

FY2016

FORT BUCHANAN

Army Defense Environmental Restoration Program

Installation Action Plan

Printed 01 November 2016

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Statement of Purpose

The purpose of the Installation Action Plan (IAP) is to outline the total multiyear cleanup program for an installation. The plan identifies environmental cleanup requirements at each site or area of concern (AOC), and proposes a comprehensive, installation-wide approach, along with the costs and schedules associated with conducting investigations and taking the necessary remedial actions (RA).

In an effort to coordinate planning information between the Installation Management Command (IMCOM), the US Army Environmental Command (USAEC), Fort Buchanan, the executing agencies, regulatory agencies, and the public, an IAP was completed. The IAP is used to track requirements, schedules, and tentative budgets for all major Army installation cleanup programs.

All site-specific funding and schedule information has been prepared according to projected overall Army funding levels and is, therefore, subject to change.

Acronyms

AEDB-CC	Army Environmental Database - Compliance-Related Cleanup
AEDB-R	Army Environmental Database - Restoration
AOC	Area of Concern
AST	Aboveground Storage Tank
Bldg	Building
CAP	Corrective Action Plan
CC	Compliance-related Cleanup
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CMI	Corrective Measures Implementation
CMI(C)	Corrective Measures Implementation - Construction
CMI(O)	Corrective Measures Implementation - Operation
CMI(P)	Corrective Measures Implementation Plan
CMS	Corrective Measure Study
CR	Compliance Restoration
CS	Confirmation Sampling
CWM	Chemical Warfare Material
DD	Decision Document
DERP	Defense Environmental Restoration Program
DES	Design
DoD	Department of Defense
DOL	Directorate of Logistics
DPT	Direct Push Technology
DPW	Directorate of Public Works
EBS	Environmental Baseline Survey
FRA	Final Remedial Action
FS	Feasibility Study
FY	Fiscal Year
GRO	Gasoline Range Organics
GW	Groundwater
HHRA	Human Health Risk Assessment
IAP	Installation Action Plan
IMCOM	Installation Management Command
IMP(C)	Implementation (Construction)
IMP(O)	Implementation (Operation)
INV	Investigation
IR	Installation Restoration
IRA	Interim Remedial Action
IRP	Installation Restoration Program
LTM	Long-Term Management
LUC	Land Use Control
MCL	Maximum Contaminant Level
MMRP	Military Munitions Response Program
MNA	Monitored Natural Attenuation
MR	Munitions Response
MW	Monitoring Well

Acronyms

N/A	Not Applicable
NFA	No Further Action
NPL	National Priorities List
NWB	Northwest Boundary
ORC	Oxygen Releasing Compound
ORO	Oil Range Organics
OWS	Oil/Water Separator
PA	Preliminary Assessment
POL	Petroleum, Oil and Lubricants
PP	Proposed Plan
ppb	parts per billion
ppm	parts per million
PREQB	Puerto Rico Environmental Quality Board
PVC	Polyvinyl chloride
RA	Remedial Action
RA(C)	Remedial Action (Construction)
RA(O)	Remedial Action (Operation)
RAB	Restoration Advisory Board
RC	Response Complete
RCRA	Resource Conservation and Recovery Act
RD	Remedial Design
RFA	RCRA Facility Assessment
RFI	RCRA Facility Investigation
RI	Remedial Investigation
RIP	Remedy-in-Place
ROD	Record of Decision
RW	Recovery Well
SI	Site Inspection
SOUTHCOM	Southern Command
SSHP	Site Safety and Health Plan
SWI	Site-Wide Investigation
SWMU	Solid Waste Management Unit
TAPP	Technical Assistance for Public Participation
TCE	Trichloroethylene
TCLP	Toxicity Characteristic Leaching Procedure
TPH	Total Petroleum Hydrocarbons
TPH-DRO	Total Petroleum Hydrocarbons -Diesel Range Organics
TRC	Technical Review Committee
USACE	US Army Corps of Engineers
USACHPPM	US Army Center for Health Promotion and Preventive Medicine
USAEC	US Army Environmental Command
USAG	US Army Garrison
USAR	US Army Reserve
USEPA	US Environmental Protection Agency
UST	Underground Storage Tank

Acronyms

VI Vapor Intrusion
VOC Volatile Organic Compounds

Acronym Translation Table

CERCLA

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

RCRA

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

Site Alias List

AEDB-R Site ID to Alias List

AEDB-R #	Alias
CC FTB-038	light pole
CCFB04S003	Bldg. 380
FTB-034	NWBoundary

Installation Information

Installation Locale

Installation Size (Acreage): 746

City: San Juan

County: Bayamón and Guaynabo

State: Puerto Rico

Other Locale Information

Fort Buchanan is located within the San Juan metropolitan area on the north coast of Puerto Rico, which is the smallest of the Greater Antilles that separates the Caribbean Sea from the Atlantic Ocean. The installation lies approximately 6 miles southwest of old San Juan and occupies approximately 746 acres within two municipalities, Bayamón and Guaynabo.

Fort Buchanan is located on the northern coastal plain, which is about 5 miles wide and slopes gently upward to the central mountain chain, the Cordillera Central. A busy commercial area lies to the east of Fort Buchanan outside the East Main Gate. State Road PR-2 connects San Juan with the municipalities of Guaynabo and Bayamón and the surrounding shopping areas, restaurants, and other businesses. Fort Buchanan is surrounded to the north by Puerto Rico State Highway 28, to the northeast by Amelia Industrial Park, and to the northeastern corner by a federal detention center. The Puma Chemical Storage Facility (formerly the Caribbean Gulf Refinery) and the Puerto Rico Department of Corrections occupy land to the west of the installation. A privately-owned wooded area lies to the southwest, and numerous residential areas including Tintillo Gardens, Villa Caparra, Chalets de Caparra, Villa España, Tintillo Hills, and Victor Bragger lie to the south.

Installation Mission

A forward based training platform dedicated to enhancing individual and unit readiness and a forward based staging platform capable of rapidly deploying Joint Combined Armed Forces in support of Combatant Commanders.

Lead Organization

IMCOM

Lead Executing Agencies for Installation

USAEC

Regulator Participation

Federal	US Environmental Protection Agency (USEPA), Caribbean Field Office, Region II
State	Puerto Rico Environmental Quality Board (PREQB)

National Priorities List (NPL) Status

FORT BUCHANAN is not on the NPL

Installation Restoration Advisory Board (RAB)/Technical Review Committee (TRC)/Technical Assistance for Public Participation (TAPP) Status

The community has expressed no sufficient, sustained interest in a RAB.

Installation Information

Installation Program Summaries

IRP

Primary Contaminants of Concern: Volatiles (VOC)

Affected Media of Concern: Groundwater

CR

Primary Contaminants of Concern: Metals, Pesticides, Petroleum, Oil and Lubricants (POL)

Affected Media of Concern: Groundwater, Soil, Surface Water

5-Year / Periodic Review Summary

5-Year / Periodic Review Summary

Status	Start Date	End Date	End FY
Planned	202007	202009	2020

5-Year / Periodic Review Details

Associated ROD/DD Name	Sites
FTB-034	FTB-034

Land Use Control (LUC) Summary

LUC Title: DD FTB-034 & CCFTB-039

Site(s): CC FTB-039

ROD/DD Title: DD FTB-034 and Sites in CCFTB-039

Location of LUC

Sites 2,3,9,11 &12 (CCFTB-039)

Land Use Restriction: Media specific restriction - Prohibit, or otherwise manage excavation, Restrict land use - No daycare/hospital/school use, Restrict land use - No residential use

Types of Engineering Controls: None

Types of Institutional Controls: Dig Permits, Notations in Master Plan

Date in Place: 201608

Modification Date: N/A

Date Terminated: N/A

Inspecting Organization: Other Army Entity

Record of LUC: Master Plan or Equivalent

Documentation Date: N/A

LUC Enforcement: Annual Inspections

Contaminants: METALS, PESTICIDES

Additional Information

Site FTB-034 : Do not consider using groundwater inside TCE plume as a potable water source until concentrations of TCE are below federal, state, and local drinking water standards.

Cleanup Program Summary

Installation Historic Activity

In 1903, the first Puerto Rican US Army unit, the Puerto Rico Regiment, was established under the command of Lieutenant Colonel James A. Buchanan. Camp Buchanan, established in 1923, was originally located on a 300-acre tract of land some 6 miles south of San Juan Bay.

