US Army Garrison Rheinland-Pfalz

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
AAFES	Army and Air Force Exchange Service
AFFF	Aqueous Film-Forming Foam
AHC	Aromatic Hydrocarbon
ALEX	Altlastenexpertengruppe
AOX	Adsorbable Organic Halides
ARLOC	Area Location
ASL	Above Sea Level
AST	Aboveground Storage Tank
BBodSchG	Bundes-Bodenschutz-Gesetz Federal Soil Protection Act
BBodSchV	Bundes-Bodenschutz-Verordnung Federal Soil Protection Ordinance
BDL	Below Detection Limit
BGL	Below Ground Level
BGS	Below Ground Surface
BTEX	Benzene, Toluene, Ethylbenzene, and Xylenes
cbm	cubic meter
CC	Compliance-related Cleanup
cDCE	1, 2-Dichloroethene
CHC	Chlorinated Hydrocarbon
CRL	Cleanup Restoration & Liabilities
CT	Carbon Tetrachloride
DERP	Defense Environmental Restoration Program
DNAPL	Dense Non-Aqueous Phase Liquid
DOC	Dissolved Organic Carbon
DODI	Department of Defense Instruction
DUC	Database of USAREUR Contaminated Sites
DUCS	Database of USAREUR Contaminated Sites
E	East
ENE	East Northeast
ENV	Environmental
EPR	Environmental Program Requirements
ESCK	Kaiserslautern Equipment Support Center
FS	Feasibility Study
FY	Fiscal Year
g/d	grams per day
GWS-VwV	German Federal Groundwater Regulation

Acronym	Definition
ha	hectare
HN	Host Nation
HRS	Hazard Ranking Score
IAP	Installation Action Plan
IAW	In Accordance With
ID	Identification
IR	Installation Restoration
IRA	Interim Remedial Action
ISCO	In Situ Chemical Oxidation
ISTT	In-Situ Thermal Treatment
JP	Jet Propellant
KAD	Kaiserslautern Army Depot
kg	kilogram
km	kilometer
KOAG	Coordination Working Group
L	liter
LBodSchG	State Soil Protection Act
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
MAD	Miesau Ammunition Depot
MCA	Military Construction, Army
mg/kg	milligram per kilogram
mg/L	milligram per liter
mg/m^3	milligram per cubic meter
MNA	Monitored Natural Attenuation
MOGAS	Motor Gasoline
MP	Motor Pool
MPE	Multiphase Extraction
MR	Munitions Response
MRSPP	Munitions Response Site Prioritization Protocol
MTBE	Methyl Tertiary-Butyl Ether
N	North

Acronym	Definition
NATO	North Atlantic Treaty Organization
NATOSOFA	National Atlantic Treaty Organization Status of Forces
ND	Non-Detect
NFA	No Further Action
NPL	National Priorities List
OPEL	Opel Automobile GmbH
ORC	Oxygen Releasing Compound
P&T	Pump and Treat
PA	Preliminary Assessment
PAH	Polycyclic Aromatic Hydrocarbon
PCE	Tetrachloroethylene
PFAS	Per- and Polyfluoroalkyl Substances
PFC	Perfluorochemical
PFOS	Perfluorooctane Sulfonic Acid
POL	Petroleum, Oil and Lubricants
POTW	Publicly Owned Treatment Works
POV	Privately-Owned Vehicle
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
ROB	Rhine Ordinance Barracks
ROD	Record of Decision
RP	Regierungspräsidium
RRSE	Relative Risk Site Evaluation
S	South
SC	Site Closeout
SE	Southeast
SGD	Struktur-und Genehmigungsdirektion
SI	Site Inspection
SOFA	Status of Forces Agreement
SVE	Soil Vapor Extraction
SW	Southwest
TBD	To Be Determined

Acronym	Definition
TCA	1,1,1-Trichloroethane
TCE	Trichloroethylene
tDCE	Trans-Dichloroethylene
TMP	Transportation Motor Pool
TPH	Total Petroleum Hydrocarbons
ug/L	micrograms per liter
USACSEUR	US Army Claims Service Europe
USAG	United States Army Garrison
USAG-RP	United States Army Garrison Rheinland-Pfalz
UST	Underground Storage Tank
VC	Vinyl Chloride
W	West
WHG	Wasserhaushaltsgesetz
XRF	X-ray Fluorescence

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 CC Sites: 5/23

SITE-LEVEL INFORMATION

GE07N - Baumholder Qm Area

Installation Name: US Army Garrison Rheinland-Pfalz

Installation City: Baumholder

5581A.1001_CCBH015_GE07N_POL Storage Class III

Env Site ID: CCBH015

Cleanup Site: GE07N_POL Storage Class III

Alias: KHBH015

Regulatory Driver: DODI

RIP Date: 1/31/2003

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: N/A

Phase	Start	End
PA:	11/30/1988	11/30/1988
SI:	11/30/1988	7/31/1989
RI/FS:	1/31/1990	8/31/1992
RD:	10/31/1994	11/30/2002
IRA:	- -	- -
RA(C):	1/31/2003	9/30/2004
RA(O):	1/31/2003	9/30/2054
LTM:	- -	- -

Site Narrative: SITE LOCATION AND DESCRIPTION

1. Location- The site is a former bulk POL point located near Bldgs. 8732 and 8733 in the northwestern portion of Baumholder Quartermaster Area (ARLOC GE07N). The site is located adjacent to the northwestern boundary of the ARLOC.

2. Physical Layout/Site Use- The site is primarily used as an Access Control Point and partially used by a MP unit (kennels and training area for dogs). Half of the site is comprised of concrete and asphalt surfaces. The rest of the area is grass and lawn. A new Access Control Point was installed in the area of the former fuel truck parking.

CONCEPTUAL SITE MODEL

1. Release Description- While no exact quantity of release has been identified, it is suspected that TPH and AHC groundwater contamination was caused by fuel handling losses or undocumented spills associated with the use of the site as a tank farm between the 1950s and 1990s.

2. Media Impacted- TPH and AHC contaminated groundwater is present at concentrations that exceed the State Screening Values oPW for TPH of 0.10 mg/L and AHC of 20 ug/L.

3. Nature and Extent of Contamination- A total of 15 wells are monitored once every other year for TPH and AHC. In May 2022, mineral oil hydrocarbons were detected in the area of the former tank field with a maximum concentration of 0.9 mg/l, which slightly exceeds the oPW ALEX 02 list value. AHC was detected at a maximum concentration of 1,010 ug/L in well B 10, exceeding the oPW ALEX 02 value of 20 ug/L. Benzene had a maximum concentration of 1,000 ug/L in B 10, exceeding the oPW ALEX 02 value of 0.5 ug/L and Xylene had a maximum concentration of 6 ug/L in B 3, exceeding the oPW ALEX 02 value of 5 ug/L. At the former track filling station, hydrocarbons were detected with concentrations of 0.5 mg/l. In 2020, low TPH concentrations were found only temporarily and only in a few observation wells. In 2018, the sum of aromatic hydrocarbons were detected at 120 ug/L that exceeded the oPW ALEX 02 List

value of 20 ug/L The contaminant concentrations are slowly but steadily showing decreasing trends. The depth to groundwater is between 2.0 m to 12 m and flows in a westerly direction.

4. Receptors- The site is not located in a groundwater protection area. However, in Germany the groundwater itself is a protected receptor in accordance with German regulations.

REMEDIAL OBJECTIVE

1. Long-Term Closeout Strategy- Contaminant concentrations are expected to naturally attenuate during monitoring activities that are planned for an indefinite 30 years. Once TPH and BTEX are below State Screening Values, the HN will be contacted for their concurrence that NFA is appropriate. The achievable remedial action objective is to continue to monitor groundwater every other year to ensure no off-site migration occurs to expose potential receptors.

2. Achievable Remedial Action Objective- Continue to monitor groundwater to ensure no off-site migration occurs to expose potential receptors.

3. Specific Regulatory Standards and Legal Drivers- The following regulatory citations are applicable at this site- WHG 3&21, BBodSchg, LBodSchG and the Leaflet ALEX 02.

4. Remediation Methods Planned or Being Conducted- Partial remediation was executed from the early 1990's to 2001 to the maximum extent possible. No further remediation is planned.

5. Response Complete- Will be achieved at the conclusion of MNA.

6. Site Closure- The site will be closed following receipt of a host nation closure letter after RA(O) is complete.

7. Host Nation Involvement- The HN environmental authority for the site is the Rheinland Pfalz Struktur- und Genehmigungsdirektion Nord (SGD - Nord), who is aware of this site and will be contacted for their concurrence that NFA is appropriate following RA(O).

PHASE SCHEDULE

1. Current Phase Objective- Groundwater monitoring is being conducted every other year under the RA(O) phase for an indefinite 30 years primarily to monitor the natural attenuation of contaminants and ensure that TPH and BTEX present in groundwater above regulatory standards do not migrate off-site.

2. Milestones- RIP (1/31/2003), RC (09/30/2054), Site Closeout (09/30/2054)

SCHEDULE & BUDGET CHANGES

1. Schedule- During the Spring 2024 data call, one year was added to the RC and RA(O) end dates.

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

HISTORICAL SITE ACTIVITIES

The Class III Yard was established in the 1950's and 1960's. The site consisted of a rail car unloading area for POL, a gas station for fuel truck unloading, and five former 500,000 L ASTs for fuel. Several soil studies performed in the late 1980's and 1990's found elevated TPH and BTEX concentrations in soil and groundwater that required remedial action. The contamination was presumably caused by releases from the former ASTs and non-POL tight surfaces. Soil remediation was completed at the site between the early 1990s and 2001, with removal of the five 500,000 L ASTs, excavation and disposal of contaminated soil capping, the area with a clay layer (in the tank farm area) and excavation and disposal of contaminated soil (in the rail car unloading area). Groundwater impacts could not be remediated due to low groundwater permeability in fractured solid bedrock. Therefore, RA(O) has been done to monitor natural attenuation of the contaminants since 1995. All fuel facilities were upgraded after remediation. A portion of the site had been used as a bulk POL point with a rail car unloading facility for fuel two new 10,000 L buffer USTs for MOGAS, JP8, and a gas station until summer 2011. The upgraded fuel truck

parking area is also no longer in use. The whole bulk POL point was mothballed in 2011. After remediation, the highest contaminant concentrations detected in groundwater were 10 mg/L for TPH and approximately 1.0 mg/L for BTEX. Heavy metals are also present at the site. Groundwater impacts could not be remediated due to low groundwater permeability in fractured solid bedrock. Therefore, monitoring has been done since 1995 to ensure contaminants do not migrate or increase in concentration. The contaminant concentrations are slowly but steadily showing decreasing trends. The depth to groundwater is between 2.0 m to 12 m and flows in a westerly direction. Contaminant concentrations are expected to naturally attenuate during monitoring activities that are planned for an indefinite 30 years. The site was previously included in the DUCs database under DUCs number KHBH015.

PROJECT APPROVAL

The project is required IAW DoDI 4715.08 (1 Nov 13), Enclosure 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.

GE10V - Breitenwald TrainingArea

Installation Name: GE10V - Breitenwald TrainingArea

Installation City: Landstuhl

5586A.1001_CCKL190_GE10V_Breitenwald Firing Range

Env Site ID: CCKL190

Cleanup Site: GE10V_Breitenwald Firing Range

Alias: #

Regulatory Driver: DODI

RIP Date: 10/16/2023

RC Date: 9/30/2054

RC Reason: Not assigned

SC Date: 9/30/2054

Program: Compliance-related Cleanup

Subprogram: CC

NPL Status: Not assigned

Hazardous Ranking Score: 0

RRSE: N/A

MRSPP: N/A

Phase	Start	End
PA:	1/16/2016	3/15/2016
SI:	3/16/2016	3/15/2017
RI/FS:	3/16/2017	11/15/2018
RD:	- -	- -
IRA:	- -	- -
RA(C):	11/16/2018	10/15/2023
RA(O):	10/16/2023	9/30/2054
LTM:	- -	- -

Site Narrative: SITE LOCATION AND DESCRIPTION

1. Location- The site is located 3.2 km west of the town center of Landstuhl in the German federal state of the Rhineland-Palatinate. The site is in a forest area near the Local Training Area (LTA) Breitenwald Firing Range.

2.Physical Layout/Site Use- The site consists of a combined rainwater and drainage basin. The catchment has an unpaved surface area of approximately 1,200 m2 and a retention volume of 420 m3. The site is located on the northwestern perimeter of the firing range in the forest. There is an inflow inlet in the southwestern corner of the basin; a drainage outlet fitted with an overflow spillway has been built in the northwestern section.

CONCEPTUAL SITE MODEL

1. Release Description- The soil contamination has presumably been largely caused by the release of lead-containing dust and particles through the drainage system of the LTA Breitenwald.

2. Media Impacted- 150 m2 lead impacted soil is present at concentrations >1,000 mg/kg.

3. Nature and Extent of Contamination- Post excavation sediment sampling was performed in May 2021 at six sampling locations, each with three depth intervals (0 – 2 cm, 2 – 5 cm, 5 – 10 cm). Four out of six sampling locations had exceedances of the oPW3 orienting screening value for lead (SP 1, SP 3, SP 4, and SP 5). The maximum lead concentration of 9,900 mg/kg was identified at sampling location SP 5, located closest to the two drainage outlets discharging from the shooting range. Concentrations decreased with increasing distance from these outlets. Sampling conducted in June 2022 included three additional sampling locations (SP7-SP9). During this event, exceedances of the oPW3 screening value for lead were identified at one sampling locations (SP9). The highest lead concentrations were identified at SP4 (9,200 mg/kg), SP5 (9,900 mg/kg), and SP9 (2,000 mg/kg), located closest to the drainage referred to as Pipe 1 discharging from the shooting range, with concentrations decreasing with increasing distance from the

outlet. Lead concentrations >oPW3 are bound to the brown loamy surface layer with high organic content on top of the red-brown weathered sandstone.

4. Receptors- The site is freely accessible and land use is comparable to parks and recreational areas. Lead concentrations on the solid matter leads to the conclusion that there is a risk to human health by direct contract.

REMEDIAL OBJECTIVE

1. Long Term Closeout Strategy- Conduct soil sampling at ten locations every five years for an indefinite 30 years to re-evaluate the contaminant situation.

2. Achievable Remedial Action Objective- Removal of 30 m3 of highly lead contaminated soil surrounding the inflow outlet was conducted in FY19. Additional sampling was conducted in FY21 and FY22. Sampling will be conducted every five years for an indefinite 30 years.

3.Specific Regulatory Standards and Legal Drivers- Federal Soil Conservation Act of Germany (BBodSchG) dated 1 March 1999 in combination with the Federal Soil Protection and Contaminated Sites Ordinance (BBodSchV) dated 12 July 1999.

4.Remediation Methods Planned or Being Conducted- Removal of 30 m3 of highly lead contaminated soil surrounding the inflow outlet was conducted in FY19. At the completion of the excavation activities an abandoned drainage pipe was discovered, posing risk of re-contamination. No further remediation is currently planned.

5. Response Complete- Will be achieved following the additional soil sampling every five years for 30 years.

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

7. Host Nation Involvement- The HN upper regulatory board for this site is identified as Rheinland Pfalz Struktur-und Genehmigungsdirektion Sued (SGD Sued). The HN was sent the report that summarized the July 2017 soil investigation. An onsite visit with the HN regulator took place on 29 May 2018. This site will be monitored and tracked by HN through the Coordination Working Group (KOAG) which was set up in response to congressional inquiries regarding contamination in the Kaiserslautern Military Community. No internal project number has been established yet.

PHASE SCHEDULE

1. Current Phase Objective- Conduct soil sampling every five years for a rolling 30 years under the RAO phase. The future funding at the site has been programmed in FY26, FY31, FY36, FY41, FY46, and FY51.

2.Milestones- RIP (10/16/2023), RC (9/30/2054), Site Closeout (09/30/2054)

SCHEDULE & BUDGET CHANGES

1. Schedule- During the Spring 2024 datacall, the RAO phase for soil sampling was programmed from 10/16/2023 to 9/30/2054.

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

HISTORIC SITE ACTIVITIES

Storm water is collected on the LTA Breitenwald in a drainage system and routed into a combined rainwater and drainage basin. The drainage basin is located to the northwest of the firing range in the forest. Following rainfall events, the water infiltrates from the surface of the rainwater basin into the unsaturated soil zone or into the bedrock. The firing range drainage system consists of a main sewer with two secondary sewer branches. The main sewer runs along the northern perimeter of the 300 m range towards the west and is blocked off and out of use. One of the secondary sewer branches drains the

paved area in front of the backstop wall (bullet trap) of the 25 m range. The bullet traps on the firing range are roofed, however the roofs do not prevent the bullet traps from getting wet during driving rain events. Precipitation infiltrating the backstop wall seeps into the drainage system along with sand and dust particles. On 14 June 2016, a preliminary assessment of the combined rainwater retention and drainage basin was conducted, showing sediments in the vicinity of the outlet discharging storm water into the drainage basin impacted with lead (>oPW3). The storm water and the water accumulations within the drainage basin are inconspicuous. In July 2017, lead was detected in near surface soils (0.0 - 0.1 m) at concentrations >1,000 mg/kg over an area of 150 m2 immediately surrounding the inflow inlet and at concentrations >500 mg/kg over an area of 260 m2. Lead was detected at depth intervals of 0.1 – 0.4 m >1,000 mg/kg over an area of 65 m2 and at concentrations of >500 mg/kg over an area of 91 m2. For this area a risk is posed by the Soil – Human pathway. Heavy metal accumulations can be attributed either to the long operating time of the LTA or to possibly significant higher pollutant concentrations in the discharge water in the past. Based on these findings, removal of the center of the lead contamination by excavating 150 sqm (=30 m3) of impacted soil was recommended and executed in FY19. Ten remediation goal samples taken at a sampling depth between 20 to 40 cm bgl established that the lead concentrations were below the remediation goal of 500 mg/kg. During the excavation activities, an unknown abandoned drainage pipe was discovered clogged with sediment. Due to these observations, there is a strong possibility that residual contamination emitting from the drainage pipe outlet may have contaminated the earthen slope direction down into the basin and additional sampling would be required for verification. Additional soil sampling is occurred in FY21 and FY22.

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 was conducted.

GE140 - Coleman Barracks

Installation Name: GE140 - Coleman Barracks

Installation City: Mannheim

5595A.1001_CCMA103_GE140_Bldg 4-9/1375 CHC

Env Site ID: CCMA103

Cleanup Site: GE140_Bldg 4-9/1375 CHC

Alias: HDMA103

Regulatory Driver: DODI

RIP Date: 10/31/2007

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: N/A

Phase	Start	End
PA:	10/31/1990	11/30/1990
SI:	12/31/1991	4/30/1993
RI/FS:	5/31/1993	1/31/2006
RD:	- -	- -
IRA:	3/31/1997	7/31/2001
RA(C):	1/31/2006	9/30/2007
RA(O):	10/31/2007	9/30/2054
LTM:	- -	- -

Site Narrative: SITE LOCATION AND DESCRIPTION

1. Location- The site is located near Bldgs 4, 9, and 1375 in the center of Coleman Barracks. The site is located approximately 600 m from the northern installation boundary, and contains administrative and former housing facilities, barracks, and a deactivated airfield and former maintenance areas for helicopters and other military equipment.

2. Physical Layout/Site Use- The site contains administrative and former housing facilities, an inactive airfield, and maintenance areas. The ground surface of the airfield is covered with approximately 0.5 m thick concrete pavement. Adjacent areas are unpaved and covered with grass.

CONCEPTUAL SITE MODEL

1. Release Description- The degreasing operations that were conducted at Bldg 1376 are a probable source of the CHC plume.

2. Media Impacted- CHC contaminated groundwater is present at the site.

3. Nature and Extent of Contamination- The CHC groundwater plume originates from two source areas identified as the eastern and western source area. The eastern source area is located in the vicinity of P7 and P20 and consists mainly of TCE and tDCE. The western source area is located in the vicinity of P4, P5, and P15 and consists of mainly PCE and cDCE. The monitoring well identified as P15 has exhibited the highest CHC concentrations but was obstructed during the November 2020, April 2021, and October 2021 monitoring events. In November 2020, CHC concentrations ranged from 0.8 in well P20 to 53.4 ug/L in well P5. In April 2021, the CHC concentrations ranged from 1.1 ug/L at wells P13 and P25 to 127 ug/L at well P20, above the 10 ug/L HN reference value. In October 2021, CHC concentrations ranged from 0.6 ug/L in well P25 to 47.0 ug/L in well P5. During the April 2022 sampling event, the threshold value was exceeded in 8 monitoring wells, with a maximum CHC value of 79.5 ug/L detected in P15. The CHC groundwater plume covers an area of approximately 100,000 m^2. The depth to groundwater is 5.0

to 6.0 m bgs and flows to northwest. Flow velocities in the shallow aquifer are 50 m/a, and 23 m/a in the deeper aquifer.

4. Receptors- In Germany, the groundwater itself is a protected receptor in accordance with German regulations.

REMEDIAL OBJECTIVE

1. Long-Term Closeout Strategy- Conduct MNA to continue reducing CHC concentrations.

2. Achievable Remedial Action Objective- MNA activities have been demonstrating overall decreasing CHC concentrations and is expected to reduce CHCs below HN Reference Values 20-25 years from 2014.

