

Size:	72,516 acres
Mission:	Develop and test equipment and provide troop training
HRS Score:	31.09 (Michaelsville Landfill); placed on NPL in October 1989 53.57 (Edgewood Area); placed on NPL in February 1990
IAG Status:	IAG signed in March 1990
Contaminants:	VOCs, SVOCs, arsenic, phosphates, PCBs, explosives, nitrates, solvents, petroleum products, pesticides, heavy metals, asbestos, low-level radioactive waste, and chemical-agent materials and their degradation products
Media Affected:	Groundwater, surface water, sediment, and soil
Funding to Date:	\$332.2 million
Estimated Cost to Completion (Completion Year):	\$761.4 million (FY2051)
Final Remedy in Place or Response Complete Date:	FY2019



Edgewood and Aberdeen, Maryland

Restoration Background

Environmental studies, beginning in FY83, identified eight areas of contamination, including chemical munitions and manufacturing waste sites. RCRA Facility Assessments identified 319 solid waste management units (SWMU), which were combined into 13 study areas. Removal Actions completed in FY91, FY92, and FY93 included removal and incineration of soil contaminated with polychlorinated biphenyls (PCB) and DDT. In FY93 and FY94, 12,500 tons of soil from the fire training area that were contaminated with petroleum hydrocarbons and trichloroethene were removed and incinerated.

Remedial Investigations and Feasibility Studies (RI/FS) identified high levels of hydrocarbons in groundwater in four study areas. RI/FS also identified small amounts of volatile organic compounds (VOC) in on-post parts of tributaries to Chesapeake Bay.

In FY91, the Army and regulators signed an Interim Record of Decision (ROD) for the Old O-Field Site and a ROD for no further action for the White Phosphorous Underwater Burial Site. The Army completed a Remedial Action (RA) to install a cap-and-cover system at the Michaelsville Landfill.

In FY95, the installation completed 12 Removal Actions, including removal of underground storage tanks (UST), a white phosphorus-contaminated scrubber tower, and UXO found on the surface along the Edgewood Area Boundary. The installation converted its technical review committee to a restoration advisory board (RAB). The RAB's 20 members meet monthly to discuss proposed actions.

In FY96, the Army and regulators signed RODs and completed remedy designs for the Building 103 Dump Site and the Building 503 Burn Sites. Final RODs were signed for the J-Field Soil Operable Unit

(OU); the former Nike Site, Cluster 1 (ground-water, landfill, and sewer lines); and the Carroll Island OU A (disposal pits). The installation completed draft RIs for the O-Field Site, Carroll Island (sitewide), and Graces Quarters (groundwater). It also prepared final RIs for Michaelsville OU2 (groundwater) and the Western Boundary Groundwater OU.

Removal Actions were completed at nine sites. Site characterization began in the Lauderick Creek Boundary chemical weapons/munitions (CWM) Removal Action and at the Westwood Radiological Materials Disposal Facility. The Army began constructing the 2-foot sand layer of the Old O-Field Permeable Infiltration Unit in August 1996, using teleoperated low-ground-pressure equipment.

FY97 Restoration Progress

The installation performed removal activities at five sites and upgraded the groundwater extraction system at the Old O-Field Site. The Army completed RODs for three study sites and investigation of the final report on natural attenuation processes at the West Branch of Canal Creek. Early actions were removal of the Aberdeen Area Battery Disposal Site, the Aberdeen Area Chlordane SWMU, and the Edgewood Lewisite Sump and closeout of the Building 510 Drum Dump and the Rod and Gun Club Dump.

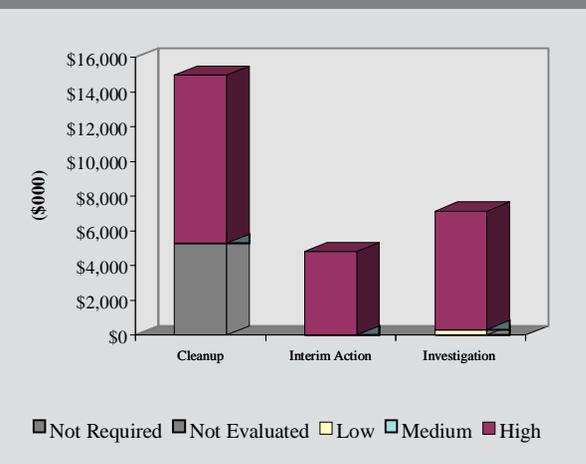
The installation implemented several innovative technologies, including hybrid poplar phytoremediation, vegetation gas flux chambers for measuring off-gassing of VOCs, honeybee biomonitoring, and the ballistic foam technology test for chemical rounds. Geoprobe, cesium vapor magnetometer, and Fourier transform infrared air-monitoring techniques also accelerated site characterization and fieldwork.

The first four activities in the current plan of action were scheduled for completion in FY97. They were delayed for the following reasons: the installation discovered an additional disposal area in new O-field; the RI/FS for Graces Quarters groundwater was delayed because of the discovery that a large plume had migrated to another aquifer; and needed stakeholder input for a community relations plan (CRP) and a site-specific removal plan was delayed.

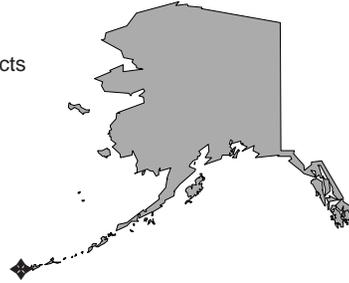
Plan of Action

- Sign ROD for one study site and complete Remedial Design in FY98
- Initiate RAs for J-Field, the Building 103 Cap and Cover System, and excavation of Building 503 Burn Sites in FY99
- Complete final RIs for Carroll Island (sitewide), Graces Quarters (groundwater), and the O-Field site in FY98
- Continue the J-Field phytoremediation study in FY00
- Complete site characterization, CRPs, and site-specific Lauderick Creek CWM removal plan in FY98
- Complete Focused Feasibility Studies for five projects in FY98

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 76,800 acres
Mission: Provided services and materials to support aviation activities and operating forces of the Navy
HRS Score: 51.37; placed on NPL in May 1994
IAG Status: Federal Facility Agreement signed in November 1993
Contaminants: UXO, heavy metals, PCBs, VOCs, pesticides, and petroleum products
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: \$89.1 million
Estimated Cost to Completion (Completion Year): \$70.6 million (FY2002)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2000



Adak, Alaska

Restoration Background

In September 1995, the BRAC Commission recommended closure of Adak Naval Air Facility. Operational Naval forces departed the island on April 1, 1997, and command functions were assumed by Engineering Field Activity Northwest. The installation closed in September 1997.

In FY86, an Initial Assessment Study identified 32 sites at the installation. Site types include landfills, unexploded ordnance (UXO) areas, and polychlorinated biphenyl (PCB) spill sites that have released contaminants into groundwater, soil, surface water, and sediment. Twenty sites were recommended for further investigation. Beginning in FY88, RCRA Facility Assessments were conducted that identified 76 solid waste management units (SWMU), 73 of which are being managed as CERCLA sites under the Federal Facility Agreement (FFA) signed in 1993.

From FY90 to FY95, Interim Actions were conducted at several sites. These actions involved disposal of PCB-contaminated water and sludge; bioremediation of 4,500 tons of petroleum-contaminated soil; and excavation, removal, and disposal of leaking incendiary (napalm) and cluster bombs. In addition, the installation has removed approximately 30 underground storage tanks and aboveground storage tanks and their associated pipelines. All petroleum-contaminated sites are being evaluated through the cooperative assessment and decision-making approach pursued by the Navy and the state of Alaska.

An Interim Record of Decision (ROD) was signed in FY95 for two landfills (SWMUs 11 and 13). Under this ROD, the Navy completed remediation activities at these sites in 1997. The activities consisted of installing an intrusive barrier of clean fill material at the sites, recontouring the sites to provide proper drainage, and revegetating the site.

The installation completed a community relations plan in early FY90 and revised the plan in FY95. In FY92, it formed a technical review committee, which was converted to a restoration advisory board (RAB) in January 1996. The RAB has been an active participant in the decision-making process since its inception.

During FY96, the installation completed fieldwork for the basewide Remedial Investigation and Feasibility Study (RI/FS) and completed final evaluation reports for 10 SWMUs. Removal Actions and Interim Remedial Actions also were completed for a number of SWMUs.

FY97 Restoration Progress

The installation completed a Tier Assessment to Risk Assessment (TARA) at petroleum sites and continued petroleum recovery activities at SWMU 17. Remedial Design (RD) work also was initiated for the areas surrounding SWMU 17. SWMUs 19 and 25 were closed, and a Non-Time-Critical Removal Action at SWMUs 16, 16A, and 67, as well as a Time-Critical Removal Action for drum removal at SWMU 27, were completed. UXO investigations and clearance for high-priority reuse areas continued, and corrective actions on abandoned landfill sites were completed. Use of geoprobe well installation has drastically accelerated the subsurface investigations for petroleum contamination.

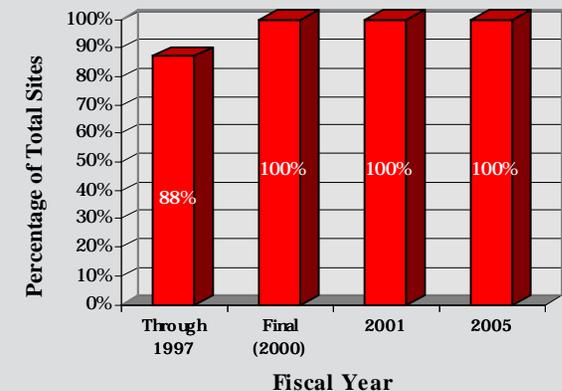
As part of the community relations program under BRAC, a Local Redevelopment Authority and a BRAC cleanup team (BCT) have been established. The BCT includes representatives from the Navy, EPA, the state of Alaska, and the U.S. Fish and Wildlife Service. This team works in close partnership to arrive at consensus-based decisions on remediation requirements for sites on Adak. The BCT developed a draft BRAC Cleanup Plan, which was signed by representatives of the Navy, the state of Alaska, and EPA in FY97. Partnership with

regulatory agencies and the state of Alaska was instrumental in development and review of the draft Reuse Plan. Monthly RAB meetings have provided input on virtually every aspect of environmental cleanup activities, including comments on the RI/FS and UXO Management Plan.

Plan of Action

- Initiate RD work and remediation for SWMU 4 (abandoned landfill) site in FY98
- Initiate RD for sediment remediation in Sweeper Creek estuary in FY98
- In FY98, continue biological assessment to determine the impact of contaminants on offshore marine ecosystem

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 1,943 acres
Mission: Provided services and material support for transition of aircraft and tenant commands
HRS Score: NA
IAG Status: None
Contaminants: Asbestos, paint, solvents, petroleum/oil/lubricant liquids and sludges, and heavy metals
Media Affected: Groundwater and soil
Funding to Date: \$25.5 million
Estimated Cost to Completion (Completion Year): \$42.8 million (FY2005)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2001



Agana, Guam

Restoration Background

In July 1993, the BRAC Commission recommended that Agana Naval Air Station be closed. The station was closed on March 31, 1995.

In FY84, an Initial Assessment Study (IAS) identified two potentially contaminated sites. In FY93, a Preliminary Assessment (PA) identified an additional 13 potentially contaminated sites (later identified as points of interest [POI]). After the Environmental Baseline Survey (EBS) was completed in FY94, eight additional POIs were identified. In FY95, an update of the EBS identified six additional POIs, bringing the total number of sites identified to 29.

The final Site Inspection (SI) report, published in FY94, revealed the presence of contamination in soil and groundwater at the two sites identified in the original IAS. Because of the complex hydrogeology of the area, the installation initiated an aggressive groundwater investigation to characterize the groundwater regime beneath the base. In FY95, monitoring wells and pumps were installed. Initial heat pulse flow readings were collected, in addition to data from the monitoring wells, which indicated contamination by trichloroethene (TCE) and dichloroethane.

In FY94, fast-track actions were initiated for the investigation of soil contamination at 17 sites. In FY95, the installation completed an SI at 1 site and initiated SIs at 14 others.

The BRAC cleanup team (BCT) was established in FY93, and the BRAC Cleanup Plan was completed in FY94. A community relations plan was published in FY92, and three information repositories were established. The installation formed a restoration advisory board (RAB) in FY93, and a partnership agreement was reached with regulatory agencies in FY95.

In FY95, the Environmental Condition of Property assessment was completed; it identified four parcels considered suitable for reuse. Findings of suitability to lease were completed for three parcels. The installation completed one interim lease agreement and one joint use agreement with the Guam International Airport Authority.

The Local Redevelopment Authority, called the Komitea Para Tiyan, has submitted a revised reuse plan that addresses the requirements of the U.S. Department of Housing and Urban Development.

During FY96, the RAB and the BCT met quarterly. The BCT also conducted monthly teleconferences. A Removal Action was initiated at 1 site, and Remedial Investigation (RI) fieldwork was completed at 29 sites, 11 of which were recommended for no further action. To streamline and expedite the investigation, the BCT agreed that an EBS was to serve as the SI phase.

FY97 Restoration Progress

In FY97, all aboveground and underground storage tanks were permanently closed and removed. An Action Memorandum recommending no further action for eight sites was prepared, and a wellhead treatment system was installed. Technological initiatives included use of granular activated carbon for groundwater treatment, ground-penetrating radar for geophysical survey, and passive gas tubes for soil gas survey.

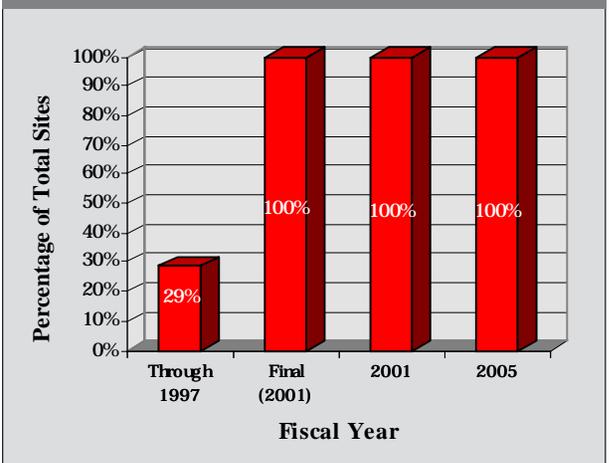
The RAB and BCT continued to meet quarterly. To reduce time in the field and to involve the BCT in all aspects of the investigation, the BCT reviewed intermediate field data. Documents were sent directly from the contractor to the regulators to lessen the time required before fieldwork began. Conference calls were used to resolve concerns. The RAB also has been involved in document review, training, advising the BCT, and project scope reviews.

Some activities scheduled for completion in FY97 were delayed because of funding constraints.

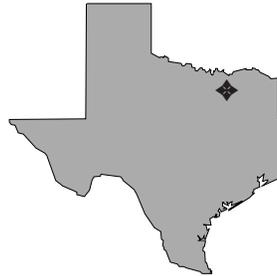
Plan of Action

- Prepare an Action Memorandum recommending no further action for six sites in FY98
- Conduct a limited dye trace study and complete the RI at Site 29 in FY98
- Prepare Engineering Evaluations and Cost Analyses for seven sites and conduct Removal Actions at five sites in FY98 and at two sites in FY00
- Conduct RIs at six sites in FY98
- In FY02, implement long-term monitoring at the on-site production well and begin the Feasibility Study at Site 29

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 602 acres
Mission: Manufacture aircraft and associated equipment
HRS Score: 39.92; placed on NPL in August 1990
IAG Status: IAG signed in 1990
Contaminants: Solvents, paint residues, spent process chemicals, PCBs, waste oils and fuels, heavy metals, VOCs, and cyanide
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: \$40.0 million
Estimated Cost to Completion (Completion Year): \$35.4 million (FY2013)
Final Remedy in Place or Response Complete Date: FY2002



Fort Worth, Texas

Restoration Background

Air Force Plant No. 4 has served as a primary manufacturer of military aircraft and associated equipment since 1942. Since FY84, ongoing studies have identified 30 sites and confirmed groundwater, surface water, and soil contamination. Trichloroethene (TCE) has been detected in groundwater beneath six spill sites and four landfills. Groundwater is the primary drinking water source for the cities of White Settlement, Lake Worth, and Fort Worth.

A Remedial Investigation and Feasibility Study (RI/FS) began in FY88. During the RI, 8 of the 30 sites were recommended for no further action. The installation has initiated several Interim Remedial Actions (IRA). Two IRAs initiated in FY93 included the installation of an interim groundwater treatment system to address contamination from two spill sites. In FY94, the installation completed the design and construction of a soil vapor extraction (SVE) system at Building 181, the parts processing plant. Two additional carbon filtration groundwater treatment systems were installed to control the further migration of TCE. In FY95, the installation completed the RI/FS with the preparation of the Ecological Risk Assessment. The installation also began construction of a vacuum-enhanced pumping system to treat groundwater and soil contamination at Landfill No. 3. The installation undertook the expansion of several treatment systems associated with the large TCE plume. Additional extraction wells were installed at one pump-and-treat system to prevent TCE migration. The SVE pilot plant at Building 181 was expanded to a large-scale, dual-phase SVE system that will treat both groundwater and soil vapors.

To foster partnerships with the regulatory agencies, the installation conducts monthly meetings with representatives of EPA, the Texas Natural Resource Conservation Commission (TNRCC), the U.S. Army Corps of Engineers, the Air Force Center for Environmental

Excellence (AFCEE), and the U.S. Geological Survey. These meetings facilitate communication and partnering on the installation's restoration progress and schedule. In FY96, a Record of Decision (ROD) was signed by TNRCC, the Air Force, and EPA. The ROD proposed actions at the remaining two sites, including groundwater pumping and treatment, enhanced pumping and treatment using surfactants, and SVE. Also in FY96, a Memorandum of Agreement was signed by the Air Staff, AFCEE, the Base Conversion Agency, and Headquarters Air Force to integrate the restoration programs for the Carswell Field sites and the Air Force Plant No. 4 groundwater plume.

In FY95, the installation converted its technical review committee to a restoration advisory board (RAB). In FY96, the RAB was integrated with the Carswell RAB, and meetings are now held quarterly at JRB Naval Air Station, Fort Worth.

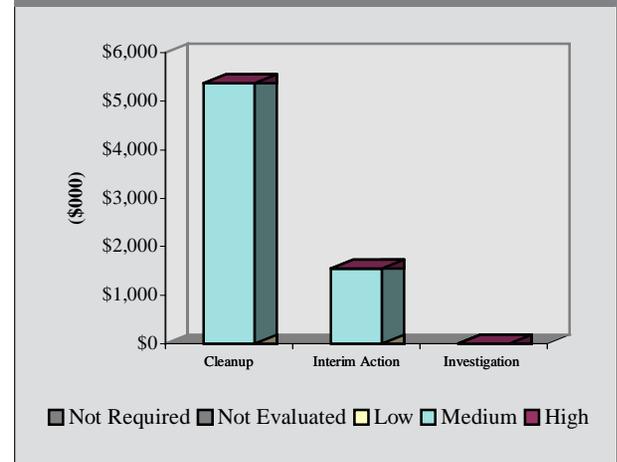
FY97 Restoration Progress

The installation completed a long-term monitoring plan and a Remedial Design (RD) work plan. The RAB sponsored an Earth Day fair to generate community interest. Regulatory review and the Federal Facility Agreement schedule delayed some actions that were scheduled for completion in FY97.

Plan of Action

- Fund final Remedial Actions (RA) in FY98
- Complete 30, 60, and 90 percent RD, in accordance with the Federal Facility Agreement in FY98
- Complete RD fieldwork and a RD Report in FY98
- Complete a RA Plan in FY99
- Install final RAs by FY00

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 420 acres
Mission: Produced aircraft and aircraft missile components
HRS Score: 50.00; proposed for NPL in January 1994
IAG Status: None
Contaminants: PCBs, petroleum hydrocarbons, VOCs, and metals
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: \$3.8 million
Estimated Cost to Completion (Completion Year): \$0
Final Remedy in Place or Response Complete Date: FY2000



Columbus, Ohio

Restoration Background

Since FY86, ongoing environmental studies have identified 11 sites and 1 area of concern (AOC) at Air Force Plant No. 85. Historical operations at the installation involved use of solvents and petroleum products. Contaminants include polychlorinated biphenyls (PCB), metals, petroleum hydrocarbons, and volatile organic compounds (VOC) that have affected groundwater, surface water, sediment, and soil. To date, decision documents have been prepared for 9 of the 11 sites; however, the Air Force has not received concurrence from regulatory agencies on any of the documents.

In FY94, the installation conducted supplemental investigations of pesticide contamination at the fire training area. In FY95, the installation began a Removal Action to remove soil contaminated with PCBs. The installation was scheduled to be sold in February 1997. The sale documents include restrictions on soil, groundwater, and other land uses. In FY96, the installation began the process of transferring the property.

In FY95, the installation formed a restoration advisory board (RAB) and began an ongoing educational program for RAB members. In FY96, a RAB meeting was held to determine public interest levels. One option presented in this meeting was to disband the RAB because of a lack of public interest and replace it with occasional public information meetings.

Also during FY96, the installation initiated a groundwater and surface water investigation. The AOC was closed under a letter of concurrence from the Ohio EPA. The restoration of the fire training area was deferred, pending analysis of the results of groundwater investigation. There is a possibility that the site will be closed after a risk assessment is conducted. The installation continued the Removal Action to remove PCB-contaminated soil. The installation also began compiling

a Relative Risk Site Evaluation Report and began fulfilling reporting requirements under CERCLA.

FY97 Restoration Progress

Fieldwork was completed for the groundwater and surface water investigation project. A provisional draft of the final report on this investigation was received in August 1997.

The Air Strategic Command (ASC) began using the state of Ohio's Voluntary Action Program rules, which were codified in FY97, to the fullest extent possible. This has resulted in resolution of issues with regulatory agencies and has expedited site characterization at AFP 85. A public meeting held in FY97 determined that the formation of a RAB was not necessary. The public and the installation agreed that information will be provided to the community informally as needed.

Some activities scheduled for completion in FY97 were delayed. A contract has been awarded for the removal of the PCB-contaminated soil, and this Removal Action has been rescheduled for early FY98. Sale of the property and recovery of funds for remediation activities have been delayed as title transfer documents are prepared and reviewed. Concurrence from regulators on final closure of sites will occur on a rolling basis and should be completed for all sites by the end of FY00.

Plan of Action

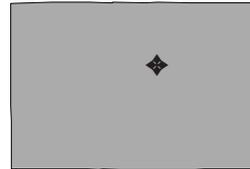
- In FY98, complete the Removal Action for soil contaminated with PCBs
- Complete the sale of the property in FY98
- Recover funds from sale for remediation activities in FY98

- Obtain concurrence from regulators for final closure of sites by FY00
- Continue to use the processes defined in the state of Ohio's Voluntary Action Program to the fullest extent possible
- Update community and provide information as needed

FY98 FUNDING BY PHASE AND RELATIVE RISK

Funding for FY98 is not planned at this installation.

Size: 464 acres
Mission: Research, develop, and assemble missiles and missile components; test engines
HRS Score: 42.93; placed on NPL in November 1989
IAG Status: None
Contaminants: Chlorinated organic solvents, VOCs, nitrate, fuel, and hydrazine
Media Affected: Groundwater and soil
Funding to Date: \$19.8 million
Estimated Cost to Completion (Completion Year): \$38.1 million (FY2014)
Final Remedy in Place or Response Complete Date: FY2009



Waterton, Colorado

Restoration Background

Air Force Plant PJKS supports the military by researching and developing and then assembling missiles, missile components, and engines. Historical operations have contaminated groundwater beneath the installation with trichloroethene (TCE), hydrazine, vinyl chloride, benzene, other volatile organic compounds (VOC), and nitrate.

Since FY86, ongoing environmental studies have identified a total of 59 sites, which were grouped into six operable units (OU). There are also six areas of concern. Twelve of 14 underground storage tanks have been removed from the installation.

In FY93, field activities began for a supplemental Remedial Investigation and Feasibility Study (RI/FS) at OU1, OU4, and OU6. In addition, RI/FS work plans have been completed for supplemental investigations at OU2, OU3, and OU5.

In FY94, the installation began using new technologies to improve field methods and data management. An electronic field data management module was used to ensure the efficient collection of high-quality analytical data. The installation also used a shallow seismic reflection device to investigate geophysical characteristics in the top portion of subsoil at various sites.

In FY94, the installation sponsored workshops to ensure that all technical and regulatory requirements for the supplemental RI/FS would be met. The workshops were attended by both technical and regulatory agency specialists and included representatives from EPA and the state. As a result of the workshops, work plans for supplemental RI/FS activities at OU2, OU3, and OU5 were renewed, approved, and made final.

In FY95, all fieldwork, sample collection, and sample analysis for the supplemental basewide RI/FS and construction of the monitoring well network were completed. During FY96, a restoration advisory board (RAB) was established. Five meetings were held, and one of the meetings included a site tour.

In FY96, work continued in support of the basewide RI. Data validation was completed, and an electronic database was established. Technical work groups were formed with the EPA, the state of Colorado, USGS, and U.S. Army Corps of Engineers to support the RI site characterization and risk assessment efforts. Site characterization and a Baseline Risk Assessment were initiated.

Also in FY96, negotiations of the Interagency Agreement (IAG) were initiated. After a delay concerning the use of Defense and State Memorandum of Agreement (DSMOA) funding to support Colorado's participation, Colorado agreed to continue with efforts to negotiate an IAG and began work on a draft agreement with EPA.

FY97 Restoration Progress

The installation signed a RAB charter in early FY97 and reevaluated and revised the Relative Risk Site Evaluations to reflect data from the RI/FS. The Air Force is in the process of divesting the installation. During FY97, the Air Strategic Command (ASC) and Lockheed Martin Astronautics (LMA) agreed to sale terms for the installation. The sale terms include environmental liability and cleanup aspects. LMA will be offering its environmental expertise and existing infrastructure as a management partner in the cleanup process.

The installation worked with the technical group formed in FY96. The group, which consists of ASC, EPA Region 8, and the state of Colorado, completed a preliminary risk assessment for one site. A

method was developed for focusing on remaining regulatory concerns and for setting a precedent for future risk assessments.

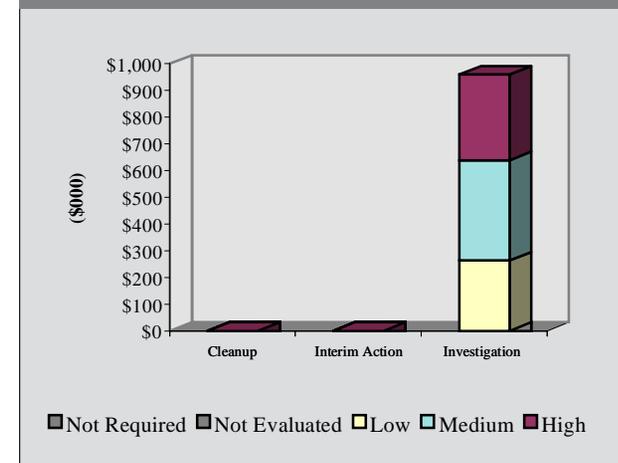
The installation held quarterly RAB meetings to discuss preliminary site characterization data, health assessments, risk assessments, and general community concerns.

IAG negotiations were suspended in late FY96 and early FY97 and have recently been restarted. The RIs scheduled for completion in FY97 should be completed in FY98. FS and Record of Decision (ROD) development, however, are expected to continue into 2001.

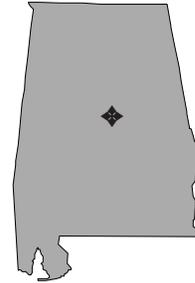
Plan of Action

- Complete and sign an IAG in FY98
- Evaluate the potential for early actions and acceleration of cleanup in FY98
- Assess the cost-effectiveness of early cleanup actions in FY98
- Form formal partnership with the state of Colorado and EPA Region 8 in FY98
- Build budget with ASC in FY99 to plan implementation of early actions in FY99
- Complete all basewide RI/FS work for OUs 1 through 6 in FY99, and submit one final RI/FS report that will include all six OUs
- Sign RODs as needed; sign an installationwide ROD in early FY01

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 2,209 acres
Mission: Manufactured explosives
HRS Score: 36.83; placed on NPL in July 1987
IAG Status: Federal Facility Agreement signed in December 1989
Contaminants: Nitroaromatic compounds, heavy metals, and munitions-related wastes
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: \$53.8 million
Estimated Cost to Completion (Completion Year): \$5.9 million (FY2001)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2001



Childersburg, Alabama

Restoration Background

Environmental studies conducted since FY83 at the Alabama Army Ammunition Plant have identified various sites as potential sources of contaminants. Prominent site types include a former ammunition production and burning ground for various explosives; industrial wastewater conveyance systems, ditches, and a red water storage basin; landfills; underground storage tanks; polychlorinated biphenyl (PCB)-containing transformers; and a former coke oven.

Remedial Investigation and Feasibility Study (RI/FS) activities, beginning in FY85, are ongoing. The installation was divided into five operable units (OU): Area A OUs 1 and 2 and Area B OUs 1, 2, and 3. The RI confirmed that groundwater, surface water, sediments, and soil are contaminated with nitroaromatic compounds, heavy metals, and explosives wastes.

In FY88, the Army excavated approximately 25,000 cubic yards of contaminated soil from the burning grounds at Area A and transported the soil to Area B to await a final decision on treatment or disposal. In FY90, the Army and regulators signed the Record of Decision (ROD) for Area B. It incorporated a generic remedy, including on-site incineration of stockpiled contaminated soil.

In FY94, the Army initiated a follow-on installationwide RI. The RI included installing monitoring wells and conducting soil borings; resampling existing monitoring wells; and collecting background samples, soil and sediment samples, surface-water samples, and ecological samples. Also in FY94, the Army completed incineration of the stockpiled contaminated soil, as prescribed in the ROD, and formed a BRAC cleanup team (BCT).

In FY95, the Army attempted to establish a restoration advisory board (RAB) but received no applications for RAB membership. Also in FY95, the Army and regulators approved the Area A RI/FS.

The Army initiated partnership efforts with EPA and the state regulatory agency. These efforts resulted in concurrence on the CERFA Report and signing of four Interim RODs. Partnership meetings also produced an Installation Management Plan, which establishes the course of action for installation cleanup through FY99.

In FY96, the Army completed a Proposed Plan and a final ROD for Area A. The installation identified an additional OU for Area B (OU4), which included all remaining lead- and explosives-contaminated soil at the plant. An Interim ROD was initiated for Area B OU4, including soil removal, incineration of explosives-contaminated soil, and solidification of lead-contaminated soil.

FY97 Restoration Progress

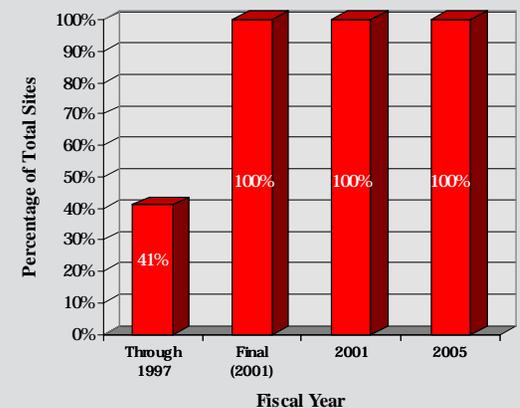
The Army and regulators approved the final ROD for Area A and completed the Remedial Action. Additional fieldwork is necessary to complete goals for Area B. The BCT conducted quarterly meetings and began delisting procedures for Area A. Approval for designation of 1,285 acres as CERFA-uncontaminated was granted by the appropriate regulatory agencies.

Some activities scheduled for completion in FY97 were delayed because additional fieldwork was needed in Area B.

Plan of Action

- In FY98–FY99, complete the follow-on groundwater investigations at Area B required for the RI/FS
- Complete a Proposed Plan and a ROD for Area B in FY98–FY99

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size:	2,639 acres, including about 1,000 offshore acres
Mission:	Maintain and operate facilities and provide services and material support for Naval aviation activities and operating forces
HRS Score:	NA
IAG Status:	Federal Facility Site Remediation Agreement under negotiation
Contaminants:	Acetone, BTEX, chlorinated solvents, cyanide, heavy metals, herbicides, pesticides, methylene chloride, petroleum hydrocarbons, PAHs, PCBs, VOCs, and SVOCs
Media Affected:	Groundwater, surface water, sediment, and soil
Funding to Date:	\$68.3 million
Estimated Cost to Completion (Completion Year):	\$149.5 million (FY2005)
Final Remedy in Place or Response Complete Date for BRAC Sites:	FY2004



Alameda, California

Restoration Background

In September 1993, the BRAC Commission recommended closure of Alameda Naval Air Station. The installation was closed in April 1997.

Environmental cleanup activities at this installation are being conducted at 24 sites. Prominent site types at the installation include landfills, offshore sediment areas, plating and painting shops, pesticide control areas, transformer storage areas, and a former oil refinery.

In FY94, the installation completed an Interim Remedial Action (IRA) under which lead- and acid-contaminated soil was removed from Site 13. During FY95, four underground storage tanks (UST) and associated contaminated soil were removed at Site 7. A Time-Critical Removal Action to remove debris from catch basins was initiated at Site 18. Sixty abandoned tanks and associated contaminated soil were removed as part of the UST program.

The installation initiated a bench-scale demonstration at Site 5 for removal of metals from soil by electrokinetics. The installation completed Phase I of an Environmental Baseline Survey (EBS) for all sites in FY94 and Phase I of an Ecological Risk Assessment for all sites in FY95.

The installation formed a technical review committee in FY90 and converted it to a restoration advisory board (RAB) in FY93. The RAB, which has 32 members, meets monthly. The installation completed a community relations plan (CRP) and established an administrative record in FY89. The administrative record was updated in FY96. Two information repositories also were established.

A BRAC cleanup team was formed in FY93. A BRAC Cleanup Plan (BCP) was completed in FY94 and is updated annually. The Navy worked to promote the use of innovative technologies by establishing

an innovative partnering contract with the University of California, Berkeley.

The installation will be completing a Remedial Investigation and Feasibility Study (RI/FS) for 24 sites. The installation also is conducting a Removal Action for contaminated soil at Site 15 and a Removal Action to remove PCB- and lead-contaminated soil at Site 16.

At Site 5, a pilot-scale demonstration of electrokinetics for removal of metal from soil continues. The installation also initiated Treatability Studies at Sites 1, 2, 3, 13, and 17 to evaluate the use of innovative technologies. A community land reuse plan was approved in FY96.

FY97 Restoration Progress

The installation initiated Phase II of the Ecological Risk Assessment for all sites. In addition, the EBS was completed for all of the 208 parcels with Environmental Condition of Property (ECP) assigned. EBS sampling and risk screening were conducted, and ECP recategorization was implemented. A Time-Critical Removal Action to remove sediments from storm sewer lines was completed at Site 18. A finding of suitability to lease (FOSL) was completed for the entire base (100 percent of the property) before base closure in April 1997. An Engineering Evaluation and Cost Analysis (EE/CA) was completed for Site 16. Treatability Studies were completed for Sites 3 and 13.

The final revised CRP and revised BCP were completed. Early actions took place at sites: 15, 16, and 18. Many innovative technologies were implemented, including electrokinetics, funnel and gate, acoustic imaging, intrinsic bioremediation, resolution resources, and three-dimensional seismic imaging. To accelerate fieldwork and analysis, techniques such as the Site Characterization and Analysis Penetrom-

eter System (SCAPS), ground-penetrating radar, on-site (mobile) laboratories, and direct push profiler were used.

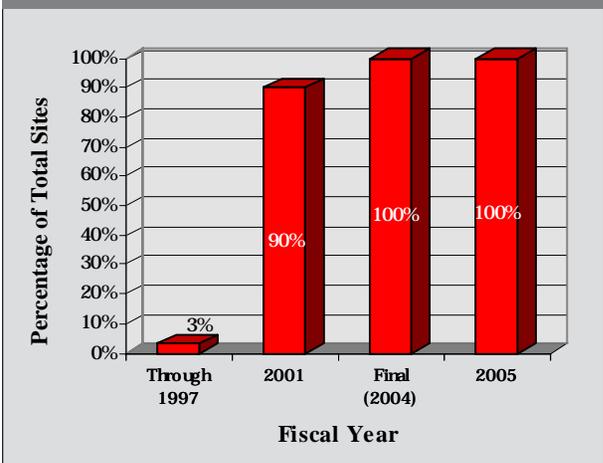
In FY97, operable units (OU) were restructured to allow no-further-action sites to be disposed of earlier. This lowered the projected cost to complete and increased focus on the most significant sites.

Some activities scheduled for completion in FY97 were delayed because risk-based corrective action (RBCA) evaluation indicated that Removal Actions might not be necessary.

Plan of Action

- Complete Removal Action at Site 18 in FY98
- Complete Treatability Studies at Sites 1, 2, and 17 in FY98
- Complete the demonstration of electrokinetics at Site 5 in FY98
- Initiate the final phase of the Ecological Risk Assessment for all sites in FY98
- Complete the recategorization of parcels in FY98
- Complete the RI for OU 1 in FY98
- Complete RI for OUs 2 and 3 in FY99
- Initiate Remedial Design (RD) for Sites 5 and 10 in FY99
- Complete the FS and sign the Record of Decision (ROD) for one OU in FY98
- Sign the ROD and initiate RD and Remedial Action for all sites in FY98
- Complete Removal Actions at Sites 7, 14, and 22 in FY98

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size:	3,579 acres
Mission:	Acquire, supply, and dispose of materials needed to sustain combat readiness of Marine Corps forces worldwide; acquire, maintain, repair, rebuild, distribute, and store supplies and equipment; conduct training
HRS Score:	44.65; placed on NPL in December 1989
IAG Status:	Federal Facility Agreement signed in July 1991
Contaminants:	VOCs, PCBs, heavy metals, pesticides, and PAHs
Media Affected:	Groundwater, soil, and sediment
Funding to Date:	\$25.8 million
Estimated Cost to Completion (Completion Year):	\$6.1 million (FY2016)
Final Remedy in Place or Response Complete Date:	FY2001



Albany, Georgia

Restoration Background

Since FY85, environmental studies have identified 29 sites (23 under CERCLA and 6 under RCRA) at the Albany Marine Corps Logistics Base. The sites at the installation were grouped into six operable units (OU), including a basewide groundwater OU (OU6) and a site screening group. Prominent site types include disposal areas, storage areas, and landfills. Primary contaminants include trichloroethene, polychlorinated biphenyls (PCB), and heavy metals.

An Initial Assessment Study was completed for eight sites in FY85. In FY87, a confirmation study was completed for nine sites, a groundwater recovery system was installed, and a quarterly groundwater monitoring program was initiated for the Industrial Wastewater Treatment Plant (IWTP) area. During FY89, RCRA Facility Investigation (RFI) activities were completed for nine sites. The installation also completed a corrective measures study (CMS) for one site and an Interim Remedial Action (IRA) for capping the IWTP sludge beds.

In FY90, the state of Georgia issued an administrative order to complete RCRA closure of the sludge beds at the Domestic Wastewater Treatment Plant (DWTP). In FY91, a Preliminary Assessment was completed for one site. In FY92, a Remedial Investigation and Feasibility Study (RI/FS) was completed and an Interim Record of Decision (ROD) was signed for both sites at OU3.

In FY93, the Remedial Design (RD) was completed for both sites at OU3, and in FY94, OU3 Removal Actions and cleanup activities were completed. An RI/FS work plan was completed, and fieldwork was initiated for all five sites at OU4. The installation also completed final Remedial Action (RA) for the removal of soil from the DWTP sludge beds at solid waste management unit (SWMU) 3.

During FY95, the RI/FS for all four sites at OU1 was submitted to the regulators. An IRA was completed for one site at OU1. The RI/FS for OU2 was submitted and an Engineering Evaluation and Cost Analysis was completed for one site at OU4. In addition, the installation completed a focused FS, signed an Interim ROD, and completed the RD for one site at OU5. The installation also completed RCRA closure of the DWTP sludge beds at SWMU 3.

A technical review committee (TRC) was formed in FY89 and meets periodically. Because community interest has been insufficient, the TRC will not be converted to a restoration advisory board. In FY92, a community relations plan was completed, and an information repository and an administrative record were established.

During FY96, the installation completed the construction of a pilot-scale groundwater treatment system and initiated a Treatability Study for one site at OU1. During the same period, the installation completed a Removal Action for another site at OU1. A final ROD for no further action was signed for OU2, and the site was closed. An IRA was completed for one site at OU5. Three RFIs, three CMSs, and one RI/FS were in progress at the end of FY96.

FY97 Restoration Progress

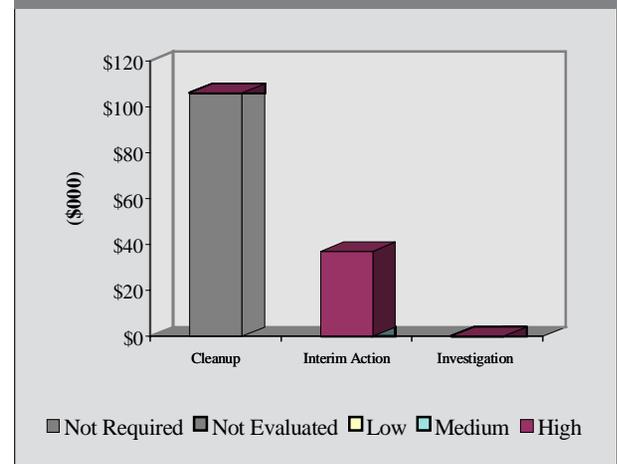
The installation completed the Remedial Investigation/Baseline Risk Assessment (RI/BRA) and RI/BRA addendum and signed a final ROD for four sites at OU1. Two sites required no further action, and two sites required implementation of institutional controls. Also, a final ROD was signed for two sites at OU3: one site received a no further remedial action planned (NFRAP) designation and one site required implementation of institutional controls. Progress on the RI/BRA at OU4 and OU6 continued. The PSC Screening Technical Memorandum was completed for nine sites, seven of which will be

listed as NFRAP in the RCRA Permit. Two of the screening sites (4, 21) will require further action. The RI/BRA and the NFRAP Proposed Plan for two sites at OU5 were completed. In addition, the RFI and the CMS for two SWMUs and corrective measures implementation were finished. Removal Actions were conducted for two sites, which will be listed as NFRAP in the RCRA permit.

Plan of Action

- Complete RI/BRA and decision documents for five sites at OU4 in FY98
- Complete a no-further-action ROD for two sites at OU5 in FY98
- Continue progress on OU6 basewide groundwater technical documents and Data Quality Objectives and RI/BRA in FY98
- Complete the investigation and decision documents for the remaining screening sites in FY98

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 1,628 acres (1,572 acres owned by the Navy)
Mission: Research, develop, and produce solid propellant rocket motors for DoD and NASA
HRS Score: 50.00; placed on NPL in May 1994
IAG Status: Federal Facility Agreement under negotiation
Contaminants: VOCs, RDX, HMX, and silver
Media Affected: Groundwater and soil
Funding to Date: \$11.4 million
Estimated Cost to Completion (Completion Year): \$60.0 million (FY2033)
Final Remedy in Place or Response Complete Date: FY2013



Mineral County, West Virginia

Restoration Background

Environmental studies initiated in FY83 identified 11 sites at this government-owned, contractor-operated installation. A confirmation study completed in FY86 recommended further study at eight of these sites. Remedial Investigation and Feasibility Study (RI/FS) activities began for six sites in FY92. Site 1, an immediate concern, consists of six waste disposal units, including ordnance burning grounds, inactive solvent and acid pits, a drum storage area, a former open-burn area, and an ash landfill.

In FY93, a RCRA Facility Assessment identified 119 solid waste management units (SWMU) and 12 areas of concern (AOC). Further action was recommended at 61 of the SWMUs and AOCs. In FY94, Site 7, a beryllium landfill, was excavated. Also in FY94, the installation began to negotiate waste disposal options with the state of West Virginia and EPA Region 3. In addition, the Agency for Toxic Substances and Disease Registry completed a Public Health Assessment of the installation.

During FY95, the installation began sampling off-site residential wells. It also completed the Focused Remedial Investigation (RI) for Site 1 and initiated a Phase I RCRA Facility Investigation (RFI) for the SWMUs and AOCs. Baseline Risk Assessments were completed for Sites 1 through 5 and Site 10.

The installation established a technical review committee in FY89 and converted it to a restoration advisory board (RAB) in FY95. The RAB, which has 25 members, reviews technical documents, presents its views to the community, and communicates the progress of the cleanup program. In FY94, a community relations plan was completed, and an administrative record and two information repositories were established.

During FY96, the installation completed the Focused Feasibility Study (FFS) for groundwater, initiated an FFS for soil, and initiated groundwater Remedial Design (RD) for Site 1. The installation also completed the FFS and initiated the RD for landfill contents and soil at Site 5. For Site 7, all excavated material was segregated and removal of contaminated soil was initiated. Negotiation of waste disposal options continued with the state of West Virginia and EPA Region 3. The installation also completed an Engineering Evaluation and Cost Analysis for Site 7; initiated an FFS for Site 10; continued the Phase I RFI activities for the SWMUs and AOCs; and completed a Site Inspection and initiated an RI/FS for Site 11.

FY97 Restoration Progress

The Record of Decision (ROD) for Site 1 was signed, and the RD for a WTP was implemented to obtain hydraulic containment. Remedial Action (RA) was initiated for groundwater at Site 1. A ROD was signed, and the FFS for Site 5 was completed. An RD was implemented for a landfill cap to prevent leaching of contaminants. Negotiation of waste disposal options was concluded and the Removal Action for Site 7 was completed. Three-dimensional seismic survey validation was used to accelerate fieldwork. Eight SWMUs were cleaned under a voluntary action to expedite closure and accommodate facility construction.

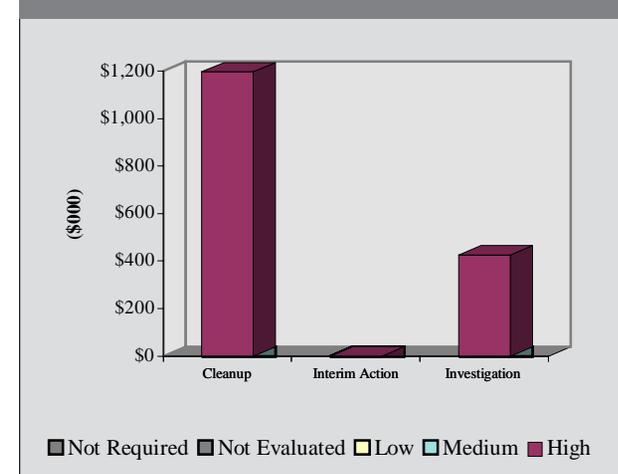
Partnering efforts have allowed documents to be reviewed and decisions to be made during meetings and via correspondence. Technical meetings have been scheduled with regulators to present cases for variances to state regulations. The RAB is very involved with the environmental issues and participates in activities such as site tours and document reviews. Local contractors and suppliers are used for a large portion of the restoration work in order to boost the local economy.

Remedial efforts related to Site 5 groundwater (which were scheduled to begin in FY97) will be addressed only if monitoring indicates they are necessary. Other FY97 actions that were not completed on schedule were delayed to allow proper regulatory coordination.

Plan of Action

- Initiate and complete the RA for the landfill in FY98
- Complete an FFS and initiate the RD for Site 10 in FY98
- Complete the Phase I RFI for SWMUs and AOCs in FY98
- Sign the ROD, initiate the RD, and complete the RI/FS for Site 11 in FY98
- Initiate an RA for soil and groundwater for Site 10 in FY99
- Initiate the RD for soil at Site 1 in FY00

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 15,400 acres
Mission: Support the Air Force mission in the Pacific by providing troops, equipment, and facilities
HRS Score: 50.00; placed on NPL in October 1992
IAG Status: Federal Facility Agreement signed in March 1993
Contaminants: VOCs, metals, asphalt, and UXO
Media Affected: Groundwater and soil
Funding to Date: \$52.9 million
Estimated Cost to Completion (Completion Year): \$70.8 million (FY2005)
Final Remedy in Place or Response Complete Date: FY2005



Yigo, Guam

Restoration Background

In FY84 and FY85, Preliminary Assessments identified 50 sites at Andersen Air Force Base, including landfills, waste piles, fire training areas, hazardous waste storage areas, and spill sites. The 50 sites were consolidated into 39 sites and grouped into 6 operable units (OU). Restoration activities were begun when low levels of trichloroethene (TCE) and tetrachloroethene (PCE) were detected in the sole-source drinking water aquifer on the island.

Increased ecological concerns have made restoration activities at the installation more complex. Rapid commercial development of nonmilitary lands on the island has made the base a de facto nature preserve. Various threatened and endangered species may inhabit areas of the installation. The federal Endangered Species Act requires extensive ecological inventories before any field activities can be conducted within an identified habitat of endangered species.

Landfill 5 was capped in FY93. To avoid the high cost of importing sterilized soil to Guam, the installation used a synthetic cover material to cap the landfill. The installation's demonstrated success with that innovative technology has prompted other agencies on Guam to use the same synthetic material. Remedial Investigation and Feasibility Study (RI/FS) activities also began in FY93.

Thirty-five monitoring wells have been installed at the installation. Groundwater sampling continued, including sampling of the production wells on and off Air Force property.

The installation formed a technical review committee (TRC) in FY93 and built a partnership with the Navy to establish a Defense Environmental Restoration Team. The TRC was converted to a restoration advisory board (RAB) in February 1995. The installation also fostered good communication with the neighboring villages of

Yigo, Dededo, and Mangilao to disseminate information on potential contamination problems and restoration activities at the base.

In FY96, 25 additional groundwater monitoring wells were installed to facilitate initial quarterly RI sampling and later long-term monitoring (LTM) of groundwater located in the underlying karst aquifer. Field activities included groundwater and soil sampling and analysis, soil gas survey, geophysical survey, and site inventories. After receiving data from groundwater sampling, the installation reevaluated relative risk at several sites and reprioritized efforts.

FY97 Restoration Progress

The installation completed soil sampling and analysis, soil gas surveys, geophysical surveys, and site inventories for five sites. A gas chromatography/mass spectrometry lab was employed to analyze soil gas samples on site and accelerate fieldwork. The base was geographically reorganized into four OUs to accommodate excess-land issues and address groundwater at each site. The installation also performed risk site evaluations. An air stripping tower was constructed near a base booster station to treat Air Force potable water sources for volatile organic compounds (VOC).

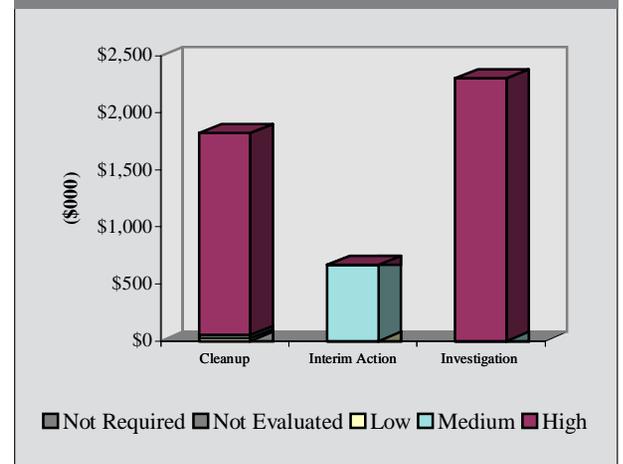
Community and regulatory agency partnering continued through RAB efforts, including participating with the Natural Resources Conservation Service in a watershed committee in order to include Air Force information and working with the local university to provide drilling and site data that facilitate the design of a groundwater model.

Completion of the Records of Decision (ROD) that were scheduled for FY97 will follow the public comment period. Some sites that were originally scheduled for Remedial Design (RD) work will be handled as Interim Remedial Actions (IRA) instead. LTM will not start until FY98.

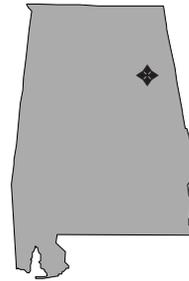
Plan of Action

- Implement IRAs and LTM of groundwater for 15 sites in FY98
- Proceed with cleanup of excess lands in FY98
- Complete RODs for six sites in FY98
- In FY98, process peer review waivers to employ presumptive remedies such as excavation and transport/treatment off-island, recycling of asphaltic tar, and intrinsic remediation
- Foster continuous partnership with Guam EPA and EPA Region 9 remedial project manager in FY98
- Expedite release of excess land parcels by completing cleanup of Environmental Baseline Survey of areas of concern in FY98
- Continue LTM of groundwater in FY98

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 600 acres
Mission: Maintain combat vehicles
HRS Score: 51.91; placed on NPL in March 1989
IAG Status: IAG signed in June 1990
Contaminants: VOCs, heavy metals, phenols, petroleum products, acids, and caustics
Media Affected: Groundwater and soil
Funding to Date: \$31.4 million
Estimated Cost to Completion (Completion Year): \$128.3 million (FY2032)
Final Remedy in Place and Response Complete Date: FY2005



Anniston, Alabama

Restoration Background

Since 1948, the Army has repaired, rebuilt, and modified combat vehicles and artillery equipment at the Anniston Army Depot Southeast Industrial Area. Painting, degreasing, and plating operations at the installation generate wastes containing volatile organic compounds (VOC), phenols, heavy metals, and petroleum distillates. Environmental studies have revealed soil and groundwater contamination at 44 sites, most prominently with VOCs, metals, and phenols.

During closure activities in FY79, the Army pumped 2 million gallons of waste from an unlined lagoon into a lined lagoon. Later, Interim Remedial Actions (IRA) at RCRA Corrective Action sites resulted in the removal of 62,000 tons of sludge and contaminated soil.

From FY87 to FY89, the installation executed four IRAs, installing groundwater interception and treatment systems that use air stripping and carbon adsorption to remove VOCs and phenols.

In FY93, the installation conducted an emergency Removal Action to remove 82,200 pounds of sludge contaminated with VOCs, metals, and petroleum products from a former industrial wastewater treatment plant. The Army installed a large-diameter experimental well in FY94 to enhance groundwater recovery.

In FY95, the installation removed two underground storage tanks (UST) and included the associated contaminated groundwater in the existing groundwater operable unit (OU). The Phase I Remedial Investigation (RI) was completed and the Phase II RI and Feasibility Study (FS) activities began. Those activities included investigative activities at the industrial wastewater sewers. Under an Interim Record of Decision (ROD), the installation also began a pilot study to address problems with chemical fouling in the groundwater extraction system.

An Emergency Response Plan was developed to identify further response actions at public water-supply sites and residential wells that might be affected by activities at the installation. The installation addressed concerns of the local community by sampling residential groundwater wells.

In FY96, the commander solicited responses concerning interest in forming a restoration advisory board (RAB) but received few responses. The installation completed a source delineation at solid waste management unit (SWMU) 12, and the Army completed fieldwork for Phase II of the RI/FS.

FY97 Restoration Progress

The installation completed dye-tracing work at OU3, the off-post OU. The monitoring well inventory was completed. A Phase I RI began at SWMUs 10 and 11 and the TNT Washout Facility and leaching beds in the Ammunition Storage Area. A partnership initiative began that involved all members of the restoration process, including federal and state regulators, contractors, and members of the installation. The installation also held two technical review committee (TRC) meetings and a public availability meeting.

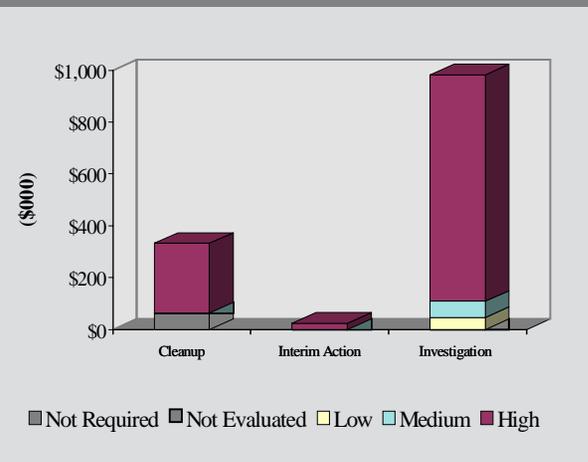
The installation used accelerated fieldwork techniques to expedite the cleanup process. New technologies included an innovative in situ technology for remediating VOC-contaminated soil; a geoprobe for monitoring the Emergency Removal Action; Field Test Kits to help assess SWMUs 10 and 11; and ground-penetrating radar to help identify the material in the subsurface along the depot boundary.

Some activities scheduled for completion in FY97 were delayed because an ecological risk assessment for the Phase II RI is being revised to accommodate the latest guidance and because the feasibility study for the groundwater part recently got under way.

Plan of Action

- Complete the emergency Removal Action at SWMU 12 in FY98 using peroxide injection
- Complete Phase II of the RI and begin the FS at the Southeast Industrial Area in FY98
- Complete the fieldwork Ammunition Storage Area RI in FY98
- Complete additional geophysical work on the depot boundary in FY98 to support off-post RI
- Complete preliminary ecological screening for the off-post RI in FY98
- Solicit public interest in establishing a RAB in FY98
- Complete Proposed Plan and ROD for the Southeast Industrial Area in FY99
- Complete ROD for the Ammunition Storage Area in FY00
- Complete Remedial Design in FY00 and Remedial Action in FY01 for the Southeast Industrial Area
- Complete ROD for the off-post RI in FY03

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 6,500 acres
Mission: House the Army Armaments Research, Development, and Engineering Command
HRS Score: 42.92; placed on NPL in February 1990
IAG Status: IAG signed in July 1991
Contaminants: VOCs, explosives, and heavy metals
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: \$64.6 million
Estimated Cost to Completion (Completion Year): \$70.4 million (FY2009)
Final Remedy in Place or Response Complete Date: FY2009



Rockaway Township, New Jersey

Restoration Background

In 1880, Dover Powder Depot, now known as Picatinny Arsenal, was established to store the gunpowder needed to manufacture ammunition. From 1898 to the early 1970s, explosives, propellants, and ammunition were manufactured at the installation. The installation now houses the Army Research, Development, and Engineering Command.

Regulators performed a Preliminary Assessment and Site Inspection in FY87. In FY91, the installation developed a Remedial Investigation Concept Plan which identified 156 sites. Prominent site types include a burning ground, landfills, underground storage tanks (UST), former production areas, and former testing sites. Releases of volatile organic compounds (VOC), explosives, and heavy metals from these sites have contaminated groundwater, surface water, sediment, and soil.

Formal Remedial Investigation and Feasibility Study (RI/FS) activities under the Interagency Agreement (IAG) with EPA began in FY91. The RI/FS approach divided the sites into 16 areas, prioritized the areas, and organized the investigation in three phases. The installation conducted an additional RI for the burning ground in FY94. Interim Actions included removing USTs, installing a groundwater extraction and treatment system, and removing drums from a landfill.

In FY95, the installation conducted several Interim Actions, including cleanup of lead-contaminated soil, operation of a groundwater pump-and-treat system for an on-site trichloroethene (TCE) plume, and installation of a drinking-water line to 12 nearby residences. The FS for the Burning Ground and the Phase I draft RI Report were submitted to the regulatory agencies. The installation also began Phase II RI activities.

In FY96, the technical review committee (TRC), which was formed in FY91, was converted into a restoration advisory board (RAB). The RAB includes representatives of neighboring communities, local organizations, labor unions, and the residents of Picatinny.

Also in FY96, EPA approved the Phase II RI work plan. The Army collected data from 77 sites to determine the relative risk category. It approved site investigation work plans for fast-track collection of relative risk data for 37 sites. RI activities continued throughout the installation. Use of an on-site analytical laboratory provided significant time and cost savings during RI.

The Army Corps of Engineers, Baltimore District, awarded a Total Environmental Restoration Contract (TERC) and is using Picatinny Arsenal as the anchor site for the contract. Work plans were fast-tracked through use of biweekly meetings. These efforts also accelerated initiation of Treatability Studies and implementation of other actions.

FY97 Restoration Progress

Regulators approved the Phase I RIs. The Army completed RI fieldwork, the draft Phase II Report, and relative risk scoring of all sites. In addition, the installation began an assessment of natural attenuation as an alternative for remediation of groundwater plumes in Area D. An air quality survey also was conducted to evaluate whether TCE had migrated into local residential basements.

The installation commissioned the United States Geological Survey (USGS) to conduct studies in support of natural attenuation of the TCE plume in Area D. The installation also began work with the Environmental Technologies Group in Picatinny to evaluate the effectiveness of phytoremediation for metal contamination at the Burning Ground Site.

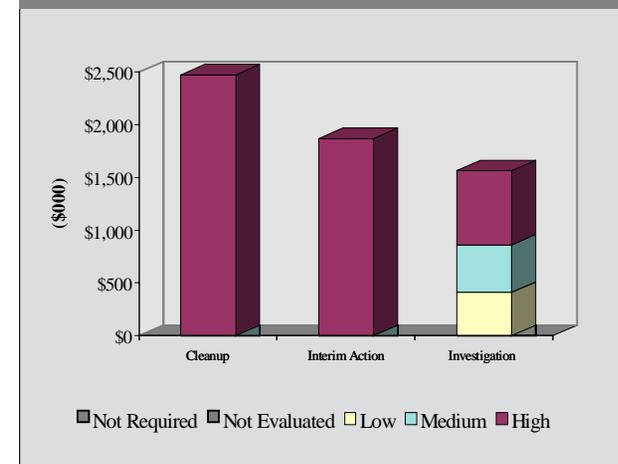
The U.S. Army Corps of Engineers awarded over \$12 million in contracts for FY97. Over \$7 million is earmarked for the Removal Action at three sites, including the pyrorange, Bear Swamp Brook Sediment Basin, and a landfill behind the arsenal burning grounds. The award also includes capping of the Post Farm Landfill.

The activities in the first bullet in the current plan of action were scheduled for completion in FY97. They were delayed because of late contract awards.

Plan of Action

- Obtain approval of Burning Ground FS, conduct three Removal Actions, and initiate Proposed Plan and Record of Decision in FY98
- By FY98, obtain no-further-action decisions on appropriate sites based on nonresidential cleanup standards
- Work with regulators to accomplish incremental stages of FSs and other regulatory requirements by FY98
- Complete Remedial Design for Sanitary Landfill in southern part of Arsenal in FY98
- Complete Relative Risk Site Evaluation at the two remaining sites in FY98
- Install cap at the Post Farm Landfill with New Jersey Department of Environmental Protection and EPA in FY99

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 40,000 acres
Mission: Simulate flight conditions
HRS Score: 50.00; proposed for NPL in August 1994
IAG Status: None
Contaminants: VOCs, PCBs, heavy metals, acids, petroleum hydrocarbons, and asbestos-containing material
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: \$48.3 million
Estimated Cost to Completion (Completion Year): \$59.3 million (FY2027)
Final Remedy in Place or Response Complete Date: FY2003



Coffee and Franklin Counties, Tennessee

Restoration Background

Arnold Engineering Development Center is a test facility for the Air Force Material Command. Its primary mission is to simulate flight conditions in aerodynamic, propulsion, and space ground-testing facilities. The installation also conducts research and applies new technology to improve facilities and associated testing techniques and instrumentation.

Principal sites at the installation include a landfill, a chemical treatment plant, a main testing area, a leaching pit, a leachate burn area, and a fire training area. The chemical treatment plant, main testing area, and leaching pit contain soil and groundwater contaminated with volatile organic compounds (VOC). Environmental studies have identified 24 sites, of which 6 remain active. Interim Remedial Actions (IRA) have begun at five of these sites. The remaining site is still under investigation.

Between FY88 and FY94, the installation removed 37 underground storage tanks (UST). In FY94, several IRAs were initiated, including (1) installation of groundwater extraction and treatment systems at two landfills, (2) provision of city water to nearby residents, (3) installation of a skid-mounted air stripper to treat contaminated surface water, (4) ex situ biological treatment of soil at a leachate burn area, and (5) removal by reverse osmosis technology of surface water contaminated with heavy metals and polychlorinated biphenyls (PCB) at the steam plant ash pits. All IRAs were completed in FY95.

During FY89, a RCRA Facility Assessment identified 110 solid waste management units (SWMU). RCRA Facility Investigations (RFI) were conducted at 13 of these units, and the need for additional sampling was identified for 57. The additional sampling and RFI fieldwork was completed in FY94. Preliminary Assessments also were completed for

all remaining sites, and RCRA closure was approved for four hazardous waste facilities in FY94.

In FY91, the installation formed a technical review committee (TRC), which worked closely with EPA and state regulatory agencies in partnering sessions to meet all regulatory requirements. In FY95, the TRC was converted into a restoration advisory board (RAB), which meets quarterly. Agenda items considered by the RAB include restoration updates, project status, and the Relative Risk Site Evaluation process.

In FY95, the RFI Phase I Report was completed, and confirmatory sampling was completed for Site 19. The installation also implemented four Interim Actions, including low-temperature thermal treatment of soil contaminated with VOCs and installation of a groundwater extraction and treatment system.

In FY96, the installation completed Remedial Designs (RD) for modified RCRA landfill caps at Sites 1 and 3. These RDs constitute the final actions for those sites. The installation also implemented three interim corrective measures to treat contaminated groundwater.

FY97 Restoration Progress

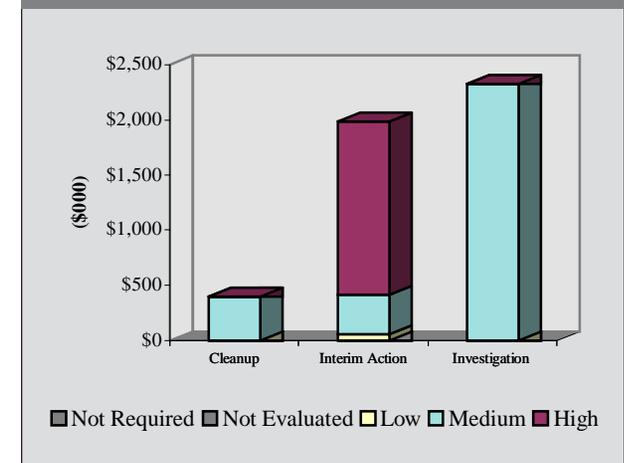
The installation constructed 36 wells to monitor groundwater for Site 19. At three other sites, the installation performed a corrective measures study (CMS) for final action and completed one of two planned landfill caps. The installation also employed on-site laboratories, roto sonic direct-push drilling technology, joint design workshops, and risk evaluations at various sites to accelerate fieldwork and improve site management.

RAB efforts in FY97 included benchmarking demonstration programs at Charleston and Wright-Patterson Air Force Bases and the use of geophysics to expedite site characterization.

Plan of Action

- Add solvent recovery effort to current cleanup activities at Site 8 in FY98
- Implement additional source containment at Site 6 in FY98
- Complete and analyze results from a phytoremediation pilot study and ZVID (zero valent iron destruction of chlorinated compounds) reactor pilot study in FY98
- Improve decision-making process by using statistical control charts to plot monitoring well data at Sites 1 and 3; this analysis will reveal trends in contamination movement at the sites

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 280 acres
Mission: Provide Air National Guard training
HRS Score: 39.65; placed on NPL in August 1991
IAG Status: Federal Facility Agreement signed in July 1993
Contaminants: VOCs, SVOCs, lead, copper, and pesticides
Media Affected: Groundwater and soil
Funding to Date: \$1.5 million
Estimated Cost to Completion (Completion Year): \$2.2 million (FY2004)
Final Remedy in Place or Response Complete Date: FY2001



Pleasantville, New Jersey

Restoration Background

Atlantic City International Airport is a Federal Aviation Administration (FAA) facility. It was placed on the National Priorities List (NPL) in 1991 because of its proximity to the South Branch of Doughty’s Mill Stream, which flows into Upper Atlantic City Reservoir, a source of drinking water for local residents. In addition, a sole-source aquifer underlying the FAA facility contributes 85 to 90 percent of the watershed for the Upper Atlantic City Reservoir. Sites located at the facility are the FAA salvage yard, the FAA jet fuel farm, the FAA fire training facility, and the FAA’s old landfill.

The 177th Fighter Wing, New Jersey Air National Guard (ANG), is a tenant at the FAA facility. The installation’s mission is to maintain fighter aircraft on continuous peacetime air defense alert to preserve U.S. air sovereignty. During wartime, the mission is to mobilize personnel and equipment for deployment to designated locations and to use air-to-air munitions in strategic defense of the North American continent. The ANG sites were not ranked for the NPL, but the ANG facility is on the NPL because it is a tenant on FAA property.

A Preliminary Assessment (PA) for the ANG facility was completed in November 1989. The PA identified six sites. The PA recommended Site Inspections (SI) at all six. Two of the six sites (Sites 1 and 4) were found to be sites that the FAA was investigating and were referred to the FAA for further investigation. None of the ANG sites are suspected of contributing contamination to groundwater. An SI was completed by HAZWRAP in FY95 on Sites 2, 3, 5, and 6.

A Memorandum of Agreement (MOA) between the FAA and the Air National Guard Readiness Center (ANGRC) was signed in FY95. The MOA stipulates that the FAA will perform any additional studies, and the Remedial Design and Remedial Action if necessary, at ANG sites. ANGRC will provide funding. In FY95, the ANGRC transferred

\$300,000 to FAA to perform work under an SI Addendum for additional soil and groundwater sampling at Sites 2, 3, 5, and 6.

In June 1996, fieldwork required under the SI Addendum continued, allowing the review of the draft SI Report by the FAA.

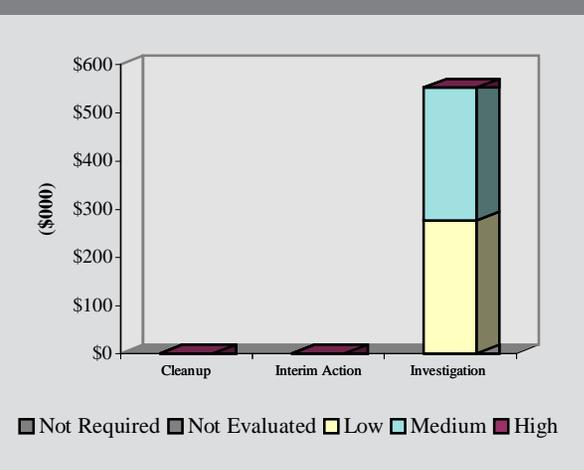
FY97 Restoration Progress

The SI Addendum was completed in FY97. Relative risk assessment was completed at Sites 2, 3, 5, and 6. A technical review committee (TRC), which meets every 6 weeks, helped resolve issues with regulatory agencies and contributed to successful partnering. The TRC met with the state Pinelands Commission and with local community representatives to resolve issues. The SI addendum is still being reviewed by the FAA and has not been sent to state regulators.

Plan of Action

- Initiate Remedial Investigation in FY98

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 6,692 acres
Mission: Provide support base for Trident submarines
HRS Score: 30.42 (Bangor Ordnance Disposal); placed on NPL in July 1987
 55.91 (Bangor Naval Submarine Base); placed on NPL in August 1990
IAG Status: Federal Facility Agreement signed in January 1990
Contaminants: TNT and RDX residues, Otto fuel residues, ammonium picrate, electroplating wastes, dinitrotoluene, benzene, PCBs, pesticides, herbicides, and chlorinated organic compounds
Media Affected: Groundwater, soil, and sediment
Funding to Date: \$71.3 million
Estimated Cost to Completion (Completion Year): \$23.5 million (FY2008)
Final Remedy in Place or Response Complete Date: FY2006



Silverdale, Washington

Restoration Background

From the early 1940s until it was commissioned as a submarine base in 1977, Bangor Naval Submarine Base was used for storage and shipment of munitions. Most of the environmental contamination at the installation originated from the detonation, demilitarization, and disposal of explosive ordnance. The Navy conducted an Initial Assessment Study in FY83 that identified 11 sites requiring further investigation because of suspected soil and groundwater contamination.

In FY90, the Navy, EPA, and the state of Washington signed a Federal Facility Agreement. Investigation of 22 sites was recommended. These sites were grouped into seven operable units (OU) for the Remedial Investigation and Feasibility Study (RI/FS).

Between FY91 and FY95, RI/FSs were completed for all seven OUs. Also during this time period, several Records of Decision (ROD) were signed and updated: a ROD and an update for OU1 (FY91); an interim ROD (FY91) and an update (FY94) for OU2; RODs for OU3 and OU5 (FY93); a ROD for OU4 specifying no further action (FY94); a ROD for OU6 (FY94).

Early actions have involved removal of underground storage tanks (UST) from four UST sites. Removal Actions at OU7 consisted of removing drums and reconstructing a bermed area. In FY95, the installation discovered and added an eighth OU and conducted a Removal Action to provide alternative drinking-water supplies to residences near the installation.

The installation completed a community relations plan in FY93. Partnering sessions with regulatory agencies have expedited the cleanup of several contaminated areas. The sessions streamlined the decision-making process by reducing the number of deliverables and

allowing resolution of issues in person rather than through formal review comments, responses, and revisions.

A technical review committee was formed in FY87 and was converted to a restoration advisory board (RAB) in FY96. The RAB has held public workshops and several tours of the installation. The installation also completed a Remedial Design (RD) for OU2 and an RD for soil for OU6. Remedial Action (RA) activities were started at OU2, OU6, and UST 1.

The installation initiated long-term monitoring (LTM) at Sites 10 and 26 at OU7 during FY96 and continued 5-year monitoring at OU3. A ROD was signed for OU7, and an RD for OU7 was developed in FY96.

FY97 Restoration Progress

The installation completed the RA for soil and began an RA for groundwater at OU2. Five-year monitoring at OU3 continued. The RA for groundwater and off-site disposal of soil began at OU7. The installation constructed and began to operate a pump-and-treat containment system at OU8. The RA continued, began, and was completed at UST 1, UST 4, and OU1 (groundwater), respectively. The installation implemented operation and maintenance and LTM at OU7. The installation also completed the RI/FS and operated the pump-and-treat system at OU8.

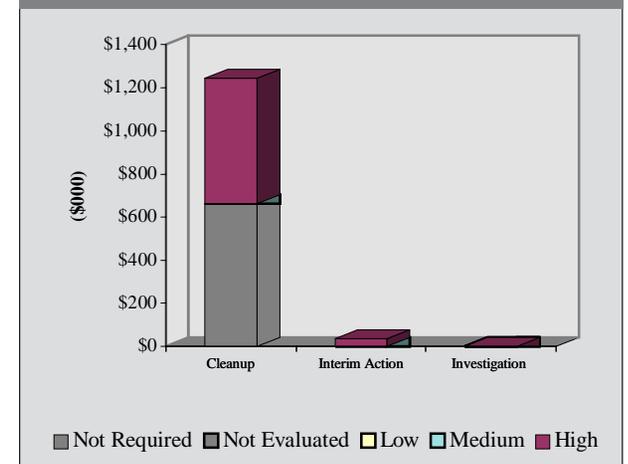
The installation was able to expedite document review by sending documents directly to RAB members. The contents of the documents were discussed with the appropriate regulatory agencies before document distribution.

Some activities scheduled for completion in FY97 were delayed because the scope of OU8 was expanded from presumptive remedies to include innovative technologies and natural attenuation.

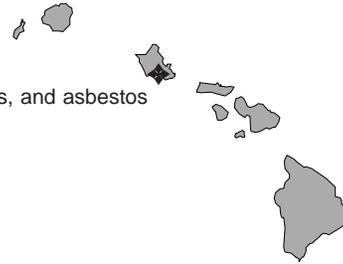
Plan of Action

- Sign the ROD, complete the RD, and begin the RA for OU8 in FY98, FY99, and FY00, respectively
- Complete RAs at UST 1 and UST 4 in FY98

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 3,833 acres
Mission: Maintain and operate facilities and provide services and material support to aviation activities and units of the operating forces
HRS Score: NA
IAG Status: None
Contaminants: PCBs, heavy metals, petroleum hydrocarbons, pesticides, solvents, and asbestos
Media Affected: Groundwater and soil
Funding to Date: \$19.3 million
Estimated Cost to Completion (Completion Year): \$46.2 million (FY2009)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2004



Barbers Point, Hawaii

Restoration Background

In July 1993, the BRAC Commission recommended closure of Barbers Point Naval Air Station. The installation is slated for operational closure in 1999.

In the early 1980s, a Preliminary Assessment (PA) identified nine sites at the installation. Contamination sources at the facility include disposal pits, a pesticide shop, a landfill, and transformer sites. Only three sites required further investigation. In FY93, an Expanded Site Inspection determined that only one of the three sites required further investigation. Primary contaminants, which affect groundwater and soil, include polychlorinated biphenyls (PCB) and heavy metals.

In FY94, the installation began the Remedial Investigation and Feasibility Studies (RI/FS) for 17 areas identified for further investigation. In the same year, after an initial site characterization, two groups of underground storage tanks (UST) were added to the sites already identified. Other USTs had been removed in FY92 and FY93. In FY95, some areas on the installation were designated for retention. Further work at the Sanitary Landfill, the Golf Course Maintenance Building, and one group of USTs will be conducted under the Navy Environmental Restoration program.

A restoration advisory board was formed in FY94. The installation also maintains an information repository, which is available to the public. A community relations plan (CRP) was prepared in FY95.

A BRAC cleanup team (BCT) was formed in FY94. The team has helped accelerate the cleanup process through BCT meetings, on-site visits, and concurrent review of documents. The BCT also decided to conduct Interim Removal Actions (IRA) at all sites requiring cleanup and to consider use of boilerplate Records of Decision when possible.

The installation completed an Environmental Baseline Survey in FY94. Nearly all property was classified as Category 7, but further investigation was required because the installation had not determined whether groundwater had been affected by historical activities. Three properties identified for further investigation during the PA were classified as Category 6. This property classification cannot be changed until the groundwater investigation is complete.

During FY96, data evaluation under the RI continued for 16 sites, and a sixth round of quarterly sampling in the groundwater investigation was completed. The installation completed a Removal Action for waste at one UST site and a corrective action plan (CAP) for another UST site. A draft land-reuse plan was developed by the Local Redevelopment Authority.

FY97 Restoration Progress

An Environmental Evaluation and Cost Analysis (EE/CA) was prepared for Site 1, and the LRP for the site was completed. EE/CAs also will be started for Sites 2 and 20. A CAP was completed at UST 6. In addition, the BCT determined that the EE/CA and the Remedial Design (RD) for Site 9 were unnecessary.

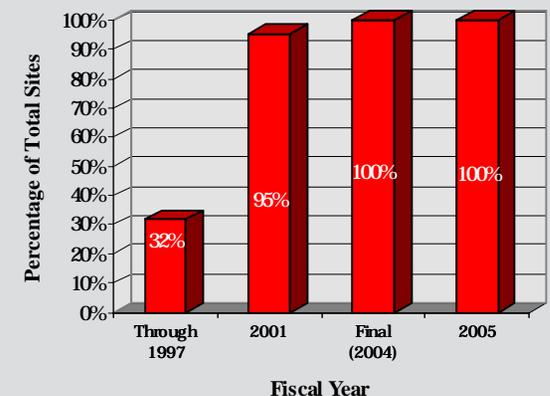
The BCT also concluded that the groundwater beneath nearly all of the base was suitable for transfer, moving most of the base out of Environmental Condition of Property category seven. Relative Risk Site Evaluations have been completed at all sites where required. The latest version of the BRAC Cleanup Plan was completed in February 1997. Three thousand acres have been identified and approved by the appropriate regulatory agencies as uncontaminated.

Some activities scheduled for completion in FY97 were delayed because of funding constraints.

Plan of Action

- Complete RI/FS at Sites 8 through 13, and 19 in FY98
- In FY98, complete EE/CAs and continue monitoring at Sites 1 and 2
- Prepare an EE/CA and complete an RD and an IRA for Site 20 in FY98
- In FY98, close UST 2 and perform quarterly monitoring at UST 6 for 1 year
- Obtain regulatory concurrence for CERFA-uncontaminated acreage in FY98
- Complete long-term monitoring (LTM) for one site in FY98 and another in FY02
- Conduct an IRA at Site 15 and begin an IRA at Site 18 in FY99
- Complete LTM for Sites 1 and 2 in FY99
- Begin LTM at Site 19 in FY03

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 5,688 acres
Mission: Maintain, repair, rebuild, store, and distribute supplies and equipment; formerly conducted industrial operations
HRS Score: 37.93; placed on NPL in November 1989
IAG Status: Federal Facility Agreement signed in October 1990
Contaminants: Heavy metals, PCBs, petroleum hydrocarbons, pesticides, herbicides, and VOCs
Media Affected: Groundwater and soil
Funding to Date: \$70.8 million
Estimated Cost to Completion (Completion Year): \$69.2 million (FY2029)
Final Remedy in Place or Response Complete Date: FY2009



Barstow, California

Restoration Background

Barstow Marine Corps Logistics Base consists of three distinct areas: Yermo Annex, Nebo Main Base, and the Rifle Range. Typical operations that contributed to contamination at the installation are vehicle maintenance, repair and maintenance of weapons and missile systems, and storage of petroleum and chemical products. The installation was placed on the National Priorities List (NPL) after high concentrations of trichloroethene (TCE) were detected in groundwater monitoring wells.

Initial Assessment Studies and other investigations conducted between FY83 and FY90 identified 38 CERCLA sites and 2 underground storage tank (UST) sites. Site types at the installation include sludge-disposal areas, plating waste disposal areas, low-level radioactive waste storage areas, spill sites, and evaporation ponds. To facilitate cleanup efforts, in accordance with the Federal Facility Agreement (FFA), the installation grouped the sites into seven operable units (OU).

OUs 1 and 2 address groundwater contamination at Yermo Annex and Nebo Main Base, respectively. After an Action Memorandum was completed in FY89, the Navy installed an activated carbon groundwater treatment system to address volatile organic compounds (VOC) in the Yermo Main Base drinking-water system. In FY93, an Interim Remedial Action at OU2 provided potable water to nearby residents. In FY93, a Treatability Study using a pilot-scale extraction well and an air-sparging system was completed at OU1 to determine the groundwater recovery rate needed to control off-base migration of the contaminant plume. During FY95, the installation conducted two pilot-scale studies at OU2, one for air sparging with vapor extraction and the other for a groundwater pump-and-treat system. In the same year, a Time-Critical Removal Action was conducted to install carbon

filtration in wells at private residences near Yermo Annex. During FY96, the installation completed construction of the groundwater treatment system at OU1 and conducted a Removal Action involving installation of carbon filtration systems in two residential wells.

OUs 3, 4, 5, and 6 address contaminated soil at 36 sites. In FY93, the installation completed a Removal Action to remove industrial waste sludge from the Oil Storage/Spillage and Industrial Wastewater Treatment Plant. The percolation ponds at Site 35 continue to be aerated, and a filter was installed to remove solvents from water before it is discharged into the ponds. In FY94, the installation conducted Removal Actions at two sites to excavate and dispose of contaminated soil. A pilot-scale groundwater treatment study was completed at a landfill site in OU3.

The installation removed 41 abandoned USTs from UST Area 1 in FY92. In FY95, the installation completed an investigation of UST Area 2. In addition during FY95, the installation conducted Remedial Investigation and Feasibility Study (RI/FS) activities at all 38 sites. EPA Region 9 initiated a RCRA Facility Assessment (RFA) at the installation. The expectation is that sites identified during the RFA will be studied under CERCLA as OU1. EPA completed the RFA for 61 sites in FY96.

In FY91, the installation formed a technical review committee, prepared the community relations plan, and established an information repository and an administrative record. Because of lack of public interest, no restoration advisory board has been formed to date.

FY97 Restoration Progress

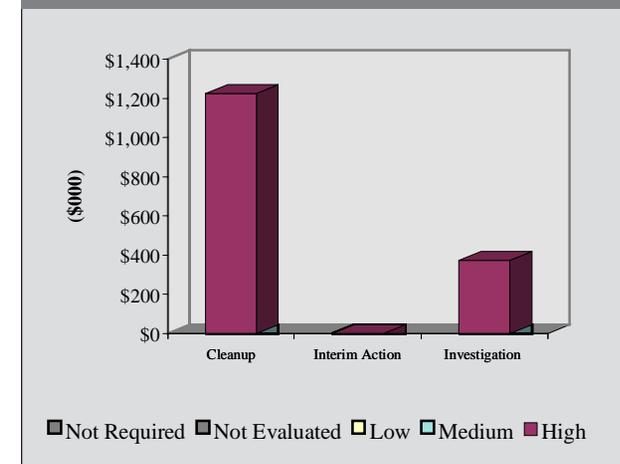
The installation completed the RI/FSs for OUs 5 and 6 and completed a Remedial Site Evaluation and a Removal Action at Site 21. In addition, it completed corrective actions at UST Area 2. The

innovative technology UV/Ozone Oxidation was implemented. The installation also participated in a successful partnering effort via the FFA, which helped to drive the program.

Plan of Action

- Complete Record of Decision for OUs 5 and 6 in FY98
- Complete a Remedial Design for Site 23 in FY98
- Complete corrective actions at UST Area 1 in FY98
- Complete Remedial Actions at Sites 20 and 23 in FY98
- Begin long-term monitoring and operation and maintenance at Yermo Annex and Nebo Main Base in FY98
- Install caps at several base landfills in FY98 and FY99

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 679 acres (437 acres upland, 242 acres of water)
Mission: Manage movement of DoD cargo
HRS Score: NA
IAG Status: None
Contaminants: Petroleum hydrocarbons, BTEX, VOCs, SVOCs, dieldrin, heavy metals, and PCBs
Media Affected: Groundwater and soil
Funding to Date: \$3.6 million
Estimated Cost to Completion (Completion Year): \$10.4 million (FY2002)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2002



Bayonne, New Jersey

Restoration Background

In July 1995, the BRAC Commission recommended that Bayonne Military Ocean Terminal be closed. The installation is scheduled to close by July 2001.

Contaminated areas identified in previous environmental studies include underground storage tanks (UST), a fire training area, a landfill, storage areas, a battery acid pit, and polychlorinated biphenyl (PCB) spill areas. Groundwater and soil are contaminated with petroleum hydrocarbons and volatile organic compounds (VOC).

In FY89, Remedial Investigation (RI) activities began at 10 sites. Interim Actions at the installation included closing the landfill, removing 450 tons of diesel-contaminated soil, and removing or recertifying PCB-containing transformers.

In FY95, the installation conducted an Environmental Baseline Survey (EBS) and formed a BRAC cleanup team (BCT).

In FY96, the installation formed a restoration advisory board (RAB) with members representing the installation, regulatory agencies, and the community. The BCT met regularly to investigate all areas of concern, to manage the basewide cleanup program, and to allow transfer of all BRAC parcels. The installation began an Environmental Impact Statement (EIS) and a Cultural and Natural Resources Investigation. The U.S. Army Corps of Engineers, Baltimore District, initiated a contract for the RIs on the basis of the EBS delineations.

FY97 Restoration Progress

By the first quarter of FY97, the installation had completed the final BRAC Cleanup Plan (Version 1) and a final Environmental Condition of Property Statement for a parcel planned for transfer to the U.S. Coast Guard. The work plan for the Light Rail Parcel was completed

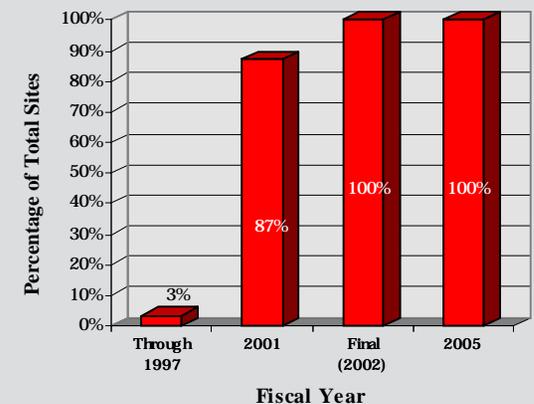
ahead of schedule because it was placed on the fast track for accelerated transfer. In addition, the cultural resources inventory was completed and received regulatory concurrence ahead of schedule. Completion of the Natural Resources Inventory and EIS, which was planned for FY97, was delayed until FY98 and FY99 respectively because the draft reuse plan was not available until October 1997.

The Army completed the EBS. Presentations to regulators before document review identified critical areas and expedited review. Issues with regulatory agencies were resolved through increased communication, including conference calls and written comments containing additional details. The BCT reviewed the EBS, established points for inclusion in the BRAC Cleanup Plan, directed the fast-track Light Rail Parcel New Jersey Transit project, conducted the bottom-up review, and reviewed and established cleanup project priorities.

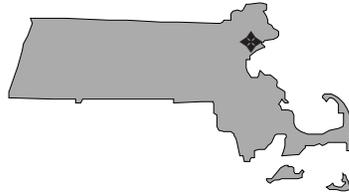
Plan of Action

- Complete the CRP in FY98
- Complete Natural Resources Inventory in FY98
- Complete Remedial Investigation/Feasibility Study requirements in FY98
- Remove PCB-contaminated soil at the OU2 LRP New Jersey Transit project in FY98
- Begin a survey of radioactive substances in FY98
- Complete the NEPA EIS in FY99
- Complete Remedial Action in FY02 at sites identified in RI/FS as requiring Remedial Action

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 46 acres
Mission: Design, fabricate, and test prototype weapons and equipment
HRS Score: 50.00; placed on NPL in May 1994
IAG Status: None
Contaminants: Acids, BTEX, incinerator ash, industrial wastes, paints, petroleum/oil/lubricants, photographic wastes, solvents, and VOCs
Media Affected: Groundwater and soil
Funding to Date: \$10.8 million
Estimated Cost to Completion (Completion Year): \$11.6 million (FY2016)
Final Remedy in Place or Response Complete Date: FY2002



Bedford, Massachusetts

Restoration Background

This government-owned, contractor-operated plant produces and tests prototype weapons and equipment, such as missile guidance and control systems. Four sites have been identified at the installation: Site 1 (incinerator ash disposal areas), containing soil contaminated with ash and heavy metals; Site 2 (components laboratory fuel oil tank), containing soil contaminated with low levels of petroleum/oil/lubricants; Site 3 (northwest groundwater plume), where groundwater is contaminated with a plume of volatile organic compounds (VOC); and Site 4 (former fuel pump/tank BTEX area), containing soil and groundwater contaminated with benzene, toluene, ethylbenzene, and xylene (BTEX).

Remedial Investigation and Feasibility Study (RI/FS) activities began in FY88, and the Phase II RI began in FY92. Development of the work plan and fieldwork continued through FY93 and FY94 to further characterize soil contamination, locate sources of the VOC groundwater plume, and characterize migration of contaminants in groundwater.

In FY95, the draft Phase II RI Report was submitted for regulatory review. A fate-and-transport groundwater model was initiated to support the risk assessment, and a Remedial Action Contract was awarded. In cooperation with the Massachusetts Department of Environmental Protection (MADEP), the Navy implemented a Remedial Action (RA), defined under state law as a short-term remedial measure, to contain and remediate the VOC groundwater plume. The treatment system, constructed under an alternative contract vehicle, is expected to prevent migration of VOCs off site.

The installation established a technical review committee (TRC) in FY89 and converted the TRC to a restoration advisory board (RAB) in FY95. A community relations plan (CRP), originally developed in

FY89, was updated in FY92. An information repository is maintained at the Bedford Public Library to provide public access to the installation's administrative record.

During FY96, the installation's RAB met bimonthly, the baseline Human Health and Ecological Risk Assessment work plan was completed and submitted to the EPA for approval, and a fate-and-transport report was completed. The RA for the pump-and-treat system at Site 3 continued through FY96, as did the installation's informal partnership and regular meetings with MADEP and EPA.