From 1926 to 1930 Camp Buchanan was used as a maneuver training area and range by the regular Army and National Guard troops and as a citizen military training camp. A small arms firing range was established on 32 acres and was known as Camp Buchanan Training Area. Records indicated that chemical warfare material was requested, received and stored at Camp Buchanan. In May 1940, Camp Buchanan training area was designated as Fort Buchanan and expanded to 1,514 acres and later to 4,500 acres and permanent facilities were constructed.

After World War II, the post was gradually reduced to its present 746 acres.

Today, Fort Buchanan is the only DoD installation in the Caribbean Basin. It continues to support the Reserve and Active Soldiers in Puerto Rico, US Virgin Islands and is a relevant asset in relations with Central and South America.

Installation Program Cleanup Progress

IRP

Prior Year Progress: On 06 August 2015 a public meeting was held to seek comments on the proposed remedial action plan for Site FTB-034. No comments were received and a final decision document (DD) was drafted on 15 November 2015. Between 27 July 2015 and 15 November 2015, Fort Buchanan developed CERCLA related documents to memorialize all voluntary RCRA corrective action decisions for AEDB-R sites FTB-034 and CCFTB-039. Groundwater sampling occurred in 19-25 January 2016.

Future Plan of Action: CMI(O) phase with monitored natural attenuation (MNA) for the Northwest Boundary (NWB) is anticipated to continue for 30 years. CCFTB-039 cleanup is complete and is NFA based on nonresidential use.

CR

Prior Year Progress: On 03 June 2015, a final DD document and 29 September 2015 corrective action was completed for Site CCFTB-038. On 15 November 2015 Site CCFTB-039 - Former RCRA Facility Investigation (RFI) Sites (No. 2, No. 3, No. 9, No. 11 and No. 12) a final DD was developed indicating no further action (NFA). On 20 November 2015, the Underground Storage Tanks (USTs) were removed at CCFB04S003.

Future Plan of Action: Between 27 July 2015 and 15 November 2015, Fort Buchanan developed CERCLA related documents to memorialize all voluntary RCRA corrective action decisions for AEDB-R sites FTB-034 and CCFTB-039. Site CCFB04S003 (former Building 380 Area) will continue groundwater monitoring until concentrations of contaminants are below state requirements.

FORT BUCHANAN
Army Defense Environmental Restoration Program
Installation Restoration Program

IRP Summary

Installation Total Army Environmental Database-Restoration (AEDB-R) Sites/Closeout Sites Count: 18/17

Installation Site Types with Future and/or Underway Phases

1 Contaminated Ground Water
(FTB-034)

Most Widespread Contaminants of Concern

Volatiles (VOC)

Media of Concern

Groundwater

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

Site ID	Site Name	Action	Remedy	FY
FTB-007	PX SERVICE STATION	FRA	OTHER	1984
FTB-016	BUILDING 539 PESTICIDE STORAGE	FRA	WASTE REMOVAL - SOILS	1991
FTB-034	TCE Groundwater Investigation	FRA	BIOREMEDIATION - IN SITU GROUNDWATER	2015

Duration of IRP

Date of IRP Inception: 198309

Estimated Date for Remedy-In-Place (RIP)/Response Complete (RC): 201507/204509

Date of IRP completion including Long Term Management (LTM): 204509

IRP Contamination Assessment

Contamination Assessment Overview

In January 2005 the USAG Fort Buchanan was notified by the USEPA Region II to conduct an RFI for 15 sites. These include: five solid waste management units (SWMU); nine AOCs and one site (FTB-001-R-01) being addressed under the Military Munitions Response Program (MMRP). One of the five SWMU sites is the trichloroethylene (TCE) contamination site and is being tracked separately as FTB-034. The remaining four SWMUs and nine AOC sites are collectively referred to as the site-wide investigation (SWI).

Based on Fort Buchanan's research and confirmed by USEPA, there is no consent order issued for the site nor is there a RCRA permit. During the RFI and corrective measures study (CMS) cleanup was being performed under a voluntary cleanup agreement. During the RFI, the USEPA recommended the NWB component address the groundwater for the entire site, since it was investigated in detail for the NWB area. The SWI RFI will address soils for the entire site and include limited groundwater evaluation as it pertains to each site.

A draft RFI report was submitted to USEPA for the TCE component in September 2009. Comments made by USEPA were received in September 2010. The final TCE report was submitted in March 2012 and approved in April 2012 by PREQB and USEPA. The report concluded that the TCE groundwater plume was located at the northwest boundary and has moved off-site. The HHRA found potential concerns for the commercial worker due to vapor intrusion only if any buildings were constructed in the Northwest Boundary Area. The HHRA also found potential concerns for the off-site resident only if groundwater was used as a tap water source in the Northwest Boundary Area. At present no groundwater is being used as tap water nor buildings being constructed in the Northwest Boundary Area.

In June 2012, a draft final CMS was submitted to USEPA and PREQB. The CMS report presented five alternatives and presented the preferred alternative no. 3 enhanced bioremediation reductive dechlorination, MNA, and land use controls (LUC). In June 2012 the USEPA developed a statement of basis that was released for community feedback with no response. A final CMS was submitted to USEPA and PREQB in September 2012 and was approved in October 2012. A new contract was awarded in January 2014 to conduct a pilot scale treatability study, vapor intrusion (VI) study, baseline groundwater sampling, implementation (construction) [IMP(C)] phase, and implementation (operation) [IMP(O)] phase.

Baseline groundwater sampling was conducted July 2014; then additional sampling in July 2015, and Jan 2016. Groundwater sampling results indicated that the TCE plume concentrations continue to decrease. From March to May 2014 a pilot treatability study was performed to determine the population size of the dehalococoides present and the geochemical properties of the groundwater at the site. The study determined the need to augment the population.

In September 2014 a VI study was performed. In May-June 2015 corrective measures were implemented. Based on the SWI RFI review comments from the USEPA dated Dec. 17, 2010, there were concerns raised regarding the site background concentration levels for pesticides and metals. Considering these comments, it was anticipated that future limited RAs (e.g., limited excavation/removal) may be required at sites FTB-035, FTB-036 and FTB-037. The three sites were opened up as Compliance Restoration (CR) sites. Because of the results of the background study and the final RFI, NFA was recommended for sites 1 (FTB-035), 4, 5, 6, 7 (FTB-036), 8, 10, 13 (FTB-037), and 15. Sites 2, 3, 9, 11 and 12 will move forward with a CMS phase. The CMS action will be captured in site CCFTB-039 under the CR program. The final RFI report was submitted in September 2012 and approved by PREQB and USEPA in October 2012. A new contract was awarded in January 2014 to conduct the CMS. A CMS was conducted for CCFTB-039 sites 2, 3, 9, 11 & 12. A report was submitted in 2014.

Cleanup Exit Strategy

Anticipate MNA to go 30 years unless proven otherwise. Establish LUCs restricting groundwater use as a potable source in the area of the TCE plume.

Site CCFTB-039 will now be addressed in the CR program. The CMS recommended NFA and that notes be made to the master plan indicating land use to be zoned for industrial/community and not for residential for the former RFI sites 2, 3, 9, 11, and 12.

Between 27 July 2015 and 15 November 2015, Fort Buchanan developed CERCLA-related documents to memorialize all voluntary RCRA corrective action decisions for AEDB-R sites FTB-034 and CCFTB-039. In order to meet Defense Environmental Restoration Program (DERP) requirements, the Office of General Council requested that these documents be developed.