3. Specific Regulatory Standards and Legal Drivers- German Federal Soil Protection Act and Ordinance Bundesbodenschutzgesetz, Bundesbodenschutzverordnung), the German Federal Water Act (Wasserhaushaltsgesetz [WHG 3 &21] and state regulations, Baden-Württemberg.

4. Remediation Methods Planned or Being Conducted- MNA is currently being conducted for an indefinite 30 years.

5. Response Complete- Will be achieved at the conclusion of the RA(O) phase.

6. Site Closure- The site will be closed when CHCs decline to concentrations below the HN Reference Value.

7. Host Nation Involvement- The HN environmental regulatory authority for the site is the City of Mannheim Fachbereich Baurecht und Umweltschutz. The HN regulator is regularly involved with site strategy and decision making at this site.

PHASE SCHEDULE

1. Current Phase Objective- MNA is being conducted semiannually at 22 monitoring wells for an indefinite 30 years.

2. Milestones- RIP (10/31/2007), RC (09/30/2054), Site Closeout (09/30/2054)

SCHEDULE & BUDGET CHANGES

1. Schedule- One year was added to the RC,RAO, and SCO phase end dates during the Spring 2024 datacall.

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

HISTORICAL SITE ACTIVITIES

In 1990, groundwater contaminated by CHC was discovered within the upper aquifer in the area west of Bldg. 1375 at Coleman Barracks at concentrations up to 1,200 ug/L. Six soil vapor and groundwater studies were conducted from 1990-1996 to characterize the affected soils and aquifer materials, and the nature and extent of the soil vapor and groundwater contamination. Maximum contaminant concentrations detected were 5,274 ug/L total CHC in groundwater and 51 mg/ m^3 total CHC in soil vapor. As part of the subsurface investigations, SVE pilot tests were performed at one well in February/March 1992 and in April 1994. During these two SVE pilot tests contaminant concentrations decreased from 51 mg/m^3 to 4.1 mg/m^3 total CHC at the test end. Soil samples collected upon discontinuation of SVE, demonstrated that no remnant soil impact was present. In March 1997, a pump-and-treat groundwater remediation system, comprised of two extraction wells, an air stripper unit, and two re-infiltration wells was installed in the vicinity of Bldg. 1375. By March 2001, CHC concentrations at extraction well P15 had decreased to 36.9 ug/L, and at well P7 to approx. 100 ug/L. The total amount of contaminants removed from groundwater at that time was calculated to be 153 kg of recovered CHC. Due to the fact that contaminant concentrations in groundwater remained at low and constant levels, it was not expected that ongoing operation of the existing pump & treat system would lead to any further

CHC decrease. Therefore, operation was terminated. A soil investigation was conducted in 2005 within the vicinity of the former electroplating plant in Bldg. 1376. Soil samples were collected from four soil borings (depth- 5 m) to confirm that the degreasing basin of the former electroplating plant was the main source area. During groundwater investigations performed in 2006, two different CHC fingerprints were found within the plume thus suggesting there were also solvent spills during aircraft maintenance activities near buildings 4 and 9. Both impacts have formed one combined CHC plume. In 2006, the joint groundwater contamination plume extended approx. 280 m in E-W direction and 100 m in N-S direction. Biodegradation tests in both distinct impact areas in 2005 indicated ongoing contaminant degradation. Therefore, an MNA study was performed in 2006. The results of this study indicated the plume had reached steady state conditions and was shrinking. MNA results are being continuously evaluated to determine the efficacy of this remedial technique. Data collected between 2008 and 2014 indicate that; with the exception of, VC, CHCs have degraded to concentrations below the reference value along the flow path between the source area and the runway. Along this flow path, VC only remains above the reference value in the deeper aquifer, and evidence suggests that advanced degradation is occurring. Although VC concentrations exceed the reference value at several locations, the mass flux rate for VC (0.17g/d) is below the threshold value of 6.5 g/d. One of the main factors contributing to the effectiveness of natural attenuation is the low groundwater flow velocity. An investigation report prepared in 2014 estimated that without addition of remedial additives CHCs in the source area will be below the reference value within 20 to 25 years. Data collected from 2008 to 2017 indicate that CHC concentrations are decreasing within the source area. HN environmental regulatory authority for the site is the City of Mannheim Fachbereich Klima, Natur, Umwelt. In 2010, HN issued a letter with the approval to extend MNA for 5 more years. In March 2014, HN issued a letter requesting further monitoring. Previously included in the DUCs database under DUCS number HDMA103. Reports were sent to the HN in February 2023, the HN would like to see a further reduction in concentrations before closing the site. There is no current plan to return the installation to the HN, and MNA is expected for an indefinite 30 years.

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 was conducted.

5595A.1002_CCMA105_GE140_PFAS_PFC Contamination

Env Site ID: CCMA105

Cleanup Site: GE140_PFAS_PFC Contamination

Alias: #

Regulatory Driver: DODI

RIP Date: 10/16/2026

RC Date: 9/30/2056

RC Reason: Not assigned

SC Date: 9/30/2056

Program: Compliance-related Cleanup

Subprogram: CC

NPL Status: No

Hazardous Ranking Score: 0

RRSE: N/A

MRSPP: N/A

Phase	Start	End
PA:	9/16/2015	10/15/2015
SI:	10/16/2015	12/15/2019
RI/FS:	12/16/2019	6/15/2025
RD:	6/16/2025	10/15/2025
IRA:	- -	- -
RA(C):	10/16/2025	10/15/2026
RA(O):	10/16/2026	9/30/2056
LTM:	- -	- -

Site Narrative: SITE LOCATION AND DESCRIPTION

1. Location- The site is located at Coleman Barracks NW of the Hangars (bldgs. 4, 9, 1375), and at fire training sites. The site is located approximately 600 m from the northern installation boundary. Coleman Barracks is enduring and will not be closed any time soon.

2. Physical Layout/Site Use- The site contains administrative and former housing facilities, barracks, and a deactivated airfield and former maintenance areas for helicopters and vehicles. The installation is currently used for storage and maintenance of tracked and wheeled vehicles and other military equipment. The ground surface of the airfield is covered with approximately 0.5 m thick concrete pavement. Adjacent areas are unpaved and covered with grass.

CONCEPTUAL SITE MODEL

1. Release Description- Aqueous Film Forming Foam (AFFF) containing PFCs were likely released during fire training exercises accidents, discharges of fires-suppression systems in the hangars, and/or handling losses at the fire station. Other probable releases not associated with AFFF includes use of PFCs at a former electroplating facility (Bldg. 1376) which has been demolished.

2. Media Impacted- PFC contaminated groundwater is present at the site. Soil has been tested for PFCs in 2019/20. Sampling confirmed PFC impacts.

3. Nature and Extent of Contamination- The nature and extent of PFCs has not been defined. Groundwater sampling during SI activities utilized existing monitoring wells associated with CCMA103 to determine if PFCs had been released to the environment. SI activities confirmed a release has occurred, and the highest detected concentrations of total PFCs identified in the central area of CCMA103 at monitoring wells P15, P20, and P24 (PFC total 6.93 to 9.52 ug/L). In August 2019, PFOS was detected in DP8 at a maximum concentration of 120 ug/L exceeding the GFS-Wert regulatory standard of 0.1 ug/L. This area covers the site of the former electroplating facility and Building 1375 (hangar). Installation of six additional monitoring wells is recommended to determine the nature and extent of PFCs in

groundwater. PFAS investigation will be conducted in three areas. The depth to groundwater is 5.0 to 6.0 m bgs and flows to northwest. Flow velocities are 50 m/a in the shallow aquifer and 23 m/a in the deeper aquifer.

4. Receptors- In Germany, groundwater is a protected receptor.

REMEDIAL OBJECTIVE

1. Long-Term Closeout Strategy- The closeout strategy is soil excavation and operation of a pump and treat system to reduce concentrations below threshold values.

2. Achievable Remedial Action Objective- The Remedial Action Objective is expected to be a combination of soil excavation and operation of a pump and treat system in the RAO phase for an indefinite 30 years to reduce concentrations below threshold values.

3. Specific Regulatory Standards and Legal Drivers- German Federal Soil Protection Act and Ordinance (Bundesbodenschutzgesetz, Bundesbodenschutzverordnung), the German Federal Water Act (Wasserhaushaltsgesetz [WHG 3 &21], and state regulations, Baden-Württemberg. The state of Baden-Württemberg issued groundwater standards for 14 PFCs on 21 August 2018.

4. Remediation Methods Planned or Being Conducted- The appropriate remediation method will be determined following completion of RI/FS activities. A combination of soil excavation and operation of a pump and treat system in the RAO phase for an indefinite 30 years is currently planned to reduce concentrations below threshold values. As of 4 August 2021, the HN agrees with the strategy to conduct PFAS investigation in three areas.

5. Response Complete- Has been set as the same date as the RAO end date in September 2056, when concentrations are below threshold values.

6. Site Closure- The site will be closed once HN regulators remediation objectives have been achieved.

7. Host Nation Involvement- The HN environmental regulatory authority for the site is the City of Mannheim Fachbereich Klima, Natur, Umwelt. The City issued a letter on 29 September 2016 requesting PFC investigations to verify possible impacts from Coleman Barracks. Following receipt of the SI results, the City issued a letter on 20 June 2018 requesting immediate submittal of a Work Plan for additional investigations.

PHASE SCHEDULE

1. Current Phase Objective- A large-scale soil and groundwater investigation in three source areas began in FY23 to gather sufficient information to select, design, and implement the most appropriate remedial measure.

2. Milestones- RIP (10/16/2026), RC (09/30/2056), Site Closeout (09/30/2056)

SCHEDULE & BUDGET CHANGES

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

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

HISTORICAL SITE ACTIVITIES

During an off-Base investigation in the City of Mannheim, PFCs were identified in groundwater, soil, and crops. On 29 September 2015, the Untere Bodenschutz- und Altlastenbehörde (Lower Agency for Soil Protection and Contaminated Sites) of the City of Mannheim, informed USAG Rheinland-Pfalz of the PFC contamination. The city suspected Coleman Barracks was a potential source and requested performance of groundwater sampling at on-Base potential release locations to evaluate if a release had occurred. PA/SI activities were conducted by USAG Rheinland-Pfalz beginning in the Fall of 2015. Several potential scenarios and release locations were identified in the vicinity of CCMA103- PFC use at a former

electroplating facility (demolished Bldg. 1376); storage or transfer of PFC containing substances vehicle / equipment cleaning and repair at the fire station (Building 21); live exercises with AFFF; accidents requiring discharge of AFFF; and discharges or testing associated with fire suppression systems in the hangars (Bldgs. 1375, 9, 4, 4A, 1373). In October 2015, groundwater samples were collected for PFC analysis from six existing monitoring wells associated with CCMA103. Results confirmed that an adverse impact to groundwater from PFCs, as defined by the Federal Water Resources Act (WHG), had occurred. The highest PFC content was identified in the central area of CCMA103 and was detected in monitoring wells P15, P20, and P24 (PFC total 6.93 to 9.52 g/L). This area covers the site of the former electroplating facility and Building 1375 (hangar). Based on the number of sites with suspected contamination and the fact that previous groundwater investigations were only carried out at localized points, groundwater sampling via direct push at twelve locations was performed in suspected source areas, as well as upgradient and down gradient locations. The results from the investigation confirmed significant PFC impacts in three areas of concern with a maximum concentration of 120 ug/L. A legal determination allowing funds to be programed for future remediation was made in FY20. In 2021, the HN agreed with the strategy to conduct the PFAS investigation in three areas. The final remediation is anticipated to be a combination of soil excavation and operation of a pump and treat system.

PROJECT APPROVAL

The project is required IAW DoDI 4715.08 (1 Nov 13), Enclosure 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.

GE30J - Germersheim Army Depot

Installation Name: GE30J - Germersheim Army Depot

Installation City: Germersheim

5621A.1001_CCHD105_GE30J_ACP Site at Gate 1

Env Site ID: CCHD105

Cleanup Site: GE30J_ACP Site at Gate 1

Alias: #

Regulatory Driver: DODI

RIP Date: 10/15/2026

RC Date: 10/15/2026

RC Reason: Not assigned

SC Date: 10/16/2026

Program: Compliance-related Cleanup

Subprogram: CC

NPL Status: No

Hazardous Ranking Score: 0

RRSE: N/A

MRSPP: N/A

Phase	Start	End
PA:	3/31/2009	3/31/2009
SI:	3/31/2009	3/15/2013
RI/FS:	3/16/2013	6/15/2025
RD:	6/16/2025	9/15/2025
IRA:	- -	- -
RA(C):	9/16/2025	10/15/2026
RA(O):	- -	- -
LTM:	- -	- -

Site Narrative: SITE LOCATION AND DESCRIPTION

1. Location- The site is located west of the southeastern site boundary of the Germersheim Army Depot (GAD, ARLOC30J) at the Access Control Point (ACP) Gate 1.

2. Physical Layout/Site Use- The site is largely covered by grass with some dense gravel base, especially south of the current gate. The site comprises of an area of approximately 26,000 m².

CONCEPTUAL SITE MODEL

1. Release Description- One single source for the Total Petroleum Hydrocarbons (TPH) and Polycyclic Aromatic Hydrocarbons (PAH) contamination detected at the site was not identified. It was assumed that the contamination is associated with oil dripping engines, improper vehicle cleaning, or wood treatment on bare soils.

2. Media Impacted- TPH and PAH have been detected at concentrations exceeding the adopted respective Host Nation (HN) threshold values in the topsoil.

3. Nature and Extent of Contamination- The maximum reported concentrations are 2,100 mg/kg TPH and 311 mg/kg PAH, exceeding the adopted respective Host Nation (HN) threshold values of 1,500 mg/kg and 100 mg/kg respectively in the topsoil. The area requiring remediation is characterized by PAH concentrations exceeding the applicable HN remediation threshold value of 50 mg/kg and extends to approximately 2,680 m² and a depth of approximately 0.7 m.

4. Receptors- The primary receptor identified is groundwater. The depth to groundwater is approximately 8.5 m.

REMEDIAL OBJECTIVE

1. Long-Term Closeout Strategy- The long-term closeout strategy will be determined following the RI/FS and will include removal of contaminated soil in the RAC phase in FY26.

2. Achievable Remedial Action Objective- Confirm contamination concentrations and locations during RI/FS then complete excavation of contaminated soil during RAC.

3. Specific Regulatory Standards and Legal Drivers- German Federal Soil Protection Act and Ordinance (Bundesbodenschutzgesetz, Bundesbodenschutzverordnung), the German Federal Water Act (Wasserhaushaltsgesetz [WHG 3 & 21] and state regulations, Rheinland-Pfalz.

4. Remediation Methods Planned or Being Conducted- Soil excavation will be conducted in the RAC phase.

5. Response Complete- The RC will be dependent upon RI/FS findings and is currently set as the RAC end date.

6. Site Closure- Will be evaluated following the RI/FS and RAC and will occur upon receipt of a HN closure letter.

7. Host Nation Involvement- Project has been communicated to HN authorities. HN agreed in 2014 to conduct soil excavation as part of a construction project planned at the site in the timeframe 2018-2023. No KOAG-internal project number was assigned for this project yet.

PHASE SCHEDULE

1. Current Phase Objective- An RI/FS is underway to define confirm contamination concentration and locations.

2. Milestones- RIP (10/15/2026), RC (10/15/2026), Site Closeout (10/16/2026)

SCHEDULE & BUDGET CHANGES

1. Schedule- This site was reopened during Spring 2022 datacall. During the FY24 datacall, the RI/FS phase is underway and has an end date of 06/15/2025. The RAC start and end dates are set for 09/16/2025 and 10/15/2026. The RC date is set as the RAC end date.

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

HISTORICAL SITE ACTIVITIES

A new Access Control Point (ACP) will be constructed at the current location of Gate 1 at the Germersheim Army Depot (GAD). A PA/SI was conducted in 2008-2013 to determine contamination background conditions prior to the construction of the new ACP. The PA/SI identified TPH and PAH impacts in the topsoil with maximum concentrations of 2,100 and 311 mg/kg, respectively. The area requiring remediation is characterized by PAH concentrations exceeding the applicable HN remediation threshold value of 50 mg/kg and extends to app. 2,680 m2, and a depth of app. 0.7 m. Due to design changes of the ACP, an additional soil and soil gas investigation was undertaken in 2012, which revealed no additional contamination at the site. The site was closed in the Headquarters Army Environmental System in Spring 2017 when it was thought the FY23 MILCON excavation project would excavate the contaminated soil. It is now believed that the FY23 MILCON project and the corresponding soil excavation could be postponed again to a point in time unacceptable for HN. Given that the last data was collected in 2012, an RI/FS is planned in FY24 to confirm the contamination concentrations and location. The soil excavation is scheduled to remove the contaminated material in FY25-26.

PROJECT APPROVAL

5621A.1003_CCMA106_GE30J_Bldgs 7889, 7983, 7988

Env Site ID: CCMA106

Cleanup Site: GE30J_Bldgs 7889, 7983, 7988

Alias: #

Regulatory Driver: DODI

RIP Date: 12/31/2029

RC Date: 12/31/2029

RC Reason: Not assigned

SC Date: 12/31/2029

Program: Compliance-related Cleanup

Subprogram: CC

NPL Status: Not assigned

Hazardous Ranking Score: 0

RRSE: N/A

MRSPP: N/A

Phase	Start	End
PA:	1/1/2015	12/31/2015
SI:	1/1/2016	12/31/2020
RI/FS:	1/1/2021	12/31/2029
RD:	- -	- -
IRA:	- -	- -
RA(C):	- -	- -
RA(O):	- -	- -
LTM:	- -	- -

Site Narrative: SITE LOCATION AND DESCRIPTION

1. Location- The site is located at the Germersheim Army Depot (GAD), which is approx. 2.0 km to the northwest of the Germersheim town center and approx. 300 m to the southwest of the B9 and B35 highway intersection.

2. Physical Layout/Site Use- The GAD is bordered to the north by agricultural land and to the west and south by forest. The GAD is currently used by the US Army as a distribution center for supplies, equipment, and non-perishable food for the European, African, and Middle East regions. The site has also been used as unsurfaced parking and storage space for vehicles and military equipment.

CONCEPTUAL SITE MODEL

1. Release Description- GWM16 and GWM17 have results above the oPW ALEX02 values. The source of the CHCs has not been identified at this time; however, wells are downgradient from a warehouse complex including a household HazMat section in BLDG 7988.

2. Media Impacted- Groundwater is contaminated with CHCs above the oPW ALEX02 values.

3. Nature and Extent of Contamination- Analytical data for soil samples are lower than the relevant oPW3 for military/industrial use. Analytical data for groundwater samples were below the quantification limits for metals, TPH, BTEX, AHC, and PAH. CHC exceeded the oPW of 10 ug/l (volatile CHC), according to the ALEX02 list, in monitoring wells GWM16 and GWM17 during 2019 and 2021 monitoring events. At the monitoring well GWM16, TCE was the only detectable CHC species, exceeding the oPW of the ALEX02 list for total CHC by a factor of four during each of the three monitoring events. Only TCE and PCE were detected in monitoring well GWM17 with total CHC concentrations of 11 ug/l in February 2019, 11.3 ug/l in May 2019, and 12 ug/l in January 2021, slightly exceeding the oPW of the ALEX02 list.

4. Receptors- In Germany, groundwater is a protected receptor in accordance with German regulations.

REMEDIAL OBJECTIVE

1. Long-Term Closeout Strategy- Five years of monitoring will be conducted under the RI/FS phase. The long-term closeout strategy will be determined following the RI/FS. It is anticipated that site closure will be achieved following five years of monitoring.

2. Achievable Remedial Action Objective- Will be determined at the conclusion of the RI/FS. As of the FY24 datacall, the HN and contractor do not anticipate that remediation will be necessary.

3. Specific Regulatory Standards and Legal Drivers- The Legislative Decree (D. Lgs.152/06) is being used for the evaluation of contaminant concentrations.

4. Remediation Methods Planned or Being Conducted- The need for remediation will be evaluated during the RI/FS. As of the FY24 datacall, the HN and contractor do not anticipate that remediation will be necessary.

5. Response Complete- It is anticipated that site closure will be achieved following five years of monitoring. The RC is therefore set as the RI/FS completion date.

6. Site Closure- The site will be closed after no significant risk can be demonstrated.

7. Host Nation Involvement- The HN environmental regulatory authority for the site is the County of Germersheim as lower soil and water protection board. The HN regulator was notified of the oPW ALEX02 exceedances in February 2021.

PHASE SCHEDULE

1. Current Phase Objective- An RI/FS is underway to assess overall site conditions. Five years of monitoring and preparation of a decision document will take place during this phase.