FY97 Restoration Progress

The RI supplemental field program at Site 4 began. The installation completed construction of the pump-and-treat system at Site 3 in January 1997 and began operation in March 1997. The scheduled completion date for Site 3 is FY04. The RI Phase II report elicited substantial comments from the regulatory agencies. Meetings and discussions with these regulatory agencies have continued.

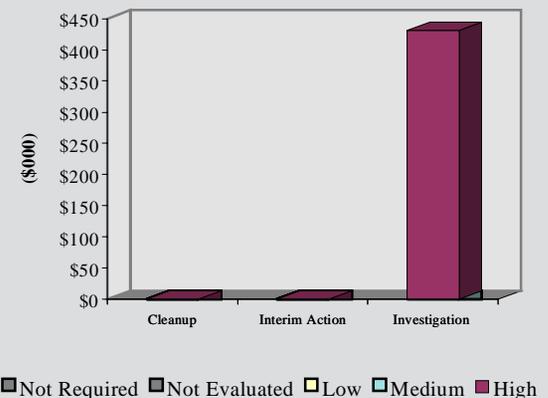
The RAB continued to meet regularly, and site tours were conducted for the public. Informal partnering will continue to expedite the decision-making process, and site tours, including a workshop, are planned to enhance community involvement.

Some activities scheduled for completion in FY97 were delayed because the RI Phase II Report had received substantial comments from the regulatory agencies. The comments have required extensive internal and external meetings to reach further agreements.

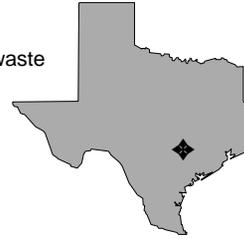
Plan of Action

- Complete the final RI Phase Report in FY98
- Complete the site management plan in FY98
- Complete the supplemental RI Phase II work plan in FY98
- In FY98, complete Records of Decision for no further action at Sites 1 and 2
- Submit the final Human Health and Ecological Risk Assessment in FY98
- Complete the RI/FS for Sites 1 through 4 in FY98
- Update the CRP in FY98

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 3,216 acres
Mission: Housed the 67th Reconnaissance Wing, 12th Air Force Headquarters, 12th Tactical Intelligence Squadron, 712th Air Support Operations Center, 10th Air Force Reserve, and 924th Fighter Group
HRS Score: NA
IAG Status: None
Contaminants: VOCs, pesticides, petroleum hydrocarbons, metals, and low-level radioactive waste
Media Affected: Groundwater and soil
Funding to Date: \$45.3 million
Estimated Cost to Completion (Completion Year): \$10.5 (FY1998)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY1998



Austin, Texas

Restoration Background

Bergstrom Air Force Base began operations in 1942, maintaining troop carrier units. In July 1991, the BRAC Commission recommended closure of the installation and retirement of the assigned RF-4 aircraft. The installation closed in late FY93, and the land reuse authority began to convert Bergstrom into a civilian airport.

Environmental studies since FY83 have identified 30 CERCLA and 451 RCRA sites. Site types include underground storage tanks (UST), landfills, fuel spill areas, a pesticide evaporation pit, firing ranges, a sludge weathering pit, aboveground storage tanks, a fire training area, and a radioactive waste disposal area. Contaminants include petroleum hydrocarbons, metals, volatile organic compounds (VOC), and pesticides, which have been released into groundwater and soil. Interim Remedial Actions include the removal of 106 USTs, the removal of contaminated soil and low-level radioactive wastes, and the closure of 45 aboveground storage tanks.

An Environmental Baseline Survey (EBS) was completed in FY93 and updated in FY95. It identified 2,919 acres as CERFA-clean, but regulatory concurrence on this designation has not been received.

A BRAC cleanup team (BCT) and a restoration advisory board (RAB) were formed in FY94. In addition, the Air Force Base Conversion Agency signed a Memorandum of Understanding governing site management and site characterization with the state regulatory agency, EPA, and the Air Force Center for Environmental Excellence.

In FY95, the installation established a strong partnership with the city of Austin and other stakeholders to accelerate the restoration process and redevelop the property. The city of Austin took the initiative in forming an executive team dedicated to resolving differences among the stakeholders. In FY96, RAB meetings were held to discuss ways

to address a trichloroethene (TCE) plume that was migrating off base and to address completion of other site cleanup activities before construction of the Austin-Bergstrom International Airport begins.

Remedial Actions (RA) included removal of remaining aboveground and underground storage tanks and oil-water separators. Soil vapor extraction and air sparging systems were installed to accelerate cleanup of groundwater plumes at a group of sites, and as a result, cleanup finished ahead of schedule. Of the 481 Installation Restoration Programs and RCRA environmental sites, 344 were designated for no further action. The installation has forwarded closure documents recommending no further action for 105 of the remaining 137 sites.

FY97 Restoration Progress

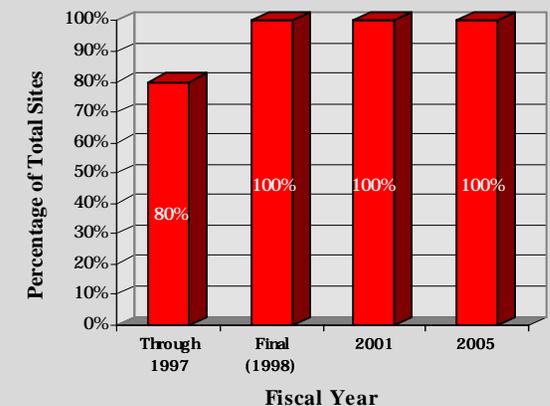
The installation completed 37 Removal Actions; cleanup of IRP Sites SS-08, SS-10, and SD17; and the latest EBS. In addition, the installation continued to work with the city of Austin, the Texas Natural Resource Conservation Commission (TNRCC), EPA, and the RAB to close out all remaining sites. The RAB was disbanded by the community members because of the successful remediation efforts at Bergstrom. Long-term monitoring (LTM) began and will continue until regulatory agencies determine that cleanup has been completed. The installation completed the air injection sparging and soil venting project to expedite cleanup. Actions for several sites under investigation were agreed upon by the TNRCC, EPA, and the Air Force through cooperative efforts. BRAC closure team meetings led to resolution of difficult remediation and investigation issues.

Some activities scheduled for completion in FY97 were delayed because of inclement weather and because of TNRCC review of projects for no-further-action determination.

Plan of Action

- Conduct and finalize remaining RAs and put in place the last remedy in FY98
- Continue LTM of TCE plume and landfills in FY98
- Establish Regional Operating Location to take over programs at Carswell AFB, Texas; England AFB, Louisiana; and Williams AFB, Arizona, in FY98
- Continue working with the city of Austin, the TNRCC, and EPA to close out the remaining 137 sites in FY98

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 7,259 acres
Mission: Provide facilities, services, materials, and aircraft for submarine warfare
HRS Score: 43.38; placed on NPL in July 1987
IAG Status: Federal Facility Agreement signed in 1989; revised in 1990 to include the state of Maine
Contaminants: DDT, PCBs, PAHs, VOCs, and metals
Media Affected: Groundwater and soil
Funding to Date: \$44.1 million
Estimated Cost to Completion (Completion Year): \$14.6 million (FY2016)
Final Remedy in Place or Response Complete Date: FY2002



Brunswick, Maine

Restoration Background

Since FY83, environmental studies have identified 19 sites at this installation. Site types include landfills, a groundwater plume contaminated with volatile organic compounds (VOC), and two underground storage tank (UST) sites. Activities that contributed to the contamination included intermediate aircraft maintenance, material support for maintenance, aircraft fueling services, storage and disposal of ordnance, and all-weather air station operations. On-site landfills were used to dispose of wastewater treatment sludge, paints, solvents, medical supplies, pesticides, petroleum products, and photographic and industrial chemicals. The installation was listed on the National Priorities List (NPL) in July 1987 because Sites 1, 2, 3, 4, 7, 8, and 9 were used for the storage or disposal of hazardous waste.

The contaminated groundwater plume associated with Sites 4, 11, and 13 (the Eastern Groundwater Plume) is believed to originate from a former fire training area; three USTs formerly used to store petroleum products and waste solvents; and a waste pit used to dispose of transformer oils, battery acids, caustics, VOCs, solvents, and paint thinners. Site Inspections were completed for 12 sites in FY85 and for 4 more between FY91 and FY95. Remedial Investigations and Feasibility Studies (RI/FS) have been completed for 14 of the 17 active sites. Remedial Design (RD) for 10 sites was completed in FY95, and one Remedial Action (RA) was completed in FY95. A Record of Decision (ROD) was signed in FY92 for an Interim Remedial Action (IRA) to address the Eastern Groundwater Plume. The IRA was completed in FY94, and operation and maintenance (O&M) of the groundwater treatment plant and extraction wells began in FY94. O&M is ongoing under the IRA.

In FY93, many USTs were removed or replaced, and work on RDs began. In FY94, the installation removed USTs from the Fuel Farm

UST site, completed pilot-scale tests at another site, and began full-scale operation of an air sparging system to remediate petroleum hydro-carbon contamination in soil.

During FY95, the installation completed a Removal Action at the former pesticide shop site where DDT had been detected in soil and unfiltered groundwater samples. Long-term monitoring (LTM) of groundwater will be conducted at the site.

In FY87, the installation established an administrative record and an information repository. In FY88, the community relations plan (CRP) was completed. The technical review committee was formed in FY88 and was converted to a restoration advisory board (RAB) in FY95. The RAB has 24 members and meets quarterly. The Navy meets with the RAB to expedite decision-making and site management. Brunswick Area Citizens for a Safe Environment, a community group, performs public oversight of the Navy's remediation efforts. The installation has held public meetings and prepared fact sheets since FY90.

In FY96, the installation constructed landfill caps at Sites 1 and 3 and developed final RAs at five sites. Three of these sites were designated as Response Complete in FY96.

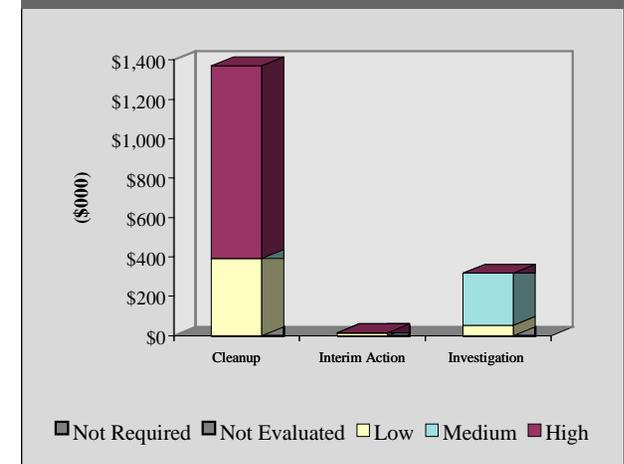
FY97 Restoration Progress

The treatment plant operations for the Eastern Groundwater Plume sites were monitored to ensure that the Interim Action was meeting its intended goals. This data review slightly delayed the final ROD, but the ROD for these sites was prepared in FY97. Changes were also recommended for the air sparging system used to remediate petroleum hydrocarbon contamination in soil at the Fuel Farm UST site. The recommendation was to focus the system on specific areas of the Fuel Farm.

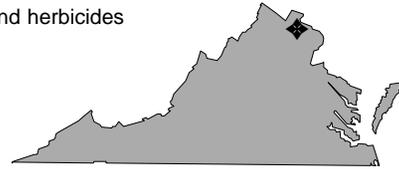
Plan of Action

- Sign final ROD for sites 4, 11, and 13 in FY98
- Complete an LTM plan, sign a final ROD, and implement LTM at Site 2 in FY98
- Expand the air sparging system for UST 2 in FY98
- Begin RD at seven sites in FY98
- Update the CRP in FY98

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 164 acres
Mission: Provided logistical and administrative support to the Military District of Washington and tenant activities
HRS Score: NA
IAG Status: None
Contaminants: VOCs, heavy metals, petroleum products, PCBs, pesticides, and herbicides
Media Affected: Groundwater and soil
Funding to Date: \$5.7 million
Estimated Cost to Completion (Completion Year): \$0.02 million (FY2002)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY1996



Alexandria, Virginia

Restoration Background

In December 1988, the BRAC Commission recommended closure of Cameron Station and relocation of its major logistical and transportation activities to Fort Belvoir, Virginia. After closure, the entire property will be returned to the community and made available for redevelopment.

In FY90, Remedial Investigation and Feasibility Study (RI/FS) activities began at the installation. Sites identified during earlier investigations include underground storage tanks (UST), polychlorinated biphenyl (PCB) and pesticide storage areas, a landfill, and burn pits. After completion of the Phase I activities, the sites were grouped into 12 operable units (OU). Petroleum hydrocarbons are the primary contaminants affecting groundwater.

Interim Actions conducted to date include removal of USTs, removal of electrical transformers containing PCBs, cleanup of the installationwide storm sewer, and removal of asbestos. RI/FS activities were completed at the installation in FY93. In FY94, Remedial Actions (RA) were completed for six OUs.

The installation formed a BRAC cleanup team (BCT) in FY93. The BCT expedited the resolution of issues, avoiding additional costs and schedule delays. To assist DoD in the base closure process, the Virginia Department of Environmental Quality (VDEQ) set up a special team to advise the installation on the restoration process. This team includes a BCT representative who acts as a contact for addressing issues related to the installation and expedites the document review process. This inclusive approach improved communication with the state.

In FY94, the installation commander formed a restoration advisory board (RAB), which worked closely with the city of Alexandria. The

installation developed a property-reuse plan to guide risk assessments and cleanup actions. The plan also helped reduce conflicts among proposed and expected uses. Regulatory agencies approved the installation's designations of CERFA-clean acreage.

In FY95, the installation and VDEQ monitored a benzene-dichloroethane plume located on the western side of the installation. Ultimately, a decision was made that the contamination originated off-post and thus required no further action by the Army. An amendment to the decision document also required no further action for the OU3 landfill, along with an agreement to regularly monitor the landfill. VDEQ approved a water discharge permit for OU5. The installation completed RAs for OUs 1 (PCBs), 4 (pesticides), and 6 (acid pits) and constructed the soil vapor groundwater extraction and treatment system for OU8 (gas station). The installation also awarded a contract to address USTs at OU12.

Also in FY95, the installation completed a comprehensive strategy to identify and implement appropriate cleanup actions. This strategy considers regulatory requirements, disposal guidelines, and the reuse goals of the local community. The BCT worked with the Cameron Station Environmental Restoration Project Team to expedite implementation of those cleanup actions by accelerating schedules, conducting concurrent Remedial Design phases, and implementing other innovative actions to address cleanup and hasten property transfer. The installation closed on schedule in FY95.

In FY96, the groundwater extraction and treatment system at OU5 continued to operate. In addition, the installation completed an Environmental Baseline Survey. The installation also completed a project for removing the remaining USTs and prepared findings of suitability to transfer for two parcels, both of which have been transferred.

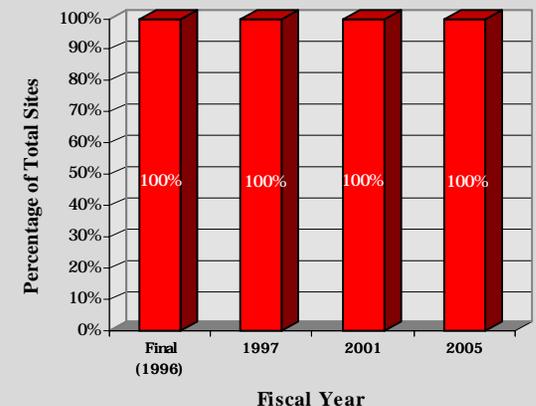
FY97 Restoration Progress

The installation continued RAs at the gas station site and at the trichloroethene-contaminated area of OU5. It also continued the 5-year monitoring program at OU3. Relative Risk Site Evaluations were completed at all sites. The installation also implemented the property-reuse plan. A transfer of parcels to private developers and the city of Alexandria was completed. The Army completed the cleanup of a leaking UST at Building 2, part of OU8, by removing the contaminated soil. A total of 36.27 acres was proposed and approved as CERFA-uncontaminated acreage in FY97.

Plan of Action

- Conduct BCT meetings to discuss progress and plan for possible closure of OU5 in FY98
- Completely sample gas station site and compare results to closure endpoints in FY98
- Continue 5-year monitoring program at OU3

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 3,020 acres
Mission: Conducted training of Active/Reserve DoD personnel
HRS Score: NA
IAG Status: None
Contaminants: Petroleum/oil/lubricants and solvents
Media Affected: Soil
Funding to Date: \$1.2 million
Estimated Cost to Completion (Completion Year): \$3.4 million (FY2005)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2005



Vancouver, Washington

Restoration Background

In July 1995, the BRAC Commission recommended closure of Camp Bonneville.

The Army identified 14 areas of concern (AOC): a leaking underground storage tank (UST) site, three landfills, a burn site, a drum burial site, a paint and solvent burial site, two wash racks, a maintenance pit, grease pits, a pesticide storage facility, and an old sewage lagoon site. The Army initiated site investigation work at the leaking 500-gallon underground petroleum storage tank.

In FY96, the Army awarded a contract for the removal of petroleum-contaminated soil at the UST site, submitted a draft Environmental Baseline Survey (EBS) for regulatory review, and completed a survey for lead-based paint and metals in soil.

FY97 Restoration Progress

The installation completed the EBS and the report on an unexploded ordnance (UXO) archive search. It also initiated an asbestos survey and submitted the report on lead-based paint and metals in soil to the regulators for approval. In addition, 2,986 acres are awaiting regulatory approval as uncontaminated.

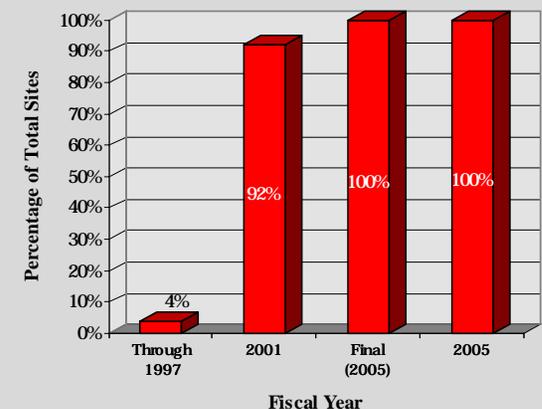
The installation's restoration advisory board became aware of, and involved in, UXO issues. An installation BRAC cleanup team was involved in document review, decision-making on site investigations, interface with the Local Reuse Authority, project prioritization, and review of applicable laws and regulations. The latest version of the BRAC Cleanup Plan was completed.

Several AOC investigations scheduled for completion in FY97 were delayed because precedence was given to initiating investigations of AOCs newly identified in the EBS.

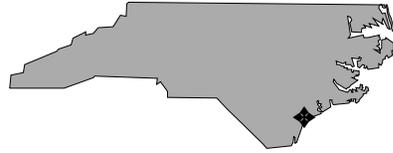
Plan of Action

- Initiate investigations of remaining AOCs in FY98
- Foster partnership with the Washington State Department of Ecology and EPA Region 10 in FY98
- In FY98, determine no-further-action sites and necessary future studies and Interim Actions
- Propose more CERFA-uncontaminated acreage in FY98
- Complete the 24 remaining Relative Risk Site Evaluations by FY99

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 151,000 acres
Mission: Provide housing, training facilities, logistical support, and administrative supplies for Fleet Marine Force units and other assigned units; conduct specialized schools and other training as directed
HRS Score: 36.84; placed on NPL in October 1989
IAG Status: Federal Facility Agreement signed in February 1991
Contaminants: Battery acid, fuels and used oils, paints and thinners, PCBs, pesticides, solvents, and metals
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: \$63.8 million
Estimated Cost to Completion (Completion Year): \$161.5 million (FY2098)
Final Remedy in Place or Response Complete Date: FY2009



Jacksonville, North Carolina

Restoration Background

Investigations at this installation have identified 176 sites, including 86 leaking underground storage tank (UST) sites. Contaminants released from past storage and disposal operations at the installation have migrated to a shallow aquifer, several surface water bodies, and a deep aquifer that is used for drinking water.

In 1991, a Federal Facility Agreement under CERCLA was signed. Since then, 18 operable units (OU), comprising 42 of the 91 installation restoration (IR) sites, have been identified as requiring additional investigation or remediation.

Since FY83, the installation has completed an Initial Assessment Study for 72 sites and Site Inspections (SI) for 8 sites, conducted 26 Remedial Investigations and Feasibility Studies (RI/FS), signed Records of Decision (ROD) for 19 sites, and completed Remedial Design (RD) for 4 sites. The installation also completed an Interim Remedial Action (IRA) for two sites and four Time-Critical Removal Actions (TCRA).

The installation formed a technical review committee in FY88 and converted it to a restoration advisory board (RAB) in FY95. The installation completed a community relations plan in FY90 and established an information repository and an administrative record in FY91.

Since FY88, the installation's UST program has completed site assessments (SA) at 76 sites and corrective action plans (CAP) at 34. Remediation systems have been designed and implemented at 23 sites, and active remediation systems are in place at 16. The installation has requested closure and no further action at 26 sites. Eleven UST sites have been passed to the installation's IR program for further action.

FY97 Restoration Progress

An RI Phase I investigation was completed at 6 sites, and RIs were completed at 12 sites. A groundwater modeling study was completed; air sparging and in-well aeration Treatability Studies (TS) were completed for two sites; a surfactant-enhanced aquifer remediation TS was initiated; and a TCRA for polychlorinated biphenyl (PCB)-contaminated soil was initiated. Long-term monitoring (LTM) was performed at nine sites, and long-term operations (LTO) were conducted at three sites. Final Record of Decisions (RODs) were signed for four sites. The final RODs for OU6 and OU9 were delayed because of the need for additional sampling and for a groundwater modeling study, respectively.

The SA phase was completed at five UST sites. One was determined to require no further action. The DES was completed at four UST sites, and the installation management plan was completed at three others. Corrective action is in progress at 12 UST sites.

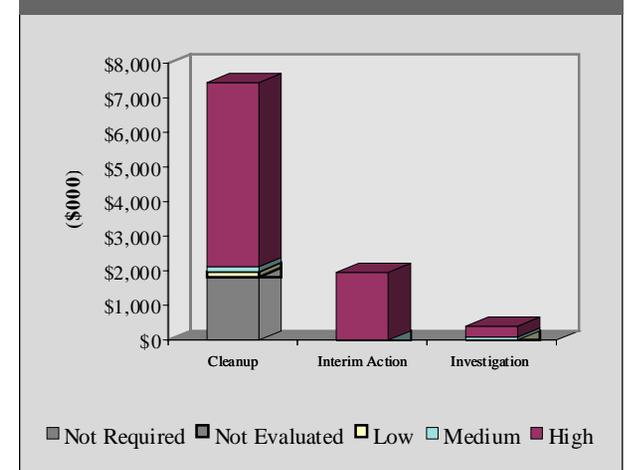
Regulatory review of documents has been expedited through regular partnering meetings. RAB members are provided with program status updates, informed of publication of technical documents, and encouraged to ask questions about any aspects of the program.

Plan of Action

- Continue LTO at three sites in FY98
- Continue LTM at eight sites in FY98
- Initiate LTM at Site 3 in FY98
- After demonstration of no remaining contaminants of concern, discontinue LTM at Site 24 in FY98
- Initiate natural attenuation program at five sites in FY98

- Complete TS at two sites and Remedial Action (RA) for Site 3 in FY98
- Complete TCRA for three sites in FY98
- Complete IRA for Site 35 and Engineering Evaluation and Cost Analysis for Site 88 in FY98
- Complete RD for three sites in FY98
- Sign final ROD for 12 sites in FY98
- Complete response at UST 17 and SA at UST 65 in FY98
- Complete CAPs at six USTs in FY98
- Complete additional design work at UST 13 in FY98
- Complete IRA at USTs 10 and 33 in FY98
- Designate three USTs as requiring no further action in FY98
- Employ innovative technology at UST 78 in FY98
- Complete DES at USTs 9 and 50 and initiate it at UST 62 in FY98
- Continue operation and maintenance at 22 USTs in FY98

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 125,000 acres
Mission: Provide housing, training facilities, logistic support, and administrative support to Fleet Marine Force Units
HRS Score: 33.79; placed on NPL in November 1989
IAG Status: Federal Facility Agreement signed in October 1990
Contaminants: Pesticides, herbicides, heavy metals, PCBs, and VOCs
Media Affected: Groundwater and soil
Funding to Date: \$86.1 million
Estimated Cost to Completion (Completion Year): \$109.4 million (FY2010)
Final Remedy in Place or Response Complete Date: FY2010



Oceanside, California

Restoration Background

Environmental contamination at Camp Pendleton Marine Corps Base resulted from maintenance of vehicles and equipment used to fulfill the installation's mission and from such support facilities as gas stations, hospitals, laundries, pest control services, and hobby shops. Wastes generated by these operations were disposed of in various locations throughout the installation. Site types at the installation include landfills, surface impoundments, pesticide storage areas, fire training areas, vehicle maintenance areas, and underground storage tanks (UST). The installation was placed on the National Priorities List (NPL) after the herbicide 2,4,5-TP (Silvex) was detected in two groundwater wells used to supply drinking water.

Of the 200 sites identified at the installation, 61 are CERCLA sites, 109 are RCRA sites, and 30 are UST program sites. The installation has completed Remedial Investigations and Feasibility Studies (RI/FS) for 27 CERCLA sites. RI/FSs for the remaining 34 sites are under way. The installation has completed Remedial Designs (RD) for three sites. A Removal Action (the final cleanup action) at one of those sites was completed in FY95. The Removal Action for the remaining two sites was delayed because of funding cutbacks and a change in treatment standards.

In FY95, the installation conducted an additional Removal Action at two surface impoundment sites to remove liquids, sludge, and liners. The installation also began Interim Remedial Actions (IRA) at UST Site 1 (which includes 30 USTs located throughout the installation) to remove soil and initiate bioremediation. Soil vapor extraction was initiated at nine other UST sites, and a draft Interim Record of Decision (ROD) was completed for four sites (Operable Unit [OU] 1).

The installation has developed partnerships with state and federal regulatory agencies. To facilitate review of documents, cleanup

decisions are made in advance through discussions with these agencies. The installation formed a technical review committee (TRC) and prepared a community relations plan in FY92. Although the TRC is active and members of the community participate, interest has been insufficient to support formation of a restoration advisory board.

During FY96, the installation completed RI/FSs for 21 sites and an FS for 13 sites and signed the final ROD for no further action at OU1. All parties to the Federal Facility Agreement (FFA) signed the final ROD. The FFA project team met several times to discuss the restoration program. The team shifted the program's focus from a traditional RI/FS approach to cleanup. It also identified five Removal Actions, closed six sites, accelerated the remediation schedule by 2 years, and decreased the investigation budget by \$3 million for the fiscal year.

The installation completed an Engineering Evaluation and Cost Analysis (EE/CA) and Action Memorandum for the pest control washrack and scrap yard sites and for Site 7 (the Box Canyon Landfill). The installation initiated IRAs for three sites, completed the initial site characterization at 25 UST sites, and completed the investigation phase and prepared a corrective action plan for four UST sites.

FY97 Restoration Progress

RIs were completed at 34 sites and a ROD signed for 13 sites. IRAs were completed at the pest control washrack and scrap yard sites. EE/CAs for five sites and Removal Actions for five sites were completed ahead of schedule. Soil stabilization aided in cleanup of pesticide-contaminated soil. The use of innovative technologies such as this led to the completion of cleanup at two sites.

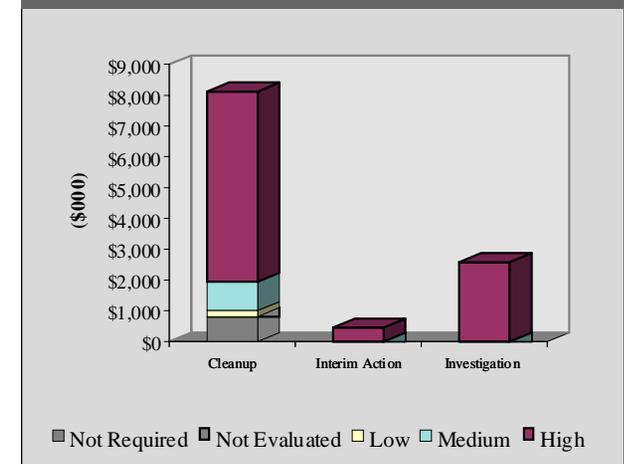
The FFA team used concurrent document review to expedite the review process. This, coupled with extensive teamwork, team field

involvement, and intense issue-focused meetings, allowed the FFA to complete difficult Removal Actions, resolve problems, and make real-time decisions.

Plan of Action

- Complete FSs at the remaining 34 sites in FY98
- Complete IRAs in FY98 at the Box Canyon Landfill
- Sign ROD for all remaining sites in FY98
- Begin implementation of a landfill cap in FY98

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 2,777 acres
Mission: Train tanker crews and service KC-135 stratotanker
HRS Score: 37.93; placed on NPL in July 1987
IAG Status: IAG signed in 1989
Contaminants: Spent solvents, PCBs, petroleum/oil/lubricants, pesticides, cyanide, and cadmium
Media Affected: Groundwater and soil
Funding to Date: \$103.7 million
Estimated Cost to Completion (Completion Year): \$92.9 million (FY2029)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2001



Merced, California

Restoration Background

In July 1991, the BRAC Commission recommended closure of Castle Air Force Base. The installation was closed on September 30, 1995.

Preliminary Assessment and Site Inspection activities have identified landfills, underground storage tanks (UST), discharge areas, chemical disposal pits, fire training areas, fuel spill areas, and six polychlorinated biphenyl (PCB) spill areas at the installation. Groundwater and soil contaminants included spent solvents, such as trichloroethene (TCE), and petroleum/oil/lubricants (POL), pesticides, cyanide, and cadmium.

Interim Actions conducted at the six PCB-contaminated spill areas consisted of excavating contaminated soil and disposing of that soil off site. Other Interim Actions consisted of installing potable water supply wells and groundwater filtration systems to remove TCE from the groundwater and removing 30 USTs. In FY86, Remedial Investigation and Feasibility Study (RI/FS) activities were initiated, and sites were grouped into four operable units (OU). In FY91, the installation submitted Records of Decision (ROD) for OU1 and OU2.

In FY93, additional areas of concern (AOC) were identified through aerial photographs, a RCRA Facility Assessment, and a contaminant source assessment. AOCs were incorporated into the Source Control OU. The installation completed Remedial Design (RD) activities at OU1 and initiated a Remedial Action (RA), which involved constructing a groundwater extraction and treatment system, capping inactive production wells, and removing abandoned USTs. The draft RI/FS Report for the basewide OU was submitted in FY94.

In FY95, the installation began operating soil vapor extraction (SVE) systems at two fuel spill areas. A pump-and-treat system also was implemented as part of the Removal Action for OU2. The installation

continued RI/FS efforts for the Source Control OU (SCOU), which includes seven landfills that have been selected tentatively for application of presumptive remedies.

The installation identified 216 acres as CERFA-clean, completed its Environmental Baseline Survey, and received concurrence on the CERFA-clean acreage.

A BRAC cleanup team (BCT) and a restoration advisory board (RAB) have been formed. Monthly RAB meetings provide a forum for dialogue with stakeholders. In FY95, the installation held two partnering sessions with regulatory agencies to examine ways of streamlining the management process.

In FY96, a Relative Risk Site Evaluation fact sheet was developed and distributed to RAB members. A report was completed that sets priorities among sites and includes comments from the BCT. The installation also obtained the approval of regulatory agencies for a presumptive remedy approach to landfills. Part 1 of the RI/FS Report was completed in FY96. The installation removed 69 USTs and 16 oil-water separators. RD/RA activities continued, including installation of two additional SVE systems and the capping of Fire Training Area 1. The pump-and-treat system at OU1 was expanded.

FY97 Restoration Progress

The installation completed construction of the pump-and-treat system at OU2. The use of geoprobe technology accelerated fieldwork efforts. Fast-track cleanup helped expedite document review and resolve issues with regulatory agencies. Abbreviated Air Force review schedules also helped expedite site characterization. In FY97, the RAB met monthly and provided community input.

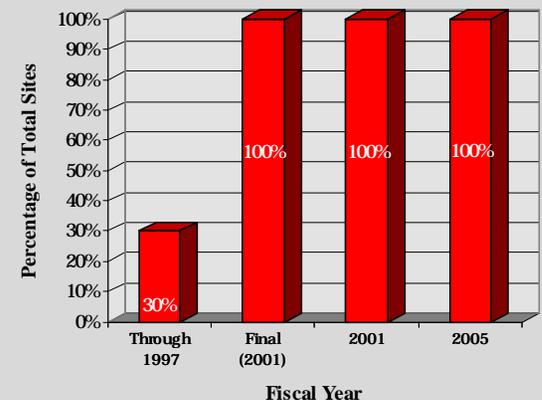
The BCT completed the SCOU RI/FS and the CB Part I ROD, completed a draft final RD/RA landfill work plan, provided the SCOU Proposed Plan for public comment, and placed four more sites in Removal Action status.

Some activities scheduled for completion in FY97 were delayed because of contractor delays. Control mechanisms for a groundwater contaminant plume are in place and operating, but the plume has been difficult to define. Lack of funds also caused delays.

Plan of Action

- Update the BRAC Cleanup Plan in FY98
- Determine the effect of municipal wells on plumes and develop control mechanisms in FY98
- Clean contaminated sediment from storm drains in FY98
- Repair the sanitary sewer system in FY98
- Initiate variable oversight training in FY98
- Cap and monitor for landfills in FY98
- Use intrinsic remediation for POL sites in FY98
- Continue SCOU ROD and RD/RA work plan in FY98
- Continue CB Part II RI/FS, Proposed Plan, and ROD in FY98
- Continue RD/RA activities in FY98 and FY99
- Achieve Remedial Action in Place status by the end of FY00

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 31,366 acres
Mission: Provide facilities, services, and material support for maintenance of Naval weapons and aircraft
HRS Score: 31.99; placed on NPL in November 1989
IAG Status: Federal Facility Agreement signed in November 1990
Contaminants: Waste fuel oil, solvents, heavy metals, halogenated aliphatics, phthalate esters, SVOCs, and lead
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: \$20.9 million
Estimated Cost to Completion (Completion Year): \$30.0 million (FY2003)
Final Remedy in Place or Response Complete Date for BRAC Sites : FY2002



Jacksonville, Florida

Restoration Background

In July 1993, the BRAC Commission recommended the FY99 closure of this installation and relocation of its aircraft, personnel, and equipment to other stations.

Since FY84, environmental investigations have identified 18 CERCLA sites; 6 major underground storage tank (UST) sites; 250 BRAC grey sites; 235 USTs to be removed, including contamination assessment; and 1 RCRA site. Typical operations that caused contamination at the installation include equipment maintenance, storage and disposal of fuel and oil, fire training, and training on target ranges.

Site Inspections were completed for all 18 CERCLA sites in FY88, and Remedial Investigation and Feasibility Study (RI/FS) activities began in FY93. The installation grouped 12 of the sites in seven operable units (OU), based on the type of waste disposed of and/or the profile of the suspected contaminants. The six remaining CERCLA sites are being investigated and remediated individually.

A BRAC cleanup team was formed in FY94. The installation's technical review committee was converted to a restoration advisory board in FY94.

A finding of suitability to lease (FOSL) was signed for 60 acres in the Yellow Water Weapons Area. The installation also completed soil removal at the North Tank Fuel Farm and installed a bioslurper during FY96.

FY97 Restoration Progress

The RI for Site 10 was completed, and the Record of Decision (ROD) was signed by the Navy. The final RI/FS (including a Baseline Risk Assessment) for Sites 7 and 8; the final RI for Sites 11, 14, and 15; and the final FS for Site 3 were completed. Removal of Day Tank 2, the Jet Engine Test Cell soil, the 103rd Street Pipeline, Site 18 unexploded ordnance (UXO), and 29 miscellaneous tanks was completed early. Other restoration activities at the installation include multiple site screenings, completion of the North Fuel Farm, the Day Tank 1 Remedial Action Plans (RAP), and the Baseline Risk Assessment; and signing of a no further action ROD for Site 10. In addition, the Remedial Design (RD) was completed for Site 17, and corrective actions for three UST sites were completed. Regulatory agencies approved 17,005 acres as CERFA-uncontaminated.

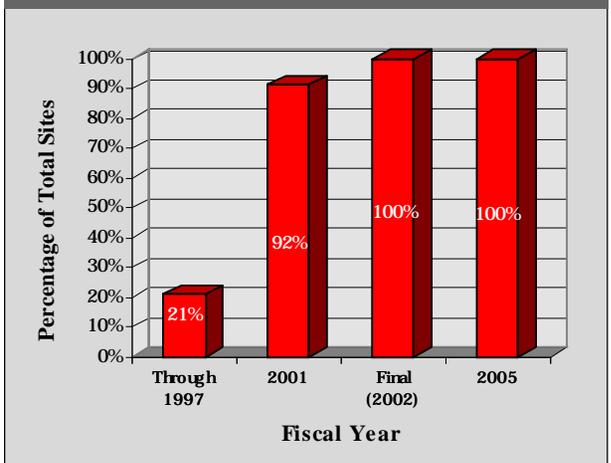
Site management improvements include two databases developed to track BRAC grey sites and action items, a decision document to formalize the implementation of Data Quality Objectives and developing cleanup proposals through small subcommittees, thus decreasing the time that the team as a whole spent on one issue. Also, the installation developed and implemented metrics to measure cleanup progress and developed a general information report to consolidate RI/FS information. Lake Fretwell was removed from the State Health Advisory List.

The high cost of some actions scheduled for FY97 necessitated their delay and reevaluation. The Site 5 Interim Remedial Action (IRA) was terminated because of its high operation and maintenance costs, and an alternative Remedial Action was developed. The installation postponed RI/FS goals at several sites in order to seek and study cheaper, quicker, and smarter cleanup methods.

Plan of Action

- Complete RD for three sites; RODs for six sites; IRA for Site 5; RI/FS for Site 4; remediation of all grey sites; and IRAs, designs, and corrective action plans for three UST sites in FY98
- In FY98, submit to team no-further-action reports for Sites 4, 9, 12, 18, and 19; FS for two sites; RI for two sites; Day Tank 2 contamination assessment report and RAP; and screening data for six sites
- Submit and implement groundwater RD for three sites in FY98
- Remove contaminated soil from two sites in FY98
- Begin RI/FS at Site 6 in FY98
- Conduct 20 Removal Actions at various BRAC grey sites in FY98
- Prepare approximately 20 findings of suitability to transfer and FOSLs in FY98
- Implement soil and groundwater remediation at South Fuel Farm in FY98
- Initiate groundwater remediation at Jet Engine Test Cell and Tank 199 in FY98
- Perform contamination assessment and develop report for 85 BRAC grey tank sites in FY98

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 2,125 acres
Mission: Served as technical training center
HRS Score: NA
IAG Status: IAG signed in September 1990
Contaminants: Petroleum/oil/lubricants, VOCs, chlorinated solvents, and metals
Media Affected: Groundwater, soil, and sediment
Funding to Date: \$40.2 million
Estimated Cost to Completion (Completion Year): \$41.8 million (FY2001)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2001



Rantoul, Illinois

Restoration Background

Chanute Air Force Base was one of five Air Training Command Technical Training Centers providing specialized training for officers, airmen, and civilian employees of the Air Force and for other DoD agencies. In December 1988, the installation was recommended for closure. A Record of Decision for reuse of the base was signed in FY91, and closure occurred in September 1993. The majority of the installation has been licensed to the village of Rantoul for use as an airport.

Environmental studies conducted between FY82 and FY92 identified 69 sites at the facility, including landfills, 4 of which cover a total of approximately 71 acres, and a fire training area that covers approximately 9 acres. Other site types include oil-water separators, additional fire training areas, a petroleum sludge disposal pit, jet engine test cells, and underground storage tanks (UST). The primary contaminants are petroleum/oil/lubricants (POL), which are contaminating the upper glacial tills and shallow groundwater. Other contaminants are volatile organic compounds (VOC) and trichloroethene (TCE).

Interim Actions at the base have included removal of USTs, pipelines, and contaminated soil at all UST sites; removal of sludge and contaminated soil at a sludge pit; and removal of oil-water separators. In FY95, the installation completed a Treatability Study at 14 former UST sites and treated 60,000 tons of fuel-contaminated soil at those sites, using low-temperature thermal volatilization. The base also installed and sampled off-base background wells to establish background levels and to determine whether base groundwater is contaminated with metals. All remaining sites at the installation were ranked according to the Relative Risk Site Evaluation process.

The village of Rantoul, Illinois, Aviation and Development Group, completed a reuse plan for the facility. As a result of the Local Redevelopment Authority's efforts, an operating civilian airport has been established on former property of the installation, and all aviation support facilities have been leased, with the exception of Buildings 68 and 850.

In FY96, a Remedial Investigation (RI) Report for 11 sites was submitted to the state of Illinois. Further investigation is required for those sites because the RI and the RI Report were determined to be flawed. Also in FY96, the installation initiated a groundwater extraction and treatment system at Building 700, a former UST site. Several parcels within Operable Unit (OU) 1 were designated as suitable for transfer. Since low concentrations of metal were shown in the resampling of three wells, transfer of the OU1 properties by deed proceeded. Cleanup operations continue at OU2.

The installation began a Remedial Design for the TCE spill and fire training sites. In addition, planning began at former UST sites for a Removal Action for soil still contaminated with fuel. Bioremediation and intrinsic bioremediation Treatability Studies for the Building 952 area spill site were designed and implemented.

The installation formed a BRAC cleanup team (BCT) and a restoration advisory board (RAB) in FY94. RAB meetings cover the progress of the ongoing RIs and address concerns of community members. Throughout FY96, RAB members were kept informed of the environmental studies and cleanup operations on the base.

FY97 Restoration Progress

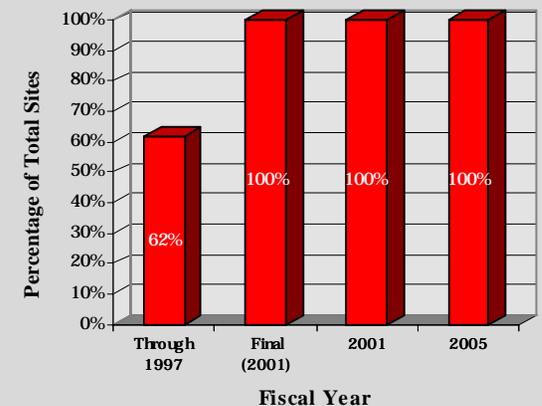
Two early actions and a site cleanup were completed. In addition, the Feasibility Studies for natural attenuation at the Building 952 area continued. The installation contracted with an engineering and research firm to expedite cleanup. The BCT continued to meet monthly and reviewed and updated the BRAC Cleanup Plan. The BCT also developed a long-term schedule for cleanup, monitored progress on current projects, and oversaw the contracting of upcoming projects.

Some activities scheduled for completion in FY97 were delayed because more-detailed studies were required at several sites. Removal Actions are ongoing.

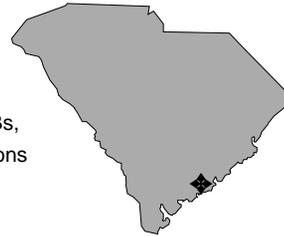
Plan of Action

- Continue Removal Actions at Fire Training Area 2 and Buildings 916, 922, 927, 932, and 975/995 in FY98
- Submit FSP for Landfill 14 in FY98
- Complete area survey and geophysics for landfills in FY98
- Complete CPT and soil gas for landfills in FY98
- Complete latest version of Environmental Baseline Survey in FY98
- Complete RI activities at 11 sites in FY99

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 4,678 acres
Mission: Repair, maintain, and overhaul Navy ships
HRS Score: NA
IAG Status: None
Contaminants: Asbestos, cyanide, decontaminating agents, heavy metals, paints, PCBs, pesticides, petroleum/oil/lubricants, solvents, and petroleum hydrocarbons
Media Affected: Groundwater, sediment, and soil
Funding to Date: \$14.6 million
Estimated Cost to Completion (Completion Year): \$27.3 million (FY2003)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2001



Charleston, South Carolina

Restoration Background

The Charleston Naval Complex houses five major naval commands (the Naval Shipyard [NSY], the Naval Station [NS], the Naval Fleet and Industrial Supply Center [FISC], the Fleet and Mine Warfare Training Center [FMWTC], and the Naval Reserve Center [NRC]), as well as several small organizations. In July 1993, the BRAC Commission recommended closure of the property and the majority of the commands. Operational closure of the complex was completed on April 1, 1996.

The primary sites of concern at the installation are areas that were used as landfills or disposal pits without controls for runoff and leachate. The complex was divided into 12 zones. There are 115 RCRA solid waste management units (SWMU) and 161 underground storage tanks (UST) at the complex. Two UST sites, one at FMWTC and the other at NRC, are Response Complete. These sites are located in 10 of 12 zones. The first 10 zones also include hundreds of areas of concern (AOC) undergoing confirmatory sampling. Zones J and L, which are currently in the RCRA Facility Investigation (RFI) stage, contain the waterside areas and the sanitary sewer system, respectively, both of which may include contamination from any site or AOC. All cleanup activities are conducted as RCRA corrective actions. Tank removals are being accomplished under the BRAC program and not necessarily under the UST program. The UST program includes sites at which soil or groundwater contamination has been identified. The installation has completed initial site characterizations for all UST sites; cleanup has been completed at two UST sites and is under way at two others.

The BRAC cleanup team (BCT), formed in FY94, has been instrumental in accelerating the cleanup process by providing an on-site decision-making team. Two reuse groups have been formed, one

representing the local community and the other a state agency. A land reuse plan was developed and approved, and transfers of property to other federal agencies, as well as leases to private businesses, were completed for much of the installation property.

The installation converted its technical review committee (TRC) to a restoration advisory board (RAB) in FY94. The 22 members of the RAB meet bimonthly. The community relations plan has been updated to include all SWMUs.

During FY96, the BCT completed a BRAC Business Plan, in lieu of the BRAC Cleanup Plan, to outline the environmental restoration status, strategies, and goals. The installation also completed an Environmental Baseline Survey (EBS). An Environmental Impact Statement was completed and a Record of Decision signed. The RCRA Facility Assessment (RFA) was completed for three SWMUs. One Interim Remedial Action (IRA) was completed and two more were initiated at one UST site at the NS. A corrective action plan (CAP) was completed at another UST site at the NS. Fifty-four tanks were removed during the fiscal year.

FY97 Restoration Progress

RFAs were completed for 64 SWMUs at the installation. Corrective measures studies (CMS) and RFIs were completed for 60 SWMUs, and 12 corrective measures designs (CMD) were completed. Corrective measures implementation (CMI) was completed for seven sites. Site Assessments, a CAP, and CMDs were completed for three USTs. In addition, 50 tanks were removed.

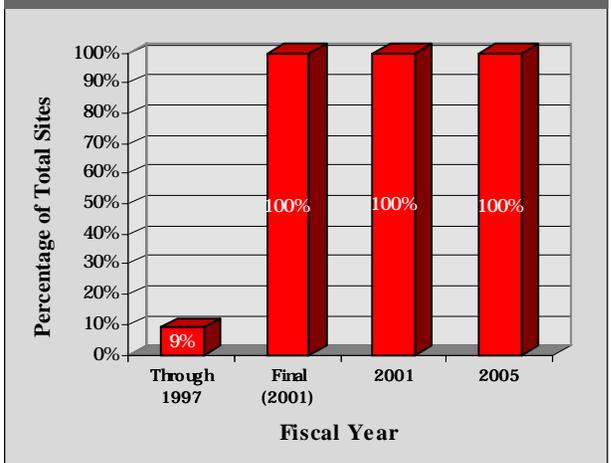
To expedite site characterization, a geoprobe was used to collect soil and groundwater samples. Site management was improved through recycling of waste oil and scrap metals and disposal of nonhazardous waste materials recovered from interim removal sites. The BCT

conducted monthly meetings at which progress of the environmental investigation was addressed and consensus decisions made with regulatory agencies. The BRAC Business Plan and the EBS were updated. At RAB meetings, the community was given the opportunity to rank remedy alternatives presented in the CMS.

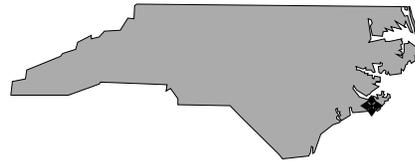
Plan of Action

- In FY98, complete CMDs for 35 SWMUs, RFIs and CMSs for 53 SWMUs, CMI for 10 SWMUs, IRAs for 4 SWMUs, four IRAs at 2 UST sites, and a CAP for 1 UST site
- Remove the final 37 tanks in FY98
- Implement iron curtain technology for chlorinated solvent cleanup in FY98
- Update BRAC Business Plan in FY98

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 27,715 acres
Mission: Maintain and operate support facilities; provide services and materials for marine aircraft
HRS Score: 70.71; placed on NPL in December 1994
IAG Status: Federal Facility Agreement under negotiation
Contaminants: PCBs, petroleum hydrocarbons, and solvents
Media Affected: Groundwater and soil
Funding to Date: \$41.0 million
Estimated Cost to Completion (Completion Year): \$84.0 million (FY2020)
Final Remedy in Place or Response Complete Date: FY2012



Cherry Point, North Carolina

- Complete the stationwide QAP, decision document, and site description document in FY98
- In FY98, create a 3-month calendar-type plan that includes all submissions, reviews, meetings, and phone conversations to help manage workload for all team members in FY98
- Hold RAB training and develop a newsletter in FY98

Restoration Background

The station conducted an Initial Assessment Study in FY83 that identified 32 sites. A RCRA Facility Assessment performed in FY88 identified 114 solid waste management units. The installation and EPA negotiated a Consent Order in FY90 in which the Navy and EPA agreed to perform additional investigations at 32 of the 114 sites.

The installation characterized 22 underground storage tank (UST) sites between FY91 and FY95 and completed corrective action plans (CAP) for 2 UST sites in FY93 and 1 UST site in FY94. During FY95, a corrective measures study was initiated for five sites and completed for one site. The installation completed corrective measures implementation for two sites and a Time-Critical Removal Action for one site. Characterizations were completed for three UST sites, and a CAP was completed for one UST site.

The technical review committee, established in FY91, meets once a year. Two information repositories were established in FY93, one at the Havelock Public Library and the other at the installation's library. The installation's restoration advisory board (RAB), established in FY95, meets quarterly. A community relations plan also was completed in FY95. The installation has established a formal partnering process with EPA Region 4 and the state of North Carolina. This process helps reduce review times, supports a streamlined site management plan, and accelerates cleanup.

During FY96, the installation completed Remedial Investigation/ Feasibility Studies (RI/FS) for two sites and nine Proposed Remedial Action Plans (PRAP). CAPs were completed at six UST sites, and designs were completed at three UST sites. A Baseline Risk Assessment is ongoing for all sites.

FY97 Restoration Progress

The RI/FS was initiated for two sites and completed for four additional sites. PRAPs were prepared for two sites and completed at three additional sites. Remedial Action (RA) was initiated for eight sites and completed for four additional sites. An Engineering Evaluation and Cost Analysis was completed for one site. Three Records of Decision (ROD) were completed, but signatures are pending because of a deed restriction.

The following innovative technologies were implemented at the installation: a horizontally drilled product slurping system installed beneath an aircraft hangar and natural attenuation for a 40-acre contaminated landfill. A facilitywide process for developing and maintaining the quality assurance plan (QAP), site background data and decision documents has been established to streamline fieldwork.

An air sparging/soil vapor extraction system to remediate groundwater and prevent migration of contaminants to surface water is planned.

Some activities scheduled for completion in FY97 were delayed because the UST program is using the CAPs for the designs.

Plan of Action

- Initiate RODs for two sites and sign RODs for six sites in FY98
- Complete Interim Remedial Actions (IRA) for nine sites in FY98
- Complete the RI/FS and PRAP and sign the ROD for two sites in FY98
- Initiate the IRA and Remedial Design for one site in FY98
- Initiate the RA for one site in FY98
- Complete Corrective Measures Designs for three sites in FY98

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 352 acres
Mission: House 126th Air Refueling Wing (Illinois Air National Guard) and Defense Logistics Agency; formerly housed 928th Airlift Wing (Air Force Reserve)
HRS Score: NA
IAG Status: None
Contaminants: VOCs, SVOCs, PNAs, petroleum hydrocarbons, metals, and low-level radioactive waste
Media Affected: Groundwater and soil
Funding to Date: \$3.6 million
Estimated Cost to Completion (Completion Year): \$0.1 million (FY2009)
Final Remedy in Place or Response Complete Date: FY2004



Chicago, Illinois

Restoration Background

Chicago O'Hare International Airport Air Reserve Station began operations in 1942 as an aircraft assembly plant. The plant was deactivated in 1945, and the Air Force Reserve (AFRES) and the Air National Guard (ANG) began flying activities in 1946, and 1954, respectively.

The 1993 BRAC Commission recommended closure of this station contingent upon receipt of funding from the city of Chicago. In late 1996, the Air Force and the city of Chicago signed a purchase agreement, which began official closure activities. Accordingly, the 928th Airlift Wing (AFRES) was deactivated on June 30, 1997, leaving the 126th Air Refueling Wing (ANG) as host for the station and its environmental programs. Most of the 126th are expected to relocate to Scott AFB in Illinois. The station will be fully closed by July 1999.

The Air Force and the city of Chicago are working closely to coordinate the environmental investigations and cleanup with property transfers. By the closure date, it is anticipated that the entire station will have been conveyed to the city, either by lease or deed. The city plans to use the property for airport and airport-related purposes, further enhancing the operations and the commercial activities at Chicago O'Hare International Airport.

Environmental cleanup studies at the station began in 1983. To date, 14 Installation Restoration Program (IRP) sites have been identified. Site types include underground storage tanks (UST), landfills, fuel spills, aboveground storage tanks (AST), a fire training area, and a low-level radioactive waste disposal area. Primary contaminants are petroleum hydrocarbons, metals, PNAs, volatile organic compounds (VOC), and semivolatile organic compounds (SVOC), which have been released into soil and groundwater.

Interim Remedial Actions to date have included removal of 21 USTs, contaminated soil, and low-level radioactive waste. Eleven ASTs also have been closed. Remedial Actions include removal of eight ASTs and partial on-site remediation of the South petroleum/oil/lubricant (POL) facility. Of the other 13 IRP sites, 10 will be recommended for no further action (NFA), 1 is planned for long-term monitoring (LTM), and 2 will require additional testing.

FY97 Restoration Progress

A Base Closure and Transition Team (BCTT) was formed in early FY97. A BCTT is similar to a BRAC cleanup team (BCT) in that it is composed of the BRAC environmental coordinator, the Illinois EPA, and EPA. The Air Force has established a strong partnership with the city of Chicago and the other stakeholders. State and federal regulatory agencies have agreed to help the Air Force meet the city's schedule by means of the fast-track process.

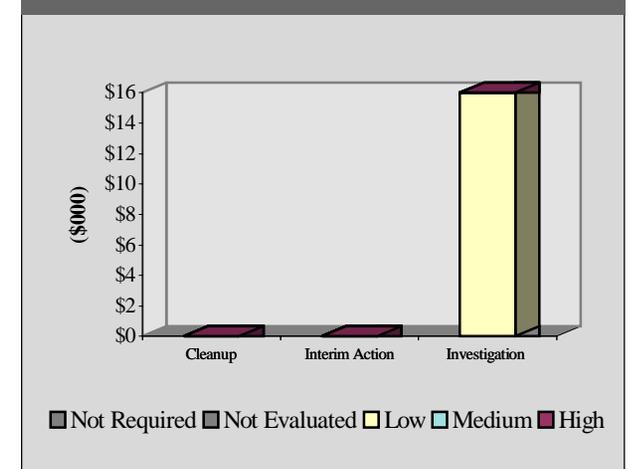
A restoration advisory board (RAB) also was formed in FY97 and met in June and July. The RAB has shown interest in all aspects of the investigation, cleanup, and long-term protection activities.

A stationwide Phase I Environmental Baseline Survey (EBS-PI) was completed in January 1997. The EBS-PI identified approximately 228 acres as CERFA-clean. EBS Phase II supplements are being prepared as investigations and cleanup occur and property transactions are developed.

Plan of Action

- Complete parcel-specific EBS for Parcels 2 and 3A, and issue finding of suitability to lease (FOSL) for property in FY98
- Complete Expanded Site Investigation (ESI) for Parcels 2 and 3A in FY98
- Complete groundwater classification for entire facility in FY98
- In FY98, close out 10 IRP sites and develop decision documents requesting NFA
- In FY98, develop decision document for one IRP site (landfill, LF-01) requesting LTM
- Complete testing to determine final closure process for South POL area (two IRP Sites, SS-12 and ST-14) in FY98
- Complete parcel-specific EBS and FOSL (or finding of suitability to transfer) for Parcel 3 in FY98
- In FY98, begin ESI, if needed
- In FY98, revise decision documents for NFA at ST-02 and FT-03 and resubmit them to regulatory agencies

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 13,023 acres
Mission: Ship, receive, inspect, and classify munitions (tidal area); serve as munitions storage and weapons maintenance, inspection, and testing facility (inland area)
HRS Score: 50.00; placed on NPL in December 1994
IAG Status: Federal Facility Site Remediation Agreement signed in September 1992
Contaminants: Heavy metals and petroleum hydrocarbons
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: \$41.9 million
Estimated Cost to Completion (Completion Year): \$34.3 million (FY2011)
Final Remedy in Place or Response Complete Date: FY2008



Concord, California

Restoration Background

Since FY83, environmental investigations have identified 58 sites at Concord Naval Weapons Station. Past operations, such as improper disposal of paints and solvents, spent ordnance, treated wood, and household and industrial waste; open burning of munitions; and spills or leaks from fuel storage tanks, have contributed to contamination. The installation was placed on the National Priorities List (NPL) in December 1994, primarily because of surface water and sediment contamination of tidal and litigation-area sites. These sites contain sensitive habitat for threatened and endangered species and are also interconnected to Suisun Bay.

In FY86, the installation completed a Remedial Investigation and Feasibility Study (RI/FS) for six litigation-area sites and an RI for one other site. In FY88, a revised final RI/FS was completed for seven litigation-area sites. The next year, a Record of Decision (ROD) was signed for seven litigation-area sites. In FY91, the Navy entered into seven consent decrees with the owners of adjacent properties and recovered costs for cleanup. A Remedial Design was completed for seven litigation-area sites in FY92. The following year, Site Inspections (SI) were completed for four tidal area sites, five inland sites, and six other sites. In addition, a RI was initiated for the four tidal area and five inland sites. In FY94, the installation completed a Remedial Action (RA) for four litigation-area sites and initiated long-term monitoring (LTM) for the sites.

A RCRA Facility Assessment was completed for 49 solid waste management units (SWMU) in FY92; 24 of the SWMUs were proposed for RCRA Corrective Action. In FY94, the installation initiated a RCRA Facility Assessment confirmation study for the 24 SWMUs.

In FY92, three tanks were removed from an underground storage tank (UST) site. In FY93, an initial site characterization was completed for one UST site. During FY95, three abandoned wells were closed and sealed at one inland site.

The installation completed its community relations plan (CRP) in FY89 and updated it in FY95. An information repository and an administrative record were established in FY89. The installation formed a technical review committee in FY90 and converted it to a restoration advisory board (RAB) in FY95. The RAB has 10 active members. In FY95, the installation distributed environmental and RAB fact sheets to the local community and conducted two site tours for the public.

During FY96, the installation's RAB met monthly and participated in two site tours. A final CRP was completed. The installation completed an RA for three litigation-area sites. The first-year LTM was completed and the second-year LTM was initiated for seven litigation-area sites. The installation also initiated corrective actions for 3 of the 24 SWMUs under investigation.

FY97 Restoration Progress

A Phase II RI was initiated for one inland site. The installation completed a Qualitative Ecological Risk Assessment and initiated the third-year LTM for seven litigation-area sites. The installation initiated SIs for 24 SWMUs and completed corrective actions for 3 SWMUs. Three corrective action interim measures also were performed.

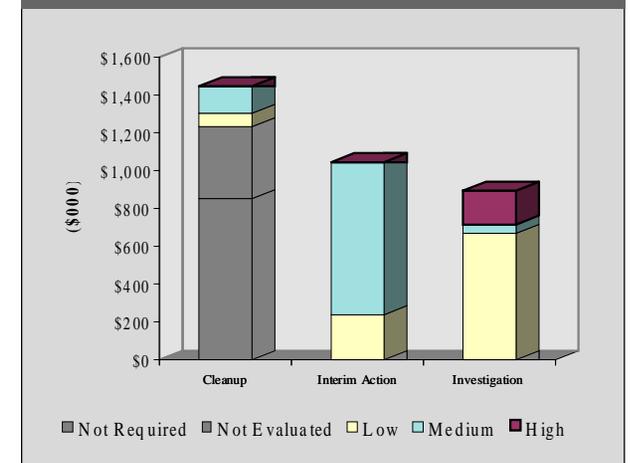
During preparation of the Ecological Risk Assessment Report, working meetings were held with regulatory agencies to obtain input on potential issues. The RAB also reviewed and commented on five draft reports.

Extension of the regulatory agency review period delayed completion of some activities scheduled for FY97. Other activities were delayed by the need for additional sampling. In addition, the work plan preparation associated with changing one action from an RA to a risk-based corrective action delayed cleanup.

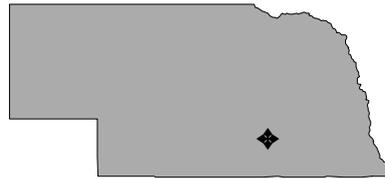
Plan of Action

- Complete RIs and initiate FSs for four tidal area sites in FY98
- Complete RIs for five inland sites in FY98
- Prepare an Engineering Evaluation and Cost Analysis and an Action Memorandum for one tidal area site in FY98
- Complete the Removal Action at one inland site in FY98
- Complete Phase II RI and initiate FS for one inland site in FY98
- Complete the FS and initiate preparation of a Proposed Plan and a ROD for one tidal area site in FY98
- Complete proposed plans and sign RODs for four inland sites in FY98
- Complete the third-year LTM and initiate fourth-year LTM for seven litigation-area sites in FY98
- Complete the Removal Action for one tidal area site in FY98
- Install landfill caps in FY00

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 11,936 acres
Mission: Manufactured ammunition
HRS Score: 51.13; placed on NPL in July 1987
IAG Status: IAG signed in 1990
Contaminants: Explosives and heavy metals
Media Affected: Groundwater and soil
Funding to Date: \$42.8 million
Estimated Cost to Completion (Completion Year): \$43.8 million (FY2033)
Final Remedy in Place or Response Complete Date: FY2014



Hall County, Nebraska

Restoration Background

Cornhusker Army Ammunition Plant is a former ammunition manufacturing facility, which used numerous sumps, cesspools, and leaching pits in the manufacturing process. Those areas, as well as disposal pits, old landfills, and open burning areas, contributed to the environmental problems at the installation, resulting in the installation's listing on the National Priorities List (NPL).

An Initial Assessment Study completed in FY80 identified 65 sites at the plant. In FY83, the Army identified an explosives-contaminated groundwater plume that had migrated off site. Unlined leaching pits, cesspools, and sumps were the primary sources of contamination. The off-site contamination affected more than 250 private residences in Hall County and nearby Grand Island. In FY86, the Army removed and incinerated about 40,000 tons of contaminated soil from cesspools and leaching pits, eliminating almost 95 percent of the sources of contamination at the installation. In FY86 and FY95, the Army provided funds to extend the Hall County municipal water distribution system to affected Grand Island residences. In FY94, the Army conducted Interim Remedial Actions to remove 5,000 tons of contaminated soil and completed an interim Record of Decision (ROD) for cleanup of groundwater contamination.

The Army also implemented innovative measures to reduce restoration costs. It used temporary well points instead of full-scale cased wells and used innovative chemical screening techniques to identify explosive materials in groundwater. Such techniques reduced analysis costs for the project to approximately one-sixth the cost of typical wet-chemical analyses.

In FY95, the Army conducted a successful pilot-scale study of an innovative treatment technology that uses a peroxone system to break down explosive compounds. The study was successful enough to

warrant a field-scale study. Also in FY95, the Army completed fieldwork for the final Remedial Investigation (RI) Report.

In FY96, the Army submitted the final RI Report and designated six sites (Operable Unit [OU] 2) as requiring no further action. A Site Inspection was also submitted for contamination at former locations of underground storage tanks. The Army submitted the 90 percent design for the groundwater treatment facility at OU1. It also issued the explanation of significant differences for the OU1 ROD and held public comment periods to explain the change in the location of the discharge point.

The community formed a Local Redevelopment Authority (LRA) in FY89. The LRA includes local citizens, farmers, politicians, representatives of industry, and installation personnel.

In FY96, the Army solicited comments from members of the community to determine the level of interest in forming a restoration advisory board (RAB). Because of a lack of public interest, the RAB was not established.

FY97 Restoration Progress

A change to the OU1 ROD initiated phased treatment. This change accelerated fieldwork on hot spots and moved the discharge location on site, with community consent, possibly saving \$5 million to \$6 million. Detailed briefings of regulatory agencies expedited document review.

The U.S. Army Corps of Engineers completed changes in the design of the OU1 treatment system after discussions with the public and regulatory agencies. In addition, the Remedial Design was completed and construction was initiated for the groundwater extraction and

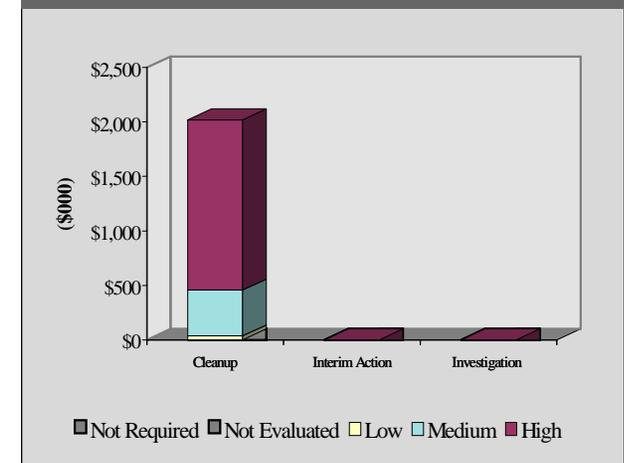
treatment system at OU1. A draft final ROD, requiring no further action, was submitted for signature for sites at OU2.

Several FY97 goals were not met because of increased regulatory review times, but projects are back on track.

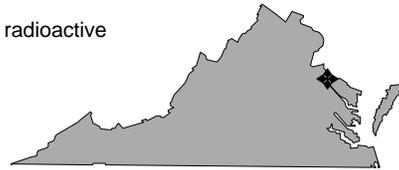
Plan of Action

- Submit the final Feasibility Study, Proposed Plan, and ROD for OU3 in FY98
- Submit the final Proposed Plan and ROD in FY98 for sites at OU2 designated as requiring no further action
- Begin NPL delisting procedures in FY98 for parcels requiring no further action
- In FY99, begin a final Removal Action for contaminated soil

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 2,677 acres main site; 1,614 acres experimental explosive area
Mission: Proof and test ordnance
HRS Score: 50.26; placed on NPL in October 1992
IAG Status: Federal Facility Agreement signed in September 1994
Contaminants: Cleaning solvents, explosive residues, heavy metals, low-level radioactive materials, mercury, PCBs, and pesticides
Media Affected: Groundwater, surface water and sediment, and soil
Funding to Date: \$18.9 million
Estimated Cost to Completion (Completion Year): \$27.1 million (FY2016)
Final Remedy in Place or Response Complete Date: FY2010



Dahlgren, Virginia

Restoration Background

Dahlgren Naval Surface Warfare Center was placed on the National Priorities List (NPL) because of the potential migration of releases from three contaminated sites that could affect the Potomac River, Gambo Creek, associated wetlands, and local groundwater aquifers that are used for drinking water. Ordnance testing operations at the installation have contributed to the environmental contamination. Site types at the installation include former landfills, former ordnance burn and disposal areas, underground storage tanks, operating ordnance ranges, and operating ordnance research and development areas. Releases from the sites have contaminated soil at the installation. All 74 identified sites are being addressed under CERCLA.

An Initial Assessment Study identified 36 sites in FY83. In FY86, a confirmation study of six sites identified one additional site. In FY92, the installation completed a Removal Action involving sampling, excavation, and disposal of soil and concrete. During FY93, a RCRA Facility Assessment identified more than 100 solid waste management units (SWMU), and a visual site inspection identified 6 areas of concern (AOC) and 31 SWMUs that required further action. During FY94, the installation completed several Interim Remedial Actions, including removal of petroleum-contaminated soil from a site and an SWMU, placement of a cover at an SWMU, removal of a waste drum from an SWMU, and removal of materials and debris from another SWMU.

During FY95, an Engineering Evaluation and Cost Analysis and a Treatability Study were initiated at two sites contaminated with depleted uranium. The installation completed Site Inspections (SI) for 10 sites and a Removal Action to clean up polychlorinated biphenyl (PCB)-contaminated soil at 1 site.

In FY91, an information repository at the Smoot Memorial Library and an administrative record at the installation's general library were established. A community relations plan (CRP) was completed in FY92. The installation formed a technical review committee in FY92 and converted it to a restoration advisory board in FY95.

The installation holds frequent meetings and conference calls with representatives of EPA, the Virginia Department of Environmental Quality (VDEQ), and other regulatory agencies to set site priorities and incorporate comments into its site management plan (SMP). The SMP includes descriptions, locations, and cleanup schedules for all identified sites. Installation personnel also have worked closely with the U.S. Geological Survey to better define the hydrology and water quality at the installation.

In FY96, the installation updated the CRP, completed SIs for 10 sites, and initiated SIs for 6 sites and Remedial Investigations (RI) for 7. The installation also began a Treatability Study of bioremediation for pesticides in soil at the Pesticide Rinse Site and completed Phase I of the Ecological Risk Assessment of Gambo Creek and Phase I of the Ecological and Human Health Baseline Risk Assessment for eight sites. The installation closed out two SWMUs and two AOCs.

FY97 Restoration Progress

Removal Actions for four sites, Remedial Actions (RA) for two sites, and Phase II of the Ecological Risk Assessment of Gambo Creek were initiated. RAs and sampling for three Appendix B sites and RI for two sites were completed. The installation completed the Feasibility Study and initiated Remedial Design (RD) for two sites. Two Records of Decision (ROD) were signed for these sites. A bench-scale Treatability Study was completed and a bioaccumulation study initiated.

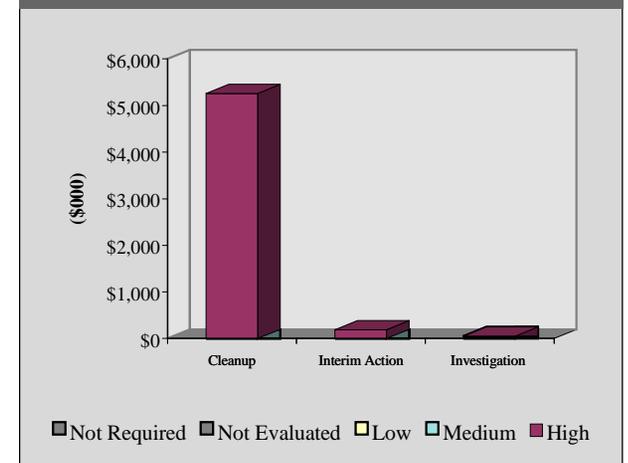
Accelerated fieldwork techniques such as a geoprobe, magnetometer, and immunoassay kits were used.

The Navy has initiated the partnering process with EPA and VDEQ. Contracting techniques for investigation and cleanup include cost plus award fee and fixed-price contracting.

Plan of Action

- Complete Phase II of the Ecological Risk Assessment of Gambo Creek and Phase II of the Ecological and Human Health Baseline Risk Assessment for six sites in FY98
- Initiate RDs for seven sites, SIs for five sites, and Removal Actions for two sites in FY98
- Complete RIs for six sites in FY98
- Complete an RA for one site in FY98
- Complete sampling and Removal Actions for Appendix B sites in FY98
- Implement air sparging and soil vapor extraction technologies

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 877 acres
Mission: Serve as a pilot training center
HRS Score: NA
IAG Status: None
Contaminants: Petroleum/oil/lubricants, solvents, heavy metals, and asbestos
Media Affected: Groundwater and soil
Funding to Date: \$3.7 million
Estimated Cost to Completion (Completion Year): \$76.8 million (FY2001)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2001



Dallas, Texas

Restoration Background

In July 1993, the BRAC Commission recommended closure of the Dallas Naval Air Station. Operations will be transferred to the Fort Worth Naval Air Station. The installation is scheduled to close in September 1998.

Dallas Naval Air Station was established in 1932 as Hensley Field of the U.S. Army Air Corps. A number of the industrial operations that supported its military mission contributed to contamination at the installation.

For investigation of environmental conditions, the installation was divided into six areas. Between FY85 and FY89, an Initial Assessment Study identified 12 sites. An additional site was later discovered, bringing the total to 13. The installation completed a confirmation study for six of these sites. Later, the installation completed a RCRA Facility Assessment, which identified 135 solid waste management units (SWMU) and 44 areas of concern (AOC).

During FY94, an Environmental Baseline Survey identified 118 AOCs. In addition, the installation formed a 14-member restoration advisory board (RAB), which meets quarterly. The RAB participated in training and presentations related to base closure activities. It also reviewed technical documents and fact sheets distributed to the public and established a bilingual information program. The installation established an information repository at the Grand Prairie Library.

A BRAC cleanup team (BCT) was formed in FY94. It includes representatives of the Navy, EPA, the state, regulators, and the local community and meets quarterly, as does a technical subcommittee. A BRAC Cleanup Plan (BCP) was completed in FY94 and updated in FY95.

During FY95, the installation initiated fieldwork for Categories B and C, initiated the design for removal of underground storage tanks (UST), and completed surveys of asbestos and polychlorinated biphenyls. Also in FY95, the Local Redevelopment Authority (LRA) was established. The LRA has adopted a land reuse plan that sets forth industrial aviation as the primary reuse for the installation.

During FY96, the installation's RAB initiated a small business program and seminar. A community relations plan was completed, and the installation revised its BCP so that it could serve as a BRAC Business Plan. The installation also completed a draft Interim RCRA Facility Investigation (RFI) Report for the area known as Category B and an Interim RFI Report for the area known as Category C. Ten SWMUs in Category C were determined to require additional sampling. The installation also remediated asbestos in all buildings and completed a background study of soil and a model finding of suitability to lease (FOSL).

FY97 Restoration Progress

The installation returned 106 acres to the city of Dallas by modifying the lease. Environmental investigations are continuing and will coexist with the new tenant. The EBST and the finding of suitability to transfer (FOST) for the transfer of Duncanville housing to the city of Duncanville were approved by the EPA and Texas Natural Resource Conservation Commission (TNRCC). The city plans to remove or demolish the houses to expand the city park. The Navy plans to revisit the site to remediate pesticides and lead-based paint. The installation also began to delineate the plume.

The BCP was updated. The BCT reviewed the draft Interim RFI Report, met with the redevelopment committee to explain environmental complexities, signed off on the EBST and the FOST for the

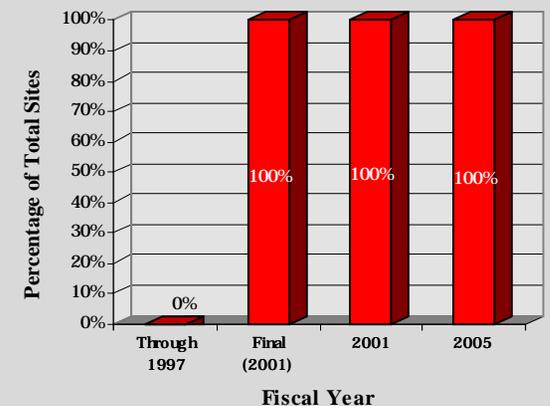
Duncanville housing, and reviewed the budget. RAB meetings were open to the public and were announced in the local news media. Bilingual fact sheets were mailed out periodically.

The follow-on investigation decision process has taken longer than anticipated. The length of this process has delayed accomplishment of several activities that were scheduled for completion in FY97.

Plan of Action

- Complete transfer of the Duncanville housing area in FY98
- In FY98, meet with EPA Region 6 representatives and TNRCC to establish a Tier II partnership
- In FY99, complete Interim RFI Reports for the areas known as Categories D, F, A, and E
- Complete RFIs and corrective measures studies (CMS) for eight SWMUs in FY99
- Complete Corrective Measures Designs for 13 SWMUs in FY99
- Complete corrective measures implementation for five SWMUs in FY99
- Complete initial site characterization, a corrective action plan, Remedial Design, and Interim Remedial Action in FY99
- Initiate corrective action for one UST site in FY99
- Initiate Removal Actions to remove USTs in FY99
- Identify extent of plumes and releases in FY99
- Complete RFIs and CMSs for 21 SWMUs in FY00

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 1,294 acres
Mission: Provided mobilization support to Naval Construction Forces
HRS Score: 34.52; placed on NPL in November 1989
IAG Status: Federal Facility Agreement signed in March 1992
Contaminants: Heavy metals, PCBs, pesticides, petroleum hydrocarbons, petroleum/oil/lubricants, and VOCs
Media Affected: Groundwater and soil
Funding to Date: \$31.6 million
Estimated Cost to Completion (Completion Year): \$32.1 million (FY1999)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY1999



Davisville, Rhode Island

Restoration Background

In July 1991, the BRAC Commission recommended closure of this installation. Construction battalion training and mobilization activities were transferred to Naval Construction Battalion Center, Gulfport, Mississippi, and to Naval Construction Battalion Center, Port Hueneme, California. The installation was closed in April 1994.

Environmental studies conducted since FY84 have identified 25 sites, including landfills, solvent storage and disposal areas, transformer storage areas, spill areas, underground storage tanks (UST), and fire training areas. Major soil and groundwater contaminants include solvents, polychlorinated biphenyls (PCB), petroleum/oil/lubricants, and pesticides.

In FY91, the installation completed Interim Remedial Actions (IRA) for two PCB spill sites. In FY92, it completed a Phase I Remedial Investigation and Feasibility Study (RI/FS) for 10 sites. In FY93, the installation completed an IRA and an RI/FS and signed a Record of Decision (ROD) for two sites. Restoration continued in FY94, with a site inspection, a Phase II RI/FS, a Remedial Design, and an Ecological Risk Assessment.

In FY92, 56 USTs were removed from 7 sites, and an initial site characterization was completed. In FY95, the installation completed a corrective action plan for 7 UST sites and removed 27 other USTs. A ROD was signed for no further action (NFA) at two sites, a Removal Action was initiated, and another Removal Action was completed.

The technical review committee, formed in FY88, was converted to a restoration advisory board in FY94. The installation established an administrative record and an information repository in FY89.

The BRAC cleanup team (BCT), formed in FY94, meets regularly. A BRAC Cleanup Plan (BCP) and a land reuse plan were completed in

FY94, and the BCP was updated in FY95. In FY94, the installation leased 70 acres to the Rhode Island Port Authority and transferred 374 acres to the Army.

In FY96, the BCT prepared a BRAC Business Plan and the installation updated its community relations plan. Twenty-four buildings and 100 acres were leased. The installation also completed five UST corrective actions, a Removal Action, and the closure of one site. The installation updated risk assessments and prepared Proposed Remedial Action Plans (PRAP) for a number of sites.

FY97 Restoration Progress

Cleanup of two sites was completed. Several innovative technologies were implemented. Accelerated fieldwork techniques included immunoassay field testing for confirmatory samples during excavation of soil contaminated with PCBs or total petroleum hydrocarbons (TPH).

To accelerate restoration, the Navy performed Environmental Baseline Survey (EBS) Phase II corrective actions, having the results approved by EPA and the Rhode Island Department of Environmental Management with a minimum of investigation. CLEAN and Remedial Action Contract (RAC) contractors formed a partnership with BCT to expedite the response to EBS Phase II corrective actions.

Regular BCT meetings and communication resolved problems and developed solutions. The BCT also dealt with numerous technical issues and decided to abandon groundwater operable units in favor of whole-site RODs to expedite property transfer.

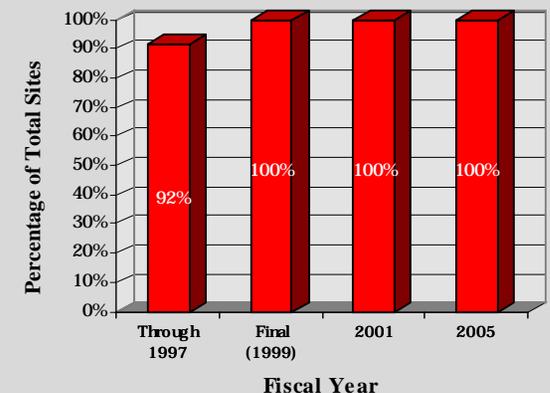
Preparation of an NFA ROD, which was scheduled for FY97, was delayed pending review of the risk assessment for the

NFA site. Other activities scheduled for FY97 were delayed by an investigation to determine the extent of a contaminant plume.

Plan of Action

- Update complete risk assessment, sign an NFA ROD for three sites, and complete basewide EBS corrective actions in FY98
- In FY98, prepare decision document to close out Study Area 15, and initiate Remedial Action (RA) for Site 9
- Remove PCB and total petroleum hydrocarbons (TPH) contamination by excavation and immunoassay field tests in FY98
- Dredge entrance channel to Allen Harbor as part of an RA for Site 9 in FY98
- In FY98, focus EBS Phase II actions on land with potential for economic reuse to expedite transfer
- Complete the RI/FS and the PRAP and sign the ROD for Site 7 in FY98 and for Site 3 in FY99
- Employ long-term monitoring at Site 7 in FY98 and at Site 3 in FY99

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 642 acres

Mission: Store and distribute clothing, food, medical supplies, electronic equipment, petroleum products, and industrial chemicals

HRS Score: 58.06; placed on NPL in October 1992

IAG Status: Federal Facility Agreement signed in March 1995

Contaminants: Pentachlorophenol, PCBs, chlorinated solvents, petroleum/oil/lubricants, pesticides, heavy metals, and chemical warfare agents (suspected)

Media Affected: Groundwater and soil

Funding to Date: \$28.3 million

Estimated Cost to Completion (Completion Year): \$28.0 million (FY2005)

Final Remedy In Place or Response Complete Date for BRAC Sites: FY2005



Memphis, Tennessee

Restoration Background

In September 1995, the BRAC Commission recommended closure of this installation. Closure occurred in 1997.

Environmental studies at the installation, beginning in FY81, identified 75 CERCLA sites. Thirty-five of the sites required no further action. Between FY86 and FY89, 11 underground storage tanks (UST) were removed from the installation. All remaining CERCLA and UST program sites were divided into four operable units (OU). Remedial Investigation and Feasibility Study (RI/FS) activities were accomplished for 40 sites in FY90. In FY95, the installation completed the RI/FS work plans for all four OUs.

In FY85, an Interim Remedial Action (IRA) was completed to remove a pentachlorophenol (PCP) wood preservative treatment vat, a UST used for PCP storage, and contaminated soil in the area of the site. In FY91, the depot initiated an IRA to address groundwater contamination at Dunn Field. In FY96, the installation received agency approval for the IRA. As part of the IRA design, 16 new monitoring wells were installed outside of Dunn Field. A model was created at the U.S. Army Corps of Engineers Waterways Experiment Station to determine how to place extraction wells most effectively. After completing background sampling, the installation was able to determine its remediation goals.

A UST survey completed in FY93 identified 16 additional UST sites and outlined actions needed to ensure that USTs are maintained in compliance with applicable regulations. Two USTs were removed in FY93. From FY94 to FY95, all but two of the remaining USTs were removed or closed in place.

In FY94, a draft no-further-action report was prepared for 13 sites, and groundwater monitoring was performed to characterize contami-

nation at the installation. On the basis of the results, a draft Proposed Plan was developed for the Dunn Field IRA. In FY95, the Interim Record of Decision for groundwater contamination at Dunn Field was completed.

In FY94, the installation developed a community relations plan. A restoration advisory board (RAB) also was formed, and the installation began distributing a quarterly newsletter describing the cleanup program.

In FY96, the installation completed fieldwork and document reviews for the Environmental Baseline Survey (EBS).

FY97 Restoration Progress

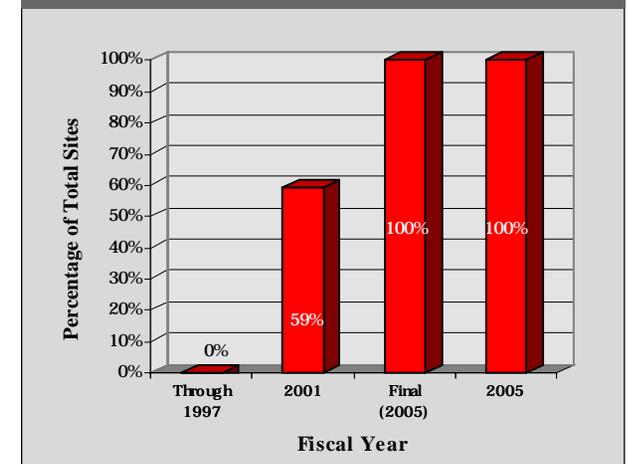
Complete mission closure of the installation was achieved in September 1997. RI/FS fieldwork for 32 sites was completed and the Remedial Design (RD) was initiated. In addition, monitoring wells were installed at Dunn Field. The installation completed the EBS; BRAC Cleanup Plan, version 1; and the Local Redevelopment Authority completed the land reuse plan.

There were delays in awarding the contract for the Chemical Warfare Material Survey, but the contract has now been awarded. Early removals and Remedial Actions (RA), which had been scheduled for FY97, cannot be performed until the RI fieldwork has been reviewed and the BRAC Cleanup Plan updated.

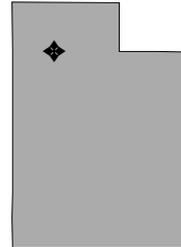
Plan of Action

- In FY98, perform a survey of chemical warfare material and investigate the possibility of its removal
- Begin RAs in FY98
- Begin the IRA at Dunn Field in FY98
- Complete RD in FY98
- Complete the FS in FY98

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 1,129 acres
Mission: Store and distribute DoD commodities, including electronic equipment and textiles; package petroleum and industrial and commercial chemicals
HRS Score: 45.10; placed on NPL in July 1987
IAG Status: Federal Facility Agreement signed in November 1989
Contaminants: Solvents, paint and paint residues, petroleum/oil/lubricants, insecticides, chemical warfare agents, methyl bromide, metal-plating wastes and sludge, PCB-contaminated transformer oils, degreasers, acids and bases, and sand-blast residues
Media Affected: Groundwater and soil
Funding to Date: \$40.8 million
Estimated Cost to Completion (Completion Year): \$27.6 million (FY2015)
Final Remedy In Place or Response Complete Date for BRAC Sites: FY2002



Ogden, Utah

Restoration Background

In September 1995, the BRAC Commission recommended closure of this installation except for minimal essential land and facilities for a Reserve Component area.

A Preliminary Assessment conducted in FY80 identified 44 potentially contaminated sites at the installation. Twenty-two of the sites required further action. Prominent site types include oil-burning pits, disposal pits, a french drain system, and burial sites, which have contaminated groundwater and soil.

In FY90, a Federal Facility Agreement divided the sites into four operable units (OU) to address groundwater and soil contamination. From FY92 through FY95, the installation conducted Remedial Actions (RA) at all OUs. RAs included excavation and disposal of more than 24,000 tons of contaminated soil and debris and installation of wells and piping for groundwater extraction and treatment systems. To date, more than 130 groundwater monitoring wells and more than 100 extraction or injection wells have been installed for the air stripping towers. The installation used a photoisotopic neutron spectrometer to aid in identifying the contents of glass bottles excavated at OU3. In addition, a portable thermal desorption unit was used to ensure the complete removal of white phosphorus from the soil at OU4.

In FY95, groundwater treatment facilities operated at OUs 1, 2, and 4; a RCRA Facility Investigation (RFI) was undertaken; low-level contamination screening sites were investigated; and leaking aboveground storage tanks were investigated.

The installation maintained a close working relationship with state and federal regulatory agencies to improve the decision-making process and expedite cleanup. The technical review committee was

converted to a restoration advisory board (RAB) in FY95. The RAB continues to address issues related to the cleanup process and helps to meet the needs of the community. A Local Redevelopment Authority (LRA) also was established during FY96.

The installation established a BRAC cleanup team (BCT) in FY95. During FY96, an installationwide Environmental Baseline Survey and a BRAC Cleanup Plan were completed. The installation also completed a draft land reuse plan and identified 441 acres as CERFA-uncontaminated.

FY97 Restoration Progress

The depot closed in September 1997. The installation implemented corrective measures for aboveground storage tanks and received agreement from regulatory agencies concerning the designation of 779 acres as CERFA-uncontaminated. In addition, the BCT participated in quarterly meetings, restoration document reviews, and training and the BCP and land reuse plans were updated.

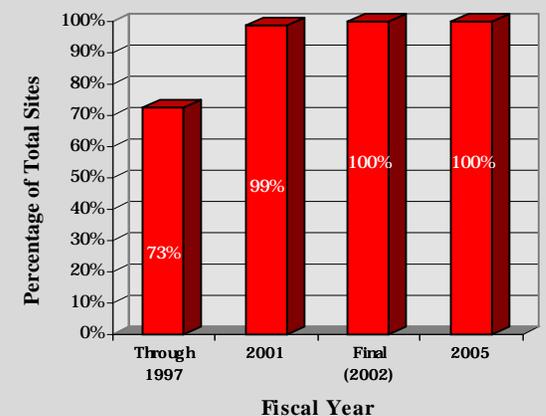
Phases I and II of the Remedial Facility Investigation were completed. Six sites were approved for no further action, leaving six sites for evaluation and cleanup. The Environmental Baseline Survey identified 30 additional sites that required further analysis. All but six were eventually approved for no further action.

Some activities scheduled for completion in FY97 were delayed because of contractor audit delay and long legal review.

Plan of Action

- Enhance groundwater treatment at OU4 in FY98
- Complete an Environmental Assessment for disposal of excess property and develop a master lease in FY98
- In FY98, approve a Cooperative Agreement with the Ogden LRA for management of the depot
- Convey the excess base property to the Ogden LRA in FY98
- Complete closure relative to the Part B permit in FY98

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 724 acres
Mission: Receive, store, and distribute supplies, materials, and equipment
HRS Score: 42.24; placed on NPL in July 1987
IAG Status: IAG signed in March 1989
Contaminants: VOCs, heavy metals, petroleum/oil/lubricants, and pesticides
Media Affected: Groundwater and soil
Funding to Date: \$43.4 million
Estimated Cost to Completion (Completion Year): \$38.0 million (FY2015)
Final Remedy In Place or Response Complete Date: FY2000



Lathrop, California

Restoration Background

This facility began operation in 1941 as a supply and maintenance center. Activities conducted at the installation included overhauls, repairs, painting, paint stripping, metal finishing, and degreasing of aircraft and heavy equipment. Investigation and assessment identified 150 sites consisting of 8 groundwater plumes and 142 contaminated or potentially contaminated soil or building sites.