IRP Previous Studies

Year	Title	Author	Date
1984	Installation Assessment of Fort Buchanan	Environmental Science & Engineering Inc. and US Army Toxic and Hazardous Materials Agency	JUN-1984
1992	Geophysical Investigation at Solid Waste Management Unit NO. 3, Fort Buchanan, PR	Geotechnical Laboratory	FEB-1992
1993	Soil Sampling Program at Solid Waste Management Unit No. 3, Fort Buchanan, PR	Geotechnical Laboratory	MAR-1993
1997	Environmental Baseline Survey	Woodward-Clyde Federal Services	JAN-1997
1999	Geohydrologic Study No. 38-EH-8181-98, US Army Garrison, Fort Buchanan, PR	USACHPPM	OCT-1999
2006	Draft Final Project Management Plan	HGS Engineering, Inc.	MAR-2006
	Northwest Boundary Investigation Work Plan and Quality Assurance Project Plan	EA Engineering, Science, and Technology	DEC-2006
2007	Addendum #1 to the Northwest Boundary Investigation Work Plan	EA Engineering, Science, and Technology	APR-2007
	Addendum #2 Northwest Boundary Investigation Work Plan	EA Engineering, Science, and Technology	OCT-2007
2008	RCRA Facility Investigation Work Plan and Quality Assurance Project Plan	EA Engineering, Science, and Technology	MAR-2008
	Addendum #3 to the Northwest Boundary Investigation Work Plan	EA Engineering, Science, and Technology	MAR-2008
	Memorandum about the Phase III Well Completion Report - Northwest Boundary Investigation Area	EA Engineering, Science, and Technology	MAR-2008
	Addendum #4 to the Northwest Boundary Investigation Work Plan, Draft Version	EA Engineering, Science, and Technology	JUL-2008
	Addendum #5 to the Northwest Boundary Investigation Work Plan, Draft Version	EA Engineering, Science, and Technology	AUG-2008
	Quality Assurance Project Plan RCRA Facility Investigation, U.S. Army Garrison Fort Buchanan, PR	EA Engineering, Science, and Technology	SEP-2008
	Phase IV and Phase VI Well Completion and Soil Investigation Report, Northwest Boundary Investigation Area, Fort Buchanan, PR	EA Engineering, Science, and Technology	NOV-2008
	Revised Phase IV and Phase VI Well Completion and Soil Investigation Report, Northwest Boundary Investigation Area, Fort Buchanan, PR	EA Engineering, Science, and Technology	NOV-2008
2009	Draft Final RCRA Facility Investigation Report U.S Army Garrison Fort Buchanan	EA Engineering Science, and Technology	APR-2009
	Draft Final RCRA Facility Investigation Report U.S Army Garrison Fort Buchanan	EA Engineering Science, and Technology, Inc.	JUL-2009
	Draft RCRA Facility Investigation northwest Boundary Investigation Final Report U.S. Army Garrison Fort	EA Engineering Science, and Technology	AUG-2009

IRP Previous Studies

Year	Title	Author	Date
2009	Buchanan, Puerto Rico		
2010	Draft Final RCRA Facility Investigation Report U.S Army Garrison Fort Buchanan	EA Engineering Science & Technology	JUN-2010
	Well Integrity Monitoring Well Sampling Report	EA Engineering Science & Technology	SEP-2010
	Addendum #6 to the Northwest Boundary Investigation Work Plan U.S. Army Garrison Fort Buchanan, Puerto Rico	EA Engineering Science & Technology	NOV-2010
2011	Addendum #1 Technical Memorandum Background Concentrations of Metals and Organochlorine Pesticides for the Fort Buchanan RFI. (Draft)	EA Engineering Science & Technology	FEB-2011
	ADDENDUM #1 TO THE RCRA FACILITY INVESTIGATION WORK PLAN	EA Engineering Science & Technology	MAY-2011
	Northwest Boundary TCE Investigation Corrective Measures Study Work Plan Draft	EA Engineering Science & Technology	MAY-2011
	Northwest Boundary TCE Investigation Corrective Measures Study Work Plan US Army Garrison Fort Buchanan, Puerto Rico (Draft)	EA Engineering Science & Technology	JUL-2011
	ADDENDUM #1 to the RCRA Facility Investigation Work Plan Final Version	EA Science & Technology	JUL-2011
	Addendum #2 to the RCRA Facility Investigation Work Plan US Army Garrison, Fort Buchanan, Puerto Rico (Draft)	EA Engineering Science & Technology	AUG-2011
	Northwest Boundary TCE Investigation Corrective Measures Study Work Plan US Army Garrison Fort Buchanan, Puerto Rico (Final)	EA Engineering Science & Technology	SEP-2011
	Northwest Boundary TCE Investigation Corrective Measures Study Work Plan US Army Garrison Fort Buchanan, Puerto Rico (Final)	EA Engineering Science & Technology	NOV-2011
	DRAFT LETTER REPORT Site 12, Results of Sediment Pore Water Sampling for the Fort Buchanan Site-wide RCRA Facility Investigation US ARMY GARRISON, Fort Buchanan, Puerto Rico	EA Engineering Science & Technology	DEC-2011
	RCRA Facility Investigation, northwest Boundary Area, US Army Garrison Fort Buchanan, Puerto Rico Working final with response to comments.	EA Engineering Science & Technology	DEC-2011
	Technical Memorandum Background Concentrations of Metals and Organochlorine Pesticides for the Fort Buchanan RFI. (Draft)	EA Engineering Science & Technology	DEC-2011
2012	RCRA Facility Investigation Northwest Boundary Area U.S. Army Garrison, Fort Buchanan Final March 2012	EA Engineering Science & Technology	MAR-2012
	Northwest Boundary Groundwater Corrective Measure Study Report, Final March 2012	EA Engineering Science & Technology	MAR-2012
	RCRA Facility Investigation Northwest Boundary Area U.S. Army Garrison, Fort Buchanan Final September 2012	EA Engineering Science & Technology	SEP-2012
	RCRA Facility Investigation (RFI) Site Wide Investigation Report Final September 2012	EA Engineering Science & Technology	SEP-2012
2013			

IRP Previous Studies

2013	Title	Author	Date
	FINAL MUNITIONS RESPONSE REMEDIAL ACTION DECISION DOCUMENT FOR THE FORT BUCHANAN MUNITIONS RESPONSE SITE CAMP BUCHANAN TRAINING AREA SAN JUAN, PUERTO RICO April 2013	ECC	APR-2013
	FINAL LAND USE CONTROL PLAN FORT BUCHANAN MUNITIONS RESPONSE SITE CAMP BUCHANAN TRAINING AREA SAN JUAN, PUERTO RICO SEPTEMBER 2013	U.S. ARMY	SEP-2013
2014	Draft Corrective Measure Study Pilot Scale Treatability Study Work Plan FTB-034 Northwest Boundary Area	KEMRON Environmental Services Inc.	FEB-2014
	Vapor Intrusion Investigation Work Plan Ftb-034 Northwestern Boundary Groundwater Army Garrison-Fort Buchanan Draft Version	KEMRON Environmental Services Inc.	FEB-2014
	Sampling And Analysis Plan UFP Quality Assurance Project Plan The Northwest Boundary Area (FTB-034 TCE Groundwater Plume) Fort Buchanan Puerto Rico Draft Version	KEMRON Environmental Services Inc.	FEB-2014
	Accident Prevention Plan RCRA CMS/CMIP for the FTB-034 and CCFTB-039 Army Garrison Fort Buchanan, Puerto Rico Draft Version	KEMRON Environmental Services Inc.	FEB-2014
	Vapor Intrusion Investigation Work Plan FTB-034 Northwestern Boundary Groundwater Army Garrison-Fort Buchanan Draft/Final Version	KEMRON Environmental Services Inc.	APR-2014
	Draft Final Sampling and Analysis Plan, Unified Federal Policy Quality Assurance Project Plan, FTB-034, Northwest Boundary Area Groundwater, Fort Buchanan, Bayamon, Puerto Rico, Revision 1	KEMRON Environmental Services Inc.	APR-2014
	Final Sampling and Analysis Plan Unified Federal Policy Quality Assurance Project Plan, FTB-034, Northwest Boundary Area Groundwater, Fort Buchanan, Bayamon, Puerto Rico,	KEMRON Environmental Services Inc.	JUN-2014
	Vapor Intrusion Work Plan FTB-034 Northwestern Boundary Groundwater Army Garrison-Fort Buchanan Army Reserve Bayamon, Puerto Rico	KEMRON Environmental Services Inc.	JUN-2014
	Final CMS Treatability Study Report FTB-034 Northwest Boundary Groundwater US Army Garrison Fort Buchanan Army Reserve Bayamon, Puerto Rico	KEMRON	JUN-2014
	CMS Corrective Measures Implementation Plan FTB-034 Northwest Boundary Groundwater US Army Garrison Fort Buchanan Army Reserve Draft	KEMRON Environmental Services Inc.	SEP-2014
	CMS Corrective Measures Implementation Plan FTB-034 Northwest Boundary Groundwater US Army Garrison Fort Buchanan Army Reserve Draft-Final	KEMRON	OCT-2014
	Vapor Intrusion Assessment Report Draft Version FTB-034 Northwestern Boundary Groundwater Army Garrison-Fort Buchanan Army Reserve Bayamon, Puerto Rico	KEMRON	OCT-2014
	Corrective Measure Study Implementation Plan (CMIP)FTB-034 Northwest Boundary Groundwater Army Garrison-Fort Buchanan Army Reserve Bayamon, Puerto Rico Draft-Final Version	KEMRON Environmental Services	OCT-2014
	Vapor Intrusion Assessment Report Draft -Final Version FTB-034 Northwestern Boundary	KEMRON	NOV-2014