2. Milestones- RIP (12/31/2029), RC (12/31/2029), Site Closeout (12/31/2029)

SCHEDULE & BUDGET CHANGES

1. Schedule- During the Spring 2024 datacall, five years was added to the RC, RIP, and RI/FS end dates.

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

HISTORICAL SITE ACTIVITIES

The GAD is located approximately 2.0 km to the northwest of the Germersheim town center and approximately 300 m to the southwest of the B9 and B35 highway intersection. The GAD is bordered to the north by agricultural land and to the west and south by forest areas. The forest area directly adjoining the base to the west was formerly used by the US Army as an ammunition depot and was returned to the Federal Republic of Germany in the 90s. Since October 1951, when the US Army moved into the depot, up to 90% of the GAD surface area has been used as unsurfaced parking and storage space for vehicles and military equipment. These sites were mostly buildings and areas in or on which hazardous or water-pollutant substances had been regularly handled, such as vehicle maintenance workshops, boiler houses, gas stations, and former firefighter training areas. At this site, possible contaminant releases into the soil in the formerly unsurfaced parking areas have been examined in the past by a series of investigations (e.g. /12./ and /14./). For soil contamination, all the analysis results are lower than the relevant oPW3 for military/industrial use. Fourteen groundwater monitoring wells were installed in FY16 to evaluate potential groundwater contamination throughout the GAD. Water samples were collected from the wells and were analyzed for heavy metal concentrations TPH, BTEX, AHC, PAH, and total VOCs. Concentrations for TPH, AHC, PAH, as well as for VOC and heavy metals were consistently lower than the parameter specific quantification limits. Three additional groundwater monitoring wells were installed in FY18 to assess groundwater quality downgradient from a hazardous materials storage area (bldg. 7889) and two large warehouses with hazardous materials storages (bldgs. 7983 and 7988). The sampling results indicated that groundwater from the well locations GWM16 and GWM17 located immediately downgradient of buildings 7988 and 7889 is impacted with CHC. The CHC concentrations

found indicate an adverse change to the groundwater quality with respect to the Federal Water Act (Wasserhaushaltsgesetz). Trichloroethylene (TCE) was the only CHC species detected at GWM16. The threshold value for total CHC (oPW = 10 ug/L) was exceeded in well GWM16 by a factor of 4. Both TCE and Perchloroethylene (PCE) were detected at GWM17. Total CHC concentration was identified as 11 and 11.3 ug/L only slightly exceeding the oPW of the ALEX02 list. 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) 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 during the RI/FS.

GE32H - Gruenstadt AAFES Fac

Installation Name: GE32H - Gruenstadt AAFES Fac

Installation City: Gruenstadt

5631A.1001_CCMA101_GE32H_Gas Station AAFES

Env Site ID: CCMA101

Cleanup Site: GE32H_Gas Station AAFES

Alias: HDMA101

Regulatory Driver: DODI

RIP Date: 1/1/2010

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: N/A

Phase	Start	End
PA:	10/31/1996	12/31/1996
SI:	10/31/1996	12/31/1996
RI/FS:	12/31/1996	12/31/2008
RD:	- -	- -
IRA:	- -	- -
RA(C):	1/31/2007	12/31/2009
RA(O):	1/1/2010	9/30/2054
LTM:	- -	- -

Site Narrative: SITE LOCATION AND DESCRIPTION

1. Location- The site is located at the AAFES Depot Gruenstadt (GE32H) on the southern perimeter of the Commercial Area South.

2. Physical Layout/Site Use- The AAFES Depot consists of a central bakery, storage Bldgs and workshops, and a motor pool/gas station. The site comprises an area of approximately 70,000 m² and is mostly sealed.

CONCEPTUAL SITE MODEL

1. Release Description- Soil and groundwater contamination associated with middle distillate presumably released more than 30 years ago near Bldg. 3556 and with carburetor fuel in the area of the former gas station at Bldg. 3570, which was partially excavated. The exact quantity and date of the releases are unknown.

2. Media Impacted- TPH, AHC, and PAH in groundwater and soil exceed the adopted HN threshold values for groundwater of 0.1 mg/L, 20 ug/L, and 0.5 ug/L; as well as soil of 1,000 mg/kg, 20 mg/kg, and 25 mg/kg, respectively.

TPH 3.0 mg/L (0.1 mg/L), CHC 57 ug/L (10 ug/L), AHC 2512 ug/L (20 ug/L), and PAH 11.71 (0.5 ug/L). Maximum concentrations of 1,900 ug/L for TPH, 5,050 ug/L for AHC, and 21 ug/L for PAH, were reported between November 2020 and May 2021. The maximum CHC concentration detected in FY21 was 89.9 ug/L at GMW7, above the regulatory value of 10 ug/L. The maximum detected AHC concentration in FY21 was 5,050 ug/L at GMW37, above the regulatory value of 20 ug/L. The maximum detected TPH concentration in FY21 was 1,900 ug/L at GMW37, above the regulatory value of 100 ug/L. LNAPL has spread over the groundwater table into the eastern downgradient area. An LNAPL smear zone with bound TPH residues in soil was formed with the fluctuating water table. The sum of all contaminants remaining in soil is estimated to be approximately 10 metric tons, 8 tons TPH and 2 tons AHC, by the feasibility study dated November 2021. At low water levels, the dissolved hydrocarbon plume covers an

area of approximately 30,000 m2 and at high water levels up to about 48,000 m2. Approximately one third of the plume area is located off-post. Another impact by diesel fuel is present at the gas station (Bldg. 3568). The release of diesel fuel at the gas station (Bldg. 3568) only marginally contributes to the current impact.

4. Receptors- In Germany, the groundwater itself is a protected receptor in accordance with German regulations.

REMEDIAL OBJECTIVE

1. Long Term Closeout Strategy- Perform two years of SVE followed by indefinite pump and treat at the fence line to prevent off site migration of contamination. Monitoring will take place concurrent with remedial action.

2. Achievable Remedial Action Objective- Two years of SVE operation followed by pump and treat and monitoring to ensure the contaminant plume is stable and reduce the mass and contaminant concentrations.

3. Specific Regulatory Standards and Legal Drivers- German Federal Soil Protection Act and Ordinance (Bundesbodenschutzgesetz, Bundesbodenschutzverordnung), the German Federal Water Act (Wasserhaushaltsgesetz [WHG 3 & 21] and state regulations, Rheinland-Pfalz.

4. Remediation Methods Planned or Being Conducted- MNA has been underway since FY10 and is expected to continue for an indefinite 30 years. An ORC pilot test was conducted in FY15, which concluded ORC socks are not a viable option. An ISCO pilot test was conducted in FY17 and found to not be a viable technique. It is expected that active remediation (e.g. SVE, air sparging), followed by MNA will be recommended for an indefinite period of time. A demolition project was conducted in FY20 within the contaminated area, but no excavation occurred. Source material couldn't be excavated within the demolition contract since the source was found below the water table respectively in the groundwater fluctuation zone. Agreement on long-term remediation plan will need to be conducted with HN authorities. As of Spring 2021, SVE is thought to be the best remedial technique to supplement MNA. A two-year pilot test is planned for SVE in FY23-24 with two years of SVE operation, in FY25-26, to follow. HN approved the SVE pilot test in October 2022. A pilot study was conducted in April 2023 for SVE, MPE, and air sparging which showed that SVE can successfully remove AHCs from the subsoil to a relevant extent and that AS may be a support for SVE at the site. During the FY24 datacall, it was determined that pump and treat along the fence line is necessary to prevent contaminant migration off site. Remedial design of this system will take place in FY26 with construction in FY27. Pump and treat operation will follow from FY27 to FY54. Thirty years of monitoring are planned in FY25-54.

5. Response Complete- Will be achieved when the contaminant plume remains stable and contaminant concentrations have been sufficiently reduced.

6. Site Closure- Will be achieved when HN concurs that no further action is required and subsequently a HN closure letter is receipt.

7. Host Nation Involvement- This site is monitored and tracked by HN. An official KOAG-internal project number is not assigned to this project yet.

PHASE SCHEDULE

1. Current Phase Objective- Continue monitoring for an indefinite 30 years. Operation of SVE for two years followed by construction and indefinite operation of a pump and treat system at the fence line.

2. Milestones- RIP (01/01/2010), RC (09/30/2054), Site Closeout (09/30/2054)

SCHEDULE & BUDGET CHANGES

1. Schedule- Five years were added to the end of the RAO and RC phases during the Spring 2024 data call.

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

HISTORIC SITE ACTIVITIES

The AAFES fuel point (Bldg. 3568) was constructed in the early 1950s and subject to upgrades and modernization between 1980 and 2000. During these projects, the soil at the site was found to be contaminated with maximum 3,680 mg/kg of TPH and 5,500 mg/kg of BTEX and soil gas contamination with maximum 13,040 mg/ m^3 of BTEX. These impacts were subsequently removed during USTs removals in 1980, 1993, and 1999. Only minor amounts of contaminated soil had to be left in place to ensure the structural integrity of an adjacent building. Initial remedial actions in 1980 included soil removal in the area of a former 25 m^3 diesel UST by Bldg. 3568. The amount of soil removed in 1980 is unknown. In 1993, two additional 10 m^3 USTs were removed by Bldg 3568. Today the exact location of the USTs is unknown; it is assumed that they were located south of Bldg. 3570. When gas station was upgraded in 1999 approx. 30 m^3 of contaminated soil was excavated. More soil than anticipated was contaminated and 300 metric tons of soil were removed following a delineating soil study. However, approximately 10-30 m^3 of contaminated soils had to be left in place to ensure the structural integrity of neighboring buildings. During groundwater investigations 2004-2006 it was observed that the contaminant concentrations decreased significantly due to ongoing natural attenuation. In 2006, TPH concentrations increased again in a few spot areas due to localized LNAPL mobilization caused by a decline of the groundwater table. In 2006, maximum contaminant concentrations were 4,600 ug/l for TPH (only in areas with LNAPL), 290 ug/l for BTEX, 7.59 ug/l for PAH, and 3017 ug/l for aromatic hydrocarbons. A pilot test for LNAPL removal from 3 wells was successfully conducted in 2007. A decision document recommending MNA as remedial action was prepared in 2009. The MNA program started in 2009 and was valid for 5 years. A very stable groundwater flow regime was observed with an ENE flow direction and a fluctuating water table. Free phase hydrocarbons were observed between 2010 and 2013. Concentrations above HN threshold values for TPH, AHC, and PAH were identified in the southern edge of the plume for the first time in spring 2012 and a further increase was observed in fall 2012/spring 2013. At the leading edge of the plume, increasing trends were established for all contaminant parameters. Latest maximum on-post concentrations were 1.3 mg/l TPH, 5,000 ug/l AHC, and 21 ug/l PAH. On-going natural attenuation has been confirmed. Since contamination was detected off-post a Claim (T- 2005-DEU-0327) was filed by the County (Kreisverwaltung) of Bad Dürkheim for TPH contamination in groundwater. On 23 May 2014, following the review of the latest monitoring results HN issued a letter questioning whether MNA is appropriate for the site. HN requested that a formal remediation plan evaluating alternative remedial options and the associated costs is submitted before a decision regarding the further procedure will be made. A pilot test was conducted in FY15 to evaluate the use of ORC socks as a remedial alternative; However, it was determined the ORC socks were not able to provide the amount of oxygen necessary to stimulate the biodegradation process. An ISCO pilot test was conducted in FY17 and found to not be a viable technique. A demolition project was conducted in FY20 within the contaminated area. Source material could not be excavated because contamination was not found in the unsaturated soil layers. A pilot study is underway in FY21 to evaluate which technology would be best suited for this site. It is expected that MNA will be recommended for an indefinite period of time. As of Spring 2021, SVE is thought to be the best remedial technique to supplement MNA, and a two-year pilot test is planned for SVE in FY23-24. A pilot study was conducted in April 2023 for SVE, MPE, and air sparging. The study showed that SVE can successfully remove AHCs from the subsoil to a relevant extent and that AS may be a support for SVE at the site. Thirty years of MNA is planned in FY24-53. The site was previously included in the EPR under DUCS number HDMA101.

PROJECT APPROVAL

GE426 - Kad & Deh Real PropArea

Installation Name: GE426 - Kad & Deh Real PropArea

Installation City: Kaiserslautern

5647A.1001_CCKL070_GE426_Bldg 2288, Vehicle Area

Env Site ID: CCKL070

Cleanup Site: GE426_Bldg 2288, Vehicle Area

Alias: DEH42851-2

Regulatory Driver: DODI

RIP Date: 1/6/2021

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: N/A

Phase	Start	End
PA:	11/30/1995	12/31/1996
SI:	11/30/1995	12/31/1996
RI/FS:	1/31/1997	1/5/2021
RD:	10/15/2020	1/5/2021
IRA:	12/15/2010	5/15/2012
RA(C):	10/15/2020	1/5/2021
RA(O):	1/6/2021	9/30/2054
LTM:	- -	- -

Site Narrative: SITE LOCATION AND DESCRIPTION

1. Location- The site is located within the central part of Kaiserslautern Army Depot (KAD, GE 426), around Building 2288.

2. Physical Layout/Site Use- Building 2288 was constructed in 1990, replacing a former wooden building and several wooden sheds. The area is in use as vehicle maintenance and storage area since US Army controls it.

CONCEPTUAL SITE MODEL

1. Release Description- A former solvent cleaning system in the building draining via an oil/water separator to an open ditch is one potential long-term source for the significant amount of CHC released and infiltrated into the ground. Wooden sheds near Bldg. 2288 were used for storing solvents and CHC was released due to improper material storage and handling procedures over the time. An amount of at least 6 - 12 tons of CHCs was released.

2. Media Impacted- CHC is severely contaminating groundwater and the unsaturated soil.

3. Nature and Extent of Contamination- The site represents one of several major source areas for the CHC plume underlying KAD (plume length of 2.5 km, reaching to a depth in excess of 80 m below ground). Maximum CHC concentrations in groundwater reached 8.0 mg/L. CHC concentrations in groundwater reached 2.0 mg/L prior to the ISCO pilot test. The distance to groundwater in the topmost aquifer (A-aquifer) is 20 - 25 meters. Both, the A and the below B aquifer, are impacted with CHC. Groundwater flows southwest, towards an area with multiple drinking water wells that supplies the city of Kaiserslautern with potable water (closest well is located in a distance of approximately 2.0 km). In March 2019, four wells south of the ISCO injection wells had low level CHC detections.

4. Receptors- In Germany, the groundwater itself is a protected receptor in accordance with German regulations.

REMEDIAL OBJECTIVE

1. Long Term Closeout Strategy- The results of the rebound study will be used to evaluate the level of CHC-decrease in the source area and will feed into the large-scale Remediation Concept. It is assumed that 30 years of MNA will be conducted.

2. Achievable Remedial Action Objective- Confirm no rebound is occurring and the CHC mass-flux is decreasing. MNA will be conducted to ensure the contaminant plume is stable and contaminant concentrations continue to decrease.

3. Specific Regulatory Standards and Legal Drivers- German Federal Water Act (Wasserhaushaltsgesetz) and state regulations, Rheinland-Pfalz. Under the provisions of Article 53 of the Supplementary Agreement to the NATO SOFA (an international agreement) the U.S. is obligated to apply this law.

4. Remediation Methods Planned or Being Conducted- ISCO via permanganate was accomplished in May 2012, currently the CHC-rebound study is ongoing. MNA has been underway since FY21 and is expected to continue for an indefinite 30 years. A pump test is scheduled for FY27.

5. Response Complete- Will be achieved when the contaminant plume remains stable and contaminant concentrations have been sufficiently reduced.

6. Site Closure- Will be achieved when the source area is sufficiently reduced.

7. Host Nation Involvement- This site is monitored and tracked by HN through the Coordination Working Group (KOAG) which was set up in response to congressional inquiries regarding contamination in the Kaiserslautern Military Community. KOAG-internal project number is K0003.

PHASE SCHEDULE

1. Current Phase Objective- Indefinite monitored natural attenuation is planned for 30 years.

2. Milestones- RIP (01/06/2021), RC (09/30/2054), Site Closeout (09/30/2054)

SCHEDULE & BUDGET CHANGES

1. Schedule- One year was added to the RC, SCO, and RAO end date during the Spring 2024 datacall.

2. Budget- The CTC for this site in Spring 2023 is TBD.

HISTORIC SITE ACTIVITIES

In the early 1980s, CHCs were detected in the Host Nation drinking water well field located down gradient of the Kaiserslautern Army Depot (KAD). Measured concentrations reached up to 14.9 ug/L, with the main species being TCE (Trichoroethylene) and PCE (Perchloroethylene). Comprehensive groundwater studies performed since 1994 over the entire area of Kaiserslautern East identified at least 6 major sources of CHCs contaminating the underlying multi-layered fractured bedrock aquifer. One of the major CHC-impacted sites with concentrations of up to 2.0 – 5.0 mg/L in the groundwater is located in the vicinity of Bldg. 2288. Vertical migration to deeper aquifer zones has been documented. Between 1999 and 2002, a first remediation concept for pump & treat (at well GW115B) was developed and a one-year pilot project was conducted. Due to adverse hydro-geological conditions the pump & treat method was abandoned. In 2005/2006, a groundwater clean-up involving in-situ remediation by injecting molasses was tested. The test failed and was terminated ahead of schedule. A feasibility study conducted in 2007 evaluated in-situ techniques and methodologies for in-situ remediation, which resulted in the selection of ISCO, using permanganate as oxidant, as an appropriate technology for this site. ISCO field testing preparation to the north of Bldg. 2288 commenced in 2008, and injection of permanganate started in December 2010. Complete injection of the targeted mass of 40 tons of permanganate in the bed rock aquifer was achieved in May 2012. The results indicated a reduction of CHC mass flux from 76 kg/a (April 2010) to 31 kg/a (September 2011) to 27 kg/a (October 2012). A

rebound study phase commenced, monitoring the rate and level of CHC desorption from the aquifer matrix to the groundwater to quantify the amount of CHC destroyed and to evaluate remediation efficiency. Multi well pumping tests determined a CHC mass flux of 11 kg/a after 27 month of injection completion, down to 9.0 kg/a 51 month later, 3.0 kg/a after 84 months (March - May 2019) and 0.6 kg/a after 122 months (July 2022), indicating a 99% overall reduction in mass flux compared to the mass flux before ISCO. This remedial success of CHC mass flux of 1.5 g/d complies with the applicable total CHC mass flux threshold of 20 g/d, applicable for contaminant hot spot emissions in the federal state of Rhineland-Palatinate. The results do further suggest that the source zone emission is still declining and there is no indication for any rebound effect yet. Dissolved permanganate is still present within the aquifer system 10 years after ceasing injection and is still available for oxidizing CHCs that might still reside in the sandstone matrix (in March 2019, four wells south of the ISCO injection wells had low level CHC detections). In a meeting with HN authorities in March 2021, the success of the cleanup was confirmed and agreed to MNA (tracked under RA(O)) of the contaminated site at selected groundwater wells. Data will serve the holistic monitoring of contaminant freight (including monitoring of degradation products) at KAD, including all other affected remediation projects in the KL-East area (CCKL168, CCKL169 etc.) after source clean-up. A follow-up pumping test to evaluate level of rebound effects is planned for FY27. This site was previously tracked under DUCS number WPKL070.

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 approved on 5 January 2021.

5647A.1006_CCKL164_GE426_Fmr Paint Shop at GW26A

Env Site ID: CCKL164

Cleanup Site: GE426_Fmr Paint Shop at GW26A

Alias: DEH42932-5

Regulatory Driver: DODI

RIP Date: 10/16/2026

RC Date: 9/30/2056

RC Reason: Not assigned

SC Date: 9/30/2056

Program: Compliance-related Cleanup

Subprogram: CC

NPL Status: No

Hazardous Ranking Score: 0

RRSE: N/A

MRSPP: N/A

Phase	Start	End
PA:	2/28/2005	2/28/2005
SI:	3/31/2005	2/28/2007
RI/FS:	3/1/2007	10/15/2025
RD:	1/27/2021	10/15/2025
IRA:	- -	- -
RA(C):	10/16/2025	10/15/2026
RA(O):	10/16/2026	9/30/2056
LTM:	- -	- -

Site Narrative: SITE LOCATION AND DESCRIPTION

1. Location- The site is close to the northern boundary of the KAD (GE426), in between Highway A6 and Bldg. 2256.

2. Physical Layout/Site Use- The surface around Bldg. 2256 is sealed, partly in bad condition. Bldg. 2256 and the adjacent area are used for vehicle/equipment maintenance activities ever since.

CONCEPTUAL SITE MODEL

1. Release Description- The identified contaminants likely represent residuals of an old spill around Bldg. 2256. The source of the contamination is unknown.

2. Media Impacted- The groundwater is impacted with TPH and AHC, mainly xylene.

3. Nature and Extent of Contamination- Groundwater impact seems to be limited to GW26A. The source area is unknown. A preliminary investigation in 2004 detected a significant impact of POL and xylene in GW 26A. Follow-up investigations identified maximum concentrations of up to 400 ug/L for TPH (threshold value 100 ug/L) and up to 75 ug/L for AHC (threshold value 20 ug/L). Groundwater monitoring started in 2013. Over the past years it showed declined TPH and CHC concentrations well below applicable threshold values but still elevated AHC and xylene concentrations. In December 2017, maximum concentrations of 9.1 ug/L for total Xylenes and 87.9 ug/L for total AHC were present in GW26A exceeding their respective oPW ALEX 2 regulatory standards of 5 ug/L and 20 ug/L. Up to today, both contaminants do not show a decreasing trend line. The source of contamination is not identified or delineated during all the investigations. It is assumed that the contamination might be associated with the operations of the former paint shop at Building 2256. Recent indications show that soil and waste fill materials excavated in 1998 were not completely removed and that these residues could also be a potential source of groundwater contamination.