The Remedial Investigation and Feasibility Study (RI/FS) for groundwater was completed in FY91, and a Record of Decision (ROD) was signed in FY93. Per ROD requirements, the two interim groundwater extraction and air stripping systems, which have been in operation since FY87 and FY90, respectively, were upgraded to further treat and control the migration of trichloroethene (TCE) plumes in their associated areas. A third groundwater extraction and treatment system using air stripping and carbon adsorption was installed and went into operation in June 1995 to capture the depot's central area plume. The final groundwater system includes 46 extraction wells and 3 treatment plants, with a treatment capacity of more than 1,300 gallons per day.

Between FY85 and FY95, 67 underground storage tanks (UST) and sumps underwent removal and corrective actions, and 57 sites were closed. Twelve sites still require remediation or further documentation to achieve closure. Approximately 10,000 cubic yards of contaminated soil were removed and disposed of during this period.

A Removal Action for pesticide-contaminated soil was accomplished in 1995-1996, following approval of an Engineering Evaluation and Cost Analysis (EE/CA) and an Action Memorandum by the regulatory agencies. The Removal Action was conducted at the former pesticide mixing area. Approximately 500 cubic yards of pesticide-contaminated soil were removed.

An installationwide RI/FS and a risk assessment were completed in FY95, and the Proposed Plan was prepared and provided to the public for comment. The final ROD for Operable Unit (OU) 2, the sitewide remedy, was signed in February 1996.

FY97 Restoration Progress

During FY97, the installation started and completed a Removal Action for lead- and chromium-contaminated soil at Sharpe's former industrial waste treatment plant pond. The soil removal was completed in November 1996, and the final closure report was submitted in January 1997. A total of 4,165 tons of contaminated soil was removed and disposed of at an appropriately permitted site.

The installation also continued its efforts to raise interest within the surrounding community through a technical review committee and distributed fact sheets describing remediation efforts.

The pilot in situ bioventing project at former UST Site 17 continued. This technology will probably be implemented at several former UST sites. The groundwater long-term monitoring and operation and maintenance (O&M) at the sitewide groundwater treatment systems continued. In addition, the design of the lead/chromium Soil Removal Action stipulated in the OU2 ROD was completed. Several sites in the northern and southern portions of the installation will be remediated.

Four USTs were removed and two were closed. Two other sites will require further action. A study is in progress to determine the best in situ technologies for remediating UST sites where soil contamination has migrated beneath a building or other structure.

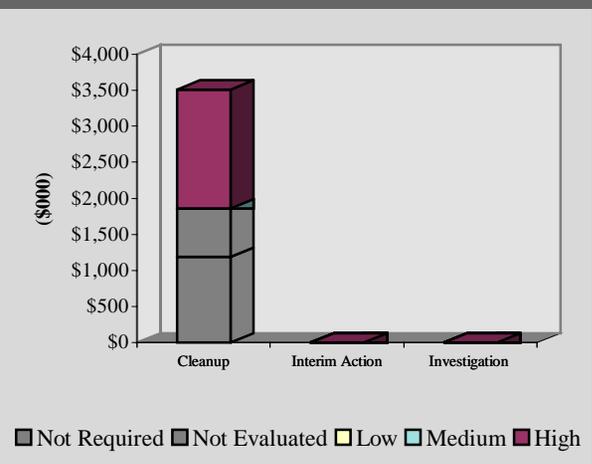
The installation completed design of the in situ vapor extraction remedy for the TCE-contaminated soil. This design will be implemented at five sites. In addition, analysis indicated that no further

action would be required at 11 other sites, either because concentrations were below the threshold limit or because the contaminated mass was so low that it was not economically feasible to implement the vapor extraction technology at these sites.

Plan of Action

- In FY98, award contract for removal of lead- and chromium-contaminated soil per OU2 ROD requirements; Removal Action should be completed in FY98
- In FY98, award contract for the in situ TCE vapor extraction remedy per OU2 ROD requirement; remedy should be completed in 2 years
- Award long-term groundwater treatment system O&M contract by January 1998; continue operating system and continue monitoring groundwater to ensure compliance with ROD

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 908 acres
Mission: Store and distribute medical, textile, food, electronic, industrial, construction, chemical, and other supplies and equipment
HRS Score: 37.16; placed on NPL in August 1990
IAG Status: Federal Facility Agreement signed in 1991
Contaminants: Chlorinated solvents, heavy metals, pesticides, petroleum/oil/lubricants, and VOCs
Media Affected: Groundwater and soil
Funding to Date: \$63.4 million
Estimated Cost to Completion (Completion Year): \$28.3 million (FY2015)
Final Remedy In Place or Response Complete Date: FY2000



Tracy, California

Restoration Background

Beginning in FY80, environmental studies identified 32 sites at this installation, including burn and disposal pits, hazardous waste storage sites, and other areas of contamination. Newly discovered sites and underground storage tanks (UST) brought the total site count to 65. Contamination has been identified in on-site soil and in on-site and off-site groundwater.

In FY86, the Remedial Investigation and Feasibility Study (RI/FS) was initiated to address the groundwater and soil contamination. The groundwater investigation was placed on a faster track because of the potential threat of contamination to the drinking water of the area.

Between FY88 and FY91, 32 USTs were removed, along with 1,060 cubic yards of contaminated soil. As of FY96, 16 sites had been closed, and 15 required Remedial Action or further characterization to achieve closure. Three former waste UST sites are being remediated via the CERCLA process because of the constituents found (e.g., trichloroethene [TCE], tetrachloro-ethene [PCE]).

A Record of Decision (ROD) for the remedy of groundwater contamination was signed in early FY93 and modified in FY95 to allow for natural attenuation of a portion of the contaminant plume outside the installation. The draft sitewide RI/FS was completed late in FY96.

In FY92, bottled drinking water was supplied to two nearby farm residences where wells were threatened by the groundwater plume. The depot also completed installation of a pump-and-treat system consisting of an air stripping plant with carbon absorption, five extraction wells, and three injection wells.

In FY95, a pilot low-flow groundwater monitoring project was completed. On the basis of the results of this project, future projects

were planned to reduce sampling costs as much as possible. An environmental geographic information system (GIS) was established, which facilitates RI/FS and Remedial Design and Remedial Action (RD/RA) work. The installation removed more than 1,000 cubic yards of contaminated soil at the child-care facility. The installationwide risk assessment was completed, and the Proposed Plan was prepared and provided to the public for comment.

In FY96, an Engineering Evaluation and Cost Analysis and an Action Memorandum for the removal of pesticide-contaminated soil from the former industrial pond and pipeline sites were completed and concurred on by the regulatory agencies. Design work for this Removal Action was initiated. The installation of extraction wells and infiltration galleries for the Operable Unit (OU) 1 groundwater air stripping pump-and-treat system also was initiated.

FY97 Restoration Progress

The design for the Industrial Pond Soil Removal Action was completed and the implementation contract awarded. Work began on the Pesticide-Contaminated Soil Removal Action. The final sitewide RI/FS also was completed. The installation prepared the Proposed Plan for sitewide remedies, and the draft sitewide OU2 ROD was prepared and submitted.

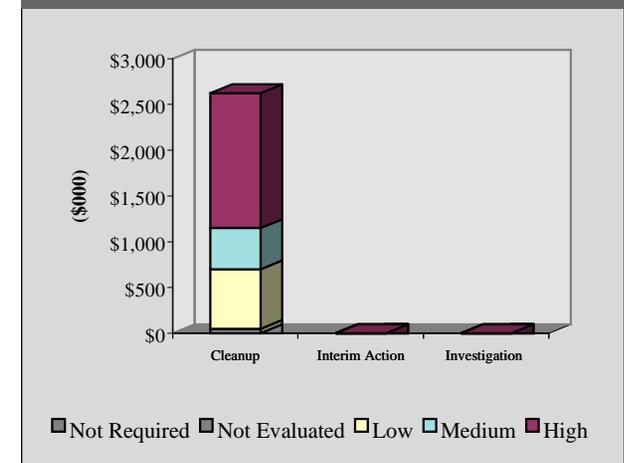
Construction continued on the OU1 extraction wells. The pump-and-treat system continued to operate. This system will be modified as part of optimization of the capture and treatment process. The contract for construction of the OU1 pump-and-treat system was awarded. Also, contaminated-soil Removal Actions were performed at five former UST sites, and approximately 376 cubic yards of contaminated soil were removed.

Closure was not achieved. Use of alternative remedial technologies such as soil bioventing and soil vapor extraction may be necessary to achieve clean closure of these sites because of economic factors and the sites' proximity to building foundations.

Plan of Action

- Complete Soil Removal Action at former industrial and pipeline sites by the end of FY98
- Complete implementation of alternative technology for RA at remaining contaminated former UST sites; implement pilot tests in FY98
- Complete final sitewide OU2 ROD and obtain regulatory agency signatures on document
- Begin design of selected remedies for the various types of contaminated sites
- Continue operation of pump-and-treat system in FY98
- Implement low-flow sampling sitewide in FY98

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 164 acres
Mission: Provide logistical support to the military services by supplying electrical and electronic material
HRS Score: NA
IAG Status: None
Contaminants: Low-level radioactive waste (suspected), paint, petroleum/oil/lubricants, solvents, pesticides, herbicides, PCBs, lead, hydrofluoric acid, and coal pile runoff
Media Affected: Groundwater and soil
Funding to Date: \$4.6 million
Estimated Cost to Completion (Completion Year): \$1.1 million (FY2000)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2000



Kettering, Ohio

Restoration Background

In July 1993, the BRAC Commission recommended closure of the Defense Electronics Supply Center (Gentile Air Force Station) and relocation of its mission to the Defense Construction Supply Center in Columbus, Ohio. An Environmental Baseline Survey (EBS) completed in FY94 identified 9 sites and 48 areas of concern (AOC) at the installation. Prominent site types include underground storage tanks (UST); areas of past industrial operations; and landfills containing construction debris, hardfill, small amounts of waste oil, solvents, asbestos, low-level radioactive waste, and a subsurface material suspected to be paint thinner. Releases from these sites have contaminated soil and groundwater.

To expedite the closure process, a reuse committee was formed in FY93. The committee includes installation personnel, state and local government officials, local business leaders, employees of the local utility company, and other local stakeholders. The primary objective of the committee is to evaluate the effect that closure of the installation will have on the community and to provide advice on the long-term future use of the installation. The committee was instrumental in preparing a market survey that evaluated types of commercial space in high demand in the area. In FY95, the findings were incorporated into an award-winning reuse plan.

The installation's BRAC cleanup team (BCT) works to identify past environmental concerns and to develop a workable plan to fully investigate the sites and AOCs. The goal of the BCT is to investigate and ensure approved cleanup of all AOCs to allow the earliest possible transfer to the Local Redevelopment Authority (LRA). The LRA has subleased two parcels on the installation. In FY96, a finding of suitability to lease was completed to further a planned conveyance by

deed of the remainder of the installation. Approximately 86 acres were leased to the LRA and the city of Kettering.

A restoration advisory board (RAB) was formed in FY94. During FY95, the RAB met quarterly to provide a forum for discussion and information. Local stakeholders showed an increased interest in the environmental program at the installation.

In FY96, the installation completed an Environmental Impact Statement, updated the installationwide EBS, and completed a Record of Decision. Remedial Design and Remedial Action activities began at the installation. In FY95, all but one of the remaining polychlorinated biphenyl (PCB) transformers were removed from the installation, and all USTs had been removed by FY97.

FY97 Restoration Progress

The installation closed on December 1, 1996. A Memorandum of Agreement between the Defense Logistics Agency and the Air Force Conversion Agency was signed to document funding responsibilities, and the latest EBS was completed.

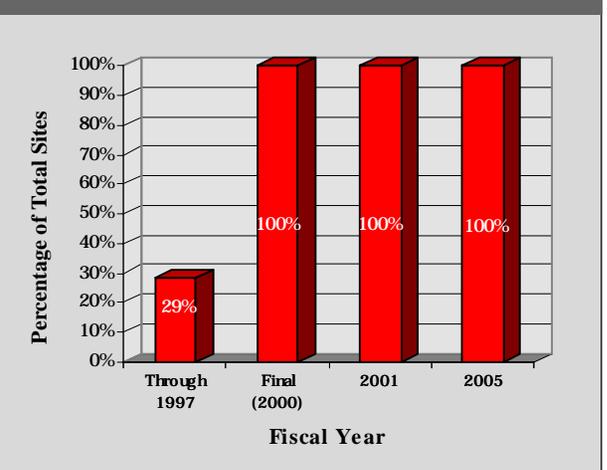
Comment resolution meetings were held to expedite document finalization, and partnering sessions and teleconferences improved working relationships with regulatory agencies. Early regulatory buy-in for Site R2 was promoted to expedite site characterization. This facilitated the prompt transfer of Parcel A to the LRA for a required tenant move-in date with a similar approach used in preparing Parcel D for transfer. In addition, the installation plans to propose and obtain regulator concurrence for CERFA-uncontaminated acreage as part of the finding of suitability to transfer preparation process for Parcels B, C, E, and F.

Some activities scheduled for completion in FY97 were delayed because EPA required validation of the draft Phase II RI data.

Plan of Action

- Complete Phase I of the Remedial Investigation and Feasibility Study, and complete closure of the installation in FY98 under an Economic Development Conveyance
- Start long-term monitoring program in FY98
- Complete cleanup at Sites S5 and D4 in FY98
- Complete evaluation of sites M1, M7, S1, and S3 in FY98
- Complete update of BRAC Cleanup Plan in FY98
- Transfer remaining parcels of the installation by FY99

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 87 acres
Mission: Procure and distribute textile, subsistence, and medical supplies in support of the Armed Forces
HRS Score: NA
IAG Status: None
Contaminants: Petroleum/oil/lubricants, PCBs, pesticides, and asbestos
Media Affected: Groundwater and soil
Funding to Date: \$11.6 million
Estimated Cost to Completion (Completion Year): \$1.5 million (FY2001)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2001



Philadelphia, Pennsylvania

Restoration Background

In July 1993, the BRAC Commission recommended closure of the Defense Personnel Support Center (DPSC) and relocation of the mission to the Aviation Supply Office in North Philadelphia, Pennsylvania. The BRAC Commission also recommended closure of two DLA activities located at DPSC: the Defense Clothing Factory and the Defense Contract Management District Mid-Atlantic.

Environmental studies since FY82 identified the following site types: underground storage tanks (UST), aboveground storage tanks, pesticide management areas, hazardous waste management areas, polychlorinated biphenyl (PCB)-containing transformers, asbestos-contaminated areas, and former railroad track areas. A plume, identified as primarily JP-4 jet fuel underlies large portions of the installation. Studies conducted to date indicate that the plume originated off site and migrated onto DPSC.

The installation completed the cleanup of a PCB-contaminated sewer site, preliminary analysis of soil and groundwater, and a draft work plan for Remedial Investigation and Feasibility Study (RI/FS) activities. RI/FS and Remedial Action (RA) activities began at the clothing factory in FY94 in preparation for interim leasing to the city of Philadelphia. RA activities included the cleanup of DDT in two buildings and the removal of two USTs associated with use of DDT.

A hazardous waste management area was closed, and asbestos remediation was completed in one of the buildings of the clothing factory. RI activities to determine the extent and source of the petroleum contamination underlying the installation are now complete.

The BRAC cleanup team (BCT), formed in FY94, has provided information to the Base Transition Office and the Local Redevelop-

ment Authority to support reuse plans for the installation. The final Environmental Baseline Survey and the BRAC Cleanup Plan (BCP) are complete, and an Environmental Assessment was prepared to evaluate alternatives for the reuse of the clothing factory. The BCP is updated annually. In FY95, a restoration advisory board was established.

During FY95–FY96, RAs were completed at all known UST sites and three USTs were closed. All PCB-containing transformers were removed. Remediation of asbestos contamination at several buildings continued, and Phase I of the basewide Expanded Site Inspection (ESI), previously known as the RI/FS, was completed. Baildown and recovery tests were completed for 12 on-site wells where a petroleum groundwater plume is present, and removal of free product from the surface of the groundwater began. A consent decree was signed between the installation, the Pennsylvania Department of Environmental Protection (PaDEP), and Sun Oil allowing the parties to collaborate on defining the extent of the plume and to develop a remediation plan to recover free product.

FY97 Restoration Progress

The finding of suitability to lease for Building 13, portions of Building 9, and an adjacent parking area was completed in April 1997. The lease for these parcels was signed in May 1997.

A conceptual plan and a risk assessment plan for the installation were completed in May 1997 and approved by PaDEP on July 29, 1997. The risk assessment study will be completed in January 1998. Phase II of the ESI has been completed.

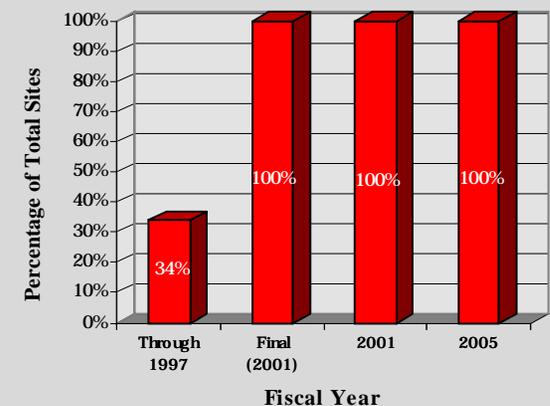
Approximately 15 percent of the parcels at the installation have been certified as environmentally clean.

Nineteen FFCA Sites are identified, of which two have been remediated and certified closed by the BCT. Twenty-four of the original 44 Installation Restoration Program (IRP) sites were in various stages of investigation or remediation in FY97.

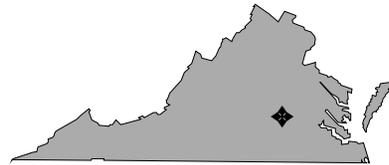
Plan of Action

- Phase III of the ESI will be completed in FY98
- Continue Remedial Action and/or closure of the IRP sites will continue in FY98
- The Human Health Risk Assessment will be completed in FY98
- Begin Phase I of the plume remediation in FY98
- Complete closure of the installation in FY99

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 631 acres
Mission: Manage general supplies for the Armed Services
HRS Score: 33.85; placed on NPL in July 1987
IAG Status: IAG signed in 1991
Contaminants: Phenols, solvents, paints and paint residues, corrosives, pesticides, refrigerants, antifreeze, photographic chemicals, and oils
Media Affected: Groundwater and soil
Funding to Date: \$25.5 million
Estimated Cost to Completion (Completion Year): \$32.6 million (FY2015)
Final Remedy In Place or Response Complete Date: FY2001



Richmond, Virginia

Restoration Background

Preliminary Assessment and Site Inspection activities identified 31 sites at this installation. During negotiation of an FY91 Interagency Agreement, sites were grouped into eight operable units (OU) and six Expanded Site Inspections (ESI). In FY92, a ninth OU was listed as an Interim Action site. Seven of the sites were determined to pose no hazard to the environment; four sites are not covered by CERCLA.

In FY89, an underground storage tank (UST) program was implemented. Through FY95, 30 tanks were replaced with double-wall plastic tanks and the need for 20 tanks was eliminated.

Two Records of Decision (ROD) were signed in FY92, designating institutional controls for contaminated soil at OU1 and a vapor vacuum extraction system as the Remedial Action (RA) for contaminated soil at OU5. Operations at a pilot plant indicated that contamination in the OU5 soil had decreased to nondetectable levels, prompting modification of the ROD and OU5 closeout.

In FY93, a third ROD was signed, requiring installation of an extraction and treatment system to remove volatile organic compounds (VOC) from the groundwater at OU9. The system was implemented in September 1996.

In FY95, a fourth ROD requiring a two-phase RA for soil at the National Guard Area was signed. Institutional controls and excavation and disposal of 150 cubic yards of contaminated soil have been implemented.

Six ESIs were completed in FY95. Three of the areas proceeded to the Remedial Investigation and Feasibility Study (RI/FS) phase and were designated OU10, OU11, and OU12. One area was combined with OU4, and the remaining two require no additional action. During the RI/FS for OU7, another site was identified, which was called OU13.

In FY95, exploratory trenching of soil at OU2 was conducted to characterize the materials that had been disposed of in an abandoned landfill.

During FY96, the installation completed investigations at one UST site, closed out the investigation of an indoor pistol range, and implemented an air stripping system. The RIs for the fire training area (OU4 and OU7), the acid neutralization pits (OU8), and the fire training pit (OU7) were completed. Fieldwork also was completed for a pilot study for OU7 and OU8 to determine the feasibility of a dual-phase vacuum vapor extraction technology and for the background risk assessment. A computer model of the contamination plume for the PX Gas Station was completed, and the corrective action plan was modified.

FY97 Restoration Progress

The installation implemented a recovery system for the gasoline phase on groundwater at the PX Gas Station. The installation completed remediation of soil at OU3 and finished the draft RIs for OU10, OU11, OU12, and OU13. The installation also completed the background risk assessment, the draft FS for OU2, and the final FS for OU4. A work plan for removal of contaminated soil from OU2 and a draft Proposed Plan for OU4 were completed.

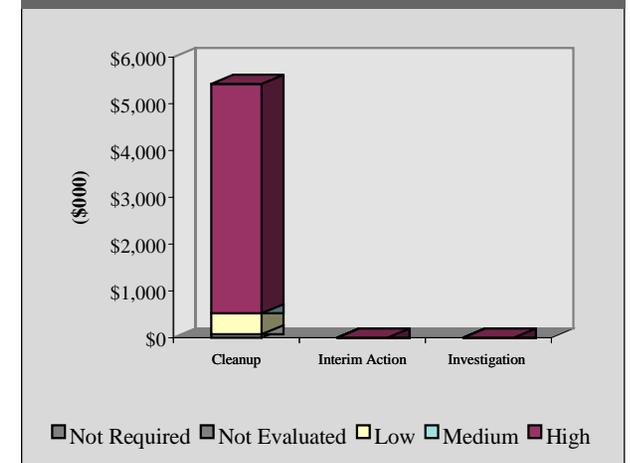
The installation initiated a Treatability Study for groundwater at OU8 and continued groundwater monitoring at the PX Gas Station to update the computer model.

Some activities scheduled for completion in FY97 were delayed because comments from EPA required additional studies for several sites.

Plan of Action

- Perform oil Removal Action for soil at OU2 in FY98
- Complete FS and Proposed Plan for OU2 in FY98
- Complete Proposed Plan, issue ROD, and start Remedial Design (RD) for soil at OU4 in FY98
- Determine point of compliance, complete FS, draft Proposed Plan, and draft ROD for OU6 in FY98
- Conduct pilot test for density-driven convection technology at OU7 in FY98
- Complete FS, finalize Proposed Plan, and submit draft ROD at OU7 in FY98
- Complete Treatability Study and FS for OU8 and submit draft Proposed Plan and ROD in FY98
- Issue RODs for OU10 and OU11 in FY98
- Complete FS for OU12 and OU13 in FY98.
- Submit draft Proposed Plan and draft ROD for OU13 in FY98

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 342 acres
Mission: Develop, field, and sustain combat and tactical vehicles
HRS Score: NA
IAG Status: None
Contaminants: Heavy metals, VOCs, SVOCs, and PCBs
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: \$3.5 million
Estimated Cost to Completion (Completion Year): \$8.6 million (FY2001)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2001



Detroit, Michigan

Restoration Background

In July 1995, the BRAC Commission recommended the realignment of Detroit Arsenal and the closing and disposing of the Detroit Arsenal Tank Plant. The installation is scheduled to close in September 1998.

Environmental studies conducted at the installation identified the following site types: underground storage tanks (UST), landfills, metal plating and surface treatment areas, and petroleum release areas. Studies have determined that groundwater and soil are contaminated with volatile organic compounds (VOC) and heavy metals.

Completed Interim Actions include removal of USTs, excavation of contaminated soil, and in-situ treatment of petroleum-contaminated soil. Cleanup activities also were completed at a fuel farm site and a metal plating area.

In FY95, the installation formed a BRAC cleanup team (BCT), and the Local Redevelopment Authority (LRA) began work on the land reuse plan.

In FY96, the commander established a restoration advisory board (RAB) that elected members and held meetings to promote exchange of information between the community and regulatory agencies. The installation completed an Environmental Baseline Survey (EBS) and a CERFA report. Based on the results of the EBS, the installation initiated a contract for a Remedial Investigation and Feasibility Study (RI/FS) and held a kickoff meeting for evaluating radiological hazards.

FY97 Restoration Progress

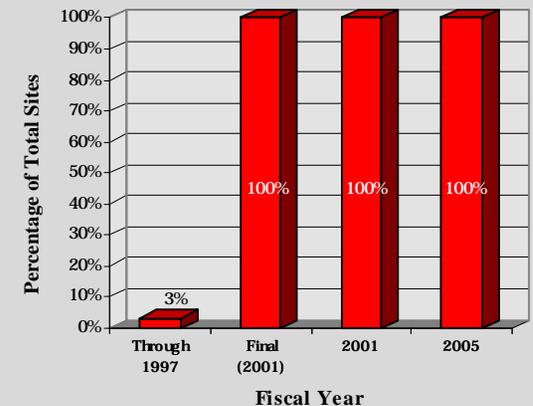
The regulatory agencies approved RI work plans. The installation subsequently completed the RI Phase I fieldwork and presented the results in the RI Phase I Report. The report is now under review. The LRA completed the land reuse plan, which consists of a mixture of commercial and industrial reuse. A finding of suitability to transfer (FOST) was initiated to transfer CERFA-clean acreage for immediate reuse.

The installation completed the Version I BRAC Cleanup Plan. The Army entered into a Defense and State Memorandum of Agreement (DSMOA) Cooperative Agreement with the state of Michigan to shorten document turnaround time. Subject matter experts addressed RAB meetings to educate RAB members on the RI and cleanup process.

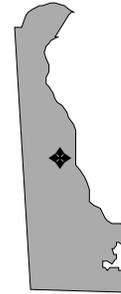
Plan of Action

- Complete the RI/FS in FY98
- Transfer CERFA-clean acreage in FY98
- In FY98, transfer all sites recommended for no further action on the basis of the Phase I sampling results
- Complete Relative Risk Site Evaluation at remaining 25 sites in FY98
- In FY99, transfer all sites recommended for no further action on the basis of the Phase II sampling results
- Initiate Remedial Action for Buildings T-12 and T-18, and Area 521, in FY99
- Complete all BRAC activities by the end of FY01

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 3,730 acres
Mission: Provide airlift support for troops, cargo, and equipment
HRS Score: 35.89; placed on NPL in March 1989
IAG Status: Federal Facility Agreement signed in August 1989
Contaminants: Solvents, paints, petroleum products, VOCs, heavy metals, and plating wastes
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: \$33.7 million
Estimated Cost to Completion (Completion Year): \$58.2 million (FY2011)
Final Remedy in Place or Response Complete Date: FY2004



Dover, Delaware

Restoration Background

Since 1942, this base has provided airlift assistance for troops, cargo, and equipment. Waste management practices at the installation have contaminated the shallow groundwater aquifer with petroleum products, volatile organic compounds (VOC), and heavy metals. The principal site types at the installation are underground storage tanks (UST), oil-water separators, fire training areas, landfills, fuel spills and leaks, and a fuel hydrant system.

Environmental studies have identified 59 sites since FY83. These sites include petroleum and VOC contamination. Sources of petroleum contamination include the fuel hydrant system and tank farm sites; sources of VOC contamination include aircraft cleaning and maintenance operations.

In FY86, the installation conducted soil removal at the old industrial waste basins. In FY92, contaminated soil was removed from a fire training area. Remedial Investigation and Feasibility Study (RI/FS) fieldwork was completed in FY94. A focused Feasibility Study (FFS), undertaken in FY94, addressed three source areas: VOC-contaminated soil, affecting groundwater; sediment in a drainage ditch contaminated with heavy metals; and a solvent plume in the shallow groundwater aquifer.

In FY95, the installation began pilot tests of innovative treatment technologies. Three RODs were signed, which incorporated the innovative treatment technologies into Remedial Actions (RA). The installation completed the RA at the former waste oil tank site, removed USTs from one site, and began recovery of free product at two sites contaminated with JP-4 jet fuel. In addition, one FFS was completed for groundwater contaminated with chlorinated solvents.

An installationwide FS planned for mid-FY96 was postponed because of problems associated with ecological risk.

The installation implemented natural attenuation at one of the four sites contaminated with chlorinated solvents. Information about the three remaining sites is not yet sufficient to begin remediation.

The installation characterized the area of soil in the industrial area that is contaminated with pesticides. Corrective action plans (CAP) were completed for seven sites contaminated with petroleum products: three sites were slated for natural attenuation; one site is undergoing excavation; bioslurping is being implemented at two sites; and vacuum-enhanced product slurping (VEPS) is in use at one site.

FY97 Restoration Progress

Installationwide RIs were approved by state and federal regulators. Subsequent FSs were delayed because of EPA concerns about ecological risk. Potential solutions are being evaluated by EPA's Biological Technical Assistance Group, and the concerns are expected to be resolved by mid-calendar-year 1998. The installation continued natural attenuation at one of the four sites contaminated with chlorinated solvents. Remediation Technology Development Forum technical evaluations of natural attenuation, bioremediation, and cometabolic bioventing continued at the three remaining chlorinated solvent sites. Three Records of Decision (RODs) were signed for four additional sites in FY97. A Remedial Design characterization of a former fire training area was conducted by magnetic scanning and ground-penetrating radar. In addition, the National Test Site conducted field experiments in cooperation with the Dover Air Force Base Restoration Program using six-phase

resistive heating, geoprobe, cone penetrometer, and on-site laboratory analysis.

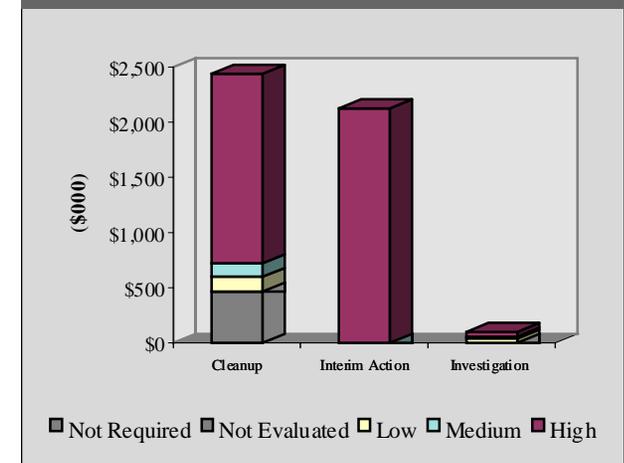
The installation characterized a source of pesticide soil contamination in the industrial area and completed Engineering Evaluation and Cost Analysis of soil removal with an asphalt cap. CAPs were completed and approved for six petroleum-contaminated sites. Natural attenuation is the remedy for three of these sites, and free-product recovery by skimming will be implemented at the other three sites. An ongoing excavation of contaminated soil at the site of a former landfill on the golf course will be completed by early 1998.

Some activities scheduled for completion in FY97 were delayed because differing site conditions prevented free-product recovery pilot tests and the soil excavation project, and approval of a no-further-remedial-action-planned ROD for approximately 20 sites is on hold pending resolution of ecological issues.

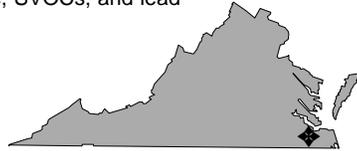
Plan of Action

- Complete construction of free-product recovery skimming project in FY98
- Complete soil excavation project on the golf course in FY98
- Complete pesticide source excavation and asphalt cap project in FY98
- Complete FSs for active sites in FY98
- Generate ROD to close out approximately 20 sites in FY98
- Complete design and investigation of a former fire training area in FY98

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 597 acres
Mission: Provided radio transmitting facilities and services to support Naval ships, submarines, and aircraft
HRS Score: NA
IAG Status: None
Contaminants: Dichlorobenzene, PCBs, petroleum/oil/lubricants, trichlorobenzene, SVOCs, and lead
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: \$6.8 million
Estimated Cost to Completion (Completion Year): \$0 (FY 2001)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY1996



Suffolk, Virginia

Restoration Background

This facility was established as a Naval Air Station to train pilots during World War II. The installation was converted to a transmitter facility after the war. In July 1993, the BRAC Commission recommended closure of the installation. Installation operations ceased on March 31, 1994.

Since FY84, environmental studies have identified 11 sites at the installation. Site types include a former service station, two polychlorinated biphenyl (PCB) spill areas, and a number of landfills and other areas used to dispose of solvents, acids, bases, and general refuse.

In FY87, a confirmation study was completed for Sites 1, 5, and 8. At Site 1, a former landfill, semivolatile organic compounds (SVOC) were detected in groundwater. In FY93, the installation completed a Removal Action to remove PCB-contaminated soil at Site 5. In FY94, a Remedial Investigation and Feasibility Study (RI/FS) was completed and a Record of Decision (ROD) was signed for Site 5. In addition, cleanup was completed at Site 8, a former gas station, where soil was contaminated with petroleum hydrocarbons and lead.

During FY95, the installation completed a Site Inspection (SI) for Sites 2, 3, 4, 6, 9, 10, and 11; no further action was recommended for the sites. The installation also completed the RI/FS at Site 1 and initiated long-term monitoring (LTM) at the site. The Remedial Design and Remedial Action (RD/RA) were completed for Site 5. Cleanup consisted of removing and disposing of 2,200 cubic yards of PCB-contaminated soil. The installation also constructed a soil cap for creosote-contaminated soil at Site 7. A Removal Action for Site 8, which consisted of excavation and off-site thermal incineration of contaminated soil, also was completed. The installation removed PCB-contaminated soil from the storage area near Building D-10.

An Environmental Baseline Survey (EBS) was completed in FY94. The EBS identified 557 acres as uncontaminated. The installation was divided into five parcels to facilitate transfer of property. In FY92, the installation completed baseline Ecological and Human Health Risk Assessments for Site 5.

The installation formed a technical review committee in FY88 and converted it to a restoration advisory board (RAB) in FY94. The RAB holds quarterly meetings. Its members represent the Navy, the Virginia Department of Environmental Quality, EPA Region 3, and the local community. In FY92, the installation completed a community relations plan and an Administrative Record, and established an information repository at the Morgan Memorial Library.

A BRAC cleanup team (BCT), formed in FY94, includes representatives of the state, EPA Region 3, and the Navy. The BCT prepared a BRAC Cleanup Plan (BCP) in FY94. The BCT's monthly meetings have reduced project schedules and costs because the BCT can address issues, concerns, and regulatory comments in advance of any action.

During FY96, the installation completed a Preliminary Assessment, an SI, and an RA for Site 7 and completed an RA for Building D-10. Hydraulic and ecological LTM began at Sites 1, 5, and 7. The installation also completed its land reuse plan.

As the focus of a FY96 fast-track initiative, the installation used field screening techniques at two sites. These techniques fostered well-informed selection of sampling points, improved the efficiency of field investigations, and produced high-quality site characterization data.

FY97 Restoration Progress

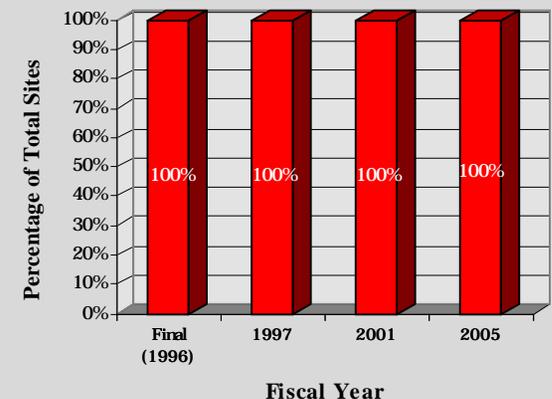
The installation completed the final versions of the BCP and made addendums to the original EBS. The Site 1 ROD also was completed and signed, and LTM continued at Sites 1, 5, and 7. The RAB was discontinued.

Some activities scheduled for completion in FY97 were delayed because the Land Reuse Plan may need to be modified.

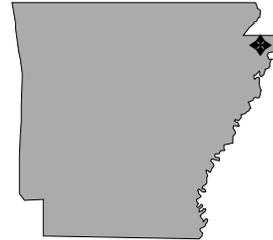
Plan of Action

- Prepare a finding of suitability to transfer for the property in FY98
- Update the land reuse plan and the EBS in FY98

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 3,286 acres
Mission: Supported B-52 strategic bombers and KC-97 and 135 stratotanker operations
HRS Score: NA
IAG Status: None
Contaminants: Petroleum hydrocarbons, VOCs, and metals
Media Affected: Groundwater and soil
Funding to Date: \$25.2 million
Estimated Cost to Completion (Completion Year): \$4.8 (FY2003)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY1999



Blytheville, Arkansas

Restoration Background

In July 1991, the BRAC Commission recommended closure of Eaker Air Force Base, which formerly supported aircraft and tanker operations. The installation was closed on December 15, 1992.

Prominent site types at the installation include underground storage tanks (UST), aboveground storage tanks, oil-water separators, petroleum/oil/lubricant (POL) spill sites, and landfills. Other sites identified during previous investigations include a fire training area, storage areas, an explosive ordnance disposal (EOD) range, a small arms firing range, a trap and skeet range, a JP-4 jet fuel hydrant system, and a bulk fuel storage tank farm. Petroleum hydrocarbons, volatile organic compounds (VOC), and metals have been released into groundwater and soil from those sites. Environmental studies conducted between FY85 and FY90 identified 12 sites. In FY90, a RCRA Facility Assessment identified 21 solid waste management units and 9 areas of concern.

Remedial Investigation and Feasibility Study fieldwork was initiated for the first 12 sites. Later, an Administrative Consent Order was signed that indicated that 30 sites (including the initial 12 sites) are subject to RCRA corrective action and will be addressed under a RCRA Facility Investigation (RFI). The installation also completed an Environmental Baseline Survey and identified 337 acres as CERFA-clean.

Interim Actions completed at the installation include removal of 125 USTs and 31 oil-water separators, abandonment in place of the JP-4 fuel hydrant system, remediation of contaminated soil at the UST sites and at the JP-4 fuel hydrant system by a soil treatment technology, and provision of an interim soil cover and native vegetation for Landfill 4. Several innovative technologies were demonstrated under the installation's restoration program. The installation also is using

natural attenuation and land treatment to remediate contaminated soil. In FY95, fieldwork began for the RFI.

In FY96, the installation submitted an RFI Report to the regulatory agencies. Human Health and Ecological Risk Assessments were performed at contaminated sites. Remediation by bioslurping was implemented at the installation service station, and bioventing was initiated at three sites. The installation completed clearance of unexploded ordnance at the EOD range and is completing a report presenting the results of sampling conducted there. The installation also completed sampling at the Defense Reutilization and Marketing Office (DRMO) storage facility under an approved closure plan.

The installation formed a BRAC cleanup team and a restoration advisory board in FY94. The installation completed a community relations plan in FY95.

FY97 Restoration Progress

Several Interim Removal Actions occurred: removal of pesticide-contaminated soil, removal of one UST, and removal of free product by bioslurper at the base service station. Several wells at various SWMUs also were bailed periodically to remove product. In addition, the installation continued to use innovative technology such as bioslurping and geoprobe. Cleanup activities continued at POL spill sites. The installation also evaluated parcels of land for possible lease or transfer. The installation is awaiting concurrence from regulatory agencies on the determination of 337 acres as CERFA-clean.

The initiation of on-site instead of off-site treatment of wastewater from remedial activities improved site management in FY97. Use of a model site during the planning stage of the corrective measures study (CMS) to demonstrate the CMS process and variables helped resolve issues with the state and EPA. The latest version of the BRAC

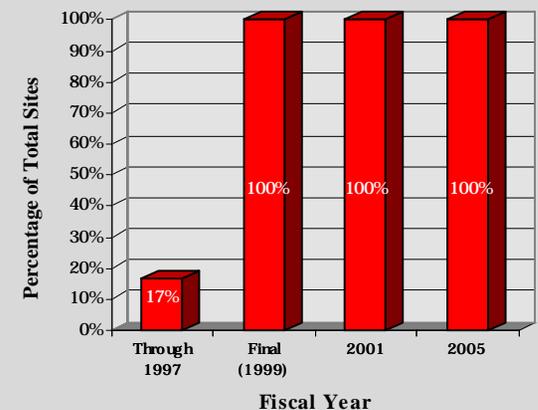
Cleanup Plan and several Supplemental Environmental Baseline Surveys also were prepared.

An unanticipated lag in providing regulators with responses to comments on closure documents delayed completion of some activities scheduled for FY97.

Plan of Action

- Receive approval on RFI Report and conduct CMS and Interim Remedial Actions in FY98
- Complete closure of the EOD range in FY98
- Close the DRMO storage facility in FY98
- Implement and have in place all Remedial Actions by FY99

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 706 acres shoreside; 10,428 acres inland
Mission: Handle, store, renovate, and ship munitions
HRS Score: 37.21; placed on NPL in August 1990
IAG Status: Federal Facility Agreement signed in December 1990
Contaminants: VOCs, SVOCs, heavy metals, hydrocarbons, and petroleum products
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: \$13.0 million
Estimated Cost to Completion (Completion Year): \$21.5 million (FY2030)
Final Remedy in Place or Response Complete Date: FY2004



Colts Neck, New Jersey

Restoration Background

Preliminary Assessments completed in FY83 identified 29 sites of concern, 4 of which required further investigation. The sites include landfills, production areas, storage areas, maintenance areas, and disposal areas. To date, 65 sites (46 CERCLA and 19 underground storage tank [UST]) have been identified. Releases of volatile organic compounds (VOC) and heavy metals from landfills and production areas have contaminated groundwater and soil at the installation.

In FY87, a Site Inspection (SI) identified 11 contaminated sites. An SI in 1992 examined 16 additional sites. The first SI recommended additional characterization of the 11 identified sites through well monitoring, soil borings, and surface water sampling. No further action was recommended for two sites. The second SI recommended further action at 13 sites and established the need for basewide background data for decision-making.

In FY91, the installation began Remedial Investigation and Feasibility Study (RI/FS) activities. An interim draft RI report for the first 11 sites was submitted in FY92. The report recommended cleanup of all sites, including capping, removal, and long-term monitoring (LTM). The first round of RI/FS was completed in late FY93. Background and watershed data were obtained during the second RI/FS round in FY94.

The installation completed Removal Actions for several UST sites in FY93. One UST site was investigated in FY91 and closed in FY92. Spills and overfills at two UST sites had contaminated surrounding soil, which was excavated and disposed of in FY93.

In FY94, the installation completed a work plan, an Action Memorandum, and an Engineering Evaluation and Cost Analysis for a Removal Action at Site 20. The installation also began preparing a corrective

action plan for UST 8. USTs that had been used to store heating oil were removed, and a number of leaking USTs were identified.

In FY95, the installation completed RI fieldwork at 21 sites. EPA approved recommendations for no further action at 14 sites. A Removal Action was completed at Site 20. The removed soil was taken to an asphalt plant for recycling. No further action was recommended for six UST sites.

In FY90, the installation formed a technical review committee (TRC), completed a community relations plan (CRP), and established an information repository containing a copy of the administrative record. In FY95, the TRC was converted to a restoration advisory board (RAB). A public meeting was held with the Monmouth County Health Department to discuss the cleanup program at the installation and the formation of the RAB. The RAB also held its first formal meeting, and 20 RAB members participated in a site visit.

Coordination and cooperation between the Navy, EPA Region 2, the New Jersey Department of Environmental Protection (NJDEP), and officials of Monmouth County are good. Under a partnership initiated in FY95 with the Monmouth County Health Department, geographic information system (GIS) maps of the installation were developed to support decision-making and promote public involvement.

In FY96, the installation signed a data-sharing agreement with NJDEP. This agreement enabled the Navy to overlay state wetland delineations and aerial photographs onto GIS maps. The installation completed the RI for 27 sites, initiated Removal Actions at 5 sites, and began FS activities at 4 sites. A pilot study begun in FY96 helped the installation determine the best method of removing a layer of free product from groundwater at Site 16.

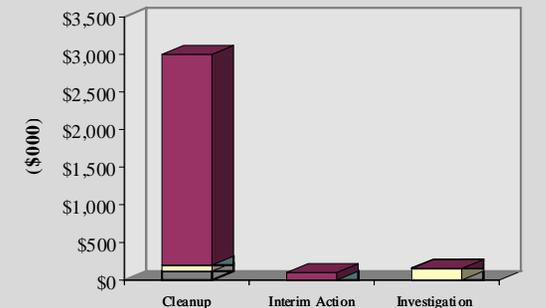
FY97 Restoration Progress

The installation completed Remedial Actions (RA) at five sites and the FS at four sites. Remedial Design (RD) began for two landfill caps, surface soil remediation, and four UST sites. The installation began using accelerated fieldwork techniques such as laser-induced fluorescence, geoprobe, and cone penetrometer. The combination of these techniques and use of an on-site mobile laboratory expedited site characterization.

Plan of Action

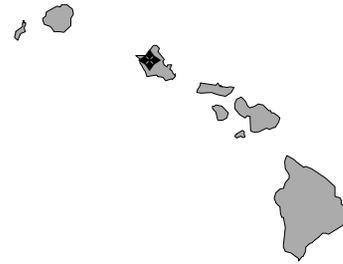
- Update the CRP in FY98
- Complete the RD for three sites in FY98
- Install landfill caps and perform soil removal in FY98
- Begin corrective actions for four UST sites and RA at four other sites in FY98
- Begin RD for Site 26 in FY98

FY98 FUNDING BY PHASE AND RELATIVE RISK



■ Not Required ■ Not Evaluated □ Low □ Medium ■ High

Size: 2,400 acres
Mission: Operate and maintain communications facilities and equipment for Naval shore installations and fleet units in the eastern Pacific
HRS Score: 50.00; placed on NPL in May 1994
IAG Status: Draft Federal Facility Agreement
Contaminants: PCBs, metals, and petroleum hydrocarbons
Media Affected: Soil
Funding to Date: \$5.9 million
Estimated Cost to Completion (Completion Year): \$45.3 million (FY2030)
Final Remedy in Place or Response Complete Date: FY2014



Wahiawa, Hawaii

Restoration Background

This installation operates six facilities on the island of Oahu but conducts industrial operations primarily at the main station and receiver site in Wahiawa and the Naval Radio Transmitting Facility in Lualualei. The restoration program has focused on those two facilities, where maintenance and operation of electrical transformers and switches have been the primary sources of contamination. The installation was placed on the National Priorities List (NPL) because polychlorinated biphenyl (PCB)-contaminated soil was detected in work and residential areas. Contamination with metals and petroleum hydrocarbons also resulted from the station's operation and maintenance activities.

Environmental investigations began at the installation in FY86. A total of 24 CERCLA sites and 4 underground storage tank (UST) sites have been identified to date. Site Inspections (SI) have been conducted for Sites 1, 5, 11, and 14 through 19. Expanded Site Inspections (ESI) were conducted for Sites 1, 5, and 11.

In FY92, the installation conducted a Removal Action at Site 14 to remove PCB-contaminated soil in the vicinity of eight transformers. The results of a risk assessment prepared after the Removal Action indicated that no further action was required. The ESI identified elevated levels of lead and mercury at the Old Wahiawa Landfill and the Building 6 Disposal Area.

In FY95, the installation completed planning documents for the Remedial Investigation and Feasibility Study (RI/FS) at Sites 1, 5, 6, 10, 12, 13, 17, 18, and 20. RI/FS activities include screening risk assessments to determine whether further action is required. This approach is intended to accelerate the cleanup process at the installation.

Because the installation consists of two primary facilities, two restoration advisory boards (RAB) were established. Both the Wahiawa and the Waianae/Lualualei RABs have approximately 25 members representing the community. Both meet quarterly. Members of the community have been instrumental in the discovery of sites, as well as in locating numerous wells in the vicinity of the installation. The final community relations plan was completed in FY95.

In FY95, the Navy completed a draft Federal Facility Agreement (FFA) with EPA. The Navy acknowledged the receipt of the draft FFA and its willingness to begin negotiations on the agreement. Since then, however, the Navy has given the FFA low priority because the cleanup program has been progressing at the installation.

In FY96, the Navy conducted RI/FS activities at Sites 1 and 5 and determined that no further action was required at UST Site 6. In the same year, initial site characterization was conducted at UST Site 8.

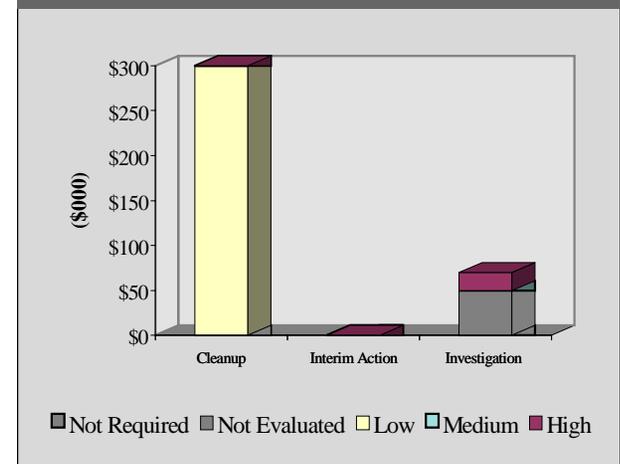
FY97 Restoration Progress

The installation continued RI/FS activities at Sites 1 and 5 and began RI/FS activities at Sites 2 and 22. An Engineering Evaluation and Cost Analysis (EE/CA) was prepared for the Removal Action at transformer locations at Sites 17, 18, and 20.

Plan of Action

- Complete RI/FS at Sites 1, 2, 5, and 22
- Initiate Removal Action fieldwork at Sites 17, 18, and 20

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 301,000 acres
Mission: Research and develop aircraft
HRS Score: 33.62; placed on NPL in August 1990
IAG Status: Federal Facility Agreement signed in 1990
Contaminants: Waste oils, solvents, VOCs, petroleum hydrocarbons, petroleum/oil/lubricants, rocket fuel, and heavy metals
Media Affected: Groundwater and soil
Funding to Date: \$105.6 million
Estimated Cost to Completion (Completion Year): \$248.5 million (FY2015)
Final Remedy in Place or Response Complete Date: FY2004



Kern County, California

Restoration Background

In FY93, an Expanded Source Investigation and a RCRA Facility Assessment identified solid waste management units and the following site types: underground storage tanks (UST), fuel pipelines, landfills, hazardous waste disposal areas, and wastewater and surface water runoff collection areas.

The installation has conducted the following Interim Remedial Actions (IRA): installed a groundwater extraction and treatment system to remove JP-4 jet fuel; removed 330 USTs; removed barrels of hazardous waste from and capped one site; stabilized soil to immobilize dioxin and heavy metals; replaced leaking JP-4 jet fuel pipelines; capped the fire training facility; implemented bioventing at three sites; implemented a groundwater extraction and treatment system to remove volatile organic compounds (VOC); installed a fence at a landfill; and conducted Removal Actions at seven sites.

In FY94, the installation's technical review committee was converted to a restoration advisory board. The installation has entered into two partnership agreements, one with the U.S. Geological Survey to use abandoned groundwater wells to monitor aquifer conditions and the other with Stanford University to develop and demonstrate innovative treatment technologies.

In FY96, using bioventing, the installation cleaned and closed a former UST site ahead of schedule. An innovative bioremediation treatment facility was opened to remediate soil contaminated with petroleum products. IRAs were initiated at Operable Unit (OU) 1 with the construction of two two-phase extraction systems to remediate contamination with petroleum hydrocarbons in the groundwater and soil. At OU2, IRAs were conducted to activate a bioventing system and to begin construction of a two-phase extraction system. In

September, pilot-testing of a dual extraction system began at an area contaminated with tetrachloroethene (PCE).

Also in FY96, decision documents were signed for 40 areas of concern (AOC) at OUs 1 and 2, increasing the number of sites that require no further action to 105. Relative Risk Site Evaluation scores were reevaluated in light of more-accurate data on contaminants and hazards. The installation began five Interim Actions. Several portions of the Federal Facility Agreement (FFA) were renegotiated to take into account funding shortfalls.

FY97 Restoration Progress

Meetings and conference calls with regulatory agencies cut the review time for several draft documents. Remediation of the aquifer was delayed because of a change in the regulatory attitude.

Twenty-four early actions and 15 site cleanups occurred. Innovative technologies were implemented. The Site Technology Assessment and Remediation (STAR) program, and Base Environmental Analysis Laboratory (BEAL), a laboratory on base, were used to accelerate fieldwork. Soil vapor extraction (SVE) with thermal treatment and bioremediation were also used. All three dual-phase extraction systems constructed in FY96 began operation in FY97.

Site management was improved by placing some equipment on skids for easy removal, combining AOC descriptions at the South Base OU into a summary report, forming an agreement with regulatory agencies for one basewide Record of Decision (ROD) rather than a separate ROD for each OU, and creating a database of applied or relevant and appropriate requirements (ARAR) to help in decision-making.

In continuing partnering efforts, preliminary draft documents were subject to a 10-day internal review, controversial issues were discussed in advance by remedial project managers and regulators,

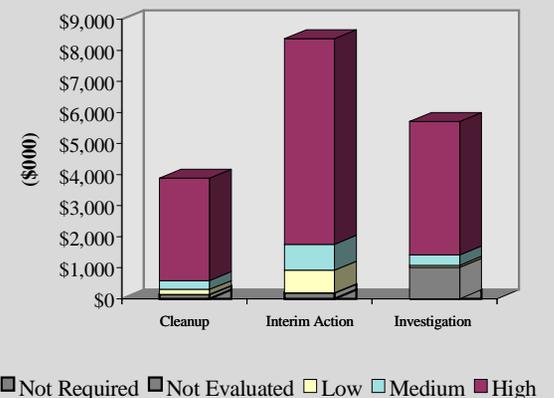
EPA Region 9 and the base met to discuss quality assurance (QA), and FFA requirements concerning Remedial Investigations (RI) were set aside to accelerate the CERCLA process.

A change in the regulatory attitude about the cleanup of the main base (OU1) and some parts of the Phillips Laboratory (OU4) raised concerns among the RPMs that it may not be technologically or economically feasible to remediate the aquifer. Therefore some of the IRAs were put on hold. The Treatability Study of an in situ permeable treatment was not performed because the rate of groundwater migration has been very slow.

Plan of Action

- In FY98, continue use of the STAR rig to evaluate AOCs and PRLs, and continue use of the BEAL to provide screening data on field samples
- Use PRL and site reports to replace lengthy OU RIs in FY98
- In FY98, implement pre-ROD Engineering Evaluation and Cost Analysis and IRAs at those sites with highest risk
- In FY98, use SVE and catalytic oxidation to treat of contaminated soil and groundwater extraction with above-ground treatment and carbon filtration for contaminated groundwater
- Partner with EPA Region 9 to implement a multiphase QA program in FY98
- Continue to develop business performance indicators for process improvement in FY98
- In FY98, revise management action plan to reflect new streamlined cleanup strategy

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 19,790 acres
Mission: Provide tactical air support to Pacific Air Forces
HRS Score: 48.14; placed on NPL in November 1989
IAG Status: IAG signed in May 1991
Contaminants: Heavy metals, petroleum/oil/lubricants, VOCs, PCBs, and solvents
Media Affected: Groundwater and soil
Funding to Date: \$50.7 million
Estimated Cost to Completion (Completion Year): \$5.8 million (FY2011)
Final Remedy in Place or Response Complete Date: FY1999



Fairbanks, North Star Borough, Alaska

Restoration Background

Environmental studies at Eielson Air Force Base began in FY82. By FY93, the installation had identified a total of 64 sites. Thirty-one of the 64 sites were grouped into six operable units (OU). Of the remaining sites, 24 were investigated and determined to require no further action.

Site types at the installation include fire training areas, landfills, spill sites, aboveground storage tanks, underground storage tanks (UST), and disposal pits. The most significant contamination has resulted from leaks and spills from piping and storage tanks associated with petroleum/oil/lubricant (POL) distribution systems. The primary contaminants affecting groundwater and soil include POLs, benzene, and chlorinated solvents.

Interim actions completed at the installation in FY90 and FY91 include removal of four USTs and removal and incineration of POL-contaminated soil. Bioventing was implemented at two POL sites, and land treatment is being used to remediate the POL-contaminated soil excavated during Remedial Investigation (RI) activities and Removal Actions. Four POL sites are being treated with free-product removal systems, and bottled water is being provided to residents of two remote areas.

In FY94, Eielson Air Force Base presented a demonstration of the use of air sparging to remove volatile organic compounds (VOC) from contaminated groundwater. A mobile wastewater treatment system also was set up at the facility to treat monitoring-well purge water. This system will greatly reduce the costs associated with disposal of investigation-derived waste.

In FY95, the installation received regulatory approval for use of bioventing and natural attenuation as cleanup alternatives and began Remedial Design (RD) at OUs 1 and 2. The installation also began

fate-and-transport modeling for lead-contaminated sites at OU2. A Remedial Action (RA) contract for landfill capping, bioventing, natural attenuation, soil vapor extraction (SVE), and remediation of lead contamination was initiated at OUs 3, 4, and 5.

In FY95, the installation converted its technical review committee to a restoration advisory board (RAB) to ensure community participation in the restoration process.

In FY96, an RD was conducted for polychlorinated biphenyl (PCB) contamination at Garrison Slough. Bioventing and SVE were initiated at OUs 1 and 2. The installation also completed Removal Actions for lead and POL soil contamination at OU2. A cesspool and a dry well were removed.

FY97 Restoration Progress

Remedial efforts were completed at all 66 Federal Facility Agreement (FFA) sites except Site SS-067, which contained additional PCB contamination. Approximately 235,000 pounds of PCB-contaminated soil from this site were shipped to a TSCA receiving facility. In addition, land treatment operations continue using a windrow technique implemented in FY96. Cleanup efforts at the Chena River Site are 95 percent complete. All long-term operations (LTO) and long-term monitoring (LTM) activities at active sites continued through FY97. All ROD documents for the base's Installation Restoration Program have been signed.

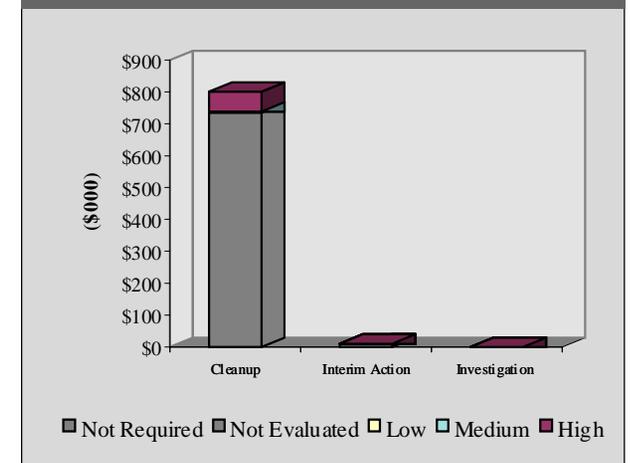
Areas of concern (AOC) were largely addressed in FY97. Limited field investigations (LFI) and response actions were completed at 44 sites where more than 3,000 drums were removed and disposed of and over 218,000 pounds of lead-contaminated sand were removed from a firing range.

Biennial indicator test kit-type monitoring was initiated in the annual sitewide sampling and analysis program, producing an analysis and report cost savings of 80 percent over confirmational laboratory sampling and reporting procedures.

Plan of Action

- Complete remediation of Site SS-067 in FY98
- Complete LFI and response actions at the remaining 16 AOCs in FY98
- Continue LTO/LTM at active sites in FY98
- Meet land treatment area remediation goals and close the land treatment area in FY98
- Complete a small soil excavation beneath a septic tank at the Chena River Site in FY98
- Reach Construction Complete phase of the program in FY98
- Continue biannual RAB meetings in FY98 and FY99
- Solicit community interest for converting RAB to a community advisory board in FY98

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size:	4,812 acres
Mission:	Serve as the primary Marine Corps jet fighter facility on the West Coast; provide materials and support for Marine Corps aviation activities; provide housing for Marine Corps personnel
HRS Score:	40.83; placed on NPL in February 1990
IAG Status:	Federal Facility Agreement signed in October 1990
Contaminants:	Trichloroethene, petroleum hydrocarbons, PCBs, pesticides, herbicides, and other VOCs
Media Affected:	Groundwater and soil
Funding to Date:	\$46.8 million
Estimated Cost to Completion (Completion Year):	\$77.8 million (FY2003)
Final Remedy In Place or Response Complete Date for BRAC Sites:	FY2002



Irvine, California

Restoration Background

In July 1993, the BRAC Commission recommended that this installation be closed and that its aircraft, personnel, equipment, and support be transferred to Miramar Naval Air Station and Camp Pendleton Marine Corps Base in California. The installation was placed on the National Priorities List (NPL) in 1990.

Environmental studies conducted at the station since FY86 have identified 25 CERCLA sites, more than 450 areas of concern, and more than 400 underground storage tanks (UST) in 18 groups. Site types include landfills, USTs, and spill sites at which solvents and petroleum hydrocarbons were released into soil and groundwater.

In FY89, an Interim Remedial Action (IRA) was initiated to address contaminated groundwater. A treatment system using granular activated carbon technology was installed to remove trichloroethene (TCE) from groundwater. An IRA initiated in FY94 involves installation of drainage controls, slope stabilization, access controls, and limited waste consolidation at two landfills.

The 25 CERCLA sites were grouped into three operable units (OU): volatile organic compound (VOC)-contaminated regional groundwater (OU1), sites believed to be contributing to groundwater contamination (OU2), and all remaining CERCLA sites (OU3). Remedial Investigation and Feasibility Study (RI/FS) activities began in FY90. A Phase I RI/FS was completed in FY93. Phase II activities began in FY94.

The installation investigated 157 solid waste management units and completed a RCRA Facility Assessment in FY93. The installation's UST Tiger Team removed 41 inactive USTs in FY95 and continues to develop scopes of work for Remedial Actions at the remaining UST sites.

The installation formed its BRAC cleanup team (BCT) in FY94. The Environmental Baseline Survey, completed in FY95, indicated that 63 percent of the installation property required no further action.

A technical review committee was formed in FY90 and converted to a restoration advisory board (RAB) in FY94. A RAB Steering Committee has been formed, and the RAB, which has more than 50 members, developed and approved a mission statement.

In FY96, the installation updated its community relations plan and its BRAC Cleanup Plan. The Local Redevelopment Authority (LRA) approved two proposals to convert the installation into a commercial airport, which is addressed in the FY96 draft Reuse Plan. The installation also completed the RI for some OU2 sites. The installation began operating soil vapor extraction (SVE) systems at two UST sites and a free-product recovery system at one UST site.

FY97 Restoration Progress

Proposed Plans and Records of Decision (ROD) were completed and signed for the first group of OU3 sites. Eleven site cleanups were completed, and three early actions occurred. Coordination of the Removal Action Contract (RAC)/CLEAN improved site management. Reduced Federal Facility Agreement (FFA) review time and fast-track signing of two RODs resulted from cooperative efforts with regulatory agencies. Other goals for FY97 were obviated by resolution of regulatory comments through partnerships with regulators and coordination with Navy policy.

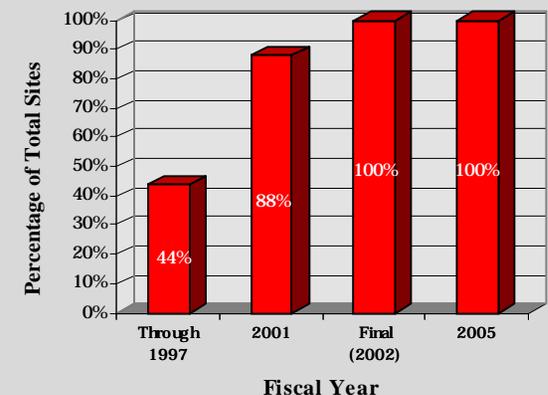
The RAB conducted two public comment meetings in preparation for FY97 ROD signings, as well as educational briefings for the Homeowners Association. The BCT supported numerous RAB meetings, participated in formal public meetings, reviewed FFA

documents, and signed an Interim ROD for one site and a final ROD for 11 no-further-action sites. Regulatory agencies approved 3,209 acres as uncontaminated.

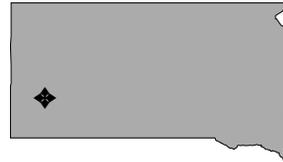
Plan of Action

- Complete the RI/FS for a part of OU3 in FY98
- Complete the FS and Proposed Plans, and sign RODs for OUs 2A, 2B, and 2C in FY98
- Complete the RI for the remaining sites at OU3 in FY98
- In FY98-FY99, remove operational USTs in close coordination with tenant migration activities
- In FY98-FY99, implement SVE remediation at VOC source area before migration of aircraft operations
- Begin use of Fixed-Price RAC services procurement in FY98-FY99
- Complete the Proposed Plan and sign the ROD for OU1 in FY99

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 4,858 acres
Mission: Provide long-range bombardment missiles and air refueling support
HRS Score: 33.62; placed on NPL in August 1990
IAG Status: Federal Facility Agreement signed in January 1992
Contaminants: Solvents, petroleum/oil/lubricants, lead, and low-level radioactive waste
Media Affected: Groundwater and soil
Funding to Date: \$51.5 million
Estimated Cost to Completion (Completion Year): \$47.1 million (FY2001)
Final Remedy in Place or Response Complete Date: FY2001



Rapid City, South Dakota

Restoration Background

Environmental studies conducted from FY85 to FY87 identified 20 sites at Ellsworth Air Force Base. Site types include landfills, underground storage tanks (UST), maintenance areas, a fire training area, and a low-level radioactive waste burial site. Groundwater and soil contamination resulted from releases of trichloroethene (TCE) and petroleum/oil/lubricants (POL) at these sites.

Sites at the installation were classified in 12 operable units (OU), which were then placed in four groups. Group 1 contains OUs 1, 2, and 4; Group 2, OUs 9, 10, and 12; Group 3, OUs 3, 5, 7, and 8; and Group 4, OU 11. OU6, which entered the CERCLA process first, was not placed in a group.

In FY91, the installation removed 72 USTs and constructed a pilot-scale groundwater treatment plant for TCE and POL contamination. In FY93, 160 UST sites were evaluated and 31 USTs were removed, including 5 USTs removed from the low-level radioactive waste burial site. The installation designed an accelerated cleanup program to reduce project cost and accelerate cleanup. Field-screening techniques were used to eliminate 1 year of Remedial Investigation and Feasibility Study (RI/FS) activities. Negotiations with EPA and the state regulatory agency decreased the time needed to review primary documents from 60 to 45 days, established standard formats, and provided for concurrent review.

In FY94, a restoration advisory board (RAB) was formed. The RAB continues to meet quarterly. The installation also formed partnerships with regulatory agencies to expedite document review and to facilitate compliance with regulations through preventive measures. Remedial Design activities were initiated for OUs 1, 2, 4, and 9 through 12. At OUs 1, 2, and 4, the installation began a pilot-scale study of a soil vapor extraction (SVE)/groundwater extraction and treatment system.

An Interim Action extended the installation's water supply line to three private homes near the southwest part of the base. An additional 100 USTs were removed.

In FY95, the installation completed the final FS for OUs 1, 2, 4, 9, 10, and 12 and began Interim Remedial Actions, which included groundwater extraction and treatment and SVE. A two-phase vacuum extraction test was conducted at OUs 1, 2, and 4. The drinking water program was extended to 12 additional nearby residences. A final 12 USTs and 4,000 cubic yards of contaminated soil were removed, thus completing the UST investigation and removal program.

During FY96, a final FS Report and a Proposed Plan for OUs 3, 5, 7, and 8 were completed along with the RI/FS Report and the Proposed Plan for OU11. Remedial Action (RA) activities were started for OUs 1 through 5, 7 through 10, and 12. Construction of a groundwater extraction and treatment system began for OU11, and RA construction was completed at OU 6. Interim Records of Decision (ROD) were signed for OUs 1 and 4, and final RODs were signed for OUs 1 through 10 and OU12. Nine of the final RODs required RAs (OUs 1 through 8 and OU12); two proposed no further action (OU9 and OU10). The RAB held public meetings to review all 11 of the final RODs.

FY97 Restoration Progress

The ROD for OU11 was signed, and the RA was started. RAs were completed for OUs 1 through 5, 8, and 12, and long-term monitoring (LTM) and operation and maintenance started. For four of the sites, the remedy was a landfill cover. LTM at OUs 6 and 7 continued.

The installation made an effort to keep EPA Region 8 and the South Dakota Department of Environment and Natural Resources well informed about, and involved in, installation cleanup activities.

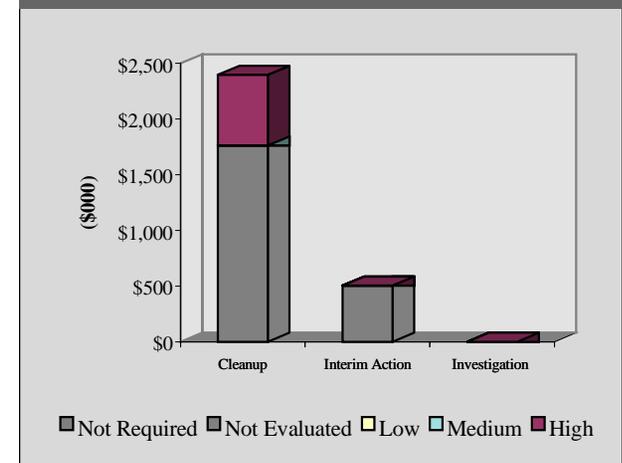
Monthly construction meetings involving installation personnel, regulatory agencies, contractors, and the U.S. Army Corps of Engineers allowed integrated project coordination and execution.

The removal of unexploded ordnance from Site OT-18 delayed initiation of the PA/SI for that site.

Plan of Action

- Begin the Preliminary Assessment and Site Inspection (PA/SI) for Site OT-18 upon clearance of unexploded ordnance from the site in FY98
- Continue LTM of operations at all OUs
- Complete a PA/SI for a new area of concern (AOC-24) in FY98

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 13,103 acres
Mission: Headquarters Alaskan Command, 11th Air Force and host unit, 3rd Wing; also hosts Alaskan NORAD Region, Rescue Coordination Center, and 632nd Air Mobility Support Squadron
HRS Score: 45.91; placed on NPL in August 1990
IAG Status: Federal Facility Agreement signed in 1991
Contaminants: VOCs, heavy metals, petroleum/oil/lubricants, solvents, and paints
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: \$59.5 million
Estimated Cost to Completion (Completion Year): \$21.4 million (FY2026)
Final Remedy in Place or Response Complete Date: FY2000



Anchorage, Alaska

Restoration Background

Environmental studies completed between FY83 and FY97 identified 81 sites at this installation, which are grouped into six operable units (OU). Sites include old construction landfills, petroleum spill sites, and underground storage tanks (UST). Thirty-seven sites are covered under the Federal Facility Agreement (FFA), and 39 sites are covered under the State-Elmendorf Environmental Restoration Agreement (SERA) with the state of Alaska. The SERA agreement addresses solid waste, USTs, and petroleum/oil/lubricant spills covered under 18 AAC 75.

In FY92, asphalt recovery was completed at SS10 in OU4. In FY93, the installation completed construction of a long-term groundwater treatment system at OU2. The system extracts free petroleum product from the groundwater and treats the groundwater by air stripping. This Interim Remedial Action was performed at a site containing four 1-million-gallon USTs.

The installation removed polychlorinated biphenyl (PCB)-contaminated sediment from a stormwater ditch at OU3 in FY94. Because the ditch is adjacent to an elementary school in a residential area, an expedited response action was initiated to remove the polychlorinated biphenyl (PCB).

In FY94, bioventing Treatability Studies were completed at three sites. The results indicated that bioventing was beneficial in the remediation of petroleum-contaminated soil at the installation. An intrinsic remedial Treatability Study also was completed for OU4, and a Record of Decision (ROD) was signed for OU1.

In FY95, the installation continued Remedial Investigation and Feasibility Study (RI/FS) work at OU6 and completed RODs for OU2, OU4, and OU5. Remedial Designs (RD) were completed to close the four 1-million-gallon USTs at OU2, clean up PCBs at OU3, install

bioventing systems at OU4, and construct an engineered wetland at OU5. Removal Actions were conducted at a pesticide storage facility in OU7 and an asphalt seep area at OU1. The installation also installed, and began operating, bioventing systems at eight UST sites and initiated long-term monitoring (LTM) of groundwater.

In FY96, the installation prepared RDs for OU6. RDs included beach sweeps at LF04, a two-phase high vacuum extraction (HVE) system at SD15, and debris removal and partial covering at LF02. In addition, the installation closed the four 1-million-gallon USTs and removed associated pipeline at OU2, conducted a PCB Treatability Study for OU3, installed the bioventing systems at OU4, and began construction of the engineered wetland at OU5.

The Office of Public Affairs (OPA) coordinates the installation's public involvement program. OPA serves as the focal point for all communication between the public and the installation about the environmental restoration program, provides information about activities, and responds to community inquiries and concerns. In FY95, the installation formed a restoration advisory board (RAB). In FY96, the board met quarterly and toured remediation areas.

FY97 Restoration Progress

RODs were signed for OUs 3 and 6. RDs were completed for remediation of PCBs at OU3 and for removal of the North Jet Pipeline. The installation initiated beach sweeps at LF04 in OU6 and Treatability Studies for a two-phase HVE system at SD15 in OU6 and began limited field investigations at nine areas of concern (AOC). In addition, long-term operations (LTO) continued for the completed engineered wetland at OU5 and for 22 bioventing systems at 10 sites.

Basewide LTM of groundwater and surface water continued, one bioventing system closed, and 13,800 feet of pipeline at ST32 was removed. The installation recovered 0.40 gallons of free product,

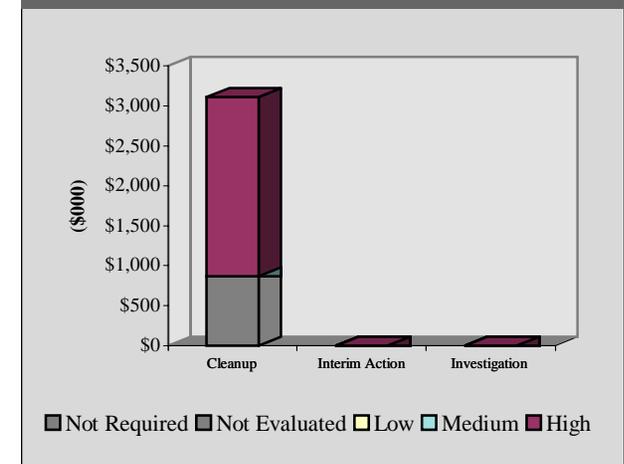
treated 36,000 gallons of water, completed closure of the four 1-million-gallon USTs, and removed associated pipeline at OU2.

In FY97, the RAB charter was rewritten to focus on all environmental activities, not just restoration. This began the transition to a community advisory board. The Board toured installation environmental activity areas. Furthermore, in FY97, Elmendorf's RAB received the Pentagon Crystal Award.

Plan of Action

- Complete PCB removal at OU3 and limited field investigations at nine AOCs in FY98
- Complete removal of 11,000 feet of North Jet Pipeline in FY98
- Continue recovery of free product at OU2 in FY98
- Continue LTO of OU5 engineered wetland system, a two-phased HVE system at SD15 in OU6, and 22 bioventing systems at 10 sites in FY98
- Continue beach sweeps at LF04 in OU6 in FY98
- Continue LTM of basewide groundwater and surface water in FY98
- Conduct 5-year ROD reviews and Remedial Action Completion Reports for OU1 through OU6 in FY98

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 2,282 acres
Mission: Used as a tactical fighter wing
HRS Score: NA
IAG Status: None
Contaminants: Industrial waste, spent solvents, fuels, waste oil, paints, pesticides, alkali, low-level radioactive waste, chlorine gas, PCBs, TCE, and medical waste
Media Affected: Groundwater and soil
Funding to Date: \$26.5 million
Estimated Cost to Completion (Completion Year): \$3.9 (FY2028)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY1998



Alexandria, Louisiana

Restoration Background

In July 1991, the BRAC Commission recommended closure of England Air Force Base. The installation closed in December 1991.

Since FY82, environmental studies have identified 42 sites at the installation, including landfills, underground storage tanks, aboveground storage tanks, fire training areas, oil-water separators, a sewage treatment pond, a low-level radiation site, and gas training kit burial sites. Petroleum by-products, pesticides, and herbicides are the primary contaminants affecting the soil.

In FY92, a RCRA Facility Assessment identified 59 solid waste management units (SWMU) and 5 areas of concern. In FY93, a BRAC cleanup team (BCT) was formed.

In FY94, the installation completed the Phase I RCRA Facility Investigation (RFI) and the Environmental Baseline Survey (EBS). Regulatory concurrence was received for approximately 1,200 acres designated as CERFA-clean. In addition, the installation established a restoration advisory board (RAB). The RAB was briefed on the status of all restoration activities and on the Relative Risk Site Evaluation process. Measures taken to improve site management included fostering BCT involvement by meeting at the offices of team members. The BCT has made efforts to improve the decision-making process by developing Consensus Statements to resolve issues. The installation updated its BRAC Cleanup Plan and completed a basewide lease in early FY95.

In FY95, the installation completed comprehensive field investigations to establish background soil concentration levels, began field activities for a Phase II EBS site investigation, completed a lead-based-paint survey of houses and schools, and completed an aboveground storage tank cleaning project. The installation began

Interim Actions at several sites, including a fire training pit, a polychlorinated biphenyl (PCB) spill site, a solvent spill site, and a civil engineering drainage ditch. The installation completed closure of an aircraft refueling and hydrant system and completed cleanup of chlorine gas and the medical waste incinerator.

In FY96, quarterly RAB meetings continued. The installation replaced the fire station oil-water separator and completed cleanup activities at the civil engineering drainage ditch, low-level radiation site, hospital PCB site, and jet engine shop. Delineation of a trichloroethene (TCE) groundwater plume was completed. The final Comprehensive Background Survey (CBS) was submitted to EPA and the Louisiana Department of Environmental Quality (LDEQ).

The installation transferred 167.5 acres of CERFA Category 1 through 4 property to new owners and completed a finding of suitability to transfer (FOST) for an additional 991 acres. In addition, negotiations with regulatory agencies began for the Phase II RFI.

FY97 Restoration Progress

The work initiated in FY96 on a Human Health Risk Assessment and an Ecological Risk Assessment Consensus Statement continued in FY97. In addition, a corrective measures study for RFI sites was completed in FY97. The installation completed the Interim Action at the Fire Training Site and three other contaminated-soil sites. SWMU 41 was closed and capped. The process of obtaining EPA and LDEQ concurrence on the final CBS report also began.

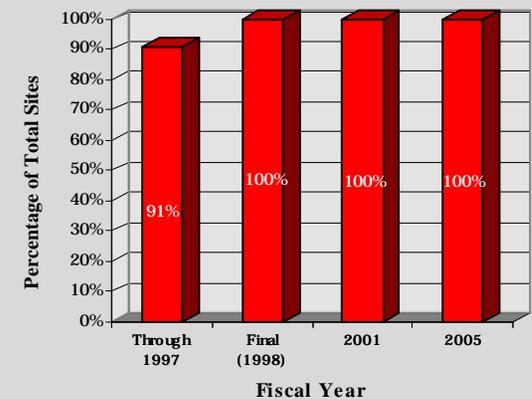
The BCT conducted monthly meetings, and the LDEQ and EPA Region 6 each presented briefings.

Some activities scheduled for completion in FY97 were delayed because of a need for further studies.

Plan of Action

- Characterize TCE plume in FY99
- Obtain EPA and LDEQ concurrence on the final CBS report in FY98
- Obtain EPA and LDEQ concurrence on Human Health Risk Assessment and Ecological Risk Assessment Consensus Statements in FY98
- Complete Site Inspections at restoration sites in FY98
- Begin the removal and incineration of contaminated soil from the Chemical Burial Mound in FY98

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 5,869 acres
Mission: Provide intercontinental ballistic missile and aerospace rescue operations
HRS Score: 39.23; placed on NPL in February 1990
IAG Status: Federal Facility Agreement signed in September 1991
Contaminants: Oil, solvents, metals, acids, petroleum, and explosives residues
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: \$52.0 million
Estimated Cost to Completion (Completion Year): \$61.9 million (FY2009)
Final Remedy in Place or Response Complete Date: FY2009



Cheyenne, Wyoming

Restoration Background

The Air Force began restoration activities at F.E. Warren Air Force Base in FY84, when solvent-contaminated soil was removed from an area near a helicopter maintenance facility. In FY85, a basewide Preliminary Assessment and Site Inspection identified 25 potentially contaminated sites, including underground storage tanks, spill sites, fire training areas, landfills, small-arms firing ranges, and explosive ordnance disposal areas. Remedial Investigation and Feasibility Study (RI/FS) activities began at those sites in FY87. The RI Report confirmed the presence of contaminants at 20 sites, which subsequently were grouped into 10 operable units (OU), and identified 5 plumes of trichloroethene (TCE)-contaminated groundwater.

In FY90, the entire base was placed on the National Priorities List (NPL) because of the TCE-contaminated groundwater. Approximately 2,500 private wells, used primarily for irrigation and watering of livestock, are located within 3 miles of the installation. To accelerate cleanup, the installation has implemented generic remedies, such as air stripping of contaminated groundwater, capping of landfills, and removal of contamination sources at spill sites.

In FY92, the installation signed a Record of Decision (ROD) for OU4. In FY94, the installation submitted RI Reports for OUs 1 and 3 and a ROD specifying no further action (NFA) for OU5.

In FY94, a packed-tower air stripper was installed as part of a Treatability Study for TCE-contaminated groundwater at Spill Site 7. To minimize the risks associated with a contaminated groundwater plume potentially generated by Landfill No. 3, the installation began delivering bottled water to more than 20 families in the Nob Hill subdivision next to the base. The installation also began bioventing of petroleum hydrocarbon-contaminated soil at OU10.

In FY95, the installation removed and disposed of an oil-water separator and associated soil contaminated with TCE and began construction of a landfill cap. A leachate collection system and a groundwater extraction and treatment system also began operating. The installation began implementing a 1-year Treatability Study for a packed-tower air stripper at a spill site. The installation also was selected to test a two-phase vapor extraction system.

In FY95, the installation signed a ROD specifying NFA for soil contamination at OU1. The installation also submitted a Proposed Plan to provide a municipal water line to the residents of Nob Hill, who were receiving bottled water. In addition, a restoration advisory board was formed.

In FY96, 11 sites were evaluated through the Relative Risk Site Evaluation process. Eight sites ranked high, two ranked medium, and one was determined to need NFA. A design was completed for a Time-Critical Removal Action at Landfill 2C, and presumptive remedies, including air stripping, were implemented at OU2.

FY97 Restoration Progress

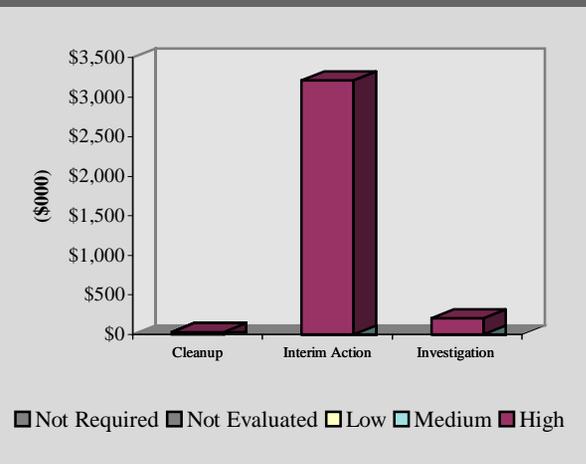
At Landfill 6, construction of an evapotranspiration (ET) cover began as part of a Proposed Plan and ROD for an interim corrective action. The installation completed construction of the water line to provide drinking water to residents of Nob Hill and resubmitted the RI/FS to the regulatory agencies. Bioventing at OU10 continued after reevaluation. In addition, RODs were signed for the installation of a RCRA D cap as an interim corrective action at Landfill 5A and a passive treatment wall (iron filing wall) for treating contaminated groundwater at Spill Site 7.

Also in FY97, the installation conducted a bottom-up review and redirected the entire environmental program in light of funding constraints. Projects were reprioritized, and the Federal Facility Agreement was revised and rescheduled. In addition, early action field investigation work plans were implemented to expedite landfill characterization.

Plan of Action

- In FY98, amend ROD for Landfill 5A to use soil cover as selected remedy; begin cover construction
- Design an iron filing wall at Spill Site 7 to remediate TCE in groundwater in FY98
- Complete Removal Action at Landfill 2C in FY98
- Complete a strategic site cleanup plan based on stabilized funding in FY98
- Continue to use innovative technologies to expedite cleanup in a cost-effective manner

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 4,300 acres
Mission: Provide aerial refueling and airlift services
HRS Score: 31.98; placed on NPL in March 1989
IAG Status: IAG signed in 1990
Contaminants: Solvents, fuels, electroplating chemicals, cleaning solutions, corrosives, photographic chemicals, paints, thinners, pesticide residues, and PCBs
Media Affected: Groundwater and soil
Funding to Date: \$32.7 million
Estimated Cost to Completion (Completion Year): \$43.7 million (FY2026)
Final Remedy in Place or Response Complete Date: FY2003



Spokane County, Washington

Restoration Background

Environmental studies since FY85 have identified 37 sites at the installation, including contaminated fire training areas, landfills, radioactive waste sites, spill sites, waste pits, disposal pits, and ditches.

In FY92, Interim Actions undertaken at the installation included implementation of an extraction and treatment system for groundwater contaminated with trichloroethene (TCE) and removal of 1,600 cubic yards of soil contaminated with fuels and oils.

By FY93, the installation had identified 30 sites and completed Remedial Investigation and Feasibility Study (RI/FS) activities at 8 sites. The Air Force signed two Records of Decision (ROD). Two sites required no further action, two required long-term monitoring (LTM) or institutional controls, and four required cleanup.

In FY94, the installation completed Remedial Designs (RD) for two sites, began RD activities at a third site, and started construction on a Remedial Action (RA) at a base landfill. The installation was an active participant in the bioventing technology and intrinsic remediation initiatives of the Air Force Center for Environmental Excellence. The intrinsic remediation study evaluated the decomposition of benzene and its breakdown products. The installation also participated in an in-well air stripping experiment.

In FY95, the installation formed a Restoration Advisory Board (RAB). The installation also completed construction of a landfill cap and expansion of the existing extraction and treatment system to contain a TCE-contaminated groundwater plume at a base landfill. The construction of a new groundwater extraction and treatment system to contain a TCE-contaminated plume at a wastewater lagoon site also began in FY95. Innovative technologies employed at the installation

include low-flow well purging techniques and direct push technology for site characterization of soil to reduce investigation-derived waste. The installation began a Preliminary Assessment and Site Inspection (PA/SI) for nine areas of concern (AOC) and the two remaining original sites. Drinking water was provided to members of the local community to replace drinking water contaminated by TCE leaching from a landfill.

The installation completed an RI/FS for 20 sites in FY96, and the Air Force signed a ROD for the sites. Currently, 13 sites require no further action, 1 requires institutional controls, 5 require LTM, and 1 requires long-term operations (LTO). The installation completed construction of the wastewater lagoon treatment plant and placed the plant in operation. RA construction began at a former fire training area, a TCE-contaminated ditch, and a spill area at the Bulk Fuel Storage Site. Because of contamination identified during the PA/SI, seven AOCs were transferred to the Installation Restoration Program, thereby increasing the number of sites at the installation to 37.

FY97 Restoration Progress

Groundwater air sparging and soil bioventing systems at the former fire training area were implemented. In addition, construction and/or Interim Removal Actions were initiated at the following sites: wastewater lagoons, a petroleum/oil/lubricant (POL) bulk storage area, a waste storage area, waste fuel operations, a fuel transfer facility, arsenic ditches and culverts, and TCE orphan plumes. LTO and LTM continue for basewide groundwater.

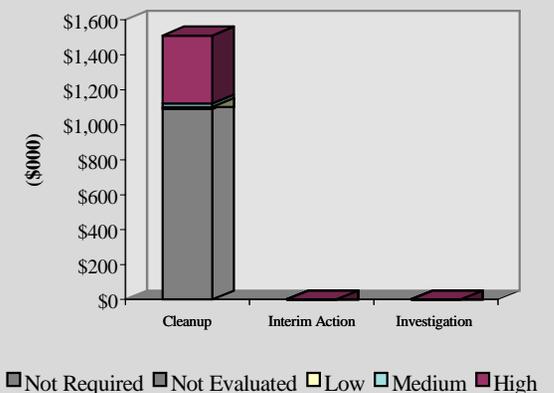
Cooperation with EPA and the state and good communication and understanding of goals helped expedite document review, resolve issues, and foster partnering. The Final PHA report has been released, validating the past and current base clean-up program.

RAB input to the Agency for Toxic Substances and Disease Registry's Public Health Assessment was critical in FY97. The final PHA report has been released, validating the past and current base cleanup program. The RAB also assisted with Relative Risk Site Evaluations, as well as document review, construction schedules, and project prioritization.

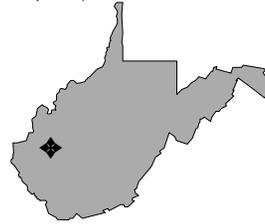
Plan of Action

- Initiate delisting with EPA and state in FY98
- Sign ROD for nine sites and two AOCs in FY98
- Continue construction and/or Interim Removal Actions at the wastewater lagoons, petroleum/oil/lubricant bulk storage area, waste storage area, waste fuel operations, fuel transfer facility, and arsenic ditches and culverts in FY98
- Continue LTM and operation and maintenance for groundwater treatment plants in FY98
- Implement natural attenuation with 3-year review at TCE orphan plumes in FY98
- Continue LTM and operation and maintenance at both bioventing and groundwater air sparging sites in FY98
- Continue basewide and off-base residential well sampling program in FY98

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 12 acres of former 16,000-acre government plant
Mission: Manufacture smokeless powder (private party operated a batch chemical plant)
HRS Score: 36.3; placed on NPL in September 1983
IAG Status: None
Contaminants: Dioxin, organic and inorganic chemicals, and metals
Media Affected: Groundwater and soil
Funding to Date: \$0.6 million
Estimated Cost to Completion (Completion Year): \$0.6 million (NA)
Final Remedy in Place or Response Complete Date: NA



Nitro, West Virginia

Restoration Background

Environmental restoration sites at Fike-Artel Chemical have been grouped into five operable units (OU): disposal of storage tank and drum contents (OU1); decontamination and disposal of storage tanks, surface drums, and aboveground structures (OU2); removal of buried drums (OU3); Remedial Investigation and Feasibility Study (RI/FS) of groundwater and soil (OU4); and RI of the cooperative sewage treatment plant (OU5). Private-sector potentially responsible parties (PRP) and EPA are leading all environmental restoration activities.

In FY93, an RI was completed for OU1. In FY94, RI activities began for OU2. Twenty PRPs signed an agreement with EPA to remove 7,000 to 16,000 buried containers from OU3.

In FY95, an Interim Action was conducted to remove underground storage tanks (UST) and aboveground storage containers (OUs 1, 2, and 3). RI activities for OU2 were completed, RI/FS activities began for OU4, and RI activities were undertaken for OU5.

In FY96, USTs and building OUs were demolished and removed. Final allocation of liability was reached and a principal agreement was signed. The Consent Decree for OU4 was lodged in court and protested by a nonsigning party. The RI work plan was submitted to EPA for approval. EPA and the PRPs were negotiating a Consent Decree.