IRP Previous Studies

2014	Title	Author	Date
	Groundwater Army Garrison-Fort Buchanan Army Reserve Bayamon, Puerto Rico		
2015	Vapor Intrusion Assessment Report FTB-034 Northwest Boundary Groundwater Army Garrison-Fort Buchanan Army Reserve Bayamon, Puerto Rico Final Version	KEMRON Environmental Services, Inc.	MAR-2015
	Corrective Measure Study Implementation Plan (CMIP) FTB-034 Northwest Boundary Groundwater Army Garrison-Fort Buchanan Army Reserve Bayamon, Puerto Rico Final Version	KEMRON	MAR-2015
	Decision Document Northwestern Boundary (FTB-034) and sites 2,3,9,11, and 12 (CCFTB-039) U.S. Army Garrison-Fort Buchanan Army Reserve Bayamon, Puerto Rico Draft	KEMRON	SEP-2015
	Technical Memorandum FTB-034 Northwestern Boundary Groundwater U.S. Army Garrison-Fort Buchanan Army Reserve Bayamon, Puerto Rico Draft	KEMRON	OCT-2015
	Decision Document Northwestern Boundary (FTB-034) and sites 2,3,9,11, and 12 (CCFTB-039) U.S. Army Garrison-Fort Buchanan Army Reserve Bayamon, Puerto Rico Final	KEMRON	NOV-2015
	Technical Memorandum FTB-034 Northwestern Boundary Groundwater U.S. Army Garrison-Fort Buchanan Army Reserve Bayamon, Puerto Rico Draft - Final	KEMRON	DEC-2015

FORT BUCHANAN
Installation Restoration Program
Site Descriptions

Site ID: FTB-034

Site Name: TCE Groundwater Investigation

Alias: NWBoundary

STATUS

Regulatory Driver: CERCLA

RRSE: HIGH

Contaminants of Concern: Volatiles (VOC)

Media of Concern: Groundwater

Phases	Start	End
PA.....	199602.....	199701
SI.....	199602.....	199701
RI/FS.....	200602.....	201209
RD.....	201305.....	201401
RA(C).....	201503.....	201507
RA(O).....	201507.....	204509

RIP Date: 201507

RC Date: 204509

SITE DESCRIPTION

This site is composed of a groundwater plume that previously was approximately 50 acres in size of chlorinated solvents, primarily TCE, that have been detected along the northwest boundary of Fort Buchanan and within the adjacent Puma Chemical Storage Facility (formerly the Caribbean Refinery Company property). In accordance with the USEPA's letter of January 2005, Fort Buchanan has installed a total of 48 monitoring wells located in the northwest corner of Fort Buchanan and the adjoining non-DoD property. The groundwater exceeds maximum contaminant levels (MCL) for TCE, tetrachloroethylene and vinyl chloride. Historically the area of contamination is located beneath the northwest portion of Fort Buchanan and extends northwesterly across Route 28 and Route 22 beneath adjoining non-DoD property. Fort Buchanan initiated a phased delineation for the TCE plume.

Draft RFI reports were submitted to the USEPA in September 2009 and December 2011. The final RFI was submitted in April 2012 and approved by USEPA on April 11, 2012. A final CMS was submitted in May 2012 and again in September 2012. The CMS was approved by the USEPA in a letter dated Oct. 16, 2012. The CMS report presented five alternative remediation methods and recommended Alternative 3: enhanced in situ bioremediation reductive dechlorination.

The enhanced bioremediation process stimulates anaerobic reductive dechlorination using carbon substrate, electron donor and nutrients to remediate the areas with the highest groundwater impacts, along with MNA and LUCs. The remedy is implemented through the use of a push-pull delivery approach using injection wells (source area) and direct push technology (DPT) injection points (barrier wall) to deliver the carbon formula, followed by extracting groundwater at nearby wells to increase the radius of influence. Following the installation and development of the injection/extraction wells, the aquifer is pre-conditioned by injecting the carbon substrate, nutrients and buffering agents. Once the aquifer has been pre-conditioned, the bacteria is injected into the aquifer through the well screens using nitrogen gas at a low pressure to allow for enhanced reductive dechlorination of chlorinated volatile organic compounds (VOC) in groundwater to expedite the remediation process.

The work for the injection wells and extraction wells was contracted in January 2014. A pilot treatability study was performed between March to May 2014 to determine the feasibility of the corrective action. The study determined that enhanced bioremediation will work and that augmentation of existing native bacteria will be needed to reach target cleanup goals. In July 2014 a baseline groundwater sampling was performed.

In October 2014 a CMIP was prepared and provided to USEPA. USEPA provided comments to the CMIP in January 2015. Fort Buchanan submitted the final version of the CMIP in February 2015.

In November 2014, a VI assessment was performed to investigate concentrations of VOCs in near-slab soil gas around buildings within 100 feet of the TCE plume. The USEPA provided comments to the VI draft-final version report in February 2015. Fort Buchanan submitted the final version of the VI in March 2015.

During May-July 2015 the enhanced bioremediation system was installed. The CMI (C) Phase was completed. MNA and LUCs will be part of the proposed remediation action.

Site ID: FTB-034
Site Name: TCE Groundwater Investigation
Alias: NWBoundary

Based on Fort Buchanan's research and confirmed by the USEPA in FY10 there was no consent order or RCRA permit for the installation. As a result, cleanup was being performed as a voluntary action. Between 27 July 2015 and 15 November 2015, Fort Buchanan developed CERCLA related documents to memorialize all voluntary RCRA corrective action decisions for AEDB-R sites FTB 034 and CCFTB 039. In 2015, a proposed plan (PP) was developed and a public meeting was held; and in Nov. 2015; a final DD was issued under CERCLA.

CLEANUP/EXIT STRATEGY

Cleanup action includes source treatment with enhanced in situ bioremediation using an available commercialized substrate, such as a lactate carbon donor, to stimulate anaerobic reductive dechlorination as the principal treatment mechanism. The remedy was implemented through the use of a push-pull delivery approach using injection wells (source area) and DPT injection points (barrier wall) to deliver the carbon formula, followed by extracting groundwater at nearby wells to increase the radius of influence. MNA and LUCs will be added.

Site Closeout (No Further Action) Summary

Site ID	Site Name	NFA Date	Documentation
FTB-001	DEH MOTOR POOL/SHOP BUILDING 556	198403	This site was closed based on the 1997 EBS. but subsequently was reopened under USEPA's request in letter dated 31 January 2005 to conduct an RFI. This site was investigated under the Site-Wide Investigation (Site #3). This site is currently investigated under the Compliance Restoration Program under CCFTB-039.
FTB-002	ANTILES SCHOOL SYS MOTOR POOL/SHOP	198403	This site was closed based on the 1984 Installation Assessment of Fort Buchanan (Environmental Science & Engineering Inc. and US Army Toxic and Hazardous Materials Agency).
FTB-003	AREAWIDE MILITARY SUPPORT ACTIVITY MP	198403	This site was closed based on the 1984 Installation Assessment of Fort Buchanan (Environmental Science & Engineering Inc. and US Army Toxic and Hazardous Materials Agency).
FTB-006	DIRECTORATE OF PERSONNEL AND CA AC SHOP	198403	This site was closed based on the 1984 Installation Assessment of Fort Buchanan (Environmental Science & Engineering Inc. and US Army Toxic and Hazardous Materials Agency).
FTB-007	PX SERVICE STATION	199201	This site was transferred to CC and received NFA.
FTB-008	WASH RACK BUILDING 538	198403	This site was closed based on the 1997 EBS.
FTB-012	MEDDAC LAB BUILDING 518	198403	This site was closed based on the 1984 Installation Assessment of Fort Buchanan (Environmental Science & Engineering Inc. and US Army Toxic and Hazardous Materials Agency).
FTB-013	VET LAB	198403	This site was closed based on the 1984 Installation Assessment of Fort Buchanan (Environmental Science & Engineering Inc. and US Army Toxic and Hazardous Materials Agency).
FTB-015	BUILDING 556 PESTICIDE STORAGE	198403	This site was closed based on the 1997 EBS.
FTB-016	BUILDING 539 PESTICIDE STORAGE	199101	This site was closed based on the 1997 EBS but subsequently was reopened under USEPA's request in letter dated 31 January 2005 to conduct an RFI. This site was investigated under the Site-Wide Investigation and resulted in NFA in the RFI dated September 2012 and approved by the USEPA October 2012.
FTB-017	PESTICIDE BURIAL N PR 28	199507	This site was closed based on the 1997 EBS but subsequently was reopened under USEPA's request in letter dated 31 January 2005 to conduct an RFI. This site was investigation under the Site-Wide Investigation(Site #2).This site is currently investigated under the Compliance