4. Receptors- The primary receptor identified is groundwater. In Germany, groundwater itself is a protected receptor.

REMEDIAL OBJECTIVE

1. Long Term Closeout Strategy- It is assumed that 30 years of MNA will be conducted.

2. Achievable Remedial Action Objective- Confirm that the contaminant plume is stable or reducing and contaminant concentration is decreasing through MNA.

3. Specific Regulatory Standards and Legal Drivers- German Federal Soil Protection Act and Ordinance (Bundesbodenschutzgesetz, Bundesbodenschutzverordnung), the German Federal Water Act (Wasserhaushaltsgesetz [WHG 3 & 21] and state regulations, Rheinland-Pfalz. Under the provisions of Article 53 of the Supplementary Agreement to the NATO SOFA (an international agreement) the U.S. is obligated to apply this law.

4. Remediation Methods Planned or Being Conducted- Advanced monitoring, including isotope analysis, PCR, and mass flux calculation to determine microbiological activity and to verify contaminant degradation will take place in FY24, followed by MNA conducted for an indefinite 30 years.

5. Response Complete- Will be achieved when the contaminant plume remains stable and contaminant concentrations shows a decreasing trend line.

6. Site Closure- Will be achieved once groundwater contaminant concentrations fall below the HN regulatory values.

7. Host Nation Involvement- This site is monitored and tracked by HN through the Coordination Working Group (KOAG) which was set up in response to congressional inquiries regarding contamination in the Kaiserslautern Military Community. KOAG-internal project number is K0153.

PHASE SCHEDULE

1. Current Phase Objective- An RI/FS is underway through FY25. It is expected that MNA will be conducted for an indefinite 30 years.

2. Milestones- RIP (10/16/2026), RC (09/30/2056), Site Closeout (09/30/2056)

SCHEDULE & BUDGET CHANGES

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

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

HISTORIC SITE ACTIVITIES

Since the 1970s, Bldg 2256 and the adjacent area have been used for maintenance activities such as a painting (abandoned in the 1990s), sand blasting, and steam cleaning. In 1998, this area was subject to a preliminary soil and soil vapor investigation. No contamination could be found. During construction work started in 1998, soil and waste fill materials (mostly dry paint residues) were discovered and excavated. Groundwater investigation at GW26A in 2004 revealed high xylene concentrations, generated most likely by paint shop activities. A follow-up pumping test on GW26A in 2005 confirmed TPH and AHC impacted groundwater. The source area could not be determined at that time nor in the course of a follow-up investigation in 2007/2008, when a floating heating oil layer, free phase TPH, could be observed on the water sample. In 2009, a 30-day emission pumping test was performed to determine if trapped heating oil can be mobilized as a result of drawing down the water table (xylene in concentrations of 21 ug/L to 39 ug/L was found in groundwater). Maximum concentrations of 400 ug/L (threshold value 100 ug/L) for TPH and 75 ug/L (threshold value 20 ug/L) for AHC were identified during this emission pumping testing. In addition, water levels were monitored to investigate the correlation between the water level in the nearby retention basin and the presence of heating oil in groundwater. Based on hydraulic results from

the emission pumping test and the groundwater monitoring data there were no Indications for a source zone of heating oil in the vicinity of the investigated area or of a significant impact to groundwater or for a contaminant plume migrating off-site. The identified contaminants likely represent residuals of a minor and supposedly rather old spill. Contemporary investigations at a former US facility approximately 200 m north of the CCKL164 site conducted under the US Army Claims Service (USACSEUR) did not indicate an off-site contamination source either. Due to rapidly decreasing TPH contamination levels, the expert considered a permanent groundwater extraction or any other remedial action as disproportional. As GW26A still showed elevated AHC, it was agreed during a meeting with HN in August 2011 to continue with the groundwater monitoring for 5 years. These monitoring events confirmed TPH and CHC concentrations well below applicable threshold values but still showed elevated AHC level in-between 100 - 120 ug/L (threshold value is 20 ug/L) and elevated xylene concentrations of 41 ug/L (threshold value is 5 ug/L). Facing the contamination results until spring 2016, the contractor recommended continuation of the monitoring, and linking concentration levels and precipitation, and on the long-term to develop an investigation program for the basis of a risk assessment. In FY18, the monitoring program was modified accordingly, and the sampling was expanded to include a total of 4 wells (GW26A and adjacent GW 48, GW 49, and GW 50). The data until 2022 specified data gaps as local groundwater hydraulics and contaminant transport mechanisms for the site are not fully understood. The monitoring efforts are being extended and adjusted to collect more information on the groundwater hydraulics, contaminant transport mechanism, mass-flux, and bio/chemical degradation. As of now a forecast as to how long the emission of contaminants to groundwater will continue and what mass of contaminants will be released is not possible since the contaminant source has not yet been identified or delineated. Recent indications show that soil and waste fill materials excavated in 1998 were not completely removed and that these residues could be a potential source of groundwater contamination. This site was previously included in EPR under DUCS number WPKL164.

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 and LEC consultation conducted prior to moving into the RA(C) phase.

5647A.1012_CCKL168_GE426_South Bldg 2227 GW05

Env Site ID: CCKL168

Cleanup Site: GE426_South Bldg 2227 GW05

Alias: DEH42910-7

Regulatory Driver: DODI

RIP Date: 4/16/2023

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: N/A

Phase	Start	End
PA:	9/30/2002	6/30/2003
SI:	7/1/2003	1/31/2007
RI/FS:	2/1/2007	8/15/2016
RD:	- -	- -
IRA:	- -	- -
RA(C):	8/16/2016	4/15/2023
RA(O):	4/16/2023	9/30/2054
LTM:	- -	- -

Site Narrative: SITE LOCATION AND DESCRIPTION

1. Location- The site of concern is an open storage area for military, located in Kaiserslautern Army Depot (KAD, GE 426), which is in a forested area between Bldg. 2227 and the southern installation border downhill to Mannheimerstrasse.

2. Physical Layout/Site Use- Forested area with clearings to store military vehicles and equipment on open ground.

CONCEPTUAL SITE MODEL

1. Release Description- Military equipment is stored in this area since the 1950s. In the past, the equipment was maintained and cleaned using CHC containing products. CHCs were released over past decades due to improper storage and handling procedures.

2. Media Impacted- CHC contaminated soil and groundwater.

3. Nature and Extent of Contamination- The chlorinated solvents (primarily PCE) were probably released in the early 1980s. The southwestern edge of the storage area is regarded as the main release area, causing contamination of the shallow aquifer (A-aquifer). The site represents one of several major source areas for the CHC contamination plume in the groundwater underlying KAD (plume length of 2.5 km, reaching to a depth in excess of 80 m below ground). The contaminant plume from site CCKL168 overlaps with other CHC source areas in the surroundings, which are partly located upgradient. The distance to groundwater in the A-aquifer is 20 - 25 meters. Both, the A- and the below B-aquifer, are impacted with CHC. Groundwater moves southwest towards an area with multiple drinking water wells that supplies the city of Kaiserslautern with potable water (closest well is located in a distance of approximately 1.5 km). The mean groundwater flow velocity downgradient of the site is estimated to be about 4.0 m/d (1.5 km/year).

4. Receptors- Humans (via drinking water) and groundwater. In Germany, the groundwater itself is a protected receptor in accordance with German regulations.

REMEDIAL OBJECTIVE

1. Long Term Closeout Strategy- MNA as RAO for an indefinite 30 years. Due to a decreasing trend in contaminant concentrations, the strategy has changed from source zone remediation using thermal injection to an indefinite 30 years of MNA.

2. Achievable Remedial Action Objective- MNA will be conducted to ensure that contaminant concentrations continue to decrease.

3. Specific Regulatory Standards and Legal Drivers- German Federal Water Act (Wasserhaushaltsgesetz) and state regulations, Rheinland-Pfalz. Under the provisions of Article 53 of the Supplementary Agreement to the NATO SOFA (an international agreement) the U.S. is obligated to apply this law.

4. Remediation Methods Planned or Being Conducted- RA(C) included excavation of the shallow overburden conducted in Spring 2018, followed by construction and operation of thermal injection system (ISTT) as pilot test that thermally treated the unsaturated bedrock to reduce contamination. Due to decreasing contaminant concentrations, the strategy has changed from thermal injection to MNA for an indefinite 30 years.

5. Response Complete- Will be achieved at the conclusion of MNA when contaminant concentrations remain below regulatory standards.

6. Site Closure- Will be achieved when MNA is completed.

7. Host Nation Involvement- This site is monitored and tracked by HN through the Coordination Working Group (KOAG) which was set up in response to congressional inquiries regarding contamination in the Kaiserslautern Military Community. KOAG-internal project number is K0108.

PHASE SCHEDULE

1. Current Phase Objective- MNA is planned for an indefinite 30 years.

2. Milestones- RIP (04/16/2023), RC (09/30/2054), Site Closeout (09/30/2054)

SCHEDULE & BUDGET CHANGES

1. Schedule- One year was added to the RC, RAO, and SCO end dates during the Spring 2024 datacall.

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

HISTORIC SITE ACTIVITIES

In the early 1980s, CHCs were detected in the Host Nation drinking water well field located down gradient of the KAD. Measured concentrations reached up to 14.9 ug/L, with the main species being TCE (Trichloroethylene) and PCE (Perchloroethylene). Comprehensive groundwater studies performed since 1994 over the entire area of Kaiserslautern East identified at least 6 major sources of CHCs contaminating the underlying multi-layered fractured bedrock aquifer. GW05 (well depth- 20 m) hit one of these major source areas showing CHC concentrations of up to 1,660 ug/L at that time. In 2004 and 2008/2009, further investigations continued to delineate the impact, to define the source area and to improve the hydrogeological site knowledge. In 2012, detailed investigations continued to understand the CHC migration in soil and groundwater (via integrated pumping tests at wells GW05A and GW35A, soil gas extraction, gore sorber samplings, and Passive Diffusion Bags sampling) and to estimate the off-site mass flux. The results confirmed a significant CHC reservoir in the unsaturated zone within an open storage area between wells GW05A and GW35A. Follow-up investigations in FY14 delineated a significant CHC (90 %PCE) soil impact at the southwestern corner of the open storage area. Dense non-aqueous phase liquids (DNAPL) were confirmed within the soil matrix of the unconsolidated deposits in

an area of approximately 600 m² to a depth of 1.5 meters. The contaminant mass was estimated 150 kg. This estimated up to about 12 kg/year of PCE leaching from the unsaturated zone into the groundwater (given a calculated total off-site CHC mass flux of 15 – 20 kg/year, CCKL168 area turned out to be the major CHC source area for the total mass discharging from the KAD). The majority of the dissolved contaminant plume is restricted to the upper 15 – 20 m of the aquifer. In January 2015, the maximum CHC concentration at GW73A was 1,100 ug/L. Based on the investigation results, the contractor identified the contaminated unconsolidated deposits above the bedrock as the area with the highest potential for groundwater contamination and recommended removal of the contaminated overburden and to address the contaminated unsaturated bedrock by applying In-Situ-Thermal-Treatment (ISTT). In a first step, in Spring 2018, the contaminated overburden was excavated. In February/March 2018, a total of 1,200 m³ or 1,636 metric tons of the unconsolidated soils were excavated to the top of the bedrock (approx. 2 m bgs). The contaminant mass removed by the excavation was estimated to be about 100 kg. Afterwards, a Pilot Test for an In-Situ Thermal Treatment (ISTT) of the unsaturated part of the sandstone bedrock, using steam as heating medium commenced between Jan – 25 Mar 2019. The results support the validity of the conceptual site model which assumes a cascading contaminant transport through the unsaturated zone. A follow-up data gap analysis showed that excavation and thermal remediation worked better than expected. CHC soil vapor concentration in bedrock is significantly lower than initially expected. Along with observed rapid drop in soil vapor concentration of CHC, ISTT is therefore not considered viable and proportional any longer. In a meeting with HN on 22 June 2022, the regulator concurred with this conclusion and agreed to the termination of ISTT. Remediation of the unsaturated zone is therefore considered complete and MNA is planned for an indefinite 30 years. This site was previously tracked under DUCS number WPKL140 and CCKL140.

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 was conducted.

GE428 - KaiserslauternEqpSptCtr

Installation Name: GE428 - KaiserslauternEqpSptCtr

Installation City: Kaiserslautern

5649A.1002_CCKL169_GE428_Bldg 3040/3041

Env Site ID: CCKL169

Cleanup Site: GE428_Bldg 3040/3041

Alias: DEH44903-7

Regulatory Driver: DODI

RIP Date: 10/16/2025

RC Date: 9/30/2055

RC Reason: Not assigned

SC Date: 9/30/2055

Program: Compliance-related Cleanup

Subprogram: CC

NPL Status: No

Hazardous Ranking Score: 0

RRSE: N/A

MRSPP: N/A

Phase	Start	End
PA:	9/30/2002	6/30/2003
SI:	7/1/2003	1/31/2007
RI/FS:	2/1/2007	4/15/2021
RD:	10/16/2021	10/15/2024
IRA:	4/16/2010	10/15/2025
RA(C):	10/16/2024	10/15/2025
RA(O):	10/16/2025	9/30/2055
LTM:	- -	- -

Site Narrative: SITE LOCATION AND DESCRIPTION

1. Location- The site is located near Bldgs. 3040/3042/3050 in the southern area of the Kaiserslautern Equipment Support Center (ESCK, GE428). A drinking water protection zone borders to the southern installation boundary.

2. Physical Layout/Site Use- The area consists of buildings, roads, and hardstands amidst forest area.

CONCEPTUAL SITE MODEL

1. Release Description- At least 2 tons of CHCs were released over past decades due to improper storage and handling procedures.

2. Media Impacted- CHC contaminated soil and groundwater is present at concentrations that require remediation.

3. Nature and Extent of Contamination- CHC in groundwater up to 2.5 mg/L was detected along the southern installation boundary, adjacent to the drinking water protection zone. Various CHC species indicate separate release events. A significant release area was identified under Bldg. 3050, a vehicle maintenance location. The release area is located close to a tectonic fault in sandstone bedrock. The CHC impacts in the unsaturated zone appear to extend approx. 40 - 50 m away from MW B3 in all directions except for the west. In the saturated zone, higher CHC concentrations (>2,000 ug/L) are present at MW B2, B3, B4, B7, B9, B10 and B12. The center of the contamination is likely to be the MW B3, B9, and B10 area where CHC concentrations were on average between 5,000 and 6,000 ug/L. The CHC contamination mainly consists of PCE, TCE, and cisDCE. Total CHC concentrations above 1,000 ug/L were measured in boreholes B1, B2, B3, B4, B5, B7, B9, B10, B12 and B13 and in groundwater monitoring well GW47A1. The center of the contamination in groundwater is located between the B3, B7, B9, and B10. The two boreholes B6 and B8 located at the western edge of the investigation area showed relatively low concentrations. Groundwater flows southwest, towards a groundwater protection zone bordering the installation fence line.

4. Receptors- Humans exposure to and consumption of contaminated groundwater. In Germany, the groundwater itself is a protected receptor.

REMEDIAL OBJECTIVE

1. Long Term Closeout Strategy- The results of the ongoing investigations, along with the results of the CHC-rebound study at CCKL070 and the results of the mass flux study at CCKL140, will be used to develop a Remediation Plan, addressing a KL-East holistic site management approach. It is assumed that P&T for 30 years and 2 years of SVE will be selected as viable method at CCKL169 to remove CHC from the aquifer.

2. Achievable Remedial Action Objective- A combination of SVE, MPE, and P&T to treat the source area while controlling the migration of CHCs and demonstrate the site is no longer contributing mass discharge of CHCs to the contamination plume at levels unacceptable to the HN accepted values that have yet to be negotiated.

3. Specific Regulatory Standards and Legal Drivers- German Federal Water Act (Wasserhaushaltsgesetz) and Rheinland-Pfalz state regulations. Under the provisions of Article 53 of the Supplementary Agreement of the NATO SOFA (an international agreement) the U.S. is obligated to apply to this law.

4. Remediation Methods Planned or Being Conducted- The optimized pump & treat, that is being conducted as a hydraulic control, seems a viable IRA to simultaneously contain the CHC and remove it from the aquifer. It is expected that 2 years of MPE and SVE will be conducted in FY25-26.

5. Response Complete- Will be achieved when HN agrees that no further source area treatment is needed based upon rebound and decreasing mass flux.

6. Site Closure- Will be achieved when the source area is sufficiently reduced.

7. Host Nation Involvement- This site is monitored and tracked by HN through the Coordination Working Group (KOAG) which was set up in response to congressional inquiries regarding contamination in the Kaiserslautern Military Community. KOAG-internal project number is K0151.

PHASE SCHEDULE

1. Current Phase Objective- Currently in the IRA and RD phases with pump & treat being conducted for hydraulic control to prevent contaminant migration under IRA with an underway investigation to delineate contamination. P&T system expected to operate as RA(O) for 30 years. It is expected that 2 years of MPE and SVE will be conducted in FY25-26. Treatment system optimization will likely take place in FY25

2. Milestones- RIP (10/16/2025), RC (09/30/2055), Site Closeout (09/30/2055).

SCHEDULE & BUDGET CHANGES

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

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

HISTORIC SITE ACTIVITIES

In the early 1980s, CHCs up to 14.9 ug/L (HN threshold value is 10 ug/L) were detected in the HN drinking water well field located downgradient of the Kaiserslautern Army Depot (KAD). Comprehensive groundwater studies performed since 1994 over the entire area of Kaiserslautern East identified at least 6 major sources of CHCs contaminating the underlying multi-layered fractured bedrock aquifer. The area around Bldgs. 3040/3042/3050, once consisting of a filling station and equipment maintenance and service shops, is suspected to be one major source site. A drinking water protection zone III (used by Kaiserslautern's public water works) borders to the southern installation boundary. Detailed investigations of the impact were initiated in 2004. Groundwater samples taken on- and off-post (within

water protection zone III, financed by US Army Claims Service) showed CHC levels of up to 2,680 ug/L in the upper aquifer. In 2010, a Pump & Treat (P&T) system started operation as interim measurement to secure and contain the CHCs. The contaminant potential in groundwater was estimated at least 250 kg and approximately 40 kg of CHC were extracted in the first year. P&T was continued in 2012 in order to evaluate the CHC recovery and capture zones, parallel to further hydrogeological investigations to characterize and delineate the impact. Data pointed to establishing an optimized P&T operation as an approach to reduce the CHC mass in groundwater by 90% in 20 years. To confirm this assumption, the small-scale P&T system was replaced by a full- scale system, starting operation in November 2013. Since that time, the P&T system proofs functionality as containment for the contamination plume; the effect reaches beyond installation fence line and covers the contaminated A- as well as the not impacted B-Aquifer. In 2014, the plant extracted a total of 33 kg of CHC, resulting in a calculated extraction efficiency of 90% CHC mass reduction in 45 years. Data gained by a long-term pump test performed in 2015 indicated far more than 45 years of P&T required, considering current mass extraction in the amount of 10% and foreseeing a reduction in extraction over the time. While continuing IRA, an evaluation of measurements to improve the groundwater remediation process was initiated in 2016. Investigations (installation of additional wells, long-term pump test, SVE) focused on a relevant PCE contamination discovered in the unsaturated zone and the upper section of the saturated zone area of Bldg 3050. SVE showed concentrations of up to 275 mg/m³, not dropping below the threshold value of 50 mg/m³ even after 24 hours. Investigation results allowed to sufficiently delineate the CHC contamination plume and to identify the most suitable approach for the decontamination of the Bldg 3050 source area-remediation of the unsaturated zone with a SVE/MPE system to reduce the CHC mass and to continue operation of an optimized P&T system to treat the saturated zone. The final remedy will include SVE and MPE for 2 years, and P&T for an indefinite 30 years. A decision document was finalized in November 2021 but not yet approved by Headquarters.

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 in February 2021.

5649A.1003_CCKL165A_GE428_POL Bldg 3040/3042

Env Site ID: CCKL165A

Cleanup Site: GE428_POL Bldg 3040/3042

Alias: K0154

Regulatory Driver: DODI

RIP Date: 10/16/2025

RC Date: 9/30/2055

RC Reason: Not assigned

SC Date: 9/30/2055

Program: Compliance-related Cleanup

Subprogram: CC

NPL Status: No

Hazardous Ranking Score: 0

RRSE: N/A

MRSPP: N/A

Phase	Start	End
PA:	2/28/2005	2/28/2005
SI:	3/1/2005	9/30/2007
RI/FS:	10/1/2007	4/15/2021
RD:	- -	- -
IRA:	4/16/2010	10/15/2025
RA(C):	10/16/2024	10/15/2025
RA(O):	10/16/2025	9/30/2055
LTM:	- -	- -

Site Narrative: **CCKL165 was inadvertently set up under the incorrect ARLOC GE426 (KAD & DEH Real Property Areas), Level 6. CCKL165 was discontinued in February 2016 and reopened as CCKL165A under the correct ARLOC GE428 (Kaiserslautern Equipment Support Center), Level 6. **

SITE LOCATION AND DESCRIPTION

1. Location- The site is located in the southern part of the Kaiserslautern Equipment Support Center (ESCK, GE428) in the area of Bldgs. 3040 and 3042, close to a Groundwater Protection Zone III.