FY97 Restoration Progress

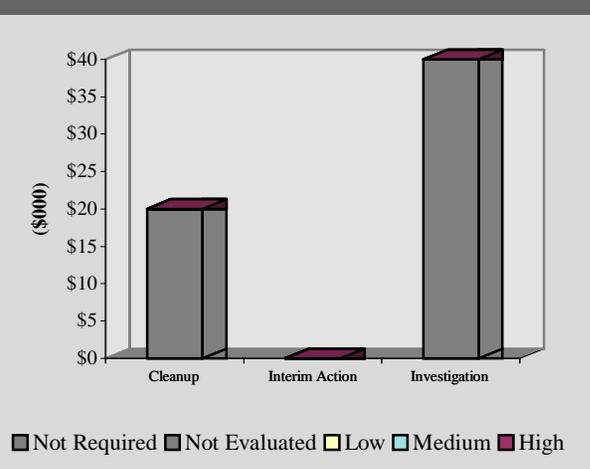
During the fiscal year, the PRPs (private and government) continued to improve site management techniques and partnering efforts by revising the RI/FS work plan for OU4. The RI/FS work plan has been submitted to EPA for review and concurrence. The U.S. Army Corps of Engineers also completed a UST Removal Action for OU5.

Some activities scheduled for completion in FY97 were delayed while the revised OU4 RI/FS work plan awaits EPA concurrence.

Plan of Action

- In FY98, begin the RI/FS for OU4 and OU5, including Relative Risk Evaluation upon EPA approval of the work plan

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 443 acres of 13,400-acre former ordnance plant
Mission: Manufactured ordnance (private use involved solvent recycling and chemical manufacturing)
HRS Score: 52.05; placed on NPL in September 1983
IAG Status: None
Contaminants: VOCs, solvents, PCBs, PAHs, and inorganic compounds
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: \$5.6 million
Estimated Cost to Completion (Completion Year): \$40.6 million (FY2020)
Final Remedy In Place or Response Complete Date: FY2020



La Porte, Indiana

Restoration Background

Environmental studies conducted at Fisher-Calo in FY82 identified 11 areas of contamination, including 8 areas of soil contamination and 3 groundwater contaminant plumes. Surface soil is contaminated with solvents, inorganic compounds, and polychlorinated biphenyls (PCB). Groundwater is contaminated with volatile organic compounds (VOC). Surface water samples indicate the presence of inorganic compounds, and sediment samples contain PCBs.

A Remedial Investigation (RI) was completed in FY89, and a Feasibility Study (FS) was completed in FY90. A Record of Decision was submitted in late FY90. A Consent Decree, entered into by EPA and the potentially responsible parties (PRP), requires the PRPs to conduct Remedial Design and Remedial Action (RD/RA) activities. In FY93, the RD work plan was completed and approved by the regulatory agencies. RD activities in FY94 included design of a groundwater extraction and treatment system and a soil flushing or soil vapor extraction (SVE) system. By FY97, the U.S. Army Corps of Engineers had conducted relative risk evaluation at all sites.

In FY95, RD activities included operation of the SVE system and enhanced vapor extraction pilot treatment facilities. Interim Remedial Actions included removal and disposal of about 3,000 buried containers.

During FY96, continuing RD/RA efforts included excavating and incinerating soil containing semivolatile organic compounds and PCBs, completing design of soil flushing or SVE for soil contaminated with VOCs, and completing design of groundwater extraction and treatment systems. These actions are being completed by the PRP site group, which also has continued to pursue litigation on issues related to the extent of DoD's liability.

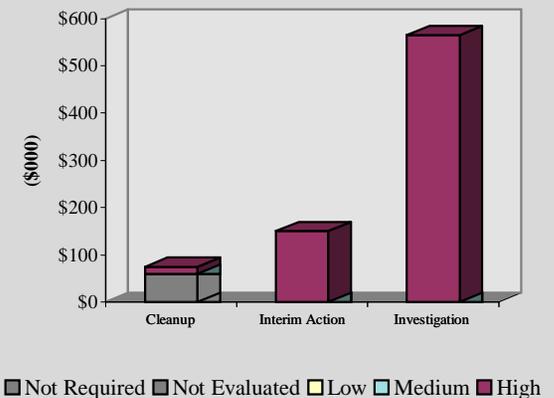
FY97 Restoration Progress

Litigation for resolving issues related to allocation of liability is awaiting scheduling by the District Court. Construction of the groundwater treatment system was initiated, and the private PRPs continued to operate existing source area systems and began the design of others. Source area design is under EPA review. The Area 3 air sparging system is being operated.

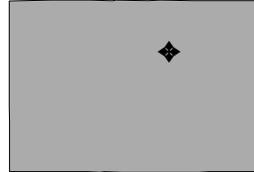
Plan of Action

- Respond to litigation schedule as necessary in FY98

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 577 acres
Mission: Provided medical services, training, and research
HRS Score: NA
IAG Status: None
Contaminants: Petroleum hydrocarbons, asbestos, lead-based paint, and radioactive waste
Media Affected: Groundwater and soil
Funding to Date: \$5.7 million
Estimated Cost to Completion (Completion Year): \$20.0 million (FY2000)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2000



Aurora, Colorado

Restoration Background

In July 1995, the BRAC Commission recommended closure of all facilities at Fitzsimons Army Medical Center except the Edgar J. McWhethy Army Reserve Center. All tenants will be relocated to other installations. The Army will transfer ownership of excess property to public and private entities no later than FY01.

Environmental studies at the installation identified several sites, including aboveground storage tanks, underground storage tanks (UST), landfills, clinical areas, pesticide and herbicide facilities, a wastewater treatment plant, a sanitary sewer system, and maintenance areas.

EPA and the state regulatory agency reviewed the scope of work for the Environmental Baseline Survey (EBS) and the BRAC Cleanup Plan in FY95.

The commander formed a restoration advisory board (RAB) in FY96. The RAB elected a community co-chair and held monthly meetings to promote the exchange of information among community members and federal and state regulatory agencies. The installation also completed a community relations plan. A BRAC cleanup team (BCT) was formed to investigate and ensure cleanup of all areas of concern and to allow property transfer to the Fitzsimons Redevelopment Authority. In addition, the EBS and the Site-Specific EBS for the former main hospital (Building 500) were completed.

The installation removed tanks and associated contaminated soil from the UST area for the former heating plant and is awaiting formal approval of closure documents from the Office of the State of Colorado Oil Inspector.

The old low-level radioactive waste landfill (Landfill 5) was excavated, and no indication of radioactivity was detected. Before

beginning the excavation, the installation held a media day to address community concerns.

The installation began an asbestos and lead-based-paint survey program. Abatement has been completed at some buildings. Buildings 500, 533, and 534 and the 300/600 areas were surveyed for asbestos and lead-based paint before the Department of the Army halted funding for the program. Clauses concerning asbestos and lead-based paint are now added to lease and transfer documents.

FY97 Restoration Progress

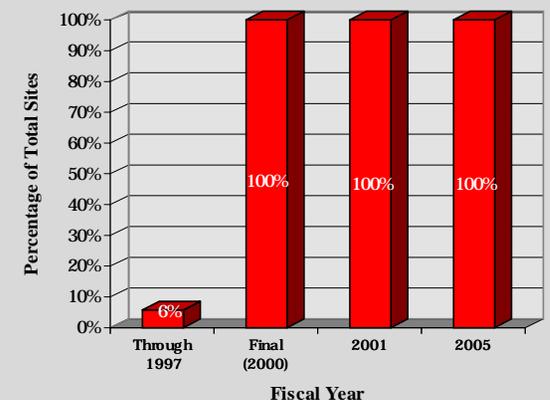
The installation initiated groundwater studies and Site Inspections for all sites. Accelerated fieldwork techniques (hydropunch, geoprobe, and cone penetrometer) were employed at the installation. The installation removed 15 fuel oil tanks and contaminated soil from Facility 216, a former heating plant. In addition, a Total Environmental Restoration Contract was employed at the installation.

Throughout FY97, the installation held BCT meetings every other week, including the Fitzsimons Redevelopment Authority in every other meeting. Also in FY97, the RAB held a public meeting concerning the installation's Environmental Impact Statement

Plan of Action

- In FY98, initiate Site Inspections for sites not funded in FY97
- Initiate Remedial Investigations for sites funded in FY98
- Initiate necessary tank removals and Remedial Actions on the basis of results from the ongoing site investigations
- Complete the NRC Decommissioning process by the end of FY98

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 2,501 acres
Mission: Housed U.S. Army Soldier Support Center; provided personnel, financial, and soldier physical fitness administration and training
HRS Score: NA
IAG Status: None
Contaminants: VOCs, fuel hydrocarbons, petroleum products, pesticides, and heavy metals
Media Affected: Groundwater and soil
Funding to Date: \$18.0 million
Estimated Cost to Completion (Completion Year): \$4.5 million (FY1999)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY1999



Lawrence, Indiana

Restoration Background

In July 1991, the BRAC Commission recommended closure of Fort Benjamin Harrison; realignment of the Soldier Support Center to Fort Jackson, South Carolina; and retention of the DoD Finance and Accounting Service, Indianapolis Center.

The primary site types at the installation include spill areas, underground storage tanks (UST), fire training areas, aboveground storage tanks, hazardous waste storage areas, firing ranges, and maintenance shops. Petroleum products, pesticides, and heavy metals are the primary contaminants of concern.

Phase I of a RCRA Facility Investigation (RFI) and an Environmental Investigation (EI) began in FY92. In FY94, the Army completed a CERFA investigation that identified clean parcels. The state regulatory agency has not yet concurred with those designations.

The installation also began Interim Actions in FY94 to prevent contaminant migration to groundwater and to clean a storage building contaminated with pesticides. The installation landfill was closed, and capping and monitoring activities began. The installation also has removed 26 USTs.

A restoration advisory board and a BRAC cleanup team (BCT) were formed in FY94. The BCT completed the initial version of the BRAC Cleanup Plan (BCP). A land reuse plan was prepared as part of the NEPA Environmental Impact Statement.

In FY95, the installation completed Phase I of the RFI and the EI and initiated Phase II. Also in FY95, the installation prepared a revised version of the BCP and site-specific Environmental Baseline Surveys for all property disposals.

The installation officially closed at the end of FY95. The Army transferred about 600 acres and leased almost 2,000 acres of property to various recipients.

FY97 Restoration Progress

The Army initiated Remedial Action (RA) at the firing ranges. It also conducted an unexploded ordnance survey and completed a RCRA closure of the hazardous materials storage facility. Cleanup of the former AAFES gas station site by soil aeration with enzymatic by-product was completed early. Use of geoprobes and ground-penetrating radar in the Phase II EI and RFI accelerated fieldwork.

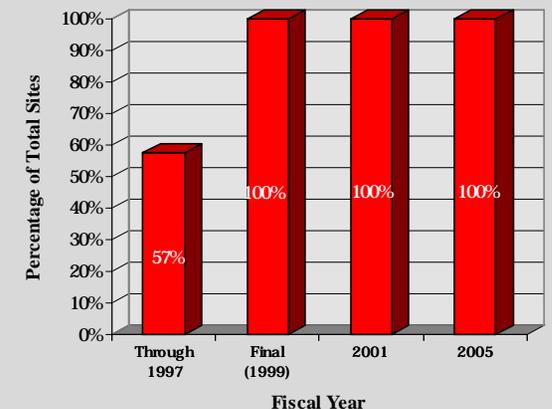
The Army is conducting an internal review of documents concurrently with regulatory review in order to expedite the review process. The BCT conducted a review of the Phase II RFI Report, planned closeout of small sites not involved in major investigations, reviewed findings of suitability to lease for Lawton Loop and Encroachment Parcels, reviewed and completed an Engineering Evaluation and Cost Analysis for a Removal Action at the former firing ranges, and planned and reviewed the stream relocation early action at the former state police firing range. In addition, 1,475 acres of proposed CERFA-clean acreage are awaiting regulatory approval.

The first activity in the current plan of action originally was scheduled for completion in FY97, but it was postponed because of regulatory delays.

Plan of Action

- Complete the Phase II RFI and EI in FY98
- Plan and complete Removal Actions and RAs in FY98
- Complete the latest version of the BCP in June 1998
- Complete all BRAC activities by the end of FY99

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 71,359 acres
Mission: Light infantry and mobilization
HRS Score: NA
IAG Status: None
Contaminants: Petroleum/oil/lubricants, DDT, PCBs, and heavy metals
Media Affected: Groundwater and soil
Funding to Date: \$8.0 million
Estimated Cost to Completion (Completion Year): \$62.2 million (FY2005)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2003



Fort Chaffee, Arkansas

Restoration Background

In July 1995, the BRAC Commission recommended closure of Fort Chaffee, except for a few essential ranges, facilities, and training areas that will be used as a Reserve Component training enclave. The BRAC parcel available for transfer is approximately 7,233 acres. The installation is scheduled to close in October 1997.

The primary site types identified in previous studies include underground storage tanks (UST), two fire training areas, landfills, an open-burning and open-detonation unit, and hazardous waste and hazardous material storage areas. Primary contaminants of concern include petroleum/oil/lubricants in groundwater and soil and heavy metals and pesticides in soil.

Interim Actions at the installation have included removal of USTs and soil remediation at all abandoned UST locations. The community formed a Local Redevelopment Authority in FY95. No property has been leased or transferred.

In FY96, the installation formed a BRAC cleanup team (BCT) and a restoration advisory board. The installation also began developing the BRAC Cleanup Plan. Also in FY96, the installation completed a RCRA Facility Investigation (RFI) that had been initiated in FY95. The draft final Environmental Baseline Survey Report was completed and submitted to the regulatory agencies. The Army began investigations at the North POW Landfill and awarded a contract for site characterization of the Hazardous Waste Storage Facility. The contract to remove USTs from the BRAC parcel also was awarded.

FY97 Restoration Progress

The installation removed USTs from the BRAC parcel. The Army used Site Characterization and Analysis Penetrometer System

(SCAPS) trucks for accelerated fieldwork. In addition, installation project managers received hazardous-waste operations training to improve site management and project oversight. The installation took lead-agency authority under CERCLA but also met with the director of the state agency and obtained a commitment to work through the BCT. This prevented work stoppage while disagreements were resolved.

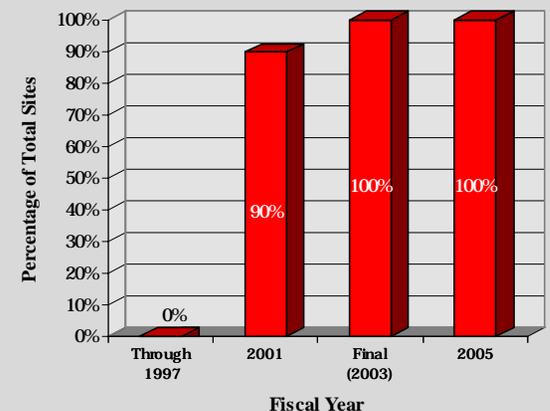
The BCT completed and implemented the open-burning and open-detonation unit-closure work plan. It also completed work plans for closing the Hazardous Waste Storage Facility and the Army National Guard Burn Pit. Phase I of the Site Investigation was initiated, and work began on removal of postwide USTs, oil-water separators, wash racks, and fuel-fill stands.

The installation closed at the end of FY97 and established a caretaker staff. The first three activities in the current Plan of Action were originally scheduled for completion in FY97. They were delayed because of Army and BCT discussions about environmental propensity and because enclave lines needed to be redrawn.

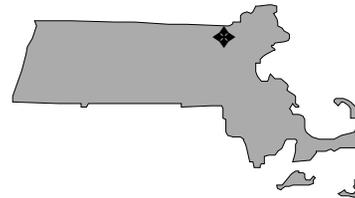
Plan of Action

- Complete RCRA closure evaluation for the Hazardous Waste Storage Facility in FY98
- Complete the report on the North POW Landfill investigation in FY98
- Begin design and remediation of the North POW Landfill in FY98
- Complete Relative Risk Site Evaluations for the remaining sites in FY98
- Implement presumptive remedies at all landfills in FY98 and FY99

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 9,219 acres
Mission: Support Reserve Component training
HRS Score: 42.24; placed on NPL in November 1989
IAG Status: IAG signed in November 1991
Contaminants: VOCs, heavy metals, petroleum products, PCBs, pesticides, herbicides, and explosive compounds
Media Affected: Groundwater and soil
Funding to Date: \$76.2 million
Estimated Cost to Completion (Completion Year): \$25.1 million (FY2010)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2000



Fort Devens, Massachusetts

Restoration Background

In July 1991, the BRAC Commission recommended that Fort Devens close and establish a reserve enclave. The installation has made significant progress in its environmental restoration and base closure programs. The scheduled closure date is March 1997.

Environmental investigations conducted at this installation since FY89 have identified 84 sites, including landfills, vehicle and equipment maintenance and storage yards, the Defense Reutilization and Marketing Office scrapyard, motor pools, and underground storage tanks (UST). Investigations revealed soil contaminated with heavy metals, petroleum products, and polychlorinated biphenyls (PCB); and groundwater contaminated with heavy metals and solvents. Interim Actions were conducted for removal of contaminated soil and USTs and capping of a landfill.

In FY94, the commander formed a restoration advisory board (RAB). The technical review committee, now a subcommittee of the RAB, reviews and comments on all technical documents. A BRAC cleanup team meets regularly to address restoration issues related to regulatory requirements, technical and resource constraints, and reuse.

In FY95, the installation began several Interim Actions, including removal of USTs and the installation of a soil vapor extraction system. In FY95, the installation completed two Records of Decision (ROD) for the Shepley's Hill Landfill Operable Unit (OU) and the Barnum Road Maintenance Yards OU. In addition, an Environmental Impact Study was completed, and an enhanced Preliminary Assessment identified 10 areas requiring evaluation.

The Army provides cooperating-agency status to two federal agencies, the Federal Bureau of Prisons and the U.S. Fish and Wildlife Service, and two state entities, the Massachusetts Government Land Bank

(MGLB) and the Joint Board of Selectmen (representing four surrounding communities). The Army and those organizations signed a Memorandum of Agreement outlining the roles and responsibilities of each member. The installation formed a primary coordination team, which included these cooperating agencies, to coordinate realignment of the installation and to implement the NEPA Environmental Impact Statement. In FY95, the Local Redevelopment Authority and the MGLB developed a land reuse plan. The plan proposed leasing or transferring property to other federal agencies or to the MGLB.

In FY96, the Army closed Fort Devens, replacing it with the Devens Reserve Forces Training Area (RFTA), which assumed the remaining Army mission. The Army transferred 2913 acres and leased 669 acres of the former Fort Devens to the local reuse authority, the Massachusetts Development and Finance Agency (formerly known as the MGLB). The Army and regulators signed a ROD for the South Post Impact Area to monitor the level of explosives and solvents in the groundwater. The installation completed radiological surveys for 98 percent of affected buildings on the former property and completed all fieldwork for the Explosive Ordnance Survey. Feasibility Study (FS) for landfill consolidation is under way.

FY97 Restoration Progress

An additional 21 acres of previously leased land were transferred to the Massachusetts Development Agency. Approximately 222 acres were transferred to the Federal Bureau of Prisons. The installation completed the Environmental Condition of Property (ECP) for a 22-acre parcel to be transferred to the U.S. Department of Labor. An ECP for the U.S. Fish and Wildlife Service was still under review at the end of FY97.

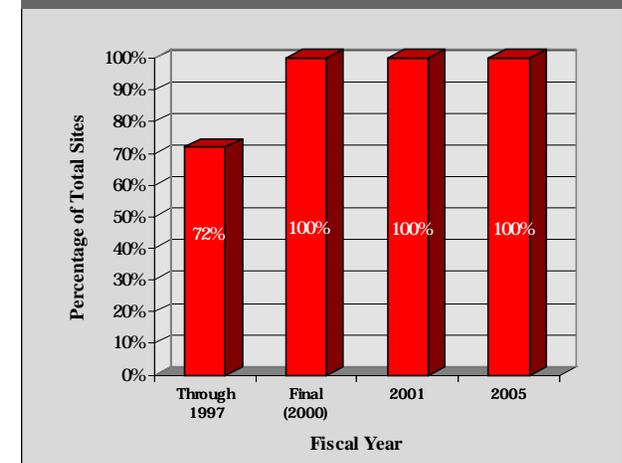
Of 324 BRAC areas requiring environmental evaluation (AREE) or CERCLA sites, 204 have approval for no further action. The Army and EPA approved a no-further-action ROD for area of concern (AOC) 63AX. The installation completed the Remedial Investigation (RI)/FS and the Proposed Plan for AOCs 32 and 43A were completed; the ROD is expected early in FY98. The installation also completed the Explosive Ordnance Survey.

The first three activities in the current Plan of Action originally were scheduled for completion in FY97 but were delayed because of delays in regulatory review.

Plan of Action

- Complete RIs at three sites in FY98
- Complete FSs at three sites in FY98
- Sign four RODs for 10 sites in FY98
- Initiate Remedial Actions at 10 sites in FY98
- Transfer 858 acres in FY98. The acres transferred are as follows: 836 acres to Fish and Wildlife Service and 22 acres to the Department of Labor.

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 30,997 acres
Mission: Provide training and reserve support
HRS Score: 37.40; placed on NPL in July 1987
IAG Status: Federal Facility Agreement signed in September 1991
Contaminants: Heavy metals, petroleum/oil/lubricants, and chlorinated solvents
Media Affected: Groundwater and soil
Funding to Date: \$33.0 million
Estimated Cost to Completion (Completion Year): \$102.1 million (FY2031)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY1998



Pemberton Township, New Jersey

Restoration Background

In July 1995, the BRAC Commission recommended additional realignment of Fort Dix, allowing it to retain the ranges, facilities, and training areas required for Reserve Components training.

In FY79 and FY82, the installation evaluated the Fort Dix Sanitary Landfill and 16 other sites, including storage areas, underground storage tanks (UST), landfills, lagoons, impact areas, and an incinerator. Heavy metals, petroleum/oil/lubricants, and chlorinated solvents were released into soil and groundwater. The installation responded by placing a series of groundwater monitoring wells around the perimeter of the landfill.

In FY93, the installation performed site characterizations and field screening at several sites. USTs and the associated contaminated soil were removed from seven sites. In FY94 and FY95, the installation built a multilayer cap over the Fort Dix Sanitary Landfill. Fort Dix established successful partnerships with state and local regulatory agencies and formed a technical review committee. In FY95, the Army formed a BRAC cleanup team (BCT) that includes representatives of the installation, EPA, and the state regulatory agencies.

In FY96, the commander formed a restoration advisory board (RAB) with elected community board members. The installation continued Remedial Investigation (RI) activities at the MAG-1 Area and continued an Environmental Investigation report on 19 sites. The installation also began RI activities at eight sites. Interim Remedial Actions (IRA) were completed at two landfills.

The installation began developing a BRAC Cleanup Plan (BCP) and an Environmental Baseline Survey (EBS). It initiated an archive search to investigate the possible presence of radioactive materials and unexploded ordnance (UXO). In addition, the installation

undertook a survey to determine the presence of polychlorinated biphenyl (PCB) contamination at transformer sites. A NEPA Environmental Assessment also was initiated.

FY97 Restoration Progress

The BCP, the EBS, and the groundwater model were completed. Additional monitoring wells were installed where needed, and a monitoring program began. The RI and Feasibility Study (FS) was completed for golf course sites. Two early actions (removal of 65 UST sites and initiation of an IRA at the Taxi Stand site) also were completed. Use of innovative technologies expedited site characterization and fieldwork. Relative Risk Site Evaluations have been completed at all but six sites.

The RAB conducted numerous technical presentations. The BCT prepared the BCP abstract, completed the EBS Report, and held meetings. Awaiting regulatory approval are 228 acres of proposed CERFA-uncontaminated acreage.

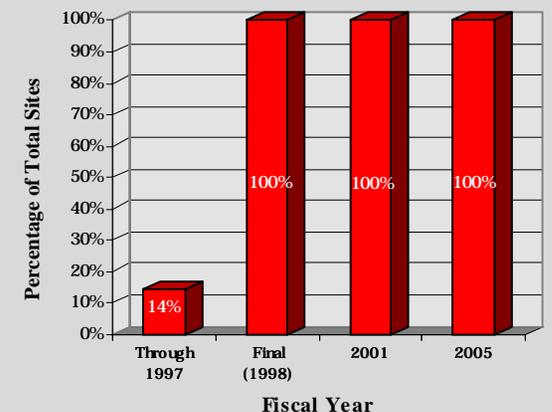
Some activities scheduled for completion in FY97 were delayed because of a need to reprogram funding.

Plan of Action

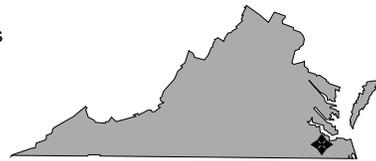
- Propose further CERFA-uncontaminated acreage in FY98
- Continue removal of abandoned USTs and investigate USTs with contamination in FY98
- Incorporate the groundwater model into the Fort Dix geographic information system and local area network in FY98
- Continue long-term monitoring and long-term operations of the National Priorities List Landfill

- In FY98, complete Proposed Plans and sign Records of Decision (ROD) for the MAG-1 Area, the 19 sites, and ANC-9 and begin Remedial Design (RD)
- Complete RI/FS for Fire Training Tanks, Boiler Blowdown, and ARDC sites and prepare Proposed Plans in FY98
- In FY98, complete Proposed Plan, sign ROD for the golf course sites, and begin RD
- In FY98, continue IRA for Taxi Stand site using ECGO
- Complete final BRAC UST Report in FY98
- In FY98, complete BRAC PCB sampling, radiological survey and archive search, and UXO survey
- Complete BRAC limited site investigation in FY98 for three areas of concern identified in the EBS Report
- In FY98, complete BRAC Asbestos Survey and Abatement of Properties for Transfer to the State
- In FY98, complete BRAC finding of suitability to transfer documents for the Coast Guard, Navy, Mid-State Prison, Federal Correctional Institute, and the State of New Jersey BRAC properties
- Continue support of the RAB in FY98

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size:	8,228 acres
Mission:	House the Army Transportation Training Center; provide training in rail, marine, and all other modes of transportation involved in amphibious operations
HRS Score:	50.00; placed on NPL in December 1994
IAG Status:	None
Contaminants:	Petroleum products, PCBs, VOCs, pesticides, and heavy metals
Media Affected:	Groundwater, surface water, sediment and soil
Funding to Date:	\$39.9 million
Estimated Cost to Completion (Completion Year):	\$11.2 million (FY2006)
Final Remedy in Place or Response Complete Date:	FY2006



Newport News, Virginia

Restoration Background

Fort Eustis is home to the Army Transportation Center, where officers and enlisted soldiers receive education and training in all modes of transportation, aviation maintenance, logistics and deployment doctrine, and research. Previous investigations identified 27 sites, including landfills, underground storage tanks (UST), pesticide storage areas, range and impact areas, and surface impoundments. The migration of contaminants from some sites to creeks and estuaries and the potential migration through surface water and the upper water table to the James River are of greatest concern at the installation. Results of analysis of samples in FY87 and FY90 indicated the presence of polychlorinated biphenyls (PCB), pesticides, polyaromatic hydrocarbons (PAH)s, and lead in surface water and sediment.

In FY90, a Remedial Investigation (RI) began for four sites located near estuaries at the installation. In FY92, a Preliminary Assessment and a Site Inspection were completed at eight additional sites at which suspected soil contaminants include fuel and oils, pesticides, and volatile organic compounds (VOC).

In FY94, the installation completed Interim Remedial Actions for removal of contaminated soil at the Felker Airfield Tank Farm and a waste-oil storage tank site. It also completed cleanup activities at the two landfills. In the following year, the state approved a corrective action plan (CAP) for the installation of pneumatic pumps and passive skimmers to recover petroleum products from groundwater at the Helicopter Maintenance Area UST site.

The installation formed a technical review committee (TRC), which meets semiannually. The TRC includes representatives of the installation, state regulatory agencies, the City of Newport News, and the local community. Agenda items discussed during meetings include the status of restoration activities and community relations activities,

identification of new sites, and tours of the installation. The installation is working closely with EPA and the state regulatory agencies to develop the scope of services for future work. The installation also completed a community relations plan and began developing an administrative record.

In FY96, a team building and partnering session with EPA and the state regulatory agencies was conducted to develop a remedial cleanup alternative for PCB-contaminated sediment in an estuary contaminated with PCBs. In addition, the installation established information repositories at three local libraries.

The state regulatory agency approved another CAP for the installation of a free-product recovery system at the Gas Station UST site. The installation awarded a project for the design of methane-gas collection systems at two closed landfills and developed RI work plans for Eustis Lake.

The Agency for Toxic Substances and Disease Registry released the draft public health assessment for Fort Eustis. After a 30-day public comment period, a final health assessment was published that indicated that the Fort Eustis National Priorities List (NPL) site poses no apparent risk to public health and that health education and follow-up health study actions are not warranted.

FY97 Restoration Progress

In FY97, the installation continued operation of free-product recovery systems at two UST sites. The installation also continued long-term monitoring (LTM) of the groundwater and surface water at three closed landfills. The draft Feasibility Study and Engineering Evaluation and Cost Analysis for two areas of contaminated sediment was distributed. A contract was awarded to begin construction of the methane-gas collection systems at two landfills.

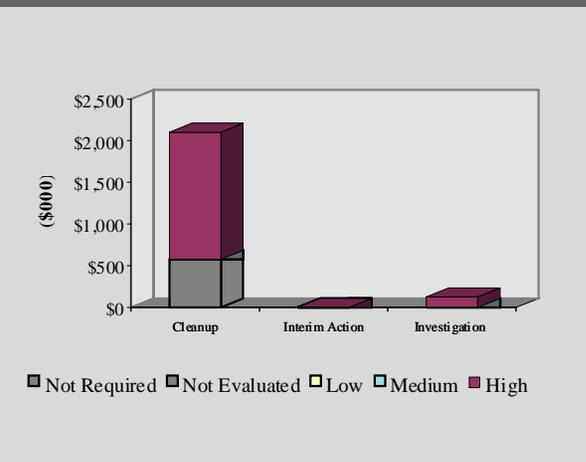
The installation had EPA and state regulators review the scope of work in FY97 to help reduce additional sampling efforts later. The installation employed on-site laboratories to expedite site characterization. Fort Eustis solicited public interest in forming a Restoration Advisory Board (RAB), but there was insufficient interest.

The first activities on the current plan of action were scheduled for completion in FY97. They were delayed because EPA had comments on the final RI report that needed addressing and because the validation of Eustis lake report sample took longer than expected.

Plan of Action

- Continue operation of free-product recovery system at two UST sites (ongoing)
- Continue LMT of the groundwater and surface water at three closed landfills (ongoing)
- Complete the review of and complete an RI report on three estuary sites, a fire training area, and buried sludge site in FY98
- Complete the investigation and field efforts at Eustis Lake and the pesticide storage area and distribute the draft reports to regulatory agencies for review and comment in FY98
- Put the administrative record on CD-ROM to improve the community's access

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 13,860 acres
Mission: Serve as administrative post to various DoD tenants
HRS Score: 52.0; proposed for NPL in June 1997
IAG Status: None
Contaminants: Heavy metals, petroleum hydrocarbons, VOCs, and UXO
Media Affected: Groundwater and soil
Funding to Date: \$46.7 million
Estimated Cost to Completion (Completion Year): \$27.2 million (FY2004)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY1999



Fort Meade, Maryland

Restoration Background

In December 1988, the BRAC Commission recommended closing Fort Meade range and training areas, including the airfield, to realign Fort Meade from an active Army post to an administrative center. The National Security Agency is now the primary tenant of the new administrative center. In July 1995, the commission recommended additional realignment of the installation, reducing Kimbrough Army Community Hospital to a clinic and eliminating in-patient services. To date, the Army has transferred 8,100 acres to the Department of the Interior. The remaining 366 acres hold Tipton Army Airfield. The Army plan to lease that parcel to Anne Arundel County awaited completion of the remediation of unexploded ordnance (UXO).

Investigations beginning in FY88 identified several areas of concern at the installation, including landfills, petroleum and hazardous waste storage areas, underground and aboveground storage tanks, asbestos-containing material in structures, and UXO.

In FY94, the installation completed a UXO survey of 1,400 acres. A survey of the remaining 7,600 acres was completed in FY95. A risk assessment for UXO also was completed.

To expedite cleanup, the installation completed several Interim Actions, including removal of compressed-gas cylinders, underground storage tanks, and contaminated soil. Remedial Design and Remedial Action activities were conducted concurrently with investigations at six sites. The designs used generic remedies whenever feasible.

The installation formed a BRAC cleanup team (BCT) in FY94 and a restoration advisory board (RAB) in FY95. Both have facilitated the installation cleanup and generated the community support necessary to accomplish reuse of closing property.

In FY96, the Army began UXO removal at Tipton Airfield. Fort Meade began an installationwide Ecological Risk Assessment and continued Remedial Investigation and Feasibility Study (RI/FS) activities at eight sites. The installation also began to prepare one of the documents required by NEPA to address BRAC 95 realignment actions. Remediation projects began at the four landfills, the medical waste site, and the fire training area.

FY97 Restoration Progress

The installation removed and disposed of soil in the pit from the fire training area. It also completed the installation Environmental Baseline Survey, the finding of suitability to lease, and the report of availability for BRAC properties. The Army leased Tipton Army Airfield to Anne Arundel County and completed the cleanup at the medical waste site.

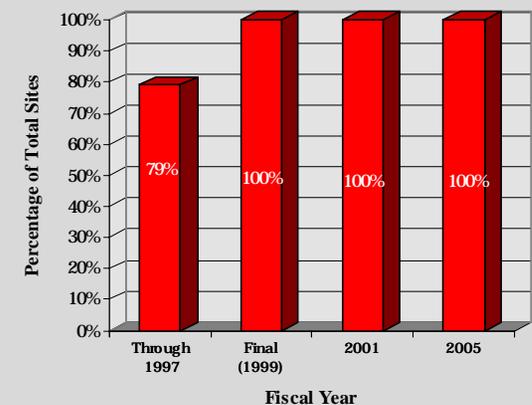
EPA proposed placing Fort Meade on the National Priorities List (NPL) in April 1997. The Army provided comments disputing the proposed listing in June. Despite concerns about the technical accuracy of EPA's scoring, the Army anticipates that the site will be placed on the NPL in either January or May of 1998.

The first two activities in the current Plan of Action were scheduled to be completed in FY97, but were delayed because additional work was required by the EPA under the RI/FS. In addition, a Record of Decision has not been completed.

Plan of Action

- Complete UXO removal at the fire training area in FY98
- Remove and renovate the medical waste site in FY98
- Complete BRAC activities in FY99

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 640,000 acres
Mission: Support Army training, cold weather testing, and cold weather training
HRS Score: NA
IAG Status: None
Contaminants: Petroleum/oil/lubricants, pesticides, solvents, and radionuclides
Media Affected: Soil
Funding to Date: \$8.7 million
Estimated Cost to Completion (Completion Year): \$16.6 million (FY2012)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2003



Fort Greely, Alaska

Restoration Background

In July 1995, the BRAC Commission recommended realignment of Fort Greely. Realignment of the installation is scheduled to be completed by FY02. The site types identified at the installation include underground storage tanks (UST), fire training areas, and a cooling-water waste line from a nuclear power plant. Soil contaminants from leaking USTs and associated piping include petroleum/oil/lubricants (POL). Pesticides, such as DDE and DDT, also have contaminated soil at the installation.

To reduce environmental risk, the installation conducted Interim Actions, including the removal of USTs and POL-contaminated soil. The installation also has used land treatment, bioventing, and low-temperature thermal desorption to remediate contaminated soil.

During FY95, a Local Redevelopment Authority (LRA) was formed to develop a land reuse plan for the installation.

In FY96, the commander formed a restoration advisory board (RAB) and members were elected to represent the community. The RAB held regular meetings for information exchange between the community and federal and state regulatory agencies. The Army also formed a BRAC cleanup team (BCT) to investigate and ensure cleanup of all areas of concern, and conducted an Environmental Baseline Survey (EBS).

FY97 Restoration Progress

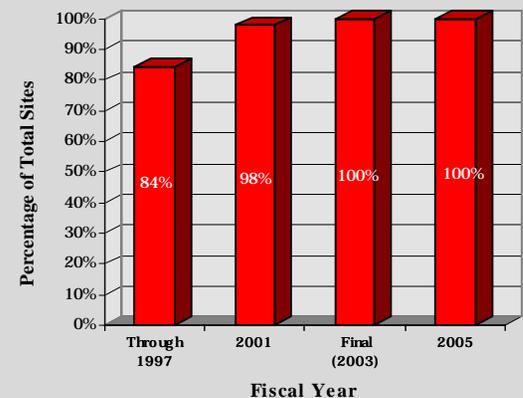
Fort Greely took advantage of an available Total Environmental Restoration Contract (TERC) contract to complete investigation of the majority of EBS sites. In addition, ground penetrating radar was used to locate the nuclear power plant cooling-water waste line for removal.

To expedite document review, the Army held a kick-off partnering session with the regulators to provide early buy-in to field investigation plans. In addition, biweekly teleconferences held with the Alaska District Corps of Engineers, LRA, contractors, the State of Alaska, and other subject matter experts led to increased communication. The BCT attended RAB meetings, produced the latest BRAC Cleanup Plan (BCP), concurred with the designation of CERFA-clean acreage, and set cleanup levels for the nuclear powerplant cooling-water waste line removal.

Plan of Action

- Complete site evaluations for remaining 37 locations in FY98
- Obtain concurrence from the regulatory agencies on CERFA-uncontaminated acreage in FY98
- Complete remediation of fire training areas in FY98
- Dispose of radioactive waste associated with the cooling-water waste line removal and continue removal of contaminated pipe and associated soil from nuclear power plant cooling-water waste line in FY98
- In FY99, complete investigations of sites requiring further sampling, as indicated by the EBS and BCP studies
- Complete removal of contaminated pipe and associated soil from nuclear power plant cooling-water waste line in FY99

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 86,176 acres
Mission: House I Corps Headquarters; plan and execute Pacific, NATO, or other contingency missions; provide troop training, airfield, medical center, and logistics
HRS Score: 42.78 (Landfill No. 5); placed on NPL in July 1987; deleted from NPL in May 1995
 35.48 (Logistics Center); placed on NPL in November 1989
IAG Status: IAG signed in January 1990
Contaminants: VOCs, heavy metals, waste oils and fuels, coal liquification wastes, PAHs, solvents, and battery electrolytes
Media Affected: Groundwater and soil
Funding to Date: \$38.2 million
Estimated Cost to Completion (Completion Year): \$35.9 million (FY2029)
Final Remedy in Place or Response Complete Date: FY2003



Fort Lewis, Washington

Restoration Background

Two Fort Lewis sites, Landfill No. 5 and the Logistics Center, were placed on the National Priorities List (NPL) after investigations revealed soil and groundwater contamination. Additional sites identified during environmental studies include landfills, disposal pits, contaminated buildings, and spill sites. As a result of previous waste management practices, primary contaminants of concern include organic solvents, heavy metals, and fuels.

Cleanup actions at Fort Lewis have involved both generic remedies, such as soil vapor extraction (SVE), and innovative technologies, such as low-temperature thermal desorption. The installation closed a drinking water well at the Logistics Center as an interim action in FY91.

The Army and regulators signed the Record of Decision (ROD) for the Logistics Center in FY90. The final remedy, a groundwater extraction and treatment system, became operational in FY95.

In FY92, the Army and regulators signed a ROD specifying no further action and long-term monitoring (LTM) for the Landfill No. 5 site. In FY94, a ROD was signed for Landfill No. 4 and the Solvent Refined Coal Plant. Fort Lewis completed the Remedial Design (RD) for contaminated soil at the Solvent Refined Coal Plant in FY95 and awarded the construction contract for the Remedial Action (RA). The installation also completed a pilot-scale study at Landfill No. 4.

In FY95, EPA removed Landfill No. 5 from the NPL. This was the first federal site, and the first DoD site, to be removed from the NPL.

To expedite the document review process, the installation worked closely with EPA and state regulatory agencies. It provided parts of documents to the agencies for review before submitting complete

documents. This approach has helped foster a strong relationship between the installation and the regulatory agencies and improved the decision-making process.

In FY95, the installation distributed a periodic newsletter to local governments, community groups, and citizens to provide specific information about restoration activities.

The installation made significant progress in the treatment and removal of contaminated soil at the Solvent Refined Coal Plant. The installation also completed the RD for groundwater sparging and the SVE system at Landfill No. 4 and awarded the RA contract.

LTM continued according to schedule at Landfill No. 5, the former NPL site. Groundwater extraction and treatment continued at Landfill No. 2 at the Logistics Center.

FY97 Restoration Progress

The installation completed the RA at the Solvent Refined Coal Plant in FY97 and is awaiting site closeout, pending EPA review. In addition, it initiated RA work at Landfill No. 4 and the study of the Explosive Ordnance Disposal Range. Groundwater sparging and SVE continued at Landfill No. 4, and air strippers were used for RA operations at the Logistics Center.

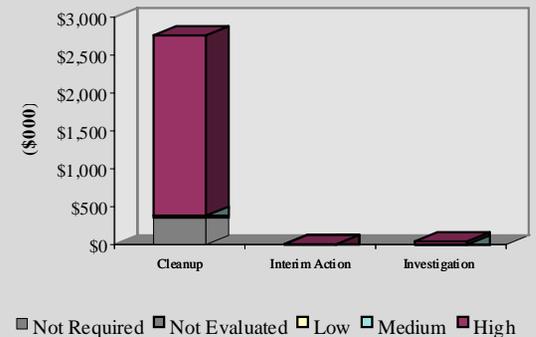
The Army formed a working group, including EPA and the U.S. Geological Survey (USGS), that will accelerate Installation Restoration Program (IRP) cleanups and reduce IRP life-cycle costs. There has been no community interest in forming a restoration advisory board (RAB), but the installation will poll the local community to determine public interest.

A funding shortfall precluded installation of a fence and some investigations scheduled for completion in FY97 are still in progress.

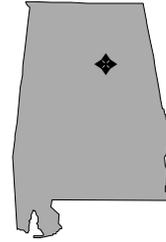
Plan of Action

- Repair the fence at the polychlorinated biphenyl-contaminated site in FY98
- Complete investigations at Landfill No. 1 in FY98
- Complete further study of the Explosive Ordnance Disposal Range in FY98
- Poll the local community again to determine possible interest in forming a RAB in FY98.
- Continue RD for the groundwater sparging and SVE innovative technologies in FY98
- Develop master plan for accelerating cleanups through the Fort Lewis-EPA-USGS Working Group

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 41,191 acres
Mission: House the U.S. Army Chemical School, the U.S. Army Military Police School, and the DoD Polygraph Institute
HRS Score: NA
IAG Status: None
Contaminants: VOCs, SVOCs, pesticides, explosives, metals, UXO, radioactive sources, and chemical warfare agents
Media Affected: Groundwater and soil
Funding to Date: \$12.3 million
Estimated Cost to Completion (Completion Year): \$112.5 million (FY2002)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2002



Anniston, Alabama

Restoration Background

In July 1995, the BRAC Commission recommended closure of most of Fort McClellan's facilities. The minimum essential land and facilities for a Reserve Component enclave, essential facilities for auxiliary support of the chemical demilitarization operation at Anniston Army Depot, and the Chemical Defense Training Facility were retained. The installation is scheduled to close in FY99.

Environmental studies since FY90 identified the following site types: maintenance facility areas; training and range areas; underground storage tanks (UST); landfills; incinerators; handling storage areas for toxic and hazardous materials; and chemical agent and radioactive substance training, storage, and disposal areas. TCE and 1,1,2,2-tetrachloroethane are the primary contaminants affecting groundwater.

In FY90, the installation conducted an enhanced Preliminary Assessment, which identified 67 sites. In FY91 and FY92, Site Inspections (SI) were conducted at 17 of these sites. The 17 sites include 12 former chemical agent training areas, 3 former landfills, and 2 possible munitions-disposal areas. On completion of the SIs in FY93, 12 of the sites were moved into the Remedial Investigation (RI) phase.

In FY95, the installation conducted RI activities at the 12 sites. The SI Report and other supporting data were provided to EPA to enable the agency to determine the installation's National Priorities List (NPL) status. On the basis of these data, EPA concluded that environmental conditions at Fort McClellan did not warrant NPL listing of the installation.

Also in FY95, the installation conducted a radiological characterization of the Hot Cell (Building 3192) and the surrounding grounds. The Nuclear Regulatory Commission (NRC) approved the work plans

to clean up the Hot Cell later that year. The installation conducted several UST removals during FY95. The Army selected the BRAC environmental coordinator and established information repositories at three locations. In addition, the community formed a Local Redevelopment Authority.

In FY96, the installation commander formed a BRAC cleanup team to investigate and ensure cleanup of all areas of concern. The commander also formed a restoration advisory board (RAB). The Army completed remediation of the Hot Cell in August, as required for closeout of the NRC license. The Army also awarded a contract for SI at 17 sites.

FY97 Restoration Progress

The installation accelerated fieldwork in FY97 by using the GORE-SORBER passive soil gas screening technique to screen 11 sites for volatile organic compounds (VOC) and semivolatle organic compounds (SVOC). The installation also used a geoprobe technique at UST sites for site characterization. The installation removed 11 USTs and replaced 13 USTs. It also conducted a comprehensive postwide background metals survey to supplement the earlier RI Report and to lay the foundation for a risk-based approach to all future investigation decisions. The Army conducted a Risk Assessment Training Course for BCT and RAB members to clarify how risk assessments will be handled. The BCT also attended partnering training.

Fort McClellan hosted the Defense Environmental Response Task Force (DERTF) meeting in 1997. This meeting gave RAB members an opportunity to address DERTF on the cleanup and subsequent reuse of property contaminated with unexploded ordnance (UXO). The BCT

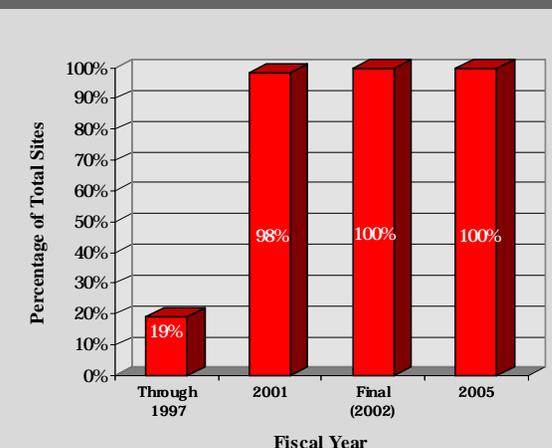
also implemented the Total Environmental Restoration Contract as the contracting mechanism for the BRAC sites.

Some activities scheduled for completion in FY97 were delayed because regulators asked for additional changes in the Environmental Baseline Survey (EBS). This delay in the EBS caused a delay in the completion of the BRAC Cleanup Plan (BCP).

Plan of Action

- Complete the BCP in FY98
- Complete the EBS in early FY98
- Complete the Environmental Impact Statement in FY98
- Develop risk-based screening levels for both ecological and human health components in FY98
- Use ultrawide-band synthetic aperture radar imagery to develop detailed survey of suspected UXO areas in FY98
- Perform Engineering Evaluations and Cost Analyses on UXO-contaminated parcels in FY98-FY00

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 761 acres
Mission: House the Headquarters of the Army Communications and Electronics Command
HRS Score: NA
IAG Status: None
Contaminants: Petroleum hydrocarbons, VOCs, SVOCs, PCBs, heavy metals, radionuclides, asbestos, and lead paint
Media Affected: Groundwater and soil
Funding to Date: \$11.0 million
Estimated Cost to Completion (Completion Year): \$18.1 million (FY2001)
Final Remedy in Place and Response Complete Date for BRAC Sites: FY1998



Monmouth County, New Jersey

Restoration Background

In July 1993, the BRAC Commission recommended the realignment and partial closure of Fort Monmouth, which houses the headquarters of the Army Communications and Electronics Command. The realignment involves closing the entire Evans Area (215 acres), transferring a portion of the Charles Wood Area (36 acres) to the Navy, and relocating personnel from the Evans Area and Vint Hill Farms Station to the Main Post and Charles Wood Area. The Fort Monmouth BRAC property has been divided into three parcels of land, the Charles Wood Housing Area and two parcels at the Evans Area, to accelerate transfer.

Environmental studies identified 37 sites in three areas. In FY94, an enhanced Preliminary Assessment (PA) of the BRAC parcels identified 32 sites at the Evans Area and 8 sites at the Olmstead Housing Area. Prominent site types include landfills, underground storage tanks (UST), hazardous waste storage areas, polychlorinated biphenyl (PCB) spill areas, asbestos areas, and radiological storage and spill areas. Primary contaminants released into groundwater and soil include chlorinated solvents, petroleum hydrocarbons, and heavy metals.

In FY94, the installation formed a BRAC cleanup team and completed version I of the BRAC Cleanup Plan. The CERFA Report identified 209 acres as CERFA-clean and this designation received regulatory concurrence. An FY94 enhanced-PA identified 15 sites requiring additional investigation.

In FY95, one site at the Evans Area was determined to require no further action. Site Inspections (SI) for all sites were completed by the end of FY96. The two sites at the Olmstead Housing Area required no further action. Interim Actions completed at the installation include the removal of USTs and PCB-containing transformers.

During FY95, the installation completed a Cultural and Historical Resources Survey and a threatened and endangered species survey. It also completed a draft Environmental Impact Statement for disposal and reuse of the Evans Area and a final Public Involvement and Response Plan. The Army transferred a portion of the Charles Wood Housing Area (36 acres) to the Navy.

In FY96, the installation commander formed a restoration advisory board. The installation completed supplemental SI fieldwork and the final SI Report for all sites as well as a radiological site characterization work plan. The installation also began radiological decommissioning fieldwork at the Evans Area. The installation's land reuse plan and the survey for asbestos-containing material were completed.

FY97 Restoration Progress

The Army developed remediation plans for nine sites recommended for environmental remediation. In addition, work was initiated for the removal of fuel oil USTs and the replacement of a few USTs at buildings that will be reused by the Local Redevelopment Authority following conveyance.

Radiological decommissioning fieldwork continued in the vacant parcels and was started in buildings that recently had been vacated.

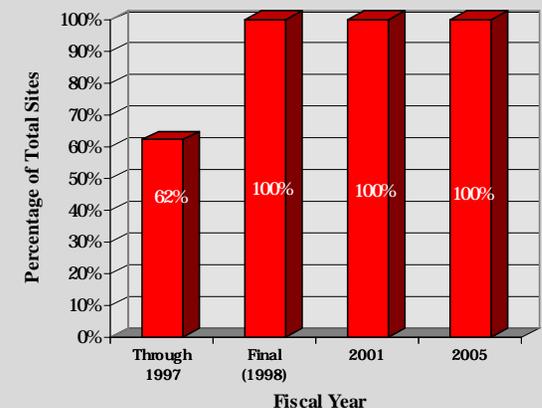
The Army received final regulatory comments on the draft Supplemental Site Inspection Report (SSIR) and prepared a draft final SSIR. In addition, a draft finding of suitability to transfer (FOST) and a draft updated Environmental Baseline Survey Report were prepared for the early conveyance of the parcel of land north of Laurel Gully Brook (93 acres).

The installation is awaiting regulatory concurrence on the determination of 71 acres as CERFA-clean.

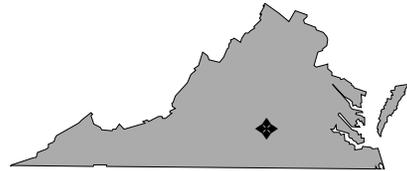
Plan of Action

- Complete the final SSIR in FY98
- Continue closing all USTs in FY98
- Continue radiological decommissioning effort in FY98
- Initiate Remedial Action (RA) at nine sites in FY98
- Complete FOST/EBS for the early conveyance of the parcel of land north of Laurel Gully Brook in FY98
- Complete Relative Risk Site Evaluations at the remaining 30 UST sites by FY99
- Complete BRAC activities, including radiological decommissioning and UST closures by FY99

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 45,160 acres
Mission: Provide training support for Active and Reserve Component Units of all Services
HRS Score: NA
IAG Status: None
Contaminants: Petroleum hydrocarbons, metals, propellants and explosives
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: \$2.9 million
Estimated Cost to Completion (Completion Year): \$19.4 million (FY2001)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2001



Blackstone, Virginia

Restoration Background

In July 1995, the BRAC Commission recommended closure of Fort Pickett except for essential training areas and facilities used for Reserve Components. The installation closed on September 30, 1997. Training and maneuver areas and part of the cantonment were transferred to the National Guard. Once it was slated for closure, the installation began to build a framework for restoration activities.

Site types identified at the installation include underground storage tanks (UST), petroleum spills, landfills, and fuel-burning equipment. Petroleum hydrocarbons are the primary contaminants affecting groundwater, surface water, sediment, and soil at the installation. Interim Actions taken at the installation include upgrading of USTs, asbestos surveys, and Removal Actions.

During FY95, the installation held meetings with regulators to foster partnerships. The resulting partnerships facilitated identification of sites that required restoration and development of the execution plan for FY96. The community formed the local reuse authority in FY95.

In FY96, the Army formed a BRAC cleanup team (BCT) to investigate and ensure cleanup of all areas of concern and allow transfer of all BRAC parcels. A restoration advisory board (RAB) was also formed. The local reuse authority contracted with a consultant to develop a local reuse plan. The installation performed an Environmental Baseline Survey (EBS). The BCT and the RAB reviewed the draft EBS Report. Programs to upgrade UST sites and monitor groundwater quality continued.

The Army initiated projects to replace polychlorinated biphenyl (PCB)-containing transformers and to performing an asbestos survey of the buildings in the Excess Area. The Army also undertook an Environmental Assessment (EA) and a Remedial Investigation (RI) of

the 5-mile gasoline pipeline. The installation began a survey of all radioactive materials stored on the installation to support closeout of its license and conducted an archive search for unexploded ordnance (UXO) on its property.

FY97 Restoration Progress

The installation completed an asbestos survey and the removal, replacement, and disposal of PCB-containing transformers. In addition, it completed the UXO survey and continued support of the Army's UST Upgrade Program. Fort Pickett initiated a multisite Preliminary Assessment and Site Inspection (PA/SI) for the BRAC excess property and completed historical aerial photo analysis. The aerial photo analysis was used to identify sites in need of investigation.

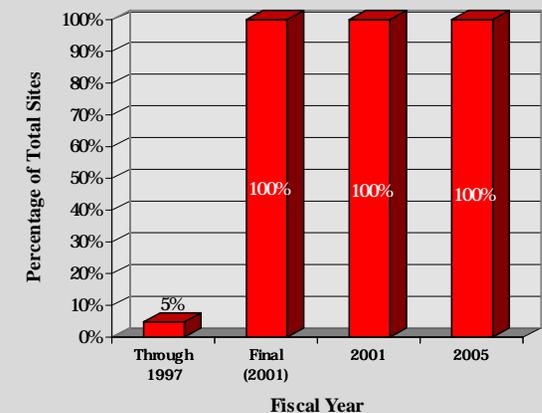
The installation implemented standard operating procedures for expediting document review and site characterization in FY97. The RAB was instrumental in working with the local reuse authority and the BCT to obtain funding for asbestos abatement.

Plan of Action

- Investigate former building demolition and burial sites in FY98
- Complete expanded multisite PA/SI in FY98
- In FY98, begin RI and Feasibility Study for sites that contain CERCLA-regulated wastes
- Complete asbestos abatement in FY98
- In FY98, perform Removal Actions at sites that have non-CERCLA wastes
- Complete an EA and an analysis of alternatives in FY97 and FY98

- Complete the RI of the gasoline pipeline system in FY97 and FY98
- Prepare site-specific documentation for the finding of suitability to lease and the finding of suitability to transfer under the EBS in FY98 and FY99
- Conduct investigation and remediation at motor pools, landfills, and fire training areas in FY98 and FY00
- Complete all BRAC cleanup work by the end of FY00

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 64,470 acres
Mission: Support and sustain forces assigned to U.S. Army Alaska
HRS Score: 50.00; placed on NPL in May 1994
IAG Status: Federal Facility Agreement signed in December 1994
Contaminants: White phosphorus, PCBs, heavy metals, petroleum/oil/lubricants, solvents, dioxins, chemical agents, UXO, explosives, and pesticides
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: \$58.4 million
Estimated Cost to Completion (Completion Year): \$31.2 million (FY2014)
Final Remedy in Place or Response Complete Date: FY2014



Anchorage, Alaska

Restoration Background

Since World War II, Fort Richardson has supported combat unit training and operations, primarily for light infantry. These activities contaminated soil, surface water, sediment, and groundwater with petroleum/oil/lubricants (POL), solvents, and polychlorinated biphenyls (PCB). In addition, parts of a 2,500-acre wetland serving as an ordnance impact area are contaminated with white phosphorus.

Preliminary Assessments and Site Inspections completed in FY83 identified 38 contaminated sites. Since then, Removal Actions have addressed PCB contamination in soil, underground storage tank (UST) sites, two drum burial sites, and more than 4,000 cubic yards of soil contaminated with trichloroethene, 1,1,2,2-tetrachloroethane, and buried chemical agent identification sets. In addition, the Army treated more than 20,000 cubic yards of POL-contaminated soil by a thermal desorption treatment system.

In FY88, the installation and state and federal regulatory agencies established one of the earliest Cooperative Agreements by forming the Eagle River Flats Task Force. The task force was converted into the Eagle River Flats Biological Technical Assistance Group in FY94. Through a Memorandum of Agreement with the Cold Region Research and Engineering Laboratory (CRREL), several agencies have been conducting scientific research to satisfy CERCLA requirements and develop techniques for cleaning up the Eagle River Flats ordnance impact area.

In FY95, the installation conducted a Remedial Investigation (RI) for Operable Unit (OU) A to address three potential sources of PCBs, chlorinated solvents, heavy metals, and POLs. Completed RI phases included field investigative work and installation of groundwater monitoring wells. The Army also conducted an RI at OU B, which once was a disposal site for chemical agent identification sets and

other small munitions. The CRREL conducted a geophysical survey of the disposal area and identified potential subsurface anomalies in an unexcavated area of the site. The Army installed groundwater monitoring wells in that area.

In FY95, the installation also conducted a Focused Treatability Study for dredging white phosphorus contamination at OU C, the Eagle River Flats area. The installation also completed a preliminary source evaluation in OU D at nine potential source areas, only three of which should require remediation.

In FY96, the installation continued to solicit public interest in forming a restoration advisory board (RAB) by advertising in the local newspaper. The installation held quarterly public meetings and distributed quarterly fact sheets to update the public on restoration activities and results of analyses.

Also in FY96, the Army completed groundwater sampling at the three sites in OU A and submitted a draft RI and Feasibility Study (FS) to EPA. It completed additional sampling at the former Fire Training Pit area at Ruff Road. The major contaminants of concern are POLs. The installation completed groundwater sampling at OU B and submitted the draft RI/FS to EPA. The installation initiated RIs for OU C and OU D and a pond draining/pumping Treatability Study for OU C.

Evaluations of petroleum sites were completed under the restoration agreement between the state of Alaska and the Army. More than 20 sites required no further action with negotiated alternate cleanup levels.

FY97 Restoration Progress

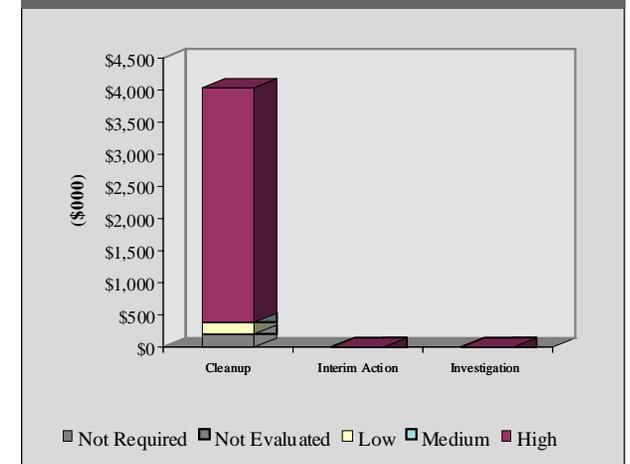
The installation completed a Treatability Study involving heat-enhanced soil vapor extraction (SVE) at OU B. It also completed the RI/FS for OU C and the RI for OU D. Records of Decision (ROD) for OUs A and B were completed and signed. The Army initiated an ongoing postwide risk assessment.

An excellent relationship between the Army, the state of Alaska, and EPA has developed at Fort Richardson. Biweekly teleconferences are held to expedite handling of regulatory issues.

Plan of Action

- Establish a RAB in FY98
- Complete the postwide risk assessment in FY98
- Proceed with pond draining/pumping at OU C in FY98
- Install a heat-enhanced SVE system at OU B in FY98
- Complete and sign OU C ROD in FY98
- Conduct SVE at POL-contaminated sites in FY98

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 100,671 acres
Mission: Provide training, readiness, and deployability for three component combat brigades; mobilize and deploy active and reserve component units
HRS Score: 33.79; placed on NPL in August 1990
IAG Status: IAG effective June 1991
Contaminants: VOCs, pesticides, and lead
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: \$43.2 million
Estimated Cost to Completion (Completion Year): \$39.4 million (FY2037)
Final Remedy in Place or Response Complete Date: FY2007



Junction City, Kansas

Restoration Background

Environmental studies at the installation began in FY74. Sites identified in the installationwide site assessment include a former firing range, a former pesticide storage facility, a dry-cleaning facility, a closed landfill, and a former fire training area. Studies in FY74 and FY86 identified pesticide-contaminated soil and sediment at the pesticide storage facility. Groundwater monitoring detected volatile organic compound (VOC) contamination at the Southwest Funston Landfill.

The installation identified five operable units (OU): the Southwest Funston Landfill (OU1), the Pesticide Storage Facility (OU2), the Dry Cleaning Facility (OU3), the former Fire Training Area (OU4), and the 354 Area Solvent Detection Site (OU5).

Remedial Investigation and Feasibility Studies (RI/FS) were initiated at OU1 and OU2 in FY91, and at OU3 in FY92. By FY95, the Army had completed RI/FSs in draft or final form for OU1.

In FY93, the Army completed the Engineering Evaluation and Cost Analyses (EE/CA) for OU1 and OU2. In FY94, the installation conducted pilot-scale tests for soil vapor extraction (SVE) at OU3. Bioventing and SVE were performed at OU4 in FY95.

In FY95, the installation stabilized the riverbank at OU1 as a partial Removal Action and conducted additional Removal Actions at a former firing range and at OU2. The installation completed a Proposed Plan and prepared a draft final Record of Decision (ROD) for OU1. The installation also formed a partnership with USGS to develop and perform long-term monitoring (LTM) of groundwater at OU1. The Army also evaluated all sites under the Relative Risk Site Evaluation process.

In FY96, the installation renegotiated all project schedules with the regulatory agencies on the basis of funding levels and project priorities. The Army completed cover improvements at OU1 and prepared the final ROD for signature. LTM and operation and maintenance (O&M) plans were also drafted. The installation resolved technical issues and drafted the Proposed Plan, which proposed no further action (NFA) at OU2. At OU4, the installation conducted additional investigations to document the concentrations of contaminants in soil and initiated an EE/CA to evaluate optional measures for controlling exposure of nearby users of the groundwater.

Also in FY96, the installation drafted a decision document for numerous sites needing no further action. The Army awarded a contract, and construction began, for remediation of utility trenches contaminated with fuel oil in the 6200 Family Housing Area. A contract was awarded for performance of initial field investigations at OU5.

FY97 Restoration Progress

The Army completed the LTM and O&M plans for OU1 and obtained signatures on the ROD. The installation completed the Proposed Plan and obtained the signatures needed to approve the OU2 ROD. A draft RI Addendum and the revised draft FS evaluating use of natural attenuation at OU3 were submitted to the regulators. The Army completed the RI/FS work plan and evaluated potential early actions addressing groundwater contamination at OU4. An EE/CA was initiated for the groundwater contamination. In July, the Army awarded a contract for early groundwater action. The installation performed initial field investigations at OU5. The fuel oil cleanup in the 6200 Family Housing Area was completed.

All goals were met through cooperative efforts of the Army, the state of Kansas, EPA, and contractors. Remote satellite data collection on groundwater levels was used, allowing military training activities to continue without interruption.

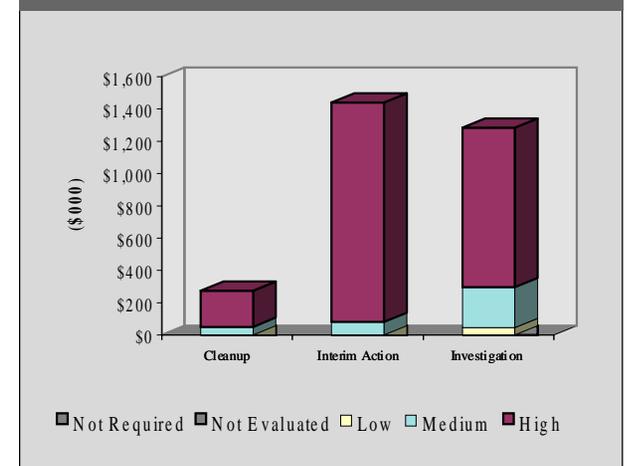
EPA and the Kansas Department of Health and Environment participated in development of the Installation Action Plan (IAP). This produced regulator understanding of, and “buy-in” to, project approaches; better coordination and scheduling; and more-efficient resource allocation. A restoration advisory board orientation meeting was held, and a community co-chair was selected.

The NFA ROD scheduled for completion in FY97 was delayed because EPA extended the review period.

Plan of Action

- In FY98, complete the Proposed Plan and hold a public comment period for NFA site (OU3)
- Implement exposure-control early action for OU4 in FY98
- Complete evaluation and selection of early groundwater treatment and control for OU4 in FY98
- Initiate RI/FS work plan for OU5 in FY98

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 638 acres
Mission: Supported Site R underground facility
HRS Score: NA
IAG Status: None
Contaminants: UXO, heavy metals, and asbestos
Media Affected: Groundwater and soil
Funding to Date: \$0.4 million
Estimated Cost to Completion (Completion Year): \$9.7 million (FY2000)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2000



Fort Ritchie, Maryland

Restoration Background

In July 1995, the BRAC Commission recommended that Fort Ritchie be closed. The installation is scheduled to close on October 1, 1998.

Environmental contamination at Fort Ritchie resulted from underground storage tanks (UST), a mortar firing range, and a skeet range. The closed mortar range may contain unexploded ordnance (UXO). Housing units and administrative buildings contain asbestos and lead-based paint.

Interim Actions have included removal or replacement of all USTs, relining of sewer lines with plastic, removal of falling lead paint and high-hazard friable asbestos, and closure of an incinerator in the 1970s. A gasoline spill reported in FY84 was cleaned up in FY92.

The installation developed a positive working relationship with state and local officials. Measures taken to improve the decision-making process and communication at the installation include forming a planning group, conducting meetings at the town hall, conducting quarterly in-process reviews, establishing hot lines to answer employee questions, and relaying installation updates to the local news media.

In FY96, the Army formed a BRAC cleanup team (BCT) to investigate, and ensure cleanup, of all areas of concern and to allow transfer of all BRAC parcels. The commander formed a Restoration Advisory Board (RAB). Also in FY96, the Environmental Baseline Survey (EBS) and the BRAC Cleanup Plan (BCP), Version I, were completed.

The installation's supporting U.S. Army Corps of Engineers (USACE) District negotiated a Total Environmental Restoration Contract for all restoration work. The contractor began work on the Environmental Impact Statement (EIS) required under NEPA and the draft report for

the archive search for UXOs. In addition, the installation developed partnerships with the Local Redevelopment Authority.

FY97 Restoration Progress

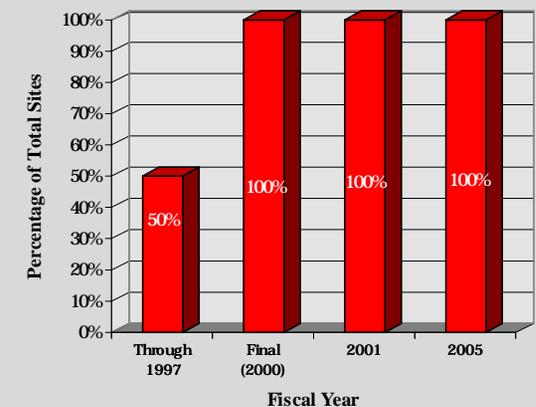
The installation completed the UXO archive search with assistance from the USACE St. Louis District. The installation initiated hazardous, toxic, and radioactive waste and UXO sampling and conducted the RAB meetings. It also completed the draft Version II of the BCP and published a draft EIS.

Some activities scheduled for completion in FY97 were delayed because of a change in management and directives.

Plan of Action

- Initiate the skeet range cleanup in FY98
- Complete BCP Version II in FY98
- Complete a "programmatic agreement" with cultural and historical agencies (the State Historic Preservation Office and the Advisory Council for Historic Preservation) in FY98
- Complete the NEPA EIS in FY98
- Lease facilities once the Army vacates in FY98
- Convey clean parcels in FY99
- Complete all BRAC activities in FY00, depending on the results of UXO sampling

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 712 acres
Mission: Provided administrative and logistical support; non-excess property currently used as Army Reserve installation and Navy Housing Area
HRS Score: NA
IAG Status: None
Contaminants: VOCs, fuel hydrocarbons, PAHs, metals, and UXO
Media Affected: Groundwater and soil
Funding to Date: \$33.2 million
Estimated Cost to Completion (Completion Year): \$8.1 million (FY2008)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2003



Fort Sheridan, Illinois

Restoration Background

Fort Sheridan began operations in 1887. In December 1988, the BRAC Commission recommended its closure. Over its 100-year history, Fort Sheridan's missions have included cavalry and infantry training, NIKE systems maintenance, and administrative and logistical support. Currently, 104 acres are used as an Army Reserve installation.

Sites identified in previous environmental studies include landfills, pesticide storage areas, hazardous-material storage areas, underground storage tanks (UST), asbestos-containing material (ACM) sites, polychlorinated biphenyl (PCB)-containing transformers, and unexploded ordnance (UXO) areas. Petroleum hydrocarbons, volatile organic compounds (VOC), and polyaromatic hydrocarbons (PAH) affect groundwater and soil. Early actions included removal of USTs, contaminated soil, and ACM.

Remedial Investigation and Feasibility Study (RI/FS) activities began in FY90. Investigations identified the following areas for potential cleanup: groundwater and soil contamination at two gas stations, seven landfills, and soil contamination at coal-storage areas. In FY94, the installation conducted a survey that identified UXO at the former artillery range at the north end of the fort.

In FY94, the installation completed an Environmental Baseline Survey (EBS) that identified 304 acres as clean under CERFA requirements. Regulatory agencies concurred that 122 acres are CERFA-clean. The commander formed a BRAC cleanup team that completed the Version I BRAC Cleanup Plan (BCP).

FY95 actions included starting removal of contaminated soil from Building 208 and a Time-Critical Removal Action involving removal of contaminated sediment from Buildings 43 and 368. The installation

also began an Interim Action to close Landfills 6 and 7. During FY95, the installation prepared a draft data validation report for Phase I RI data, conducted a Site Inspection of the installation's golf course, prepared a background sampling plan, conducted the background sampling, and classified groundwater conditions at the installation. The commander also formed a restoration advisory board, and the Army approved a land reuse plan prepared by the Local Redevelopment Authority.

In FY96, removal of contaminated sediment at Buildings 43 and 368 marked completion of Removal Actions at those sites. The installation completed Phase II and Phase III RI fieldwork at the excess property and initiated the draft RI for the same property. The installation also initiated Phase II RI fieldwork at the nonsurplus property. A completed Archive Search Report recommended additional ordnance surveys, which were conducted later. The installation performed a UXO Removal Action and completed Version II of the BCP.

The Army removed several USTs on excess property and conducted asbestos and lead-based-paint hazard abatement for excess-area buildings. The Army also completed a radiological closeout survey. A Focused Feasibility Study and a Proposed Plan were prepared for the Landfill 6 and 7 Interim Action.

FY97 Restoration Progress

The Army began construction activities for the Landfill 6 and 7 Interim Remedial Action (IRA) and completed the decision document for the sites. A Non-Time-Critical Removal Action for cleaning up coal-storage areas and a blacksmith's shop on excess property also was initiated. In addition, the installation prepared an RI, a Proposed Plan, and a no-action decision document for Landfills 3 and 4.

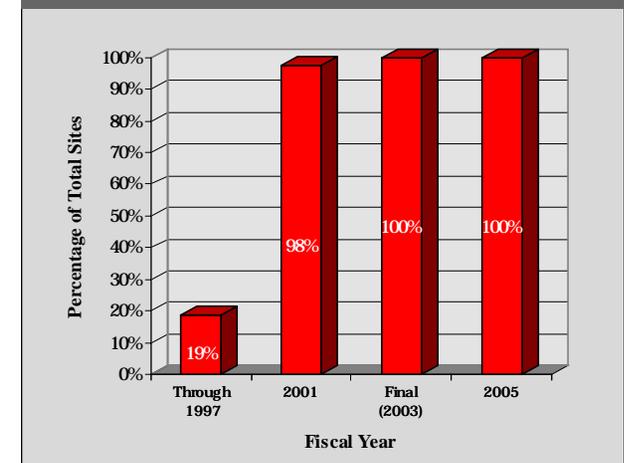
The Army completed the lead-based-paint hazard abatement for excess property in May 1997. In addition, RI reports were prepared for the remaining parts of the excess property. A specific EBS for property transfers and leases was completed, as was Phase II RI fieldwork on nonsurplus property.

The RI/FS planned for FY97 was not completed because the Surplus operable unit (OU) split into two OUs, causing a change in the installation's priorities. An RI was completed for one of these OUs, and a draft RI was completed for the other.

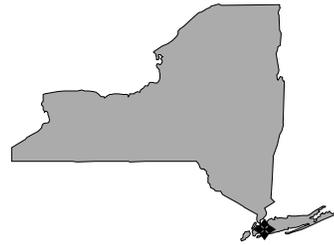
Plan of Action

- Complete RI/FS for remainder of excess property in FY98
- Initiate RI/FS for nonsurplus property in FY98
- Prepare EBS and findings of suitability to transfer for property transfers in FY98
- Conduct Non-Time-Critical Removal Action on excess property in FY98
- Continue IRA at Landfills 6 and 7
- Conduct UXO clearance on former rifle range in FY98
- Propose CERFA-clean acreage and obtain concurrence from appropriate regulatory agencies in FY98
- Complete all BRAC work by end of FY02, with long-term monitoring continuing until FY24

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 135 acres
Mission: Provided administrative and logistical support; non-excess property currently used as an Army Reserve Installation and Navy Housing Area
HRS Score: NA
IAG Status: None
Contaminants: VOCs, fuel hydrocarbons, metals
Media Affected: Groundwater and soil
Funding to Date: \$1.7 million
Estimated Cost to Completion (Completion Year): \$3.9 million (FY2001)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY1999



Bayside, New York

Restoration Background

In 1995, the BRAC Commission recommended closing Fort Totten except for use as a U.S. Army Reserve enclave. In 1989, the installation initiated a broad Installation Restoration Program. The Army conducted several preliminary studies, including groundwater sampling at the former landfill area and soil sampling throughout the installation, at locations with the potential for contamination. The installation completed several Interim Remedial Actions and removals. The actions include removal and replacement of polychlorinated biphenyl (PCB)-containing transformers, tank removals and replacements, petroleum-contaminated soil removal, and removal of asbestos from family housing. In FY95, the installation initiated an Environmental Baseline Survey (EBS). The EBS identified seven areas on BRAC property that required further evaluation.

In FY96, the installation submitted a draft EBS Report to the regulatory agencies for review. An unexploded ordnance archive search was performed, along with a limited field survey. Those studies concluded that further surveying might be necessary.

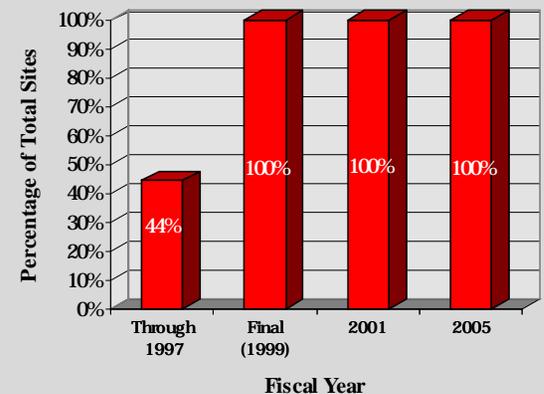
FY97 Restoration Progress

The Army completed the EBS and initiated an Environmental Investigation. The BRAC cleanup team (BCT) was able to expedite document review by implementing a 15-day review process. The restoration advisory board (RAB) for Fort Totten reviewed technical documents and responded to public comments on environmental issues. The BCT was able to coordinate with RAB members in making decisions. The Army identified 100 acres of CERFA-uncontaminated acreage at the installation for transfer. This designation was approved by the appropriate regulatory agencies.

Plan of Action

- Investigate Little Bay sediment in FY98
- Conduct further investigations at Old Fort Area in FY98
- In FY98, perform tightness tests of four USTs and remove USTs if necessary
- In FY98, continue monitoring certain groundwater wells to determine whether cleanup is required
- Submit remainder of CERFA-uncontaminated acreage for regulatory concurrence in FY98

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 917,993 acres
Mission: House the Headquarters of the 6th Light Infantry Division
HRS Score: 50.00; placed on NPL in August 1990
IAG Status: Federal Facility Agreement signed in November 1991
Contaminants: Petroleum/oil/lubricants, heavy metals, solvents, pesticides, paints, UXO, ordnance compounds, and chemical agents
Media Affected: Groundwater and soil
Funding to Date: \$84.2 million
Estimated Cost to Completion (Completion Year): \$63.4 million (FY2026)
Final Remedy in Place or Response Complete Date: FY2007



Fairbanks, Alaska

Restoration Background

Since World War II, Fort Wainwright has housed light infantry brigades, most recently the 1st Brigade, 6th Infantry Division (Light). Numerous installation operations that supported the military mission contributed to soil and groundwater contamination.

Environmental studies identified the following site types: a chemical agent dump, drum burial sites, underground storage tanks, a railroad car off-loading facility, an open burning and open detonation area, a former ordnance disposal site, solvent groundwater plumes, petroleum/oil/lubricant (POL) plumes, and pesticide-contaminated soil. The installation divided the sites into five operable units (OU). In FY90, the installation established a technical review committee.

The Army conducted two Interim Actions in FY93 and FY94. The first removed more than 500 drums and reduced a source of subsurface soil and groundwater contamination. The second treated more than 50,000 cubic yards of POL-contaminated soil by bioremediation and thermal desorption.

In FY93, the installation completed Site Inspections at 30 sites, 15 of which required no further action. In FY94, the installation continued Remedial Investigation/Feasibility Study (RI/FS) activities, which included characterization of POL and solvent groundwater plumes. The Army used an innovative ground-penetrating radar technology to determine environmental conditions at the installation.

In FY95, the installation continued RI/FS activities, including fieldwork for a drum area, a paint area, a former pesticide storage area, and a former landfill. The fifth site in OU1, the Chemical Agent Dump Site, was addressed separately under an Interim Record of Decision (ROD).

After the RI/FS, the installation completed Proposed Plans for the landfill area and power plant coal storage yard sites in OU4. The installation continued RI/FS fieldwork in OU5, which consists of several groundwater plumes north of the airfield.

In FY96, the Army and regulators signed RODs to address groundwater contamination in OU3 and soil and groundwater contamination in OU4. The OU4 remedy specifies natural attenuation of groundwater contamination, capping of the landfill, and in situ treatment of coal storage lot soil and air sparging of associated groundwater. Remedial Designs (RD) began for all sites addressed under those RODs, and some OU3 Remedial Action (RA) construction was completed.

The Army completed the Fire Training Pits (OU4) Removal Action during FY96 and closed the site.

Sampling at hot spots at the Railroad Off-Loading Facility (OU3) showed decreasing levels of contamination. At breaks in the pipeline from Fairbanks to Eielson Air Force Base (also OU3), treatment included injection of oxygen-releasing compounds to enhance in situ biodegradation of benzene, toluene, ethyl benzene, and xylene compounds in the groundwater.

The installation is continuing the postwide RA that was scheduled to be completed in FY97.

FY97 Restoration Progress

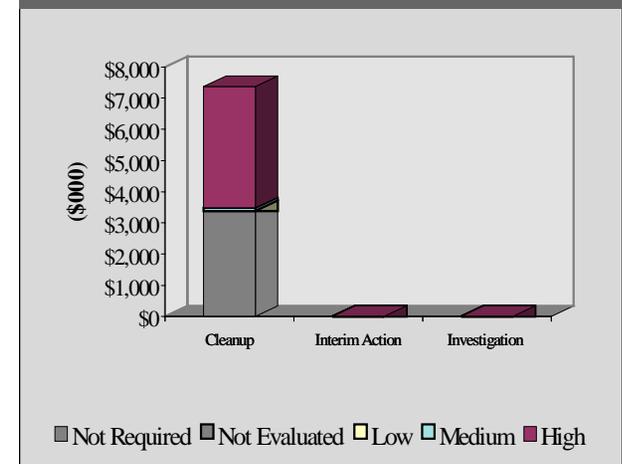
The installation completed the FS, the Proposed Plan, and the ROD for OU1. The Army and regulators signed the ROD for OU2, and the installation initiated RD. The OU4 RD was completed. The installation completed the draft FS and initiated Treatability Studies, including installation of a horizontal well, for OU5. A postwide risk assessment was incorporated into the FS for OU5.

The Army achieved early completion of a pipeline study for OU3 and OU5. It also initiated a Treatability Study at OU5 and installed horizontal air sparging/soil vapor extraction technology. The commander formed a restoration advisory board. The Army, EPA, and the Alaska Department of Environmental Conservation continue to meet jointly to review and write documents to expedite review. This ongoing partnership continues to be highly successful.

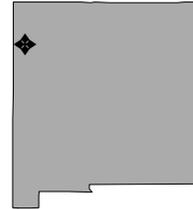
Plan of Action

- Conduct RA construction and RA operation in FY98
- Initiate Treatability Studies for OU5 that will enhance cleanup in FY98
- Remove the retaining structure at OU5 that borders the Chena River in FY98
- Continue to provide bottled water to neighboring churches under OU3 in FY98
- Complete ROD and begin RD for OU5 in FY98
- Enhance community involvement by RAB expansion and continuing publication of fact sheets and newspaper articles

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 22,120 acres
Mission Stored, shipped, and received ammunition components and disposed of obsolete or deteriorated explosives and ammunition
HRS Score: NA
IAG Status: None
Contaminants: Explosive compounds, UXO, PCBs, pesticides, heavy metals, asbestos, and lead-based paint
Media Affected: Groundwater and soil
Funding to Date: \$17.6 million
Estimated Cost to Completion (Completion Year): \$47.3 million (FY2032)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2003



Gallup, New Mexico

Restoration Background

From 1949 to 1993, Fort Wingate stored, conducted functional testing of, and demilitarized munitions. Open burning, detonation, incineration, and bomb washout were the principal demilitarization methods used. Past practices deposited ordnance-related waste on and off the facility. Restoration efforts are focused on the following conditions: clearance of lands affected by unexploded ordnance (UXO); regulated closure of the Open Burning and Open Detonation (OB/OD) Area; remediation of soil at a pistol range, pesticide-contaminated soil at Building 5, and explosives-contaminated soil associated with the former Bomb Washout Plant Lagoons; remediation of polychlorinated biphenyl (PCB) contamination inside Buildings 501 and 11 and demolition of the former Bomb Washout Plant (Building 503); and closure of three unpermitted solid waste landfills.

Interim Remedial Actions conducted by the installation included removal of seven underground storage tanks. In addition, at the direction of regulatory agencies, the installation implemented groundwater monitoring at the Building 6 tanks.

The installation identified 16,417 acres as CERFA-clean in FY94. The regulatory agencies have not yet concurred with that designation. A BRAC cleanup team was formed in FY94 and now meets every 3 months. The installation commander formed a restoration advisory board in FY94. During FY95, the installation completed revision of the BRAC Cleanup Plan and placed the administrative record in local libraries.

In FY95, the Army conducted a Removal Action to clear UXO from Indian tribal lands adjacent to the OB/OD Area. In addition, Remedial Designs (RD) were completed for the pistol range and for Building 5 soil.

In FY96, the Army reached an agreement in principle with regulatory agencies to develop a binding installation wide cleanup agreement. The installation conducted additional fieldwork for a Remedial Investigation and Feasibility Study (RI/FS) in response to regulatory comments on a draft final report. It also completed field investigations of the three unpermitted solid waste landfills. The regulatory agencies approved OB/OD Area field investigations that began during the fiscal year. The RD for cleanup of explosives and demolition of Building 503 was completed. The installation also finished sampling target buildings for contamination with lead-based paint. Groundwater contamination was detected at the former TNT Washout Plant.

FY97 Restoration Progress

The installation initiated the cleanup and demolition plan for the former Bomb Washout Plant and awarded a contract for the work. Other planned activities were delayed by lack of funding, regulator concerns, and changes in the cleanup plan for the pistol range.

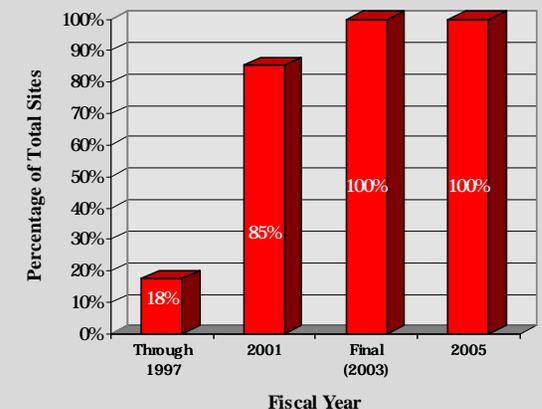
The installation initiated negotiations with regulators on a cleanup agreement. The agreement will facilitate resolution of overlapping jurisdiction applicable to closure of the OB/OD Area under RCRA and will facilitate closure of solid waste landfills.

Plan of Action

- Complete investigation for sites outside the OB/OD Area in FY98
- Initiate the cleanup of Building 5 in FY98
- Further evaluate groundwater contamination at the former TNT Washout Plant in FY98
- Develop and sign an installation-wide cleanup agreement with regulators in FY98

- Conduct remediation of Buildings 501 and 503, including demolition, in FY98
- Install monitoring wells to address groundwater contamination at the Bomb Washout Plant and the OB/OD Area in FY98
- Complete investigations for sites inside the OB/OD Area in FY99
- In FY98, submit post-closure care plan for OB/OD Area
- Close and remediate the OB/OD Area, implement cleanup of soil contamination installation wide, continue evaluation of groundwater contamination, close and remediate the western and central landfills, and implement all other necessary remedies by FY03

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 3,253 acres
Mission: Housed the 7th Bombardment Wing, 436th Training Squadron and Detachment 1, and the 1365th Audiovisual Squadron
HRS Score: NA
IAG Status: None
Contaminants: Waste oils, petroleum/oil/lubricants, JP-4 jet fuel, solvents, TCE cleaners, and low-level radioactive material
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: \$23.2 million
Estimated Cost to Completion (Completion Year): \$21.7 million (FY2015)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY1999



Fort Worth, Texas

Restoration Background

In July 1991, the BRAC Commission recommended the closure of Carswell Air Force Base. The installation closed in FY93 but was reopened in FY94 after the BRAC Commission recommended realignment of the installation as a joint reserve base. The installation name is now Fort Worth JRB Naval Air Station, and all restoration activity is the responsibility of the Air Force Base Conversion Agency.

Environmental studies at the installation since FY84 have identified the following site types: underground storage tanks (UST), landfills, fire training areas, waste burial areas, contaminated groundwater plumes, contaminated ditches, and oil-water separators. The primary contaminants are petroleum hydrocarbons in groundwater, surface water, sediment, and soil and trichloroethene (TCE) in groundwater and soil.

In FY89, a RCRA Facility Assessment was conducted at the installation. In FY92, RCRA Facility Investigation (RFI) activities were completed for 13 solid waste management units (SWMU).

Contaminated soil has been removed, Remedial Investigations (RI) have been completed for several sites, and cleanups have been completed for a petroleum/oil/lubricant tank farm, a fire training area, and a stormwater ditch. Several USTs also were removed.

The installation initiated a basewide RI for TCE-contaminated groundwater. To accelerate cleanup, the study and cleanup phases were conducted simultaneously and interagency document reviews were done concurrently.

In FY94, the installation formed a BRAC cleanup team and a restoration advisory board (RAB). An Environmental Baseline Survey was completed, and 147 acres were identified as CERFA-clean. The installation also entered into an agreement with the Aeronautical

Systems Center at Wright-Patterson Air Force Base to investigate options for preventing a contaminated groundwater plume from entering sites at the installation.

RFIs were completed at five sites in FY95. The installation characterized a JP-4 jet fuel spill site and completed a pilot test of a bioventing system at the site. The installation removed or upgraded 23 USTs and abandoned in place a hydrant refueling system. The installation also is using an air stripper system to remove TCE hot spots at a landfill.

In FY95, the installation and the neighboring Air Force Plant No. 4 began a joint effort to enter all data collected during environmental investigations at both installations into a geographical information system. Air Force Plant No. 4 installed an air stripper system to prevent a TCE groundwater plume from migrating onto the installation.

During FY96, the installation and Air Force Plant No. 4 held joint monthly RAB meetings. Also in FY96, cleanup activities were completed at the Maintenance Barn site at the Golf Course. The installation continued delineating the groundwater plume at the air field. In addition, risk assessment activities were completed at Fire Training Area No. 2, which was later closed. The installation completed cleanup activities at 20 hazardous waste storage units, 23 oil-water separators, and a polychlorinated biphenyl (PCB) storage area. When the background study has been completed, the installation will close the sites as required by RCRA and will transfer ownership of the units to the Navy.

FY97 Restoration Progress

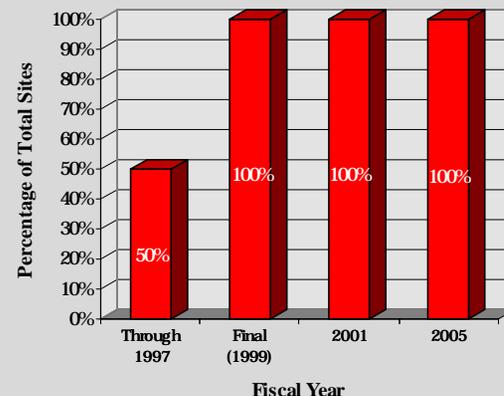
The Remedial Action for the stream project was completed. Before the site can be closed, a background study must be completed. Risk assessments at Landfills 4 and 5 were initiated during FY97, and will continue in FY98.

The Remedial Design at the base service station was completed, and a risk assessment was conducted. The results of the risk assessment were conclusive, and closure of the base service station was approved. No further action is required at the service station at this time.

Plan of Action

- Close the stream project site in FY98
- Continue risk assessments at Landfills 4 and 5, the Sanitary Sewer, and the Off-Base Weapons Storage Area in FY98
- Begin long-term monitoring at some sites in FY99 and at all sites by FY01

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 82.6 acres
Mission: Design and manufacture advanced weapons systems
HRS Score: 30.83; placed on NPL in November 1989
IAG Status: Federal Facility Agreement signed in March 1991
Contaminants: Petroleum/oil/lubricants and VOCs
Media Affected: Groundwater and soil
Funding to Date: \$21.7 million
Estimated Cost to Completion (Completion Year): \$30.6 million (FY2014)
Final Remedy in Place or Response Complete Date: FY2004



Fridley, Minnesota

Restoration Background

Investigations conducted at this government-owned, contractor-operated plant between FY83 and FY88 identified trichloroethene (TCE) in groundwater. The plant was placed on the National Priorities List (NPL) in FY90 because of the TCE contamination in the groundwater, which discharges into the Mississippi River upstream from the Minneapolis drinking water plant.