Site Closeout (No Further Action) Summary

Site ID	Site Name	NFA Date	Documentation
			Restoration Program under CCFTB-039.
FTB-019	DEH UST BUILDING 556	198403	NFA letter from PREQB from June 2001.
FTB-027	PHOTO LAB DPTSEC/TASC	198403	This site was closed based on the 1984 Installation Assessment of Fort Buchanan (Environmental Science & Engineering Inc. and US Army Toxic and Hazardous Materials Agency).
FTB-028	CONSTRUCTION LANDFILL	198403	This site was closed based on the 1997 EBS but subsequently was reopened under USEPA's request in letter dated 31 January 2005 to conduct an RFI. This site is currently tracked under the Site-Wide Investigation.
FTB029	ABANDONEDUST BLDG 152	199710	NFA letter from PREQB from April 1997.
PBC@Buchanan	RCRA Sites and TCE Groundwater	201209	All funds under the PBC were obligated and USAEC directed this site to be closed.
Site Wide Inv.	Site Wide Investigation	201210	USEPA letter dated 16 October 2012 approved RFI recommendation and sites with future phases are in the CR program.

IRP Schedule

Date of IRP Inception: 198309

Past Phase Completion Milestones

1984

SI (FTB-001 - DEH MOTOR POOL/SHOP BUILDING 556, FTB-002 - ANTILES SCHOOL SYS MOTOR POOL/SHOP, FTB-003 - AREAWIDE MILITARY SUPPORT ACTIVITY MP, FTB-006 - DIRECTORATE OF PERSONNEL AND CA AC SHOP, FTB-007 - PX SERVICE STATION, FTB-008 - WASH RACK BUILDING 538, FTB-012 - MEDDAC LAB BUILDING 518, FTB-013 - VET LAB, FTB-017 - PESTICIDE BURIAL N PR 28, FTB-027 - PHOTO LAB DPTSEC/TASC, FTB-028 - CONSTRUCTION LANDFILL)

RA(C) (FTB-007 - PX SERVICE STATION)

INV (FTB-019 - DEH UST BUILDING 556)

RFA (FTB-015 - BUILDING 556 PESTICIDE STORAGE, FTB-016 - BUILDING 539 PESTICIDE STORAGE, PBC@Buchanan - RCRA Sites and TCE Groundwater, Site Wide Inv. - Site Wide Investigation)

PA (FTB-001 - DEH MOTOR POOL/SHOP BUILDING 556, FTB-002 - ANTILES SCHOOL SYS MOTOR POOL/SHOP, FTB-003 - AREAWIDE MILITARY SUPPORT ACTIVITY MP, FTB-006 - DIRECTORATE OF PERSONNEL AND CA AC SHOP, FTB-007 - PX SERVICE STATION, FTB-008 - WASH RACK BUILDING 538, FTB-012 - MEDDAC LAB BUILDING 518, FTB-013 - VET LAB, FTB-017 - PESTICIDE BURIAL N PR 28, FTB-027 - PHOTO LAB DPTSEC/TASC, FTB-028 - CONSTRUCTION LANDFILL)

ISC (FTB-019 - DEH UST BUILDING 556)

CS (FTB-015 - BUILDING 556 PESTICIDE STORAGE, FTB-016 - BUILDING 539 PESTICIDE STORAGE)

1991

CM(C) (FTB-016 - BUILDING 539 PESTICIDE STORAGE)

1994

RI/FS (FTB-017 - PESTICIDE BURIAL N PR 28)

1997

SI (FTB-034 - TCE Groundwater Investigation)

PA (FTB-034 - TCE Groundwater Investigation)

1998

ISC (FTB029 - ABANDONEDUST BLDG 152)

2012

RI/FS (FTB-034 - TCE Groundwater Investigation)

RFI/CMS (PBC@Buchanan - RCRA Sites and TCE Groundwater)

2013

RFI/CMS (Site Wide Inv. - Site Wide Investigation)

2014

RD (FTB-034 - TCE Groundwater Investigation)

2015

RA(C) (FTB-034 - TCE Groundwater Investigation)

Additional Past Phase Completion Milestones

2014 Pilot Treatability Study FTB-034 TCE GW Inv.
 2014 Vapor Intrusion Study FTB-034 TCE GW Inv.

Projected Phase Completion Milestones

See attached schedule

Projected Record of Decision (ROD)/Decision Document (DD) Approval Dates

Site ID	Site Name	ROD/DD Title	ROD/DD Date
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IRP Schedule

Final RA(C) Completion Date: 201507

Schedule for Next Five-Year Review: 2020

Estimated Completion Date of IRP at Installation (including LTM phase): 204509

FORT BUCHANAN IRP Schedule

= phase underway

SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
FTB-034	TCE Groundwater Investigation	RA(O)						

FORT BUCHANAN
Army Defense Environmental Restoration Program
Compliance Restoration

CR Summary

Installation Total Army Environmental Database-Restoration (AEDB-R) Sites/Closeout Sites Count: 10/8

Installation Site Types with Future and/or Underway Phases

- 1 Oil Water Separator
(CCFB04S003)
- 1 Spill Site Area
(CC FTB-038)

Most Widespread Contaminants of Concern

Metals, Pesticides, Petroleum, Oil and Lubricants (POL)

Media of Concern

Groundwater, Soil, Surface Water

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

Site ID	Site Name	Action	Remedy	FY
CCFB04S00 8	Building 746 UST Corrective Actions	FRA	REMOVAL	2008
CCFB07S00 1	UST Corrective Action Site 376	FRA	GROUND WATER TREATMENT	2011
CCFB04S00 3	Building 380 OWS	FRA	FREE PRODUCT RECOVERY	2012
CCFB04S00 7	Building 390 UST Corrective Actions	FRA	FREE PRODUCT RECOVERY	2012
CCFB04S00 7	Building 390 UST Corrective Actions	FRA	REMOVAL	2012
CCFB04S00 8	Building 746 UST Corrective Actions	FRA	WASTE REMOVAL - SOILS	2012
CC FTB-040	UST removal and fuel impacted soil	FRA	WASTE REMOVAL - SOILS	2015
CCFB04S00 3	Building 380 OWS	FRA	REMOVAL	2016
CCFB04S00 3	Building 380 OWS	FRA	GROUND WATER TREATMENT	2016

Duration of CR

Date of CR Inception: 199006

Estimated Date for Remedy-In-Place (RIP)/Response Complete (RC): 201611/204608

Date of CR completion including Long Term Management (LTM): 204608

CR Contamination Assessment

Contamination Assessment Overview

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

The CR sites include:

- Fuel impacted sites from former underground storage tanks (UST) at Buildings 376 (CCFB07S001) and 390 (CCFB04S007). A final remediation report was submitted to PREQB in spring 2013 seeking NFA for Buildings 376 and 390. Agency approval was received in 2014, and all wells were permanently closed in December 2014.

- A fuel impacted site near Building 517 (light pole project-CCFTB-038); a site investigation was conducted in March 2014. RFI, CMS and DD were conducted in 2015. Source removal was conducted in July and September 2015. 60 cubic yards of soil were removed. Existing infrastructure prevents any further removal. Concentrations of total petroleum hydrocarbons (TPH) remain above PREQB guidelines. Army recommends NFA with future monitoring of dig permits.

- A petroleum, oil, and lubricants (POL) site that includes Building 380 (CCFB04S003); in situ chemical oxidation and source removal were conducted in 2012. Remediation continued at Building 380 with source removal in the traffic circle in spring 2013 and chemical oxidation in 2011 and again near monitoring well (MW)-5 in July to December 2014. Groundwater parameters for benzene, naphthalene, and lead are still above state regulatory requirements.