2. Physical Layout/Site Use- The site formerly housed a filling station. The filling station was demolished and replaced by a paved parking.

CONCEPTUAL SITE MODEL

1. Release Description- Contamination is associated with operation of the filling station from the 1970s to the 1990s.

2. Media Impacted- TPH and AHC contaminated groundwater is present.

3. Nature and Extent of Contamination- AHC concentrations up to 272 ug/L that exceeds the HN threshold value of 20 ug/L and TPH concentrations up to 370 ug/L that exceeds the HN threshold value of 100 ug/L were detected in the upper aquifer in 2004. The data have shown a decreasing trend between 2004 and 2009. Since 2009, TPH has no longer detected. Groundwater moves in the southwestern direction towards an adjacent groundwater protection zone.

4. Receptors- The primary receptor is groundwater. In Germany, groundwater itself is a protected receptor.

REMEDIAL OBJECTIVE

1. Long Term Closeout Strategy- Demonstrate there is no risk to receptors. In terms of risk control, a P&T plant addressing the CHC impact in groundwater is operating in close vicinity (see CCKL169). Due to this, CCKL165A has been linked to site CCKL169.

2. Achievable Remedial Action Objective- Confirm AHC impacts can be sufficiently addressed under CCKL169.

3. Specific Regulatory Standards and Legal Drivers- German Federal Soil Protection Act and Ordinance (Bundesbodenschutzgesetz, Bundesbodenschutzverordnung), the German Federal Water Act (Wasserhaushaltsgesetz [WHG 3 & 21] and state regulations, Rheinland-Pfalz. Under the provisions of Article 53 of the Supplementary Agreement to the NATO SOFA (an international agreement) the U.S. is obligated to comply with German law.

4. Remediation Methods Planned or Being Conducted- The pump and treat for CCKL169 remediates the CCKL165A area.

5. Response Complete- Is expected to be achieved in September 2054.

6. Site Closure- Will be achieved when CCKL165A can be rolled under the CCKL169 program.

7. Host Nation Involvement- This site is monitored and tracked by the Host Nation (HN) through the Coordination Working Group (KOAG) which was set up in response to congressional inquiries regarding contamination in the Kaiserslautern Military Community. KOAG-internal project number is K0154.

PHASE SCHEDULE

1. Current Phase Objective- Currently in the RAC phase. Pump and treat is being performed for hydraulic control under CCKL169.

2. Milestones- RIP (10/16/2025), RC (09/30/2054), Site Closeout (09/30/2054).

SCHEDULE & BUDGET CHANGES

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

2. Budget- This is a zero cost site in Spring 2024.

HISTORIC SITE ACTIVITIES

In 2004, three monitoring wells were installed in the area of a former filling station in the vicinity of Bldgs. 3040/3042 to investigate a known CHC plume originating at Kaiserslautern Army Depot (KAD, GE426, see project CCKL070) and to assess the potential local impact originated from the filling station. AHC at concentrations up to 272 ug/L and TPH at concentrations up to 370 ug/L were detected in the upper aquifer (GW38A). Until December 2006, the fuel-related contamination in the upper aquifer had decreased, while 52 ug/L TPH were still detected in the lower aquifer (GW38B) after a pumping test conducted at GW38A. Follow- up groundwater monitoring results in February 2009 confirmed the decreasing TPH trend as TPH could not be verified any more. Nevertheless, the threshold value for benzene (0.5 ug/L) at GW25A (2 ug/L) and at GW38A (4 ug/L) was exceeded. Considering the decreasing contamination trend, it was recommended to terminate the groundwater monitoring. In a meeting with HN in August 2011, the regulators disagreed on this approach. As AHC exceeds the threshold value and the impacted area is close to a drinking water protection zone III, groundwater monitoring has to continue, including an assessment of the potential risk to groundwater of benzene in relation to precipitation. Further data for this site is collected in the course of the larger scale RI/FS for CCKL169, to include the CCKL165 area. According to the results, at least 2 AHC source areas were identified (max. 208 ug/L AHC in GW38A and max. 17.7 ug/L AHC in GW66A). As the operating full-scale pump & treat system for CCKL169 contains the AHC impacts sufficiently, no additional remedial action is currently required for CCKL165. The CCKL165 site was previously included in EPR under DUCS number WPKL165.

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. Neither a Decision Document nor LEC consultation has been conducted.

GE45P - Kleber Kaserne

Installation Name: GE45P - Kleber Kaserne

Installation City: Kaiserslautern

5659A.1001_CCKL006_GE45P_Bldg 3287 Frankenheimer

Env Site ID: CCKL006

Cleanup Site: GE45P_Bldg 3287 Frankenheimer

Alias: DEH45802-9

Regulatory Driver: DODI

RIP Date: 6/1/1994

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: N/A

Phase	Start	End
PA:	10/31/1987	10/31/1987
SI:	10/31/1987	10/31/1987
RI/FS:	10/31/1987	8/31/1991
RD:	9/1/1991	3/31/1994
IRA:	- -	- -
RA(C):	4/1/1994	5/31/1994
RA(O):	6/1/1994	9/30/2054
LTM:	- -	- -

Site Narrative: SITE LOCATION AND DESCRIPTION

1. Location- The site of concern is located in the southern part of Kleber Kaserne (GE45P) and extends from the dental clinic (Bldg. 3287) south/southwest across Frankenheimer Strasse towards the southern fence line.

2. Physical Layout/Site Use- The site is partly covered with roads and parking areas, partly greened and partly graveled open ground.

CONCEPTUAL SITE MODEL

1. Release Description- A filling station was operating until the 1980s. Contamination is most likely due to improper Hazardous Material storage and handling procedures at that time. Petroleum Hydrocarbons were released and penetrated into ground.

2. Media Impacted- Soil and shallow groundwater are significantly impacted with TPH and AHC.

3. Nature and Extent of Contamination- The contaminant source area (approximately 3,400 sqm) is encapsulated with a slurry wall. Quaternary sediments reach to a depth of approximately 4.0 - 6.0 m below ground level (bgl). A shallow aquifer (depth between 2.0 - 4.0 m) is formed in the quaternary sediments and a deep aquifer in the underlying Triassic bedrock. Groundwater flow direction in both aquifers is to the west. The deep aquifer provides the City of Kaiserslautern with drinking water and the closest drinking water well is located 300 m south of the impacted area. An upward hydraulic gradient was observed between the deep and shallow aquifer. This gradient switches in times of high water extraction from the deep aquifer. Contaminant transport to the closest drinking water well Br. A is not expected.

4. Receptors- The receptor of concern is municipal supply well Br. A, which is extracting groundwater from the deeper bedrock aquifer. The supply well is located about 300 m south of the contained area and therefore cross-gradient to the prevailing western groundwater flow direction.

REMEDIAL OBJECTIVE

1. Long Term Closeout Strategy- As soon as the results of the groundwater monitoring reliably confirm no risk to groundwater and demonstrate that the slurry wall efficiently works as long-term containment for the contamination, site closure will be discussed with HN regulators. The remediation is working but will need to be monitored indefinitely.

2. Achievable Remedial Action Objective- The containment slurry wall in place largely prevents the migration of dissolved contaminants from the source area into the surrounding shallow aquifer. MNA will be conducted to further reduce contaminant concentrations.

3. Specific Regulatory Standards and Legal Drivers- German Federal Water Act (Wasserhaushaltsgesetz) and state regulations, Rheinland-Pfalz. Under the provisions of Article 53 of the Supplementary Agreement to the NATO SOFA (an international agreement) the U.S. is obligated to comply with German law.

4. Remediation Methods Planned or Being Conducted- MNA is planned for an indefinite 30 years.

5. Response complete- Will be achieved at the conclusion of MNA.

6. Site Closure- As soon as HN concurs that the monitoring data for groundwater contamination and the functionality of the slurry wall reliably prove there is no threat to groundwater in the long term.

7. Host Nation Involvement- This site is monitored and tracked by HN through the Coordination Working Group (KOAG) which was set up in response to congressional inquiries regarding contamination in the Kaiserslautern Military Community. The KOAG-internal project number is K0020.

PHASE SCHEDULE

1. Current Phase Objective- Monitoring of groundwater to assess the risk that contamination presents to groundwater. MNA within the slurry wall and downstream to show non-migration of the contamination (slurry wall is functional) as well as to prove that small leakages will not cause a problem.

2. Milestones- RIP (06/01/1994), RC (09/30/2054), Site Closeout (09/30/2054)

SCHEDULE & BUDGET CHANGES

1. Schedule- One year was added to the RC and RAO phase end dates during the Spring 2024 datacall.

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

HISTORIC SITE ACTIVITIES

In the 1980s, a filling station was demolished to be replaced by a dental clinic and a vehicle parking area. During the construction work in 1985, a fuel related impact of the subsoil was detected. Investigations in 1986 confirmed an impact with aromatic hydrocarbon (AHC) and hydrocarbon (TPH) in soil (TPH levels up to 17,930 mg/kg) and groundwater (TPH levels up to 4,500 mg/L). Contaminated soils were partly removed to a depth of approximately 2.0 m below ground level (bgl) in an area of 550 sqm. As the impacted site is located within a municipal groundwater protection zone III, groundwater remediation was required. In 1995, a SVE for in-situ mitigation of the TPH and AHC impact started operation and a gallery of extraction wells was installed down gradient to prevent down gradient migration. In 1997, this system was replaced by a dual phase extraction system and a slurry wall to encapsulate the main contamination. In 2002, the remediation method switched to bio-sparging. In 2004, a pilot test for nutrient-enhanced bio-sparging to speed up the degradation process started. These measures removed over 10,000 kg TPH- about 10,000 kg by SVE (1998 - 2000) and 55 - 263 kg by biosparging (2004 - 2010). In January 2010, bio-sparging was interrupted to allow establishing of natural hydrological conditions to assess the risk the remaining contamination poses to groundwater and drinking water wells. Samples taken in soil and shallow groundwater within the slurry wall area showed TPH and AHC concentrations

significantly exceeding the applicable trigger values. Fuel related contamination in shallow groundwater outside the contained area was either negligible or in the range of applicable trigger values. The deep groundwater within the underlying bedrock showed no impact. The results of this rebound study demonstrated that the hydrogeological conditions at the site prevent a vertical migration of contaminants into the bedrock aquifer and they verified the functionality of the slurry wall. In 2011, a comprehensive 5-year program to monitor natural attenuation in groundwater (MNA) was implemented to document the slurry wall's proper functionality and to show decreasing risk to shallow and deep groundwater. To minimize the risk for hydraulic short cuts between the quaternary and bedrock aquifer, the monitoring well network was optimized. Since then, no significant contamination was observed in the bedrock aquifer. Two down-gradient wells filtering in the Quaternary aquifer show fluctuating AHC, PAH, and TPH concentrations exceeding the HN threshold values for AHC (383 ug/L against 20 ug/L), PAH (1.32 ug/L against 0.5 ug/L), and TPH (0.13 mg/L against 0.1 mg/L). The fluctuating contaminant concentrations were considered attributable to a small leak in the slurry wall, caused by a water pipe intersecting the wall and passing well A2 within the groundwater fluctuation zone, providing a preferred flow path for the accumulated water inside the containment. The 5-year MNA program results showed that the general containment function is intact, that natural degradation processes effectively reduce contaminant concentrations along the flow path in the shallow aquifer outside the slurry wall and recommended continuation with MNA. MNA is effectively controlling the slurry wall leak. The data gained since 2016 till today indicate that shallow groundwater inside the containment area still exhibits AHC and benzene values exceeding the relevant thresholds for these parameters. The elevated concentrations of contaminants on Control Plane CP1 in Wells A2 and A4 are presumably due to intermittent contaminant migration from the impact source in the direction of CP1 or to residual contamination in the smear zone outside the slurry wall. No elevated contaminant concentrations were detected in any of the other wells downstream of the containment area. This confirms the assumption that natural attenuation processes are significantly contributing to contaminant reduction and thus to a decrease in downgradient contamination. The MNA program is continued in its current form. The site was previously tracked under DUCS number WPKL006.

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. This project started prior to 1998; at that time neither a decision document nor consultation of LEC was required.

GE48R - Landstuhl Hospital

Installation Name: GE48R - Landstuhl Hospital

Installation City: Landstuhl

5665A.1001_CCKL080_GE48R_Bldg 3726 Gas Station

Env Site ID: CCKL080

Cleanup Site: GE48R_Bldg 3726 Gas Station

Alias: DEH49807-0

Regulatory Driver: DODI

RIP Date: 10/31/2010

RC Date: 10/31/2010

RC Reason: Study Completed, No Cleanup Required

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:	1/31/1997	2/28/1997
SI:	3/1/1997	1/31/1998
RI/FS:	2/1/1998	10/31/2010
RD:	- -	- -
IRA:	- -	- -
RA(C):	- -	- -
RA(O):	- -	- -
LTM:	11/1/2010	9/30/2054

Site Narrative: SITE LOCATION AND DESCRIPTION

1. Location- The site is located in the south-eastern portion of the Landstuhl Hospital installation (GE48R) in the vicinity of Bldg. 3726 (a former gas station). The post boundary is located approximately 90 m east of the site.

2. Physical Layout/Site Use- The site comprises of an area of approximately 200 m^2 and is currently used for parking. The site is level and sealed with asphalt. There is a steep slope to the south of the site, which drops approximately 5.0 m in elevation.

CONCEPTUAL SITE MODEL

1. Release Description- TPH and AHC contamination is associated with leaks and spills of gasoline and diesel from former USTs and associated fuel infrastructure prior to 1987. The quantity of gasoline and diesel released is unknown.

2. Media Impacted- TPH and AHC is present in soil at concentrations that exceed the HN threshold values.

3. Nature and Extent of Contamination- In January 2021, 97 samples were collected from 10 borings and analyzed for TPH and AHC. TPH and ACH exceeded their respective oPW3 concentrations of 1,500 mg/kg and 25 mg/kg at two (SB15 and SB16) and three (SB14, SB15 and SB16) borings, respectively. Exceedances of the oPW1 and oPW2 threshold for TPH and/or AHC were also identified for samples from borings SB 21 and SB 22. AHC concentrations above the oPW3 (maximum 435.3 mg/kg) were identified at depths between 6.0 and 8.0 m bgs (SB15 and SB16) at the top of the slope, confirming the results from the previous 2015 investigation. The data does not indicate a further downgradient migration since 2015. At the bottom of the slope, AHC concentrations above the oPW3 (maximum 593.6 mg/kg) were identified at SB14 between 1.5 and 4.5 m bgs together with exceedances of the oPW1 or oPW2 for TPH between 0.2 and 3.5 m bgs. Approximately 450 m^3 of contaminated soil remains in place. The depth to groundwater is > 100 m.

4. Receptors- In Germany, the groundwater itself is a protected receptor in accordance with German regulations.

REMEDIAL OBJECTIVE

1. Long Term Closeout Strategy- Inspection of conditions of site surface sealing and monitoring of TPH and AHC contamination every 5 years by advancing 2-3 borings in the area of the contamination. Increased sampling, with 8 total soil borings, will be conducted during the next monitoring event in FY25.

2. Achievable Remedial Action Objective- No active remediation required.

3. Specific Regulatory Standards and Legal Drivers- German Federal Soil Protection Act and Ordinance (Bundesbodenschutzgesetz, Bundesbodenschutzverordnung), the Federal Water Act (Wasserhaushaltsgesetz [WHG 3 &21] and state regulations, Rheinland-Pfalz.

4. Remediation Methods Planned or Being Conducted- Sheet piling was installed in 2001. SVE was conducted from 2001 to 2008. Soil excavation, UST removal, and cap installation was conducted in 2008. No further remediation is expected.

5. Response Complete- Was achieved when the site transitioned from RI/FS to LTM in FY11.

6. Site Closure- Will be achieved when a sound site sealing is present, reduction/ stagnation of the TPH/BTEX contamination is confirmed, and HN closure letter is received.

7. Host Nation Involvement- This site is monitored and tracked by the HN through the Coordination Working Group (KOAG) which was set up in response to congressional inquiries regarding contamination in the Kaiserslautern Military Community. KOAG- internal project number is K0046.

PHASE SCHEDULE

1. Current Phase Objective- NFA exists but HN requires two soil borings every 5 years for 30 years (LTM). Based upon the recommendations of a contractor, 10 additional soil borings were advanced to 10 meters below grade in order to assess the risk to deep groundwater and to determine the extent of soil contamination to the southeast of the former gas station located south of Building 3726 during the soil sampling event in FY21. The future funding at the site has been programmed in FY25, FY30, FY35, FY40, FY45, and FY50. A larger sampling event including 8 soil borings will take place in FY25. All subsequent events will include 2 soil borings.

2. Milestones- RIP (10/31/2010), RC (10/31/2010), Site Closeout (09/30/2054)

SCHEDULE & BUDGET CHANGES

1. Schedule- During the Spring 2024 datacall, one year was added to the LTM end date.

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

HISTORIC SITE ACTIVITIES

The filling station Bldg. 3726 at Landstuhl Hospital was in operation until May 2008. It was equipped with two 10,000-liter USTs (diesel and gasoline) and dispensing pumps. In 1997, prior to a planned upgrade of the filling station, a soil investigation was performed that identified TPH up to 3,000 mg/kg and BTEX up to 14.6 mg/kg exceeding the applicable HN threshold values in soil. During further investigations in 1998, the gasoline UST was identified as the contamination source and further investigation was requested. A subsequent 1999 RI/FS recommended containment of the TPH and BTEX-impacted soil with sheet piling, and remediation using SVE. The HN agreed to these recommendations and in 2001, a sheet pile wall was installed to a depth of approx. 6.5 m to secure the contamination from perched water and a SVE plant was operated between February and August 2001 (total extraction of approximately 7.0 kg BTEX). After the fuel station was decommissioned in 2008, the USTs were removed and a total of app. 125 m^3 contaminated soil excavated and disposed of. The area was sealed with an asphalt cap in November

2008. The residual hydrocarbon impact was horizontally and vertically delineated with approximately 450 m^3 of contaminated soil in place. Hydrocarbon impacts exceeding the applicable threshold value were essentially detected between 5.0-8.0 m below ground level. Maximum measured contaminant concentrations were 4,000 mg/kg TPH and 1,188.6 mg/kg AHC. Vertical hydrocarbon migration more than one meter into the underlying sandstone bedrock was not detected. Due to the age, extent, mass, and depth of the remaining impacted soil as well as the local geological setting and depth to groundwater (> 100 meters) no threat to groundwater or human beings is expected. Excavation or any other remediation method was assessed as technically and economically not feasible. Maximum concentrations of TPH of 4,750 mg/kg and AHC of 1,049.3 mg/kg were identified during an investigation in 2015. The concentrations detected were slightly higher than 2009 results and were found 2.0 m deeper. An additional investigation was completed during the FY21 monitoring event in addition to continuing the usual 5-year cycle. The site was previously included in EPR under DUCS number WPKL080 internal project number is DEH49807-0.

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 was conducted.

GE55J - Miesau Ammo Depot

Installation Name: GE55J - Miesau Ammo Depot

Installation City: Bruchmuehlbach-Miesau

5678A.1001_CCKL025_GE55J_Bldg 1631 Elect Maint.

Env Site ID: CCKL025

Cleanup Site: GE55J_Bldg 1631 Elect Maint.

Alias: DEH55819-8

Regulatory Driver: DODI

RIP Date: 1/1/2002

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: N/A

Phase	Start	End
PA:	1/31/1992	1/31/1992
SI:	2/1/1992	9/30/1996
RI/FS:	10/31/1996	12/31/2000
RD:	- -	- -
IRA:	- -	- -
RA(C):	1/1/2001	12/31/2001
RA(O):	1/1/2002	9/30/2054
LTM:	- -	- -

Site Narrative: SITE LOCATION AND DESCRIPTION

1. Location- The site is located in the central eastern portion of Miesau Ammunition Depot (MAD, GE55J).

2. Physical Layout/Site Use- The site comprises of an area of approx. 45,000 m². It is mostly covered by forest and extends between a maintenance building (Bldg. 1631) and Rohrbach Creek (about 250 m distance), located to the south. The area around Bldg. 1631 is mostly sealed. Bldg. 1631 is an abandoned storage building that belongs to a missile maintenance site.

CONCEPTUAL SITE MODEL

1. Release Description- The contamination with CHC, mostly 1,1,1-trichloroethane (TCA), is associated with missile maintenance at Bldg. 1631 in the past. The exact quantity of release is unknown.

2. Media Impacted- CHC impacted soil, soil gas, and groundwater were identified during previous investigations.

3. Nature and Extent of Contamination- The maximum CHC concentration detected June 2018 at the extraction well identified as P4.21 was 549.5 ug/L. The CHC plume currently extents from the southern boundary of the Patriot Missile Maintenance Area further to the south towards Rohrbach Creek. The aerial extent of CHC contaminated groundwater with concentrations greater than the HN threshold value of 10 ug/L is approximately 17,000 m². The depth to groundwater is about 5.0 m and flows towards the Rohrbach Creek located southeast of the site.