Site types at the installation include waste disposal pits and trenches, old sanitary sewer lines, a foundry core butt disposal area, and the groundwater drainage system. Wastes and contaminants associated with these site types include petroleum/oil/lubricants, solvents, plating sludge, construction debris, and foundry sands.

In FY83, the installation completed Preliminary Assessments and established four sites. A fifth site was established in FY91 for all groundwater, basewide. The five sites have been divided into three operable units (OU). OU1, Site 5 is the groundwater, basewide. OU2, comprising Sites 1, 2, and 4, includes all source areas outside of the plant buildings. OU3, Site 3 is the source areas under the factory building. Sites 1 and 2 have Response Complete (RC) status.

OU1 Feasibility Study (FS) activities were completed in FY88, and a Record of Decision (ROD) was signed in FY90. The ROD included a Remedial Action (RA) to provide hydraulic containment and recovery of all future off-site migration of contaminated groundwater. In FY95, the installation initiated a Remedial Design (RD) for the water treatment plant.

The installation formed a technical review committee in FY93 and converted it to a restoration advisory board (RAB) in FY95. The installation prepared its community relations plan (CRP) in FY91 and

updated the plan in 1997. An administrative record was compiled and an information repository established in FY95.

In FY96, the installation combined OU2 (soil in the vadose zone outside the main plant) with OU3 (source contamination beneath the main plant) to more effectively manage sitewide cleanup. In addition, the installation began an Interim Remedial Action (IRA) for removal of drums from Site 4. EPA, the Minnesota Pollution Control Agency, and the Navy also started formal partnering. The partnering team meets monthly at the installation.

FY97 Restoration Progress

The installation updated the CRP. The IRA for removal of the drums from Site 4 was completed. In July 1997, the work plan for Site 3 was completed. A Human Health Risk Assessment (HHRA) is being conducted for Site 3 and will be incorporated into the draft Remedial Investigation (RI) report. The installation initiated construction of the water treatment plant in September 1997.

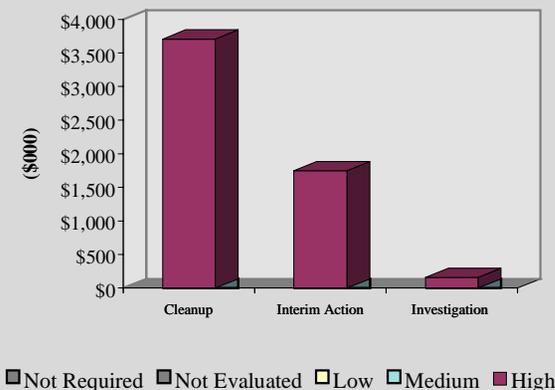
A site management plan was issued and used to track progress. The formal partnering agreement enhanced the team's ability to reach decisions quickly. The RA contractor began construction of the water treatment plant before completion of the design, saving time and allowing the installation to make necessary adjustments to design implementation. The partnering team has developed a plan for screening an off-site area of groundwater migration to better understand any potential impact on the Mississippi River.

The HHRA, which was scheduled for completion in FY97, will be incorporated into the draft RI Report. This report was delayed because a number of agency comments remained to be resolved. Delays in design and in assessing the effects of scaling postponed construction of the water treatment plant.

Plan of Action

- Complete HHRA and construction of a water treatment plant in FY98
- Complete evaluation of contamination remaining in Anoka County Park in FY98
- Implement exit strategies in FY98
- Begin long-term monitoring at Sites 3 and 5 in FY99, after water treatment plant is on-line
- In FY00, complete a source identification at Site 1 to shorten the life cycle of the Site 5 remedy and/or to develop a more efficient extraction system

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 5,226 acres
Mission: Provided tactical fighter operations support
HRS Score: 33.62; placed on NPL in February 1990
IAG Status: Federal Facility Agreement signed in October 1990
Contaminants: Petroleum/oil/lubricants, VOCs, and lead
Media Affected: Groundwater and soil
Funding to Date: \$71.7 million
Estimated Cost to Completion (Completion Year): \$59.0 million (FY2031)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY1999



Victorville, California

Restoration Background

Environmental studies conducted at George Air Force Base since FY81 have identified the following site types: landfills, petroleum spill sites, underground storage tanks (UST), waste storage and disposal units, and fire training areas. Chlorinated solvents, such as trichloroethene (TCE) and tetrachloroethane, have migrated from sites and have contaminated groundwater and soil. Sites were subsequently grouped into three operable units (OU).

Remedial Investigation and Feasibility Study (RI/FS) activities began in FY84 and have been accelerated by the use of field screening techniques. The installation has completed Relative Risk Site Evaluation at all sites.

In FY91, the installation implemented an Interim Remedial Action (IRA) at OU1. In FY93, IRAs were in progress at OU1 and OU2. Other Interim Actions at the installation included removal of more than 80 USTs and contaminated soil and cleanup and closure of a hazardous waste storage yard.

In FY91, a RCRA Facility Assessment identified 113 solid waste management units. In FY92, the installation prepared an Engineering Evaluation and Cost Analysis and installed a pumping system at OU2. In FY93, the installation completed a final draft FS and a Proposed Plan for OU1 and began an Environmental Baseline Survey. In FY94, the Air Force and regulatory agencies signed a final Record of Decision (ROD) for OU1.

In FY95, the installation removed 30 oil-water separators and associated contaminated soil, began operation of bioventing systems at seven fuel-contaminated sites, and removed and disposed of soil from a low-level radioactive waste disposal site. All basewide RI/FS fieldwork was completed, and a draft report was issued. The installation selected cleanup actions for all sites.

In FY96, the installation began construction of landfill-surface rehabilitation projects and continued TCE cleanup actions at OU1. These cleanup actions involved the installation of additional groundwater extraction wells. Mobile recovery units were developed for use at OU2 to remove JP-4 jet fuel from contaminated groundwater. In addition, removal of the liquid fuel distribution system and of all USTs was completed. The installation also began cleanup by bioventing at six fuel spill sites. Completion of the RI/FS and signing of the basewide ROD were on hold, pending review by the regulatory agencies.

A BRAC cleanup team (BCT) was formed in FY92, and the installation's technical review committee was converted to a restoration advisory board (RAB) in FY94. The installation closed on December 15, 1992. The installation has continued to hold scheduled meetings with the RAB throughout FY96 and has worked with the Local Redevelopment Authority to lease major remaining parcels of land.

The installation began construction of landfill-surface rehabilitation projects and continued TCE cleanup actions at OU1 that involved the installation of additional groundwater extraction wells. Mobile recovery units were developed for use in OU2 to remove JP-4 jet fuel from contaminated groundwater. In addition, removal of the liquid fuel distribution system and all USTs was completed. The installation also began cleanup by bioventing at six fuel spill sites.

Work on the RI/FS continued. However, completion of the RI/FS and signing of the basewide ROD were not accomplished because review by the regulatory agencies had not been completed.

FY97 Restoration Progress

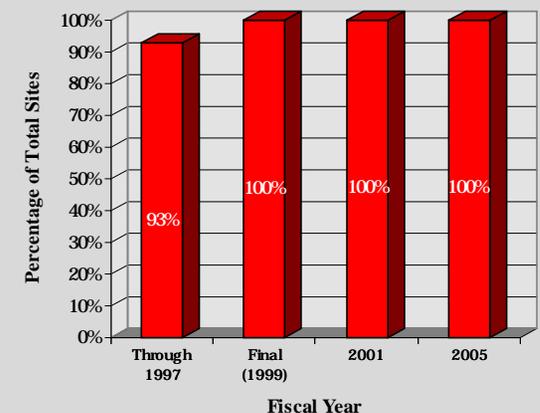
The installation completed construction of all landfill closures and landfill-surface rehabilitation projects. In addition, it continued TCE cleanup at OU1, bioventing cleanup at six fuel spill sites, and free-product recovery and long-term monitoring (LTM) at OU2. The installation also documented over 2,500 acres as CERFA-clean.

Partnering with the community and with regulatory agencies was promoted through RAB efforts and annual scheduled meetings. The RAB focused on activities that would increase community response and involvement. The BCT continues to meet monthly. The OU2 Treatability Study and FS were not completed, which in turn delayed the basewide ROD.

Plan of Action

- Complete bioventing sites and remove wells in FY98
- Complete removal of lead shot at isolated shooting range in FY98
- Complete Remedial Design and Remedial Action for last OU3 site (OT-51) in FY98
- Conclude the groundwater modeling Treatability Study for OU2 and issue an FS in FY98
- Continue TCE cleanup of OU1 and complete installation of additional groundwater extraction wells in FY98
- Complete all remedial construction in FY98
- Complete RI/FS in FY98 and sign a basewide ROD in FY99
- Complete removal of free product in OU2 by FY00
- Continue LTM and long-term operations at OU2 through FY31

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 1,285 acres (1,121 acres at Glenview; 164 acres at Libertyville)

Mission: Provided accommodation for aircraft, conducted flight and general training, and served as a NIKE missile location (Libertyville site)

HRS Score: NA

IAG Status: None

Contaminants: Petroleum hydrocarbons, heavy metals, PCBs, solvents, asbestos, and waste activated sludge

Media Affected: Groundwater, surface water, sediment, and soil

Funding to Date: \$19.3 million

Estimated Cost to Completion (Completion Year): \$13.8 million (FY2000)

Final Remedy in Place or Response Complete Date for BRAC Sites: FY2000



Glenview, Illinois

Restoration Background

In July 1993, the BRAC Commission recommended closure of Glenview Naval Air Station and the Libertyville Training Site. Closure occurred in FY95.

Glenview was established in 1937 to provide accommodations for Service aircraft. In World War II, the station was used for flight training. In 1946, it became a Reserve Command training facility. Libertyville was a flight training site and a NIKE missile air defense location.

Forty-three sites have been identified at the two bases: 33 CERCLA sites and 2 underground storage tank (UST) sites at Glenview; 7 CERCLA sites and 1 UST site at Libertyville. Of the sites identified, those that present the greatest risk are fire-fighter training areas, landfills, fuel storage areas, and areas where waste was disposed of on the land surface.

In FY88, a Preliminary Assessment Study identified six potentially contaminated sites at Glenview. A Site Inspection (SI) completed in FY92 identified three more sites at Glenview. Between FY92 and FY94, the installation completed an Interim Removal Action for five of seven identified CERCLA sites at Libertyville. During FY94, an Environmental Baseline Survey was completed for Glenview and Libertyville.

Because Glenview is 18 miles from the Libertyville Training Site, two separate local communities are involved with these sites, necessitating the formation of two restoration advisory boards. The installation prepared a community relations plan for Libertyville in FY93 and one for Glenview in FY95. The BRAC cleanup team (BCT), formed in FY93, works closely with the two Local Redevelopment Authorities

(LRA), which also formed in FY93. A BRAC Cleanup Plan was completed in FY94, and a land reuse plan was completed in FY95.

During FY95, an SI was completed at Glenview Site 8. The installation initiated SI activities at 16 Glenview sites and Remedial Investigation and Feasibility Study (RI/FS) activities at 4 Glenview sites.

In FY96, the installation completed removal of all USTs from Glenview, initiated SIs at three sites, and replaced contaminated soil with clean fill in parts of the airfield. The installation also prepared a finding of suitability to transfer (FOST) for Glenview Golf Course and began developing a FOST for the majority of the airfield property.

FY97 Restoration Progress

Restoration activities performed by the installation included initiation of an SI at 7 sites in Libertyville, initiation of an RI and an Interim Remedial Action (IRA) at 7 sites in Glenview, completion of an SI at 20 sites in Glenview, and completion of all UST removals at 1 site in Glenview.

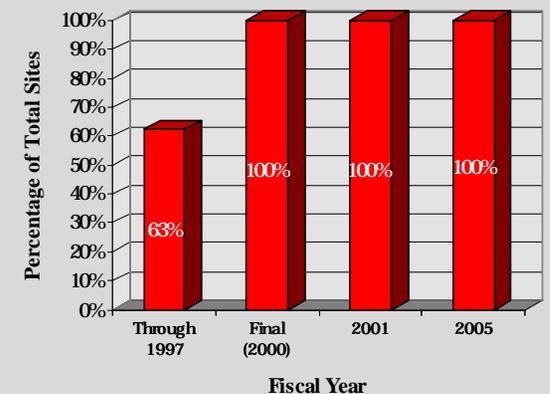
The Navy implemented a formal partnering agreement with regulatory agencies and conducted training for facilitated meetings. Partnering with regulatory agencies also assisted in setting priorities and regularly communicating with the LRA to coordinate cleanups. The BCT approved a FOST for 535 acres of the former airfield at Glenview. Also at Glenview, 120 acres of property have been leased. A FOST for an additional 80 acres was initiated in FY97.

Some sites scheduled for remediation in FY97 were found to require no further action. Some actions at other sites were delayed because of the need for further site characterization and changes in plans to suit reuse.

Plan of Action

- Complete an SI at five sites at Glenview and seven sites at Libertyville in FY98
- Initiate an RI at one site at Glenview and four sites at Libertyville in FY98
- Complete RI at two sites at Glenview in FY98
- Initiate an IRA at seven sites at Glenview and four sites at Libertyville in FY98
- Complete IRA at six sites at Glenview in FY98
- Complete UST removal at one site at Libertyville in FY98
- Complete an RI at two sites at Libertyville in FY98
- Initiate an IRA at three sites at Libertyville in FY98
- Complete an IRA at three sites at Libertyville and four sites at Glenview in FY99
- Complete an SI at three sites at Glenview in FY99
- Complete an RI at five sites at Glenview in FY99

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 3,552 acres
Mission: Operate air refueling and long-range bombardment facility
HRS Score: 34.20; placed on NPL in July 1987
IAG Status: Federal Facility Agreement signed in June 1990
Contaminants: VOCs, heavy metals, PCBs, grease, degreasers, caustic cleaners, dyes, penetrants, pesticides, and solvents
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: \$81.8 million
Estimated Cost to Completion (Completion Year): \$48.7 million (FY2031)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2001



Rome, New York

Restoration Background

In FY81, a Preliminary Assessment and a Site Inspection identified 54 sites at Griffiss Air Force Base. Site types include landfills, underground storage tanks (UST), fire training areas, disposal pits, and spill areas. Releases of polychlorinated biphenyls (PCB), volatile organic compounds (VOC), pesticides, metals, and petroleum products have occurred at those sites and have caused contamination of soil, groundwater, and surface water. Possible off-site groundwater contamination was identified.

Interim actions conducted at the facility between FY86 and FY91 included modification of a landfill cap and removal of contaminated soil and USTs from a tank farm, various disposal pits, and the area adjacent to an aircraft nosedock. During FY91 and FY92, as an Interim Remedial Action (IRA), an \$8 million alternative water distribution system was constructed to serve community residents outside of the installation. Remedial Investigation (RI) Reports on areas of concern (AOC) were completed in FY93.

In FY95, work began on numerous UST closures and contaminated soil removals. Contracts for closures under RCRA and contracts for the closure of fuel distribution systems were awarded. The installation also completed a draft Environmental Impact Statement (EIS) and an Environmental Baseline Survey (EBS). The installation received concurrence on 45 of the 1,150 acres proposed as uncontaminated.

In FY95, a BRAC cleanup team (BCT) and a restoration advisory board (RAB) were formed. A Local Redevelopment Authority (LRA) was formed to address socioeconomic issues related to closure of the installation. During FY95, a final reuse plan was submitted.

In FY96, the installation presented the Relative Risk Site Evaluation (RRSE) to the members of the RAB for questions and comments. The RAB concurred with the RRSE process for determining priorities.

The installation completed the EIS in November and issued a final reuse Record of Decision (ROD) for the BRAC III realignment. The BRAC IV realignment ROD was deferred.

In FY96, 96 of the 210 UST sites and hydrant fuel systems were closed. Confirmatory sampling was completed for closure of all 48 RCRA sites. Comments on the RI report for the 31 AOCs were received from the regulatory agencies. In March 1996, the installation began Feasibility Study (FS) activities. Design work began for an IRA at seven AOCs. Samples were collected at 30 sites and 470 sites were screened under the Area of Interest program, which identifies potential sites.

FY97 Restoration Progress

The final RI Report for 31 AOCs (Federal Facility Agreement sites) was completed. EPA does not concur with all sites. Thirteen draft Proposed Plans for no further action were submitted. The Proposed Plans cover no-further-action for soil at 12 sites and no-further-action for the off-base groundwater. Supplemental investigations have begun. The FS process began with submission of the draft Remedial Alternative Development and Screening Report. IRAs have begun at eight sites.

Cleanup is proceeding for RCRA sites that failed initial screening; however, a lack of funding has prevented actions on two sites.

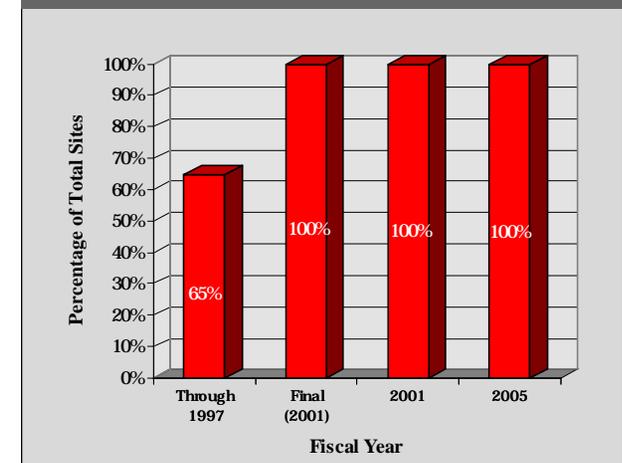
Under the Area of Interest program, 32 of the 470 areas are listed as confirmatory sampling sites. Of these 32 sites, 12 will enter the Expanded Site Inspection (ESI) stage, 17 sites are proposed for no further action, and 3 sites will be closed under other programs.

Oil-water separator closure is under way. The UST removal program continues.

Plan of Action

- Complete IRAs for seven sites
- Complete the AOC supplemental investigation
- Complete the area of interest ESI
- Begin the AOC designs
- Begin the area of interest FS and designs
- Begin the close-spill-site program
- Initiate the baseline for long-term monitoring
- Complete soil remediation for the RCRA closures
- Begin airfield closure (BRAC IV)
- Complete BRAC IV EBS/EIS

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 2,722 acres
Mission: House a refueling wing; formerly housed a bombardment wing
HRS Score: NA
IAG Status: None
Contaminants: Household and industrial waste, spent solvents, fuels, waste oil, pesticides, lead, silver, munitions, asbestos, and lead-based paint
Media Affected: Groundwater and soil
Funding to Date: \$10.5 million
Estimated Cost to Completion (Completion Year): \$2.5 million (FY2003)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY1999



Peru, Indiana

Restoration Background

In July 1991, the BRAC Commission recommended realignment of Grissom Air Force Base. Following realignment, some 1,300 acres will be returned to the community for redevelopment. The Air Force retains approximately 1,400 acres for military activities. The installation was realigned in September 1994.

Sites identified include underground storage tanks (UST), a hydrant system, fire training areas, landfills, a fuel-sludge weathering site, a munitions burn and burial area, a small-arms firing range, oil-water separators, and various petroleum-contaminated sites from former leaking USTs. Remedial Investigation and Feasibility Study activities began in FY89.

Interim Actions have included removal of 63 USTs and associated petroleum-contaminated soil and use of soil bioremediation, air sparging, removal of free product, and natural attenuation to effect cleanups. Significant cleanups include completion of clean-closure at UST removal sites and completion of no-further-action documents for 13 areas of concern (AOC) and one Installation Restoration Program (IRP) site.

In FY94, the installation formed a BRAC cleanup team (BCT) and prepared a BRAC Cleanup Plan. In FY95, the installation formed a restoration advisory board (RAB). The installation also proposed one acre as CERFA-clean and completed supplemental Environmental Baseline Surveys on specific parcels with the intention of leasing or redeveloping the property.

Also in FY95, the installation began ex situ bioremediation and natural attenuation and reduced investigative costs by efficiently using geoprobe sampling at 31 former UST sites. The installation also began site characterization and corrective action plans for UST sites in the

Military Family Housing Area and at the BX gas station. Regulatory agencies have been involved since the start of planning and decision making and have provided comments on proposed cleanup actions before their implementation.

During FY96, the installation held quarterly RAB meetings and continued accomplishing significant soil removal and bioremediation. Priorities for cleanup activities were established and the installation applied cleanup criteria based on risk to human health to close specific sites without remediation. The installation developed a Focused Feasibility Study to fill specific data gaps and continued investigation and closure of AOCs. An Economic Development Conveyance was signed in May 1996, and concurrence on CERFA-clean acreage was received from the regulatory agencies.

FY97 Restoration Progress

The first finding of suitability for early transfer (FOSET) was accomplished, and 201 acres were transferred to the state of Indiana for construction of a state prison before environmental cleanup on the parcel was complete. Long-term monitoring (LTM) of groundwater began. Investigation and closure of AOCs continue.

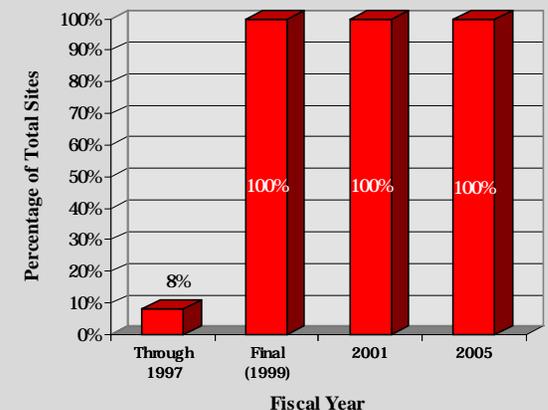
The BCT reached a consensus on Remedial Action (RA) for landfills, and work on the revised decision document began. To help resolve issues with the regulatory community, the BCT established ground rules for its meetings. It also oversaw three major investigations and removed the 12 remaining USTs.

An investigative study for fire protection areas and explosive ordnance disposal (EOD) for the former munitions burn and burial area, both originally scheduled for completion in FY97, will be completed in FY98.

Plan of Action

- Sign RA decision document for landfills in FY98
- Continue closeout of AOCs in FY98
- Reach consensus on RA and sign decision document for fire protection training areas in FY98
- Complete finding of suitability to transfer (FOST) for the remainder of the property in FY98
- Complete RA for former leaking USTs in FY98
- Finish EOD and environmental work at former munitions burn and burial area in FY98
- Resolve dispute with regulators over closure of the Firing in Buttress site in FY98
- Optimize LTM in FY98
- Resolve RCRA Interim Hazardous Waste Storage Site closure in FY98
- Complete investigation and Engineering Evaluation and Cost Analysis of trichloroethene contamination at Oil-Water Separator 896 in FY98
- Complete investigation and cleanup of the small-arms firing range in FY98

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 18,253 acres
Mission: Maintained and operated facilities, provided services and materials, and stored and issued weapons and ordnance in support of the operating forces of the Navy and shore activities; provided dry-dock facilities, repair services, and related services for Guam Naval Activities
HRS Score: NA
IAG Status: IAG signed in 1993
Contaminants: PCBs, petroleum/oil/lubricants, and heavy metals
Media Affected: Groundwater and soil
Funding to Date: \$75.8 million
Estimated Cost to Completion (Completion Year): \$75.2 million (FY2029)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2001



Apra Harbor, Guam

Restoration Background

This facility consists of Navy commands in the Apra Harbor area and the former Naval Magazine (NAVMAG) area southeast of the harbor. Four of the commands—Guam Naval Activities (NAVACTS), Naval Fleet and Industrial Supply Center (FISC), Naval Ship Repair Facility (NSRF), and Public Works Center (PWC)—were recommended for realignment or closure by the BRAC Commission in July 1995.

Typical operations that contributed to contamination were support, photographic and printing shops, a dry-cleaning plant, power plants and boilers, pest control operations, and chemical and medical laboratories. Wastes were stored and disposed of in landfills, incinerators, and wastewater treatment plants.

Combined, the four commands have 29 CERCLA sites in the Installation Restoration Program and 26 RCRA sites, 3 of which were transferred to BRAC. Of the CERCLA sites, three are in the study phase of a Remedial Investigation and Feasibility Study (RI/FS), eight are scheduled for the study phase in FY04, one is in the cleanup phase, and five are in the study phase of an Interim Removal Action. Of the RCRA sites, 20 are in the RCRA Facility Investigation and corrective measures study (CMS) phase. Five Removal Actions have been completed and a Human Health Risk Assessment and an Ecological Risk Assessment have been prepared for NAVACTS, PWC, FISC, and NSRF.

The complex converted its technical review committee, formed in FY89, to a restoration advisory board in FY95. The complex also completed a joint community relations plan (CRP) in FY92. A local information repository was established in FY94.

During FY96, the installation's BRAC cleanup team (BCT) convened for the first time and completed an Environmental Baseline Survey (EBS) and a BRAC Cleanup Plan (BCP) for all four activities.

FY97 Restoration Progress

The facility ceased operations in September 1997. During FY97, a Removal Action continued at PWC Site 16, the Interim Remedial Action (IRA) phase continued at several sites, and cleanup occurred at one site. As the draft Engineering Evaluation and Cost Analysis (EE/CA) was completed and the Action Memorandum was prepared and signed, fieldwork began at FISC under the IRA for Site 19.

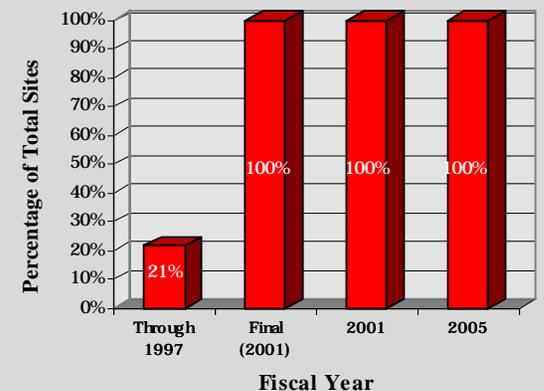
Initiation and implementation of a Memorandum of Understanding between regulators and the Navy resolved issues with regulatory agencies and expedited document review and site characterization. The BCT completed the EBS and began a BCP for new sites. It also conducted a joint site visit, completed a finding of suitability to lease (FOSL) for both NSRF and COMNAVAMARIANAS parcels, began preparing a CRP, completed resampling of suspect data, and expanded an RI into adjacent wetlands. A draft of the BCP and EBS for NAVACTS sites was completed. Regulatory agencies approved the designation of 1,300 acres as CERFA-uncontaminated.

Some activities scheduled for completion in FY97 were delayed because of funding constraints and regulatory holdups.

Plan of Action

- In FY98, complete CMS and Corrective Measures Design (CMD) for solid waste management units (SWMU) at NAVACTS
- Begin CMD for SWMUs at NSRF in FY98
- Complete CMD for several SWMUs at NSRF and begin corrective measures implementation phase in FY98
- Conduct Removal Action at NSRF Site 25 in FY98
- Complete EE/CA and prepare design of Removal Action for Site 19 at FISC in FY98
- Complete Removal Action and begin RI to complete characterization of Site 16 at PWC in FY98
- Complete RI for Site 17 at PWC
- Complete Removal Action design package and begin Removal Action for Site 2810 at PWC in FY98
- Complete design and begin construction for Removal Action at NAVACTS Site 1 in FY98
- Complete Removal Action for NAVACTS Sites 4 and 14 in FY98

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 722 acres
Mission: Conducted reserve training
HRS Score: NA
IAG Status: None
Contaminants: Metals, VOCs, SVOCs, fuel hydrocarbons, PCBs, PAHs, and pesticides
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: \$17.1 million
Estimated Cost to Completion (Completion Year): \$0.7 million (FY2003)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2000



Novato, California

Restoration Background

In December 1988, the BRAC Commission recommended closure of about 700 acres at Hamilton Army Airfield (HAAF), as well as relocation of the airfield's mission. There are eight discrete areas at the installation: a former petroleum/oil/lubricant (POL) hill area; a hospital complex; five additional areas, identified as Out Parcels A-2, A-3, A-4, A-5, and A-6; and the main airfield parcel. Out Parcels A-2, A-3, A-5, and A-6 were transferred to the city of Novato, California, in 1996.

Previous investigations at the main airfield parcel addressed tidal wetlands, a perimeter drainage ditch, underground storage tanks (UST), burn pits, aboveground storage tanks, onshore and offshore fuel lines, a former sewage treatment plant, a pump station, an aircraft maintenance and storage facility, the east levee construction debris disposal site, a POL area, and a revetment area. Metals, petroleum hydrocarbons, volatile organic compounds, semivolatile organic compounds (SVOC), pesticides, and polychlorinated biphenyls (PCB) are the main contaminants of concern.

In FY94, the installation formed a BRAC cleanup team (BCT) and a restoration advisory board (RAB). To help facilitate cleanup, the BCT conducted a "bottom up" review of the installation's restoration program. Since FY94, the BCT has met monthly to discuss environmental restoration efforts, receive briefings on the restoration program, and review documents.

During FY95, the installation completed a draft Environmental Impact Statement. Additional Remedial Investigation (RI) work also continued at five sites. Cleanup actions conducted at the installation included removal of USTs and removal of soil contaminated with

petroleum constituents and PCBs. In November 1996, the local reuse authority selected a wetlands reuse scenario for the BRAC airfield parcel.

The RAB meets monthly to discuss current restoration activities and issues related to property reuse. The RAB is a mechanism for the Army for communicating with and providing information to the public. Local citizens of all economic levels continued to be solicited to serve as members of the RAB.

In FY96, the Army continued the RI/Feasibility Study (FS) activities on the main airfield BRAC parcel. Out Parcels A-5 and A-6 were transferred to a local development group.

FY97 Restoration Progress

The installation continued RI fieldwork. Two USTs were removed. The HAAF BCT, consisting of Army, the U.S. Army Corps of Engineers, the BRAC environmental coordinator office, and regulatory agencies, worked to expedite cleanup by using a data-quality-objective approach to site characterization.

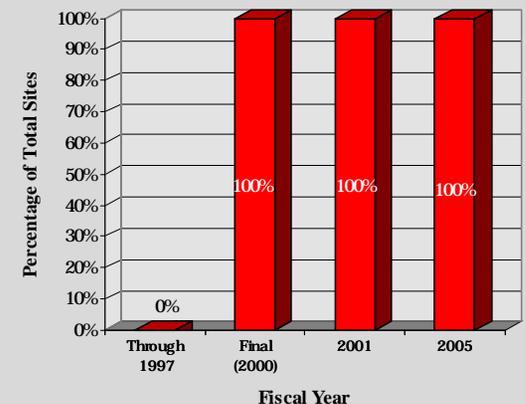
The draft Human Health and Ecological Risk Assessments, scheduled for completion in FY97, were delayed so that new exposure scenarios and RI data could be incorporated.

Plan of Action

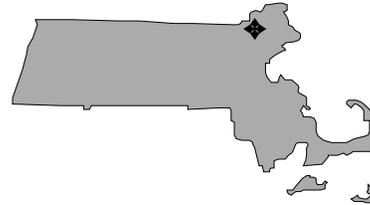
- In FY98, complete an RI Report, a Human Health Risk Assessment, an Ecological Risk Assessment, and a draft Focused Feasibility Study
- Complete the Remedial Design for the onshore fuel line at the BRAC airfield parcel in FY98

- Develop closure reports for Out Parcel A-4 in FY98
- Complete all BRAC activities by FY00, with long-term groundwater monitoring of the POL hill area until 2010

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 826 acres
Mission: Support Electronic System Center
HRS Score: 50.00; placed on NPL in May 1994
IAG Status: None
Contaminants: VOCs, chlorinated solvents, gasoline, jet fuel, tetraethyl lead, PCBs, and mercury
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: \$28.3 million
Estimated Cost to Completion (Completion Year): \$24.5 million (FY2020)
Final Remedy in Place or Response Complete Date: FY2000



Bedford, Massachusetts

Restoration Background

Historical operations at Hanscom Air Force Base involved the generation, use, and disposal of numerous hazardous substances, such as chlorinated solvents, fuel, aromatic solvents, tetraethyl lead, and polychlorinated biphenyls (PCB). Possible sources of contamination at the installation include a former industrial wastewater treatment system, a former filter-bed area, a jet fuel residue and tank sludge area, two landfills, three former fire training areas, a paint waste disposal area, a mercury spill area, aviation fuel handling and storage facilities, underground storage tanks (UST), and various fuel spill areas. These sources have contaminated groundwater and soil at the installation.

In FY84, environmental studies identified 13 sites. Subsequent discoveries increased the number of sites to 22. All required actions have been completed and no further response action is planned for 13 of these sites. Site Inspections (SI) or Remedial Investigations and Feasibility Studies (RI/FS) are under way at the remaining nine sites. Interim Remedial Actions have been completed or are continuing at eight of the nine active sites.

In FY88, the final Remedial Action (RA) was completed for the closed base landfill, and Interim Actions (removal of buried drums and/or contaminated soil) were completed at three high-risk sites in Operable Unit (OU) 1. Interim Actions also were completed at the mercury release site and the UST sites. In FY89, the final RA was completed for the mercury release site.

In FY90, the installation completed Interim Actions, including removing abandoned tanks and petroleum-contaminated soil, at UST sites. In FY91, the installation began operation of the OU1 groundwater collection and treatment system to remove VOCs from groundwa-

ter and completed an Interim Action at the AAFES Service Station UST site that included removal of 2,700 tons of contaminated soil.

In FY94, the installation's technical review committee was converted to a restoration advisory board (RAB), and the installation completed a cleanup involving removal of more than 1,300 tons of contaminated soil from a former UST site.

In FY95, the installation began an Interim Action involving a dual-phase groundwater extraction and soil vapor extraction system at Site ST21 for remediation of petroleum releases.

In FY96, the installation entered into a partnership with EPA and Tufts University's Center for Field Analytical Studies and Technologies (CFAST) to support research and development efforts while filling data gaps for OU1 and for Site ST21 in OU3.

FY97 Restoration Progress

The installation completed transition of the groundwater recovery and treatment system at OU1 to an automatic system and added two new recovery wells to the collection system. The Baseline Human Health and Ecological Risk Assessment for OU2/Site LF04 was completed, and the Massachusetts Contingency Plan (MCP) documentation was filed to establish natural attenuation and intrinsic remediation as the final remedy for the AAFES Service Station UST site.

The installation continued Human Health and Ecological Risk Assessments for OUs 1 and 3. Projects with EPA and Tufts University at OU1 and at Site 21 in OU3 continued. The installation is being used as a demonstration site for Armstrong Laboratory's direct-push monitoring point and direct-push data mapping technology. Massachusetts Institute of Technology is using Site ST21 to develop laser induced fluorescence technology.

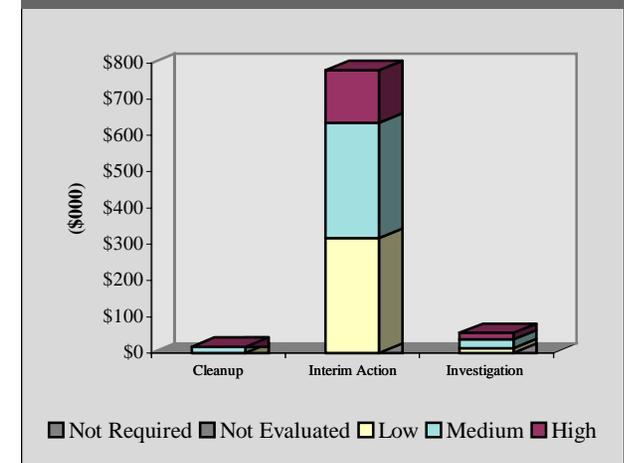
The installation conducted three RAB meetings in FY97. The RAB was briefed on ongoing investigations, actions, and reports.

The decision document for OU2 was not needed because EPA accepted the original no-further-action decision document. The IRA scheduled for Site 6 of OU3 in FY97 was not performed because the level of risk shown in preliminary RI data did not justify it. Delays in other activities for FY97 were due to technical problems. These activities have been rescheduled for FY98.

Plan of Action

- Complete SI at two UST sites and RI at the two sites in OU3 in FY98
- Complete Human Health and Ecological Risk Assessments for OU1 and OU3 in FY98
- Complete the MCP process to establish natural attenuation and intrinsic remediation as the final remedy for the Base Motor Pool UST site in FY98
- Host an Air Force technology transfer project to demonstrate vacuum-enhanced recovery of chlorinated hydrocarbons from groundwater at Site FT01 in OU1
- Continue the FS and Record of Decision processes for OU1 and OU3 in FY98
- Continue operating the groundwater recovery and treatment system for OU1 and the dual-phase recovery and treatment system for Site ST21 in OU3

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 48,753 acres
Mission: Produce, load, and store ammunition
HRS Score: 42.24; placed on NPL in June 1986
IAG Status: IAG under negotiation
Contaminants: Explosive compounds, UXO, VOCs, PAHs, and heavy metals
Media Affected: Groundwater and soil
Funding to Date: \$43.3 million
Estimated Cost to Completion (Completion Year): \$188.7 million (FY2030)
Final Remedy In Place or Response Complete Date: FY2003



Hastings, Nebraska

Restoration Background

Previous operations at the Blaine Naval Ammunition Depot subsite contributed to groundwater and soil contamination at the Hastings Groundwater Contamination Site. The U.S. Army Corps of Engineers (USACE) designated five operable units (OU) at the site: three OUs for the 2,900-acre Hastings East Industrial Park (HEIP) area (OU4, soil; OU8, vadose zone; and OU14, groundwater); one OU for the former location of the Naval Yard Dump, the Explosives Disposal Area, and the Bomb and Mine Complex Production Facility (OU16); and one OU covering a 44,500-acre area whose contamination status is unknown (OU15).

Soil sampling, installation of monitoring wells, and geophysical surveys were conducted for the Remedial Investigation (RI) of the HEIP area. EPA signed a Record of Decision (ROD) to remove surface soil; however, predesign studies for the selected Remedial Action (RA) revealed the need for modification of some aspects of the remedy. Remedial Design (RD) activities included soil vapor extraction (SVE) and an air sparging pilot study. In FY95, EPA signed an amendment to the ROD for the removal of soil from the HEIP area.

RI, Feasibility Study (FS), and RD activities have been conducted for two OUs. A Time-Critical Removal Action was conducted in the area where the air sparging pilot study was conducted, to remove utility accesses and piping that had been identified as a source of the groundwater contamination. Engineering Evaluations and Cost Analyses (EE/CA) also were performed to assess alternatives for environmental restoration in several areas. USACE also completed a preliminary environmental study for the remaining 44,500 acres at the former depot.

A Federal Facility Agreement was based on an agreement among EPA, the Nebraska Department of Environmental Quality, and DoD. The

Army signed the agreement on 30 September 1997, and signatures by other agencies are pending.

In FY96, the RD for SVE and remediation of surface soil at the HEIP area was completed. Phase II of the RD for SVE was initiated at three source areas at OU8. USACE completed the air sparging pilot study as part of the RI/FS for OU14 and initiated the Time-Critical Removal Action for the air sparging facility. The comprehensive RI for the remaining 44,500 acres at the former depot was initiated. A Time-Critical Removal Action of subsurface soil and drums was conducted at the Naval Yard Dump. In addition, an RA of surface soil at the HEIP area and a Removal Action at the HEIP area were initiated.

FY97 Restoration Progress

A sitewide groundwater Baseline Risk Assessment was initiated. USACE will pursue air sparging with in situ bioremediation capabilities in FY97; this innovative technology will be constructed in FY97. USACE employed the accelerated fieldwork techniques of shallow and deep soil gas sampling and testing, as well as preplaced RA, co-reimbursable, and indefinite-delivery contracts to expedite contracting and the cleanup process.

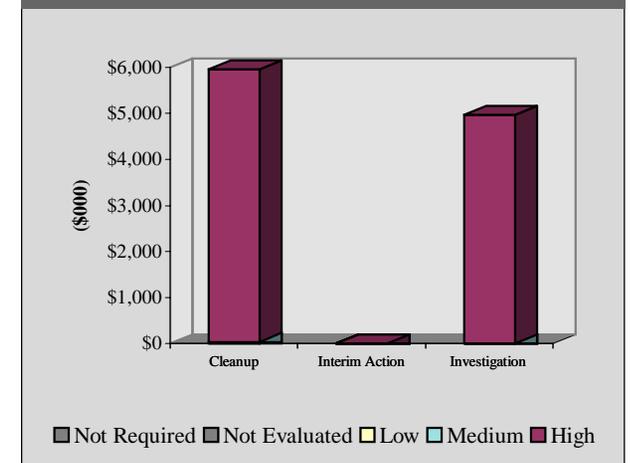
The former DoD property's restoration advisory board (RAB) conducted quarterly meetings with 20 members of varying backgrounds. RAB emphasis has been on familiarizing the members with the site and with ongoing work. Members participated in a site tour and basic risk assessment training.

Some activities scheduled for completion in FY97 were delayed because of increased regulatory review time, and the OU8 RD schedule was extended to take advantage of lessons learned from the operation of the Phase I SVE systems.

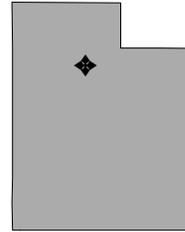
Plan of Action

- Complete OU4 RA in FY98
- In FY98, continue system operation for SVE Phase I sites at OU8
- In FY98, complete design and award construction contract to TERC for SVE Phase II sites in OU8
- In FY98, complete final RI and submit Baseline Risk Assessment for OU15 and initiate EE/CA (and additional investigations) for selected OU15 sites
- Submit work plan for OU16 RI in FY98
- In FY98, construct in situ bioremediation system and in-well stripping and groundwater recirculation system for OUs 8 and 14; continue operation as a Removal Action in FY98
- Initiate sitewide groundwater FS for OU14 in FY98
- Revise Baseline Risk Assessment for groundwater in FY98
- Complete RI for the remaining 44,500 acres in FY98
- Continue groundwater monitoring in FY98

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 6,666 acres
Mission: Provide logistics support for weapons systems
HRS Score: 49.94; placed on NPL in July 1987
IAG Status: IAG signed in April 1991
Contaminants: Solvents, sulfuric acid, chromic acid, metals, and petroleum wastes
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: \$103.7 million
Estimated Cost to Completion (Completion Year): \$270.9 million (FY2047)
Final Remedy in Place or Response Complete Date: FY2007



Ogden, Utah

Restoration Background

Between FY82 and FY87, Preliminary Assessment and Site Inspection activities were completed at Hill Air Force Base. Since FY87, 97 sites have been identified. Forty of these sites have been grouped into nine operable units (OU). Site types include disposal pits, landfills, surface impoundments, underground storage tanks (UST), fire training areas, firing ranges, discharge and wastewater ponds, a contaminated building, a munitions dump, and spill sites. Contaminants consist primarily of volatile organic compounds (VOC).

The base installed five systems to treat groundwater, capped two landfills at OU1, capped one of the discharge and wastewater ponds at OU3, and recovered and treated trichloroethene (TCE)-contaminated groundwater at OU6.

In FY95, the installation began work on the Remedial Investigation and Feasibility Study (RI/FS) for OUs 5 and 6 and implemented Phase I of the Interim Remedial Action at OU8. The installation has completed decision documents for 66 sites, signed Records of Decision (ROD) for five of nine OUs, and signed two Interim RODs.

In FY96, the installation demonstrated nine technologies that will enhance and speed cleanup of heavily contaminated chemical pits. The installation continued working with the public to resolve concerns about landfills at OU1 and facilitate the completion of the FS. A ROD was signed for Chemical Pit 3 (OU2), and construction of a containment system began. Also in FY96, four UST sites were closed. Five additional decision documents were completed, as was the ROD for OU2. The installation also completed Remedial Design and Remedial Action (RD/RA) activities at OU7. In addition, the installation completed the design and implemented the RA for upgrading the horizontal drain system at Landfill 1. RI/FS activities continued at OU8 and were completed at OU6.

The installation formed a restoration advisory board (RAB) in FY94. In FY96, the installation surveyed RAB members to determine whether the RAB is meeting its objectives for community outreach and involvement. In FY95, installation staff met with representatives of state and federal regulatory agencies to develop an approach that has reduced duplication of investigations for CERCLA and RCRA sites. Under this approach, more than 200 areas of concern were evaluated and all but 9 closed in FY97.

FY97 Restoration Progress

A ROD was signed for OU6, and the RD phase for the OU began. Investigation activities at the Utah Test and Training Range (UTTR) continued, as did the evaluation and implementation of natural attenuation. More than 200 areas of concern in OU9 were investigated and closed, requiring no further action.

Innovative technologies, such as surfactant-enhanced removal of chlorinated solvents and steam-enhanced removal of dense nonaqueous phase liquids were used at the installation. In addition, hydropunch/geoprobe, real-time groundwater chemistry monitoring, and electromagnetic techniques accelerated fieldwork. Consolidation of treatment system operations and completion of investigations at unevaluated parts of the base under a single OU saved \$600,000 and reduced the time line by 2 years.

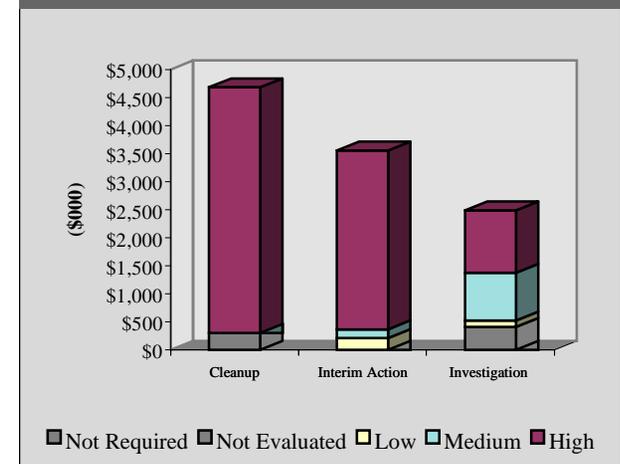
RAB meetings continued through FY97. RAB involvement in a review of the OU6 Proposed Plan provided an opportunity for early input into the groundwater collection approach. RAB comments were incorporated, reducing the estimated time to cleanup with only a marginal cost increase. The installation also implemented on-line document and design reviews with agencies to expedite document review.

Construction delays at OU2 and OU3 delayed completion of RAs for those OUs.

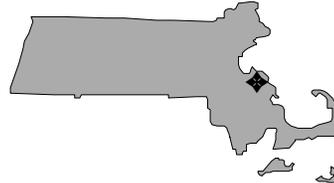
Plan of Action

- In FY98, complete construction of a hydraulic barrier wall and groundwater interceptor trench at OU2
- Complete all RD/RA activities at OU3 and move to long-term monitoring and operation and maintenance in FY98
- In FY98, implement a partnership approach to cleanup at the UTTR to avoid unnecessary investigations and studies
- Complete a risk-based corrective action approach for all remaining UST sites in FY98
- Continue partnering efforts with EPA Region 8 and the Utah Department of Environmental Quality in FY98

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 125 acres
Mission: Served as a Naval Ammunition Depot and Army Reserve Center
HRS Score: NA
IAG Status: None
Contaminants: Petroleum/oil/lubricants, heavy metals, VOCs, PCBs, and asbestos
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: \$1.1 million
Estimated Cost to Completion (Completion Year): \$0.4 million (FY1998)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY1998



Hingham, Massachusetts

Restoration Background

In July 1995, the BRAC Commission recommended closure of Hingham Annex, a sub installation of Fort Devens. The installation currently is inactive. Previous environmental studies had identified the following types of sites: underground storage tanks (UST), aboveground storage tank sites and spill sites, waste disposal areas, sewage filter beds, storage areas for polychlorinated biphenyl (PCB)-containing transformers, and areas with asbestos-containing materials (ACM). Environmental investigations have determined that groundwater and soil are contaminated with volatile organic compounds (VOC) and heavy metals.

Interim Actions at the installation include removal of USTs, aboveground storage tanks, an oil-water separator, and contaminated soil. Other Interim Actions are removal of contaminated soil from an area that held PCB-containing electrical transformers and removal of ACM (building insulation and roofing tiles). The Army also used an innovative technology, asphalt batching, to remediate contaminated soil.

In FY93, the Army formed a BRAC cleanup team (BCT) for all Fort Devens closure activities to help streamline the restoration process. Members of the BCT include representatives of the installation and the state regulatory agency. The installation has involved the community in the restoration process by holding public meetings, publishing newsletters and a brochure, and participating in televised interviews.

During FY95, a Phase II Screening Site Inspection (SSI) was completed, and a draft Human Health and Ecological Risk Assessment was prepared. The state regulatory agency allowed the installation to proceed with the removal of soil contaminated with

petroleum/oil/lubricants (POL), pending revision of the risk assessment.

In FY96, after considering an in situ process for remediating the POL-contaminated soil, the installation decided to remove the soil. A contract was awarded for studying the two areas identified in the FY95 SSI. The installation conducted an Environmental Baseline Survey (EBS), drafted an EBS report, and received and considered comments from the regulatory agencies. The BCT completed the BRAC Cleanup Plan (BCP), Version I. The installation continued to encourage public involvement in the restoration process, but public interest was insufficient to support formation of a restoration advisory board. The Army awarded contracts for additional field sampling to support a finding of no significant risk in revised Human Health Guidelines and to conduct Ecological Risk Assessments. Another contract was awarded for removing soil in which total petroleum hydrocarbons were present in concentrations above those established by regulatory limits. The installation also distributed a progress update newsletter to all residents within a 1-mile radius of the installation.

FY97 Restoration Progress

The final BCP was completed in FY97. Seven early actions, for asbestos removal, Building 25 AST, Building 25 Transformer Area, Waste Disposal Area, Building 54 Transformer Area, Building 90 AST and Building 90 PCB Transformer, were also completed. The installation conducted an unexploded ordnance (UXO) archives search to support a recommendation of no further action and prepared a report on the results. The installation performed release abatement measures (RAM) while conducting a Phase II Comprehensive Site Assessment (CSA) and an SSI.

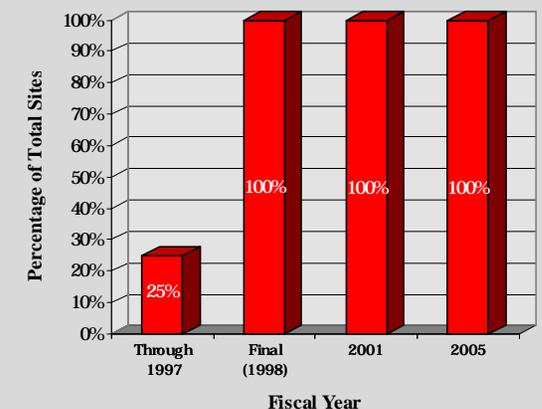
The installation began working on several projects and completed the fieldwork for several cleanup activities. These projects are currently awaiting review by regulatory agencies, the U.S. Army Corps of Engineers (USACE), or the U.S. Army Forces Command.

Some activities scheduled for completion in FY97 were delayed. Although the installation completed fieldwork for a Phase II CSA/SSI and an Environmental Assessment (EA), the Massachusetts Department of Environmental Protection has not completed its review of the Phase II CSA/SSI and the U.S. Army Forces Command has not finished reviewing the EA.

Plan of Action

- Complete a Human Health Risk Assessment in FY98
- Perform a NEPA survey and a Cultural and Natural Resources Investigation in FY98
- Remove contaminated soil from seven sites in FY98
- Perform Removal Actions at three POL-contaminated sites in FY98
- Propose acreage as CERFA-uncontaminated and receive concurrence from the appropriate regulatory agencies in FY98

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 2,940 acres
Mission: Housed the Strategic Air Command 19th and 379th Bomb Wings
HRS Score: 42.40; placed on NPL in August 1990
IAG Status: Federal Facility Agreement signed in March 1991
Contaminants: Heavy metals, VOCs, cyanide, pesticides, solvents, and PCBs
Media Affected: Groundwater and soil
Funding to Date: \$20.1 million
Estimated Cost to Completion (Completion Year): \$15.3 (FY2010)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2000



Homestead, Florida

Restoration Background

In July 1993, the BRAC Commission recommended that Homestead Air Force Base be realigned. The 31st Fighter Wing was inactivated, and all other operations except Air Force Reserve activities were relocated.

In FY86, a Preliminary Assessment and Site Inspection identified 26 sites in three major areas of concern: the fire training area, the residual pesticide disposal area, and the electroplating waste disposal area. Sites identified in previous investigations include the JP-4 jet fuel leak area, a landfill, a polychlorinated biphenyl (PCB) spill area, underground storage tanks (UST), aboveground storage tanks, and oil-water separators. Primary contaminants at the installation include heavy metals, volatile organic compounds (VOC), cyanide, pesticides, PCBs, and solvents. The contaminants have affected groundwater and soil in the area. Potential sources of contamination include more than 350 fuel storage tanks.

After experiencing hurricane damage in 1992, the installation completed an Environmental Baseline Survey (EBS) in FY94 that revealed more than 540 potentially contaminated sites. By FY95, 400 sites had been closed. In addition, over 1,000 acres were proposed as CERFA-clean. Approximately 2,052 acres are available for transfer, including the Airport Parcel.

Remedial Investigation and Feasibility Study activities began in FY87. Additional field investigations were conducted in FY92 and FY93. Interim Actions undertaken at the installation include removal of USTs and contaminated soil, groundwater extraction and treatment, and removal of oil-water separators.

By the end of FY95, the installation had completed the removal and disposal of 240 USTs, 99 aboveground storage tanks, and 142,000

cubic yards of petroleum-contaminated soil. A Removal Action for soil contaminated with lead at the fire training area in OU8 also was completed. From FY95 to the end of FY96, the installation conducted Interim Remedial Actions using hot-spot removal methodologies, voluntary maintenance, and housekeeping actions at 13 sites.

The BRAC cleanup team (BCT) holds monthly review meetings and weekly conference calls. The restoration advisory board (RAB), which was formed in FY94 and chartered in FY96, expanded to include community groups by forming the Homestead Technical Committee. The RAB, which meets bimonthly, addresses the specific concerns of members and has enabled the installation to work more closely with community groups and other government agencies. The installation and EPA have held a joint training session for RAB members on the Relative Risk Site Evaluation process.

In FY96, remaining sites identified in the FY94 EBS were consolidated into 30 OUs and 5 major fuel areas. Significant progress was made in remediating the 15 remaining sites where petroleum contamination is present, investigating 31 CERCLA sites, and removing the remaining USTs and aboveground storage tanks. The installation also transferred a 40-acre parcel of property to the U.S. Department of Labor. The cleanup of a significant portion of Parcel 6 allowed 84 acres to be transferred by deed to a local agency (the Homeless Trust).

FY97 Restoration Progress

The installation updated the cleanup schedule to coordinate activities with the U.S. Army Corps of Engineers and the Air Force Center for Environmental Excellence. The Air Force Base Conservation Agency

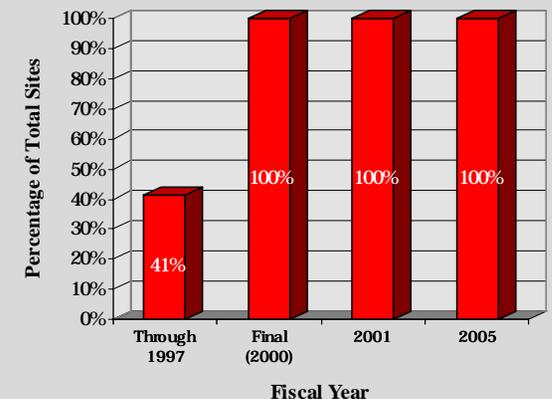
also completed Removal Actions at seven OUs. By the end of FY97, the installation will update its BRAC Cleanup Plan (BCP).

Community partnering continued through RAB efforts and regularly scheduled meetings. The BCT has implemented on-board reviews to expedite document review and site characterization.

Plan of Action

- Transfer approximately 214 acres on the northernmost portion of the facility to the U.S. Department of the Interior in FY98
- Continue all Remedial Actions so that all reuse land parcels can be transferred by FY00
- Through FY98, continue BCT on-board reviews of documents to expedite decision-making
- In FY98, implement training of RAB members to foster partnerships with other regulatory agencies

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 936 acres, including 493 acres on land and 443 acres submerged

Mission: Repaired and maintained ships

HRS Score: 48.77; placed on NPL in November 1989

IAG Status: Federal Facility Agreement signed in September 1990 and revised in January 1992

Contaminants: Heavy metals, PCBs, petroleum hydrocarbons, VOCs, and SVOCs

Media Affected: Groundwater, surface water, sediment, and soil

Funding to Date: \$118.6 million

Estimated Cost to Completion (Completion Year): \$283.8 million (FY2005)

Final Remedy in Place or Response Complete Date for BRAC Sites: FY2005



San Francisco, California

Restoration Background

In July 1991, the BRAC Commission recommended closure of this installation. The station ceased operations on April 1, 1994, is in caretaker status, and is the responsibility of the Naval Facilities Engineering Command's Engineering Field Activity West. Parts of the installation have been leased to private parties.

The installation revised its approach to investigating and remediating sites and divided the property into six geographic areas, Parcels A through F, to facilitate studies, cleanup, and transfer of the property. Environmental studies identified 78 CERCLA sites. Site types include landfills and land disposal areas containing primarily heavy metals and volatile organic compounds (VOC), which are affecting groundwater, surface water, sediment, and soil.

The installation has removed contaminated soil from Sites 1, 2, 4, 6, 8, and 11. No further action was recommended for 14 sites. In FY91 and FY93, 36 underground storage tanks (UST) were removed and 10 were closed in place. The installation successfully demonstrated an innovative technology for recycling sand-blasting grit that contained low levels of copper and lead generated by ship cleaning operations. A full-scale demonstration was completed in FY93, allowing the Navy to use the technology at other installations. A three-phase Ecological Risk Assessment is under way at the installation. The first phase has been completed.

In FY95, the installation completed the land reuse plan and the Remedial Investigation and Feasibility Study (RI/FS) for Parcel A. The installation also began removing equipment, sunken baths, aboveground structures, foundations, and contaminated soil from Site 9.

A BRAC cleanup team (BCT), formed in FY94, has helped improve communication and build partnerships among the installation, EPA, and the state. The BCT also has expedited cleanup; for example, small areas of contamination now can be excavated during investigation, eliminating the need to return to the site. The installation prepared its BRAC Cleanup Plan (BCP) in FY94 and updates it regularly.

The installation prepared a community relations plan (CRP) in FY89. The technical review committee was converted to a 33-member restoration advisory board (RAB) in FY94. The RAB meets monthly. In FY95, the installation renegotiated the schedule set forth in the Federal Facility Agreement (FFA) to include schedules for Parcels A through F.

In FY96, the installation completed the basewide Environmental Baseline Survey (EBS) and continued revising the CRP. A Record of Decision (ROD) for no further action was signed for Parcel A. The installation initiated Removal Actions at Parcels B, C, D, and E while considering a groundwater pump-and-treat system for a contaminated plume and excavation and disposal for an exploratory excavation site.

FY97 Restoration Progress

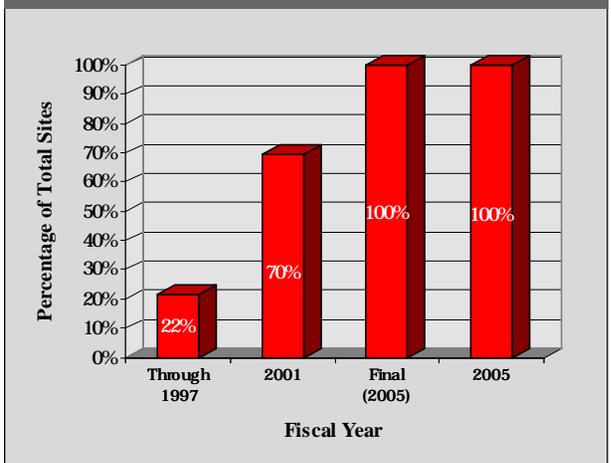
The revised CRP and the latest BCP were completed. Early actions for Sites 1, 3, 6, 9, 50, and 57 were completed at the installation. FFA schedules were renegotiated to accommodate budget shortfalls and to facilitate technical solutions. For expediting fieldwork, the installation used field variances and technical scopes. The installation also continued to support the RAB and held an open house with site tours.

Some activities scheduled for completion in FY97 were delayed because of funding restrictions.

Plan of Action

- Sign RODs and begin and complete the Remedial Designs for Parcels B and D in FY98
- Complete the RI/FS for Parcel C and sign the ROD in FY98
- Update basewide EBS in FY98
- Complete all Removal Actions at Parcels B, C, D, and E in FY98
- In FY98, complete Engineering Evaluation and Cost Analysis and an Action Memorandum and begin fieldwork for Site 3
- In FY98, complete formal agreement with San Francisco to transfer Parcel A and execute lease in furtherance of conveyance
- Complete the RI/FS for Parcel E in FY98 and sign the ROD in FY99
- Install a landfill cover in FY03

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 3,423 acres (923 acres at Stump Neck Annex)
Mission: Conduct research, development, and production of rocket and torpedo propellants and explosives
HRS Score: 50.00; placed on NPL in February 1995
IAG Status: None
Contaminants: Waste propellants, explosives, acids, paints, solvents, heavy metals, low-level radioactive material, and industrial wastewater
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: \$7.8 million
Estimated Cost to Completion (Completion Year): \$53.8 million (FY2013)
Final Remedy in Place or Response Complete Date: FY2012



Indian Head, Maryland

Restoration Background

This installation produces and handles complex chemicals to accomplish its mission. The main facility covers about 2,500 acres. The acreage at the Stump Neck Annex was not included in the National Priorities List (NPL) listing. Lead, silver, and mercury are the primary contaminants of concern.

A Preliminary Assessment (PA) completed in FY83 identified 29 potential CERCLA sites. Three of the sites were recommended for further study on the basis of available historical information. A supplemental PA prepared in FY92 identified an additional 17 potential sites, bringing the total number to 46. Two of those sites were recommended for no further study. The installation has conducted Site Inspections at 32 sites. Two additional sites were identified in FY94, bringing the total number of sites to 48.

The installation has completed Removal Actions at the X-Ray Building site and the Building 766 site. Soil at the X-Ray Building is contaminated with silver. To prevent further migration of contaminants, the contaminated soil in two swales was remediated. Soil at Building 766 is contaminated with mercury. A Site Characterization Report and an Engineering Evaluation and Cost Analysis for the Removal Action were completed. A weir was installed at the discharge point of a pond to prevent migration of mercury farther downstream. A Removal Action is under way to remove lead-contaminated soil at Site 56 (Building 790).

In FY91, the U.S. Fish and Wildlife Service completed a study of mercury levels in fish from Mattawoman Creek, which receives runoff from a large part of the facility. The study concluded that the concentration of mercury in fish at the installation was comparable to typical concentrations found in fish throughout Maryland.

In FY95, the installation completed the Removal Action at the X-Ray Building site and published the Removal Action report. The installation also completed the Removal Action to excavate mercury-contaminated soil at the Building 766 site. Biomonitoring conducted in the downstream pond indicated that the mercury had no adverse effect on fish. The installation also is conducting a Removal Action to remove trichloroethene (TCE) and treat TCE-contaminated groundwater at Site 57 (Building 292).

The installation formed a technical review committee in FY93 and converted it to a restoration advisory board (RAB) in FY95. The community is actively involved in the 14-member RAB, which meets quarterly. The installation has prepared a community relations plan and established an information repository at a nearby library.

During FY96, the installation hosted the RAB meetings and a tour of the Site 56 Removal Action. The installation also initiated Remedial Investigation/Feasibility Study (RI/FS) activities for 14 sites, completed fieldwork for the removal of lead-contaminated soil at Site 56, initiated project closeout reports to conclude the Site 56 Removal Action, and continued to treat TCE-contaminated groundwater at Site 57.

FY97 Restoration Progress

Innovative technologies and fieldwork techniques were implemented, including soil vapor extraction and a geoprobe. The installation is planning to use the geoprobe to collect groundwater samples and is planning to use a magnetometer to delineate the extent of the landfill at Site 12 during the RI.

Work groups have been established for document review to ensure that all issues and solutions are understood and agreed to by all

parties. Effective communication with regulators was maintained through regular contact and discussions of issues.

Plan of Action

- Continue the Interim Remedial Action for treating contaminated groundwater at Site 57 in FY98
- Initiate the RI/FS at Site 57 in FY98
- Establish partnerships with Maryland Department of Environment, EPA, and the Navy in FY98
- Complete RI/FS activities for 14 sites in FY99
- Perform bioremediation of Site 57 by FY01
- Use presumptive remedies for a municipal landfill and volatile organic compounds in soil by FY01-FY02

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 163 acres
Mission: Conduct research, development, engineering, and limited manufacturing of aviation electronics and of missile, space-borne, undersea, and surface weapons systems, and related equipment
HRS Score: NA
IAG Status: None
Contaminants: Solvents, degreasers, alcohol, chemical laboratory waste, pesticides, wastewater, heavy metals, acids, petroleum/oil/lubricants, and VOCs
Media Affected: Groundwater and soil
Funding to Date: \$0.4 million
Estimated Cost to Completion (Completion Year): \$1.8 million (FY2003)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY1999



Indianapolis, Indiana

Restoration Background

Indianapolis Naval Air Warfare Center, Aircraft Division (NAWCAD) was commissioned in 1942 as a Naval ordnance plant. In later years, its mission was redefined to add space, undersea, and surface weapons. Typical operations conducted at the facility in support of this mission included machining; electroplating; degreasing of metal parts; carpentry; painting; operation of photographic laboratories; testing and evaluation; destruction of documents; and storage of supplies, materials, and fuels.

In July 1995, the BRAC Commission recommended closure of NAWCAD. Various functions, along with personnel, equipment, and related support, are to be relocated, primarily to three Naval activities: Naval Surface Warfare Center, Crane, Indiana; NAWCAD, Patuxent River, Maryland; and Naval Air Warfare Center, Weapons Division, China Lake, California. The closure of this major technical center and the relocation of its principal functions reduces excess capacity, while raising aggregate military value.

The installation completed a Preliminary Assessment in FY88. In FY90, two underground storage tank (UST) sites were identified. In FY92, Site Assessments were completed at the two sites, and both were designated Response Complete. In FY96, the installation delineated Site 1 and began a Remedial Investigation and Feasibility Study (RI/FS). In addition, 18 areas of concern (AOC) were identified, and sampling began. In FY95, the installation initiated an Environmental Baseline Survey (EBS).

The installation's BRAC cleanup team (BCT) was established in FY96. A restoration advisory board (RAB) was also established and met monthly. The installation established an information repository and worked with the RAB during FY96 to complete a community relations plan.

In FY96, the NAWC Indianapolis Reuse Planning Authority (NAWC-RPA) was established and completed a preliminary privatizing business plan. The Navy signed a lease with the city of Indianapolis during FY96 and completed the transfer of operations to a private entity in FY97.

During FY96, fieldwork for the EBS was completed. The final EBS report identified 38 AOCs that required further investigation. The 38 AOCs were consolidated into 18 AOCs and 16 UST sites (compliance). The installation began the RI/FS at Site 1 and undertook sampling at the 18 AOCs.

FY97 Restoration Progress

The RI/FS for Site 1 and the initial investigation of 18 AOCs were completed. The Remedial Design (RD) at Site 1 and the tank removal were initiated. A draft baseline Human Health and Ecological Risk assessment and the BRAC Cleanup Plan were completed. Use of portable gas chromatography, direct push sample collection, and immunoassay test kits helped accelerate fieldwork.

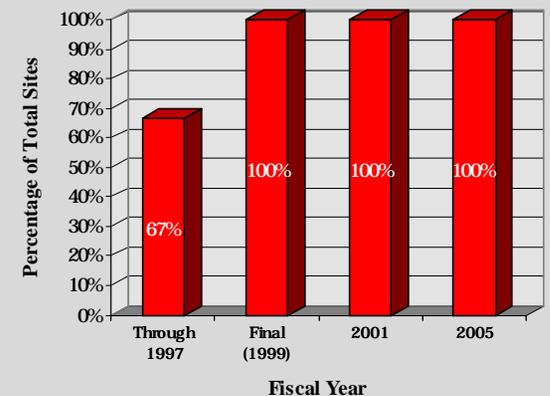
The closure of the Hazardous Waste Transfer Facility was completed in June 1997. Partnering meetings including regulators, site contractors, and Navy and facility representatives were held to review analytical data and develop conclusions and direction for document review. A RAB was formed, which participated in risk assessment training for RAB members, review of technical documents, and facility tours.

Plans to use in situ soil treatment by oxidation have been developed, and use of data quality objectives continued. The BCT has implemented an environmental justice program for minority and disadvantaged citizens who live in the NAWC vicinity.

Plan of Action

- Transfer property in FY98
- Complete RD and begin Remedial Action (RA) at Site 1 in FY98
- Complete RD and begin RA at some or all of the 18 AOCs in FY98
- Complete final baseline Human Health and Ecological Risk Assessment in FY98

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 19,127 acres
Mission: Load, assemble, and pack munitions
HRS Score: 29.73; placed on NPL in August 1990
IAG Status: IAG signed in December 1990
Contaminants: Explosives, heavy metals, and VOCs
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: \$35.8 million
Estimated Cost to Completion (Completion Year): \$101.5 million (FY2005)
Final Remedy in Place or Response Complete Date: FY2005



Middletown, Iowa

Restoration Background

In 1941, the Army constructed the Iowa Army Ammunition Plant to load, assemble, and pack various conventional ammunition and fusing systems. During operations, industrial process wastewaters and by-products were disposed of at the installation. Site types include surface impoundments, production areas, landfills, and a fire training pit. Soil and groundwater contamination resulted primarily from disposal of explosives and heavy metal-containing wastes directly on soil. The installation also identified minor amounts of contamination by volatile organic compounds (VOC).

Environmental studies, beginning in the early 1980s, identified 40 restoration sites. Of the 40 sites, 33 required further study. In FY92, Remedial Investigation and Feasibility Study (RI/FS) activities began. In FY96, the installation completed its RIs.

Restoration activities through FY96 included closing one cell in the inert landfill, removing aboveground treatment tanks, removing lead-contaminated soil from a production line, and cleaning up an abandoned coal storage yard. The installation, in coordination with the local public water utility, funded a project connecting local residences to a public water supply. More recent restoration activities involved excavation and off-site incineration of pesticide-contaminated soil and excavation of explosives-contaminated sumps. The installation created three operable units (OU)—a soil OU, an interim soil OU, and a groundwater OU—to better manage the restoration efforts.

In FY96, the installation submitted the final revised RI Report to EPA Region 7 and began excavation of explosives-contaminated soil from the two surface impoundments. At the inert landfill, the installation constructed a new RCRA cell; however, capping did not occur, because surface impoundment material and solid waste management

unit (SWMU) material are still being placed in the landfill. The installation also consolidated the remaining RI/FS sites into more manageable OUs, including a Soil OU and a Groundwater OU.

FY97 Restoration Progress

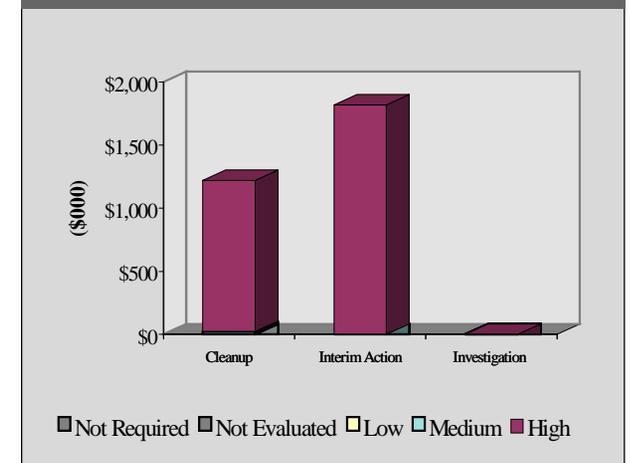
The Army removed over 80,000 cubic yards of contaminated soil from the former Line 1 impoundment area and the Line 800 lagoon. It created wetlands and began phytoremediation to clean residual contamination. The removed soil was placed in different locations at the inert landfill according to level of contamination. The inert landfill is undergoing closure action. The installation is holding the most highly contaminated soil in a designated corrective action management unit until it determines the most effective method of treatment. The Army continued its demonstration of aerobic and anaerobic bioslurry techniques at the installation. Other methods of remediating explosives-contaminated soil are also being reviewed and demonstrated at the installation through cooperative efforts of the Army, EPA, the University of Iowa, the U.S. Fish and Wildlife Service, and private entities.

The installation has been increasing community awareness through meetings and slide presentations with the installation's restoration advisory board (RAB), the public, and the news media. Monthly project management team meetings are held with EPA Region 7, the U.S. Army Corps of Engineers, and the Army Environmental Center.

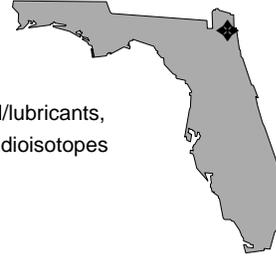
Plan of Action

- Complete a Record of Decision (ROD) to address groundwater remediation, complete interim soil ROD, and partially cap inert landfill by FY98
- Complete a ROD to address soil remediation by FY98, pending selection of innovative technology
- Cap the RCRA landfill in FY98
- Conduct cleanup of various small sites in FY99

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size:	3,820 acres
Mission:	Maintain and operate facilities; provide services and materials to support aviation activities and aircraft overhaul operations
HRS Score:	31.02; placed on NPL in November 1989
IAG Status:	Federal Facility Agreement signed in October 1989
Contaminants:	Waste solvents, acids and caustics, cyanide, heavy metals, petroleum/oil/lubricants, low-level radioactive wastes, oil, paint, PCBs, pesticides, phenols, and radioisotopes
Media Affected:	Groundwater, surface water, sediment, and soil
Funding to Date:	\$54.2 million
Estimated Cost to Completion (Completion Year):	\$71.7 million (FY2016)
Final Remedy in Place or Response Complete Date:	FY2014



Jacksonville, Florida

Restoration Background

Jacksonville Naval Air Station includes the following site types: fire training areas, waste storage and disposal areas, transformer storage areas, radioactive-waste disposal areas, and other miscellaneous support and maintenance areas. Typical operations have generated solvents, sludge (from on-site treatment plants), and low-level radioactive waste, which have migrated into nearby soil and local groundwater supplies.

There are 47 CERCLA sites, 16 underground storage tank (UST) sites, and 3 RCRA solid waste management units (SWMU) at the installation. The installation has completed Preliminary Assessments (PA) for 40 sites and Site Inspections (SI) for 42 sites. Currently, 15 sites have proceeded to the Remedial Investigation and Feasibility Study (RI/FS) phase.

To expedite the cleanup process, three operable units (OU) were defined. OU1 consists of two disposal pits, OU2 consists of six sites known as the Wastewater Treatment Plant Area, and OU3 consists of six sites known as the Industrial Area.

During three Interim Remedial Actions (IRA) in FY94, the installation erected fences at five sites and removed soil from one. A Record of Decision (ROD) has been signed for two sites. An Interim ROD was signed for one site in FY95.

To facilitate cleanup, the installation developed a Remedial Response Decision System (RRDS), which establishes guidelines and criteria for evaluating existing site data and proposing remedial response activities. The installation has developed partnerships with EPA, the Florida Department of Environmental Protection, contractors, and the Naval Facilities Engineering Command to accelerate the cleanup

process. Better communication among team members has reduced the time required to review documents and plan activities.

The installation formed its technical review committee in FY88 and converted it to a restoration advisory board (RAB) in FY95. The RAB meets monthly. In FY91, the installation completed its community relations plan and established an administrative record and an information repository. The installation also has published and distributed 17 fact sheets.

During FY96, the installation continued RI/FS activities at six sites and completed two IRAs. It completed PA/SIs for three sites, RI/FSs for two sites, and Engineering Evaluation and Cost Analyses (EE/CA) for six sites. During FY96, the installation also completed the design and implementation for UST 1. The deep plume at UST 1 received a designation of no-further-action and a Site Assessment, two closure action plans, and an Interim Remedial Action (IRA) were completed for UST sites. For two UST sites, monitoring-only plans were approved during FY96, and corrective measures implementation (CMI) was completed at one SWMU site. Five IRAs were initiated in FY96.

FY97 Restoration Progress

The installation completed the Remedial Design and Remedial Action (RA) for OU1. The corrective action and the IRA for UST 1 were completed, and a monitoring-only plan was implemented at UST 10. IRAs for Site 18 and SWMU 2 were completed. The long-term monitoring (LTM) was initiated for SWMU 2 as well.

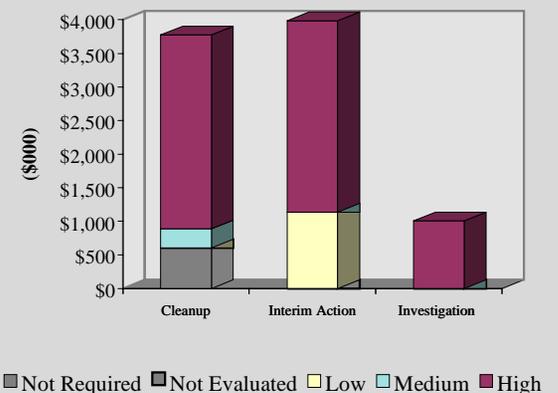
The RAB continued to meet monthly and to receive input and information from the Navy. The RAB also received monthly training. The Naval Air Station Jacksonville partnering team continued to work together to meet station cleanup goals.

Some activities scheduled for completion in FY97 were delayed because other projects prevented compliance with accelerated review cycles.

Plan of Action

- Conduct a Baseline Risk Assessment and complete RI/FS activities for OU2 in FY98
- Begin LTM at UST 1 in FY98
- Complete RI/FS at six sites and continue RI/FSs at six other sites in early FY98
- Complete one PA/SI, one IRA, and two RAs in FY98
- Continue six RI/FSs in FY98
- Complete one corrective action plan and one corrective action in FY98
- Complete the CMI and IRA for SWMU 1 in FY98

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 55,270 acres
Mission: Perform production acceptance testing of ammunition, weapons, and their components
HRS Score: NA
IAG Status: None
Contaminants: Solvents, petroleum products, VOCs, PCBs, heavy metals, depleted uranium, and UXO
Media Affected: Groundwater and soil
Funding to Date: \$18.5 million
Estimated Cost to Completion (Completion Year): \$22.3 million (FY2021)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2002



Madison, Indiana

Restoration Background

In December 1988, the BRAC Commission recommended closure of the Jefferson Proving Ground in Madison, Indiana, and relocation of the installation's mission to Yuma Proving Ground in Arizona. The installation was closed on September 30, 1995.

Sites identified during environmental studies included landfill and disposal areas, hazardous waste storage areas, fire training areas, underground storage tanks (UST), and buildings with asbestos-containing materials. Contaminants present at the installation include depleted uranium, heavy metals, unexploded ordnance (UXO), solvents, polychlorinated biphenyls (PCB), volatile organic compounds (VOC), and petroleum hydrocarbons. Interim Actions include installation of a landfill cap, removal of USTs, and excavation of contaminated soil.

In FY94, the installation submitted the draft Phase I Remedial Investigation (RI) Report for sites south of the firing line. In response, the regulatory agencies requested additional studies to further characterize contaminants at those sites. Phase II RI data collection began in FY96 and continued into FY97.

In FY94, a finding of suitability to lease (FOSL) report and a finding of suitability to transfer (FOST) report were prepared for two portions of the installation's property. The Army also conducted a field demonstration in which innovative technologies were used to locate mock ordnance items in subsurface soil. Two additional FOST reports were completed in FY96.

Interim Actions conducted at the installation during FY95 included removal of 18 USTs, treatment of contaminated soil in Bioremediation Cell No. 1, and construction of a landfill cap at Gate No. 19. Also in FY95, the installation surveyed and decontaminated depleted uranium

support facilities and began work plans for Interim Remedial Actions (IRA) at 10 sites in the south area.

The installation prepared a technical memorandum for approximately 23 sites. The restoration advisory board (RAB) expanded its membership by adding representatives of the Nuclear Regulatory Commission, the U.S. Fish and Wildlife Service, the Indiana Department of Health, the Madison Industrial Development Corporation, environmental contractors, and public interest groups. A Local Redevelopment Authority replaced the existing Redevelopment Board and worked to implement the land reuse plan.

In FY96, the installation submitted IRA work plans for 10 sites to the regulatory agencies and began cleanup activities. Phase II RI activities continued, and Phase II field sampling began. The Army completed the UXO survey work plan and began the UXO survey. The installation initiated long-term monitoring of the landfill at Gate No. 19. The Army leased approximately 3,400 acres of the containment area in "furtherance of conveyance," which will allow formal transfer within 5 years. In addition, 1.2 acres were transferred under a no-cost public conveyance.

FY97 Restoration Progress

The Army completed FOST and FOSL reports for portions of the installation, in conjunction with the Record of Decision. The installation also initiated a facilitated partnership with regulators while enhancing community outreach with an updated community relations plan. Ten early actions were initiated. The installation held six RAB meetings, including a congressionally attended town hall meeting.

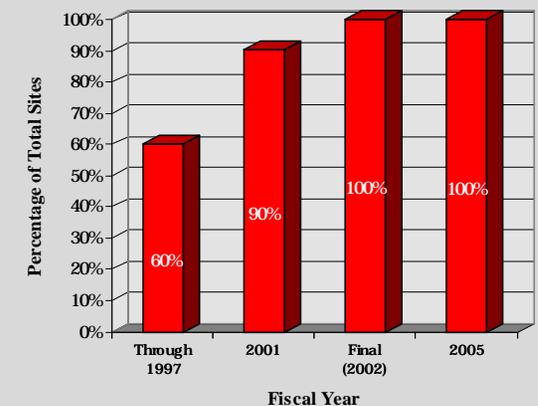
Delays in regulatory review, the need for additional fieldwork, and the need to resolve regulatory comments delayed completion of the

first four items in the current Plan of Action, which originally were scheduled for completion in FY97.

Plan of Action

- In FY98, complete and submit the Phase II RI Report to the regulatory agencies for review
- Complete technical memorandums to eliminate sites from the RI in FY98
- Complete a work plan in FY98 for intrinsic bioremediation (natural attenuation) at solvent sites and submit the plan to the regulatory agencies for review
- Complete Ecological Risk Assessment field studies in FY98
- Form partnerships with Nuclear Regulatory Commission, U.S. Fish and Wildlife Service, and Indiana Department of Natural Resources in FY98
- Obtain regulatory concurrence for closure of open burning unit in FY98
- Complete Relative Risk Site Evaluations for the remaining 10 sites by FY00
- Complete all BRAC activities by FY20

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 176 acres
Mission: Conduct research and develop aeronautics, rocketry, and space exploration technology
HRS Score: 50.00; placed on NPL in October 1992
IAG Status: IAG between NASA and EPA signed in 1992
Contaminants: VOCs and various inorganic chemicals
Media Affected: Groundwater
Funding to Date: \$0.6 million
Estimated Cost to Completion (Completion Year): \$0.3 million (NA)
Final Remedy In Place or Response Complete Date: NA



Pasadena, California

- Issue Record of Decision stipulating selection of appropriate environmental restoration alternatives upon completion of the RI/FS in FY99

Restoration Background

In 1980, samples from drinking water wells of the city of Pasadena were found to be contaminated with volatile organic compounds (VOC), including trichloroethane (TCA), trichloroethene (TCE), and tetrachloroethene (PCE). NASA and the California Institute of Technology Jet Propulsion Laboratory initiated an environmental study to determine whether the Jet Propulsion Laboratory was a potential source of the contaminants. A Preliminary Assessment and a Site Inspection were conducted, and an Expanded Site Inspection was completed in FY90.

On December 10, 1993, the Omaha District of the U.S. Army Corps of Engineers (USACE) proposed an Interim Settlement Agreement to NASA and the California Institute of Technology Jet Propulsion Laboratory for DoD participation in funding environmental restoration activities.

For study and cleanup, the laboratory site was divided into three operable units (OU): on-site groundwater contamination (OU1), on-site contamination sources (OU2), and off-site groundwater contamination (OU3). In addition, the installation identified eight waste disposal areas. NASA prepared and submitted a Remedial Investigation and Feasibility Study (RI/FS) work plan to EPA for approval. NASA is the lead agency for the RI.

In FY94, RI/FS activities began with the installation of groundwater monitoring wells at OU1. RI fieldwork at OU3 also was initiated. RI/FS activities continued during FY95 with a second sampling round for on-site soil vapor extraction wells.

In FY95, an Interim Remedial Action (IRA) was implemented. The IRA involved installation of a groundwater treatment system for

contaminated municipal wells. In the third quarter of FY95, five off-site groundwater monitoring wells were installed, and one round of groundwater samples was collected.

Early in FY96, NASA conducted a second round of groundwater sampling at five off-site monitoring wells. Three additional monitoring wells were installed to determine the direction of groundwater migration beneath the installation. Four soil-gas probes also were installed to determine the extent of vertical migration of contamination. NASA completed all off-site drilling at the installation.

FY97 Restoration Progress

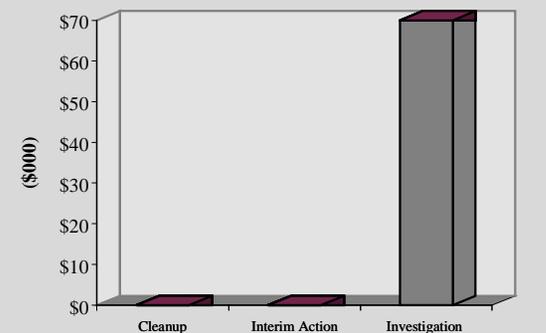
USACE conducted off-site quarterly well sampling and monitoring. Risk assessment analysis was developed. USACE also completed the on-site RI and began the FS in FY97. Pilot treatment plants for VOCs and perchlorates were implemented and may result in Interim Actions.

Some activities scheduled for completion in FY97 were delayed because of the discovery of an additional contaminant of concern, perchlorates, which previously could not be detected.

Plan of Action

- Continue conducting off-site quarterly well sampling and monitoring in FY98
- Complete developing the risk assessment in FY99
- Complete the FS in FY99
- By FY00, determine DoD's liability upon receipt of NASA's response to the proposed Interim Settlement Agreement of December 10, 1993, which is under review by NASA

FY98 FUNDING BY PHASE AND RELATIVE RISK



Not Required
 Not Evaluated
 Low
 Medium
 High

Size: 23,544 acres
Mission: Manufacture, load, assemble, and pack munitions and explosives
HRS Score: 35.23 (Loading, Assembling, and Packing Area); placed on NPL in March 1989
 32.08 (Manufacturing Area); placed on NPL in July 1987
IAG Status: IAG signed in June 1989
Contaminants: Explosives, heavy metals, VOCs, and PCBs
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: \$22.0 million
Estimated Cost to Completion (Completion Year): \$177.1 million (FY2033)
Final Remedy in Place or Response Complete Date: FY2004



Wilmington, Illinois

Restoration Background

The Army constructed Joliet Army Ammunition Plant (JOAAP) in the early 1940s. It served as one of the largest munitions and explosives manufacturers in the Midwest. Installation operations included manufacturing of explosives and loading, assembling, and packing (LAP) of munitions for shipment. The 14,385-acre LAP Area and the 9,159-acre Manufacturing Area have been placed on the National Priorities List (NPL).

Environmental studies conducted in FY88 identified 53 sites, including 35 in the LAP Area and 18 in the Manufacturing Area. Prominent site types in the two areas include ash piles, landfills, open burning and open detonation areas, and surface impoundments. The installation consolidated all sites into two operable units, one that addresses groundwater contamination and another for contamination of soil and sediment.

During an FY85 Interim Remedial Action (IRA), the Army removed more than 7 million gallons of explosives-contaminated water from the Red Water Lagoon. After disposing of the water off site, the Army dredged the lagoon, removed the sludge and liner and covered the entire area with a clay cap. IRA activities in FY93 included capping two ash piles. In FY94, a Phase II Remedial Investigation (RI) was completed for the Manufacturing Area and approved by the regulatory agencies.

In FY95, the Army completed the initial phase of a bioslurry reactor demonstration. For follow-up technology demonstrations, the Army began an informal partnership with a commercial company to exchange information about process enhancements. In the same year, a field screening effort was initiated to gather data to more accurately estimate the volume of explosives-contaminated soil. Tufts University and Argonne National Laboratory executed an adaptive sampling

demonstration for that effort. The installation also completed the Phase II RI for the LAP Area and this was approved by regulatory agencies.

In FY94, the Joliet Arsenal Citizen Planning Commission developed and approved a future land use plan for the installation. The plan identifies reuse initiatives and future owners of the site. A bill to implement the plan was submitted and was approved by Congress.

In FY95, the installation formed a restoration advisory board (RAB). The RAB has 20 members, who represent the area within a 250 mile radius of the installation.

In FY96, the RAB prepared a charter and elected officers. The Army completed an environmental screening of 15,000 acres to be transferred to the Forest Service, U.S. Department of Agriculture. A 982-acre parcel was transferred to the Department of Veterans Affairs.

The Army completed its bioslurry reactor demonstration. Regulatory agency approval was granted for the land application of the treated material. The installation set preliminary remediation goals for contaminated sites and received regulatory agency approval of those goals.

The installation conducted two significant Removal Actions: removal of more than 1,000 exterior-mounted, oil-filled electrical switches that contained polychlorinated biphenyls (PCB) and removal of 3 oil pits from the explosives burning ground. Some of the oils collected in the pits contained PCBs and had caused PCB contamination of the site. During FY96, the installation removed petroleum- and PCB-contaminated soil from Site L6 and cleared the ground for transfer to future owners.

FY97 Restoration Progress

JOAAP provided a host site for USAWES for a field trial of explosives and metal probes for the Site Characterization and Analysis Penetrometer System (SCAPS) unit. Also, the Army completed Feasibility Studies (FS) at all active study sites for the Manufacturing and LAP Areas.

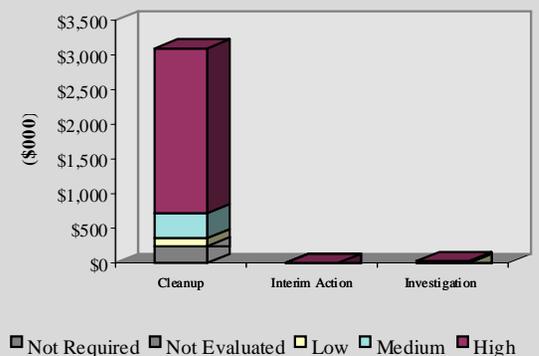
The RAB participated in the 97 Work Prioritization and remedy selection for the Removal Action for Site L6; hosted a media tour; and received specialized training on risk assessment, risk management, and risk communication.

Partnering efforts included cooperating with EPA and USAWES on a groundwater natural attenuation/phytoremediation study and inclusion of state and federal remedial project managers in review of internal draft reports

Plan of Action

- Complete Proposed Plans and Record of Decision documents for all sites in FY98
- Transfer approximately 2,000 acres to the state of Illinois for industrial development and 455 acres to Will County for use as a landfill in FY98
- Identify additional land that is environmentally suitable for transfer in FY98
- Conduct competitive biotechnology demonstration in FY98 to select bioremediation process
- Initiate remedial actions for all sites in FY99

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 5,215 acres
Mission: Conducted long-range bombardment and air refueling operations
HRS Score: NA
IAG Status: None
Contaminants: Petroleum, pesticides, heavy metals, and solvents
Media Affected: Groundwater and soil
Funding to Date: \$36.0 million
Estimated Cost to Completion (Completion Year): \$23.6 million (FY2012)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY1999



Marquette, Michigan

Restoration Background

In July 1993, the BRAC Commission recommended closure of K.I. Sawyer Air Force Base, inactivation of the 410th Wing, and transfer of the base's B-52H aircraft to Barksdale Air Force Base, Louisiana. In FY95, the installation officially closed.