- Individual sites from the SWI that will move forward in the cleanup process. These sites include former SWI site 2 Pesticide Burial Trench, former SWI site 3 Spent Solvent Storage Area, former SWI site 9 Used Oils Storage Area, former SWI site 11 Heavy Equipment Storage Area and former site 12 Intermittent Waste Disposal Area. Former SWI sites 2, 3, 9, 11 and 12 will be tracked under site CCFTB-039. In January 2014 a CMS was contracted for these sites. The results of the September 2014 draft/final version of the CMS recommended NFA with notes in the master plan for industrial/community use at the former SWI RFI sites. The USEPA provided comments in January 2015 to finalize the report.

- CCFTB-040 consisted of an abandoned UST encountered at the new Directorate of Public Works (DPW) Building 34 in FY13. Over 500 cubic yards of fuel impacted soil were removed. Fort Buchanan submitted a UST closure report to the agency in December 2013 regarding NFA at site CCFTB-040; the agency provided an approval letter in February 2015.

Cleanup Exit Strategy

The investigations and RAs will develop toward a goal of NFA. Methods of remediation include in situ treatment using chemical oxidation (Perozone®) for POL contamination followed by monitoring for a specified number of years at Building at 380. In addition, source removal is proposed for isolated hot spots at Building 380.

Additional source removal and groundwater treatment at Building 380 is scheduled for FY16 followed by additional groundwater monitoring. Since there is no standing exit agreement with the regulatory agency under DERP requirements monitoring will extend to 30 years. Approval is anticipated at Building 380 in August 2017.

Fort Buchanan will recommend NFA with future monitoring of dig permits for site CC FTB-038

Between 27 July 2015 and 15 November 2015, Fort Buchanan developed CERCLA related documents to memorialize all voluntary RCRA corrective action decisions for AEDB-R sites FTB 034 and CCFTB 039. In order to meet DERP requirements, the Office of General Council requested that these documents be developed.

CR Previous Studies

Year	Title	Author	Date
2008	Us Army Garrison Fort Buchanan Limited Source Removal Report for Area 746	Water & Air Research Inc.	OCT-2008
2009	US Army Garrison Fort Buchanan Supplemental Site Assessment Report for Area 376	Water & Air Research, Inc.	MAR-2009
	US Army Garrison Fort Buchanan Supplemental Site Assessment Report for Area 390	Water & Air Research Inc.	MAR-2009
	Health & Safety Plan Soil Cleanup Activities at Army Garrison Fort Buchanan Building 390D Guaynabo, Puerto Rico	CR Environmental Inc. (CRE Inc)	OCT-2009
	Work Plan Soil Clean up Activities at Army Garrison Fort Buchanan Building 390D Guaynabo, Puerto Rico	CR Environmental Inc. (CRE Inc)	OCT-2009
2010	Work Plan Soil Cleanup Activities at Army Garrison Fort Buchanan Building 390D Guaynabo, Puerto Rico	CR Environmental Inc. (CRE Inc.)	FEB-2010
	US Army Garrison Fort Buchanan April 2010 Supplemental Site Assessment Report for Area 376; Prepared for the United States Army Corps of Engineers Jacksonville CESAJ-CT Draft Version	Water & Air Research Inc.	APR-2010
	US Army Garrison Fort Buchanan May 2010 Supplemental Site Assessment Report for Area 376; Prepared for the United States Army Corps of Engineers Jacksonville CESAJ-CT	Water & Air Research Inc.	MAY-2010
	US Army Garrison Fort Buchanan April 2010 Supplemental Pilot Test Report for Area 390D; Prepared for the United States Army Corps of Engineers Jacksonville CESAJ-CT Draft Version	Water & Air Research Inc.	JUN-2010
	US Army Garrison Fort Buchanan Air Sparge/Soil Vapor Extraction Pilot Test Report for Area 390; Draft Version, August 2010.	Water & Air Research Inc.	AUG-2010
2011	Final Report Soil Cleanup Activities at the US Army Garrison Fort Buchanan Building 746 Guaynabo, Puerto Rico	CR Environmental Inc. (CRE Inc.)	FEB-2011
	Final Report Soil Cleanup Activities at the US Army Garrison Fort Buchanan Building 746 Guaynabo, Puerto Rico	CR Environmental Inc. (CRE Inc.)	MAR-2011
	Monthly Progress Report Compliance Clean up Remedial Action Phase Building 376, 380 and 390; Monthly	AEROSTAR	MAY-2011
	DRAFT FIELD SAMPLING PLAN CLEANUP COMPLIANCE at FORT BUCHANAN, Puerto Rico	AEROSTAR	MAY-2011
	DRAFT ACCIDENT PREVENTION PLAN CLEANUP COMPLIANCE at FORT BUCHANAN, Puerto Rico	AEROSTAR	MAY-2011
	DRAFT QUALITY CONTROL PLAN CLEANUP COMPLIANCE at FORT BUCHANAN, Puerto Rico	AEROSTAR	MAY-2011
	DRAFT WORK PLAN CLEANUP COMPLIANCE at FORT BUCHANAN, Puerto Rico	AEROSTAR	MAY-2011
	DRAFT SITE SAFETY & HEALTH PLAN CLEANUP COMPLIANCE at FORT BUCHANAN, Puerto Rico	AEROSTAR	MAY-2011
	Monthly Progress Report Compliance Clean up Remedial Action Phase Building 376, 380 and 390; Monthly	AEROSTAR	DEC-2011
2012			

CR Previous Studies

2012	Title	Author	Date
	Monthly Progress Report Compliance Clean up Remedial Action Phase Building 376, 380 and 390; Monthly	AEROSTAR	JAN-2012
	Monthly Progress Report Compliance Clean up Remedial Action Phase Building 376, 380 and 390; Monthly	AEROSTAR	DEC-2012
2013	Draft Remedial Implementation Report Clean up Compliance Remedial Action Phase Area 376 Fort Buchanan January 2013	AEROSTAR	JAN-2013
	Draft Remedial Implementation Report Clean up Compliance Remedial Action Phase Area 390 Fort Buchanan January 2013	AEROSTAR	JAN-2013
	Draft Remedial Implementation Report Clean up Compliance Remedial Action Phase Area 376 Fort Buchanan, Puerto Rico	AEROSTAR	MAR-2013
	Draft Remedial Implementation Report Clean up Compliance Remedial Action Phase Area 390 Fort Buchanan, Puerto Rico	AEROSTAR	MAR-2013
	UST REMOVAL ACTIVITIES FINAL REPORT AT NEW DIRECTORATE OF PUBLIC WOKS FACILITY US ARMY GARRISON FORT BUCHANAN UST # 02-13-0002	CRE	OCT-2013
	UST Removal Activities Final Report at New Directorate of Public Works Facility U.S. Army Garrison Fort Buchanan UST #02-13-0002	CRE	OCT-2013
2014	Draft Remedial Implementation Report Clean up Compliance Remedial Action Phase Area 390 Fort Buchanan, Puerto Rico	AEROSTAR	FEB-2014
	Draft Site Investigation Report Building 517 (CCFTB038) Cleanup Compliance Projects 2013 Continuation at Fort Buchanan Guaynabo, Puerto Rico	AEROSTAR	JUN-2014
	Corrective Measures Study FTB-039 Sites 2,3,9,11 & 12 U.S. Army Garrison Fort Buchanan version Draft	KEMRON Environmental Services Inc.	JUN-2014
	Corrective Measures Study FTB-039 Sites 2,3,9,11 & 12 U.S. Army Garrison Fort Buchanan version Draft Final	KEMRON Environmental Services Inc.	SEP-2014
2015	Draft Final RCRA Facility Investigation Report Building 517 (CCFTB038) Cleanup Compliance Projects 2013 Continuation at Fort Buchanan Guaynabo, Puerto Rico	AEROSTAR	MAR-2015
	Final RCRA Facility Investigation Report Building 517 (CCFTB038) Cleanup Compliance Projects 2013 Continuation at Fort Buchanan Guaynabo, Puerto Rico	AEROSTAR	APR-2015
	Final Corrective Measure Study (CMS) Building 517 (CC FTB-038) Cleanup and Compliance Projects 2013 Continuation at Fort Buchanan Guaynabo, Puerto Rico Contract Number: W912EP-13-D-0028	AEROSTAR	JUN-2015
	Final Supplemental Work Plan Building 517 (CC FTB-038) Cleanup and Compliance Projects 2013 Continuation at Fort Buchanan Guaynabo, Puerto Rico Contract Number: W912EP-13-D-0028	AEROSTAR	JUN-2015

