family Housing is directly to the north-west, and the Boeblingen Range is located to the south of Panzer Kaserne. The site is located between Bldgs 2970 and 2972 and consists of a former filling station (former bldg. 2982) [former CCST018A], and adjacent waste oil UST #02969 & hazardous waste accumulation point (HWAP) [former CCST018B].

CONCEPTUAL SITE MODEL

1. Release Description- During a historical survey of Panzer Kaserne, several releases were identified. The releases are presumed to be from leaking structures and undocumented handling losses from historic site use.

2. Media Impacted- POL, AHC, and CHCs in soil and groundwater.

3. Nature and Extent of Contamination- Maximum contaminant concentrations in soil were 7,500 mg/kg (POL), 10,986 mg/kg (AHC), and 0.549 mg/kg (CHC). Contaminants in soil were observed in the upper 6m, however were not delineated laterally. In 2017 and 2018, a 10-cm thick layer of LNAPL observed in the monitoring well identified as KB4. Concentrations of POL and AHC were below detection limit and CHC was below trigger level in KB1 and KB2 in 2018. While still below the trigger level, CHCs were present in these wells at concentrations of 2.2 ug/L and 1.4 ug/L, respectively. In March 2020, POL was below regulatory values in KB1, elevated POL, CHC, and AHC were not detected in KB2, and free phase product is still present in KB4 along with elevated dissolved petroleum hydrocarbons. In March 2022, in KB1 POL was below the detection limit and CHCs were below the regulatory limit. In KB4, POL

concentrations were detected at 8,300 ug/l for C10-C-22 and 9,500 ug/l for C10-C40. These concentrations significantly exceed the regulatory limit (Prüfwert) in KB4.

4. Receptors- The site is not located within a groundwater protection zone; however, Panzer Kaserne lies within the outer zone of the mineral spring protection zone Stuttgart which is the primary receptor.

REMEDIAL OBJECTIVE

1. Long-Term Closeout Strategy- During the next few years, identify changes to the plume so technical control of the contamination can be examined.

2. Achievable Remedial Action Objective- Groundwater will be monitored annually through FY26 under the RI/FS phase. Free product removal is also needed for an indefinite period of time.

3. Specific Regulatory Standards and Legal Drivers- Baden-Wuerttemberg state assessment criteria (P-W for groundwater), the Federal Soil Act (BBodSchG) and the related Federal Soil Protection- and Contaminated Site Ordinance (Bundes Bodenschutz und Altlastenverordnung (BBodSchV).

4. Remediation Methods Planned or Being Conducted- Future remediation may be required. While MNA is not applicable due to free phase, 30 years of absorbent socks deployment for free product removal will be added to the current monitoring. RAO for free product removal will take place on one well from FY28-57. The free product is removed from the well during the monitoring activities.

5. Response Complete- Is expected to be achieved following the 30 years free product removal.

6. Site Closure- The site will be closed following receipt of a Host Nation Closure letter.

7. Host Nation Involvement- The HN environmental regulatory authority is the Water Board of the District Office Landratsamt Böblingen and is the agency that must agree with the NFA recommendation for site closure.

PHASE SCHEDULE

1. Current Phase Objective- The current phase objective is to monitor groundwater under the RI/FS phase annually through FY26 to identify changes to the plume. Additionally, future remediation for free product removal will be required.

2. Milestones- RIP (04/16/2028), RC (09/30/2058), and Site Closeout (09/30/2058)

SCHEDULE & BUDGET CHANGES

1. Schedule- No changes to the phase schedule were made during the Spring 2024 datacall.

2. Budget- The CTC for this site in Spring 2024 is TBD.

HISTORICAL SITE ACTIVITIES

Since about 1936 Panzer Kaserne Boeblingen has been used by the German and United States Military. Prior to the U.S. Army taking over the site in 1945, it was known as Ludendorff-Kaserne and was bombed during World War II. Today, Panzer Kaserne headquarters different Army and Marine special forces as well as administrative, operative, and maintenance units. In addition, the largest American supermarket in Germany, called “Panzer Exchange” was opened at the beginning of 2007. Medical, education, and social facilities are also located within the site boundaries, as well as the Panzer Hotel. Panzer Kaserne comprises an area of approximately 445,000 m2 and lies within the outer zone of the mineral spring protection zone Stuttgart. Remediation was conducted based upon coordination with the HN regulator. In March 2000, maximum concentrations in groundwater were 0.099 mg/L (POL), 20 ug/L (AHC), and 244.4 ug/L (CHC). The filling station was demolished in 2001; the USTs were cleaned and removed, approximately 430 metric tons (t) of impacted soil material >LAGA Z4 and approximately 50 t soil material of LAGA Z2 were removed to a maximum depth of 4.0 m bgs and the filling island was demolished and approximately 50 t building material were recovered during the period 30 July through 2

August 2001. In September 2012, the maximum concentration of AHC was 620 ug/L. During a 2017 comprehensive historical survey for the site, contamination was found in soil and groundwater. Based on this discovery, the HN regulatory authority required annual groundwater sampling for TPH, BTEX, and CHCs at three wells for a period of three years. The Site was opened in the Headquarters Army Environmental System during the spring 2018 datacall. The site was originally included in the DUCs database as cleanup site STST018.

PROJECT APPROVAL

The project is required IAW DoDI 4715.08 (1 Nov 13), Encl. 3, Par 1e (international agreement). The requirements are imposed by the BBodSchG (Bundes-Bodenschutz-Gesetz/ Federal Soil Protection Act) and the BBodSchV (Bundes-Bodenschutz-Verordnung/ Federal Soil Protection Ordinance. Pursuant to Art 53 of the Supplementary Agreement to the NATOSOFA [a binding international agreement within the meaning of DODI 4715.08, Encl. 3, par 1e (2)(b)] the US is to apply the provisions of these laws where applicable. A Decision Document will be prepared prior to remediation. LEC consultation will be conducted.

SITE SUMMARY

SITE CLOSEOUT SUMMARY

CRL ID	Site Name	Site Closeout Date
5585A.1002	CCST115_GE09C - DoDDS Devpmt Proj. (EUR	10/15/2014
5688A.1001	CCST102_GE643 - Bldg 2908, POV Scrap Yar	8/31/2004
5688A.1003	CCST116_GE643 - Panzer Kasrne OWS Survey	3/19/2020