Environmental studies have been ongoing at the installation since FY84. Sites include landfills, fire training areas, underground storage tanks (UST), aboveground storage tank spill sites, drainage pits, and a drainage pond. Petroleum hydrocarbons, trichloroethene (TCE), tetrachloroethene, vinyl chloride, 4-methyl phenol, and heavy metals are the primary contaminants affecting soil and groundwater.

Interim Remedial Actions (IRA) conducted at the installation include removal and replacement of USTs; removal and cleanup of contaminated soil; installation of 14 groundwater extraction wells; construction of a groundwater treatment plant, which treats 1.5 million gallons of groundwater daily; and initiation of a fuel recovery system. In addition, an IRA was completed at a petroleum/oil/lubricant (POL) storage area to remove JP-4 jet fuel from groundwater, and pilot-scale bioventing systems were installed in the fire training area and the POL area.

The installation has completed Remedial Investigations (RI) at six sites and Feasibility Studies at four sites. The installation developed a basewide groundwater monitoring plan and RCRA closure plans for the Explosive Ordnance Disposal (EOD) Range and the Hazardous Waste Interim Storage Facility.

The installation completed its Environmental Baseline Survey in FY94. It identified approximately 393 acres as CERFA-clean and received regulatory concurrence on the designations. In FY95, the Local Redevelopment Authority submitted a reuse plan and began

working with the Michigan Jobs Commission to coordinate the transfer of property at the installation to civilian use. In addition, the installation began leasing property and completed a redevelopment plan.

A restoration advisory board (RAB) was formed in FY94. The installation's BRAC cleanup team (BCT) schedules meetings immediately before RAB meetings, thereby facilitating communication between the two groups.

In FY96, the installation conducted fieldwork for an RI at one site and fieldwork for focused RIs at five sites. The first comprehensive RI for the basewide groundwater monitoring program was completed. Fieldwork for the RI and Remedial Action (RA) projects was completed at 16 areas of concern (AOC) and is ongoing at 91 additional areas.

The Central Heating Plant fuel supply system, which included two large aboveground storage tanks, was removed. Five large aboveground tanks were removed from the POL Yard, as was the aircraft hydrant refueling system, which consisted of 20 large USTs and distribution plumbing. Closure under RCRA was completed at one Battery Lime Pit, and corrective measures were completed at two Interim Status Hazardous Waste Storage Facilities. The EOD Range and a Grenade Range were cleared of ordnance residues, and two oil-water separators and 22 USTs were removed from the ranges. RA plans and Environmental Assessments were developed for four sites, and decision documents were completed for two fuel release sites. Closure under RCRA was conducted for Building 744 and the Defense Reutilization and Marketing Office (DRMO).

FY97 Restoration Progress

Investigation and cleanup of AOCs and two spill sites took place in FY97. The installation continued to remove USTs, oil-water separators, and aboveground storage tanks. In addition, the second round of the basewide groundwater monitoring program was completed along with the RA to cap Landfill 4. Geoprobes were used to take groundwater samples and measure groundwater elevation at Landfill Site 1. A bioventing IRA in the POL Yard also was implemented.

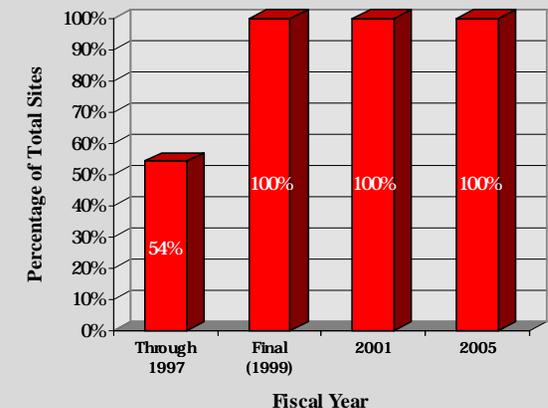
Improved tracking of investigation-derived waste and on-site management of change orders saved the installation time and money. Frequent teleconferencing on project issues and status ensured that programs remained on track. The BCT established decision pathways, consulted with technical experts, and reviewed cleanup decisions. The RAB continued to meet and participated in several site tours.

Data indicate that an aggressive and efficient free-product recovery system at the POL area is not possible. Therefore, this activity was not completed. A Remedial Action Plan and Environmental Assessment (RAP/EA) must be completed before the solution is agreed on. Closure of the EOD range was postponed to FY98 because high levels of metals were found at the site.

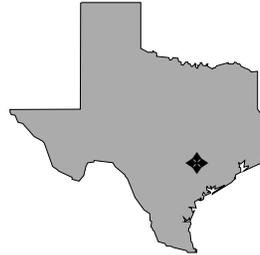
Plan of Action

- Complete closure of EOD Range in FY98
- Complete RAP/EAs at seven sites in FY98
- Prepare abstract of latest BRAC Cleanup Plan in FY98

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 4,660 acres
Mission: Provide depot-level aircraft and engine repair
HRS Score: NA
IAG Status: None
Contaminants: Metals, VOCs, and SVOCs
Media Affected: Groundwater and soil
Funding to Date: \$107.9 million
Estimated Cost to Completion (Completion Year): \$138.2 million (FY2016)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2001



San Antonio, Texas

Restoration Background

In July 1995, the BRAC Commission recommended realignment of Kelly Air Force Base. As a result of this realignment, the Defense Distribution Depot, San Antonio, will be closed and the airfield and all associated support activities will be attached to Lackland Air Force Base in Texas. As of July 1995, the installation had focused its efforts on laying the groundwork for base closure.

Environmental investigations have identified 52 sites and several areas of interest on base, including landfills, spills from the industrial waste collection system, former fire training areas, possible low-level radioactive waste sites, underground storage tanks (UST), aircraft maintenance areas, sludge lagoons, and sludge-spreading beds. Sites are geographically separated into five zones: Zone 1 contains properties located west of Leon Creek, which are to be realigned to Lackland Air Force Base; Zone 2 contains property south and west of the runway; Zone 3 contains the present and former industrial operations area on the base; Zone 4 consists of the area off the main base known as east Kelly; and Zone 5 consists of the flightline, warehouses, and base administrative support operations. Most of Zone 5 is scheduled to be realigned to Lackland Air Force Base. Metals, volatile organic compounds, and semivolatile organic compounds have affected groundwater and soil at the installation and off-base groundwater.

A basewide groundwater and surface water monitoring program, known as the Basewide Remedial Assessment, began in FY94. This assessment provides an annual snapshot of groundwater conditions installationwide, both on and off base. By the end of FY95, final reports had been prepared for Remedial Investigation and Feasibility Study (RI/FS) phases for approximately 41 sites in Zones 1, 2, and 3. Approval from the state regulatory agency is still pending on some of these reports and associated decision documents.

The installation established partnerships with state and federal regulatory agencies and conducts document reviews through a BRAC cleanup team, which was formed in FY96. The first BRAC Cleanup Plan was issued in FY96. The installation worked with the city of San Antonio on preliminary construction plans for a stormwater culvert rerouting east of Zone 3. A draft groundwater compliance plan was prepared and is awaiting approval. Design and construction of additional interim remedial systems have been postponed, pending development of a strategy for implementing final actions at sites.

FY97 Restoration Progress

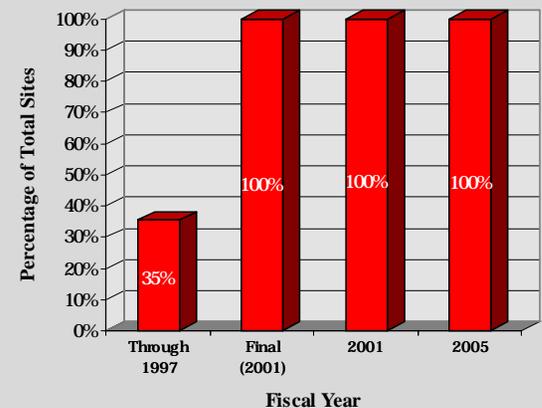
RI activities continued in Zones 4 and 5. Zone 3 and Zone 4 FS activities began in both zones, including a Focused FS for groundwater affected by Zone 4 and Zone 3 industrial activities. A site in Zone 4 was remediated, and the property was leased to private industry. A source area was discovered in Zone 3 at site MP, and investigative activities began in order to determine the source characteristics. Negotiation with the state regulatory agency continued on the Zone 1 FS. Final reports were submitted for regulatory review on the Zone 5 RI and the Zone 3 groundwater decision document.

The stormwater culvert project remained in the planning and design stage. A project was awarded for cleanup of soil in Zones 2 and 3 and implementation of final Remedial Actions (RA). An optimization project was initiated to review operating parameters and necessary upgrades for the existing groundwater extraction systems. Monitoring for natural attenuation parameters was completed. A partnering initiative with state and federal regulatory agencies began as an effort to expedite document reviews and the property transfer process in preparation for closure.

Plan of Action

- Continue RI/FS activities for Zone 4 and the FS for Zone 5, on and off base, in FY98
- Award a design contract for an interim final groundwater collection system in FY98
- Delineate off-base contamination from Zones 3 and 4 in FY98
- Continue investigation of the source area at Site MP and select RAs for the source area and downgradient plume in FY98
- In FY98, initiate optimization studies for long-term monitoring and long-term operations, including optimization of groundwater monitoring
- Perform additional field investigations in Zone 1 in FY98
- Complete final RAs for soil in Zones 2 and 3 in FY98

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 340 acres
Mission: Test, prove, overhaul, and issue torpedoes
HRS Score: 32.61; placed on NPL in October 1989
IAG Status: Federal Facility Agreement signed in 1990
Contaminants: VOCs, heavy metals, petroleum hydrocarbons, herbicides, fuel, and pesticides
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: \$21.8 million
Estimated Cost to Completion (Completion Year): \$38.5 million (FY2016)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2005



Keyport and Indian Island, Washington

Restoration Background

In September 1995, the BRAC Commission recommended realignment of this installation. The center's responsibility for maintaining combat system consoles and its general industrial workload will be moved to Puget Sound Naval Shipyard.

Operations at the installation, including plating, torpedo refurbishing, and disposal practices, contributed to contamination at the site. Since FY84, environmental investigations at the installation have identified several site types, including underground storage tanks, sumps, spill sites, a landfill, and an underground trench. Ongoing environmental investigations conducted under CERCLA have identified 12 sites.

In FY92, a Removal Action was completed at a chromate spill site. An underground trench and several sumps were excavated, and chromium-contaminated soil was removed and replaced with clean fill.

The installation completed Remedial Investigation and Feasibility Study (RI/FS) activities at Sites 2, 3, 5, 8, and 9 in FY93. Because of public concern about the Proposed Remedial Action Plan for Site 1, additional RI activities were initiated. Temporary buildings located above the landfill at Site 1 were vacated and removed as a precautionary measure.

In FY94, a Record of Decision (ROD) was signed for Operable Unit 2 (Sites 2, 3, 5, 8, and 9). The installation also completed interim corrective measures for Site 23. In FY95, the installation conducted a Phase I Removal Action at Site 8. At Site 23, a corrective action consisting of removal and closure in place continued for hazardous waste storage tanks and sumps.

A technical review committee (TRC) was formed in FY89 and was converted to a restoration advisory board (RAB) in FY95. A community relations plan (CRP) was completed in late FY90. The

installation has prepared and distributed quarterly fact sheets and conducted a door-to-door community survey and several open houses and workshops. The RAB meets monthly and has participated in such activities as regional workshops, open houses, and production of community information publications.

To improve site management, regulatory agencies have been involved in developing the scope of work and documents. In addition, technical memorandums are prepared to convey issues before documents are made final. Concurrent document reviews also are conducted.

During FY96, the CRP was updated and the installation conducted additional groundwater, sediment, and tissue sampling and analysis at Site 1 and began long-term groundwater monitoring at Sites 2 and 8. In addition, the installation completed the confirmational groundwater sampling at Site 5, and groundwater and sediment sampling at Site 9, required under the ROD. Work plans for the Phase II soil removal were initiated at Site 8. Corrective measures, including removal of tanks and soil and in situ remediation of contaminated soil, were completed at Site 23.

FY97 Restoration Progress

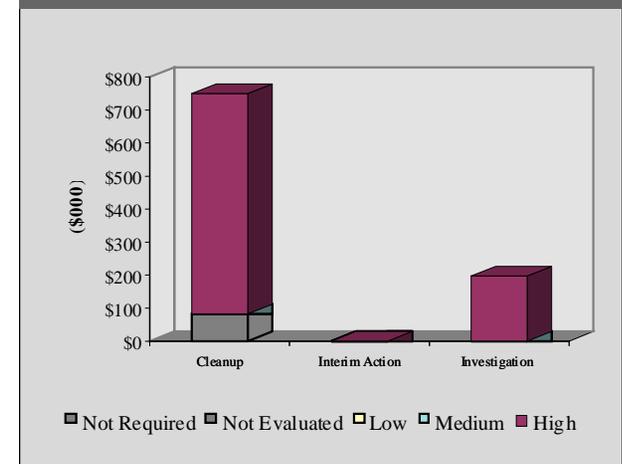
The installation continued groundwater monitoring at Sites 2 and 8. For Site 8, a Site Characterization and Analysis Penetrometer System of cone-penetrating radar and ground-penetrating radar was implemented. A Phase II soil removal was performed at the site. In addition, the installation is receiving input from the U.S. Geological Survey on groundwater flow modeling, degradation analysis, and tritium dating in support of natural attenuation at Site 1. The University of Washington is providing information on phytoremediation. The RAB, regulators, and technical experts are identifying technology alternatives for the Site 1 Focused Feasibility Study.

Increased involvement of the RAB and the community delayed some activities scheduled for FY97. Other activities were postponed because of funding constraints and risk priorities.

Plan of Action

- Continue groundwater monitoring at Sites 2 and 8 in FY98
- Complete the Phase II soil removal at Site 8 in FY98
- Complete the RI/FS and the Proposed Plan and sign the ROD for Site 1 in FY98
- Complete corrective action at Site 23 in FY00
- Complete Removal Action at all sites in FY00

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 3935 acres
Mission: Manufacture, store, and test small-arms munitions
HRS Score: 33.62; placed on NPL in July 1987
IAG Status: IAG signed in September 1989
Contaminants: Explosives, heavy metals, solvents, and petroleum/oil/lubricants
Media Affected: Groundwater and soil
Funding to Date: \$43.5 million
Estimated Cost to Completion (Completion Year): \$118.3 million (FY2028)
Final Remedy in Place or Response Complete Date: FY2006



Independence, Missouri

Restoration Background

Operations at the Lake City Army Ammunition Plant, a government-owned, contractor-operated facility, include the manufacture, storage, and testing of small-arms munitions. Principal site types at the installation include abandoned disposal pits, sumps, firing ranges, old lagoons, old dumps, and closed RCRA lagoons and burning grounds. Environmental studies initially identified 73 sites, which were consolidated into 35 sites for further investigation.

Sampling at seven representative areas identified groundwater contaminated with volatile organic compounds (VOC), explosives, and heavy metals. After the plant was placed on the National Priorities List (NPL), it conducted a Remedial Investigation and Feasibility Study (RI/FS). The RI/FS focused on four operable units (OU), including the Northeast Corner, Area 18, and Area 8 OUs, and an installationwide OU. Area 8 was subsequently incorporated into the installationwide OU.

In FY93, the installation drafted RI/FS Reports for the Area 18 OU and the Northeast Corner OU. In FY94, the installation revised the RIs for two OUs and completed the draft RI Report for the Area 8 and installationwide OUs. The installation completed Relative Risk Site Evaluations in FY94. After completing an Engineering Evaluation and Cost Analysis (EE/CA), an Action Memorandum, and design documents in FY95, the installation planned to conduct one Removal Action to construct and operate a groundwater extraction and treatment system in the Area 18 OU. Draft revisions to the Area 18 OU FS were completed in the same year. The draft FS Report for the Area 18 OU identified several innovative technologies for discussion with the regulatory agencies.

In FY95, to improve site management, the installation held quarterly meetings of project managers in conjunction with technical review committee (TRC) meetings.

In FY96, the installation began revising its community relations plan. In addition, the installation began converting the TRC into a restoration advisory board (RAB). The installation initiated a Removal Action at the Area 18 OU, with concurrent development of the final Record of Decision (ROD). The FS Report for the Area 18 OU was completed, and the Proposed Plan was submitted to the regulatory agencies. The installation and EPA subsequently began an informal dispute resolution process in order to obtain agreement on the Proposed Plan for the Area 18 OU.

Also, in FY96, the installation initiated Removal Actions for sumps, installationwide groundwater containment, and the capping and leachate collection system for the abandoned landfill in Area 16. The installation submitted a draft final FS for the Northeast Corner OU. A VOC groundwater plume discovered in the Northeast Corner OU may be migrating off site. In addition, the Army initiated Treatability Studies for dual-phase vapor extraction in the Area 18 OU and the Northeast Corner OU.

FY97 Restoration Progress

The installation completed the Area 18 pump-and-treat system. Use of innovative technologies helped expedite site characterization and fieldwork to determine the extent of off-base migration of the contaminant plume. The installation developed an EE/CA and an Action Memorandum for the leachate collection trench and a cap for the abandoned landfill in the Area 16/Northeast Corner OU. The Northeast Corner OU oil and solvent pits, which created the plume leading to the installation boundary, became a higher priority than the

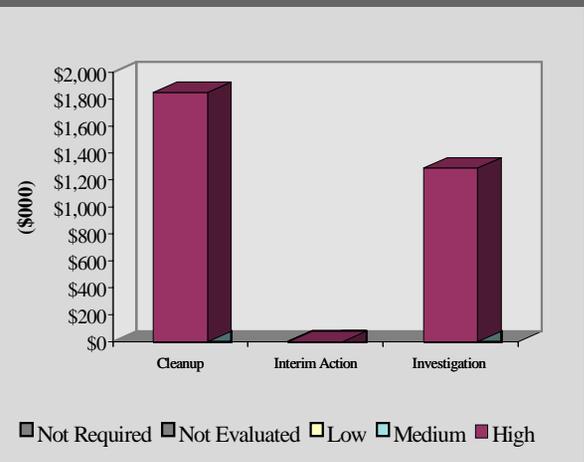
abandoned landfill. The Army is proceeding with an interim ROD to install a permeable reactive barrier in the Northeast Corner OU. The Army abandoned the Removal Action for the landfill and is incorporating the landfill's cleanup into the final Northeast Corner OU ROD.

A RAB was formed in March 1997. The local community, therefore, became better informed of the plant's Installation Restoration Program activities and environmental problems. Many questions about plant operations and environmental issues were answered to the public's satisfaction. In addition, the U.S. Army Corps of Engineers assisted in document review, and issues with regulatory agencies were resolved through monthly program managers' meetings.

Plan of Action

- Complete Interim Action/Early Action Proposed Plan/ROD for the Northeast Corner in FY98
- Complete three Removal Actions (Well EW2, groundwater containment, and sump) in FY98-FY99
- Complete remaining RI/FS activities by FY99
- Complete RODs for Area 18 and Northeast Corner OUs and begin Removal Actions by FY99
- Complete all current Removal Actions by FY99
- Use phytoremediation and reactive walls to treat groundwater in FY99
- Complete the ROD for the installationwide OU and begin Remedial Action (RA) there by FY01
- Complete all RA activities by FY04

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 7,382 acres
Mission: Technology development and engineering
HRS Score: 50.53; placed on NPL in July 1987
IAG Status: Federal Facility Agreement signed in October 1989
Contaminants: Fuels, PCBs, solvents, and waste oils
Media Affected: Groundwater and soil
Funding to Date: \$34.3 million
Estimated Cost to Completion (Completion Year): \$46.2 million (FY2016)
Final Remedy in Place or Response Complete Date: FY1999



Lakehurst, New Jersey

Restoration Background

Historical operations at this installation involved handling, storage, and on-site disposal of hazardous substances. Records, aerial photographs, field inspections, and interviews identified 45 potentially contaminated sites. Investigation began in FY83, and the Remedial Investigation and Feasibility Study (RI/FS) was completed for all but one site by the end of FY95. Of the 45 sites, 33 require no further action.

Records of Decision (ROD) were signed in FY96 and FY97 to continue groundwater treatment systems at Areas A/B, C, E, and H. An Interim ROD for a 3-year pilot project for natural restoration at Areas I and J was signed in FY95; the pilot project began in FY96.

Removal Actions were conducted at 23 sites to remove contaminated soil, drums, tanks, and debris. Innovative technologies have been implemented, including soil washing, asphalt batching, and solar-powered spray irrigation and sparge treatment systems. Passive soil gas surveys were used to identify the most contaminated areas in a closed landfill and the extent of petroleum contamination in a wetland. In FY93, the installation developed in-house expertise in groundwater modeling. The modeling supported and built consensus for use of natural attenuation as the proposed action for a large trichloroethene (TCE) plume. The cost of this method is less than 1 percent the cost of a pump-and-treat system.

Partnerships with the U.S. Geological Survey (USGS), Rutgers University, the New Jersey Department of Environmental Protection (NJDEP), and the Pinelands Commission have been established to study the use of composted biosolids for capping or for fill material.

In FY87, the installation established a technical review committee which meets to discuss the status of National Priorities List (NPL)

sites. A restoration advisory board (RAB) was also formed. The RAB solicits public involvement through the local newspaper and poster displays.

In FY96, Remedial Designs (RD) were completed for upgrades of the installation's four pump-and-treat systems and RODs were completed for continued treatment of groundwater and soil in Areas C and H. FSs for Areas A/B, E, and K also were completed. A soil vapor extraction system began operating at Site 13, and soil bioventing/vapor extraction systems began operating at Sites 16 and 17.

FY97 Restoration Progress

Groundwater is being treated by pump-and-treat systems, spray irrigation treatment, and free-product extraction. RODs for Areas A/B, E, and K were signed, and final RDs for Areas A/B and E were completed. In-house staff prepare documentation and pursue completion of Federal Facility Agreement schedule requirements. Cost-saving techniques, including in-house data interpretation and reporting for groundwater pump-and-treat systems and vapor extraction/bioventing systems, reduced contractor costs by \$185,000. Negotiated reduction of monitoring for the pump-and-treat systems from quarterly to semiannually will save up to \$150,000 per year.

Accelerated fieldwork techniques were implemented, including excavation and restoration of petroleum hydrocarbon-contaminated wetlands. The installation created an aeration system and a surface water reservoir to treat groundwater and irrigate the station's golf course.

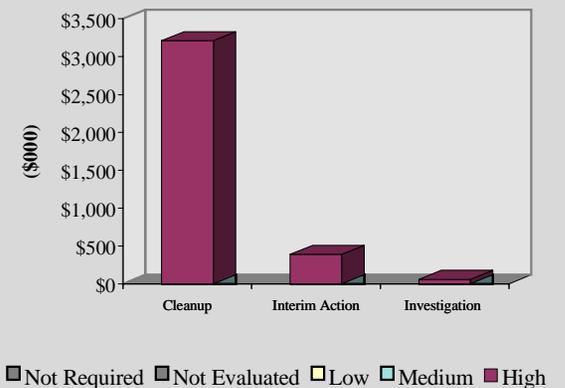
The site manager is in constant communication with regulatory agencies about modifications to reports. An ongoing partnership between the station, USGS, and NJDEP is studying revegetation of mined sites through use of composted biosolids.

Some activities scheduled for completion in FY97 were delayed because of contractual delays.

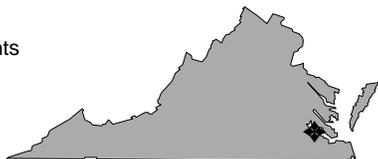
Plan of Action

- Modify groundwater treatment systems at Areas C and H in FY98
- Complete final FS for Areas I and J in FY98
- Complete design and construction of the groundwater treatment system at Area K in FY98
- Modify recovery systems at existing pump-and-treat systems in FY98 to accelerate remediation
- In early FY98, install additional treatment systems at groundwater contamination areas to accelerate attainment of applicable or relevant and appropriate requirements
- Modify pump sizing and injection systems at Sites 16 and 17 in FY98
- In FY98, modify treatment processes at Site 13 to include extraction as well as injection
- Sign final ROD for Areas I and J in FY99

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 3,152 acres
Mission: House Air Combat Command Headquarters, 1st Fighter Wing, 74th Tactical Control Facility, 480th Reconnaissance Technical Group, and NASA Langley Research Center
HRS Score: 50.00; placed on NPL in May 1994
IAG Status: Federal Facility Agreement under negotiation
Contaminants: Petroleum products, chlordane, PCBs, heavy metals, and solvents
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: \$41.7 million
Estimated Cost to Completion (Completion Year): \$44.3 million (FY2005)
Final Remedy in Place or Response Complete Date: FY2001



Hampton, Virginia

Restoration Background

The installation includes Langley Air Force Base and the NASA Langley Research Center. This base, which has been an airfield and an aeronautical research center since 1917, is the home base of the First Tactical Fighter Wing. NASA Langley Research Center conducts some 270 operations and operates various wind tunnels for research and development efforts.

A FY81 Preliminary Assessment and Site Inspection (SI) and additional studies identified 45 sites at the installation. Site types include landfills, underground storage tanks (UST), a bulk fuel distribution system, and storm sewers. Additional investigations have determined that contaminants are migrating into Tabb Creek, the Back River, and ultimately the Chesapeake Bay. The most significant sites include landfills adjacent to Tabb Creek and a storm sewer that discharges into the Back River.

In FY85, the installation discovered additional fuel contamination and free-product plumes. Subsequently, the installation replaced the fuel distribution system, investigated contaminated sediment in the storm sewers, and conducted Removal Actions to address free product at eight sites. Corrective action plans for the eight petroleum-contaminated sites have been completed, and USTs at those sites have been removed. Removal Actions to remediate soil and groundwater have been initiated at three other sites. Additional actions at the sites included removal of abandoned USTs and free product and installation of a treatment plant to remove emulsified fuel from groundwater.

In FY93, the installation began SIs at 33 sites, Remedial Action (RA) construction at six sites, and construction of a second groundwater treatment plant to remove a plume of free petroleum product at two sites. In FY94, NASA removed about 600 cubic yards of contaminated sediment from a portion of its storm sewers.

In FY95, the installation completed construction of a second groundwater extraction and treatment system for petroleum-contaminated groundwater at two sites. A soil vapor extraction system also was implemented to remediate petroleum-contaminated soil near a filling station. A pilot-scale test using laser-induced fluorescence was conducted to identify and delineate a plume of petroleum-contaminated groundwater.

During FY96, Remedial Investigations (RI) were initiated at 13 sites. Time was saved by conducting scoping efforts with regulatory agencies and by implementing fieldwork under approved portions of the work plan while the final work plan was being prepared. Also during FY96, the installation completed SI activities at 33 sites and Removal Actions at two sites. It continued operation and maintenance (O&M) of the groundwater extraction and treatment system for petroleum-contaminated groundwater at two sites. The operation of the second groundwater treatment plant was discontinued in the spring.

In FY95, the installation's restoration advisory board (RAB) participated in the Variable Oversight Initiative, part of a national initiative by EPA and the state regulatory agency to streamline the regulatory review process. The initiative involved formation of the Langley AFB Partnership to improve communication and to set cleanup priorities. The partnership included EPA Region 3; the Virginia Department of Environmental Quality; the U.S. Army Corps of Engineers, Omaha Division; and the primary contractor involved in cleanup activities at the installation.

FY97 Restoration Progress

The installation implemented Removal Actions at three sites and continued O&M of the groundwater treatment plant.

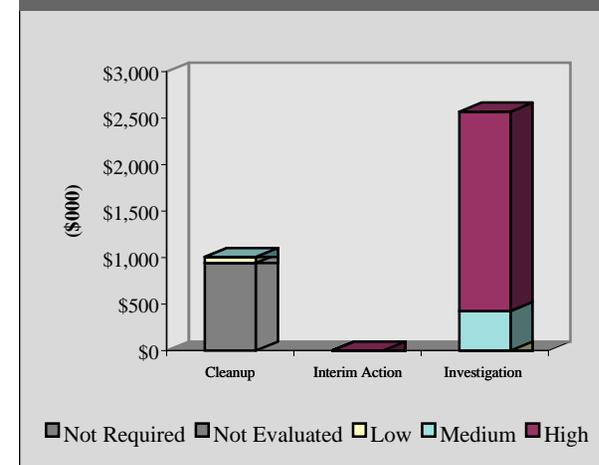
Site management techniques were improved by implementing a streamlined oversight and partnering process. In one case, this process reduced the magnitude of the interim Removal Action at Site OT-06 by removing the exposure pathway (a playground) instead of removing the contaminated soil. In addition, to gain regulatory concurrence, the installation developed a consensus on the closure process for pre-RI/Feasibility Studies (FS) sites. The Langley RAB completed updating its community relations plan with community interviews.

Some activities scheduled for FY97 have been pushed back to FY98 or FY99. Completion of the Federal Facility Agreement (FFA) was delayed because EPA withdrew from the negotiated agreement. A ROD for one site was delayed because additional work was required, and a ROD for a second site was delayed by a lack of technical review resources at EPA.

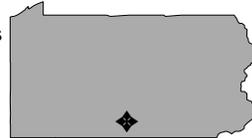
Plan of Action

- In FY98, continue use of streamlined oversight tools to reach decisions on sites
- Sign the FFA in FY98
- Sign two Records of Decision (ROD) in FY99
- Close out seven sites in FY99

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 19,243 acres
Mission: Store, maintain, and decommission ammunition; rebuild and store tracked and wheeled vehicles; rebuild, store, and maintain missiles; provide warehousing and bulk storage
HRS Score: 34.21 (Southeastern Area); placed on NPL in July 1987
 37.51 (Property Disposal Office); placed on NPL in March 1989
IAG Status: IAG signed in February 1989
Contaminants: VOCs, petroleum/oil/lubricants, PCBs, heavy metals, explosives, and asbestos
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: \$78.3 million
Estimated Cost to Completion (Completion Year): \$182.3 million (FY2030)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2003



Franklin County, Pennsylvania

Restoration Background

Letterkenny Army Depot contains a variety of contaminated sites, including disposal lagoons and trenches, oil burn pits, an open burning and open detonation area, an explosives washout plant, two scrap yards, landfills, industrial wastewater treatment plant lagoons, and industrial wastewater sewer lines. Two National Priorities List (NPL) sites are located in the southern part of the installation.

The installation has concentrated its remedial efforts on source removal. Removals have included excavation, low-temperature thermal treatment (an innovative technology), backfilling, and capping of soil in the industrial wastewater treatment plant lagoons and the three K-Areas; emergency repairs to leaking industrial wastewater sewers; removal of the Property Disposal Office (PDO) fire training pit; and emergency removal of playground soil at the PDO Area and of sediment contaminated with polychlorinated biphenyls (PCB) in the springhouse at Rocky Spring. In FY91, the installation completed Site Inspection fieldwork for the Ammunition Area and signed a Record of Decision (ROD) for no further action for PDO Operable Unit (OU) 1. Remedial Investigation and Feasibility Study (RI/FS) activities were expanded to seven OUs in the Southeastern Area and five OUs in the PDO Area.

In FY94, the Army completed the RI/FS for volatile organic compound (VOC)-contaminated groundwater at PDO OU2. In addition, RI fieldwork began at the Mercury Detections in Rocky Spring Lake and at five OUs in the Southeastern Area. The installation also initiated an off-site dye study to identify migration pathways of contaminants from sources in the Southeastern Area to groundwater and surface water.

During FY95, the Army upgraded the existing groundwater extraction and treatment system. The rehabilitation of existing wells and the

addition of a recovery well have more than doubled the system's extractive capacity. The installation completed a Remedial Action (RA) in the K-Area portion of the installation's Disposal Area, treating about 14,000 cubic yards of VOC-contaminated soil through use of low-temperature thermal desorption. In addition, a draft final ROD was prepared for enhanced passive aeration of the groundwater at PDO OU2.

In FY96, the Army established a BRAC cleanup team (BCT) to facilitate restoration. The community formed a Local Redevelopment Authority (LRA), and the commander established a restoration advisory board. The design of the off-site treatment plant at Rowe Spring was completed.

The installation began removal of contaminated sediment from Rowe Run and Conococheague drainage sites, emergency delineation and RA at the old PDO Burn Pit, and delineation of contaminated soil at the spill area in Area A of PDO OU5. It also performed additional RI fieldwork for PDO OU5 and completed Phase I of the Environmental Baseline Survey (EBS).

FY97 Restoration Progress

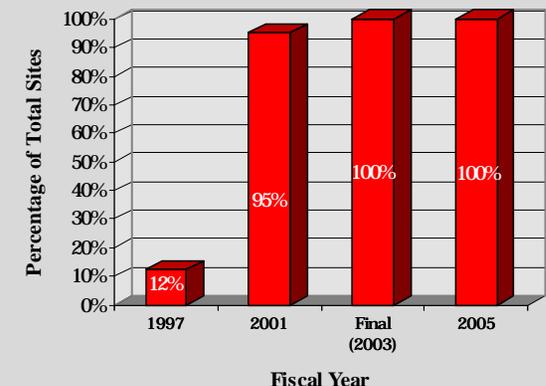
The installation completed four Removal Actions at Rowe Run Drainageway, Conococheague, industrial wastewater sewers, and the spill site in Area A. The installation used in situ hydrogen peroxide injection for chlorinated solvent-contaminated soil at the former Oil Burn Pit. A site cleanup also was completed at the Open Truck Storage Area. The BCT developed sample-screening protocols to expedite property transfer. A Removal Action at the former PDO Oil Burn Pit and a finding of suitability to lease for eight buildings were completed.

The base met regularly with EPA, Pennsylvania Department of Environmental Protection, the LRA, and Letterkenny officials. The BCT completed the BRAC Cleanup Plan (BCP), the CERFA letter report, a sample-screening protocol for open vehicle storage parcels and railroad tracks, and the BCP abstract. Investigative fieldwork began for PDO OU6 and Southeastern Area OU8.

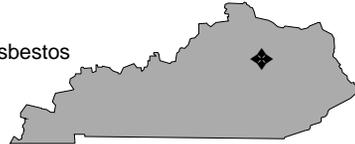
Plan of Action

- Complete Phase II of the EBS in FY98
- Complete the second version of the BCP in FY98
- Finish RIs of Rowe Run and Conococheague drainageways, Areas A and B, and industrial sewers in FY98
- Begin construction of Rowe Spring treatment plant in FY98
- Complete construction of the off-post treatment plant at Rowe Spring in FY99
- Complete investigative fieldwork for PDO OU6 and Southeastern Area OU8 in FY98
- Prepare finding of suitability to transfer for Phase I property transfers in FY98
- Complete Environmental Assessment for BRAC Realignment Action in FY98
- Complete Focused Feasibility Study for Southeastern Area OU3 Disposal Area and Southwest Industrial Area groundwater in FY98

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 780 acres
Mission: Conducted light industrial operations, including-paint stripping, metal plating, etching, and anodizing operations
HRS Score: NA
IAG Status: None
Contaminants: VOCs, SVOCs, heavy metals, PCBs, pesticides, herbicides, and asbestos
Media Affected: Groundwater, surface water, sediment and soil
Funding to Date: \$23.5 million
Estimated Cost to Completion (Completion Year): \$29.3 million (FY2028)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2000



Lexington, Kentucky

Restoration Background

In December 1988, the BRAC Commission recommended closure of the Lexington Facility–Lexington-Bluegrass Army Depot (LBAD). In FY90 the Army began environmental studies that identified 67 sites requiring further investigation. Recommended actions included additional soil, groundwater, and underground storage tank (UST) investigations. A RCRA Facility Assessment (RFA), also conducted in FY90, identified 30 solid waste management units (SWMU) and two areas of concern (AOC).

On the basis of the RFA findings, the Army began fieldwork for a RCRA Facility Investigation (RFI) and a corrective measures study (CMS) in FY90. The initial Phase I RFI effort and the draft CMS documents were completed in FY93. Sampling data from the initial phase of the RFI indicated contaminated groundwater, soil, and sediment at 29 sites. The major AOCs were as follows: the new landfill, the industrial and sanitary waste disposal landfill, the old landfill, industrial waste lagoons, industrial wastewater treatment plants (IWTP), Area A, Area B, the north end of Building 135, and groundwater. Initial results of the Phase I groundwater investigation demonstrated the need for soil cleanup and increased the potential for long-term groundwater treatment. In 1994, the Kentucky Department for Environmental Protection (KDEP) issued a Corrective Action Order for LBAD.

In FY94, the installation formed a BRAC cleanup team (BCT); its members include the installation's BRAC environmental coordinator and representatives of EPA and KDEP. The installation completed a draft Environmental Baseline Survey and a BRAC Cleanup Plan. In addition, the Army signed an interim lease with the Commonwealth of Kentucky for the entire 780 excess acres.

The installation completed the final Phase I RFI, the CMS, and the groundwater investigation documents in FY95 and submitted them to the Army and regulatory agencies for approval.

During FY95, the installation removed USTs, contaminated soil, PCB-contaminated transformers, and asbestos. A finding of suitability to transfer (FOST) was signed for 22 buildings and a parking lot. The Army transferred the 22 buildings and the parking lot to the Commonwealth of Kentucky in 1995, and the installation closed as scheduled.

In FY96, the installation continued work on several Interim Actions. The groundwater investigation continued. Cleanup of the IWTP, Washrack 1, and the oil-water separator at Buildings 8 and 19 began. The installation completed Interim Remedial Actions for Area A, Area B, and the Coal Pile Run-Off Area.

FY97 Restoration Progress

The installation completed the removal of contaminated soil and sludge from the industrial waste lagoons. Early actions took place at the sump and sand filter at Building 139 and at the oil-water separator at Buildings 8, 10, 19, and 43. The installation improved site management techniques in FY97 by developing work plans for small sites during BCT meetings. In addition, to expedite site characterization and to ensure consensus on the work plan, the installation worked with the regulator before sampling was conducted.

In FY97, EPA and KDEP concurred with the Phase I RFI and CMS documents. The installation began the Phase II RFI and CMS. A Phase II installationwide groundwater investigation (RFI/CMS) and Removal Actions at the industrial waste lagoons were completed. The Army signed a FOST for the Phase II transfer of 78 buildings and structures. Interim measure work plans, which had been prepared for a

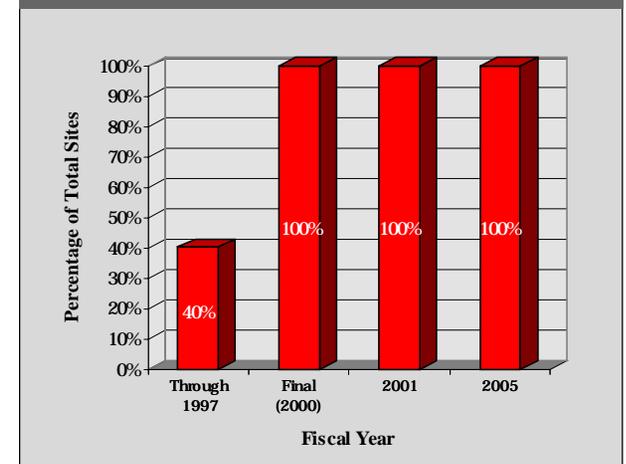
number of SWMUs, also were forwarded to KDEP and EPA for approval. The Army capped three landfills; excavated contaminated soil from the lagoons, Area A, Area B, and IWTP; and conducted Remedial Actions (RA) at other AOCs.

The second, fourth, and sixth activities in the current Plan of Action were not completed in FY97 as scheduled because of delayed regulatory reviews.

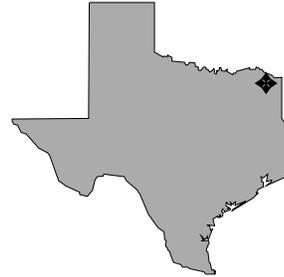
Plan of Action

- Complete Phase II transfer to the Commonwealth of Kentucky in FY98
- Complete the RA for the affected areas (Area A, Area B, and the Coal Pile Run-Off Area) in FY98
- Draft the Phase II RFI in FY98 and complete Phase II RFI activities in FY99
- Complete the investigation of groundwater contamination in FY99
- Draft and complete Phase II CMS in FY99
- Start cleanup of Building 135 in FY99
- Complete cleanup of old wastewater treatment plant in FY00
- If required, design and install a groundwater monitoring system in FY00
- Complete all BRAC activities, including monitoring, by FY10

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 15,546 acres
Mission: Load, assemble, and pack ammunition
HRS Score: 31.85; placed on NPL in July 1987
IAG Status: IAG signed in September 1990
Contaminants: VOCs, petroleum, heavy metals, and explosives
Media Affected: Groundwater and soil
Funding to Date: \$16.5 million
Estimated Cost to Completion (Completion Year): \$21.1 million (FY2004)
Final Remedy in Place or Response Complete Date: FY2004



Texarkana, Texas

- Excavate contaminated soil at Paint Filter Site and RDX Pit K-2 in FY98
- Implement natural attenuation technologies in FY98
- Complete two Relative Risk Site Evaluations by April 1998
- Remove ordnance debris and institute erosion control measures at ODA in FY99

Restoration Background

Lone Star Army Ammunition Plant loads and packs munitions. From 1943 to 1944, the Old Demolition Area (ODA) was used to destroy faulty or nonstandard explosives. Environmental studies revealed explosives and metal contamination in the ODA. EPA therefore placed that area on the National Priorities List (NPL) in July 1987. The ODA is the only CERCLA site at the installation.

Other RCRA sites investigated include surface impoundments, landfills, fuel storage areas, and load lines. Investigations revealed soil contamination with solvents, metals, and explosives at some sites. At one site, groundwater is contaminated.

Interim Actions undertaken by the installation include closing two surface impoundments, installing industrial treatment facilities to treat wastewater before discharging it, and removing the bulk fuel storage area and the service station.

In FY92, the installation began a RCRA Facility Investigation (RFI) for RCRA corrective action sites and completed a corrective action at one underground storage tank site.

In FY94, the installation used roto-sonic drilling, an innovative technique, during additional EPA- and state-required field investigations of the ODA. This technique enhanced the quality of the core samples recovered, which, in turn, aided the installation in negotiations with regulatory agencies on Phase IV of the Remedial Investigation (RI). In addition, the University of Texas conducted a biodegradation study of installation soil that was contaminated with explosives and metals.

In FY95, the installation continued the Phase IV RI for the ODA by conducting soil boring and installing monitoring wells, accompanied by analytical sampling. The installation also obtained regulatory

approval for, and began, sampling of biota at the ODA. The installation conducted groundwater investigations under RCRA at the two closed surface impoundments and performed soil and groundwater investigations at the bulk fuel storage area.

In FY96, the Army collected samples of groundwater and surface soil at the ODA in accordance with plans approved by EPA. RI activities were completed in the area. The installation took soil borings and established groundwater wells for the RFI. It also completed a draft survey to determine ambient concentrations of contaminants for the entire installation.

The installation's technical review committee (TRC) includes representatives of the installation, the state, and EPA and leaders of the local community. The TRC meets quarterly to discuss current and proposed environmental actions under CERCLA.

FY97 Restoration Progress

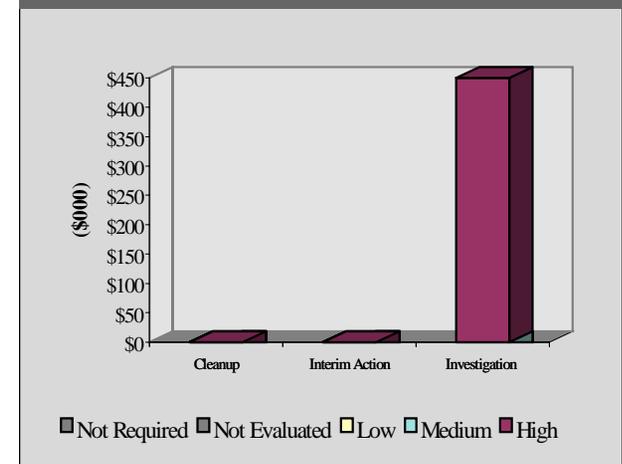
The Army completed a background survey to determine ambient concentrations of contaminants. The survey report was submitted to the state after completion of all field activities. The state approved the report in September 1997.

Underestimation of the activities required to complete work at newly discovered solid waste management units (SWMU) delayed completion of ongoing RFI activities.

Plan of Action

- Complete ongoing RFI activities, including activities at newly discovered SWMUs, in FY98
- Complete a Record of Decision for the ODA in FY98
- Decontaminate and remove cisterns in FY98

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 1417 acres
Mission: Provide logistics support for assigned ships and service craft; perform authorized work in connection with construction, alteration, dry docking, and outfitting of ships and craft assigned; perform manufacturing, research, development, and test work
HRS Score: NA
IAG Status: None
Contaminants: Chlorinated solvents, solvents, acids, blasting grit, paint, heavy metals, industrial wastewater, and industrial liquid waste
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: \$40.7 million
Estimated Cost to Completion (Completion Year): \$81.7 million (FY2006)
Final Remedy In Place or Response Complete Date for BRAC Sites: FY2006



Long Beach, California

Restoration Background

The Long Beach Naval Complex consists of the Long Beach Naval Shipyard (NSY), the Naval Station (NS) Long Beach, and the Long Beach Naval Hospital (NAVHOSP). The BRAC Commission recommended closure of the NAVHOSP, the NS, and associated housing areas in FY91, and closure occurred in FY94. Closure of the NSY and associated housing areas was recommended in July 1993, and occurred in September 1997.

NSY and NS operations that contributed to contamination include ship and vehicle repair and maintenance, utility maintenance and operation, support shops, storage of petroleum products and hazardous materials, laundry and dry-cleaning, steam plant operations, and air compressor operations. Portions of housing areas associated with the NSY were used to dispose of ship wastes, drilling mud, and construction debris. The primary sites of concern are disposal pits into which a variety of wastes were deposited.

The installation is investigating the NSY, NS, and related housing areas. A Removal Site Evaluation was completed at NS Site 6A to support an interim lease to the port of Los Angeles. It concluded that no action was necessary for industrial use of the site. The most difficult cleanup challenge occurred at Site 7, the NS and NSY harbor. To streamline the study process, Phases I and II of the Remedial Investigation and Feasibility Study (RI/FS) were combined.

In FY94, the installation formed a BRAC cleanup team (BCT), which completed the BRAC Cleanup Plan (BCP) and the Environmental Baseline Survey (EBS) for NS and NAVHOSP in FY94. The joint NS and NSY technical review committee was formed in FY92 and converted to a restoration advisory board (RAB) in FY94. A separate RAB for the San Pedro housing area and the Defense Fuel Support Point (DFSP) (an adjacent facility) was formed in FY95.

In FY96, the city of Long Beach completed the land reuse plan for NSY. The installation completed the RI for NS Sites 1 through 6A and the Engineering Evaluation and Cost Analysis (EE/CA) and Action Memorandum for NS Site 3. The removal of arsenic-contaminated soil from Site 3 also was completed. At the former NS gas station, the installation began operating a soil vapor and liquid extraction and bioremediation system to clean up petroleum contaminants in soil and groundwater.

FY97 Restoration Progress

The installation began an Interim Remedial Action (IRA) at Sites 2, 11, 12 (Palos Verdes housing), and 5 (San Pedro housing). Groundwater investigation for Site 6A began, and cleanup for Site 6B NSY was completed in August. EE/CAs for four sites and an EBS for NSY housing were finished. NSY was closed, and an EBS was written for NS.

To expedite document review, workshops were held and regulators were given sampling results from the laboratories, as well as advance information reports. The process of delineating contamination was enhanced by streamlined sampling and combining phases.

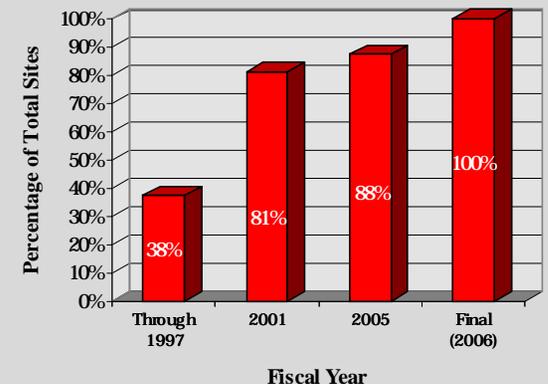
RAB activities included document review, comments on Remedial Action alternatives, and site tours and workshops for the community. A partnering agreement is under development among BCT and project team members. The BCT completed the latest BCP in March.

Some activities scheduled for completion in FY97 were delayed because of funding reductions.

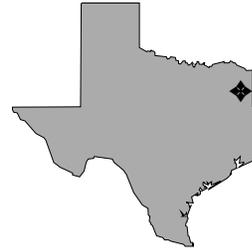
Plan of Action

- Complete the RI/FS for NSY Sites 8 through 13 in FY98
- Complete an IRA at four sites and an SI for Site 14 in FY98
- Implement phytoremediation for Sites 1 and 2 in FY98
- Complete the FS for Sites 3 to 6A in FY98 and the Record of Decision (ROD) in FY99
- Complete the IRA for Sites 1 and 2 in FY98, the FS in FY00, and the ROD in FY01
- Sign the ROD for NSY Sites 8 through 13 in FY99
- Complete the RI/FS for Site 7 in FY99 and sign the ROD in FY00

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 8,493 acres
Mission: Load, assemble, and pack pyrotechnical and illuminating signal munitions and solid-propellant rocket motors
HRS Score: 39.83; placed on NPL in August 1990
IAG Status: IAG signed in October 1991
Contaminants: Explosives, heavy metals, and VOCs
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: \$57.9 million
Estimated Cost to Completion (Completion Year): \$84.3 million (FY2006)
Final Remedy in Place or Response Complete Date: FY2006



Karnack, Texas

Restoration Background

Longhorn Army Ammunition Plant (LHAAP) manufactured pyrotechnical and illuminating signal munitions and solid-propellant rocket motors. Environmental studies have identified 50 sites, including storage areas, landfills, open burning grounds, industrial areas, burial pits, sumps, and wastewater treatment plants. Eighteen of these sites are being dealt with under the Installation Restoration Program (IRP) process and are listed on EPA reports for LHAAP. The installation divided the sites into five groups.

Follow-up studies conducted at the installation identified volatile organic compounds (VOC), heavy metals, and explosives in on-site groundwater, surface water, and soil. The studies also confirmed two sources of VOC contamination beneath the Active Burning Ground Site.

A FY84 Remedial Action (RA) included design and construction of a landfill cap for an unlined evaporation pond formerly known as the Rocket Motor Washout Pond. In FY91, the installation began a Remedial Investigation and Feasibility Study (RI/FS) at 13 sites. Phase I of the RI was completed in FY93. Phase II investigations at 11 sites that required additional fieldwork activities were completed in FY95.

In FY94, the Army also completed a pilot-scale study for an Interim Remedial Action (IRA) at Burning Ground No. 3, which includes the capped, unlined evaporation pond. The pilot-scale study consisted of groundwater extraction and treatment to remove trichloroethene (TCE) and methylene chloride, combined with low-temperature thermal destruction of soil and source material.

During FY95, the installation completed three Records of Decision (ROD), one for Burning Ground No. 3, another for two landfills, and a third for two sites at which no further action was necessary.

The installation's technical review committee (TRC), which meets quarterly, includes representatives of the installation, the Army, EPA, the Texas Natural Resources Conservation Commission, the local government, and environmental interest groups. The TRC solicits comment from the community about restoration activities at the installation. The commander attempted to form a restoration advisory board (RAB), but interest was not sufficient to sustain the effort. The Interagency Agreement (IAG) for the installation requires that both state and federal regulatory agencies review primary documents to ensure compliance. Partnering sessions have been advantageous in completing the review cycle.

In FY96, construction began on the Burning Ground Treatment Facility and the caps for Landfills 12 and 16. The installation completed Phase II RI investigations. It also began evaluating alternatives to pumping and treating the groundwater at Site 16. An RA began for 84 wastewater sumps.

FY97 Restoration Progress

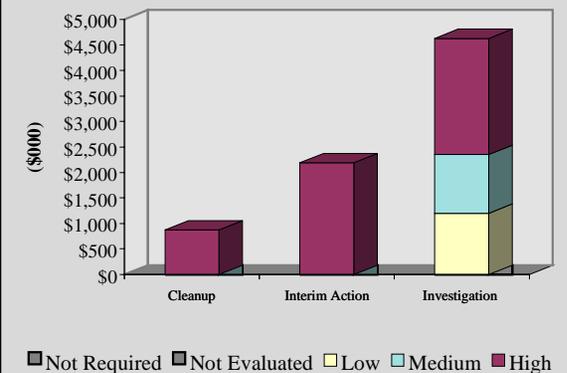
The installation compiled data to complete the Group 1 RI and initiated Phase III of the RI for Group 2. It also completed construction of the Burning Ground Treatment Facility and began treatment of groundwater and soil. Completion of the cap on Landfill 12 was delayed because of weather conditions but will be completed in early FY98. A Site Inspection report for Group 5 recommended no further action at two of the four sites. In addition, four Interim Actions or Removal Actions were initiated in FY97.

The Army improved site management and document review through concurrent review of primary documents with regulators. The TRC began including Audubon Society members at monthly managers' meetings.

Plan of Action

- Sign ROD for no further action for Group 1 in FY98
- Continue treating groundwater and soil at the Burning Ground Treatment Facility in FY98
- Complete treatment of soil at the Burning Ground Treatment Facility in FY98
- Initiate Group 2 and Group 4 RI/FS studies
- Complete RI/FS for Landfill 16 in FY98
- Submit a no-further-action ROD for four sites (Group 1) in FY98

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 9,477 acres
Mission: Support B-52 bombers and KC-135 tankers
HRS Score: 34.49; placed on NPL in February 1990
IAG Status: Federal Facility Agreement signed in April 1991; revision signed in 1994
Contaminants: VOCs, waste fuels, oils, spent solvents, PCBs, pesticides, and heavy metals
Media Affected: Groundwater and soil
Funding to Date: \$101.1 million
Estimated Cost to Completion (Completion Year): \$63.2 million (FY2035)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2000



Limestone, Maine

Restoration Background

Loring Air Force Base was established in 1952 to support B-52 bombers and KC-135 tankers. In July 1991, the BRAC Commission recommended closure of the base.

Wastes generated at the installation include waste oils, fuels cleaned from aircraft and vehicles, spent solvents containing volatile organic compounds (VOC), pesticides, polychlorinated biphenyls (PCB), and heavy metals. The Flightline and Nose Dock Areas, where industrial shops and maintenance hangars were located, are the primary areas at which wastes were released into soil and groundwater.

Environmental studies have been ongoing at the base since FY84. Sites include spill areas, landfills, fire training areas, underground storage tanks (UST), aboveground storage tanks, and low-level radioactive waste areas. In FY93, the sites were grouped into 13 operable units (OU).

Interim Remedial Actions initiated in FY93 included removal of free product at three sites, source removal at two sites, and Treatability Studies of bioventing at one site and of solvent extraction at another site. In FY94, Remedial Actions (RA) were completed for two OUs. This effort remediated four sites, with a total of approximately 7 acres of solvent-contaminated, fuel-contaminated, and PCB-contaminated soil.

An Environmental Baseline Survey identified 4,746 acres as CERFA-clean, and the installation received regulatory concurrence on the designations. About 6,340 acres are available for transfer. A BRAC cleanup team (BCT) and a restoration advisory board (RAB) were formed in FY94.

In FY95, Interim Actions consistent with the final remedy were completed at six sites and initiated at another six. A pilot study for

recovery of fuels from bedrock was begun. The installation, regulatory agencies, the U.S. Geological Survey, and the Air Force Center for Environmental Excellence supported and helped implement a pilot study at the fire training area. In addition, the Maine Department of Environmental Protection (MDEP) entered into partnership with the University of Maine to provide oversight and support the review of documents.

In FY96, under EPA's Superfund Innovative Technology Evaluation program, the installation demonstrated an innovative emission control system, using a soil vapor extraction system, at the Base Laundry. The University of Maine at Orono and MDEP collaborated on a study of bioventing systems. The RAB worked with the BCT to mitigate community concerns after a fishing advisory was issued for waterways in and around the installation.

Landfill covers were completed at 2 sites, bioventing systems were installed at 8 sites, Interim Actions were completed at 15 sites, and numerous USTs were removed. PCB cleanups were initiated at an underground transformer site and for the base drainage system.

Four Records of Decision (ROD), including the installation's first ROD for groundwater, were signed, documenting cleanup decisions for 31 sites. A corrective action plan (CAP) was submitted to the state regulatory agency to address fuel-related contamination from numerous fuel tank sites. Remedial Investigation and Feasibility Study (RI/FS) activities for basewide groundwater and surface drainage OUs neared completion.

FY97 Restoration Progress

The installation implemented a decision for remediation of the surface drainage OU. The installation also initiated the cleanup plan for the pipeline from the installation to Searsport. Early Removal Actions

took place at OU5 and at two pump houses in OU10. The accelerated fieldwork techniques of geoprobe and an on-site laboratory were employed at the installation.

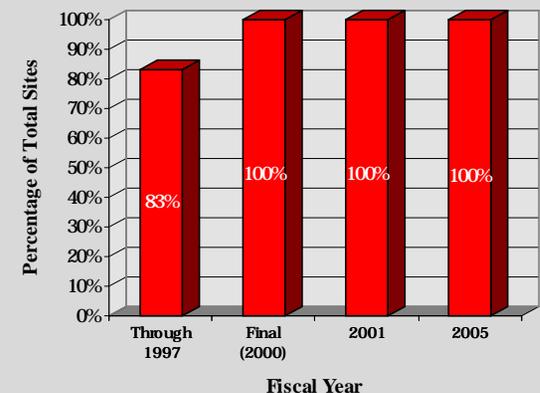
To expedite document review, the installation implemented an on-board review process. This process expedited site characterization for the CAP on the former fuel pipeline and accelerated work plan implementation for basewide surface drainage remediation.

RODs have not been completed for all sites, and the BCT has agreed to delay FS completion of basewide groundwater, pending completion of a pilot study that is needed because of new site information at the base quarry.

Plan of Action

- Complete RODs for remaining sites in FY98
- Complete RA for basewide surface drainage OU in FY98
- Complete the RI/FS for basewide groundwater OU in FY98
- Begin Site Closeouts in FY98
- Complete construction of cover at Landfill 3 in FY99
- Complete ROD for basewide groundwater OU in FY99

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 14,974 acres
Mission: Maintain an ammunition metal parts manufacturing facility and maintenance or layaway of ammunition production facilities
HRS Score: 30.26; placed on NPL in March 1989
IAG Status: IAG signed in 1989
Contaminants: Oils, grease, degreasers, phosphates, solvents, metal plating sludges, acids, fly ash, TNT, RDX, and HMX
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: \$50.2 million
Estimated Cost to Completion (Completion Year): \$13.1 million (FY2023)
Final Remedy in Place or Response Complete Date: FY2000



Doyline, Louisiana

Restoration Background

Sites identified at the Louisiana Army Ammunition Plant include lagoons, burning grounds, and landfills contaminated with explosives and plating wastes. Seven sites were identified during a Preliminary Assessment and Site Inspection in FY78, and a preliminary Remedial Investigation and Feasibility Study (RI/FS) was completed in FY82. The installation initiated full-scale RI/FS activities at four of the seven sites in FY85. The studies identified no off-site contamination; however, groundwater monitoring wells at the installation were contaminated with explosive compounds, such as TNT, RDX, and HMX.

The potential for off-site migration of contaminants required groundwater monitoring beyond the northern and southern boundaries of the installation. Groundwater monitoring at the installation and beyond its boundaries has continued until the present.

Between FY89 and FY90, the installation incinerated almost 102,000 tons of explosives-contaminated soil and treated more than 53 million gallons of contaminated water. Between FY88 and FY90, the lagoons underwent RCRA closure and were revegetated. The installation must monitor the vegetated protective cap and maintain it regularly to ensure its integrity.

The Army identified two additional sites in FY93 and FY94. The first of those sites, the Y-Line Etching Facility, may be contaminated with chromium and solvents. Soil and groundwater at the second site, the Load-Assemble-Pack Lines, may be contaminated with explosives. In FY95, the installation began the RI at the Load-Assemble-Pack Lines and completed the RI at the Y-Line Etching Facility.

In FY94, the Army completed a 5-year review of the Interim Remedial Action at the Area P lagoons, evaluating the effectiveness of interim

measures. The findings of the review confirmed that the source of the contamination had been removed.

The installation's technical review committee meets quarterly to exchange information about the cleanup program, to assist in the review and approval of documents, and to discuss ongoing restoration progress, Remedial Design, and report preparation.

The installation established a partnership with the U.S. Army Corps of Engineers Waterways Experiment Station to study the feasibility of using natural attenuation to treat groundwater contaminated with explosives.

In FY96, the installation received approval from EPA for the Record of Decision concerning soil at the first seven sites. A separate operable unit will address the installationwide groundwater. In addition, the installation completed the first phase of the RI at the Load-Assemble-Pack Lines and began the FS for the Y-Line Etching Facility.

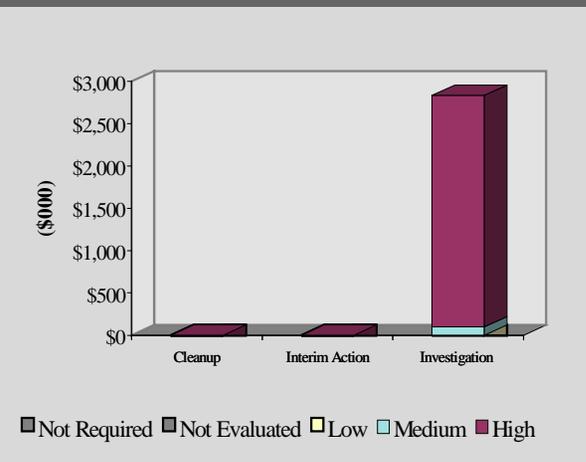
FY97 Restoration Progress

The installation completed the RI/FS for the Y-Line Etching Facility. The RI/FS determined that there was no risk from contaminated soil at the site. A no-further-action ROD is planned for 1998. The groundwater, however, is contaminated with trichloroethene. Remedial options for the contaminated groundwater will be developed under the sitewide groundwater operable unit.

Plan of Action

- Continue investigating the Load-Assemble-Pack Lines in FY98 and complete the RI Ecological Risk Assessment
- Complete an investigation of the groundwater operable unit in FY99
- In FY99, complete an evaluation of the effectiveness of natural attenuation for treating groundwater contamination

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 152 acres
Mission: Overhaul ships; procure and produce weapons systems and components; perform engineering designs; and support research, development, and testing
HRS Score: NA
IAG Status: None
Contaminants: Heavy metals, solvents, cyanide, and petroleum/oil/lubricants
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: \$2.6 million
Estimated Cost to Completion (Completion Year): \$30.8 million (FY2005)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2000



Louisville, Kentucky

Restoration Background

In July 1995, the BRAC Commission recommended the closure of the Louisville Naval Surface Warfare Center (NSWC). Appropriate functions, along with personnel, equipment, and support, will be relocated, primarily to three Naval Activities: Naval Shipyard Norfolk, Virginia; NSWC Port Hueneme, California; and NSWC Crane, Indiana.

Operations that may have contributed to contamination at the installation include machining, welding, draining of lubricating fluids, painting, electroplating, degreasing and cleaning of metals, and paint stripping. Site types include waste storage and disposal areas, manufacturing operations and disposal areas, and other miscellaneous support and maintenance activity areas. Contaminants have migrated into nearby soil and local surface water and groundwater.

In FY86, the installation was issued a RCRA Part B permit that included requirements for corrective action before an initial RCRA Facility Assessment (RFA) was conducted. A Preliminary Assessment (PA) identified five sites. Two sites continued to the Site Inspection (SI) phase, with the remaining site requiring no further action. In FY91, another site was added (Site 6, Building E plating shop). In late FY95, the installation awarded a contract to complete an Environmental Baseline Survey (EBS) and to develop a BRAC Cleanup Plan.

During FY96, the installation established a restoration advisory board (RAB) and an information repository. The installation also completed its community relations plan and assembled an Environmental Restoration Management Alliance (ERMA) team. The ERMA will serve as a BRAC cleanup team and establish a partnership with state and federal regulatory agencies.

A local reuse committee was formed and developed a land reuse plan during FY96. By FY97, approximately 80 percent of the installation's acreage had been transferred to private entities. A finding of suitability to lease was completed.

Also during FY96, the installation released a final EBS Report and conducted a basewide RCRA Facility Investigation (RFI). Results of the EBS and the RFA were combined to identify solid waste management units (SWMU) and areas of concern (AOC). The installation also completed a final RFA and identified 69 SWMUs and 18 AOCs. Confirmatory sampling was recommended for 33 SWMUs and 14 AOCs, but none of the potential SWMUs or AOCs were included in the restoration program.

FY97 Restoration Progress

The installation completed several restoration activities, including the decontamination of SWMU 7 (a less-than-90-day storage area) and cleanup, repairs, and upgrades at eight SWMUs and AOC K. Work is in progress to repair breaks in the combined sewer system, AOC I. The installation anticipates completing 2,262 samples for the RFI in December 1997. Use of a geoprobe, a local laboratory, and aerial photographs by a local business helped expedite site characterization and fieldwork.

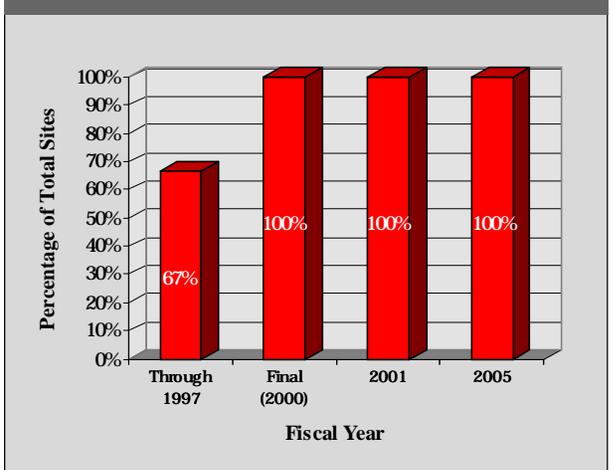
A Tier II Partnering Team, created with the Commonwealth of Kentucky, has allowed elevation of points of conflict from Tier I. The RAB is active in investigative efforts in the field. Seminars are conducted on various aspects of environmental investigation and remediation requirements. Regulatory agencies have concurred in the designation of 75 acres as uncontaminated.

In lieu of the Round 1 RFI Report (scheduled for completion in FY97), the Navy will submit a findings report in early FY98, as well as an RFI Report after the Round 2 investigation.

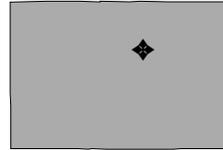
Plan of Action

- Prepare a findings report in FY98
- Transfer and identify sites for the restoration program in FY98
- Complete the corrective measures study for SWMUs in FY98
- Conduct Round 2 field sampling and prepare draft RFI Report in FY98
- Prepare a final RFI Report for Round 2 investigations in FY98
- Apply risk-based cleanup criteria and assess natural attenuation parameters in FY98

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 1,866 acres
Mission: House the 3400th Technical Training Wing; served as a technical training center
HRS Score: NA
IAG Status: IAG under negotiation
Contaminants: Waste oil, general refuse, fly ash, coal, metals, fuels, VOCs, solvents, and petroleum hydrocarbons
Media Affected: Groundwater and soil
Funding to Date: \$35.0 million
Estimated Cost to Completion (Completion Year): \$30.2 million (FY2003)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2000



Denver, Colorado

Restoration Background

In July 1991, the BRAC Commission recommended closure of all but 7 acres of this base. The installation was closed in September 1994. The last 7 acres were closed in September 1997.

Sites identified in previous investigations include fire training areas, landfills, a fly ash disposal area, coal storage yards, and underground storage tanks (UST). Petroleum hydrocarbons, metals, volatile organic compounds (VOC), and solvents are contaminating groundwater and soil. Interim Remedial Actions (IRA) included removal of 20 USTs, removal of free product from the water table, closure of off-base wells, operation of an in situ bioventing system, and construction of an aboveground bioremediation land treatment area. In FY94, the installation began a RCRA Facility Investigation and a basewide groundwater investigation to determine the extent of trichloroethene (TCE) contamination.

In FY95, the installation completed fieldwork for a facility assessment and conducted Phase II site assessments for eight UST sites. The installation began IRAs involving placement of extraction wells at the boundaries of the installation to intercept the TCE groundwater plume and installation of bioventing systems at two petroleum-contaminated sites. Dual-phase vapor extraction is being used at the source of the TCE groundwater plume. The installation also demonstrated a technology that uses a reactive treatment wall to intercept TCE-contaminated groundwater. A Focused Feasibility Study was conducted to characterize a landfill before closure activities.

The installation's technical review committee was converted to a restoration advisory board, and a BRAC cleanup team (BCT) was formed. The Environmental Baseline Survey (EBS) identified 1,649 acres as environmentally suitable for transfer. Of these acres, 1,509

are considered CERFA-clean, but the installation has not received regulatory concurrence on those designations.

During FY96, the BCT conducted concurrent document reviews and used field screening data to expedite decision-making. The BCT coordinated budget programming through participation in peer reviews and reviews of project costs to ensure cost-effective use of BRAC funds. The facility assessment, fieldwork for 18 areas of concern, and Phase I of the basewide groundwater investigations were completed. Actions included initiation of Remedial Investigations (RI) of five study areas and long-term monitoring and operation and maintenance of bioventing systems at two UST sites. In addition, the installation completed removal of all USTs and construction of the hydraulic containment system for the TCE plume.

FY97 Restoration Progress

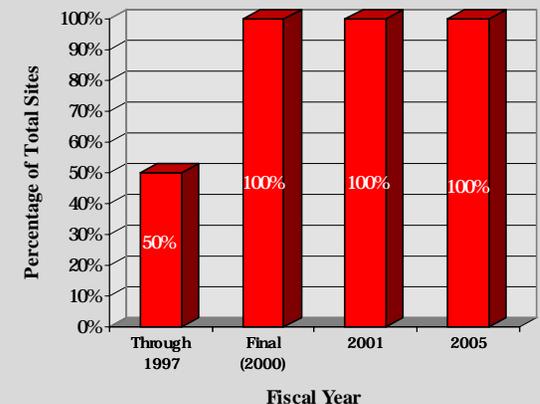
A Local Redevelopment Authority (LRA) road project was used to cap a part of a former coal storage yard. Two hundred and seven acres were deemed transferable by the BCT and decided to the LRA for residential redevelopment. Second-level site assessments were accomplished. The EBS for the BRAC 95 parcel was completed, and the Environmental Impact Statement was initiated. The Remedial Design (RD) for Landfill OU2 was completed. Final definition of groundwater contamination (OU5) was accomplished. The hydraulic containment system began operation, and an interim response (Source Reduction Area project) for OU5 was placed under construction. Final actions at the Flash Disposal Area (OU3) were completed, and the Air Force is pursuing a no-further-remedial-action-planned designation with the regulators. The cleanup of contaminated soil and storage tanks at the Auto Body Shop (OU4) was started.

Activities scheduled for completion in FY97 have been rescheduled for FY98 and FY99. The installation is awaiting a decision on the landfill RA from HQ AFBCA.

Plan of Action

- Complete second-level site assessments in FY98 at removed -UST locations
- Complete the dual-phase vapor extraction system at the TCE source area in FY98
- Complete FSs at three sites and initiate RA, if warranted, in FY98
- In FY98, initiate RAs in additional areas where necessary
- Complete FS at the Landfill Zone in FY98
- Determine suitability for transfer and transfer approximately 500 acres in FY98
- Complete mercury and radiation testing in FY98
- Initiate RD for remainder of coal storage yard
- Split OU5 sites into separate FS documents in FY99
- In FY99, complete the RI/Feasibility Study (FS) for basewide groundwater investigations and begin determining whether further Remedial Actions (RA) are required
- Begin RA construction and conduct closure activities at the Landfill Zone in FY99

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 4,198 acres
Mission: Provide advanced F-16 fighter training
HRS Score: 37.93; placed on NPL in August 1990
IAG Status: Federal Facility Agreement signed in September 1990
Contaminants: Petroleum/oil/lubricants, waste solvents, waste oils, general refuse, lead, and chromium
Media Affected: Groundwater and soil
Funding to Date: \$18.0 million
Estimated Cost to Completion (Completion Year): \$1.4 million (FY2004)
Final Remedy in Place or Response Complete Date: FY1999



Glendale, Arizona

Restoration Background

Historically, Luke Air Force Base provided advanced training to fighter pilots. The current mission of the 56th Fighter Wing, the host unit at the installation, is to provide combat crew training for F-16 aircraft personnel in addition to aircraft maintenance, training, and engineering support.

A Preliminary Assessment completed in FY82 and a basewide Site Inspection completed in FY85 identified 31 sites, which were later consolidated into two operable units (OU). Site types include fire training areas, disposal trenches, landfills, spill sites, and surface drainage canals. Soil is the primary medium affected. Petroleum/oil/lubricants, waste solvents, and waste oils have been identified in disposal trenches and in the fire training areas.

Interim actions conducted at the installation have included removal of three underground storage tanks, use of soil vapor extraction (SVE) to clean up contaminated soils at the North Fire Training Area, and stabilization of the bank of a landfill adjacent to the Agua Fria River.

In late FY91 and early FY92, the installation completed the final Remedial Investigation and Feasibility Study (RI/FS) work plans and field sampling plans. In FY92, an Interim RI Report for OU1 and a Final RI Report for OU2 were submitted to, and approved by, the regulatory agencies. In FY93, a new site at the fuel handling area was discovered and added to OU1. In late FY93, a Final FS Report was submitted to, and approved by, EPA and the state regulatory agency.

In FY94, the installation completed RI fieldwork and submitted a draft report to the regulatory agencies. A Record of Decision (ROD) for OU2 was signed directing the cleanup of one site by soil

bioremediation, and the continuing maintenance and inspection for 30 years of a concrete cap at another site.

In FY94, EPA suspended the laboratory that had analyzed RI samples because of deviations from acceptable quality control practices. EPA's audit of the RI data and suspension of the laboratory delayed completion of a ROD for the installation; however, cleanup activities at OU1 were not delayed.

In FY95, the installation completed construction for the Phase I Remedial Action at OU2. The installation also began a Treatability Study of bioventing at OU1.

A technical review committee was formed and converted to a restoration advisory board (RAB), which includes 24 members representing the community. The installation has an agreement with EPA and the state regulatory agency to perform a Focused Feasibility Study of such generic remedies as soil bioremediation, SVE, and institutional controls.

During FY96, the RAB reviewed and commented on the ongoing programming and budget execution plans. RAB members visited a site at which an internal combustion engine (ICE) SVE technology was in use and received a briefing on the operation. Also in FY96, soil at OU2 was composted to treat contamination with benzo(a)pyrene located off-base and soil was sampled to support a Phase II Remedial Design for composting on-base contamination. The installation deployed an ICE for SVE cleanup of soil contaminated with jet fuel in the bulk fuels storage area of OU1.

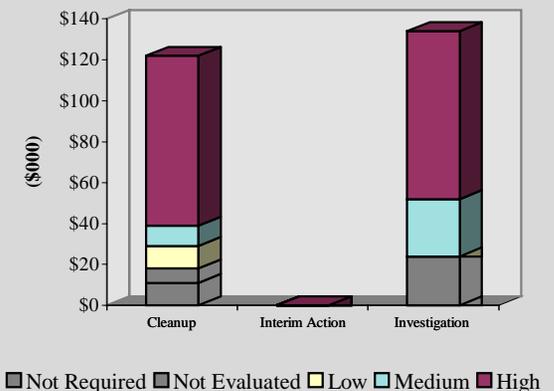
FY97 Restoration Progress

Remediation of contamination at OU2 was completed in July 1997. ICE SVE and geoprobe technology accelerated fieldwork. A meeting with EPA and the state, facilitated by the Air Force Regional Environmental Office, helped resolve issues between regulatory agencies.

Plan of Action

- Complete implementation of ICE SVE at OU1 and complete remediation of the site by FY98
- Complete the Final RI Report in FY98
- Complete the FS Report and sign a ROD for OU1 in FY98

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 165 acres
Mission: Tested rocket engines and exotic rocket fuels
HRS Score: 33.62; placed on NPL in July 1987
IAG Status: IAG signed in 1990
Contaminants: VOCs
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: \$2.7 million
Estimated Cost to Completion (Completion Year): \$0.02 million (NA)
Final Remedy In Place or Response Complete Date: NA



Malta, New York

Restoration Background

Malta Rocket Fuel Area operated as a testing facility for exotic rocket fuels and rocket engines. Its primary site types include aboveground storage tanks, underground storage tanks, dry well areas, and surface disposal areas. Environmental studies have identified volatile organic compounds (VOC)-contaminated groundwater and sediment at the Formerly Utilized Defense Site (FUDS) property.

In FY89, EPA issued a Unilateral Consent Order to eight potentially responsible parties (PRP). In FY90, the state of New York, DoD, and a private corporation entered into an Interim Participation Agreement to conduct the Remedial Investigation and Feasibility Study (RI/FS). The RI, completed in FY93, identified two VOCs, trichloroethene (TCE) and carbon tetrachloride, as the primary contaminants of concern in the groundwater. EPA recommended additional investigation under the RI, including test pit excavations, which were conducted in late FY93. In FY94, the U.S. Army Corps of Engineers (USACE) completed additional RI activities and submitted a revised RI report to EPA for review.

In FY95, the participating parties addressed EPA's comments, completed the RI Report, began FS activities, and submitted a draft FS Report to EPA for review. In addition, PRPs completed the removal of two gas cylinders and drums, and USACE awarded a contract for completing a PRP Search Report.

In FY96, the PRP Search Report was completed. USACE then formulated DoD's position and made recommendations to the Department of Justice. Participating PRPs completed the FS Report.

FY97 Restoration Progress

Based on the technical advice and recommendations provided by USACE, the Department of Justice concluded negotiations with other PRPs for DoD's share of liability. Settlement documents are being routed for final approvals.

Plan of Action

- Complete PRP project in FY98
- In FY98, on completion of the PRP project, refer site to the New York District for evaluation of the need for further actions

FY98 FUNDING BY PHASE AND RELATIVE RISK

All sites are in the long-term monitoring phase.

Size: 6,545 acres
Mission: Maintain, repair, and refuel aircraft
HRS Score: 31.94; placed on NPL in November 1989
IAG Status: Federal Facility Agreement signed in September 1990
Contaminants: VOCs, petroleum/oil/lubricants, and PCBs
Media Affected: Groundwater and soil
Funding to Date: \$131.6 million
Estimated Cost to Completion (Completion Year): \$37.0 million (FY2019)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY1998



Riverside, California

Restoration Background

In July 1993, the BRAC Commission recommended that March Air Force Base undergo realignment. It was also recommended that the installation serve as an Air Reserve Base once realignment has been completed. Base realignment was accomplished in April 1996.

Environmental studies at March Air Force Base began in FY84. During a Preliminary Assessment and Site Inspection, 28 sites were identified at the installation, including three fire training areas, seven inactive landfills, several underground storage tanks (UST), an engine test cell, sludge drying beds at a sewage treatment plant, and various spill sites.

In FY90, an Engineering Evaluation and Cost Analysis and a Removal Action were conducted to prevent the off-base migration of contaminated groundwater. The installation also initiated a Removal Action for the Panero hydrant refueling system and began treatment of contaminated soil. In FY91, sites were grouped into three operable units (OU) to assist in investigation and cleanup. In FY92, a groundwater extraction and treatment system plan was implemented to prevent further migration of groundwater contamination off base.

In FY94, generic remedies, including modified RCRA caps and stream modifications, were initiated at some landfill sites, in conjunction with removal of debris and centralization of waste. Two innovative treatment technologies were demonstrated at the installation through the EPA Superfund Innovative Technology Evaluation program. These technologies involved use of modified vapor extraction and recovery systems to clean up contaminants in soil and groundwater.

In FY95, Removal Actions were conducted at five sites, and two landfills were closed. Soil from several landfills was excavated as part

of the on-site landfill consolidation project. A soil vapor extraction pilot system was installed at Site 31 (Solvent Spill), and an air sparging system was installed at Site 18 (Engine Test Cell). The installation continued long-term monitoring at OU1 and OU3.

In FY94, the technical review committee was converted to a restoration advisory board (RAB), and the installation completed its Environmental Baseline Survey. In FY95, both the RAB and the Local Redevelopment Authority (LRA) were involved in the reuse process at the installation and attended a briefing on the Relative Risk Site Evaluation process.

A Record of Decision (ROD) for OU1 was signed in FY96. Remedial Actions (RA) involving construction of a dual-phase treatment system for groundwater trichloroethene (TCE) contaminated soil began for Site 31 and the related groundwater plume at OU1. Six landfill sites on the western portion of the base were cleaned up. The debris was consolidated at Site 6, allowing the LRA unrestricted use of an additional 100 acres. Soil removal was conducted at Site 12. Interim Removal Actions (IRA) were completed at Site 25 and continued at two sites within the flight line.

FY97 Restoration Progress

The draft final Remedial Investigation and Feasibility Study (RI/FS) was submitted, and the Proposed Plan and ROD for OU2 were completed. The Remedial Design was initiated for a combined treatment facility for Sites 2, 8, and 27. The IRA at Site 30 was completed.

Indicator analytes were used in groundwater sampling to expedite site characterization. The Groundwater Technical Group participated in partnering efforts and held quarterly meetings. Annual RAB training was conducted.

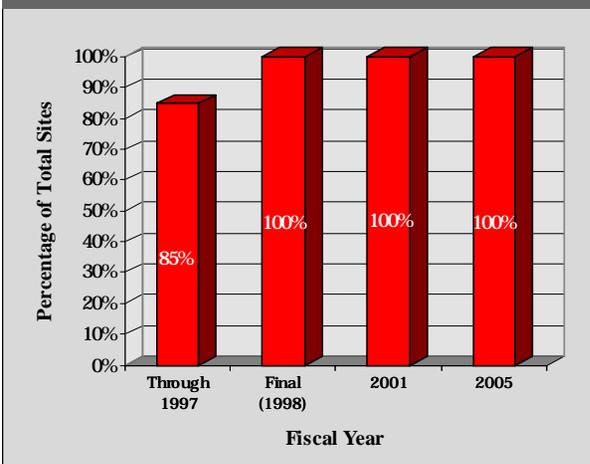
The BRAC cleanup team approved the RI/FS for OU2, six RAs, and the decision document for OU3. It also held a public meeting for OU2.

Some activities scheduled for completion in FY97 were delayed because funds were not provided early enough in the fiscal year.

Plan of Action

- Submit the draft basewide RI/FS in FY98
- Complete basewide RI/FS approval in FY98
- Approve ROD for OU2 in FY98
- Approve basewide Proposed Plan in FY98
- Continue to hold quarterly RAB meetings in FY98
- Complete the ROD for OU3 by FY99

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 5,460 acres
Mission: Maintain and repair ships and provide logistical support for assigned ship and service craft
HRS Score: NA
IAG Status: Federal Facility Agreement signed in September 1992
Contaminants: Heavy metals, VOCs, PCBs, pesticides, petroleum hydrocarbons, lead oxides, and unexploded ordnance
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: \$42.5 million
Estimated Cost to Completion (Completion Year): \$115.0 million (FY2004)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2004



Vallejo, California

Restoration Background

In July 1993, the BRAC Commission recommended closure of Mare Island Naval Shipyard and relocation of the Combat Systems Technical School's Command Activity to Dam Neck, Virginia. The BRAC Commission recommended that the installation's family housing be retained to support Naval Weapons Station Concord. The installation closed on April 1, 1996.

Environmental studies since FY80 have identified 28 sites and 20 solid waste management units at this installation. Sites 1 through 24 have been divided into three operable units (OU) on the basis of the type or location of the contamination and other available information.

The installation completed a Preliminary Assessment (PA) for 15 sites in FY83. In FY88, the installation completed a Site Inspection (SI) for one site and initiated Remedial Investigations and Feasibility Studies for 23 sites. In FY90, the installation completed an initial site characterization (ISC) for one underground storage tank (UST) site. In FY91, SIs were completed for 12 sites and PA/SIs were completed for 6 sites. The installation completed an Interim Remedial Action (IRA) for one site in FY93. In FY93, the installation completed IRAs for six UST sites. In FY94, ISCs were completed for seven UST sites. In FY94, Removal Actions were completed for two sites. The installation also completed a land reuse plan in FY94. The plan includes an open recreational area, offices and light industrial areas, residences, heavy industrial areas, historic districts, and neighborhood centers.

In FY95, the installation initiated Removal Actions for five sites and completed a Removal Action for one site. The installation also began to develop corrective action plans for eight UST sites. The installation also completed an Environmental Baseline Survey, which designated 500 acres of property as CERFA-clean.

During FY96, the installation's BRAC cleanup team (BCT), which was formed in FY94, reviewed cleanup schedules, completed a Time-Critical Removal Action for one site, initiated Removal Actions for two sites, initiated a Record of Decision for no further action for one site, and completed Removal Actions for three sites and the Defense Reutilization and Marketing Office Scrapyard.

The installation formed a technical review committee in FY90 and converted it to a restoration advisory board (RAB) in FY94. The RAB has 25 members and meets monthly. An administrative record and an information repository were established in FY90. The installation completed its community relations plan in FY92 and updated it in FY94.

The BCT negotiated a Memorandum of Understanding (MOU) with the city of Vallejo, the U.S. Fish and Wildlife Service, and the Navy. The MOU outlined the requirements for the cleanup program and a Habitat Conservation Plan. The installation completed a BRAC Cleanup Plan in FY94, revised it in FY95, and updated it in FY96.

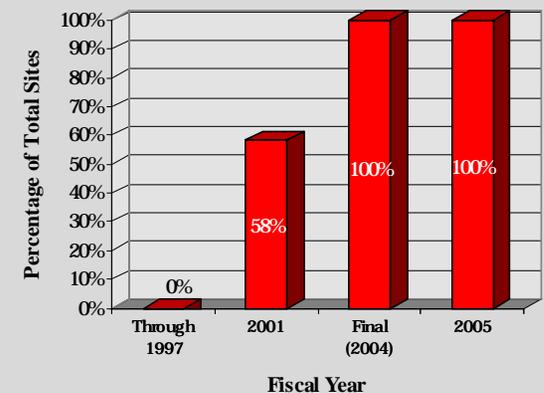
FY97 Restoration Progress

A Removal Action was initiated for one site. USTs were removed, and those UST sites require no further action. The installation instituted a thermal desorption demonstration project for polychlorinated biphenyls (PCB) and employed accelerated fieldwork techniques such as magnetometer, geometrics, geoprobe, and an on-site field laboratory. In FY97, the installation hosted a RAB public site tour and open house.

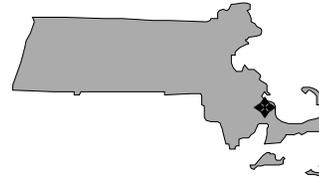
Plan of Action

- Complete Removal Action for one site in FY98
- Complete lead oxide removal action in FY98
- In FY98, accelerate cleanup through use of an integrated schedule combining all elements to transfer property
- Complete unexploded ordnance removal in FY99
- Install landfill cap by FY00

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 22,000 acres
Mission: Provide Army and Air National Guard training and support the East Coast Air Defense and Coast Guard Air and Sea Rescue Units
HRS Score: 45.93; placed on NPL in November 1989
IAG Status: Federal Facility Agreement signed in April 1992, and amended in June 1995.
Contaminants: Waste solvents, emulsifiers, penetrants, photographic chemicals, and VOCs
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: \$184.7 million
Estimated Cost to Completion (Completion Year): \$563.2 million (FY2022)
Final Remedy in Place or Response Complete Date: FY2009



Falmouth, Massachusetts

Restoration Background

Environmental studies have identified 79 sites at the installation. Site types include chemical and fuel spill sites, storm drains, landfills, former fire training areas, coal yards, and more than 180 underground drainage structures. Contamination resulting from activities at the installation has affected an estimated 66 billion gallons of groundwater. Private and municipal wells in the vicinity of the installation were closed after off-base migration of groundwater contamination was detected.

Since FY90, the installation has conducted several cleanup actions. Removal Actions for six sumps associated with the underground drainage structures were conducted in FY91. Contaminated liquids and sediment from these drainage structures were removed and disposed of properly.

In early FY93, a groundwater extraction and treatment system was installed to contain a contaminant plume migrating from a former motorpool and storage yard. Additional Remedial Investigation and Feasibility Study work also began in FY93.

In FY94, an Interim Remedial Action (IRA) was conducted at the largest of four landfills. This IRA involved capping the landfill to reduce infiltration of surface water. The Installation Restoration Program also began a soil treatment project under which thermal desorption was used to treat more than 22,000 cubic yards of contaminated soil from several sites at the installation.

In FY95, partnerships were established with Rice University and the University of Waterloo Center for Groundwater Research to demonstrate innovative technologies at the installation, including reactive wall treatment technology. In October 1995, an air sparging system was implemented to remove subsurface soil contamination at Fuel Spill Site 12.

In June 1996, the strategic plan delineating the cleanup strategy for the reservation was accepted by the appropriate regulatory agency and other stakeholders. In April 1997, the Federal Facility Agreement was amended to include the plume response schedule and enforceable milestones of the strategic plan.

During FY96, 74 community stakeholders were interviewed, and their comments were used in a draft community involvement plan (CIP).

Ongoing restoration activities in FY96 included the continual identification of remedial sites and the cleanup of 20,000 tons of contaminated soil. More than 180 underground drainage structures have been removed. A private-well testing program was initiated to identify replacement drinking water supplies for the neighboring community of Bourne. New monitoring wells were installed for a hydraulic performance evaluation of a groundwater extraction and treatment system.

FY97 Restoration Progress

The installation continued to remove underground drainage structures and conducted thermal treatment of contaminated soil, which led to final remediation and closure of Fire Training Area 1. A computer model for the groundwater extraction and treatment system was developed, and pilot testing of recirculation wells was initiated at three locations. In addition, fieldwork techniques such as on-site laboratories and sampling techniques, sonic geophysical analysis, and microwells for ecological studies were implemented.

The reactive wall pilot program continued and included drilling and sampling of monitoring wells to establish background plume conditions. Furthermore, the CIP was revised and issued for public comment.

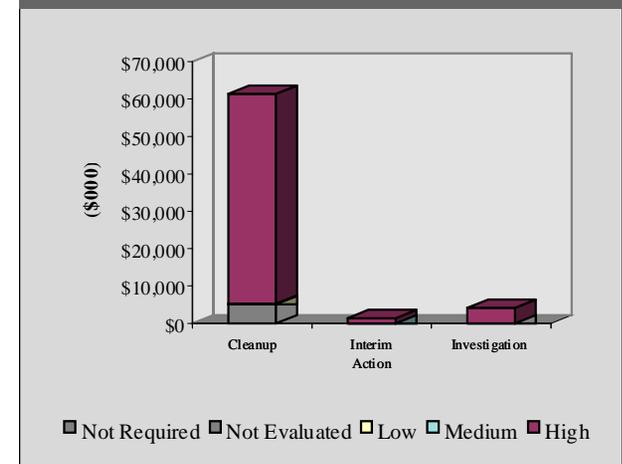
For the Air Force, regulators, and community members to reach consensus on remediation of four plumes, a decision-criteria response action and schedule program was used. Issues not resolved at lower levels were forwarded for resolution through a tiered management structure with representatives from all agencies. Remedial project managers from the Air Force and regulatory agencies developed a protocol for expediting document review.