CR Previous Studies

	Title	Author	Date
2015	Final Decision Document Building 517 (CC FTB-038) Cleanup and Compliance Projects 2013 Continuation at Fort Buchanan Guaynabo, Puerto Rico Contract Number: W912EP-13-D-0028	AEROSTAR	JUN-2015
	Draft-Final Corrective Measures Implementation Plan Building 517 (CC FTB-038) Cleanup and Compliance Projects 2013 Continuation at Fort Buchanan Guaynabo, Puerto Rico Contract Number: W912EP-13-D-0028	AEROSTAR	NOV-2015
	Final Decision Document Northwest Boundary Area Site FTB-034 and Site CCFTB-039 Sites 2,3,9,11 &12. Fort Buchanan	KEMRON	DEC-2015
2016	Draft/Final Corrective Measures Implementation Plan Building 517 (CC FTB-038) Cleanup and Compliance Projects 2013 Continuation at Fort Buchanan Guaynabo, Puerto Rico Contract Number: W912EP-13-D-0028	AEROSTAR	FEB-2016
	Draft Corrective Action Plan Area 380 Underground Storage Tank Removal Remediation Fort Buchanan	Aerostar	APR-2016

FORT BUCHANAN
Compliance Restoration
Site Descriptions

Site ID: CC FTB-038
Site Name: Fuel impacted soil near Bldg. 517
Alias: light pole

STATUS

Regulatory Driver: OTHER

Phases	Start	End
PA.....	200808.....	201111
SI.....	201309.....	201408
RI/FS.....	201409.....	201503
RA(C).....	201503.....	201611
RIP Date:	N/A	
RC Date:	201611	

SITE DESCRIPTION

Soils contaminated with fuel were discovered while replacing a light pole within Fort Buchanan on 01 August 2008. The source of the fuel contamination has not been determined and there are no known USTs or aboveground storage tanks (AST) sites in the immediate vicinity. Light pole (No. LH021) is located between Building 501 occupied by the installation bank - Banco Popular; and Building 517 occupied by Directorate of Logistics (DOL). During the process to install the new light pole, the excavated soil had a petroleum odor. A grab soil sample was collected on Aug. 1, 2008 from the excavated soil and analyzed for total petroleum hydrocarbons-Diesel Range Organics (TPH-DRO), gasoline range organics (GRO), and oil range organics (ORO) and Toxicity Characteristic Leaching Procedure (TCLP) pesticides (method 8081A); TCLP herbicides (method 8151A); TCLP VOC (method 8260B) and TCLP semi volatiles (method 8270). The soil sample results exceeded regulatory levels for TPH-DRO [225 parts per million (ppm)], TPH- ORO (260 ppm), TPH total (485 ppm); semi volatiles 1- methylnaphthalene [(132 parts per billion (ppb)), 2- methylnaphthalene (180 ppb) and benz(a)anthracene (27 ppb)]. Due to regulatory exceedances for TPH, it was determined that additional investigation/delineation was required.

Investigation was conducted between 12-13 March 2014 to determine horizontal and vertical extent of the fuel impacted soil. Based on the analytical results, soils with benzo(a)pyrene concentrations above the regulatory levels were only detected in surface soil samples in soil borings SB-1, SB-2, SB-8 and SB-10. Elevated concentrations of TPH-GRO above the PREQB UST regulations were also detected in surface soil samples SB-7 and SB-8. No groundwater impacts were detected during this investigation.

Based on the presence of surface soil impacts, a corrective action plan (CAP) was developed that described and recommended implementation of cost-effective, potential remedial methods. An RFI/CMS was completed. Source removal events were carried out in July and September 2015. A DD was signed in July 2015. A total of 60 cubic yards of impacted soil was removed.

Confirmatory soil sample results indicate that fuel-impacted soil still exists in limited areas at the walls of some of the excavations that are bounded by the infrastructure (concrete canal walls, under road and within subsurface utilities i.e, fiber optics). No Further Action is recommended.

Initial investigation was under the UST program. No tank was discovered. The site is being cleaned up as an AOC.

Based on Fort Buchanan's research and confirmed by the USEPA, there is no consent order for the installation nor is there a RCRA permit. Cleanup at Fort Buchanan is performed under a voluntary cleanup agreement between the installation and USEPA.

CLEANUP/EXIT STRATEGY

NFA documentation is underway.

Site ID: CCFB04S003
Site Name: Building 380 OWS
Alias: Bldg. 380

STATUS

Regulatory Driver: RCRA

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

Media of Concern: Groundwater, Soil

Phases	Start	End
ISC.....	199006.....	199106
INV.....	200601.....	200609
CAP.....	200609.....	200709
DES.....	200709.....	200809
IMP(C).....	201105.....	201606
IMP(O).....	201208.....	204608

RIP Date: 201606

RC Date: 204608

SITE DESCRIPTION

Building 380 which served as a motor pool dispensing POLs for military tactical vehicles. The site contained two washracks, a below-grade oil/water separator (OWS) and two, 5,000-gallon USTs. In 1991, the USTs were replaced with two 10,000-gallon USTs. In November 2003, free-product was observed in a nearby storm drain inlet where an abandoned concrete pipeline was located. The OWS used to be connected to the storm drain but a new OWS was installed and is connected to the sewer system. SIs were conducted and identified fuel-impacted soil and groundwater at the site. During subsequent investigations, free-product was encountered in monitoring wells MW-14 and MW-5. During 2008, remedial activities were initiated that consisted of a free-product recovery system. The system was removed because it was not operating correctly. In 2009, Fort Buchanan decided to use the site for refueling government vehicles.

In 2010, Building 380 was demolished, but the pump dispensers were checked and made operational. The two USTs, the OWS and the underground hydraulic components of the washrack lift remained. Free-product was also discovered during the installation of a security fence in the vicinity of the service station (Bldg 380). In FY11, the USACE Jacksonville District provided technical oversight for remedial efforts. These efforts included conducting a baseline groundwater sampling; delineating free-product plume and setting up a collection system; removing the existing OWS; investigate and removing any UST used to operate the hydraulic lift bays; and installing a chemical oxidation remediation system. In May 2011, baseline groundwater samples were collected. Groundwater sample results indicated that concentrations of TPH were below regulatory limits but levels of benzene and naphthalene exceeded regulatory limits. Ten inches of free-product was measured in MW-14. A new free-product recovery well consisting of a 4-in diameter PVC pipe 5 ft deep with two 10-ft long laterals replaced the existing MW-14. Sixty cubic yards of fuel impacted soil was removed, characterized and disposed as nonhazardous waste. Fifteen gallons of oxygen releasing compound (ORC) was added to the backfill to enhance the micro-bacterial remediation of the fuel-impacted soils. The OWS was removed. In addition, ground penetrating radar (GPR) was used over the hydraulic powered lift bays to look for two USTs. Anomalies identified at the site were excavated but no tanks were found. The tanks are believed to have been removed during the demolition activities of Building 380.

In FY12 USACE recommended in situ treatment [chemical oxidation Perozone (R)] for POL contamination. Twelve injection points were installed and the system was introduced from February to September 2012. Quarterly groundwater sampling was conducted. Based on the September 2012 groundwater sampling results, benzene and naphthalene concentrations were still above regulatory limits. Benzene is regulated by the state agency but naphthalene is not; however, the Florida Department of Environmental Protection (FLDEP) Groundwater Target Cleanup Level (GTCL) for naphthalene is 14 micrograms per liter (ug/L). Benzene concentrations in groundwater exceed the PREQB and federal regulatory action levels of 5 ppb. Benzene concentration levels are 20.5 ppb at MW-5 and 1,042 ppb at the recovery well (RW-01) located at portions of the traffic circle not previously excavated. The traffic circle area was excavated and ORC was added to the new clean backfill material.

In April 2013, the remaining half of the traffic circle was excavated and 75 cubic yards of fuel-impacted soil were removed and transported as nonhazardous waste. The recovery well was replaced.

In 2014, four new injection wells were added for six more months of treatment in the remaining area of contamination.

Site ID: CCFB04S003
Site Name: Building 380 OWS
Alias: Bldg. 380

In February 2015 levels of benzene were still above regulatory levels and the USTs were removed under a separate funding source.

CLEANUP/EXIT STRATEGY

Groundwater monitoring of the site will continue until cleanup objectives are obtained. A request for NFA will then be submitted to PREQB. Because there is an indefinite cleanup period for this site, assume 30 years of groundwater sampling is required per DoD guidance.