4. Receptors- In Germany, the groundwater itself is a protected receptor in accordance with German regulations.

REMEDIAL OBJECTIVE

1. Long Term Closeout Strategy- Reduction of CHC by pump and treat to prevent migration of contaminants into Rohrbach Creek.

2. Achievable Remedial Action Objective- Reduction of concentrations of contaminants of concern to the target agreed with HN to reduce risk to receptor.

3. Specific Regulatory Standards and Legal Drivers- German Federal Soil Protection Act and Ordinance (Bundesbodenschutzgesetz & Verordnung), the Federal Water Act (Wasserhaushaltsgesetz [WHG] and state regulations Rheinland-Pfalz, and State Ordinance on Surface Water Survey and Monitoring (Landesgewaesserbestandsaufnahme- undzustandsueberwachungs-Verordnung).

4. Remediation Methods Planned or Being Conducted- Groundwater remediation by pump & treat is underway and has been conducted since 2001.

5. Response Complete- Will be achieved when it is determined the residual concentrations are sufficiently low enough to turn off the pump & treat system.

6. Site Closure- Will be achieved when CHCs are below HN target values and risk to the receptor is considered sufficiently low by HN.

7. Host Nation Involvement- This site is monitored and tracked by HN through the Coordination Working Group (KOAG) which was set up in response to congressional inquiries regarding contamination in the Kaiserslautern Military Community. KOAG-internal project number is K0024. Prior to remediation, LEC was consulted. Negotiations with the HN regarding future remediation target values will need to be conducted.

PHASE SCHEDULE

1. Current Phase Objective- Continue operation of pump and treat system, semi-annual groundwater monitoring at 11 groundwater monitoring wells, and quarterly sampling of surface water (Rohrbach Creek) for an indefinite 30 years. The HN has requested to develop a concept for a one year shut down of the pump and treat system to evaluate contaminant concentrations. A reduction of pump and treat discharge rate and length will take place after this shut down. Well inventory and repairs will take place in FY24.

2. Milestones- RIP (01/01/2002), RC (09/30/2054), Site Closeout (09/30/2054)

SCHEDULE & BUDGET CHANGES

1. Schedule- One year was added to the RC date and RAO end date during the Spring 2024 datacall.

2. Budget- The CTC for this site in Spring 2023 is TBD.

HISTORIC SITE ACTIVITIES

Prior to 1990, Bldg. 1631 was used to maintain and repair electronic equipment and to perform missile maintenance, including cleaning of electronic parts with CHCs. The used CHCs were passed through concrete channels and were stored in concrete basins. The collected CHCs were periodically pumped out and stored in a waste oil container for final disposal. A preliminary SI conducted in 1989 detected CHCs in groundwater. Based on investigations performed 1992-1996, the impact center was assumed to be located in the area of monitoring well P4.5. The main CHC constituent was found to be 1,1,1-trichloroethane, and groundwater contamination was restricted to the upper aquifer. A pump & treat system including one pumping well, an air stripper tower, and a granular activated carbon unit was installed in 2001 to prevent further contaminant migration and to evaluate the efficiency of this remediation method at the site. In addition, a total of 20 soil vapor wells have been installed in 2004. At the beginning of groundwater remediation in 2002, the maximum CHC concentration in soil gas was at 270 mg/ m^3. By 2004, CHC concentrations in soil gas decreased to levels below regulatory limits; however, CHCs were still present in groundwater at concentrations up to 671.3 ug/L in down gradient well P4.17. In 2005, the CHC plume was found to have migrated in SE direction. In 2007, the pumping wells for the P&T system were repositioned to wells P4.17 and P4.21 further to the south to intercept

the plume. In consequence, the CHC plume in the bedrock aquifer diminished significantly in the direct vicinity of these wells. A piezometer was installed at the eastern property perimeter to evaluate potential off-post CHC migrating along the Rohrbach Creek. Surface water from the creek is monitored quarterly. The CHC concentrations in the extraction well declined from 2005 (2,452 ug /l) to 2011 and then stabilized at around 400 ug /l. The June 2013 CHC concentration is 644 ug/l. The size and concentrations of the plume have steadily declined since 2005, and the plume has migrated to the south, away from the assumed source area near Bldg. 1631. To date, no contamination rebound was observed within the original source area. Most recent monitoring results confirm that the eastern and western edges of the plume are controlled by the extraction. In March 2013, increased CHC concentrations were observed in the southern part of the site. The increase is explained with heavy rainfall during winter/spring. Maximum CHC concentrations in the creek Rohrbach decreased from 10 ug/L to 7.5 ug/L at the location of assumed maximum contaminant discharge and 2.0 ug/L downgradient of the property boundary. An increase is expected when groundwater extraction is stopped. The applicable remediation target for the creek still needs to be negotiated with HN. The 2012-13 data indicate that significant contamination is still present in the aquifer, with CHCs continue to discharge into the nearby surface water stream at low but persistent concentrations. The results obtained between October 2021 and September 2022 identified that the CHC concentrations in groundwater still exceed the regulatory reference values within the project area. The oPW reference value (10 ug/L) from the ALEX-02 guideline is exceeded in the groundwater extracted from well P4.21, as well as in groundwater at four monitoring wells (RP1, RP2, P4.10, and P4.11-3). The CHC concentrations at almost all wells located up-gradient of extraction well P4.21 were below or only slightly above the oPW reference value indicating that an up-gradient CHC source no longer exists. Since the start of the P&T system in 2005, a total of approx. 112.1 kg CHC have been removed from the groundwater. The existing data series shows that both, the contaminant levels in the extraction well (P4.21) and the groundwater monitoring wells show considerable seasonal fluctuations in concentration. CHC concentration levels in spring sampling are usually significantly higher than concentrations measured in fall (often by a factor of 1.5 to 4). Surface water samples collected from the Rohrbach creek identified CHC concentrations between non-detect and 3.5 ug/L. During a project meeting on 7 Mar 2022, HN suggested to develop a concept for a one-year shutdown trial as the start of an exit strategy to obtain information about the contaminant potential (source strength), the contaminant distribution, and possible effects on the relevant protected assets. Further, a well inventory and damage analysis was recommended in order to conduct repair works and properly decommission wells which are no longer used. The site was previously included in EPR under DUCS number WPKL025 internal project number is DEH55819-8.

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 was conducted.

5678A.1002_CCKL133_GE55J_GW Monitoring MAD West

Env Site ID: CCKL133

Cleanup Site: GE55J_GW Monitoring MAD West

Alias: DEH55811-1

Regulatory Driver: DODI

RIP Date: 1/1/2015

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: N/A

Phase	Start	End
PA:	5/31/1992	6/30/1992
SI:	7/1/1992	8/31/2002
RI/FS:	9/1/2002	12/31/2011
RD:	- -	- -
IRA:	- -	- -
RA(C):	1/1/2014	12/31/2014
RA(O):	1/1/2015	9/30/2054
LTM:	- -	- -

Site Narrative: SITE LOCATION AND DESCRIPTION

1. Location- The site comprises two unauthorized landfills within the restricted area of the Miesau Ammunition Depot (MAD, GE55J). The area near Bldg. 12330 is located near the South installation border and the area near Bldg. 12135 is located in the northeast of the MAD.

2. Physical Layout/Site Use- The area east of Bldg. 12330 is a former sand pit (approximately 6,000 m^2 fill thickness 1.3-5.0 m, up to 25,000 m^3 covered with trees). The area south of Bldg. 12135 is a former fire pond (approximately 6,400 m^2, fill thickness 2.0 m, approximate volume of 12800 m^3).

CONCEPTUAL SITE MODEL

1. Release Description- The contamination in these areas is associated with the unauthorized dumping of various materials in the past.

2. Media Impacted- TPH concentrations in soil and TPH, PAH, heavy metals, and DOC concentrations in groundwater are elevated.

3. Nature and Extent of Contamination- Near Bldg. 12330 recent concentrations of PAH and DOC in monitoring wells are still above HN threshold values of 0.5 ug/L, and 4 mg/L, respectively. The depth to groundwater is 6.5-8 m and groundwater flow direction is in southwesterly direction towards the river Glan. In the area near Bldg. 12135 concentrations exceeding HN threshold values for TPH, DOC, cadmium, nickel, zinc, and PAHs were identified. Long-term monitoring indicates stable concentration levels for nickel and zinc, both exceeding the HN thresholds of 0.04 and 0.3 mg/L respectively. At both locations, concentrations are stable over the 15-year monitoring period and the overall impact to the groundwater and risk to human health are low. The depth to groundwater ranges between 2.5 and 8.5 m and groundwater flow direction is in southeasterly direction towards River Rohrbach.

4. Receptors- The site is not located in a groundwater protection area. However, in Germany the groundwater itself is a protected receptor in accordance with German regulations.

REMEDIAL OBJECTIVE

1. Long Term Closeout Strategy- Site closeout is expected in the near future.

2. Achievable Remedial Action Objective- Indefinite MNA was successfully conducted.

3. Specific Regulatory Standards and Legal Drivers- HN Federal Soil Protection Act and Ordinance (Bundesbodenschutzgesetz und -verordnung), Federal Water Act (Wasserhaushaltsgesetz) and state regulations Rheinland-Pfalz.

4. Remediation Methods Planned or Being Conducted- Indefinite MNA was successfully conducted.

5. Response Complete- Will be achieved upon site closure.

6. Site Closure- Will be achieved following HN consent to NFA and receipt of HN closure letter.

7. Host Nation Involvement- The site is monitored and tracked by the HN through the Coordination Working Group (KOAG) which was set up in response to congressional inquiries regarding contamination in the Kaiserslautern Military Community. KOAG tracks the project as K0157 combining former K0006 and K0015.

PHASE SCHEDULE

1. Current Phase Objective- No future funding is currently programmed since NFA and site closure is expected. Until HN concurs, 30 years will be used as the RA(O) phase duration.

2. Milestones- RIP (01/01/2015), RC (09/30/2054), Site Closeout (09/30/2054)

SCHEDULE & BUDGET CHANGES

1. Schedule- One year was added to the RC date and RAO end date during the Spring 2024 datacall to reflect the anticipated indefinite 30-year duration.

2. Budget-This is a zero cost site in Spring 2024.

HISTORIC SITE ACTIVITIES

In 1992, PA/SIs were performed for Bldg 12330 (old landfill, mainly sand, wooden pallets and construction debris) and for a former pond at Bldg 12135. For Bldg 12330, POL were detected in soil at a concentration above HN threshold value. During a subsequent RI/FS 10 groundwater monitoring wells were installed. The wells were sampled for PAH, POL, and Aromatic Hydrocarbons (BTEX). Maximum PAH was 17.76 ug/l in wells G3 and BK1 (within the dump area). At Bldg 12135, studies through 2003 revealed elevated POL, DOC, PAH, zinc, and nickel concentrations within the backfilled area and in groundwater. For both sites (Bldg 12330 Bldg 12135), potential remedial techniques (excavation landfill capping) were considered not feasible due to site characteristics (forest). Groundwater monitoring was recommended (PAH, TPH, and BTEX for bunker 12330 and PAH, Heavy Metals, TPH, DOC, and BTEX for bunker 12135). To improve the understanding of the risk posed to groundwater and drinking water wells, the overall groundwater flow regime within the bunker area was assessed in 2007. A groundwater monitoring concept covering was developed, including a periodical assessment of the groundwater flow regime. Moreover, this monitoring concept accounted for potential receptors (off- and on-post drinking water wells). First results of the area wide monitoring suggested all sites are neither located in the catchment areas of HN water supply wells in the northwest nor in the catchment area of the facility's own drinking water wells in the east. Instead of initiating an area-wide groundwater monitoring program, HN verbally agreed to focus on the vicinity of two contamination sources (Bldg. 12330m Bldg. 12135) with a reduced groundwater monitoring program, which has been conducted since 2009. Groundwater monitoring near Bldg. 12330 identified a declining trend of PAH in 2012 and concentrations below or slightly above the HN threshold value. This trend was not confirmed during FY13 monitoring with contaminant concentrations above the HN threshold in both wells (1.72 and 2.25

ug/l). Groundwater sampling conducted near Bldg. 12135 generally shows steady concentrations for nickel and zinc, above the regulatory thresholds. It is deemed unlikely that concentrations will reduce significantly within the next years. For both sites, excavation is disproportionally expensive compared to the level of risk presented by the contaminant concentrations in groundwater. The investigation areas were previously included in EPR under DUCS numbers WPKL133 and WPKL132, the internal project number is DEH55811-1. Sampling in 2020 showed stable concentrations and low impacts to groundwater and low risk to human health.

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. No Decision Document was prepared nor LEC consultation conducted.

5678A.1005_CCKL173_GE55J_Bldg 1527

Env Site ID: CCKL173

Cleanup Site: GE55J_Bldg 1527

Alias: DEH55908-8

Regulatory Driver: DODI

RIP Date: 8/15/2023

RC Date: 8/15/2023

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:	6/30/1996	12/31/2006
SI:	1/1/2007	12/31/2008
RI/FS:	1/1/2009	10/15/2020
RD:	- -	- -
IRA:	- -	- -
RA(C):	10/16/2020	8/15/2023
RA(O):	- -	- -
LTM:	8/16/2023	9/30/2054

Site Narrative: SITE LOCATION AND DESCRIPTION

1. Location- The site is located in the southern part of the restricted area of Miesau Ammunition Depot (MAD, GE55J), around the former ammunition incinerator at former Bldg. 1527.

2. Physical Layout/Site Use- The area of Bldg.1527 (demolished in 2008) is graded and backfilled. It comprises an area of 1,800 m². Two prefab buildings (Bldgs. 1525 & 1523) are present at the SW corner of the area. The site is surrounded by forest.

CONCEPTUAL SITE MODEL

1. Release Description- Heavy metals in soil is associated with past operation of an ammunition incinerator in former Bldg. 1527 between 1963 & 1996.

2. Media Impacted- Various heavy metals with concentrations exceeding the adopted HN threshold values are present in soil.

3. Nature and Extent of Contamination- The size of the area impacted with lead above the threshold for the pathway soil-to-human for commercial and industrial areas (2,000 mg/kg) is approximately 10,500 m², up to 0.25 m deep. The estimated total mass of lead is 12 tons. The main impact area for lead is co-impacted by antimony, arsenic, cadmium, copper, zinc, and chromium. Groundwater monitoring since August 2010 indicated concentrations of heavy metals below HN threshold values. The depth to groundwater is 4.0-5.0 m. The groundwater flows to the southwest towards river Glan 200 m to the south.

4. Receptors- Potential receptors are humans (via occupational exposure, the consumption of wild boar meat or mushrooms), the groundwater (groundwater itself is a protected receptor in Germany), the river Glan, and an off-post cattle breeding farm.

REMEDIAL OBJECTIVE

1. Long Term Closeout Strategy- Excavation of the main impact area to eliminate the risk to groundwater.

2. Achievable Remedial Action Objective- Eliminate lead impacted soil and the potential risk to groundwater.

3. Specific Regulatory Standards and Legal Drivers- German Federal Soil Protection Act and Ordinance (Bundesbodenschutzgesetz and -verordnung), the Federal Water Act (Wasserhaushaltsgesetz and state regulations Rheinland- Pfalz.

4. Remediation Methods Planned or Being Conducted- Soil excavation and disposal of excavated contaminated topsoil in the main impact area of 875 m^3 (3,500 m^2, down to max. 0.25 m bgs) has been completed.

5. Response Complete- Will be achieved following soil excavation that will reduce the risk to receptors.

6. Site Closure- Will be achieved with concurrence of HN authorities that the site does not pose a risk to receptors and subsequent receipt of HN closure letter.

7. Host Nation Involvement- This site is monitored and tracked by the HN through the Coordination Working Group (KOAG) which was set up in response to congressional inquiries regarding contamination in the Kaiserslautern Military Community. KOAG- internal project number is K0043.

PHASE SCHEDULE

1. Current Phase Objective- Soil excavation took place in FY23 to remove metal impacted soil that may be acting as a source of groundwater contamination. Groundwater monitoring will take place at the site every five years, with events programmed in FY25, FY30, FY35, FY40, FY45, and FY50. Five wells will be sampled semiannually for the FY25 event, followed three wells sampled annually for all subsequent events. Two wells within the excavation area will be abandoned after the FY25 event if contaminant concentrations remain below threshold value.

2. Milestones- RIP (08/15/2023), RC (08/15/2023), Site Closeout (09/30/2054)

SCHEDULE & BUDGET CHANGES

1. Schedule- One year was added to the LTM phase during the Spring 2024 datacall.

2. Budget- The CTC for this site in Spring 2023 is TBD.

HISTORIC SITE ACTIVITIES

Between 1963 and 1996, the ammunition incinerator was operated in Bldg. 1527. The incinerator plant equipment was demolished in 1996. In 1998, an investigation around Bldg. 1527 identified a significant impact of soil by lead (15,000 mg/kg), zinc (12,000 mg/kg), copper (29,000 mg/kg), chromium (1,500 mg/kg), and selenium (17 mg/kg). In 1998/1999, a partial remediation of the open area around Bldg. 1527 was conducted by removal of approximately 50 m^3 of contaminated soil. Groundwater sampling indicated a lead impact to groundwater (up to 0.58 mg/l exceeding threshold value of 0.04 mg/l). In summer 2008, Bldg. 1527 was demolished. Since previous investigations did not clarify the risk potential of the heavy metal containing topsoil to receptors, soil and groundwater investigations continued in 2010. As a result, the area of impacted topsoil was estimated between 15,000 and 20,000 m^2, with an estimated total mass of 1,000 kg lead and 100 kg antimony in topsoil. The average emission rate for heavy metals was evaluated as too low to cause a groundwater contaminant plume. Ammunition incineration residues (bullets, bullet casings, and slag) were identified in two areas of less than 2.0 m^2 east of the former Bldg. 1527. In December 2011 a total of 10 m^3 of incinerator residues and heavy metal impacted topsoil was removed within an area of approximately 74 m^2 east of the open grounds at former building 1527. Confirmatory sampling of the excavation base revealed a remaining soil contamination with lead, cadmium, and copper exceeding adopted HN threshold values. During excavation activities, obvious incinerator residues were identified south of the excavated area and a suspicious black topsoil layer was identified along the embankment south and east of the open area.

Surface near soil samples from the embankment revealed lead concentrations between 17,000 mg/kg and 44,100 mg/kg posing a potential risk regarding the soil - human pathway. No further excavation was performed due to contractual limitations (only 10 m^3 of excavation had been awarded). A decision was made to further investigate the residual contamination via X-ray fluorescence (XRF) before a decision about active remedial actions is made. The XRF survey found that the lead impact extends to a much larger area than previously expected. The total mass of lead was estimated to be approximately 12 tons. In an area of approximately 10,500 m^2 the threshold for the pathway soil-to-human for commercial and industrial areas (2,000 mg/kg) is exceeded in topsoil. In the main impact area extending to 3,500 m^2 the mean lead content is 9,000 mg/kg. A risk to groundwater by the lead content in topsoil is not expected under the current site conditions. However, a risk to groundwater is expected for the cadmium and zinc concentrations in the topsoil in the main impact area. A chromium impact exceeding the regulatory threshold for the pathway soil-to-human (1,000 mg/kg) was identified, which seems to originate from multiple sources, apart from the incinerator. The chromium impact was not delineated. The data for chromium do not suffice to assess the risk to receptors. Groundwater monitoring of five wells in the area of the incinerator conducted between August 2011 and December 2013 (4 sampling events) indicated that concentrations of the contaminants of concern were below the adopted HN threshold values. However, as of Spring 2020 it is believed that groundwater sampling of the five wells will be required once every five years for an indefinite period of time. Soil removal field work was conducted between Spring and Fall 2022. Topsoil (litter) was contaminated at a level that was too high to re-spread. As of Jan 2023, replanting works will not be required as a new tenant unit will be using the cleared site for container storage in 2023. Soil excavation took place in FY23. HN coordination to clarify upcoming requirements is ongoing. This site was previously included in EPR under DUCS number WPKL035. For the USAG-RP this site is internally tracked under DEH55908-8.

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. No Decision Document has been prepared nor LEC consultation conducted. Prior to remediation a Decision Document will be prepared and LEC consultation will be conducted.

GE72N - Rhine Ordnance Barracks

Installation Name: GE72N - Rhine Ordnance Barracks

Installation City: Kaiserslautern

5702A.1001_CCKL136_GE72N_GW-Monitoring ROB South

Env Site ID: CCKL136

Cleanup Site: GE72N_GW-Monitoring ROB South

Alias: DEH72806-2

Regulatory Driver: DODI

RIP Date: 3/16/2015

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: N/A

Phase	Start	End
PA:	3/31/2001	7/31/2002
SI:	8/1/2002	12/31/2003
RI/FS:	1/1/2004	3/15/2014
RD:	- -	- -
IRA:	- -	- -
RA(C):	3/16/2014	3/15/2015
RA(O):	3/16/2015	9/30/2054
LTM:	- -	- -

Site Narrative: SITE LOCATION AND DESCRIPTION

1. Location- The site comprises three areas within the Rhine Ordinance Barracks (ROB)- by Bldg. 363 (N central portion), by Bldg. 390 (W central portion), by Bldg. 395 (W corner).

2. Physical Layout/Site Use- The portion of ROB within which the wells are situated is developed with administrative buildings, motor pools, and storage facilities. Bldg. 363 is used as a fuel station Bldg. 390 is a hazardous waste collection point, and the area by Bldg. 395 is an unpaved parking area.