The reactive wall pilot test was delayed because of equipment and scheduling problems with the subcontractor. The CIP will be finalized upon official acceptance of new charters for the various advisory teams.

Plan of Action

- Continue to refine and utilize modeling tools in FY98
- Install two reactive walls and evaluate effectiveness in FY98
- Remove small source areas of limited soil contamination and design source area remediation in FY98
- Achieve Response Complete at 10 sites and work with state regulators to achieve 25 Site Closeouts
- Continue to update the CIP and finalize it in FY98
- Address four groundwater plumes and have treatment systems in place by FY99

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 5,716 acres
Mission: Conducted Navigation and Electronic Warfare officer training
HRS Score: 28.90; placed on NPL in July 1987
IAG Status: IAG signed in 1989
Contaminants: Solvents, jet fuel, petroleum hydrocarbons, plating waste, and heavy metals
Media Affected: Groundwater and soil
Funding to Date: \$142.4 million
Estimated Cost to Completion (Completion Year): \$106.8 million (FY2005)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY1999



Sacramento, California

Restoration Background

In December 1988, the BRAC Commission recommended that Mather Air Force Base be closed. Before becoming inactive in FY93, the installation housed the 323 Flying Training Wing, as well as a reserve air refueling group and an Army National Guard aviation unit.

Environmental studies conducted since FY82 have identified 88 sites at the installation. The sites were consolidated into five operable units (OU): OU1, Aircraft Control and Warning System; OU2, Groundwater; OU3, Soil; OU4, Landfill; and OU5, Basewide. Prominent site types include landfills, underground storage tanks (UST), fire training areas, a trichloroethene (TCE) disposal site, a weapons storage area, wash-rack areas, spill areas, and waste pits. Petroleum hydrocarbons and chlorinated solvents are the primary contaminants affecting groundwater and soil.

Interim Actions included removing USTs and contaminated soil, supplying an alternative water supply to nearby residents, removing sludge from a former wastewater treatment plant, and removing petroleum product from soil by vapor extraction. Between FY84 and FY97, the installation removed all substandard USTs identified in the environmental studies.

In FY90, a RCRA Facility Assessment identified 48 solid waste management units (SWMU) and two areas of concern (AOC). Twenty-three of the SWMUs and both AOCs required further investigation. By FY94, Remedial Investigation and Feasibility Study (RI/FS) activities had been completed at OU4. In FY94, the regulatory agencies approved the final draft Record of Decision (ROD) for OU1.

In FY95 the regulatory agencies approved the final draft ROD for OU4. Construction was completed and Remedial Action (RA) began for OU1. Removal Actions were initiated to remediate petroleum contamination at several other sites. The installation's Site 29 soil vapor extraction (SVE) system has operated nearly continuously since August 25, 1995, and as of April 1997, had extracted approximately 240,000 pounds of total petroleum hydrocarbons and 1,370 pounds of benzene. Sludge from one site was analyzed before a Removal Action began and then was disposed of in an on-site landfill.

The installation formed a restoration advisory board (RAB) and a BRAC cleanup team (BCT) in FY94. The RAB, which consists of representatives of the public and a co-chair from the Air Force Base Conversion Agency, meets every 6 weeks. An Environmental Impact Statement has been prepared for the disposal and reuse of property at the installation. In FY96 and FY97, public meetings were conducted and revisions of the community relations plan were issued. The RAB was briefed on the Relative Risk Site Evaluations and informed of estimated cleanup times at various sites.

In FY96, the regulatory agencies approved the final ROD for OU2 and OU3. Three of the installation's landfills were consolidated, and an engineered cap was installed at two of the landfills. The installation also completed the RI for OU5. Remedial Design and Remedial Action (RD/RA) activities continued at all OUs. In addition, Remedial Action Plans were prepared for three sites.

FY97 Restoration Progress

The removal of four USTs was completed. Two oil-water separator sites were closed. The Proposed Plan and the draft ROD for OU5 were released, and a public meeting was held to solicit comments.

The pump-and-treat system for OU1 was modified to improve performance of the system in order to reach design capacity. The modification required discharge into Mather Lake instead of reinjection into the aquifer.

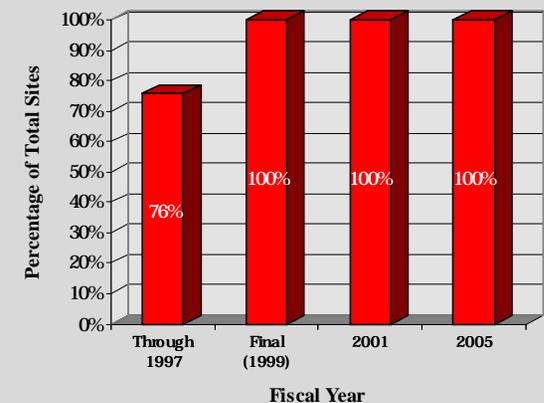
Construction of the pump-and-treat system for OU2 was initiated. An SVE/bioventing in situ system was installed at 11 sites.

A public meeting was held for the basewide OU Proposed Plan. The installation participated in informal and formal dispute-resolution procedures to resolve issues expeditiously with regulatory agencies. The BCT met every 6 weeks to review the program and environmental documents.

Plan of Action

- Remediate, by excavation, various stormwater-drainage channels in FY98
- Remediate the installation's firing and skeet ranges in FY98
- Complete RD/RA activities for OUs 1, 3, 4, and 5 by FY98
- Install SVE/bioventing in situ system at three sites in FY98
- Construct Phase II for OU2 in FY98-FY99, begin operation in FY98
- Complete RD/RA activities for all OUs by FY00

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 4,616 acres
Mission: Provide airlift services for troops, cargo, equipment, passengers, and mail
HRS Score: 31.94 (Area D/American Lake Garden Tract); placed on NPL in September 1984.
 42.24 (Wash Rack/Treatment Area); placed on NPL in July 1987; delisted from NPL in September 1996
IAG Status: Federal Facility Agreement signed in August 1989; Consent Decree with State of Washington signed in February 1992
Contaminants: VOCs, SVOCs, metals, petroleum/oil/lubricants, pesticides, herbicides, and radioactive waste
Media Affected: Groundwater and soil
Funding to Date: \$18.3 million
Estimated Cost to Completion (Completion Year): \$8.9 million (FY2016)
Final Remedy in Place or Response Complete Date: FY1996



Tacoma, Washington

Restoration Background

Environmental studies have identified 65 sites at McChord Air Force Base. Site types include fire training areas, spill areas, landfills, and waste pits. Two sites were listed on the National Priorities List (NPL): the Area D/American Lake Garden Tract (ALGT) and Wash Rack/Treatment Area (WTA). Work began at the ALGT site in FY82, after trichloroethene (TCE) was detected in off-site residential wells. An on-site landfill historically used to dispose of general refuse during the 1960s and 1970s was identified as the source of the TCE plume.

The installation initiated the Remedial Investigation and Feasibility Study (RI/FS) for the ALGT site in FY87 and completed it in FY91. The installation designed a groundwater extraction-well network and contracted for its construction in FY92. In early FY94, the installation completed construction and began operating the groundwater treatment plant, which includes carbon adsorption treatment units.

The RI/FS for the WTA site began in FY90 and was completed in FY92. The WTA was used as an outdoor aircraft wash area. Historically, wash water from the area drained directly into dry wells. The Record of Decision (ROD) for one part of the WTA site determined that groundwater in the leach pits required only monitoring. A ROD for the other portion of the WTA site specified that fuel floating on the shallow water table was to be removed and that fuel-contaminated soil must be evaluated for cleanup. In FY93, the installation began a pilot-scale test to determine the feasibility of passive fuel recovery from the trenches. Activities completed during the pilot-scale study revealed that floating fuel had been removed or naturally attenuated to the extent practical, and that, because the fuel-contaminated soil was not acting as a secondary source of groundwater contamination, the soil did not warrant cleanup.

In FY95, the installation completed studies at the two State of Washington-listed sites (SS-34 and WP-44) to evaluate the feasibility of using bioremediation. In addition, an RI/FS recommending no further action at Site WP-44 was completed and approved by the state of Washington.

The Air Force and the regulatory agencies signed a joint Explanation of Significant Differences (ESD). The ESD explained the difference between the cleanup alternative initially selected in the ROD and the alternative implemented. The ESD also stipulated that the installation begin long-term monitoring (LTM) and natural attenuation to treat contamination at the WTA site. In FY95, the installation implemented LTM at the WTA site and requested that the site be removed from the NPL.

In FY96, McChord Air Force Base mailed restoration advisory board (RAB) contact cards to more than 10,000 local residences. Only two cards were returned from individuals interested in being members of a RAB. The installation continued to operate the groundwater treatment system at the ALGT site. LTM continued at SS-34 and WP-44, and the WTA sites. The installation signed a decision document designating no further action at the remaining four active sites. All 65 sites are classified as having Remedial Action in place. Effective September 26, 1996, the EPA removed the WTA site from the NPL.

FY97 Restoration Progress

McChord Air Force Base continued operations at the ALGT groundwater treatment plant. The installation also continued the LTM program. McChord Air Force Base began evaluating natural attenuation of chlorinated solvents at ALGT. The base has asked the Region 10 EPA project manager to begin removing more than 1,000 acres of the Area D/American Lake Garden tract site from the NPL.

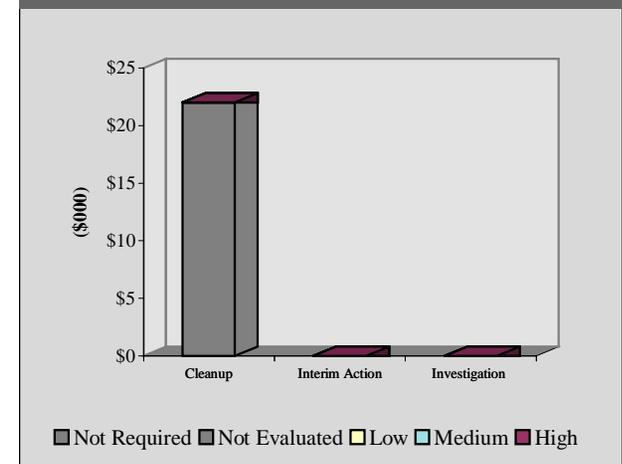
Included in the 1,000 acres is an off-base residential area. Removing the residential area from the NPL should increase the residential property value, thereby helping the community.

Some activities scheduled for completion in FY97 were delayed because the Washington Department of Ecology changed its project managers for the base and was reluctant to sign a no-further-action decision document that might prevent it from enforcing cleanup of undiscovered future contamination.

Plan of Action

- Continue ongoing operations at the groundwater treatment plant at the ALGT in FY98
- Continue the installation's LTM program in FY98
- By FY99, obtain written concurrence from the regulatory agencies for closeout of 27 sites requiring no further action
- Complete the evaluation of natural attenuation of chlorinated solvents at ALGT

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 3,688 acres
Mission: Provide logistics support for aircraft, missile, space, and electronics programs
HRS Score: 57.93; placed on NPL in July 1987
IAG Status: IAG signed in 1989
Contaminants: Solvents, metal plating wastes, caustic cleaners and degreasers, paints, waste lubricants, photochemicals, phenols, chloroform, spent acids and bases, and PCBs
Media Affected: Groundwater and soil
Funding to Date: \$360.7 million
Estimated Cost to Completion (Completion Year): \$471.0 million (FY2033)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2033



Sacramento, California

Restoration Background

Environmental contamination at McClellan Air Force Base has resulted from sumps near industrial operations, landfills, leaks near industrial waste lines, surface spills, and underground storage tanks (UST). A study in FY79 detected groundwater contamination that led to the closure of two on-base and three off-base drinking-water wells. In addition to 373 acres of contaminated soil in the vadose zone, three large plumes of contaminated groundwater have been identified over 660 acres.

Sites at the installation were grouped into 11 operable units (OU), including an installationwide Groundwater OU. Preliminary Assessments and Site Inspections have been completed for all OUs, and the Remedial Investigation (RI) for five OUs has been completed. The first interim Record of Decision (ROD), signed in FY93, addressed polychlorinated biphenyl (PCB) contamination at OU B1. In FY95, the Groundwater OU interim ROD was signed. The installation has implemented 210 Interim Remedial Actions, including a landfill cap, construction of a groundwater treatment plant, and demolition of an electroplating facility. The UST program has removed or abandoned in place 210 USTs.

To streamline the decision-making process, the installation and regulatory agencies signed three consensus statements that establish background levels for inorganic contaminants in soil, develop a rationale for making decisions for no further investigation, and document the procedure for risk screening and Baseline Risk Assessments. Another streamlining effort resulted in the development of a basewide Engineering Evaluation and Cost Analysis for implementing soil vapor extraction (SVE) at McClellan Air Force Base.

In FY93, the installation was selected as a National Test Site for technologies that clean up chlorinated solvents and inorganic contaminants in soil and groundwater. Flameless thermal oxidation for SVE of gas and dual-phase extraction for groundwater and soil cleanup have been demonstrated successfully at the base and are now an integral part of the cleanup program.

During FY95, the installation converted its technical review committee into a restoration advisory board.

FY97 Restoration Progress

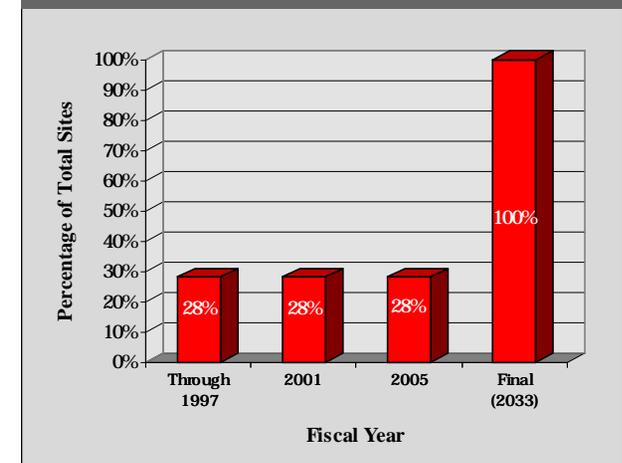
To date, over 700,000 pounds of contamination have been removed from the soil and groundwater at the base. Groundwater and soil cleanup continued with the operation of five existing SVE systems and a groundwater treatment system that pumped 700 gallons per minute of contaminated groundwater from 32 extraction wells. Two SVE systems began operation, and a dual-phase extraction system was installed to treat volatile organic compound (VOC)-contaminated soil and groundwater. Thirty-six on- and off-base groundwater wells were decommissioned, eliminating possible conduits for additional soil and groundwater contamination. Thirteen USTs were removed, and 33,000 feet of linear piping associated with the industrial waste line were inspected and 4,000 feet repaired. Investigative sampling for most of the base's industrial operations was completed. A treatment optimization strategy for groundwater cleanup was initiated. This strategy has saved \$3 million to date. A strategy for landfill cleanup that will save McClellan over \$130 million in cleanup cost was developed, and a Radiological Working Group was organized to set data quality objectives, background, and cleanup standards.

In September 1996, the base reported noncompliance in a discharge of treated groundwater into Magpie Creek. The noncompliance occurred during groundwater treatment plant modifications undertaken to incorporate more cost-effective carbon treatment into the system. On 24 February 1997, EPA assessed a \$15,000 penalty under the Federal Facility Agreement. The installation elected not to invoke dispute resolution and has accepted all responsibility for the noncompliance.

Plan of Action

- Design and install Phase II of the groundwater actions in FY98, in compliance with Interim ROD requirements for groundwater
- Install 13 SVE systems by the end of FY99
- Complete all RIs by FY99
- In FY99, complete a ROD for remediation of VOCs that allows final actions for soil before the installationwide ROD, addressing restoration of all 11 OUs, is completed in FY03
- Receive congressional approval, and pay EPA stipulated penalties

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 824 acres
Mission: Provide inventory management and supply support for weapons systems
HRS Score: 50.00; placed on NPL in May 1994
IAG Status: Federal Facility Agreement under negotiation
Contaminants: PCBs, heavy metals, pesticides, VOCs, SVOCs, and dioxin
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: \$16.3 million
Estimated Cost to Completion (Completion Year): \$34.4 million (FY2008)
Final Remedy in Place or Response Complete Date: FY2008



Mechanicsburg, Pennsylvania

Restoration Background

Historical defense industrial and inventory disposal operations have caused contamination at this installation. Environmental investigations conducted since FY84 have identified 15 CERCLA sites.

In FY89, the installation completed a Remedial Investigation and Feasibility Study (RI/FS) for Site 9, the Storm Water Drainage Ditch. Subsequently, Removal Actions were conducted to remove polychlorinated biphenyl (PCB)-contaminated soil from a portion of the ditch and to install fencing and a Gabion dam. In FY92, the installation completed an RI/FS for Site 3. In FY93, it completed an RI at Site 1. The Human Health Risk Assessment for Site 1 began in FY94. The Remedial Design (RD) for Site 9 was completed in FY93, and additional contaminated soil and sediment were removed in the Remedial Action (RA). The installation also completed RD/RA at Site 10 to remove leaking underground storage tanks and contaminated soil.

In FY93, the installation began an Interim Remedial Action (IRA) at Site 3, the Ball Road Landfill and Burn Pits, by removing contaminated soil and treating it by bioremediation for petroleum products and organic compounds. The installation is discussing additional remedial processes with state and federal regulatory agencies to address all contaminants of concern.

In FY95, a Time-Critical Removal Action was conducted at the Tredegar Industries, Inc., property located next to the installation. Approximately 600 tons of PCB-contaminated soil were removed.

The technical review committee, formed in FY88, helped foster good working relationships among the regulatory agencies, local municipalities, and the installation. Effective partnerships and community involvement are just two of the positive results of those

good relationships. To establish greater community involvement, the installation also established a restoration advisory board (RAB) in FY95. The RAB meets bimonthly.

During FY96, the installation initiated a basewide Ecological Risk Assessment (ERA) and started work on the site management plan. The installation prepared a design for groundwater modeling of a landfill at Site 3 and began to conduct the Focused FS (FFS). Additional sampling of the biocell soil was performed at Site 3, and long-term monitoring continued at Site 9. The RI/FS for Site 9 did not begin during FY96 because completion of the basewide ERA is necessary to determine whether additional work is required.

FY97 Restoration Progress

The Human Health Risk Assessment at Site 1 was completed, and the installation conducted an IRA at Site 11. On-board review of work plans for RIs at Sites 12 through 15 was implemented. The installation continued negotiations with EPA toward a final Federal Facility Agreement.

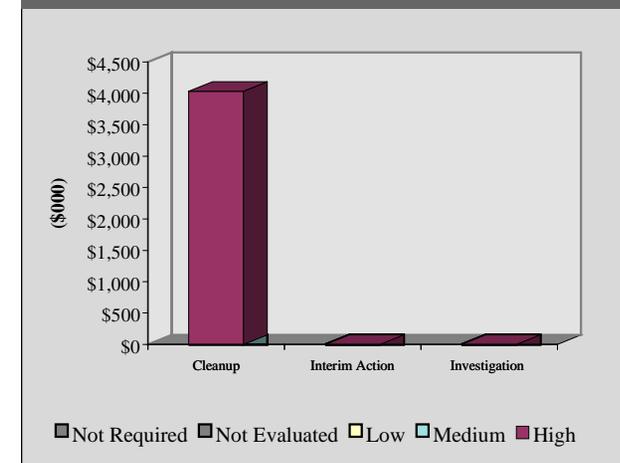
Monthly partnering efforts with the Navy and regulatory agencies led to a consensus approach to resolving differences. To provide the community with a better understanding of the installation's sites, a bus tour at all 15 sites was conducted for the RAB and other community members.

Some activities scheduled for completion in FY97 were delayed because the EPA's review of the landfill modeling took longer than expected.

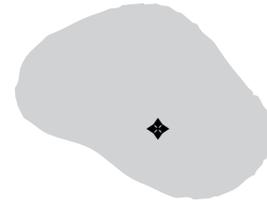
Plan of Action

- Complete the basewide ERA and site management plan in FY98
- Complete the FFS and RD and begin RA at Site 3 in FY98
- Submit final PRAP and Record of Decision for Site 3 in FY98
- Complete the RI/FS for Sites 12 through 15 in FY98
- Complete RD for Site 3 in FY98

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 1,535 acres
Mission: Provided aviation support services
HRS Score: NA
IAG Status: None
Contaminants: Heavy metals, pesticides, PCBs, and petroleum/oil/lubricants
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: \$15.2 million
Estimated Cost to Completion (Completion Year): \$0 (FY1997)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY1997



Midway Island

Plan of Action

- Complete LTM of Site 1 and 2 landfills in FY98
- Complete cleanup closure status report in FY98

Restoration Background

In 1940, a Naval Station was established at Midway Island. In 1978, the Naval Station was redesignated as the Naval Air Facility. The Navy operated and maintained facilities and provided services and materials to support aviation activities. Since FY88, environmental studies at Midway Naval Air Facility have identified 42 sites. Site types include landfills, disposal and storage areas, a former power plant, a rifle range, and pesticide spill areas.

In July 1993, the BRAC Commission recommended closure of the facility. The installation was transferred to the U.S. Fish and Wildlife Service for use as a national wildlife refuge. The installation was closed in FY93.

An Environmental Baseline Survey was completed in FY94, and a Human Health Risk Assessment was completed for all 42 sites in FY95. Representatives of the Navy, EPA, and other federal agencies formed a partnership that has successfully reduced cleanup costs through cooperative decision-making. Because Midway Island is remote and sparsely populated, no local community issues affect it. The installation does not have a restoration advisory board (RAB) because there are neither regulatory agencies with authority over the area nor an affected community. An information repository was established at the University of Hawaii at Manoa in FY95.

In FY93, the installation formed a BRAC cleanup team (BCT) that includes representatives from the Navy and EPA Region 9. The BCT meets quarterly to review the cleanup status and develop the strategy for future cleanup.

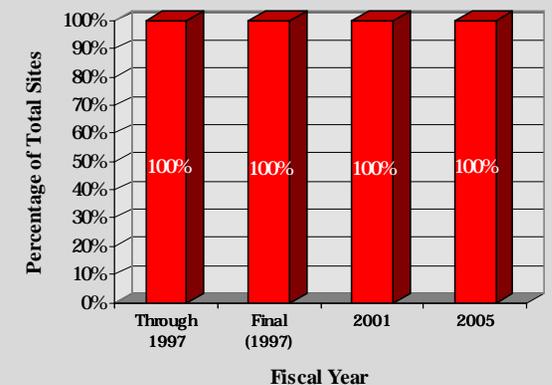
FY97 Restoration Progress

Demobilization of the Navy from the Midway Naval Air Facility occurred in June 1997. All cleanup efforts were completed by this time. The Baseline Ecological Risk Assessment for one site was completed. Remedial Investigations and Feasibility Studies were performed for five sites. Removal Actions were completed to remove contaminated soil from eight sites, cap landfills at two sites, remove drums from four sites, remove marine debris from four sites, and cap abandoned outfalls at one site. The complete remediation of soil and groundwater at 15 underground storage tank sites was accomplished.

Cost-effective cleanup strategies were developed at quarterly meetings with regulators and stakeholders. A contractor was used for many of the environmental cleanup actions. Technological initiatives included use of an on-site laboratory and installation of a soil vapor extraction and bioslurping system. A direct-push geoprobe was utilized for site characterization.

In FY97, the BCT agreed on closure of all restoration sites and maintenance of long-term monitoring (LTM) at two of the 42 sites (Site 1 and 2 landfills) until summer FY98 and terminated the FIVE cleanup system of petroleum, oil, and lubricants for underground and aboveground storage tanks. The BCT finalized the last BRAC Cleanup Plan in March and continues to work on the cleanup closure status report. By the end of FY97, all environmental work at Midway was complete with the exception of the LTM at Sites 1 and 2.

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 22,436 acres
Mission: Load, assemble, pack, ship, and demilitarize explosive ordnance
HRS Score: 58.15; placed on NPL in July 1987
IAG Status: IAG signed in 1989
Contaminants: Munitions-related wastes, heavy metals, solvents, paints, thinners, and acids
Media Affected: Groundwater and soil
Funding to Date: \$70.9 million
Estimated Cost to Completion (Completion Year): \$267.7 million (FY2033)
Final Remedy in Place or Response Complete Date: FY2005



Milan, Tennessee

Restoration Background

Preliminary Assessment and Site Inspection activities conducted at Milan Army Ammunition Plant in FY87 identified 25 sites requiring further investigation. The installation divided the sites into five operable units (OU): three OUs associated with the O-Line Ponds Area, one OU for the Northern Area, and one OU for the southern area. Installation soil and groundwater are contaminated with lead, other heavy metals, and explosive compounds. Contamination exists throughout the loading, assembling, and packing lines and at the open-burn and open-detonation area.

A Remedial Investigation and Feasibility Study (RI/FS) began in FY88. Representatives of EPA and state regulatory agencies approved the RI report in FY92. The report recommended no further action at three sites, Remedial Design and Remedial Action (RD/RA) for the O-line ponds and associated groundwater, and collection of additional RI data for the remaining sites.

In FY91, the city of Milan discovered explosive-compound contamination in its municipal water supply wells. In FY93, representatives of the Army, the city of Milan, EPA, and the state of Tennessee completed a contingency plan to protect the municipal water supply. The Army provided \$9 million to the city of Milan for development of new municipal water sources. In FY95, the Army and regulators signed a Record of Decision (ROD), and construction continued on the new municipal water system. To help prevent further off-site migration of contaminated groundwater, the installation constructed and began operating an ultraviolet oxidation treatment system for groundwater.

Interim Actions completed before FY95 include removal of underground storage tanks, capping of abandoned O-line ponds to

prevent entry of contamination into the groundwater, and removal of contaminated installation drinking water wells.

The installation also began RD activities for a carbon treatment system for groundwater at the Northern Boundary Site. An innovative technology demonstration began in FY95 to analyze the effectiveness of phytoremediation for the treatment of explosives-contaminated groundwater.

In FY96, the installation completed the design of a groundwater treatment plant for the Northern Boundary Site (OU3). The phytoremediation demonstration was expanded to a 15-month pilot-scale program. In addition, the installation initiated innovative bioremediation efforts that entail open-windrow composting of explosives-contaminated soil in the Northern Industrial Area. The installation also initiated fieldwork for an RI to address on-post soil source areas and off-post groundwater contamination.

A restoration advisory board (RAB) was formed in FY94. In FY96, the RAB continued to meet quarterly and conduct tours of the installation for interested parties. The installation also continued to solicit new members for the RAB.

FY97 Restoration Progress

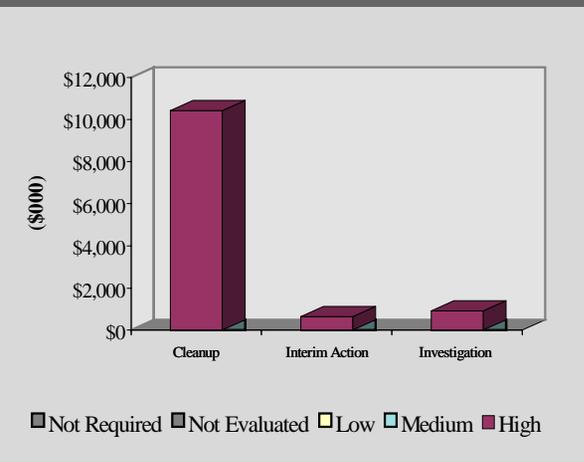
The installation started construction of a groundwater treatment plant for the Northern Boundary Site (OU3). The installation also completed the OU2 capping project and began the presumptive carbon treatment remedy. Based on the results of the demonstration, innovative phytoremediation techniques were implemented. Project managers met every 2 months to discuss issues that could either slow down the cleanup process or cause additional cost, throughout FY97. The public and RAB members were given tours of the phytoremediation demonstration project in FY97.

The state of Tennessee worked closely with the installation to make the groundwater treatment plants operational. The first three activities on the current plan of action were scheduled for completion in FY97. They were delayed because of funding constraints and the emergence of technical issues concerning discharge limits.

Plan of Action

- Complete construction and startup of the groundwater treatment plant for the Northern Boundary Site (OU3) by the end of FY98
- Complete RI/FS for OU5 by FY98
- Complete the phytoremediation pilot-scale testing of FY98
- Begin bioremediation of explosives-contaminated soil at the installation's Industrial Area (OUs 3 and 4) in FY99
- Complete the ROD for the western boundary for OU4 in FY99
- Operate and maintain the groundwater treatment plant and cap for the former O-Line Ponds Area
- Complete construction of bioremediation system for the Southern Study Area in FY99

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 280 acres
Mission: Provide tactical airlift support
HRS Score: 33.70; placed on NPL in July 1987
IAG Status: None
Contaminants: Petroleum/oil/lubricants, spent solvents and cleaners, battery acid, paint wastes, PCBs, and chlorinated hydrocarbons
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: \$4.2 million
Estimated Cost to Completion (Completion Year): \$0.6 million (FY2005)
Final Remedy in Place or Response Complete Date: FY1996



Minneapolis, Minnesota

Restoration Background

The Minneapolis-St. Paul Air Reserve Base in Minneapolis, Minnesota, is a small base that has provided support to the military since 1955. The primary area of environmental concern at the installation has been the Small Arms Range Landfill, located on a noncontiguous property 2 miles from the main installation on the Minnesota River. The landfill was used as a solid waste disposal area from 1963 to 1972 and contains primarily general refuse. However, the landfill also may have been used to dispose of industrial wastes. Groundwater investigations at monitoring wells around the landfill have detected low concentrations of volatile organic compounds (VOC).

The landfill has undergone a Preliminary Assessment and Site Inspection, followed by a Remedial Investigation and Feasibility Study. A Proposed Plan was completed in FY91, and the Record of Decision (ROD) was signed in early FY92.

The Remedial Design and Remedial Action (RA) for the landfill, including design and construction of a groundwater and surface-water monitoring program, coupled with natural attenuation, was completed in FY92. Access to the landfill was controlled by constructing a fence at the site. In FY94 and FY95, the VOC levels detected in groundwater samples from the landfill were all below the levels established in the ROD.

The installation has one other site of interest (not listed on the National Priorities List [NPL]), a former spill area. Groundwater contaminants associated with this area are petroleum/oil/lubricants. The RA implemented in FY91 included a groundwater extraction and treatment system to contain, extract, and treat free product at the site.

In FY96, the installation published in the Federal Register a notice of intent to delete the base from the NPL.

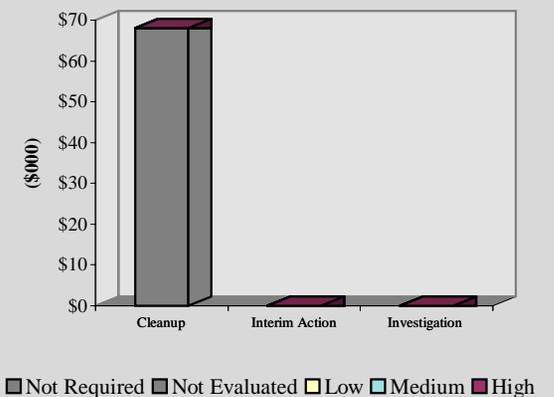
FY97 Restoration Progress

The installation continued to print an annual public notice in the local newspaper to promote interest in the formation of a restoration advisory board. Remedial operations and monitoring at the former spill area also continued, and an updated fact sheet was completed for all sites. In December 1996, the site was deleted from the NPL. A 5-year statutory review to complete site closure began in 1997 and will continue as long as EPA concludes that hazardous waste is present on-site.

Plan of Action

- Continue remedial operations and monitoring at the former spill area

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 3,097 acres
Mission: Provided support for antisubmarine warfare training and patrol squadrons and served as Headquarters for Commander Patrol Wings of the Pacific Fleet
HRS Score: 32.90; placed on NPL in July 1987
IAG Status: Federal Facility Agreement signed in September 1990
Contaminants: PCBs, petroleum products, DDT, chlorinated cleaning solvents, and heavy metals
Media Affected: Groundwater and soil
Funding to Date: \$62.1 million
Estimated Cost to Completion (Completion Year): \$69.3 million (FY2010)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2009



Sunnyvale, California

Restoration Background

In July 1991, the BRAC Commission recommended the closure of Moffett Field Naval Air Station. The installation was closed, as scheduled, on July 1, 1994, and transferred to the National Aeronautics and Space Administration (NASA).

Environmental studies since FY84 have identified 34 sites at the installation. Prominent site types include landfills, underground storage tanks (UST), a burn pit, ditches, holding ponds, french drains, maintenance areas, and fuel spill sites. Contaminants of concern include polychlorinated biphenyls (PCB), petroleum products, the pesticide DDT, chlorinated solvents, and heavy metals. These contaminants have been released into groundwater and soil. The installation was divided into seven operable units (OU). In FY90, initial site characterizations were completed for three UST sites, and 14 USTs were removed. Four leaking USTs were removed from another UST site in FY91.

The installation completed an Interim Remedial Action (IRA) to remove USTs from one site in FY90 and an IRA to conduct groundwater remediation at three other sites in FY91. Remedial Investigations (RI) also were completed for OUs 1, 2, and 5 in FY93 and for another site in FY94. Also in FY94, the installation completed a Removal Action that involved excavation and treatment of contaminated soil at one site. An IRA to remove contaminated soil was completed at another site.

During FY95, the installation completed a Site Inspection (SI) for one site. The installation also completed RIs for OU6 and three other sites and feasibility studies (FS) for OUs 1 and 5. In addition, a Record of Decision (ROD) for no further action (NFA) was signed for seven sites, and a Remedial Action (RA) for one site. The installation designed and constructed a bioventing treatment system for one site,

designed and constructed a soil vapor extraction system for another site, and designed and constructed a recirculating in situ treatment (RIST) system for a third site.

An Environmental Baseline Survey, completed in FY94, designated 7 acres as CERFA-clean. The installation completed a Phase I Ecological Risk Assessment (ERA) in FY95. In FY96, the installation initiated FSs for two sites, and OU6; signed a ROD and initiated a Remedial Design (RD) for one site; initiated an RD for one site; initiated a ROD for NFA and removed all inactive USTs from one site; and initiated negotiations for NFA at four sites. An RD and a groundwater treatment using a permeable reaction cell were completed for one site. The installation also initiated a Phase II ERA during FY96 while completing a finding of suitability to transfer for the Naval Air Manor and preparing an Environmental Business Plan.

The installation completed a community relations plan in FY89 and established an information repository at a local library. It converted its technical review committee, formed in FY89, to a restoration advisory board (RAB) in FY95.

In FY94, the installation formed a BRAC cleanup team (BCT) and completed a BRAC Cleanup Plan (BCP). It updated the BCP in FY95. During FY96, the RAB met monthly and held two public meetings to discuss remedy alternatives for two OUs. Local television news stations toured the installation and interviewed installation staff.

FY97 Restoration Progress

The ROD for OU1 was signed, and the RD and RA for one site were completed. OU6 was completed along with the Phase II ERA. The pilot test on the permeable reaction cell continued. The installation also conducted a three-dimensional seismic reflection survey to

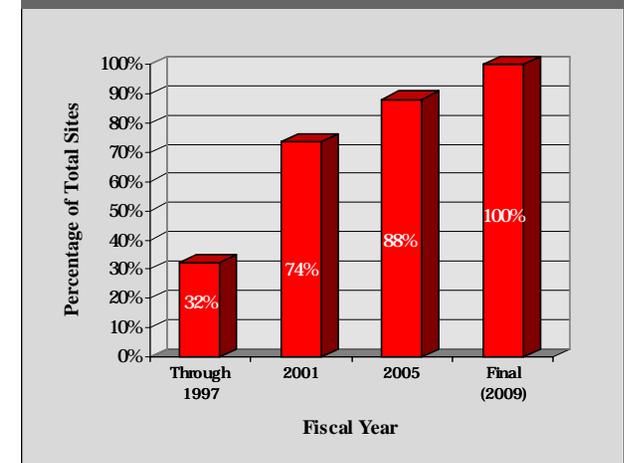
optimize groundwater extraction well locations and scope the location of sodium dithionite injection. A micropurge sampling technique was employed to reduce wastewater volume and shorten sampling time for quarterly sampling. The Site 2 RA was completed. A landfill cap was installed as a presumptive remedy. A design construction integration plan was employed at the installation along with quarterly long-term planning by BCT members to focus site actions.

Some activities scheduled for completion in FY97 were delayed because of a lack of funding and differences in ecological assessments.

Plan of Action

- Complete the RI/FSs for all sites in FY98
- Complete the FS and initiate RD for two sites in FY98
- Complete the RA and begin operations and maintenance efforts for one site in FY98
- Complete transfer of the Naval Air Manor by FY98
- Initiate the RA for three sites in FY98
- Complete the RA for OU6 in FY98
- Sign the basewide ROD in FY99
- Complete the RD for one site and OU6 in FY99

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 9,607 acres
Mission: Served as tactical air command, air transport, and strategic air command base; provided pilot training
HRS Score: 50.00; placed on NPL in October 1992
IAG Status: None
Contaminants: VOCs, jet fuel, possibly tetraethyl lead and low-level radioactive materials
Media Affected: Groundwater and soil
Funding to Date: \$2.6 million
Estimated Cost to Completion (Completion Year): \$0.2 million (FY1999)
Final Remedy In Place or Response Complete Date: FY1998



Moses Lake, Washington

Restoration Background

Larson Air Force Base served as a tactical air command base, then as a military air transport facility and a Strategic Air Command base. The installation was sold to the port of Moses Lake in 1966. It currently is operated by Grant County Airport, which is a regional aviation, industrial, and educational facility. The Moses Lake Wellfield is a city-owned water supply for residents of the former Larson Air Force Base housing area. The Wellfield property is located on the former base. This drinking water supply system is separate from other city drinking water systems. The city has performed Remedial Action activities at Wellfield, and concentrations of trichloroethene (TCE) have been reduced below the levels established in the Federal Drinking Water Standards. A privately owned water supply system for the Skyline community remains contaminated with TCE. The Skyline property adjoins the former base.

Beginning in FY87, environmental assessments identified four sites that required further investigation: 11 underground storage tanks (UST) and associated potentially contaminated soil; a TCE-contaminated groundwater plume; an area potentially containing low-level radioactive wastes; and two disposal areas potentially containing tetraethyl lead.

In FY88, TCE was detected in the Moses Lake Wellfield. A Phase I Remedial Investigation (RI) was initiated in FY91 by the U.S. Army Corps of Engineers (USACE), Seattle District, to identify potential source areas that would require further characterization. In FY93, the Phase I RI was completed. In FY94, three additional rounds of groundwater sampling were conducted under an addendum to the Phase I RI. The port of Moses Lake conducted an Interim Response

Action, providing bottled water to the community. In FY92, 11 USTs were excavated and removed from the site.

In FY94, USACE Seattle District, under contract to EPA, completed an Engineering Evaluation and Cost Analysis (EE/CA) to evaluate the drinking-water system. The EE/CA was distributed for public comment, and a public meeting was conducted.

In FY95, USACE Omaha District completed a search for potentially responsible party (PRP) and a cost allocation effort. USACE Seattle District also completed the addendum to the Phase I RI, including additional groundwater sampling. Also in FY95, USACE Omaha District submitted a cost allocation proposal to EPA based on the PRP search.

FY97 Restoration Progress

The Omaha District Office of Counsel, in coordination with its Department of Justice attorney, is in negotiation with EPA Region 10. These negotiations will lead to a determination of government liability and a decision on who (EPA, USACE, or PRPs) will take the lead in the coming investigation and Remedial Action.

Plan of Action

- Coordinate efforts with the Department of Justice to advocate DoD's responsibility and position at the site in FY98
- Continue partnership with EPA Region 10 and develop partnerships with the state of Washington Regulatory Agency in FY98

FY98 FUNDING BY PHASE AND RELATIVE RISK



■ Not Required ■ Not Evaluated □ Low □ Medium ■ High

Size: 6,000 acres
Mission: Provide composite combat air power worldwide
HRS Score: 57.80; placed on NPL in August 1990
IAG Status: Federal Facility Agreement signed in January 1992
Contaminants: VOCs, petroleum/oil/lubricants, and heavy metals
Media Affected: Groundwater and soil
Funding to Date: \$8.1 million
Estimated Cost to Completion (Completion Year): \$0.1 million (FY1996)
Final Remedy in Place or Response Complete Date: FY1996



Mountain Home, Idaho

- In FY98, plan and initiate a Treatability Study to enhance the natural attenuation at Site ST-11
- Continue to pursue deletion of the installation from the NPL in FY98

Restoration Background

Environmental studies conducted since FY83 have identified 32 sites at Mountain Home Air Force Base. Sites include landfills, fire training areas, a fuel hydrant system spill area, disposal pits, surface runoff areas, wash racks, ditches, underground storage tanks (UST), petroleum/oil/lubricant (POL) lines, and a low-level-radioactive-material disposal site. Releases from POL lines and spill sites have contaminated groundwater and soil with petroleum hydrocarbons, heavy metals, and volatile organic compounds (VOC), including trichloroethene (TCE). To improve and accelerate site characterization, the installation grouped the sites into operable units (OU).

From FY91 to FY92, Removal Actions included clean closure and removal of 12 USTs. In FY93, the installation recommended no further action for 15 of 21 sites at OU1. The remaining six sites at OU1 and one new site were combined to form OU6. As a result, restoration activities at OU1 are now complete. In FY92, Remedial Investigation (RI) activities were initiated for OU3 and OU6. A no further action Record of Decision (ROD) was signed for OU4, and an Interim Remedial Action (IRA) was conducted at OU5 (low-level-radioactive-material site). The IRA consisted of excavating 2 cubic yards of contaminated soil, a pipe, and six 55-gallon drums. Because analysis of soil samples and removed items did not reveal radioactive contamination, the excavated soil, pipe, and drums were disposed of as low-level radioactive waste.

In early FY93, a no-further-action ROD was signed for OU2. However, in mid-FY93, the state regulatory agency orally requested that 3 acres of one landfill at OU2 be capped. In late FY93, the installation complied with that request.

During FY95, the installation completed RI activities for OUs 1, 3, 5, 6; the lagoon landfill; and Fire Training Area 8. A draft RI and a final

RI Report were submitted to EPA and the state regulatory agency, and the installation began groundwater modeling, using the results of analysis of groundwater samples to determine the extent of migration of the contaminant plume.

The installation converted its technical review committee to a restoration advisory board (RAB) in FY94. The installation holds quarterly RAB meetings and in FY96, advertised the meetings in the local newspaper to increase public involvement.

In FY96, a ROD was signed for OUs 1, 3, 5, 6; the lagoon landfill; and Fire Training Area 8. Only OU3 requires further action. The regional groundwater was monitored to resolve uncertainties in the ground-water transport model. The perched water at Site ST-11, the flightline fuel spill site, was monitored. The installation submitted a request to EPA to delete the installation from the National Priorities List (NPL) in FY96. EPA indicated that it prefers to wait until a required 5 year review has taken place at site ST-11 before it begins the delisting process. The installation will continue to urge delisting of the installation from the NPL.

FY97 Restoration Progress

The installation continued to monitor regional groundwater for the groundwater transport model. The perched water at Site ST-11 also continued to be monitored. Deletion of the installation from the NPL continued to be pursued. These activities are expected to continue until September 2000.

Plan of Action

- Continue to monitor regional groundwater in FY98
- Continue to monitor the perched water at Site ST-11 in FY98

FY98 FUNDING BY PHASE AND RELATIVE RISK

All sites are in the long-term monitoring phase.

Size: 3,937 acres
Mission: Housed tactical fighter wing
HRS Score: NA
IAG Status: None
Contaminants: Spent solvents, fuel, waste oil, VOCs, metals, asbestos, paints, and thinners
Media Affected: Groundwater and soil
Funding to Date: \$33.8 million
Estimated Cost to Completion (Completion Year): \$15.5 million (FY2007)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY1999



Myrtle Beach, South Carolina

Restoration Background

In July 1991, the BRAC Commission recommended closure of Myrtle Beach Air Force Base. On March 31, 1993, the installation closed.

Sites identified during previous investigations include landfills, weathering pits, fire training areas, drainage ditches, hazardous-waste storage areas, maintenance areas, underground storage tanks (UST), explosive ordnance areas, fuel storage areas, a small arms firing range, and a lead-contaminated skeet range. Contaminants include petroleum hydrocarbons, heavy metals, and volatile organic compounds (VOC), which affect groundwater and soil. The installation has conducted Preliminary Assessments, Site Inspections, Remedial Investigations (RI), and Feasibility Studies (FS) for the identified sites. In FY94, cleanup was completed at the skeet range.

Interim measures taken include removal of contaminated soil at the weathering pit, removal of 28 USTs, removal of 20 oil-water separators, and evaluation of the integrity of 18 other oil-water separators.

In FY95, the installation began conducting a pilot program to determine the applicability of bioremediation at a site contaminated with petroleum/oil/lubricants (POL).

Interim corrective measures (ICM) were initiated to treat a 50-acre trichloroethene (TCE)-contaminated groundwater plume. The installation also began Remedial Design and Treatability Studies for the small-arms firing range and firing-in-buttruss sites. RCRA Facility Investigations have been implemented for the drainage ditches, the Old Entomology Shop, the Armament Shop,

and the Old Engine Test Cell. Corrective-measure studies are planned for the Old Entomology Shop and the Armament Shop.

A joint management team formed in FY91 assumed the role of a BRAC cleanup team (BCT) in FY93. In FY94, the installation prepared a BRAC Cleanup Plan (BCP) that outlined current and future restoration strategies and efforts for all environmental programs at the installation.

The restoration advisory board (RAB), which was formed in FY94, has conducted field trips and reviewed funding, relative risk, and site-cleanup information. The BCT has fostered formal partnerships with EPA and the state regulatory agency and has used facilitators and workshops to improve the communication and decision-making processes at meetings.

Early in FY96, the installation presented the Relative Risk Site Evaluation process at a RAB meeting. The installation also updated both the BCP and relative risk information. By the end of FY96, 48 percent of the base had been transferred by deed.

FY97 Restoration Progress

The installation completed the RI/FS reports and selected cleanup technologies for several sites. It also determined the extent of lead contamination in soil at the small arms firing range. In addition, the installation submitted clean-closure plans to the state regulatory agency for two hazardous-waste management units, corrective action plans (CAP) for the hazardous waste tank facility, and draft CAPs after investigating the UST sites. The installation completed the CAP for the Old Entomology Shop and expanded the CAP for the 50-acre TCE plume.

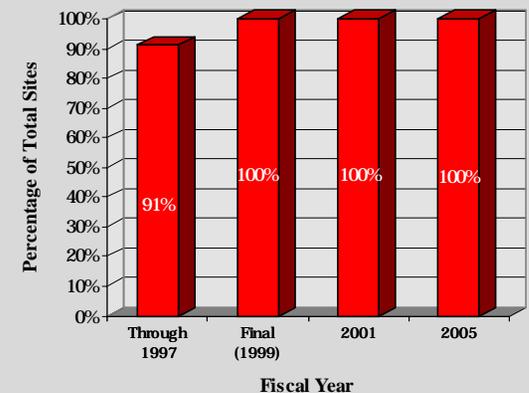
Eight early Removal Actions took place at the installation. The base also used innovative management techniques and has completed a Relative Risk Site Evaluation at all sites.

Some activities scheduled for completion in FY97 were delayed because of funding problems.

Plan of Action

- Complete ICM for soil at the Old Entomology Shop, the small-arms firing range, and waste-tank sites in FY98
- Collect additional information to fill data gaps in RI/FS reports and implement long-term monitoring at 12 sites in FY98
- Continue the pilot program for bioremediation and field investigation for complementary corrective action at two fuel-contamination sites in FY98
- Complete all Remedial Action construction by FY99
- Implement ICM for groundwater at the Armament Shop, a fire training area, an off-base area (Old Entomology Shop), and four UST sites in FY99
- Implement ICM for four landfill covers in FY98

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 320 acres
Mission: Manufacture ordnance
HRS Score: 43.7; placed on NPL in June 1986
IAG Status: None
Contaminants: VOCs, including TCE
Media Affected: Groundwater and soil
Funding to Date: \$3.2 million
Estimated Cost to Completion (Completion Year): \$0.01 million (NA)
Final Remedy In Place or Response Complete Date: NA



Eau Claire, Wisconsin

Restoration Background

Between 1981 and 1985, EPA and the Wisconsin Department of Natural Resources (WDNR) conducted groundwater studies in the general area west of the National Presto Industries (NPI) site (formerly Eau Claire Ordnance Plant No. 1). Volatile organic compounds (VOC) were detected in groundwater samples. EPA issued an Administrative Order on Consent requiring NPI to design and install an on-site groundwater treatment facility.

In FY91, EPA issued a unilateral order requiring NPI to construct a drinking water system in an area of the town of Hallie. The drinking water system was completed in FY92.

In FY92, the U.S. Army Corps of Engineers, Omaha District, awarded a contract for potentially responsible party (PRP) investigation activities, including research into historical activities at the site and an evaluation of technical data relating to potential DoD liability. Results of this investigation indicate that DoD has limited, if any, liability.

In FY94, under a Consent Order signed by NPI and EPA, removal activities began at Lagoon No. 1. Final closure of the lagoon is awaiting completion of source removal and issuance of the Record of Decision (ROD). The Remedial Investigation (RI) report identified five source areas and four plumes of groundwater contamination. The on-site groundwater extraction and treatment facility also became operational in FY94.

In FY95, NPI continued operating the on-site groundwater extraction and treatment system. A Removal Action was conducted at Lagoon No. 1 to remove waste forge compound liquids and solids. In addition, the Remedial Investigation and Feasibility Study (RI/FS) was completed, and a Proposed Plan was issued. A public meeting

was held to outline the alternatives included in the RI/FS. WDNR issued a statement on the environmental restoration levels desired; WDNR did not concur with EPA's proposed plan.

In FY96, NPI continued to operate the groundwater extraction and treatment system. Congress appropriated an additional \$15 million for NPI's CERCLA cleanup. In June 1996, the Army transferred that funding to NPI at the direction of Congress. In May, a ROD was issued with state concurrence. On September 20, WDNR issued a unilateral order to NPI.

FY97 Restoration Progress

An intermediate design for the Melby Road disposal site was submitted along with an Engineering Evaluation and Cost Analysis and a Remedial Action Plan for Lagoon No. 1. In addition, a revised Remedial Design work plan was completed and presented. Work plans also were submitted for the soil vapor extraction monitoring wells and ditch and dry well soil sampling.

NPI continued to operate several operable units (OU) on-site. NPI will continue to extract and treat groundwater for an unknown period.

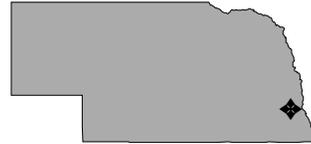
Plan of Action

- Continue to operate several OUs on-site in FY98

FY98 FUNDING BY PHASE AND RELATIVE RISK

All sites are in the long-term monitoring phase.

Size: 17,214 acres
Mission: Performed ordnance storage and manufacturing activities
HRS Score: 31.94; placed on NPL in August 1990
IAG Status: IAG signed in September 1991
Contaminants: Explosives, VOCs, and PCBs
Media Affected: Groundwater and soil
Funding to Date: \$47.3 million
Estimated Cost to Completion (Completion Year): \$121.3 million (FY2031)
Final Remedy In Place or Response Complete Date: FY2002



Mead, Nebraska

Restoration Background

From 1942 to 1956, the Nebraska Ordnance Plant produced munitions at four bomb-loading lines, stored munitions, and produced ammonium nitrate. Currently, most of the property is owned by the University of Nebraska and is used as an agricultural research station. Other portions of the property are owned by the Nebraska National Guard and private entities.

Activities on the former DoD property include munitions production areas, bomb-loading lines, a bomb booster assembly area, burn areas, a sewage treatment plant, an ammonium nitrate plant, and an Atlas Missile facility. The U.S. Army Corps of Engineers (USACE) has identified soil contaminated with polychlorinated biphenyls (PCB) and munitions, as well as on-site and off-site groundwater contaminated with explosives and volatile organic compounds (VOC). Groundwater in the area is used for drinking water, irrigation, and watering of livestock.

In FY94, USACE completed a Remedial Investigation and Feasibility Study (RI/FS) for soil contamination and prepared a draft final RI/FS Report for groundwater. In addition, a Time-Critical Removal Action for PCBs was completed, and investigations were planned for sites with ordnance, explosives waste, and other types of contamination.

In FY95, a Record of Decision (ROD) concerning incineration of contaminated soil at Operable Unit (OU) 1 was approved and Remedial Design (RD) began. USACE completed both the Proposed Plan and the FS report for groundwater contamination at OU2 and the Phase I RI fieldwork at OU3. In addition, EPA approved the final Engineering Evaluation and Cost Analysis (EE/CA) and the design for the Removal Actions for two trichloroethene (TCE)-contaminated groundwater plumes. USACE installed activated carbon canister treatment systems to treat contaminated drinking water in on-site

wells and completed field investigations to identify explosives waste. A draft EE/CA of the investigation was submitted.

In FY96, USACE completed the RD for the OU1 incinerator. The draft final ROD for contaminated groundwater at OU2 was completed and submitted to the appropriate regulatory agencies for review. In addition, USACE awarded the RD contract and completed the decision documents for the Removal Action at OU2. The Phase II RI field investigation for OU3 also was completed, and USACE completed the PCB Removal Action and the Ordnance and Explosives EE/CA and Action Memorandum.

FY97 Restoration Progress

USACE converted the technical review committee to a restoration advisory board (RAB). The RAB provided timely information to the public on controversial incinerator issues and held several public meetings to disseminate information. Full public acceptance was achieved by the end of the trial burn testing. In addition, meetings with the Lower Platte Natural Resource District on the potential beneficial reuse of treated groundwater continued.

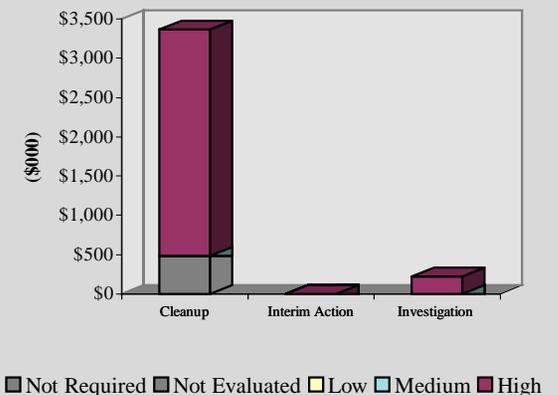
The contract for Remedial Action (RA) at OU1 was awarded, and construction was completed. The draft final RI and draft final Baseline Risk Assessment for OU3 also were completed. The design for building demolition and debris removal at the Load Line Buildings was completed, and the demolition contract awarded. Also, the contract for the Removal Action at OU2 was awarded. An ordnance and explosives Removal Action was accomplished. USACE provided point-of-use water treatment to residences whose water was affected by the groundwater plume and awarded the contract for the groundwater containment Removal Action.

Regulators and USACE jointly developed data formats to expedite review of incinerator emission data. In addition, partnering sessions, which included regulators, were conducted before construction of the incinerator to resolve any remaining issues. Monthly project manager meetings enhanced coordination among agencies.

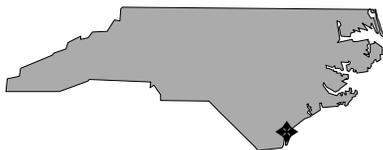
Plan of Action

- Begin asbestos removal at the Load Line Buildings in FY98
- Begin structural demolition of the Load Line Buildings in FY98 and complete demolition in FY99
- Begin the groundwater containment Removal Action in FY98
- In FY98, develop a formal Memorandum of Understanding with the Lower Platte Natural Resources District to provide a framework for coordination on groundwater cleanup issues
- Evaluate use of advanced oxidation and plasma arc technologies for inclusion in RD of groundwater treatment process in FY98
- Evaluate beneficial reuse of the extracted groundwater in FY98

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 4 acres
Mission: Served as World War II bomber command and Vietnam-era aerospace defense command
HRS Score: 39.39; placed on NPL in March 1989
IAG Status: None
Contaminants: VOCs and SVOCs
Media Affected: Groundwater
Funding to Date: \$1.7 million
Estimated Cost to Completion (Completion Year): \$1.2 million (FY2010)
Final Remedy In Place or Response Complete Date: FY2010



Wilmington, North Carolina

Restoration Background

In FY87, a Preliminary Assessment and a Site Inspection identified groundwater contamination caused by fire training activities conducted at New Hanover County Airport from FY68 through FY79. Fire training activities involved burning jet fuel, gasoline, fuel oil, and kerosene. The site included a burn pit, a mockup of an aircraft, and a 10,000-gallon aboveground storage tank that supplied fuel to the burn areas. The site also contained several other fire training stations, including a fire smokehouse, a railroad tanker car, and several automobiles. As a result of fire training activities, groundwater has been contaminated with benzene.

EPA has identified DoD, New Hanover County, Cape Fear Community College, and the city of Wilmington as potentially responsible parties (PRP) for the site.

A Removal Action completed in FY91 involved the removal of waste materials, contaminated water, contaminated surface and subsurface soil, and structures associated with the fire training activities. Soil samples also were collected to confirm that no contaminated soil remained on site. As a result of the confirmatory sampling, the recommendation was that no further action be taken at the site.

In FY92, EPA completed the Remedial Investigation and Feasibility Study for groundwater contamination, and the Record of Decision (ROD) for cleanup was signed. In FY94, PRPs began Remedial Design (RD) work at the airport to collect additional data on groundwater quality. In FY95, two monitoring wells were installed to confirm that contamination had not migrated to the lower groundwater aquifer. A 60 percent RD document was sent to EPA with a recommendation that air sparging be used as a more cost-effective treatment technology.

In FY96, the PRPs continued their efforts to obtain EPA's approval of the pilot test of the air sparging technology. The U.S. Army Corps of Engineers continued to obtain funding for DoD's share of design costs.

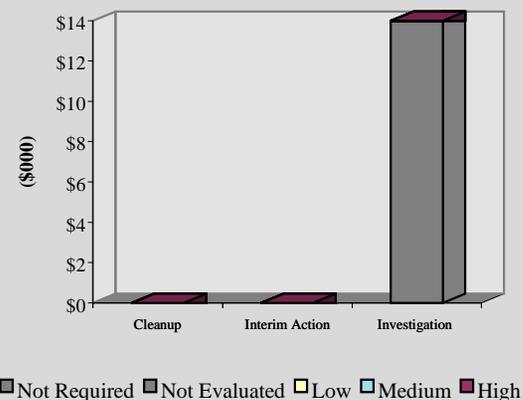
FY97 Restoration Progress

The PRPs used a low-volume/low-flow sampling technique to reevaluate metal contamination in the groundwater. The reevaluation showed that metals were no longer a contaminant of concern. This finding was instrumental in obtaining approval from EPA and state of North Carolina for implementation of the air sparging pilot study. The PRPs proactively resubmitted pilot test proposal with updated timelines, which also contributed to EPA's timely concurrence.

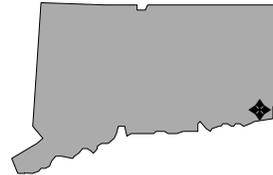
Plan of Action

- Implement a pilot test of the air sparging technology in FY98
- Evaluate the efficacy of the air sparging technology and revise RD in FY98
- Begin full-scale utilization of the air sparging technology in FY99
- Amend and implement ROD in FY99 and complete ROD in FY04

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 547 acres
Mission: Maintain and repair submarines; conduct submarine training and submarine medical research; provide a home port for submarines
HRS Score: 36.53; placed on NPL in August 1990
IAG Status: Federal Facility Agreement signed in January 1995
Contaminants: Dredge spoils, incinerator ash, petroleum/oil/lubricants, PCBs, spent acids, pesticides, solvents, construction debris, metals, and VOCs
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: \$33.6 million
Estimated Cost to Completion (Completion Year): \$59.7 million (FY2016)
Final Remedy in Place and Response Complete Date: FY2011



Groton, Connecticut

Restoration Background

Environmental studies began at the New London Naval Submarine Base in FY82. Significant sites include the Area A Landfill, a number of smaller disposal areas, and fuel and chemical storage areas. Twenty-two CERCLA sites have been identified along with underground storage tanks (UST), which have been grouped into two UST sites.

The installation was placed on the National Priorities List (NPL) because of polychlorinated biphenyl (PCB) contamination at the Area A Landfill. The landfill was used to dispose of scrap wood, metal, waste chemicals, waste acid, and drums containing solvents. In FY93, the Navy constructed a fence around the landfill and limited potential direct-contact exposures as part of an Interim Remedial Action (IRA). The installation also completed work on an IRA to install a cap on the landfill.

Several Removal Actions have been implemented at the installation. In FY91, 19 gas cylinders were removed from Site 8, the Goss Cove Landfill. In FY94, the installation removed from Site 6 2,000 cubic yards of soil contaminated with PCBs and lead. At Site 15, lead-contaminated soil was removed. At Site 9, the installation removed PCB-contaminated oil, sludge, and water from a waste oil tank. The tank was cleaned and abandoned in place.

The installation also conducted a Removal Action at Site 17 to remove lead-contaminated soil. Innovative technology was used to solidify and stabilize this soil. At UST Sites 1 and 2, the base began installing air sparging (AS) and soil vapor extraction (SVE) systems to remove gasoline from the subsurface and to bioremediate less volatile fuels.

In FY95, a Record of Decision (ROD) was signed for Site 2, the Area A Landfill. Under the ROD, the installation agreed to cap the landfill as an IRA. In addition, the draft Remedial Investigation and Feasibility Study (RI/FS) Report was completed for Sites 1 through 11, 13 through 15, and 20.

The installation formed a technical review committee (TRC) in FY89 to accelerate the decision-making process. In FY94, the installation converted the TRC to a restoration advisory board (RAB). The RAB first met formally in FY95 and now meets quarterly.

In FY96, the installation began the FSs for Sites 3 and 8 and received funding for the Remedial Action at Site 3. The installation also completed installing and began operating the AS/SVE systems at UST Sites 1 and 2 and initiated a Phase II Site Inspection (SI) at the Fuel Farm (Site 23).

FY97 Restoration Progress

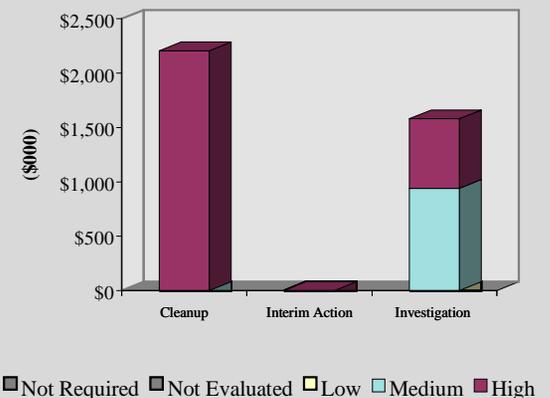
The RI for Sites 1 through 11, 13 through 15, and 20 was completed in March. In September, a landfill cap was constructed at Site 2 and the corrective action design and Phase II SI at Site 23 were completed. The Area A Landfill was capped in January 1997.

Removal Actions were completed at Site 4 and the Bank Disposal Area of Site 3. A geoprobe was employed to help accelerate field investigation activities.

Plan of Action

- Begin Remedial Action at Site 3 in FY99
- Begin FS for Site 7 in FY98
- Complete a Remedial Design for Site 8 (Goss Cove Landfill) and Site 3 (Area A Downstream) in FY98
- Begin FS for Sites 10, 11, 13, 21, and 22 in FY98
- Begin RI for basewide groundwater operable unit in FY98

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 70 acres
Mission: Repair inertial navigation systems and manage Air Force metrology and calibration process
HRS Score: NA
IAG Status: None
Contaminants: VOCs and SVOCs
Media Affected: Groundwater and soil
Funding to Date: \$2.1 million
Estimated Cost to Completion (Completion Year): \$849.0 million (FY1996)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY1996



Heath, Ohio

Restoration Background

Since 1962, Newark Air Force Base has repaired the inertial guidance and navigational systems used by most aircraft and missiles. The installation also provided specialized engineering assistance to the Air Force and DoD on problems related to inertial guidance and navigation. In July 1993, the BRAC Commission recommended that the installation be closed.

The repair of inertial guidance systems requires the use of solvents such as freon 113 and 1,1,1-trichloroethane. Past waste management activities related to those solvents affected groundwater and soil at the installation. Environmental investigations conducted at the installation since FY84 identified five sites that required additional study. In FY89, Site Inspection (SI) activities were completed for another seven sites, consisting of spill sites, a fire training area, and landfill areas.

In FY90, the installation began a Remedial Investigation and Feasibility Study for the seven sites identified in the SI. In FY91, no further action decision documents were prepared for five of the seven sites. In FY94, the installation formed a BRAC cleanup team and completed an Environmental Baseline Survey.

In FY95, work began on a Supplemental RI, which concluded in August 1996 with the publication of a final report. This report concluded that no further action was needed for the six sites studied. Remedial activities have included the removal of 17 underground storage tanks, removal of 300 cubic yards of soil from the former hazardous waste storage site (Facility 87), and operation of a soil vapor extraction system at Facility 87.

In FY95, the installation formed a restoration advisory board. Bimonthly meetings focused on promoting accelerated remediation and property transfer.

FY97 Restoration Progress

By mid-summer 1997, all unnecessary monitoring wells were closed. In September, a contract was awarded to extend the city water system onto the base and to close three drinking water wells. The contract's projected completion date is February 1998.

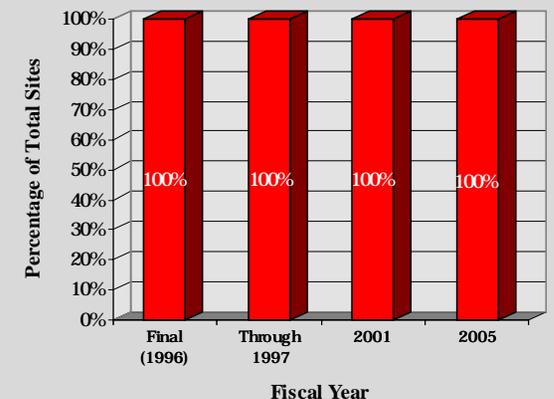
The installation is awaiting a decision by the Ohio EPA to conclude long-term monitoring and quarterly sampling of groundwater at Facility 87.

Some activities scheduled for completion in FY97 were delayed because supplemental investigations were necessary.

Plan of Action

- Decontaminate Facilities 102 and 114 (hazardous waste storage buildings) by mid-FY98
- Obtain clean closure of Facility 87 by mid-FY98
- Complete all environmental actions by FY98
- Transfer ¾-acre Facility 87 parcel, with deed restrictions, to reuse authority by FY99
- By FY99, transfer 13 acres to the Airport Authority by deed with restrictions

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 1,400 acres
Mission: Provide logistical support and serve as a training center
HRS Score: 32.25; placed on NPL in November 1989
IAG Status: Federal Facility Agreement signed in March 1992
Contaminants: PCBs, petroleum/oil/lubricants, VOCs, and SVOCs
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: \$46.0 million
Estimated Cost to Completion (Completion Year): \$28.7 million (FY2016)
Final Remedy in Place or Response Complete Date: FY2007



Newport, Rhode Island

Restoration Background

The Newport Naval Education and Training Center was used as a refueling depot from the early 1900s until after World War II, when the installation was restructured to support research and development activities and provide specialized training. Major contaminants at the installation include petroleum/oil/lubricant sludge associated with a number of tank farm sites, waste acids, solvents, and polychlorinated biphenyls (PCB) in landfills used to dispose of general refuse and shop wastes.

Phase I Remedial Investigation and Feasibility Study (RI/FS) activities were completed in FY91. The Phase II RI for the McAllister Point Landfill site was completed in FY93, and the Navy obtained a Record of Decision (ROD) to cap the 11-acre landfill. The Remedial Design for the cap and the Phase II RI for the Old Fire Fighting Training Area site were completed in FY94.

In FY92, an Interim ROD was signed for extraction and treatment of groundwater at Tank Farm No. 5 to prevent the migration of contaminants. The groundwater extraction and treatment system began operating in FY94, and activities continued into FY95. The installation also completed RIs for two underground storage tanks (UST) and began to remove the contents of the tank and petroleum-contaminated soil at another UST located on Tank Farm No. 5. The installation completed a Treatability Study involving cement fixation and stabilization of lead-contaminated solids excavated from the Melville North Landfill. It initiated another innovative technology, white rot fungus, for the destruction of petroleum contamination in soil.

Seven sites at the installation, including one UST site, have been assigned high rankings under DoD's Relative Risk Ranking System.

The installation formed a technical review committee in FY88 and converted it to a restoration advisory board (RAB) in FY95. A community relations plan was completed in FY90. Information repositories were established in FY90, and an administrative record was established in FY92. The installation also established an ecological advisory board.

In FY96, the installation's RAB met for the first time and its ecological advisory board met several times. The Ecological Risk Assessments for Sites 1 and 19 were under way. RI was initiated for Sites 2, 9, and 13. Some petroleum-contaminated hot spots in soil were removed; however, the volume of contaminated soil was larger than had been anticipated.

FY97 Restoration Progress

An FS for Site 2 was completed in September 1997. A RCRA cap was installed at Site 1, and action begun to remove contaminated soil at Site 19. After completion of the Study Area Screening Evaluation at Site 19, an onshore Removal Action was initiated to improve site management techniques.

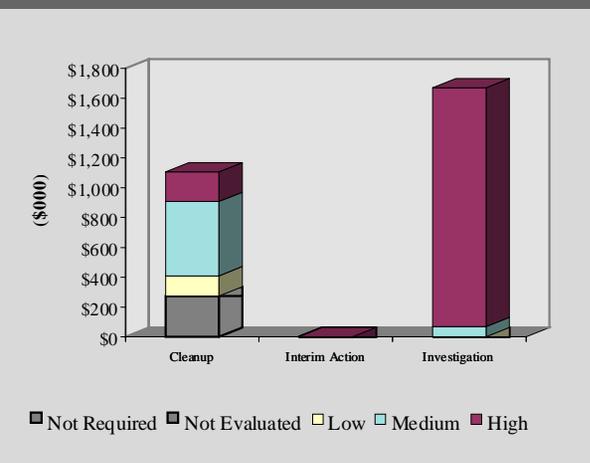
To expedite document review, the installation presented draft documents to the RAB and regulators at ecological advisory board meetings. Monthly project manager meetings were also held with regulatory agencies. An RI was completed at Site 2 (a non-NPL [National Priorities List] site) through working meetings with the state. At the working meetings, work plans and reports were presented and comments were resolved, eliminating the need for formal review. RAB meetings were held monthly to address restoration progress.

The installation began a Removal Action on contaminated soil at Site 19, instead of starting the FS for Site 12.

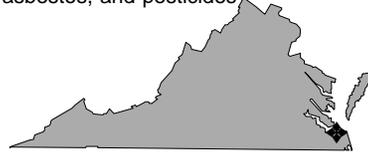
Plan of Action

- Complete FS for Sites 12 and 13 in FY98
- Begin a Removal Action in FY98 at the Melville North Landfill
- Involve community in preparing Federal Facility Agreement schedules for site cleanup in FY98
- Plan partnering session with EPA and the Rhode Island Department of Environmental Management in FY98
- Complete an onshore Removal Action at Site 19 in FY99
- Continue RI for Sites 9 and 17

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 4,631 acres
Mission: Provide services and materials to support the aviation activities and operating forces of the Navy
HRS Score: 50.00; proposed for the NPL in June 1996
IAG Status: Federal Facility Agreement under negotiation
Contaminants: Petroleum products, PCBs, solvents, heavy metals, acids, paints, asbestos, and pesticides
Media Affected: Surface water and sediment
Funding to Date: \$67.0 million
Estimated Cost to Completion (Completion Year): \$34.8 million (FY2021)
Final Remedy in Place or Response Complete Date: FY2013



Norfolk, Virginia

Restoration Background

Environmental studies conducted at Norfolk Naval Base (also known as Sewells Point Naval Complex) since FY83 have identified 22 sites and 173 solid waste management units (SWMU). Further actions are required at 10 sites, 6 site screening areas, and 10 areas of concern. Contamination has resulted from maintenance operations for the aircraft, equipment, and vehicles used to carry out the base's mission, as well as from operation of support facilities, such as hobby shops. Site types at the installation include landfills, ordnance storage areas, waste disposal areas, fire training areas, fuel spill areas, and underground storage tanks. The installation was proposed for the National Priorities List (NPL) mainly because of the potential for contaminated surface water to migrate into groundwater and soil.

During FY89, the installation completed a Remedial Investigation and Feasibility Study (RI/FS) for Site 4. In FY91, an Expanded Site Inspection was completed for Site 6 and a Remedial Design (RD) was completed for Site 4. During FY94, the installation removed drums and debris at Area B of Site 1 and completed an RI/FS and signed a decision document for Site 1.

The installation formed a technical review committee in FY89 and converted it to a restoration advisory board (RAB) in FY94. The RAB's eight community members meet quarterly. A community relations plan was completed in FY93. In FY92, the installation established several information repositories. An administrative record was established in FY93.

During FY96, the installation briefed regulatory agencies and the RAB about two sites, and the installation began placing the administrative record file on CD-ROM to improve accessibility. A Preliminary Assessment (PA) and Site Inspection (SI) was initiated

for Site 21, and an RI/FS was initiated for three sites. Construction for a treatment facility continued. A baseline Ecological Risk Assessment was completed for Site 3, and construction of an air sparging and vapor extraction system was initiated for the site.

FY97 Restoration Progress

The installation completed a draft Federal Facility Agreement (FFA) and signed two decision documents before NPL listing. In addition, an RD was completed and a Remedial Action (RA) was initiated for Sites 6 and 20. An RA was initiated for SWMU 1. The RA for Site 1 and the pump-and-treat system for the LP Fuel Farms were completed.

The use of geoprobe, ground-penetrating radar, on-site laboratories, Hydropunch, and Global Positioning System survey technologies accelerated fieldwork at various sites.

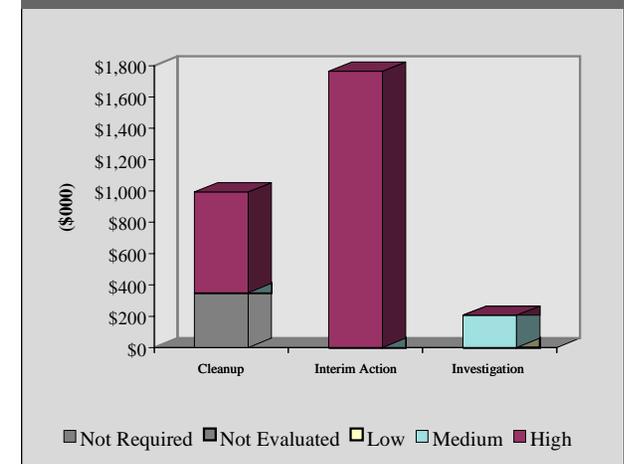
Partnering efforts initiated in early FY97 have resulted in significant savings. Activities include presentation and discussion of documents during partnering meetings to familiarize reviewers with the material quickly and conference calls to improve communication and resolution of issues. In addition, consensus agreements were used to reach agreement on issues, and subgroups were formed with technical support from each agency to address human and ecological risk issues. Joint scoping also was used to make field investigations more efficient.

Some activities scheduled for completion in FY97 were delayed. The RA at Site 21 was initiated using RSCA rules, so no PA/SI was required. Design changes and further delineation of the plume pushed back completion of the RA. The RA at SWMU 1 was initiated, but the other RAs have not begun. The draft FFA was completed and is under review.

Plan of Action

- Complete RA and begin long-term monitoring (LTM) and operation and maintenance (O&M) for Site 3 in FY98
- Sign the FFA in FY98
- Complete the RI/FS for Site 5 in FY98
- Complete the RI/FS and initiate RD for Site 2 in FY98
- Complete the RI/FS and RD for Site 22 in FY98
- Complete the RA for Site 6 in FY98
- Complete the RA and initiate LTM and O&M for Site 20 in FY98
- Initiate LTM and O&M for Site 1 in FY98
- Initiate Removal Actions for SWMUs 4 and 6 in FY99

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 2,165 acres
Mission: Support C-141 airlift operations
HRS Score: 39.65; placed on NPL in July 1987
IAG Status: IAG signed in 1989
Contaminants: Waste oils and fuel, spent solvents, paints, refrigerants, heavy metals, and VOCs
Media Affected: Groundwater and soil
Funding to Date: \$96.2 million
Estimated Cost to Completion (Completion Year): \$14.0 million (FY2012)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY1999



San Bernardino, California

Restoration Background

In December 1988, the BRAC Commission recommended closure of Norton Air Force Base. The installation closed in March 1994.

The most significant sources of contamination at this installation are a trichloroethene (TCE) groundwater plume and contaminated soil areas. Sites identified through previous environmental studies include underground storage tanks (UST), landfills, fire training areas, spill areas, and waste disposal pits.

In FY82, Remedial Investigation and Feasibility Study activities began for 22 sites. The installation also has initiated two Treatability Studies in conjunction with the removal of polychlorinated biphenyl (PCB)-contaminated soil. Since FY93, a groundwater extraction and treatment system has been used to treat groundwater at the TCE plume area.

In FY94, the installation removed 45 USTs. Three of the 45 UST sites required further action. The installation also conducted confirmation studies at 43 areas of concern (AOC) and at 3 of the original 22 sites. The studies indicated that 19 AOCs require further investigation. In addition, the installation signed a water supply contingency policy to protect users of groundwater downgradient of the TCE plume.

In FY95, the Central Base Area Operable Unit (OU) groundwater extraction and treatment system was expanded and the Base Boundary groundwater extraction and treatment system became operational. The installation formed a restoration advisory board (RAB) and a BRAC cleanup team (BCT). The BCT redefined OUs as zones and initiated Interim Actions to shorten the cleanup time by approximately 1 year. The BCT also developed target soil-cleanup goals that apply the state regulatory agency's preliminary

remediation goals to the characteristics at the installation. The effort produced predetermined cleanup standards that have been agreed upon by both the Air Force and the regulatory agencies. Removal Actions can now proceed without the need to identify separate cleanup standards for each project.

During FY96, restoration activities were completed at 10 of the 22 sites. No-further-remedial-action-planned documents were completed for Sites 3, 4, 7, 11, 15, and 18. Closure reports were completed for Sites 6 and 9. An Action Memorandum concluded that no further action is necessary at Site 22. Of the remaining 12 sites, 11 are undergoing Engineering Evaluations and Cost Analyses (EE/CA), Remedial Design (RD), or Remedial Action (RA). Site 19 has been recommended for an interim Record of Decision (ROD).

The Air Force has identified 73 AOCs that require some form of survey or investigation. Fifty-four AOCs require no further action; the remaining 19 AOCs are still under investigation. Installation of the Base Boundary groundwater extraction and treatment system was completed. Soil removal was completed at 23 UST sites, and the removed soil was treated in bioremediation cells. The Air Force, EPA, and California EPA agreed that the Central Base Area Operable Unit remediation technology was operating properly and successfully.

Closure of the Defense Reutilization and Marketing Office (DRMO) was completed in April 1996. Fieldwork for the Industrial Waste Treatment Plant closure was completed, and a closure report was submitted. Closure of the Air Combat Camera Services began, and the closure plan for the Industrial Waste Line project was reviewed by the state.

FY97 Restoration Progress

Continuation of BCT meetings conducted by the Air Force, EPA, and California EPA allowed fast document processing. The BCT reviewed numerous EE/CAs, Action Memorandums, RDs, and closure reports. The ROD for Site 19 was signed. The RD for the landfill cap at Site 2 was completed. The installation also completed the Air Combat Camera Services Closure Report.

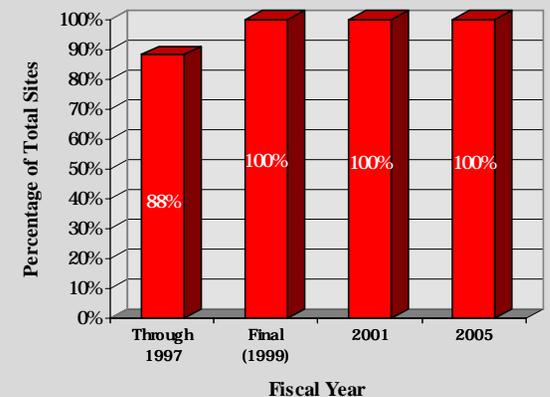
The RA was completed at Sites 1, 8, 13, and 14 through excavation and disposal. The installation also completed RAs for Sites 16 and 21.

The RA for Site 5 will be delayed until FY98 because of changing site conditions. The Ecological Risk Assessment (ERA) will be completed in FY98.

Plan of Action

- Complete RA at Site 5 in FY98
- Complete ERA in FY98
- Complete RD for Site 2 in FY98
- Complete Action Memorandum for Site 17 in FY98

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 422 acres
Mission: Military Traffic Management Command, Western Area
HRS Score: NA
IAG Status: None
Contaminants: POLs, trichloroethene, solvents, lead, PCBs
Media Affected: Groundwater and soil
Funding to Date: \$3.3 million
Estimated Cost to Completion (Completion Year): \$14.4 million (FY2004)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2002



Oakland, California

- Complete the RI/FS for OUs 1, 2, 3 and 7 in FY99
- Prepare Decision Documents for OUs 2, 3, and 7 in FY99; for OUs 1, 4, and 5 in FY00; and for OU6 in FY01
- Begin Remedial Action (RA) for OUs 2, 3, and 7 in FY99, and finish the RA for OU7 in FY99 and for OUs 2 and 3 in FY00
- Complete RAs at OUs 1, 4, 5, and 6 in FY01
- Remove all existing USTs before the property is transferred in FY01

Restoration Background

In July 1995, the BRAC Commission recommended the complete closure of Oakland Army Base (OARB) by July 2001 and relocation of the mission of the Military Traffic Management Command, Western Area (MTMCWA) and the 1302d Major Port Command.

In 1989, OARB initiated Installation Restoration Program (IRP) activities at potentially contaminated areas. Included in those areas are underground storage tanks (UST) that contained diesel and fuel oil, gasoline, waste oil, and waste liquid. Before 1994, 33 of the 38 identified tanks were removed. Several of the excavated UST sites required soil removal and groundwater monitoring.

Other areas of concern include. Berth 6 and Berth 6 1/2 storm drains, where bedding materials are contaminated with diesel fuel, waste oil, toluene, xylenes, and lead; oil and grease in the groundwater at Building 991; lead-contaminated soil at the West Grand Avenue Overpass in the U.S. Navy area and Roadside Areas in Operable Unit (OU1); trichloroethene (TCE)-contaminated soil and groundwater at Building 807; and soil contaminated with polychlorinated biphenyls (PCB) at Building 648.

The living quarters and recreational areas where children play were surveyed in FY95 for lead-based paint. Analysis of paint samples from the interior and exterior of the Capehart Housing Unit and from playgrounds for the interior and exterior of the EM Quarters showed lead contamination at levels above the action levels in several areas.

In FY96, the Army conducted an asbestos survey of the EM Quarters, the Capehart Quarters, and the Child Development Center. Of 31 samples taken, 7 indicated the presence of asbestos-containing materials in floor tiles, roofs, and dry wall, but none presented a hazard to residents and workers.

The Army formed a BRAC cleanup team (BCT) that includes representatives of EPA Region 9, the California EPA, and the BRAC environmental coordinator. The commander also formed a restoration advisory board (RAB). Key participants in the RAB include the BCT, members of the community, and technical consultants.

The installation issued the BRAC Cleanup Plan (BCP), conducted the basewide Environmental Baseline Survey (EBS), and issued the EBS Report.

FY97 Restoration Progress

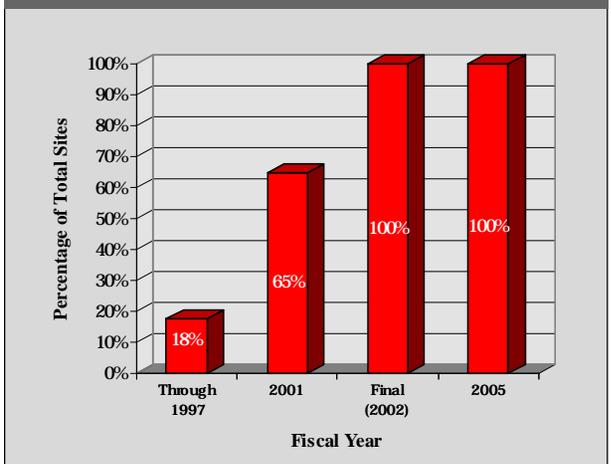
The Army initiated Remedial Investigations and Feasibility Studies (RI/FS) for OUs 1, 2, 3, and 7 as planned. Funding was obtained and activities were initiated for the UST closure program. The Army is using a Total Environmental Restoration Contract for all new projects to expedite the restoration process. In addition, the Army proposed 18 acres as CERFA-uncontaminated, but the regulatory agencies did not concur.

The BCT attended monthly remedial project manager and RAB meetings, observed Preliminary Assessment and Site Inspection (PA/SI) field activities, and educated the new state member. The BCT also worked with regulators to expedite review of environmental documents by alerting regulators to upcoming review periods and convening working meetings to reduce the number of regulatory comments.

Plan of Action

- Complete all phases of the PA/SI in FY98
- Perform RI/FSs for three OUs in FY98
- Begin the RI/FS for OUs 4, 5, and 6 in FY98

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 667 acres
Mission: Receive, store, and issue military supplies and materials to fleet units and shore activities in the Pacific Basin
HRS Score: NA
IAG Status: Federal Facility Site Remediation Agreement signed in September 1992
Contaminants: Petroleum products, VOCs, SVOCs, PCBs, pesticides, and metals
Media Affected: Groundwater and soil
Funding to Date: \$8.6 million
Estimated Cost to Completion (Completion Year): \$33.5 million (FY2005)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2002



Oakland, California

Restoration Background

In July 1995, the BRAC Commission recommended the closure of the Oakland Fleet and Industrial Supply Center. Operations at the installation include vehicle maintenance and repair and storage of hazardous wastes. The installation is scheduled to close in September 1998.

Since FY88, Environmental Investigations have identified 25 Installation Restoration (IR) sites and 3 underground storage tank (UST) sites at the installation. Soil and groundwater contamination at the installation is attributable to the operations of typical supply center facilities, including a hazardous waste storage yard, a transformer storage area, and other storage and maintenance areas.

The installation completed an initial site characterization for USTs 1, 5, and 8 in FY89. In FY93, the installation completed Interim Remedial Actions (IRA) for USTs 1 and 5. An IRA for UST 8 was completed in 1995, and a corrective action plan (CAP) was started.

During FY95, the installation completed Removal Actions for 11 IR sites and a Remedial Action Plan (RAP) for no further action on 11 IR sites. The installation also completed Phase I Remedial Investigations (RI) for five sites and Expanded Site Inspections for seven sites. A Baseline Risk Assessment was also completed for four sites.

In FY92, a partnering agreement was established among representatives of the Navy, the Department of Toxic Substances Control, and the Regional Water Quality Control Board. The partnership has accelerated the cleanup process at the installation.

The installation converted its technical review committee to a restoration advisory board (RAB) in FY95. The RAB has 18 members and meets once every 2 months. The installation also completed a

community relations plan in FY94, compiled an administrative record in FY92, and established two information repositories in FY94.

In FY96, the installation established a BRAC cleanup team (BCT) while completing a Time-Critical Removal Action for six sites. The installation also initiated the revision of an RI report on UST Sites 1, 5, and 8 in consideration of the California Regional Water Quality Board guidance on closure of low-risk fuel sites.

FY97 Restoration Progress

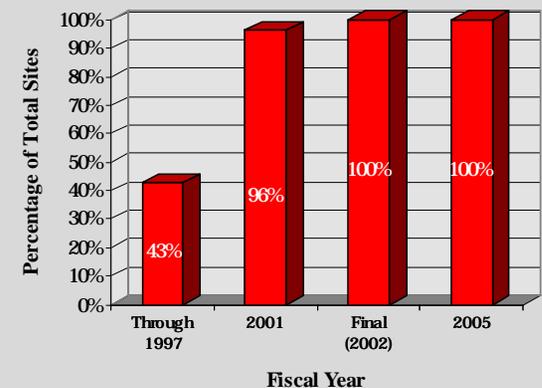
The final Baseline Risk Assessment, the RI for the offshore-sediment operable unit (OU), and the Phase II RI and Feasibility Study (RI/FS) for 10 sites were initiated. Ten sites still require Relative Risk Site Evaluation. Consolidation of the UST and IR programs improved site management.

Proactive and early presentation of data before submission of documents and discussion of issues in BCT and remedial project manager meetings helped expedite document review and resolve issues. Cooperation with the port of Oakland expedited site characterization for the offshore OU. Early feedback and guidance and regular RAB meetings improved partnering and community involvement. In addition, the BCT reviewed progress of all cleanup programs and completed the latest versions of the BRAC Cleanup Plan and the Environmental Baseline Survey. Two hundred acres proposed as CERFA-uncontaminated are awaiting approval from the appropriate regulatory agencies.

Plan of Action

- Complete two rounds of semiannual groundwater monitoring and RI for UST Sites 1, 5, and 8 in FY98
- Initiate a CAP for UST Site C1 in FY98
- Complete an additional investigation and a Removal Action for IR Site 2 in FY98
- Complete Phase II RI/FS for 10 sites in FY98
- Complete a streamlined RI/FS for the offshore-sediment OU in FY98

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 350 acres
Mission: Originally provided harbor defense for Puget Sound; during World War I, tested torpedoes and stored fuel; later served as a fire training school for the Navy and housed an anti-aircraft artillery battery
HRS Score: 50.00; placed on NPL in May 1994
IAG Status: IAG signed in July 1997
Contaminants: PCBs, heavy metals, petroleum hydrocarbons, dioxins and furans, and asbestos
Media Affected: Surface water, sediment, and soil
Funding to Date: \$2.4 million
Estimated Cost to Completion (Completion Year): \$7.3 million (FY2001)
Final Remedy In Place or Response Complete Date: FY2001



Kitsap County, Washington

Restoration Background

The Navy owned the Old Navy Dump/Manchester Annex from 1919 to 1960. During that time, a net depot, a fire training area, and a landfill were established at the site. Activities at the former DoD property included maintenance, painting, sandblasting, and storage of steel cable net. Domestic waste, wood, and metal waste from the site and the Puget Sound Naval Shipyard were disposed of in a landfill. Currently, the National Oceanic and Atmospheric Administration, the National Marine Fisheries Service, an EPA laboratory, and a portion of Manchester State Park occupy the site.

Preliminary Assessments and Site Inspections (PA/SI) conducted at the site since FY87 identified past releases of hazardous substances from the three areas. Contaminants include heavy metals, polychlorinated biphenyls (PCB), petroleum hydrocarbons, dioxins and furans, and asbestos. The contaminants have been detected in soil at the landfill and at the fire training area, as well as in surface water and sediment at the site.