Site Closeout (No Further Action) Summary

Site ID	Site Name	NFA Date	Documentation
CC FTB-035	SWMU 1: Old Haz Waste Cont. Storage	201210	EPA letter dated 16 October 2012 approved RFI recommendation for NFA.
CC FTB-036	Building 541	201210	EPA letter dated 16 October 2012 approved RFI recommendation for NFA.
CC FTB-037	Potential Haz. Mat. Burial	201210	EPA letter dated 16 October 2012 approved RFI recommendation for NFA.
CC FTB-039	Former RFI Sites 2,3,9,11,& 12	201603	
CC FTB-040	UST removal and fuel impacted soil	201501	PREQB letter dated 14-Jan-2015 approval of UST Closure at Site CCFTB-040(New DPW Bldg. 34).
CCFB04S007	Building 390 UST Corrective Actions	201412	Letter from PREQB dated 12 Sep. 2014 indicating approval for No Further Action of the Final Remedial Implementation Report Cleanup Compliance RA Phase for Area 390. ¿Carta de Relevó (UST 2-86-044 (LUST)
CCFB04S008	Building 746 UST Corrective Actions	201112	NFA letter from PREQB dated 18 Jan 2012.
CCFB07S001	UST Corrective Action Site 376	201412	Letter from PREQB dated 29 Oct. 2014 indicating approval for No Further Action of the Final Remedial Implementation Report Cleanup Compliance RA Phase for Area 376. ¿Carta de Relevó (UST 2-86-044 (LUST).

CR Schedule

Date of CR Inception: 199006

Past Phase Completion Milestones

1991

ISC (CCFB04S003 - Building 380 OWS)

1992

RFA (CC FTB-035 - SWMU 1: Old Haz Waste Cont. Storage)

PA (CC FTB-039 - Former RFI Sites 2,3,9,11,& 12)

1993

SI (CC FTB-039 - Former RFI Sites 2,3,9,11,& 12)

CS (CC FTB-035 - SWMU 1: Old Haz Waste Cont. Storage)

1997

ISC (CCFB04S007 - Building 390 UST Corrective Actions, CCFB04S008 - Building 746 UST Corrective Actions, CCFB07S001 - UST Corrective Action Site 376)

1998

RFA (CC FTB-036 - Building 541, CC FTB-037 - Potential Haz. Mat. Burial)

2006

INV (CCFB04S003 - Building 380 OWS)

2007

INV (CCFB04S008 - Building 746 UST Corrective Actions)

CAP (CCFB04S003 - Building 380 OWS)

2008

DES (CCFB04S003 - Building 380 OWS)

INV (CCFB04S007 - Building 390 UST Corrective Actions)

2009

DES (CCFB04S008 - Building 746 UST Corrective Actions)

CAP (CCFB04S008 - Building 746 UST Corrective Actions)

2010

INV (CCFB07S001 - UST Corrective Action Site 376)

2011

IMP(C) (CCFB07S001 - UST Corrective Action Site 376)

DES (CCFB04S007 - Building 390 UST Corrective Actions, CCFB07S001 - UST Corrective Action Site 376)

CAP (CCFB04S007 - Building 390 UST Corrective Actions, CCFB07S001 - UST Corrective Action Site 376)

2012

IMP(C) (CCFB04S007 - Building 390 UST Corrective Actions, CCFB04S008 - Building 746 UST Corrective Actions)

PA (CC FTB-038 - Fuel impacted soil near Bldg. 517)

2013

RFI/CMS (CC FTB-035 - SWMU 1: Old Haz Waste Cont. Storage, CC FTB-036 - Building 541, CC FTB-037 - Potential Haz. Mat. Burial)

INV (CC FTB-040 - UST removal and fuel impacted soil)

ISC (CC FTB-040 - UST removal and fuel impacted soil)

2014

CAP (CC FTB-040 - UST removal and fuel impacted soil)

SI (CC FTB-038 - Fuel impacted soil near Bldg. 517)

2015

RI/FS (CC FTB-038 - Fuel impacted soil near Bldg. 517)

IMP(O) (CCFB04S007 - Building 390 UST Corrective Actions, CCFB07S001 - UST Corrective Action Site 376)

IMP(C) (CC FTB-040 - UST removal and fuel impacted soil)

Additional Past Phase Completion Milestones

2014 IMP (O) CCFB04S007 Building 390 UST Corrective Action.

2014 IMP (O) CCFB07S001 Building 376 UST Corrective Action.

2015 IMP (C) CCFTB-040 UST removal and fuel impacted soil.

Projected Phase Completion Milestones

See attached schedule

Projected Record of Decision (ROD)/Decision Document (DD) Approval Dates

Site ID	Site Name	ROD/DD Title	ROD/DD Date
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Final RA(C) Completion Date: 201611

Schedule for Next Five-Year Review: 2020

Estimated Completion Date of CR at Installation (including LTM phase): 204608

FORT BUCHANAN CR Schedule

= phase underway

SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
CC FTB-038	Fuel impacted soil near Bldg. 517	RA(C)						
SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
CCFB04S003	Building 380 OWS	IMP(O)						

Community Involvement

Technical Review Committee (TRC): None

Community Involvement Plan (Date Published): 201301

Restoration Advisory Board (RAB): No

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

Community Interest Solicited on: 201306

Efforts Taken to Determine Interest

Community interest in a RAB was solicited in 1997 when the installation was almost placed in a Base Realignment and Closure round. Fort Buchanan resolicited community interest in a RAB with public notices as part of the ongoing investigations in March 2009, April 2011, and again in June 2013. Letters notifying the community of insufficient interest were provided for the 2011 and 2013 attempts.

During the Earth Day celebration in April 2010, 2011, 2012, 2013, and 2014 a RAB sign-up sheet and an information request sheet were placed at the restoration booth. There were no signatures in 2010-2012; there was one in 2013 and two in 2014.

Results

In March 2009, only two representing participants showed up for the RAB meeting (PREQB and a Caribbean Petroleum Corporation representative). Based on solicitation results, interest was determined to be insufficient. In April 2011, again there were two representatives from the community with personal interest. Neither wanted to co-chair the RAB. Therefore, it was determined that there was insufficient interest. Letters were sent to the community representatives indicating to them that they will be informed of the status of restoration projects. In June 2013, the meeting was held outside the installation at Community Puente Blanco, Catano, Puerto Rico. On June 5, 2013, 24 people attended (18 from the community and six from government agencies). A power failure occurred, and the meeting was rescheduled for June 27, 2013. Prior to the June 27, 2013 meeting a questionnaire was distributed to the community in the Spanish language. On June 27, 2013, 16 people attended, four of which were from government agencies. Fort Buchanan concluded insufficient interest from the community. Fact sheets regarding the environmental restoration program at Fort Buchanan are being prepared to distribute to the community on a biannual schedule. The first was provided in January 2015.

Follow-up Procedures

All present environmental restoration sites achieved remedy-in-place (RIP) in 2015; therefore, there is no further need for RAB solicitation.

Additional Community Involvement Information

A letter dated Dec. 19, 2014 signed by the Commander indicating insufficient interest in a RAB was issued to attendees of the meeting to seek RAB members. The letter included a fact sheet on the status of environmental restoration cleanup sites. An additional fact sheet was sent 09 December 2015. A 30-day public comment period was provided between 27 July 2015 and 27 August 2015 to discuss the Proposed Plan(PP) for the Site FTB-034 and Site CCFTB-039. In addition, a public meeting was held on 06 August 2015 at the San Juan Marriott Hotel located at 1309 Ashford Ave, San Juan Puerto Rico 00907 between 7:00-9:00pm to discuss the PP.

A booth with a poster presentation about Fort Buchanan's restoration sites was set up at the Fort Buchanan annual Earth Day Events between 2008-2016. College students were provided the opportunity to work as environmental interns in the restoration program in FY14 and FY16. Various articles were published in the installation newspaper El Morro related to the restoration program (Jan. 2009; Mar. 2009; Sept. 2009; April 2011; Mar. 2014 Aug. 2015; Oct. 2015).

Administrative Record is located at

DPW-BLDG. 34, Environmental Division Storage Room
South Gate Rd.
Fort Buchanan, PR 00934
787-707-3575/3573

Information Repository is located at

Dra Pilar Barbosa Public Library
PO Box 1588
Bayamon, Puerto Rico 00960-1588

Community Involvement

787-787-5161

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

TAPP Title: N/A

Potential TAPP: N/A