CONCEPTUAL SITE MODEL

1. Release Description- The contamination is associated with past releases from the former fuel station (Bldg. 363), illegal dumping (Bldg. 390) and potential spills (Bldg. 395).

2. Media Impacted- Groundwater is impacted with AHC and PAH.

3. Nature and Extent of Contamination- The March 2020 groundwater sampling results identified concentrations of total AHC, benzene, ethyl benzene, toluene, xylenes, and total PAHs exceeding respective oPW reference values for further investigation from the ALEX 02 Guideline in well GW10-390. Naphthalene was detected in wells GW1-390 and GW2-390 at concentrations slightly exceeding the detection limit. The areal extent of contaminated groundwater near Bldg 390 is approximately 210 m^2. The depth to groundwater is 3.0-6.0 m and flows towards the south.

4. Receptors- in Germany the groundwater itself is a protected receptor in accordance with German regulations.

REMEDIAL OBJECTIVE

1. Long Term Closeout Strategy- Monitor groundwater concentrations once every 5 years for an indefinite 30 years.

2. Achievable Remedial Action Objective- MNA is expected to be conducted for an indefinite 30 years.

3. Specific Regulatory Standards and Legal Drivers- German Federal Soil Protection Act and Ordinance (Bundesbodenschutzgesetz & -verordnung), the Federal Water Act (Wasserhaushaltsgesetz) and state regulations Rheinland- Pfalz.

4. Remediation Methods Planned or Being Conducted- MNA is expected to be conducted for an indefinite 30 years.

5. Response Complete- Will be achieved at the conclusion of MNA.

6. Site Closure- Will be achieved following the reduction of contaminants of concern below HN threshold values and receipt of HN closure letter.

7. Host Nation Involvement- This site tracked by the HN through the Coordination Working Group (KOAG) which was set up in response to congressional inquiries regarding contamination in the Kaiserslautern Military Community. According to an agreement between HN and USAG-RP, the previously separate KOAG-project numbers for the monitoring sites (K0005, K0029, K0105) were merged into a new KOAG-site (K0158).

PHASE SCHEDULE

1. Current Phase Objective- Ongoing groundwater monitoring is being conducted under the RA(O) phase every 5 years for an indefinite 30 years. The future funding at the site has been programmed in FY24 FY29, FY34, FY39, FY44, and FY49.

2. Milestones- RIP (03/16/2015), RC (09/30/2054), Site Closeout (09/30/2054)

SCHEDULE & BUDGET CHANGES

1. Schedule- One year was added to the RC date, RAO end date, and SCO date during the Spring 2024 datacall to reflect the anticipated indefinite 30-year duration.

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

HISTORICAL SITE ACTIVITIES

During the fuel station upgrade at Bldg. 363, Petroleum, Oil and Lubricants (POL) were found in the groundwater at levels between 9.0 and 19 mg/L. The October 2003 Feasibility Study reported the groundwater contamination plume extends more than 70 m down gradient, towards the south-southwest. Further investigations in 2005 recommended semi-annual groundwater monitoring for Total Petroleum Hydrocarbons (TPH), Aromatic Hydrocarbons (AHC) and Polycyclic Aromatic Hydrocarbons (PAH). At Bldg. 390, drums and canisters were discovered during construction of a new Hazardous Waste Collection Point. Drums and canisters were excavated and further soil, soil gas, and groundwater investigations were conducted. Groundwater impact was found to be limited to wells GW3 and GW10 and groundwater monitoring for TPH and BTEX was recommended. In the area of Bldg. 395, various pockets of POL contamination were historically detected in soil. POL, PAHs, and Chlorinated Hydrocarbons (CHC) were also detected in groundwater and groundwater monitoring was recommended. All 3 sites (Bldg. 363, Bldg. 390 and Bldg. 395) were initially observed as separate contaminated sites.

In 2007, a ROB-wide groundwater flow assessment was initiated, for which the sites were merged and the groundwater monitoring synchronized. A general groundwater flow direction towards the south (direction adjacent OPEL area) was identified. OPEL also caused groundwater contamination and is in charge of performing long term groundwater monitoring in their area. In a meeting with HN dated 26 February 2009, it was agreed that the Garrison and OPEL coordinate future groundwater flow assessments and monitoring schedules. Groundwater monitoring data in the areas of Bldg. 395 and Bldg. 363 continuously confirmed declining contamination (TPH, AHC, and PAH) trends. As a result of the 2014 groundwater monitoring campaign, the monitoring of the area near Bldg. 395 was ended due to

continued reports of CHC groundwater concentrations below the HN threshold value; for the area of Bldg. 363 the monitoring cycle was pushed out to a 5-year interval. The most recent groundwater sampling results (Nov 2020) for the area of Bldg. 363 were well below the HN threshold value and no further action is recommended. HN concurrence is pending. For the area near Bldg. 390 since the beginning of LTM in 2004 a high variance in measured contaminant concentrations was observed. The groundwater monitoring in 2012 revealed the highest BTEX concentration for GW3 of 3,310 ug/L ever reported. A strong hydrocarbon odor was reported for down gradient well GW1 for the first time. Groundwater monitoring in 2013 confirmed BTEX and PAH exceeding the HN threshold for several wells. There were indications for microbial contaminant degradation in the center of the plume. The degradation rate could not be estimated based on available data. A potential downstream migration of PAH from the center of the contamination was observed. A geophysical investigation conducted in 2013 identified up to 18 subsurface objects. A subsurface investigation in the areas of the suspected subsurface objects using backhoe excavation was executed in November 2013. In one of the pits a source for BTEX (151 mg/kg in soil exceeding the oPW3 threshold of 25 mg/kg) was identified. The October 2014 groundwater sampling results near Bldg 390 indicated xylene at a maximum concentration of 9.5 ug/L that exceeds the regulatory threshold of 5.0 ug/L and PAHs (SUM) at a maximum concentration of 1.45 ug/L that exceeds the regulatory threshold of 0.5 ug/L. The maximum October 2014 concentrations were all detected at the well identified as GW3. An excavation of this source was conducted in FY15. Due to the unexpected size of the soil contamination the excavation could not be completed and was continued in 2021. Most recent groundwater monitoring in 2020 still confirmed elevated concentrations of BTEX (80 – 540 ug/l exceeding oPW of 20 ug/l) and PAH (189 - 307 ug/l exceeding oPW of 0.5 ug/l) in two wells. Continued monitoring in 5 years is recommended. Monitoring is expected to continue once every five years for an indefinitely.

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 4715.08Encl. 3 par 1e (2)(b)] the US is to apply the provisions of these laws where applicable. No Decision Document was prepared nor LEC consultation conducted

GE79D - Smith Barracks

Installation Name: GE79D - Smith Barracks

Installation City: Baumholder

5712A.1001_CCBH025_GE79D_Baumholder Landfill

Env Site ID: CCBH025

Cleanup Site: GE79D_Baumholder Landfill

Alias: KHBH025

Regulatory Driver: DODI

RIP Date: 9/30/2008

RC Date: 9/30/2008

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:	6/1/1983	7/31/1989
SI:	6/1/1983	7/31/1989
RI/FS:	8/1/1989	9/30/1995
RD:	10/1/1995	5/31/1996
IRA:	- -	- -
RA(C):	10/31/1996	9/30/2008
RA(O):	- -	- -
LTM:	10/1/2008	9/30/2054

Site Narrative: SITE LOCATION AND DESCRIPTION

1. Location- The site is a former sanitary landfill located within the northwestern portion of Smith Barracks (ARLOC GE079D). The site is located adjacent to the northwestern boundary of the ARLOC.

2. Physical Layout/Site Use- With the exception of monitoring and maintenance, no activities are currently conducted at the site. The site has dimensions of 680 m in length and 250 m in width. The elevation of the site ranges from 500 m ASL to 537 m ASL. The site consists of maintained vegetation.

CONCEPTUAL SITE MODEL

1. Release Description- The use of the site as a sanitary landfill between the 1965 and 2005 has resulted in adsorbable organohalogen (AOX), chloride, ammonium, CHC, and dissolved organic carbon (DOC) groundwater contamination.

2. Media Impacted- Groundwater, surface water, seepage water, and landfill gas are contaminated with AOX, chloride, ammonium, CHC, and DOC.

3. Nature and Extent of Contamination- Recent maximum groundwater contaminant concentrations along with their ALEX 02 oSW target values in parentheses are as follows- AOX 0.04 mg/L (0.01 mg/L), chloride 39 mg/L (40 mg/L), ammonium 0.32 mg/L (0.1 mg/L), DOC 6.2 mg/L (2 mg/L), VHH 14.5 ug/L (0.1 mg/L), Cyanide 0.042 mg/L (0.01 mg/L), Potassium 7.0 mg/L (3.0 mg/L), and conductivity 621 uS/cm (1000 uS/cm) . The contaminant concentrations are slowly but steadily showing decreasing trends. The depth to groundwater is between 5.0 m and 20 m and flows in a northwesterly direction.

4. Receptors- The site is not located in a groundwater protection area. However, in Germany the groundwater itself is a protected receptor in accordance with German regulations.

REMEDIAL OBJECTIVE

1. Long-Term Closeout Strategy- Continue to conduct LTM activities in accordance with the HN issue permit that stipulates a variety of inspection and sampling activities be conducted. Garrison officials and Host Nation regulators have indicated that LTM is likely to continue for an indefinite 30 years.

2. Achievable Remedial Action Objective- Remediation was completed in 2008; therefore, this section is not applicable.

3. Specific Regulatory Standards and Legal Drivers- The following regulatory citations are applicable at this site- WHG 3&21, BBodSchG, LBodSchG and the Leaflet ALEX 02.

4. Remediation Methods Planned or Being Conducted- No further remediation is planned.

5. Response Complete- Was achieved following the completion of the landfill capping project in September 2008.

6. Site Closure- The site will be closed following receipt of a host nation closure letter after LTM is complete.

7. Host Nation Involvement- The HN environmental authority for the site is the Rheinland Pfalz Struktur- und Genehmigungsdirektion Nord (SGD - Nord). The 2009 HN permit stipulates a variety of landfill sampling and inspection activities that are required on either a semi-annual or annual basis (e.g. landfill gas and emission monitoring).

PHASE SCHEDULE

1. Current Phase Objective- Seepage water, groundwater, surface water, and landfill gases are sampled semiannually in accordance with the 2009 HN issued permit to monitor contaminant containment. Additionally, other physical parameters are measured, and inspections are conducted on an annual and semiannual basis to monitor landfill settlement, nuisance odors, cap integrity, and quality of recultivation layer.

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

SCHEDULE & BUDGET CHANGES

1. Schedule- One year was added to the LTM end date during the Spring 2024 datacall to reflect the anticipated indefinite 30 year duration.

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

HISTORICAL SITE ACTIVITIES

The U.S. Sanitary Landfill was opened in 1965. It was used for disposal of various kinds of waste generated in the USAG Baumholder until 2005. During investigations conducted from 1983-2001, sondier borings, bore holes and ground water monitoring wells were installed. During these investigations, CHCs were detected in groundwater at concentrations exceeding the ALEX Test Values for groundwater. TPH and heavy metals were also present in groundwater. High methane concentrations were found in the soil gas. Efforts to properly close the landfill were initiated following the study and were required by HN authorities. Subsequently, remedial actions commenced in 1996. The landfill capping project was completed in accordance with the permit requirements in October 2007. Recultivation of the surface was completed in Spring 2008. Therefore, the landfill remediation is complete and is currently in LTM. Historic maximum groundwater contaminant concentrations along with their ALEX 02 oSW target values in parentheses are as follows- AOX 0.05 mg/L (0.01 mg/L), chloride 160 mg/L (40 mg/L), ammonium 3 mg/L (0.1 mg/L), CHC 25 ug/L (10 ug/L), and DOC 10 mg/L (2 mg/L). Since closure of the landfill, concentrations of pollutants in groundwater are gradually decreasing. The site was previously included in the DUCs database under DUCS number KHBH025.

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.

5712A.1010_CCBH114_GE79D_TMP Gas Station 8415

Env Site ID: CCBH114

Cleanup Site: GE79D_TMP Gas Station 8415

Alias: KHBH114

Regulatory Driver: DODI

RIP Date: 10/1/2011

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: N/A

Phase	Start	End
PA:	1/31/1989	3/31/1989
SI:	8/31/2000	1/31/2008
RI/FS:	2/1/2008	12/31/2009
RD:	3/31/2008	3/31/2010
IRA:	- -	- -
RA(C):	4/1/2010	9/30/2011
RA(O):	10/1/2011	9/30/2054
LTM:	- -	- -

Site Narrative: SITE LOCATION AND DESCRIPTION

1. Location- The site is a former gas station (Bldg 8415) located near Chaffee Road and Prussmann Avenue in the northern portion of Smith Barracks (ARLOC GE79D). The site is located approximately 500 m from the northern ARLOC boundary.

2. Physical Layout/Site Use- The site is used as Transportation Motor Pool (TMP) with a parking area for TMP vehicles. The site has a rectangular shape and approximate size of 50 m x 40 m. The site lies on the intermediate terrace of an east facing slope. The site is predominantly covered by an asphalt parking lot.

CONCEPTUAL SITE MODEL

1. Release Description- Handling losses and undocumented spills from 1952 - 1990s associated with the gas station USTs, separator system, and/or fuel dispensers are the suspected sources of AHC and TPH contamination.

2. Media Impacted- AHC and TPH contaminated groundwater is present at concentrations that exceed the respective ALEX 02 Screening Values (oPW) of 20 ug/L and 0.1 mg/L.

3. Nature and Extent of Contamination- In May 2023, benzene and AHC were detected at maximum concentrations of 4 ug/L and 6 ug/L, respectively. In October 2022, these contaminants were detected at maximum concentrations of 10 ug/L and 15 ug/L respectively. In May 2022, benzene and AHC were detected at maximum concentrations of 8 ug/L which exceeds the respective ALEX 02 Screening Values (oPW) of 0.5 ug/L for benzene but does not exceed the respective ALEX 02 Screening Values (oPW) of 20 ug/L for AHC. The aerial extent of groundwater impacts is approximately 850 m^2. The depth to perched groundwater is between 1.3 m to 3.6 m and flows in a SE direction.

4. Receptors- The site is not located in a groundwater protection area. However, in Germany the groundwater itself is a protected receptor in accordance with German regulations.

REMEDIAL OBJECTIVE

1. Long-Term Closeout Strategy- The long-term closeout strategy is to operate the pump and discharge system in the RA(O) phase until the downgradient wells are demonstrated to be below the ALEX 02 screening values with the pumps turned off. Due to low yield pumping rates and slowly declining contaminant concentrations, it is expected that the pumps will operate for at least 30 years.

2. Achievable Remedial Action Objective- Continue groundwater remediation until remediation values for AHC and TPH are achieved in downgradient wells.

3. Specific Regulatory Standards and Legal Drivers- The following regulatory citations are applicable at this site- WHG 3&21, BBodSchG, LBodSchG and the Leaflet ALEX 02.

4. Remediation Methods Planned or Being Conducted- Groundwater pump & discharge is currently being conducted at the site to reduce AHC/TPH in the perched groundwater.

5. Response Complete- Will be achieved when the groundwater pump & discharge system is turned off in response to the concentration gradient being sufficiently low between the main hot spot area to down gradient locations. It is likely that achievement of concentrations below ALEX02 values in source-area wells will never be achieved. RC will be achieved when downgradient locations remain below remediation values (to be determined) after pump & discharge system is turned off.

6. Site Closure- Will be achieved when contaminant concentrations fall below future regulatory guidelines.

7. Host Nation Involvement- The HN environmental authority for the site is the Rheinland Pfalz Struktur- und Genehmigungsdirektion Nord, Koblenz (SGD - Nord). The SGD - Nord will be sent monitoring reports and will be closely involved with dictating the future closeout strategy for the site.

PHASE SCHEDULE

1. Current Phase Objective- A groundwater pump and treat system under the RA(O) phase will continue to be operated for indefinite 30 years to reduce AHC and TPH concentrations in groundwater.

2. Milestones- RIP (10/01/2011), RC (09/30/2054), Site Closeout (09/30/2054).

SCHEDULE & BUDGET CHANGES

1. Schedule- One year was added to the RC date and RAO end date during the Spring 2024 datacall to reflect the anticipated indefinite 30-year duration.

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

HISTORICAL SITE ACTIVITIES

The gas station was built in 1952/53 and operated through 2007. In 1980, the original 5,000 L gasoline UST was replaced by a 20,000 L UST for gasoline and a 7,000 L UST for JP8. A PA/SI was conducted in 1989 that found TPH at a maximum concentration of 2,970 mg/kg. The contamination was not completely delineated in January/February 1989; however, soil excavation was recommended. In 1994, the concrete pavement of the fuel dispensing area was upgraded; contaminated soil was partially excavated (upper soil layer) and a POL-separator was installed. An SI was executed in October 2000, with soil leachate analysis and soil vapor sampling. The PA/SI found TPH concentrations up to 12,634 mg/kg in soil and soil leachate analysis revealed BTEX concentrations of 455.2 mg/L. The TPH values exceeded the ALEX Test Value PW-3 of 1,500 mg/kg for soil. An RI/FS was conducted between November 2008 and September 2009, that included the collection of soil, soil gas, and groundwater samples for TPH, AHC, MTBE, PAH, and metals. The RI/FS found AHC in soil at concentrations up to 856.4 mg/kg exceeding the ALEX 02 Screening Value (oPW3) of 25 mg/kg. TPH was detected at concentrations of 910 mg/kg, which does not exceed the ALEX 02 Screening Value (oPW3) for TPH of 1,500 mg/kg. Both AHC and TPH were detected in groundwater at respective maximum concentrations of 47,891 ug/L and 0.57 mg/L, both exceeding the respective ALEX 02 Screening Values (oPW) of 20 ug/L and 0.1 mg/L. In May 2018,

benzene and AHC were each detected at maximum respective concentrations of 75 ug/L and 1,087 ug/L that exceeds the respective ALEX 02 Screening Values (oPW) of 0.5 ug/L and 20 ug/L. Between October 2010 and July 2011 a total of 2,721 metric tons of petroleum contaminated soil was excavated and properly disposed off-site. Three USTs with capacities of 7.0 m^3, 15 m^3, and 20 m^3 were removed along with the gas station, service building, pump island canopy, and oil water separator. The excavation was terminated when bedrock was reached at depths of between 5.0 and 7.0 m. Residual AHC concentrations of 1,072 mg/kg remained following excavation. Groundwater pumping and discharge is currently being conducted at the site to reduce AHC/TPH in the perched groundwater. Remediation values are not established at this time, and a recommendation will need to be brought to the HN for approval when the time comes to shut the system down. The site was not included in the DUCs program.

PROJECT APPROVAL

The project is required IAW DoDI 4715.08 (1 Nov 13), Enclosure 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 prior to remediation. LEC consultation was conducted.

5712A.1015_CCBH117_GE79D_Bldgs 8408, 8420

Env Site ID: CCBH117

Cleanup Site: GE79D_Bldgs 8408, 8420

Alias: #

Regulatory Driver: DODI

RIP Date: 7/16/2015

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: N/A

Phase	Start	End
PA:	7/31/2009	12/31/2009
SI:	1/1/2010	9/30/2010
RI/FS:	10/1/2010	9/30/2011
RD:	10/31/2011	9/30/2012
IRA:	- -	- -
RA(C):	10/1/2012	7/15/2015
RA(O):	7/16/2015	9/30/2054
LTM:	- -	- -

Site Narrative: SITE LOCATION AND DESCRIPTION

1. Location- The site is located around Bldg 8420 and former Bldg 8408 near Stuart Road and Prussmann Avenue in the northern portion of Smith Barracks (ARLOC GE79D). The site is located 500 m from the northern ARLOC boundary.

2. Physical Layout/Site Use- Bldg 8420 is currently used as a motor pool and is improved with a one-story vehicle maintenance building and an asphalt and concrete paved hardstand west of Bldg. 8420. The area of the site is 1 ha. Former Bldg 8408 was used as a laundry facility and is comprised of graveled surface and undeveloped green area. The area of former Bldg 8408 was selected for future MCA project #72614 (TechnoActivity Center) but the MCA project was stopped in 2014.

CONCEPTUAL SITE MODEL

1. Release Description- The use of the site as a motor pool and a laundry facility from the 1950s to the 1970s has resulted in CHC contaminated groundwater.

2. Media Impacted- TPH contaminated soil mainly at motor pool Bldg. 8420 and CHC contaminated soil and groundwater at the former laundry Bldg. 8408. The hot spots of TPH and CHC contamination at the former laundry were removed in FY14.

3. Nature and Extent of Contamination- CHC was detected in groundwater during the RI/FS up to 54 mg/L, exceeding the ALEX 02 oPW Value of 10 ug/L. Between September 2021 and March 2023, CHC was detected at concentrations ranging from 13.9 ug/L to 172.5 ug/L in downstream monitoring wells. The maximum CHC concentration detected in the former remediation area between September 2021 and March 2023 was 221.0 ug/L. CHC concentrations, calculated as chlorine, at the inlet of the plant ranged from 35.28 ug/l and 432.37 ug/l between April 2022 and April 2023. The aerial extent of CHC groundwater impacts is 3350 m^2 with an estimated pore volume of 2680 m^3. The depth to perched groundwater is between 6.7 m to 10 m and flows in an easterly direction. Removal of CHC contaminated soil was completed in 2015 and TPH no longer exceeds the ALEX 02 oPW value in groundwater.

4. Receptors- The site is not located in a groundwater protection area. However, in Germany the groundwater itself is a protected receptor in accordance with German regulations.

REMEDIAL OBJECTIVE

1. Long-Term Closeout Strategy- Remediate CHC in groundwater to the maximum extent feasible and receive a HN NFA letter.

2. Achievable Remedial Action Objective- Remove CHC contaminated groundwater that exceeds the industrial POTW pre- discharge limit of 0.5 mg/L through indefinite operation of a pump & treat system.

3. Specific Regulatory Standards and Legal Drivers- The following regulatory citations are applicable at this site- WHG 3&21 BBodSchG LBodSchG and the Leaflet ALEX 02.

4. Remediation Methods Planned or Being Conducted- Groundwater pump & treat is ongoing for an indefinite 30 years.

5. Response Complete- Will be achieved when the groundwater pump & treat system is transitioned to a pump & discharge system in response to a reduction in CHC concentrations and CHC concentrations remain below remediation values in downgradient wells. It is likely that achievement of concentrations below ALEX02 values will never be achieved in source-area wells.

6. Site Closure- The site will be closed following receipt of a HN closure letter after RA(O) is complete.

7. Host Nation Involvement- The HN environmental authority for the site is the Rheinland Pfalz Struktur- und Genehmigungsdirektion Nord Koblenz (SGD - Nord). The SGD - Nord will be closely involved with the future closeout strategy.

PHASE SCHEDULE

1. Current Phase Objective- Groundwater pump & treat is being conducted under the RA(O) phase for an indefinite 30 years.

2. Milestones- RIP (07/16/2015) RC (09/30/2054) Site Closeout (09/30/2054)

SCHEDULE & BUDGET CHANGES

1. Schedule- One year was added to the RC date, RAO end date, and SCO date during the Spring 2024 datacall to reflect the anticipated indefinite 30-year duration.

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

HISTORICAL SITE ACTIVITIES

The site was previously used as a laundry facility and a motor pool. The area of former Bldg 8408 was selected for future MCA project #72614 (TechnoActivity Center) but the MCA project was stopped again in 2014. In anticipation of the MCA construction an SI was conducted in November 2009. The investigation results are presented below for Bldg 8408 and 8420. Bldg. 8420 - The November 2009 investigation included 21 soil borings (BS 1 - BS 21) advanced to depths between 1.5 and 6.0 m for TPH and PAH analysis. Seven soil samples were analyzed for TPH in leachate. Soil gas samples were collected and analyzed for aromatic hydrocarbons. The analyzed soil samples identified TPH concentrations ranging from below the method detection limit (bdl) to 1,470 mg/kg. Elevated TPH levels were identified in the area of the soil borings BS 15 - BS 18 north of Bldg. 8420. The highest concentrations were found in samples BS 16/4 (1470 mg/kg between 2.1-3.0 m bgs) and BS 16/5 (1,180 mg/kg between 3.0-4.0 m bgs). These concentrations are below the State Screening Value oPW3 of 1,500 mg/kg but exceed the State Remediation Target Value oSW3 of 1,000 mg/kg. The report concludes that in view of the non-sensitive land use no threat to receptors is present at the site. However, no conclusive risk assessment of the detected TPH soil impact was possible during this study and further investigations were recommended. Bldg. 8408 - The November 2009 investigation included 15 soil borings (BS 1- BS 15)

advanced to depths between 1.6 and 4.0 m for TPH and PAH analysis. Seven soil samples were analyzed for TPH in leachate. Soil gas samples were collected and analyzed for aromatic hydrocarbons. The analyzed soil samples identified TPH concentrations between the method detection limit and 1,880 mg/kg. The highest TPH concentrations were found in soil samples collected from borings BS 13 and BS 14 north of Bldg 8408a. At BS 13 TPH concentrations between 880 and 1,050 mg/kg were identified between 0.9 -2.4 m bgs. These concentrations; however, are below the State Screening Value oPW3 of 1,500 mg/kg. At boring locations BS 10 and BS 12 soil gas samples identified CHC concentrations of 28 mg/m^3 (BS 10) and 3.6 mg/m^3 (BS 12). PCE was the detected component in both cases. These borings were advanced in the vicinity of the former laundry Bldg. 8408a. The February 2012 RI/FS found TPH in soil at two hot spots with concentrations up to 28,000 mg/kg. CHC was detected in two major areas in concentrations up to 161 mg/kg. CHC was present in soil gas in concentrations up to 1400 mg/m^3. CHC was also detected in perched water in concentrations up to 54 mg/L. The report concludes that a cleanup of the CHC and TPH contamination is required. Soil excavation began in Fall 2013 and was completed in FY14. The CHC concentration in groundwater could be reduced to 0.5-2.0 mg/l by removal of CHC contaminated soil in the hot spots. During the most recent groundwater sampling round (Spring 2022) total CHC concentrations measured 80.38 – 1,114.2 ug/L in pre-treatment water. The treatment plant is required to operate until the pre-treated water remains below POTW pre-discharge limits. A trend analysis has not been performed to determine how long the treatment system will operate for; therefore, it is assumed that the groundwater pump and treat system will operate under the RA(O) phase for 30 years per DERP guidance. The site was not 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) 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 4715.08Encl 3 par 1e (2)(b)] the US is to apply the provisions of these laws where applicable. A Decision Document was prepared prior to remediation. LEC consultation was conducted.

VGXA0 - SEMBACH KASERNE

Installation Name: VGXA0 - SEMBACH KASERNE

Installation City: Sembach

6872A.1003_CCKL178_GE771_POL SW of Bldg. 218

Env Site ID: CCKL178

Cleanup Site: GE771_POL SW of Bldg. 218

Alias: IRP#1206

Regulatory Driver: DODI

RIP Date: 10/31/2011

RC Date: 10/31/2011

RC Reason: Study Completed, No Cleanup Required

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:	6/30/2002	6/30/2002
SI:	7/1/2002	10/31/2011
RI/FS:	- -	- -
RD:	- -	- -
IRA:	- -	- -
RA(C):	- -	- -
RA(O):	- -	- -
LTM:	11/1/2011	9/30/2054

Site Narrative: SITE LOCATION AND DESCRIPTION

1. Location- The site is located in the southern part of Sembach Kaserne (GE771) underneath a paved road southwest of Bldg. 218.

2. Physical Layout/Site Use- The Air Force used Bldg. 218 as a motor pool. Currently the impact stretches underneath the road and parking lots as well as green spaces.

CONCEPTUAL SITE MODEL

1. Release Description- TPH soil contamination is most likely associated with the motor pool operation at Bldg. 218 over the years.

2. Media Impacted- TPH impacted soil is present below a cap.

3. Nature and Extent of Contamination- In January 2021, a maximum TPH concentration of 1,500 mg/kg, reaching the oPW3 of 1,500 mg/kg, was detected in soil. TPH was also detected at a concentration of 530 mg/kg, exceeding the oPW1 of 300 mg/kg. AHC was detected at 5.46 mg/kg, exceeding the oPW1 2 mg/kg. No PAH was detected in any soil sample. A maximum TPH concentration of 6,500 mg/kg exceeding the HN threshold value of 1,000 mg/kg was previously detected in soil. The impact was partly removed but an area of 50-100 m² and a volume of approximately 30-100 cbm of contaminated soil was left in place underneath the road.

4. Receptors- The primary receptor identified is groundwater. In Germany the groundwater itself is a protected receptor in accordance with German regulations. Due to the distance to groundwater and the sealing of the road, the risk to groundwater is considered low.

REMEDIAL OBJECTIVE

1. Long Term Closeout Strategy- The TPH contamination encountered during the repair work of the drinking water line was partly removed. The remaining contamination is capped by the road. As soon as

the TPH contamination trend line in soil confirms no risk to groundwater and the functionality of the cap, site closure will be discussed with HN regulators.

2. Achievable Remedial Action Objective- No further active remediation required.

3. Specific Regulatory Standards and Legal Drivers- German Federal Soil Protection Act and Ordinance (Bundesbodenschutzgesetz Bundesbodenschutzverordnung) the German Federal Water Act (Wasserhaushaltsgesetz [WHG 3 & 21] and state regulations for Rheinland-Pfalz. Under the provisions of Article 53 of the Supplementary Agreement to the NATO SOFA (an international agreement) the U.S. is obligated to apply to this law.

4. Remediation Methods Planned or Being Conducted- No further remediation is planned.

5. Response Complete- Was achieved with partial excavation of the contamination and reconstruction of road sealing under the lead of the US Air Force.

6. Site Closure- As soon as either HN agrees that the monitoring data for contamination in soil demonstrate no risk to groundwater and the functionality of the capping is ensured or the contaminated soil is removed during future construction work and a HN closure letter is subsequently receipt.

7. Host Nation Involvement- This site is monitored and tracked by the HN through the Coordination Working Group (KOAG) which was set up in response to congressional inquiries regarding contamination in the Kaiserslautern Military Community. KOAG- internal project number for this project is K0126. In a letter dated 21 June 2013, HN agrees that no immediate remedial activities are required but requested either a soil sampling every 5 years to document a degradation trend line along with a monitoring of the proper condition of the road sealing or a removal of the contamination as part of a construction project at that site.

PHASE SCHEDULE

1. Current Phase Objective- Maintain Road sealing and monitor TPH concentration trend in soil every 5 years to demonstrate that remnant contamination does not pose a risk to groundwater. The future funding at the site has been programmed in FY26, FY31, FY36, FY41, FY46, and FY51.

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

SCHEDULE & BUDGET CHANGES

1. Schedule- One year was added to the LTM end date during the Spring 2024 data call to reflect the anticipated indefinite 30-year duration.

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

HISTORIC SITE ACTIVITIES

In 2002, soil contamination with TPH was detected during repair work for a new drinking water line in the area south of Bldg. 218. The soil contamination was partly removed in an area of approximately 5.0 x 0.8 m (depth 1.5 m). Follow up environmental investigations were performed by the US Air Force in 2006 to delineate the impacted area. To the north, two soil borings showed elevated TPH concentrations (6,500 mg/kg and 2,700 mg/kg) within 5.0 m distance to the drinking water line. Further contaminants identified were PAH (one hit- 2.1 mg/kg), and AHC (one hit- 3.4 mg/kg). None to minor TPH concentrations were detected to the west south and southeast. In spring 2008, a new building was constructed in lieu of the old Bldg 218. Soil excavations performed at that time delineated the impacted area to the northeast towards the new building. The remaining contaminated area is approximately 100 m^2 (with a volume of approximately 30-100 cbm). In a letter dated 21 June 2013, HN agreed that no immediate remedial activities are required but requested a soil sampling every 5 years to document the degradation trend line along with a monitoring of the proper condition of the road sealing. The next soil sampling event is planned in FY26.

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 4715.08Encl. 3 par 1e (2)(b)] the US is to apply the provisions of these laws where applicable. No Decision Document was prepared nor LEC consultation conducted.

6872A.1007_CCKL185_GE771_Fill Station Bldg 227

Env Site ID: CCKL185

Cleanup Site: GE771_Fill Station Bldg 227

Alias: IRP#1201

Regulatory Driver: DODI

RIP Date: 9/30/2008

RC Date: 9/30/2008

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:	1/31/2006	3/31/2007
SI:	4/1/2007	9/30/2008
RI/FS:	- -	- -
RD:	- -	- -
IRA:	- -	- -
RA(C):	- -	- -
RA(O):	- -	- -
LTM:	10/1/2008	9/30/2054

Site Narrative: SITE LOCATION AND DESCRIPTION

1. Location- The site is the area of the AAFES filling station at Bldg. 227 located in the southern part of Sembach Kaserne (GE771).

2. Physical Layout/Site Use- The site is a filling station. The impacted area is capped.

CONCEPTUAL SITE MODEL

1. Release Description- Bldg. 227 has operated as AAFES fuel station since the late 1950s. Contamination identified is associated with use and handling of fuels and oil.

2. Media Impacted- Soil and soil gas are impacted with TPH and AHC.

3. Nature and Extent of Contamination- In January 2021, TPH was detected once in soil at a concentration of 440 mg/kg, exceeding the oPW1 at the northern tank field. No TPH concentration exceeded the regulatory triggers according to ALEX02. ACH concentrations exceeded the screening value for industrial areas at five soil borings, with a maximum concentration of 477.5 mg/kg. The contamination was completely delineated in 2007 and is limited to the northern tank field (in-situ > 3 meters below ground surface). To disconnect the migration path from seepage water to groundwater, the tank field was covered with an asphalt capping.

4. Receptors- The primary receptor identified is groundwater. In Germany the groundwater itself is a protected receptor in accordance with German regulations.

REMEDIAL OBJECTIVE

1. Long Term Closeout Strategy- The contamination cannot be fully excavated as long as the fuel tanks are in place. Given this situation, as soon as the contamination trend line in soil and soil gas confirms no risk to groundwater and the functionality of the capping is proven, site closure will be discussed with HN regulators. Currently soil testing will be performed every 5 years.

2. Achievable Remedial Action Objective- Prove no risk to groundwater.

3. Specific Regulatory Standards and Legal Drivers- German Federal Soil Protection Act and Ordinance (Bundesbodenschutzgesetz Bundesbodenschutzverordnung) the German Federal Water Act (Wasserhaushaltsgesetz [WHG 3 & 21] and state regulations Rheinland-Pfalz. Under the provisions of Article 53 of the Supplementary Agreement to the NATO SOFA (an international agreement) the U.S. is obligated to apply this law.

4. Remediation Methods Planned or Being Conducted- No remediation is being conducted or is planned.

5. Response Complete- Was accomplished with the capping of the northern tank field in September 2008.

6. Site Closure- As soon as either HN agrees that the monitoring data for contamination in soil and soil vapor demonstrate no future risk to groundwater and the functionality of the capping is ensured or the contaminated soil is removed during future construction work and a HN closure letter is subsequently receipt.

7. Host Nation Involvement- This site is monitored and tracked by the HN as part of a multiple-sites project through the Coordination Working Group (KOAG) which was set up in response to congressional inquiries regarding contamination in the Kaiserslautern Military Community. KOAG-internal project number is K0036.

PHASE SCHEDULE

1. Current Phase Objective- LTM is being conducted that includes soil testing and site inspection every 5 years for an indefinite 30 years. The future funding at the site has been programmed in FY26, FY31, FY36, FY41, FY46, and FY51.

2. Milestones- RIP (09/30/2008) RC (09/30/2008) Site Closeout (09/30/2054)

SCHEDULE & BUDGET CHANGES

1. Schedule- One year was added to the LTM end date during the Spring 2024 data call to reflect the anticipated indefinite 30-year duration.

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

HISTORIC SITE ACTIVITIES

The AAFES Filling Station at Bldg. 227 is in operation since the late 1950s. During reconstruction activities in 2000/2001, soil contamination with TPH and AHC was detected. The contamination was excavated as far as technically feasible. Residual contamination in the northern tank field as well as in the vicinity of the pump island had to be left in place and could not be delineated. To evaluate the risk to groundwater posed by the contamination and to reduce the level of the contamination soil vapor, extraction took place in 2005/2006. Adjacent fuel station units were investigated at the same time and significant fuel related soil and soil gas contamination was identified (TPH up to 1,800 mg/kg AHC up to 210 mg/kg [soil] and up to 3,400 mg/ m^3 [soil gas]) in the area of the eastern tank field the northern pump station and the oil water separator. In a detailed investigation in 2007, the remaining soil contamination was vertically and horizontally delineated. According to the results of a seepage water prognosis the contamination at the northern tank field (in-situ > 3 meters below ground surface) is locally limited but due to an open ground situation migration of contaminants by seepage water poses a potential risk to groundwater. In April 2008, the surface of the northern tank field was sealed (documentation dated April 2008 was not transferred from the Air Force but is available at SGD-Sued) to eliminate the risk to groundwater by reducing the seepage rate to less than 50 mm/a. In 2011, as part of a technical upgrade of the fuel station the deteriorated capping of the northern tank field was renewed. The most recent monitoring took place in FY21. The next sampling event is planned in FY26.

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 4715.08Encl. 3 par 1e (2)(b)] the US is to apply the provisions of these laws where applicable. No Decision Document was prepared nor LEC consultation conducted.

SITE SUMMARY

SITE CLOSEOUT SUMMARY

CRL ID	Site Name	Site Closeout Date
5581A.1002	CCBH014_GE07N - Bldg 8725 (DRMO Yd) QM A	1/15/2016
5581A.1003	CCBH123_GE07N-BLDG. 8780 FORMER GAS STAT	7/31/2016
5621A.1002	CCKL188_GE30J - DLA YARD, BLDG. 7968	10/31/2015
5647A.1002	CCKL140_GE426 - GW Plume for KAD & ESCK	9/30/2021
5647A.1003	CCKL152_GE426 - Bldg 2371, Former MP/Che	8/15/2011
5647A.1004	CCKL159_GE426 - soil contamination at Bl	6/15/2013
5647A.1005	CCKL002_GE426 - Groundwater Monitoring	3/31/2010
5647A.1007	CCKL165_GE426 - POL Cont,Bldg 3041/3026	9/30/2012
5647A.1008	CCKL166_GE426 - Illegal Dump Near Bldg 2	2/15/2012
5647A.1009	CCKL167_GE426 - Former Burn Pit, KVF 7	2/28/2007
5647A.1010	CCKL067_GE426 - Bldg 2347/2218 Unauthori	3/15/2013
5647A.1011	CCKL179_GE426-BLACK LAYER AT BLDG 2343	6/30/2017
5647A.1013	CCKL170_GE426 - Area Bldg. 2370, GW33	2/15/2016
5649A.1001	CCKL013_GE428 - Bldg 3085, Gravel Hardst	3/15/2014
5659A.1002	CCKL163_GE45P - Bldg 3260, Washrack	3/31/2007
5659A.1003	CCKL171_GE45P - Former hardstand E of Bl	2/15/2016
5659A.1004	CCKL172_GE45P - Former motorpool (Bldg 3	8/15/2011
5665A.1002	CCKL174_GE48R - Bldg 3800, Hobby Craft S	2/15/2012
5678A.1003	CCKL160_GE55J - Bldg 1410, Locomotive St	12/31/2010
5678A.1004	CCKL200_GE55J - Groundwater Monitoring,	3/31/2009
5702A.1002	CCKL139_GE72N - Bldg 623, Around Fuel St	1/31/2011
5702A.1003	CCKL154_GE72N - Open Ditch Border	12/31/2012
5702A.1004	CCKL186_ILLEGAL LANDFILL AT FORMER QUARR	8/31/2013
5712A.1002	CCBH100_GE79D - Bldg 8426, Motor Pool/Ha	9/30/2010
5712A.1003	CCBH101_GE79D-BLDG 8439--MOTOR POOL/HARD	1/31/2002
5712A.1004	CCBH104_GE79D - Bldg 8461/8460A/8462, Mo	3/15/2013
5712A.1005	CCBH105_GE79D - Bldg 8456, Motor Pool/Ha	11/15/2011
5712A.1006	CCBH108_GE79D - Bldgs. 8138/39/34/44, MP	9/30/2010
5712A.1007	CCBH110_GE79D - Bldg. 8468/69, Motor Poo	9/15/2014
5712A.1008	CCBH113_GE79D - Bldg 8451 & 8452 Motor P	12/31/2008
5712A.1009	CCBH031_GE79D - Skeet & Trap Range	3/15/2013
5712A.1011	CCBH115_GE79D - POL Separator BLDG 8407	9/30/2010
5712A.1012	CCBH035_GE79D - Motor Pool Bldg. 8260/82	9/30/2012
5712A.1013	CCBH116_GE79D - Motor Pool Bldg. 8268/82	1/15/2012
5712A.1014	CCBH112_GE79D - Bldg 8262-Motor Pool	3/31/2010
5712A.1016	CCBH118_GE79D-BLDGS 8255/8256 FORMER DRY	11/15/2019
5712A.1017	CCBH119_GE79D-BLDG 8177 FORMER REPAIR SH	11/8/2019
5712A.1018	CCBH120_GE79D-BLDGS 8401/8407 AAFES PX/G	12/31/2018
5712A.1019	CCBH122_GE79D-PARKING AREA BELOW BLDG. 8	10/6/2017
5712A.1020	CCBH124_GE79D-BLDG 8560, JMTC REPAIR SHO	10/19/2017
6872A.1001	CCKL176_POL cont open ground area north	3/15/2013
6872A.1002	CCKL177_POL underneath hardstand north o	2/15/2012

CRL ID	Site Name	Site Closeout Date
6872A.1004	CCKL182_BLACKTOP EAST OF BLDG 135	12/31/2013
6872A.1005	CCKL183_CONTAMINANT REMNANTS AT BLDG 155	12/31/2011
6872A.1006	CCKL184_SOIL GAS CONTAMINATION AT BLDG 1	11/9/2017
6872A.1008	CCKL187_FORMER OIL WATER SEPARATOR BLDG	3/31/2012