In FY94, the U.S. Army Corps of Engineers (USACE) completed the PA/SI process. USACE awarded a contract to conduct the Remedial Investigation and Feasibility Study (RI/FS) which includes preparation of the Proposed Plan, the Record of Decision (ROD), and the scope of work for the Remedial Design and Remedial Action (RD/RA). During FY95, Phase II RI/FS fieldwork was initiated. Also in FY95, a potential unexploded ordnance area was identified. USACE Huntsville Division has determined that the area is not accessible to the general public and thus should be considered for no further action.

In FY94, the Manchester Work Group, equivalent to a restoration advisory board, was established to facilitate restoration efforts at the site. The group includes representatives of EPA, the Washington State Department of Ecology, the U.S. Fish and Wildlife Service, tribal

governments, and the local community. The work group has improved the decision-making process by fostering more open and proactive communication with the regulatory agencies. In FY95, the Manchester Work Group published quarterly newsletters to solicit the interest of community groups or individuals.

In FY96, USACE continued coordination with the Manchester Work Group. USACE completed all field investigation work and the draft RI/FS Report. USACE also evaluated whether Interim Remedial Actions (IRA) would be appropriate after initial data collection activities. It was determined that, because of potential inconsistencies with the final remedy, limited risk reduction, and limited acceleration of the schedule, IRAs are not appropriate for the site. Additional rounds of ground-water sampling for Phase I and II investigations continued throughout the fiscal year.

FY97 Restoration Progress

The Interagency Agreement (IAG) was signed, and the RI/FS was completed and accelerated by use of a landfill cap presumptive remedy. USACE prepared a Proposed Plan for RA, issued a ROD, and initiated the RD and RA. The RI/FS process was accelerated by preparing the draft final RI/FS and draft Proposed Plan concurrently. Additionally, the RD/RA was expedited by working on the draft final ROD and the draft RD/RA scope of work simultaneously.

The Manchester Work Group continued to meet to discuss and resolve topics. Frequent conference calls were held with the regulatory agencies to expedite document review. A public meeting was held in FY97 to solicit public input on the Proposed Cleanup Plan. Additionally, two meetings were held to inform site employees of the plan and to identify their concerns.

The remaining USTs, which were scheduled for cleanup in FY97, will be cleaned and filled in place during the RA scheduled for FY99.

Plan of Action

- Complete RD in FY98
- In FY98, excavate dioxin-contaminated soil and debris from fire training simulators and dispose of off site
- In FY99, excavate landfill debris from Clam Bay intertidal zone and construct shoreline protection system
- In FY99, place clean sediment over intertidal Clam Bay sediment areas that exceed cleanup levels
- In FY99, install a cap over the upland portion of the landfill and a hydraulic cutoff system along upgradient edge of cap
- Clean and fill in place remaining USTs in FY99

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 825 acres
Mission: Manufactured chemicals for ordnance
HRS Score: 35.62; placed on NPL in June 1986
IAG Status: None
Contaminants: PCBs, PAHs, inorganic compounds, arsenic, and mercury
Media Affected: Groundwater and soil
Funding to Date: \$1.5 million
Estimated Cost to Completion (Completion Year): \$1.4 million (NA)
Final Remedy In Place or Response Complete Date: NA



Morgantown, West Virginia

Restoration Background

On the basis of the results of environmental studies, sites at the Ordnance Works Disposal Areas in Morgantown were grouped into two operable units (OU). OU1 consists of an old landfill, a shallow disposal area from which topsoil has been removed, and two lagoons from which sludge has been excavated. OU2 consists of all other sites, particularly those located in processing areas.

The Remedial Investigation and Feasibility Study (RI/FS) for OU1 was completed in early FY88. The Record of Decision (ROD) for OU1, which was signed in FY89, stipulated that soil contaminated with polyaromatic hydrocarbon (PAH) compounds was to be excavated and treated in a bioremediation bed. Soil washing was selected as an alternative remedy if bioremediation proved infeasible.

In FY90, EPA issued Consent Orders for both OUs. In the same year, the potentially responsible parties (PRP) signed a participation agreement for OU2.

In FY94, a pilot-test work plan was approved for the cleanup of soil contamination at OU1, and remedial work began. In FY95, the draft work plan for OU1 Phase II Interim Remedial Actions was submitted to EPA for review.

In FY95, the draft RI Report for OU2 was submitted to EPA for review. OU2 areas contained elevated levels of organic and inorganic contaminants. Removal Actions were required for five areas of OU2, two at the main processing building and three at the coke ovens and by-products area. A Time-Critical Removal Action was proposed for limited areas. This proposal of a Removal Action after the RI phase eliminated the need for an FS. In FY96, the U.S. Army Corps of Engineers (USACE) reached an agreement for allocation of the cost of remediation at OU1.

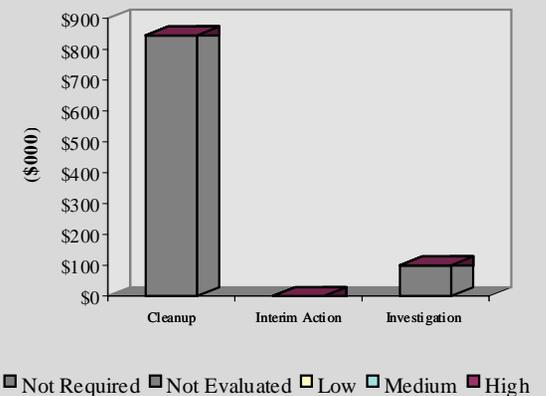
FY97 Restoration Progress

During the fiscal year, the PRP group, which includes the USACE, completed the Removal Actions at OU2 and received EPA concurrence on completion. To improve site management at OU1, the PRP group submitted a Focused Feasibility Study (FFS) to EPA for the OU1 remedy. EPA is continuing to work with the PRPs to expedite Remedial Actions (RA) at OU1.

Plan of Action

- Submit the final FFS for OU1 in FY98
- Begin RA at OU1 after EPA approval of FFS in FY98

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size:	2,034 acres
Mission:	Serve as Naval Training Center; formerly used as Army Air Force and Air Force bases
HRS Score:	NA
IAG Status:	None
Contaminants:	Asbestos, paint, petroleum/oil/lubricants, photographic chemicals, solvents, and low-level radioactive wastes
Media Affected:	Groundwater, surface water, sediment, and soil
Funding to Date:	\$12.9 million
Estimated Cost to Completion (Completion Year):	\$13.5 million (FY2000)
Final Remedy in Place or Response Complete Date for BRAC Sites:	FY2000



Orlando, Florida

Restoration Background

The Orlando Naval Training Center has four areas: the Main Base, Area C, Herndon Annex, and McCoy Annex. Most of the operational and training facilities are located on the Main Base, a 1,093-acre parcel. Area C, located west of the Main Base on 46 acres, contains warehouse and laundry operations. Herndon Annex occupies 54 acres, containing warehouse and research facilities. McCoy Annex occupies 882 acres and contains housing and community facilities. From 1941 to 1968, the installation served as an Army Air Base and an Air Force Base. Since 1968, the installation has been a Naval Training Center. In July 1993, the BRAC Commission recommended closure of the installation and relocation of its activities to Great Lakes Naval Training Center, Illinois, and New London Naval Submarine Base, Connecticut. The installation is scheduled to close in 1999.

Environmental investigations that began in FY85 have identified 10 CERCLA sites and 4 underground storage tank (UST) program sites. In addition, the installation has identified 53 areas of concern (AOC) and more than 300 tank systems that require removal or assessment.

The installation has used generic remedies, such as landfill caps and slurry walls. It also has cleaned up UST sites, beginning with the replacement of three tanks at one UST site in FY92. Corrective action plans (CAP) for the three remaining UST sites were completed in FY93. In FY94, the installation completed the site screening fieldwork for 10 sites and began to prepare Remedial Investigation and Feasibility Study (RI/FS) work plans for all landfills. In FY95, RI/FS activities began at the Main Base Landfill site. The CAP was completed for one UST site, and an Interim Remedial Action (IRA) for groundwater began at another UST site. In addition, the installation completed the removal of 55 tanks and completed 45 UST assessment reports.

To expedite the closure process, the city of Orlando established the Orlando Redevelopment Agency to implement a land reuse plan. The installation also has worked closely with the state of Florida on UST cleanups and has initiated a partnership with EPA. The partnerships facilitated the signing of an Alternative Procedure Agreement with the state in FY93.

In FY94, the installation formed a restoration advisory board (RAB) and a BRAC cleanup team (BCT). The RAB has 15 community members and meets bimonthly. In FY95, Orlando completed its land reuse plan, and a community relations plan was developed. The installation completed an Environmental Baseline Survey that identified 1,133 acres as CERFA-clean.

During FY96, the BCT began partnering efforts with contractors and changed its name to the Orlando Partnering Team. The installation also completed site screenings of 12 AOCs and began screening of an additional 12. A Preliminary Assessment and Site Inspection (PA/SI) was completed and the RI/FS was initiated at the Laundry Area C Site. PA/SI activities were completed at two other sites. The installation completed a CAP for one UST.

FY97 Restoration Progress

RI/FS activities were initiated at the McCoy Annex Landfill, Old Pesticide Shop, and Groundskeeper Storage Area. An IRA at one UST site (McCoy Gas Station) was completed. Findings of suitability to lease (FOSL) were completed for 525 acres and site screenings were completed at 20 AOCs. Fieldwork on the final 13 AOCs was initiated.

The BCT transferred 214 acres at Capehart Housing Parcel for \$1.85 million and completed a Record of Decision (ROD) on OU1 and 20 site screenings. The BCT also removed and assessed 55 tanks. Soil removal was completed as part of the IRA for Study Area 52 and

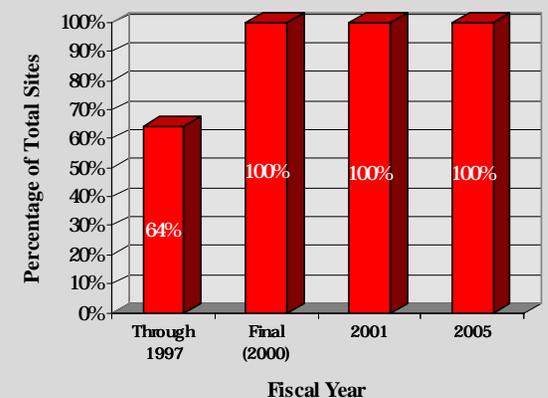
OU3. Terra-probe, cone penetrometer, ground-penetrating radar, and global positioning system techniques were used to expedite fieldwork.

Some work scheduled for completion in FY97 was not accomplished. FOSLs were completed for only 525 acres, and site screenings were completed at only 20 AOCs. Additional work in these areas has been scheduled for FY98.

Plan of Action

- Complete FOSL and findings of suitability to transfer (FOST) for 835 acres in FY98
- Complete site screenings for remaining AOCs in FY98
- Complete FOST for 1,100 acres (EDC parcel) in FY98
- Complete FOST for 75 acres (PBC parks parcel) by FY98
- Complete RI/FS on McCoy Landfill by FY98
- Complete RI/FS and IRA and begin Remedial Design at the Laundry Area C site in FY98
- Complete closure of the installation in FY99

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 16,000 acres
Mission: Produce and store military weapons
HRS Score: 51.22; placed on NPL in May 1994
IAG Status: Under negotiation
Contaminants: VOCs, SVOCs, heavy metals, chlordane, UXO, and explosives
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: \$0.2 million
Estimated Cost to Completion (Completion Year): \$12.1 million (FY2041)
Final Remedy In Place or Response Complete Date: FY2022



Pantex Village, Texas

Restoration Background

The former Pantex Ordnance Plant, located 13 miles northeast of Amarillo, Texas, began operations in 1942 as an Army Ordnance Corps facility. The property currently is owned by the U.S. Department of Energy (DOE) and Texas Tech University. Operations conducted there include fabrication, assembly, testing, and disassembly of nuclear ammunition and weapons. Past and present operations include burning of chemical waste in unlined pits, burial of waste in unlined landfills, and discharge of plant wastewaters into on-site surface water.

Environmental studies of the southern 5,000 acres, owned by Texas Tech University, have been ongoing since FY88. A Preliminary Assessment and Site Inspection completed in FY90 identified nine possible areas of emphasis (AOE) for investigation. It was suspected that some of the AOE's contained ordnance and explosives (OE). An Interim Remedial Action was conducted at three AOE's to remove OE from soil to a depth of 3 feet.

In FY94, a Phase I Remedial Investigation and Feasibility Study (RI/FS) began for two AOE's. RI/FS activities included sampling of surface and subsurface soil, sediment, surface water, and groundwater. Results of the analysis indicated that explosives, mercury, lead, chromium, and chlordane were the primary contaminants of concern. The installation began an Engineering Evaluation and Cost Analysis (EE/CA) of four AOE's at which Non-Time-Critical Removal Actions might be necessary.

In FY95, the final Phase I RI Report was completed for the hazardous, toxic, and radioactive waste (HTRW) project, and the draft EE/CA Report was completed for the OE project. In addition, a public meeting was held to present information about environmental restoration projects at the installation. DOE and Texas Tech University

established a partnership with the Texas Natural Resource Conservation Commission (TNRCC) to continue quarterly groundwater sampling.

In FY96, a contract was awarded for preparation of a potentially responsible party (PRP) search work plan. The PRP work plan will address property owned by DOE and Texas Tech University. The PRP investigation for the Texas Tech University property will not be initiated until it is determined that further action is warranted.

Representatives of Texas Tech University, DOE, the community, and TNRCC met to review the status of the site and discuss concerns. TNRCC did not agree with the recommendation of the EE/CA Report. Therefore, the cleanup remedy recommended in the report was not implemented. TNRCC was expected to provide a written response to the report.

FY97 Restoration Progress

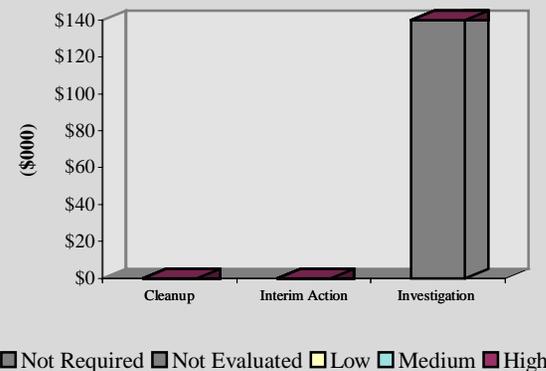
Contracts were awarded for the DOE PRP and Texas Tech property record search. Phase II HTRW investigation was initiated for the Texas Tech property. The DOE record search was completed, and a final report was submitted.

Selection and implementation of a cleanup remedy were delayed because TNRCC has not provided a written response to the EE/CA Report.

Plan of Action

- In FY98, implement the cleanup remedy recommended in the EE/CA Report for the OE project, after obtaining approval of TNRCC
- In FY98, review results of PRP search and meet with DOE and Texas Tech to determine PRP responsibility
- Conclude Phase II HTRW investigation in FY98

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 8,043 acres
Mission: Receive, recruit, and combat-train enlisted personnel upon their enlistment in the Marine Corps
HRS Score: 50.00; placed on NPL in December 1994
IAG Status: Federal Facility Agreement under negotiation
Contaminants: Industrial wastes, pesticides, paint, petroleum/oil/lubricants, solvents, ordnance compounds, metals, acids, and electrolytes
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: \$4.9 million
Estimated Cost to Completion (Completion Year): \$18.4 million (FY2018)
Final Remedy in Place or Response Complete Date: FY2008



Parris Island, South Carolina

Restoration Background

The Parris Island Marine Corps Recruit Depot was listed on the National Priorities List (NPL) in December 1994. The listing was due, primarily, to contamination at two landfill sites. Environmental investigations have identified 48 potential CERCLA and RCRA sites at the installation. Most of the sites are landfills or spill areas where groundwater and sediment are contaminated with solvents and petroleum/oil/lubricants. In FY86, an Initial Assessment Study identified 16 sites, 10 of which were designated Response Complete (RC).

In FY87, a Site Inspection (SI) was initiated for all sites. EPA prepared a RCRA Facility Assessment (RFA) for the installation in FY90. The RFA identified 44 solid waste management units (SWMU) and four areas of concern (AOC). All CERCLA sites identified previously were included as SWMUs or AOCs. All the SWMUs identified in the RFA are being addressed under the CERCLA process.

Of the 25 officially identified sites, 10 have been designated RC. At two sites, all tanks were removed and cleanup was completed, and five sites required no further action. In FY93, the installation completed an Expanded Site Inspection at the Causeway Landfill. During FY95, the installation began Remedial Actions involving tank removals, soil removal, free-product recovery, and soil vapor extraction at one UST site. Four storage tanks were removed. An Interim Remedial Action (IRA) was conducted at one of the landfill sites. A fence now restricts access to the landfill.

In FY95, the installation began negotiations to prepare a Federal Facility Agreement (FFA). Twelve sites that had been designated RC were reopened, with three being reclassified as RC soon after. Also, in partnership with the Navy Environmental Health Center, the installation began to develop a community relations plan (CRP). The

Navy, the Marine Corps, EPA, and the state regulatory agency have begun to negotiate a formal partnering arrangement. The Agency for Toxic Substances and Disease Registry performed the initial public health assessment for the installation in FY95.

During FY96, the installation began Remedial Investigation and Feasibility Study (RI/FS) activities at four sites and completed Preliminary Assessment (PA) and SI activities at three. The installation also began an IRA at a spill area, completed an assessment of contamination at UST 2, and began preparation of a corrective action plan (CAP) for that site. A draft FFA was prepared. In addition, the installation began to compile an administrative record and submitted its draft CRP to the regulatory agencies for approval.

FY97 Restoration Progress

The CAP was completed, and corrective action for UST 2 was implemented. Also, the installation completed the IRA and initiated long-term monitoring for UST 1.

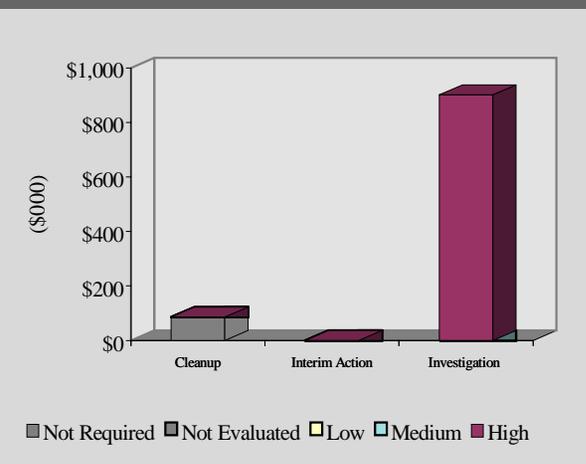
The CRP is nearing completion and restoration advisory board (RAB) formation is in its initial stages. FFA meetings are on hold; the final FFA will be based on partnering team results. Partnering team meetings are being held every other month. Three landfills will be investigated in FY98 by using the CERCLA Municipal Landfill Presumptive Remedy.

Plan of Action

- Complete the CRP in FY98
- Establish a RAB in FY98
- Sign the FFA in FY98
- Complete two RI/FSs in FY98

- Begin work on four RI/FSs in FY98
- In FY98, reopen Sites 9 and 15 (currently designated RC) for further investigation
- In FY99, complete work under the IRA at one spill area site

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 6,800 acres
Mission: Test and evaluate naval aircraft systems
HRS Score: 36.87; placed on NPL in May 1994
IAG Status: None
Contaminants: Heavy metals, pesticides, organics, petroleum/oil/lubricants, solvents, and UXO
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: 15.8 million
Estimated Cost to Completion (Completion Year): \$107.9 million (FY2016)
Final Remedy in Place or Response Complete Date: FY2014



Lexington Park, Maryland

Restoration Background

Environmental studies, beginning in FY84, have identified 46 sites at this installation. Since the installation was placed on the National Priorities List (NPL), some sites have been combined with other sites or eliminated. Three sites were scored for placement on the NPL: the Fishing Point Landfill, the Former Sanitary Landfill, and the Pest Control Shop. Wastes managed at the Fishing Point Landfill included mixed solid wastes, petroleum/oil/lubricants (POL), paints, thinners, solvents, pesticides, and photographic laboratory wastes. Wastes handled at the Former Sanitary Landfill include mixed solid wastes, POLs, paints, thinners, solvents, and pesticides. Pesticides were handled at the Pest Control Shop.

Metals and pesticides, released primarily from landfills and spills, have contaminated soil, groundwater, surface water, and sediment. Remedial Investigation and Feasibility Study (RI/FS) activities began at several sites in FY85. Additional RI/FS activities included installation of shallow and deep monitoring wells; collection of soil borings; and collection of environmental samples, including samples of water, soil, sediment, and fish. Hydrogeologic testing also was conducted. Between FY86 and FY91, the installation initiated or completed several Interim Remedial Actions (IRA), including removal of drums, polychlorinated biphenyl (PCB)-contaminated soil, pesticide-contaminated soil, and ordnance.

In FY94, IRAs conducted at the installation included an ordnance sweep to remove remaining unexploded ordnance (UXO) and stabilize the shoreline. Shoreline stabilization has prevented the erosion of a landfill into the Chesapeake Bay. Groundwater treatment and recovery of free product also continued in FY94. In FY95, the installation conducted RI/FS activities at 11 sites. Sixteen underground storage tanks (UST) identified between FY87 and FY93 were grouped into six

areas for further investigation. Interim Actions at two of the areas included groundwater treatment and recovery of free product.

In FY90, the installation formed a technical review committee, which met quarterly. The installation completed a community relations plan (CRP) in FY91 and established a restoration advisory board (RAB) in FY94. The Navy regularly updates an administrative record and two information repositories, both of which were established in FY95.

During FY96, the installation began a five-phase RI/FS for 16 sites, and a Record of Decision was signed for Site 11, the Former Sanitary Landfill. The installation also initiated IRAs at Site 11 to install a cap and at Site 24 to remove a drywell and sediment. The predesign and design phases were initiated for an IRA at Sites 6 and 17. The Corrective Measures Design was implemented at UST 1, along with a site Removal Action at UST 5. The installation also prepared a corrective action plan for UST 6. In addition, the CRP was updated.

FY97 Restoration Progress

One early action took place at the installation, and a landfill cap was installed. Corrective action at UST 4 and two Interim Actions at UST 6 also were implemented. IRAs were completed at Sites 11 and 24. A geoprobe was used to collect subsurface samples.

Interaction between the installation and the RAB continued in FY97. RAB members were given an on-site tour of the Site 11 landfill to improve their understanding of the cleanup process.

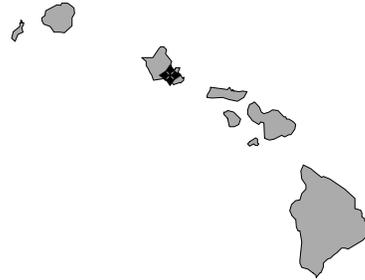
Plan of Action

- Complete Site Inspection at five sites in FY98
- Complete IRA at Site 34 in FY98
- Complete Remedial Designs (RD) for Sites 6 and 17 in FY98
- Implement corrective action at USTs 1 and 5 in FY98
- Complete landfill cap design (FY98) and construction (FY99) for Sites 1 and 12
- In FY98, foster formal partnership with EPA, the state of Maryland, Engineering Field Activity Chesapeake, and installation personnel
- Complete RI/FS for 16 sites in FY99

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 2,162 acres
Mission: Provide primary fleet support in the Pearl Harbor area
HRS Score: 70.82; placed on NPL in October 1992
IAG Status: Federal Facility Agreement signed in March 1994
Contaminants: VOCs, SVOCs, heavy metals, PCBs, pesticides, petroleum hydrocarbons, and solvents
Media Affected: Groundwater and soil
Funding to Date: \$70.5 million
Estimated Cost to Completion (Completion Year): \$125.7 million (FY2029)
Final Remedy in Place or Response Complete Date: FY2014



Pearl Harbor, Hawaii

Restoration Background

The Pearl Harbor Naval Complex (PHNC) consists of six installations: the Fleet and Industrial Supply Center, the Naval Station, the Naval Magazine, the Naval Shipyard, the Public Works Center, and the Inactive Ship Maintenance Detachment. Fuel supply activities, landfills, and other support operations have contaminated the soil and groundwater with volatile organic compounds (VOC), semivolatiles organic compounds (SVOC), and metals.

The installation has been conducting environmental investigations and cleanups, under CERCLA and RCRA, at more than 30 sites since FY83. Between FY91 and FY93, Interim Remedial Actions (IRA) included excavation of polychlorinated biphenyl (PCB)- and dieldrin-contaminated soil at the Pearl City Junction, and excavation of PCB-contaminated soil at PCB-containing transformer locations at ASSETS School and off-site disposal. An IRA to remove five underground storage tanks (UST) and tetrachloroethene (PCE) contaminated soil from the Aiea Laundry site was completed in FY94. In FY95, the installation initiated one Site Inspection (SI) and two Remedial Investigations and Feasibility Studies (RI/FS). Approximately 7,000 cubic yards of soil were excavated, removed, treated by thermal desorption, and backfilled at the Site 22 oily waste disposal pit in FY95. In the same year, planning activities began for a full-scale extraction test for groundwater and free product at Site 36. Pilot-scale testing was completed for a soil vapor extraction (SVE) system at the Aiea Laundry site.

A technical review committee (TRC) formed in FY90 was converted to a restoration advisory board (RAB) in FY95. The installation established three information repositories in FY90 and an administrative record in FY92. A community relations plan (CRP) was

completed in FY92 and updated in FY95. Several fact sheets have been prepared for TRC and RAB meetings. In FY94, the installation held several partnering sessions with the state and EPA Region 9. The installation also held meetings with the state to reach consensus on investigation and cleanup goals.

A Removal Site Evaluation (RSE) and a design package were initiated at Site 45 to address petroleum contamination. In addition, the RI/FS for the sediment at Site 19 continued. The Removal Action design packages for Sites 4 and 34 and the Site Summary Process for the Pearl Harbor Naval Complex also continued through FY97.

FY97 Restoration Progress

During FY97, IRAs were initiated at Sites 37 and 46 (Bunker C) and completed at Sites 8 and 36. Long-term monitoring (LTM) also was initiated at one site. Removal Actions were conducted for Sites 8, and 36. SIs were performed for Sites 40 through 42. The Preliminary Assessment and the SI also were finished for Sites 40 and 41. RAs and RI/FS were completed, and the IRA at Site 13 continued.

At Site 34, a solvent extraction technology was used to remove PCBs from concrete. PCBs also were removed from contaminated sediment in the catch basin at Site 13. Capping of landfill Site 8 employed an innovative technology called evapotranspiration. This process marked the completion of Site 8 cleanup, although groundwater monitoring will continue for 5 years. In addition, accelerated fieldwork techniques, including an on-site laboratory at Site 13 and a customized sediment sampling platform at Site 19, were implemented.

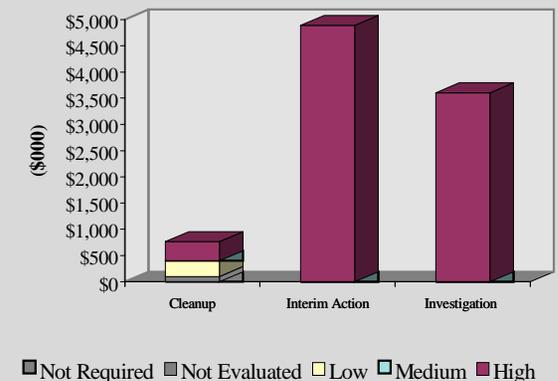
Two fixed-price Removal Action Contracts (RAC) were awarded in FY97. The RAB continued to meet quarterly, and COMNAVBASE Pearl Harbor co-chaired the meetings.

Some activities scheduled for completion in FY97 were delayed because additional sampling was required to characterize the dioxin-contaminated area.

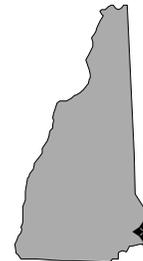
Plan of Action

- Complete the performance design package for the landfill in FY98
- Continue LTM and RI/FS activities at several sites in FY98
- Complete Phase II of RI/FS activities at two sites in FY98
- Continue RAs at three sites in FY98
- Initiate an IRA for five SWMUs in FY98
- Continue RA at Site 31 and RI/FS at Site 19 in FY98
- Implement the RI/FS planning documents at Sites 22 and 27 in FY98
- Initiate the RSE at Site 29 in FY98
- Continue the Site Summary Process for the PHNC in FY98
- Implement the design of the RA at Sites 4 and 10 in FY98
- Continue the LTM/LTO at Site 36 in FY98
- Implement electrokinetics at Site 10 and an innovative product recovery process at Site 45 in FY98
- Complete the Removal Action at Sites 37 and 46 and initiate LTM/LTO in FY98
- Begin RI/FS activities at Sites 19 and 43 in FY02

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 4,257 acres
Mission: Served as Strategic Air Command bomber and tanker base
HRS Score: 39.42; placed on NPL in February 1990
IAG Status: Federal Facility Agreement signed in 1991
Contaminants: VOCs, spent fuels, waste oils, petroleum/oil/lubricants, pesticides, and paints
Media Affected: Groundwater and soil
Funding to Date: \$138.2 million
Estimated Cost to Completion (Completion Year): \$30.5 (FY2046)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY1998



Portsmouth/Newington, New Hampshire

Restoration Background

In December 1988, the BRAC Commission recommended closure of Pease Air Force Base. In FY91, the installation was closed as scheduled. Previous environmental studies at the installation identified the following site types: fire training areas, burn pits, industrial facilities, landfills, and underground storage tanks (UST). Groundwater and soil are contaminated with petroleum products, namely JP-4 jet fuel, and industrial solvents, such as trichloroethene (TCE).

The installation completed several Interim Remedial Actions, including pilot groundwater Treatment Studies, at four sites; soil removal at three sites; and test pit operations at two sites. It also completed three soil vapor extraction (SVE) Treatability Studies and one bioventing Treatability Study. The installation removed 158 USTs and associated contaminated soil.

A BRAC cleanup team (BCT) was formed in FY93. To streamline the restoration process at the installation, the BCT developed a procedure for completing the Remedial Design (RD) concurrently with Remedial Action (RA). That approach has saved a significant amount of time in implementing remedial systems. Most actions will be implemented within 1 year to 18 months after the Records of Decision (ROD) are signed.

A restoration advisory board (RAB) was formed in FY95 from the installation's technical review committee. The RAB meets monthly and has been active in the RA process. A citizens group, Seacoast Citizens Overseeing Pease Environment (SCOPE), has participated in meetings and assisted in the development of cleanup options at the installation. SCOPE will continue evaluating the operation of RAs during operation and maintenance (O&M) and long-term monitoring (LTM).

During FY95, six RODs were signed, bringing the total number of completed RODs to 10. Cleanup actions were completed at seven locations, and a large remediation system was put into operation at Fire Training Area 2. Innovative technologies implemented include landfill consolidation and natural attenuation of groundwater.

In FY96, the installation held a community open house that focused on RAs at the installation. Steps were taken to transfer the remaining property to the Local Redevelopment Authority (LRA) under a public benefit transfer. LF-5 capping was completed, construction of the SVE and air sparging system at Site 45 began, and wetlands restoration at LF-6 was completed.

Also in FY96, construction began on the large bioventing system at Site 13, the SVE and air sparging system in Zone 2, and the groundwater recovery system in Zone 3. After demonstrating the impracticability of reducing the levels of groundwater contaminants to concentrations at or below maximum contaminant levels (in accordance with an EPA Technical Impracticability directive), the installation began implementing the groundwater containment system at Site 32. The final Remedial Investigation and Feasibility Study (RI/FS) work was completed for the Brooks and Ditches Operable Unit (OU).

FY97 Restoration Progress

The final ROD for the Brooks and Ditches OU was signed. The remaining remediation systems were brought on line, and O&M and LTM were initiated at the remaining sites. Trend analyses of site responses to cleanup activities were initiated to facilitate Site Closeout and will continue until all sites have been completed. System startup reports were issued, quarterly data submissions made, and the first annual report issued for Site 8. The BCT completed a finding of

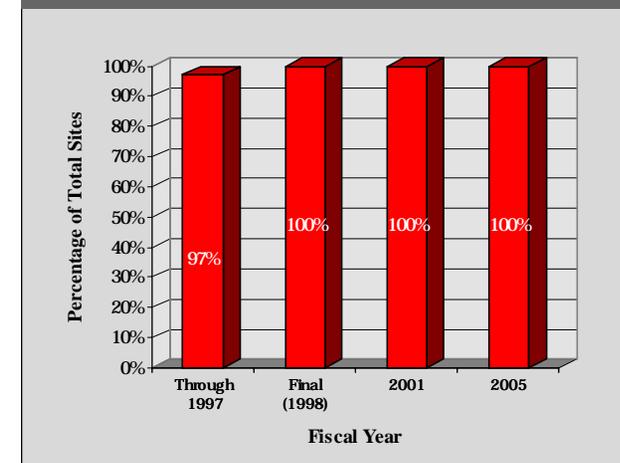
suitability to lease/Supplemental Environmental Baseline Survey document in support of a public benefit conveyance in June. A new area of contamination, Site 46, Communications Building 22, was discovered in June 1997 through an environmental site assessment conducted by a developer of the parcel. The Air Force immediately began site characterization and RI.

Use of Hydro-Punch technology and on-site regulator/LRA coordination facilitated daily field decisions and permitted accelerated fieldwork for newly discovered sites. The Air Force, Air Force Contractor, and regulators held weekly construction progress meetings for all work conducted in FY97. Concurrent, on-board review meetings are held with contractors, regulators, and RAB stakeholders. A public hearing was held for the Brooks and Ditches ROD, and all proposed action items were accepted.

Plan of Action

- Complete streamlined RI/FS and RD/RA for Site 49 in FY98
- Conduct an early RA and a full-scale Treatability Study concurrent with ROD completion for Site 49 in FY98
- In FY98, implement source area treatment for TCE in groundwater at Site 73
- Continue data trend analysis for all ongoing RAs in FY98

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 5,874 acres
Mission: Serve as a flight training center
HRS Score: 42.40; placed on NPL in December 1989
IAG Status: Federal Facility Agreement signed in October 1990
Contaminants: Ammonia, asbestos, benzene, cyanide, heavy metals, paints, PCBs, pesticides, phenols, plating wastes, and chlorinated and nonchlorinated solvents
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: \$47.3 million
Estimated Cost to Completion (Completion Year): \$67.5 million (FY2030)
Final Remedy in Place or Response Complete Date: FY2011



Pensacola, Florida

Restoration Background

This installation, which now serves as a flight training center, was formerly a naval air rework facility and aviation depot. Operations that have caused contamination at the station include machine shops, a foundry, coating and paint shops, paint stripping and plating shops, various maintenance and support facilities, landfills, and storage facilities. Environmental investigations conducted at the installation since FY83 have identified 38 CERCLA sites, 1 solid waste management unit (SWMU), and 15 underground storage tank (UST) sites.

Site types include landfills, disposal sites, polychlorinated biphenyl (PCB) transformer and spill areas, industrial wastewater treatment plant areas, and evaporation ponds. The primary areas of concern are two landfills. All active CERCLA sites at the installation are in the Remedial Investigation and Feasibility Study (RI/FS) phase. Corrective measures have been taken at two UST sites. Cleanup activities, including the installation of a groundwater pump-and-treat system, have been conducted at the SWMU. The installation has conducted several Interim Remedial Actions (IRA) and Removal Actions to limit the threats posed by contaminated sites. In FY94, the installation removed a waste tank. It also removed industrial sludge containing heavy metals from sludge-drying beds and removed stained soil from various sites. At another site, a fence was installed to restrict access to an area containing drums.

In FY95, the installation began conducting IRAs at four sites and completed the RI/FS and the Proposed Plan for an additional site. A Record of Decision (ROD) was signed for no further action at Site 39. RI reports were submitted for 10 sites; RI fieldwork was completed for two of these sites. Petroleum-contaminated soil was removed from two UST sites.

The installation formed a technical review committee (TRC) in FY90 and converted it to a restoration advisory board (RAB) in FY94. The RAB has nine members, five of whom represent the community, and meets monthly. A community co-chair has been selected, and the charter has been completed.

In FY96, a new CERCLA site was added to the program, and two USTs were closed. The installation completed IRAs at four sites. The RI/FS was completed for four sites but was delayed, along with Proposed Plans for another four sites, until resolution of issues concerning use of institutional controls. The installation submitted an RI report for seven sites and completed an RI for Site 1. The installation also completed RI fieldwork for three sites and initiated RIs for nine other sites. Remedial Design (RD) activities began at Sites 32, 33, and 35.

FY97 Restoration Progress

The completed installation restoration activities included an RI/FS for Sites 4, 16, 28, and 36; an RI for nine sites; and RD for Sites 32, 33, and 35. An RD and a Remedial Action (RA) were initiated at five sites. Monitoring for UST 17 and 22 continued through FY97. The RA for Site 32 was initiated in October 1997. IRAs for Sites 1, 9, 10, 17, 18, and 25 were awarded in September 1997.

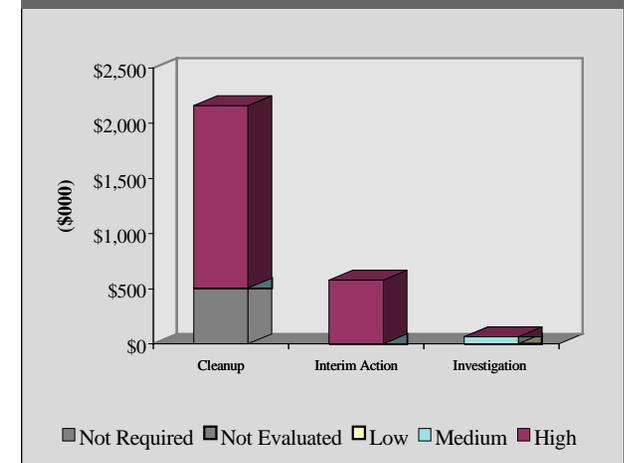
The National Oceanic and Atmospheric Administration has been included on the Partnering Team to assist in ecological risk assessment issues. The installation held an open exposition and discussion of each agency's role and limitations. The RAB participated in television appearances and newspaper interviews to encourage community involvement.

Some activities scheduled for completion in FY97 were delayed because of institutional control issues.

Plan of Action

- Complete RI for Sites 15, 19, 21, and 23 in FY98
- Complete RI/FS for Sites 7 and 18 in FY98
- Begin RD for Site 2 in FY98
- Continue development of an FS, a Proposed Plan, and a ROD for Sites 2, 9, 29, and 34 in FY98
- Complete FS, RA, and Proposed Plan and sign ROD for Site 1 in FY98
- Complete ROD for Site 38 in FY98
- Sign ROD for Sites 17 and 42 in FY98
- Complete IRA for Sites 1, 9, 10, 17, 18, and 25 in FY98
- Complete RD for seven sites in FY99
- Complete ROD for nine sites in FY99
- Begin RA for Site 38 in FY00
- Complete ROD for Sites 40 and 41 in FY00

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 1,850 acres
Mission: Provide logistical support for ships and service craft; overhaul, repair, and outfit ships and craft; conduct research and development; test and evaluate shipboard systems
HRS Score: NA
IAG Status: None
Contaminants: Petroleum/oil/lubricants, heavy metals, PCBs, solvents, and VOCs
Media Affected: Groundwater and soil
Funding to Date: \$18.2 million
Estimated Cost to Completion (Completion Year): \$1.2 million (FY2005)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY1999



Philadelphia, Pennsylvania

Restoration Background

The Philadelphia Naval Complex comprises the Philadelphia Naval Shipyard, the Philadelphia Naval Station, and the Philadelphia Naval Hospital. In December 1988, the BRAC Commission recommended closure of the Philadelphia Naval Hospital. In July 1991, it recommended closure of the Philadelphia Naval Station and the Philadelphia Naval Shipyard. The BRAC 1995 amendment deleted preservation of the Naval Shipyard to provide for emerging requirements. A significant portion of the shipyard property now is scheduled for disposal.

Prominent site types at the complex are landfills, oil spills, and disposal areas that have released petroleum/oil/lubricants and heavy metals into groundwater and soil. A Preliminary Assessment and Site Investigation (PA/SI) completed in FY88 identified 15 sites.

In FY90, Remedial Investigation and Feasibility Study (RI/FS) activities were completed at four sites. The installation began RI/FS activities for eight sites and Remedial Design and Remedial Action (RD/RA) activities for four sites. The first phase of remediation was completed in FY92, and a Record of Decision (ROD) was signed for four sites. In FY93, two Interim Remedial Actions (IRA) were completed at six sites.

In FY92, A RCRA Facility Assessment identified 167 solid waste management units (SWMU) and 15 areas of concern (AOC). The Navy began a focused RCRA Facility Investigation (RFI) to address 15 SWMUs and AOCs. Risk assessments will be completed for the remaining SWMUs to identify a cleanup level or propose no further action. In FY90, four underground storage tank (UST) sites were identified. Removal Actions were conducted at three of the four sites. Environmental Baseline Surveys (EBS) were completed for the hospital in FY94 and for the shipyard and the naval station in FY95.

The Navy conducted an EBS Phase II investigation that required study of 57 areas at the complex. Currently, 21 areas have been determined to require further evaluation. During FY95, the installation signed an amended ROD and completed remediation for four sites. The installation also completed an RI and an IRA for Site 4. Removal Actions were initiated at two UST sites at the hospital.

The complex formed a technical review committee (TRC) in FY89. The installation also established a restoration advisory board (RAB). The RAB, which has 12 members, meets monthly. In FY95, an information repository was established and the community relations plan was written. The information repository is updated twice a year. The complex formed a BRAC cleanup team and prepared a BRAC Cleanup Plan (BCP) in FY94.

During FY96, RA was completed at four sites and two sites were closed out. The installation also completed a design and remedy for an RA at one UST site and began Removal Actions at four sites. The installation also drafted an Environmental Impact Statement and submitted it to the regulatory agencies for review.

FY97 Restoration Progress

Two early actions were implemented: Site 5 Riverbank Stabilization and Site 2 Sand Blasting Grit Removal. RDs were completed at one UST site and remedial activities were completed at two other UST sites. Two RAs were initiated and two were completed. Two sites were closed. The installation also completed the corrective measures implementation and the RFI for one SWMU.

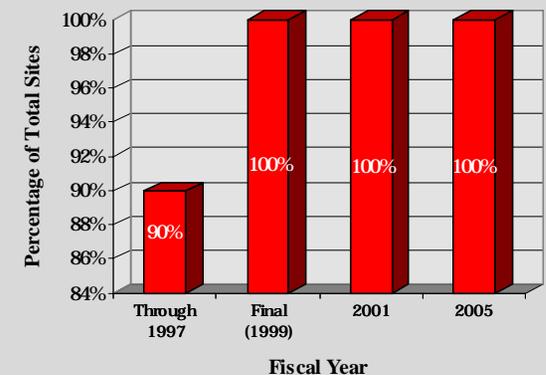
The BCP was revised extensively. The RAB continued to meet monthly and developed a poster station.

Some activities scheduled for completion in FY97 were delayed because barn owls were found in the incinerator. Addressing this problem will require further investigation and planning.

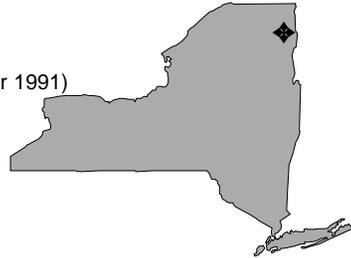
Plan of Action

- Begin long-term monitoring at two sites in FY98
- Complete a Removal Action at one SWMU in FY98
- Have all RAs in place by end of FY98
- Obtain a finding of suitability to transfer in FY98

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 3,447 acres
Mission: Refuel and deploy aircraft
HRS Score: 30.34; placed on NPL in November 1989
IAG Status: Federal Facility Agreement signed in July 1991 (effective September 1991)
Contaminants: Organic solvents, pesticides, fuels, PCBs, and lead
Media Affected: Groundwater and soil
Funding to Date: \$34.0 million
Estimated Cost to Completion (Completion Year): \$14.0 (FY2028)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY1998



Plattsburgh, New York

Restoration Background

Environmental studies have been conducted at this base since FY87, and 40 sites have been identified for investigation and closure. Site types include underground storage tanks (UST), aboveground storage tanks, landfills, industrial facilities, spill sites, and training areas. Regulatory concurrence has been received for closeout of 11 sites. The installation was placed on the National Priorities List (NPL) after the former Fire Training area was determined to be a source of groundwater contamination with chlorinated solvents and benzene, toluene, ethyl benzene, and xylene.

The installation began a Remedial Investigation and Feasibility Study (RI/FS) in FY89. In FY91, the installation completed a Removal Action for soil contaminated with the pesticide DDT and for an abandoned UST. In FY92, a soil Removal Action was completed and a free-product removal system was constructed at the former Fire Training Area. At the latter site, more than 17,000 gallons of fuel have been recovered. In addition, the installation prepared Remedial Designs for closure of two landfills. The installation completed three Removal Actions in FY93: removal of a UST that had contained DDT, closure of a pretreatment facility, and removal of soil contaminated with lead. The installation completed Records of Decision (ROD) for three sites and constructed two landfill caps.

In FY95, the installation conducted an Interim Action to remove soil contaminated with fuel from two sites and prepared final RODs for the Pesticide Storage Tank and a landfill. The installation received regulatory concurrence for no further action at seven sites and completed surveys for endangered species, Phase I archaeology, and cold war resources. The installationwide Environmental Impact Statement and the comprehensive land reuse plan were completed, and the community relations plan (CRP) was drafted.

In FY96, the installation awarded a contract for construction of two additional landfill caps. The groundwater treatment facility for free-product recovery at the former Fire Training Area was upgraded and a source Removal Action using soil vapor extraction (SVE) and bioventing was initiated. Two additional Removal Actions using SVE began, and contaminated soil at three other sites was removed.

Partnerships between the BRAC cleanup team (BCT) and regulatory agencies have fostered open communication and cooperation. In FY94, the installation formed a restoration advisory board (RAB). Members of the BCT serve on the RAB in an advisory capacity.

FY97 Restoration Progress

An off-gas treatment/incinerator was tested at the former Fire Training Area in conjunction with the SVE. Geoprobos were used for screening and Removal Action delineations to accelerate fieldwork.

Combining the Treatability Study and the Engineering Evaluation and Cost Analysis (EE/CA) into one report saved 6 months. The BCT reviewed reuse issues such as transfers and leases and laboratory quality assurance and quality control variances. The BCT also planned RODs, resolved regulatory issues, and updated site status. The latest versions of the BRAC Cleanup Plan (BCP) and Environmental Baseline Survey (EBS) were completed.

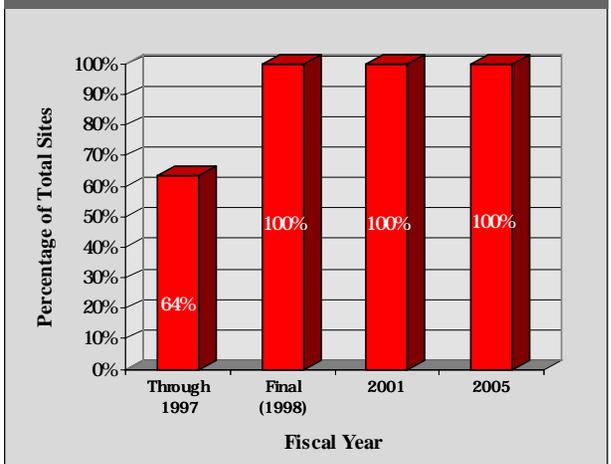
The installation held three public meetings at which RODs and Action Memorandums were proposed. The base also presented computer modeling of base groundwater contamination and its regional impact. The New York State Science Teachers Association was instructed on environmental technologies and given a site tour.

Some activities scheduled for FY97 were delayed because of contractor delays, negotiations with regulatory agencies, and the need for additional data or site characterizations.

Plan of Action

- Complete all ongoing Removal Actions and landfill caps in FY98
- Implement two additional Removal Actions in FY98
- Complete the Groundwater Impact Study in FY98
- Complete closure, investigation, and remediation of petroleum handling and storage facilities in FY98
- Update the CRP, EBS, and BCP in FY98
- Remove soil at two sites (land treatment area/RCRA landfill) in FY98
- Validate natural attenuation for Fire Training Area groundwater Operable Unit in FY98
- Complete suitability to lease or transfer for 90 percent of base property and close out six Installation Restoration Program sites by FY99
- In FY99, enter into a Memorandum of Agreement with the New York State Historic Preservation Office for preservation and transfer of historic property

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 2,716 acres
Mission: Receive, store, maintain, and issue ordnance
HRS Score: 50.00; placed on NPL in May 1994
IAG Status: IAG signed in August 1996
Contaminants: TNT, RDX, heavy metals, PCBs, and VOCs
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: \$6.6 million
Estimated Cost to Completion (Completion Year): \$8.1 million (FY2006)
Final Remedy in Place or Response Complete Date: FY2000



Port Hadlock, Washington

Restoration Background

Since FY84, environmental investigations at this installation have identified 15 sites. The primary sources of contamination are landfills and ordnance disposal sites. Environmental investigations have focused on cleaning up existing, and preventing future, contamination of shellfish beds near the installation. Contaminants can migrate by overland flow into bays or through soil to the sea-level aquifer. The bays near Port Hadlock are used for both recreational and commercial fishing. An investigation completed in FY88 found trace metals (including lead), organics, and petroleum hydrocarbons in shellfish near the North End Landfill. A study in FY93 produced similar results.

In FY87, a tank was removed and field monitoring of explosive gas concentrations was completed at the buried Imhoff tanks. A Remedial Action (RA) for the site in FY87 involved installation of piping and fans to vent methane gas from the tanks. Two Removal Actions were completed in FY91. One involved removing abandoned underground storage tanks (UST); the other included removal of one UST and excavation and disposal of associated petroleum-contaminated soil. The installation performed an additional Removal Action at this second site in FY94, removing petroleum-contaminated soil and disposing of it at an off-site landfill.

In FY95, Interim Remedial Actions (IRA) were completed at three sites. At two sites, soil contaminated with ordnance was removed and disposed of off site. At the third site, sediment containing polycyclic aromatic hydrocarbons (PAH) was removed. The two ordnance-contaminated sites are located in an area used by Native American tribes, prompting concerns about archaeological and cultural resources. A Record of Decision (ROD) for no further action was signed for these sites and three others. Erosion and groundwater

discharge from Site 10 (a landfill) have contributed to contamination of surrounding beaches and had significant influence on National Priorities List (NPL) scoring. A ROD was signed designating capping for the landfill and installation of a seawall to minimize further erosion. The installation will use biogeoenvironmental techniques to prevent shoreline erosion.

The installation formed a technical review committee in FY88 and converted it to a restoration advisory board (RAB) in FY95. The RAB includes 30 members who represent regulatory agencies, local Native American Tribes, and neighboring communities. The RAB met quarterly in FY95 and monthly in FY96. A community relations plan (CRP) was developed in FY92, and the installation distributed fact sheets covering such topics as state involvement and oversight, the Site Hazard Assessment program, the results of shellfish and sediment sampling, and the results of cleanups.

During FY96, the CRP was revised, the installation completed the Remedial Design (RD) at Sites 10, 11, 12, 18, and 21, and the RA at Site 18. The Navy and the National Council of Historic Places signed a Memorandum of Agreement to protect archaeological remains during construction of the RA. The tribes also signed after consultation.

Compliance monitoring continued at one site and began at another during FY96. A Removal Action was initiated at Site 34 (an open burn and open detonation area that had been identified in FY95), ground-water monitoring began at Site 21, and compliance monitoring continued at Site 12. The Navy, EPA Region 10, and the state of Washington signed an Interagency Agreement (IAG) for eight sites.

FY97 Restoration Progress

RA was completed at Site 10. Operation and maintenance activities and compliance monitoring for groundwater began. The IRA at Site 34 and the Site Inspection (SI) were completed. Site 34 was proposed as a no-further-action site. Site investigations were initiated at Sites 33 and 35. Compliance monitoring continued at Sites 12 and 21, which must await regulatory acceptance before response is complete.

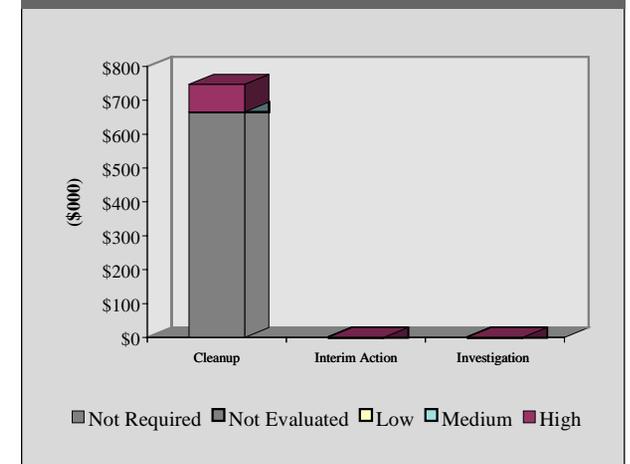
An early action at Site 10 involved use of a soft bank system consisting of rocks and vegetation to prevent the landfill from eroding. The installation also expedited document review by faxing information and holding predocumentation meetings to outline expectations before the document is drafted. The RAB met as needed in FY97. To promote community involvement, the installation held a ribbon cutting at the completion of the Site 10 landfill cap.

Some activities scheduled for completion in FY97 were delayed pending regulator acceptance of data for two sites. Site 10 monitoring will not be completed until 2002.

Plan of Action

- Complete RA activities at two sites in FY98
- Begin SI at one site in FY98
- Complete SI and begin RD at one site in FY98
- Conduct long-term monitoring of groundwater and shellfish at Site 10 until 2002

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 278 acres
Mission: Maintain, repair, and overhaul nuclear submarines
HRS Score: 67.70: placed on NPL in May 1994
IAG Status: Federal Facility Agreement under negotiation
Contaminants: Heavy metals, PCBs, pesticides, and VOCs
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: \$17.6 million
Estimated Cost to Completion (Completion Year): \$88.5 million (FY2016)
Final Remedy in Place or Response Complete Date: FY2007



Kittery, Maine

Restoration Background

Portsmouth Naval Shipyard was placed on the National Priorities List (NPL) in May 1994 after it was discovered that surface runoff and erosion from the installation were contaminating the Piscataqua River. Groundwater also was found to be contaminated in the vicinity of five sites.

A Preliminary Assessment (PA) completed in FY83 and a Site Inspection (SI) conducted in FY86 identified four potentially contaminated sites. A RCRA Facility Assessment conducted in FY86 identified 28 solid waste management units (SWMU). Site types at the installation include a landfill, a salvage and storage area, and waste oil tanks. In FY92, the installation completed a RCRA Facility Investigation (RFI).

In FY94, the installation completed an interim measure at the Defense Reutilization and Marketing Office scrapyard, and a Removal Action that involved installing a cap on a portion of the scrapyard. The installation also completed a groundwater and soil gas survey at another SWMU. Other activities accomplished in FY94 included completion of RFI fieldwork to address data gaps, development of onshore Media Protection Standards (MPS), and completion of draft offshore Ecological and Human Health MPSs. Seven underground storage tanks (UST) were removed during the RFI. Two of these UST sites remain under investigation so that the need for further cleanup can be determined.

In FY95, the installation prepared final reports on fieldwork conducted in FY94. It also began developing a work plan for data gap investigations and monitoring of the Piscataqua River. An Ecological Risk Assessment (ERA) of the Piscataqua River and Great Bay Estuary was initiated. The installation also began developing Preliminary Remedial Goals or MPSS for the installation. For the

offshore investigation, the Navy Marine Environmental Support Office developed sampling and analytical methodologies for use in the marine environment. In addition, a draft Feasibility Study (FS) Report for 11 of 13 SWMU sites was submitted to regulatory agencies.

The technical review committee, which was formed in FY87, was converted to a restoration advisory board (RAB) in FY95. The installation developed a community relations plan (CRP) in FY93 and updated the plan in FY96.

In FY96, the Navy fostered partnering by including EPA, the Maine Department of Environmental Protection (MEDEP), and the natural resource trustees early in the decision-making process. EPA facilitated the smooth transition from the RCRA Corrective Action Program to a CERCLA cleanup program, and the installation began negotiations with EPA and MEDEP on a Federal Facility Agreement. The installation continued to develop a site management plan as a project management tool.

A work plan for investigation of groundwater and seeps also was completed during FY96. Another work plan was prepared for performance of additional site characterizations at four SWMUs, including modeling of offshore migration of contaminants.

FY97 Restoration Progress

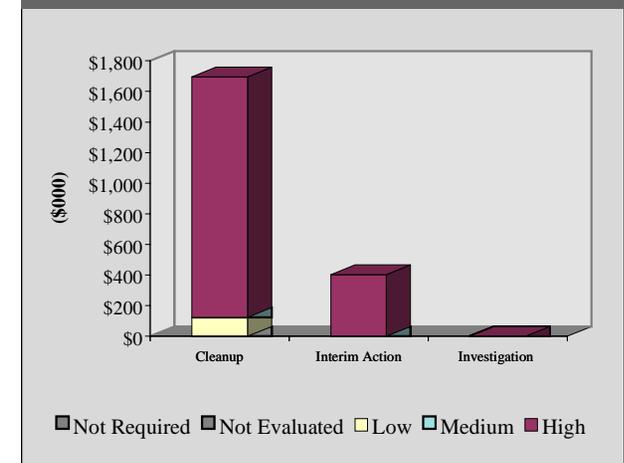
The installation completed a work plan for SWMUs 10 and 29 and Phase I groundwater modeling for SWMUs 8, 9, 10, 11, and 27. A work plan and three rounds of basewide groundwater sampling were also completed. In addition, the installation initiated a Removal Action at SWMU 9, and on June 19, 1997, completed and signed a no-further-action document for SWMUs 12, 13, 16, and 23.

To expedite document review, RAB and technical assistance grant consultants were invited to all technical meetings with the EPA and MEDEP. The CRP was updated.

Plan of Action

- Complete the ERA in FY98
- Complete site characterization for three SWMUs in FY98
- Complete an FS for one SWMU in FY98
- Complete Remedial Investigation for two sites in FY98
- Complete Phase II Fate and Transport Modeling in FY98
- Complete basewide groundwater sampling program

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 27,827 acres
Mission: Housed 7th Infantry Division (Light); undergoing transition to support the Defense Language Institute Foreign Language Center, currently at the Presidio of Monterey, California
HRS Score: 42.24; placed on NPL in February 1990
IAG Status: Federal Facility Agreement signed in July 1990
Contaminants: VOCs, petroleum hydrocarbons, heavy metals, and pesticides
Media Affected: Groundwater and soil
Funding to Date: \$166.1 million
Estimated Cost to Completion (Completion Year): \$231.5 million (FY2028)
Final Remedy in Place or Resonse Complete Date for BRAC Sites: FY2011



Marina, California

Restoration Background

Since 1917, Fort Ord has served primarily as a training and staging installation for infantry units. In July 1991, the BRAC Commission recommended closing Fort Ord and moving the 7th Infantry Division (Light) to Fort Lewis, Washington. The Army closed Fort Ord in September 1994.

In FY87, a hydrogeological investigation identified the sanitary landfills at Fort Ord as potential sources of contamination for the city of Marina’s backup drinking water supply well. In FY89, Remedial Investigation and Feasibility Study (RI/FS) activities were initiated for the landfills. In FY90, a Preliminary Assessment and Site Inspection identified 61 sites at the installation, including landfills, 241 underground storage tanks, motor pools, family housing areas, a fire training area, an 8,000-acre impact area, and an explosive ordnance disposal area. Petroleum hydrocarbons and volatile organic compounds (VOC) have migrated into groundwater.

In FY94, the installation commander converted the installation’s technical review committee into a restoration advisory board and formed a BRAC cleanup team (BCT).

The FY95 RI/FS categorized 41 sites as requiring either no further action (NFA), Interim Action, or Remedial Action. The installation constructed a groundwater treatment system at the post landfill and completed a Record of Decision (ROD) for the Fritzsche Army Air Field (FAAF) Operable Unit (OU) 1. A lead-removal pilot study was done at discrete sections of the Beach Trainfire Ranges (Site 3).

In FY96, the Army completed Proposed Plans and a Record of Decision (ROD) for the RI sites and remediation of lead-contaminated soil for the Beach Ranges. The Army began construction activities to cap the OU2 landfill and construct a groundwater pump-and-treat

system. The existing landfill with groundwater treatment system was proposed as a corrective action management unit (CAMU) to allow consolidation of waste. This procedure saved at least \$10 million in waste disposal costs and met the Superfund preference for on-site waste management.

FY97 Restoration Progress

Operation of the OU1 and OU2 systems continued. The Army prepared the Phase I Engineering Evaluation and Cost Analysis (EE/CA) addressing Removal Actions for ordnance and explosives. The EE/CA was reviewed by the community. The installation expects to complete the report and implement its recommendations in FY98. A draft Phase II EE/CA, also addressing ordnance and explosives, was prepared and began the review process. The installation’s two operational soil biotreatment units should close in FY98.

A Cooperative Agreement allowed initiation of a subsurface characterization of Fort Ord that included use of seismic reflection and downhole resistivity tests. The installation also employed on-site laboratories and hydropunch technologies to expedite fieldwork.

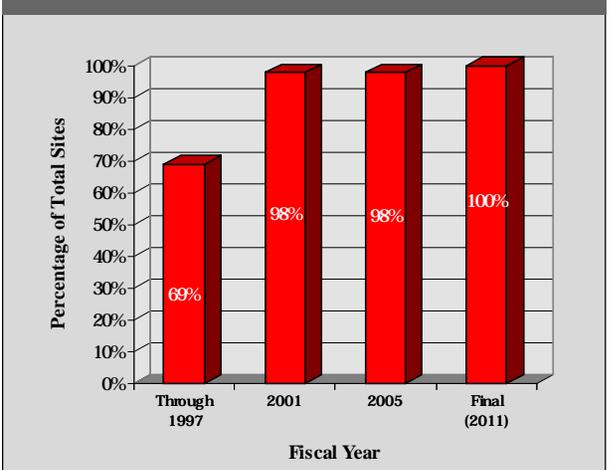
A team building session was held to improve BRAC Cleanup Team (BCT) productivity. The BCT completed the Phase I EE/CA document, a ROD for remedial sites, an interim ROD for Site 3, and an explanation of significant differences for OU2. The BCT also examined OU2 design documents, reviewed and commented on 11 findings of suitability to transfer (FOST), and initiated review of the Phase II EE/CA document.

A pending lawsuit delayed some activities scheduled for completion in FY97. Some additional RODs are required.

Plan of Action

- Continue operation of the OU1 and OU2 groundwater treatment systems
- Prepare approximately 11 FOSTs in support of 8 property transfers in FY98
- In FY98, continue assessment or cleanup of sites affected by ordnance or explosives
- Initiate a 5-year review for the OU1 treatment system in FY98
- Prepare a report on potential disposal areas at FAAF in FY98
- Consolidate remaining RI sites waste materials in the OU2 CAMU and complete OU2 cap construction in FY98
- Complete construction of pump-and-treat system for Site 2/12 in FY98
- In FY98, complete Ecological Risk Assessment for Site 3 (Beach Ranges)
- Complete the final ROD for Site 3 to address ecological risks in FY99
- Complete waste removal and post-closure risk assessments at six RI sites in FY98
- Complete Interim Removal Actions at Sites 34 and 39A in FY98

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 1,480 acres
Mission: Served as headquarters for the 6th Army, the Letterman Army Institute of Research, and the Letterman Army Medical Center
HRS Score: NA
IAG Status: None
Contaminants: Petroleum hydrocarbons, heavy metals, solvents, pesticides, and lead-based paint
Media Affected: Groundwater and soil
Funding to Date: \$78.5 million
Estimated Cost to Completion (Completion Year): \$29.9 million (FY2006)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2005



San Francisco, California

Restoration Background

In December 1988, the BRAC Commission recommended closure of the Presidio of San Francisco, including the Letterman Army Medical Center (Letterman AMC). The BRAC Commission made this recommendation primarily because the installation has no ability to expand and the Presidio and Letterman AMC functions could be relocated. The Army transferred the installation property to the National Park Service in October 1994.

Sites identified during studies at the installation include underground storage tanks (UST), a fuel distribution system, landfills, hazardous waste storage areas, and polychlorinated biphenyl (PCB)-contaminated electrical transformers. The most prominent sources of contamination are leaking USTs and a heating-fuel distribution system, which have caused petroleum contamination in groundwater and soil. Other contaminants include heavy metals, solvents, and pesticides.

Remedial Investigation and Feasibility Study (RI/FS) activities began in FY90. The second phase of RI fieldwork was completed in FY93 and was followed by a third phase in FY95. In FY94, the installation formed a BRAC cleanup team (BCT) and converted the technical review committee into a restoration advisory board (RAB). In addition, the installation completed an Environmental Baseline Survey report.

During FY95, the RAB met bimonthly to address issues related to restoration activities and to solicit comments from its members on restoration documents and plans. The National Park Service also began implementing a general management plan for reuse of the property. The BCT met monthly and focused on accelerating cleanup at the installation. The BCT also continued to expedite document review by conducting technical report presentations and maintaining

an efficient document tracking system. All RI fieldwork was completed during FY95. The Army and regulators signed a Record of Decision (ROD) for the Public Health Service Hospital Area (formerly Letterman AMC).

Cleanup actions conducted at the installation before and during FY95 included UST removal, soil excavation, and containment and treatment of contaminated groundwater. The Army attempted to implement an innovative treatment system for Vehicle Maintenance Area ground-water contamination, but the system was not effective. Other treatment options are being studied.

In FY96, the installation submitted the RI Report to the regulators for review. In addition, the installation removed more than 90 USTs and 7,500 feet of abandoned fuel distribution line and excavated approximately 7,000 cubic yards of contaminated soil. More than 70,000 cubic yards of petroleum-contaminated soil were treated on site at a low-temperature thermal desorption unit. The installation abated asbestos in the Public Health Service Hospital and abated asbestos and lead-based paint in 41 residential buildings. An Interim Removal Action was conducted for petroleum-contaminated soil near Building 637.

FY97 Restoration Progress

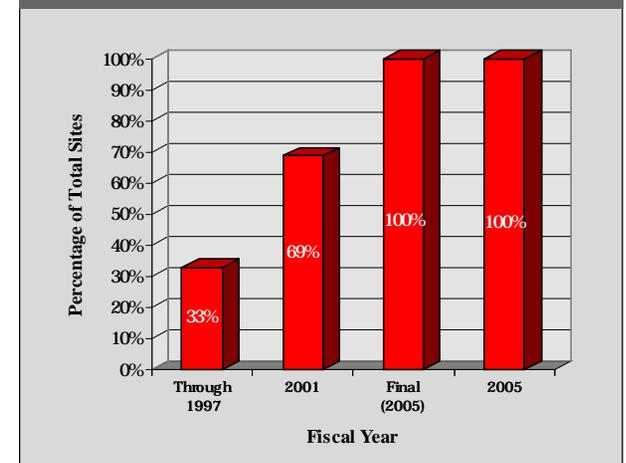
Interim Removal Actions were conducted for PCB-contaminated soil at two buildings. The installation removed 27,000 feet of fuel distribution system pipeline and an additional 70 USTs. In addition, approximately 10,000 cubic yards of petroleum-contaminated soil were treated on site by low-temperature thermal desorption. Asbestos was abated in 40 structures. Two petroleum-contaminated sites underwent extensive investigation during the year. The installation used innovative methods such as on-site laboratories, geoprobe, and magnetometers, to accelerate work.

The installation used technical working groups to resolve technical issues at various sites and developed basewide management plans for groundwater and USTs. To expedite document review, technical working groups also were used to write and review documents as they were developed. Partnering discussions and meetings helped resolve issues with regulatory agencies. The BCT published the final FS and RI, developed the program schedule, monitored the BRAC budget, and synchronized cleanup with reuse activities.

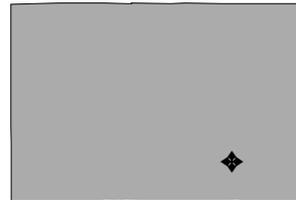
Plan of Action

- Complete removal of USTs in FY98
- Complete remediation of the Engineering and Housing area in FY98
- Complete installationwide ROD in FY98
- Complete Crissy Field Remedial Action Plan and cleanup by April 1998

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 23,121 acres
Mission: Store chemical munitions
HRS Score: 78
IAG Status: None
Contaminants: Heavy metals, petroleum/oil/lubricants, VOCs, SVOCs, pesticides, explosives, PCBs, and UXO
Media Affected: Groundwater and soil
Funding to Date: \$64.8 million
Estimated Cost to Completion (Completion Year): \$61.8 million (FY2004)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2004



Pueblo, Colorado

Restoration Background

In December 1988, the BRAC Commission recommended realignment of the Pueblo Depot Activity, primarily because of chemical demilitarization activities. The commission recommended relocating the supply mission and the ammunition mission to other bases. In October 1996, the Army placed Pueblo Depot Activity under the Chemical and Biological Defense Command and changed the name to Pueblo Chemical Depot.

Investigations identified sites such as a landfill, open burning and detonation grounds, an ordnance and explosives waste area, lagoons, former building sites, oil-water separators, a TNT washout facility and discharge system, and hazardous-waste storage units. Heavy metals and volatile organic compounds (VOC) are the primary contaminants affecting groundwater and soil at the installation.

Between FY89 and FY94, RCRA Facility Investigations (RFI) and corrective measures studies (CMS) were conducted for 45 solid waste management units (SWMU). In FY94, the installation formed a restoration advisory board (RAB) and a BRAC cleanup team (BCT). The installation also completed a final CERFA report in FY94; however, the state regulatory agency has not concurred in the installation's findings concerning CERFA-clean acreage.

In FY94, the community formed a Local Redevelopment Authority, which prepared and approved a land reuse plan. The plan is being revised. In cooperation with the local Pueblo Depot Activity Development Authority (PDADA), the installation prepared a master lease that allows subleasing of parts of the property.

In FY95, the installation constructed a groundwater extraction and treatment system to remediate and prevent the off-site migration of contaminated groundwater. An alternative drinking water supply was

provided to a residence adjacent to the installation that could be affected by contamination.

The installation submitted draft RFI work plans for 14 SWMUs, completed a Phase II RFI for 13 SWMUs, and submitted an RFI Report for 8 SWMUs. Nine SWMUs were determined to require no further action (NFA). A partnering meeting was held with representatives of the installation, regulators, and stakeholders to accelerate the restoration process.

In FY96, the installation conducted cleanup and removal of TNT washout buildings and identified the source of TNT by-products in an off-post spring. The Army and the state are resolving groundwater plant operation and monitoring issues related to the Consent Order. The installation developed Team Pueblo to coordinate public involvement in restoration and cleanup activities. It also began an installationwide unexploded ordnance (UXO) survey and partial cleanup.

FY97 Restoration Progress

The Environmental Baseline Survey and the finding of suitability to lease were completed for 74 buildings. These buildings have been turned over to PDADA for reuse. The installation and the state resolved all Consent Order issues, including reducing a \$10 million fine to \$500,000. Soil removal at TNT washout lagoons is under way. The removed soil is being stored for future bioremediation. The installation developed the depot master plan and schedule for reuse and presented it to the RAB. Several early actions occurred, including demolition of TNT buildings, clearance of UXO from 445 acres, removal of the deactivation incinerator and 6 underground storage tanks (UST), decontamination of 2 buildings, and demolition of 28 structures.

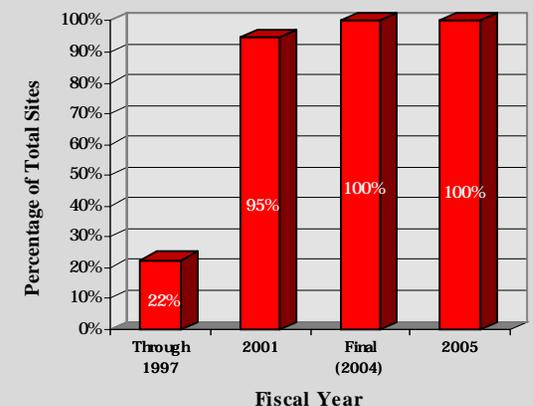
Working meetings and discussions helped resolve issues with regulatory agencies and expedited site characterization. The BCT was involved in activities such as scheduling, setting SWMU priorities, and making reuse environmental determinations.

The first activity in the current plan of action was originally scheduled for FY97 but was delayed until FY98 because the state is developing procedures for evaluation and approval of NFA recommendations.

Plan of Action

- Submit RCRA permit modification in FY98 to remove NFA site from the SWMU list
- Locate hot spots in the landfill in FY98 and determine the remediation required to eliminate the need for existing groundwater treatment system
- Conduct voluntary bioremediation cleanup in FY98
- Conduct voluntary hot-spot removal for SWMUs 14, 28, and 36 in FY98
- Initiate voluntary Interim Action at Circuli Springs Area of Concern 1 in FY98
- In FY98, clean up several buildings for reuse

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 152 acres

Mission: Provide logistical support for assigned ships and service craft; perform authorized work in connection with construction, overhaul, and other tasks

HRS Score: 50.00 (Puget Sound Naval Shipyard); placed on NPL in May 1994
50.00 (Jackson Park Housing Complex); placed on NPL in May 1994

IAG Status: None

Contaminants: Heavy metals, VOCs, petroleum/oil/lubricants, grit, paint, solvents, construction debris, acids, and silver nitrate

Media Affected: Groundwater, surface water, sediment, and soil

Funding to Date: \$50.7 million

Estimated Cost to Completion (Completion Year): \$50.6 million (FY2006)

Final Remedy in Place or Response Complete Date: FY2003



Bremerton and Kitsap Counties, Washington

Restoration Background

Most of the Puget Sound Naval Shipyard (PSNS) is built on contaminated fill material. Metals and petroleum/oil/lubricants are the primary contaminants in groundwater, soil, surface water, and sediment at the installation. The main sources of contamination at the installation are past operations, such as cleaning and demilitarization of ordnance.

An Initial Assessment Study (IAS) conducted in FY83 identified six potentially contaminated sites at PSNS. In FY90, a supplemental Preliminary Assessment identified five other potentially contaminated sites. Nine of these 11 sites were recommended for further investigation.

A draft IAS, completed in FY83 for the Jackson Park Housing Complex (JPHC), identified eight sites. Two sites were recommended for further investigation, and the remaining six were recommended for no further action. A Site Inspection Report prepared in FY88 recommended further investigation of the two sites first identified in the IAS and divided one site into two parts.

In FY92, an underground storage tank (UST) Validation Report identified 26 abandoned tanks that required further investigation. Nine of those tanks were removed. In FY94, the remaining 17 tanks were removed or closed. Subsequent negotiations with the state regulatory agency revealed a need for further action for five tanks.

In FY94, the installation excavated contaminated soil from a site at PSNS and disposed of the soil at an approved off-site facility. Three Removal Actions were conducted at JPHC.

Sampling and analysis of soil and groundwater were conducted at three sites in the JPHC and a Remedial Investigation (RI) was completed in FY95. Soil sampling and analysis were conducted at

three other sites in the housing complex. Also in FY95, an extensive demonstration of steam sparging was conducted at PSNS to address oil contamination in the subsurface environment. The installation entered into a Memorandum of Understanding with the U.S. Geological Survey to obtain the technical support of that agency.

During FY96, a Human Health Risk Assessment was completed for the terrestrial sites at JPHC, and development of Remedial Action (RA) work plans and decision documents was initiated for a site at PSNS. The demonstration of steam sparging continued. Also during FY96, corrective action was initiated for five USTs. RI and Feasibility Study (FS) activities were performed at six sites at PSNS and three sites at JPHC.

JPHC and PSNS formed their technical review committees (TRC) in FY91 and FY92, respectively. Both TRCs were converted to restoration advisory boards (RAB) in FY94. Both RABs were actively involved in an Environmental Cleanup Information Fair in FY95 at the Kitsap Regional Library. During FY96, the RABs met monthly and held a workshop to discuss issues related to community involvement and the hydrogeology of Puget Sound.

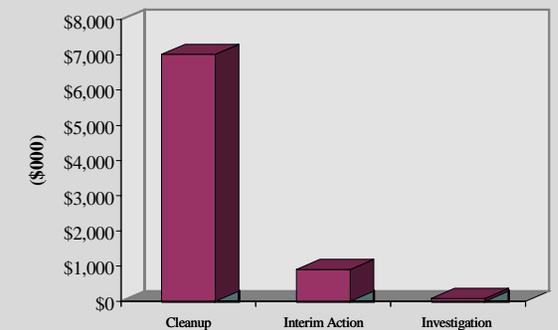
FY97 Restoration Progress

The installation completed the demonstration of steam sparging, which was so successful that the installation awarded a contract to design and construct a full-scale system. The installation used geoprobe to assist with the benzene seep investigation at JPHC. Site Characterization and Analysis Penetrometer System (SCAPS) was used to delineate the extent of petroleum contamination at PSNS operable unit (OU) C. RAs for six sites continued in FY97. RI/FS was not completed on schedule.

Plan of Action

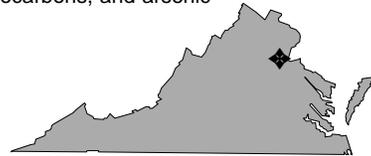
- Complete the Remedial Design (RD) for three sites at the JPHC in FY98
- Complete RD/RA at PSNS OU NSC and PSNS OU A in FY98
- Complete RI for PSNS OU B in FY98
- Complete construction and shakedown of full-scale steam sparging system at PSNS OU C in FY98
- Complete RI, FS, Proposed Plan, and Record of Decision (ROD) for JPHC terrestrial OU and marine OU in FY98

FY98 FUNDING BY PHASE AND RELATIVE RISK



Legend: ■ Not Required ■ Not Evaluated □ Low □ Medium ■ High

Size: 60,000 acres
Mission: Provides military training and supports research, development, testing, and evaluation of military hardware
HRS Score: 50.00; placed on the NPL in June 1994
IAG Status: RCRA FFCA signed December 31, 1991; Federal Facility Agreement under negotiation
Contaminants: PCBs, pesticides, VOCs, phenols, heavy metals, petroleum hydrocarbons, and arsenic
Media Affected: Surface water, sediment, and soil
Funding to Date: \$31.9 million
Estimated Cost to Completion (Completion Year): \$104.1 million (FY2020)
Final Remedy in Place and Response Complete Date: FY2014



Quantico, Virginia

Restoration Background

Quantico Marine Corps Combat Development Command operated a municipal landfill throughout the 1970s. After the 26-acre landfill closed, the area was used by the Defense Reutilization and Marketing Office as a scrapyard. During that time, polychlorinated biphenyl (PCB)-containing transformers were drained onto the ground so that copper and transformer casings could be recovered. Contamination at the old landfill area was the primary reason for the installation's placement on the National Priorities List (NPL). Site types at the installation include surface disposal areas, landfills, underground storage tanks (UST), and disposal pits that contain contaminated soil, surface water, and sediment.

Since FY81, 243 solid waste management units (SWMU) have been identified at Quantico. The number of SWMUs is expected to increase with the completion of the Federal Facility Agreement (FFA). Currently, the database contains an official count of 27 Installation Restoration sites, 71 SWMUs, and 2 USTs. Between FY81 and FY94, the installation completed Preliminary Assessments for 17 sites and 24 SWMUs, Site Inspections for 7 sites, RCRA Facility Assessments (RFA) for 4 SWMUs, and RCRA Facility Investigations (RFI) for 5 SWMUs. A corrective measures study (CMS) was completed for one SWMU. In addition, initial site characterizations were completed for two UST sites, and an investigation was completed for one UST site.

The installation completed several Interim Remedial Actions (IRA): in situ soil treatment and long-term monitoring (LTM) for one SWMU; removal of PCB-contaminated soil and scrap metal from two sites to minimize the spread of contamination; removal and incineration of pesticide- and arsenic-contaminated soil from one site; installation of runoff controls to prevent erosion of contaminated surface soil at one site; removal of waste from an embayment and placement of a stone

revetment along the shoreline; and removal of drums, tanks, and bulk containers contaminated with petroleum products from one UST site.

During FY95, the installation began development of a corrective action plan for one UST site. In addition, a Corrective Measures Design (CMD) was completed, corrective measures implementation (CMI) was initiated, and a final Remedial Action (RA) for the capping of a landfill was initiated for one SWMU. A CMD, CMI, and a final RA for the removal of contaminated soil also were completed, and operation and maintenance (O&M) and LTM were initiated for two SWMUs.

The technical review committee (TRC), formed in FY89, is composed of representatives from state and federal regulatory agencies and the local community. The TRC has not been converted to a restoration advisory board, because of insufficient community interest. In FY92, the installation established three information repositories, each containing a copy of the administrative record. In FY95, a community relations plan was completed.

During FY96, the installation prepared Remedial Investigation and Feasibility Study (RI/FS) work plans for seven sites and initiated an IRA for the capping of a landfill at one site. The installation also continued a final RA for the capping of a landfill at one SWMU.

FY97 Restoration Progress

A Record of Decision was signed for one site, and two early actions were initiated. The installation also began LTM for one SWMU and initiated RI/FSs for several sites. Land treatment with phytoremediation was implemented along with fieldwork techniques, including a geoprobe, an on-site laboratory, and ground-penetrating radar.

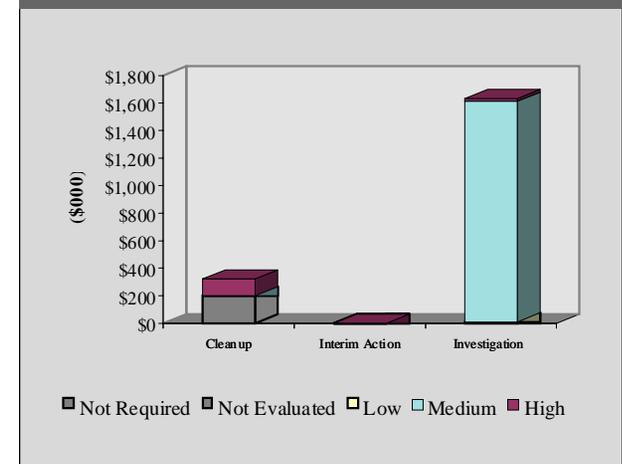
The installation entered into a partnership, called the Quantico Environmental Restoration Team (QERT), with regulatory agencies and contractors. The team meets monthly to discuss and determine investigation requirements. QERT allows all parties to interact and reach consensus on cleanup activities.

Some activities scheduled for completion in FY97 were delayed pending state response.

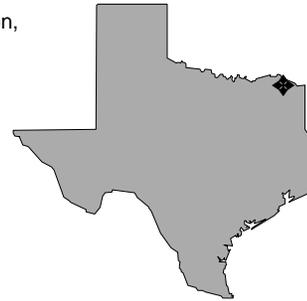
Plan of Action

- Investigate and close 20 sites/SWMUs with sampling in FY98
- Investigate five site screening areas in FY98
- Complete IRAs for two sites in FY98
- Complete a CMS and initiate corrective action for one SWMU in FY98
- Continue RI/FSs for five sites in FY98
- Initiate screening investigations for four SWMUs in FY98
- Initiate Remedial Design and RA for one site in FY99

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 19,081 acres
Mission: Provide maintenance for light combat vehicles, support rubber production, store ammunition, and conduct training
HRS Score: NA
IAG Status: None
Contaminants: TCE
Media Affected: Groundwater, surface water, and sediment
Funding to Date: \$12.2 million
Estimated Cost to Completion (Completion Year): \$24.2 million (FY2004)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2002



Texarkana, Texas

Restoration Background

In July 1995, the BRAC Commission recommended realignment of Red River Army Depot. All maintenance missions except those related to the Bradley Fighting Vehicle Series were recommended for relocation to other depots. The installation will retain its ammunition storage, intern training, civilian training, and rubber production missions.

Areas of environmental concern identified in environmental investigations at the depot include oil-water separator lagoons, spill sites from previous chemical cleanup activities, and spill sites from pesticide storage and mixing activities. Trichloroethene (TCE) is the main contaminant affecting groundwater.

Completed Interim Actions at the installation include removing the former Hays Treatment Plant Dunbar filter beds in FY88, demolishing buildings and removing contaminated soil in FY94 and FY95, and demolishing Army-Peculiar Equipment.

In FY95, the installation formed a BRAC cleanup team (BCT), which includes representatives of the installation and of federal and state regulatory agencies. The BCT prepared a BRAC Cleanup Plan (BCP) (Version I) outlining current and future strategic and planning efforts for all environmental programs associated with the installation's BRAC parcels. The community also formed a Local Redevelopment Authority. Also in FY95, the installation continued its partnership with the Texas Natural Resource Conservation Commission (TNRCC) through the Defense and State Memorandum of Agreement program. Those efforts helped reduce regulatory impediments by addressing issues related to the scope of Interim Remedial Actions (IRA) and fieldwork. IRAs included removal of more than 2,000 cubic yards of contaminated sediment from the north and south stormwater drainage ditches in the Wastewater Treatment Area.

In FY96, the installation commander formed a restoration advisory board (RAB). The installation prepared the final draft Environmental Baseline Survey (EBS) Report. BCP Version I was completed, and strategies and planning efforts outlined in the BCP were initiated at the end of the fiscal year.

FY97 Restoration Progress

The Red River Local Redevelopment Authority (RRLRA) requested that excess footprint at the installation be modified to make the footprint contiguous. The footprint acreage was changed by removing some acres and adding new acres. The new footprint total is 765 acres. Because of this change, a draft Supplemental EBS was completed in FY97. Additional cultural resource survey actions are under way. Privatization of utilities also is being pursued. The RRLRA is interested in being the utility provider. The Army is revising the preliminary draft Environmental Assessment to include additional information about the acreage. Closure was complete for the Final and Intermediate lagoons at the industrial waste treatment plant (IWTP).

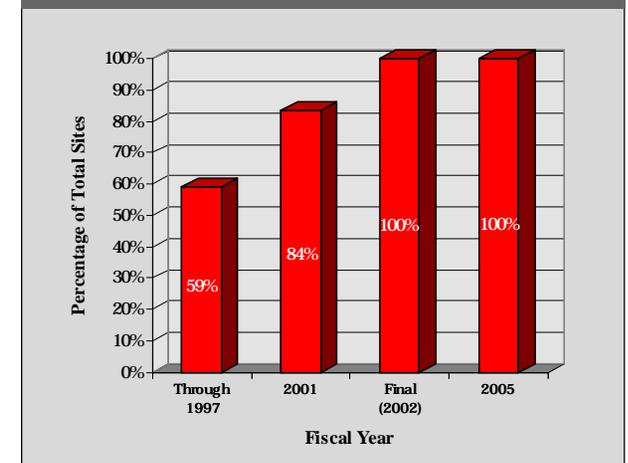
The BCT approved the final EBS and CERFA letter, participated in the Army peer review test program, reviewed and commented on five RCRA Facility Investigations, approved a depotwide risk assessment scope of activities, and conducted fieldwork that corrected the U.S. Geological Survey map for the installation area. BCP Version 1 was completed, as was the land reuse plan. Six-hundred-and-eighty-four acres are awaiting regulatory concurrence as CERFA-clean.

The change in excess footprint (mentioned above) caused the restoration advisory board to reformulate several requirements. This process, plus the addition of acreage and the issue of privatizing the utilities, delayed the first five activities on the current plan of action which were originally scheduled for completion in FY97.

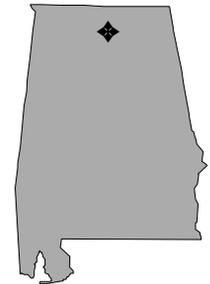
Plan of Action

- Initiate RCRA Facility Investigations in FY98 at Environmental Conditions of Property (ECP) "7" sites identified in the EBS
- In FY98, complete final Environmental Assessment and a finding of no significant impact
- Submit the administrative record in FY98
- Complete fieldwork and archives search for natural and cultural resources and issue Memorandum of Agreement in FY98
- Complete BCP Version II in FY98
- Develop installation heavy-metals background levels for soil and groundwater in FY98
- Complete risk assessment activities for nine sites in FY98
- Close two lagoons in the Wastewater Treatment Area in FY98
- Jointly develop a 6-year work plan in FY98 with the TNRCC
- Complete a cultural resources survey in FY98
- Complete a master finding of suitability to lease for the excess footprint in FY98
- Complete finding of suitability to transfer for all ECP "1 and 2" sites in FY98

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 38,300 acres
Mission: Army Aviation and Missile Command
HRS Score: 33.40; placed on NPL in June 1994
IAG Status: Federal Facility Agreement under negotiation
Contaminants: Heavy metals, solvents, SVOCs, CWM, and pesticides
Media Affected: Groundwater, sediment, and soil
Funding to Date: \$46.7 million
Estimated Cost to Completion (Completion Year): \$249.1 million (FY2011)
Final Remedy in Place and Response Complete Date: FY2004



Huntsville, Alabama

Restoration Background

Past operations at the Redstone Arsenal (RSA) include production, receipt and shipment, storage, demilitarization, and disposal of chemical and high-explosive munitions. Commercial chemical pesticides also have been produced at the installation. RSA currently conducts military research and development, manages procurement, and supports the Army's aviation and missile weapons systems.

Environmental studies at RSA began in FY77 and identified 297 sites. Of these sites, 215 are Army sites and 82 are other sites located at Marshall Space Flight Center, which are the responsibility of NASA. Site types include past disposal sites, landfills, open burn and open detonation (OB/OD) areas, chemical munition disposal sites, and solvent spill sites. Primary contaminants of concern include heavy metals, solvents, semivolatile organic compounds (SVOC), chemical weapons/munitions (CWM), and pesticides.

In FY94, Interim Remedial Actions (IRA) began at three dismantled lewisite manufacturing plants, as well as at the closed portions of the OB/OD grounds. Surface impoundments at two of the plants were fitted with an engineered clay cap, and a proposed groundwater pump-and-treat system was pilot-tested at the OB/OD grounds.

Also in FY94, RSA formed a technical review committee (TRC) and established information repositories at five locations accessible to the public.

As part of Interagency Agreement (IAG) negotiations in FY95, the Army identified 11 sites as requiring no further action. All parties agreed to a list of 86 sites that would be covered under the agreement. In 1996, negotiations on the agreement continued, and the Army submitted a revised draft IAG to the regulatory agencies.

In FY95, the installation completed three IRA designs, including three groundwater extraction and treatment systems and a RCRA cap.

In FY96, Site Inspection fieldwork began at 38 sites, Remedial Investigation (RI) activities continued at 39 sites, and Feasibility Study (FS) activities began at 10 sites. The Army constructed a groundwater extraction system and an air stripper and began treatment of contaminated groundwater in the upper aquifer of the closed sanitary landfill. In addition, the Army awarded a construction contract for a groundwater extraction and treatment system at the former Redstone Arsenal Rocket Engine (RARE) Facility North Plant.

RSA officials surveyed the public in FY96 to determine community interest in forming a restoration advisory board. Little interest was expressed.

FY97 Restoration Progress

The installation completed the RCRA cap for the closed lewisite manufacturing plant. Construction of a groundwater extraction and treatment plant was initiated, and a pilot study for a soil vapor extraction (SVE) system at the RARE Facility North Plant began. All fieldwork for a Removal Action involving an industrial septic tank system was completed in late FY97. The installation also completed an FS and initiated Proposed Plans for 10 sites.

The Army completed no-further-action decision documents for three sites and Proposed Plans for four additional sites. Three of the plans involved long-term monitoring as the preferred alternative.

The installation improved site management techniques in FY97 by reorganizing sites into operable units, developing an installationwide RI work plan and installationwide background and baseline

concentrations, and implementing site-specific work plan review meetings to expedite regulatory review processes.

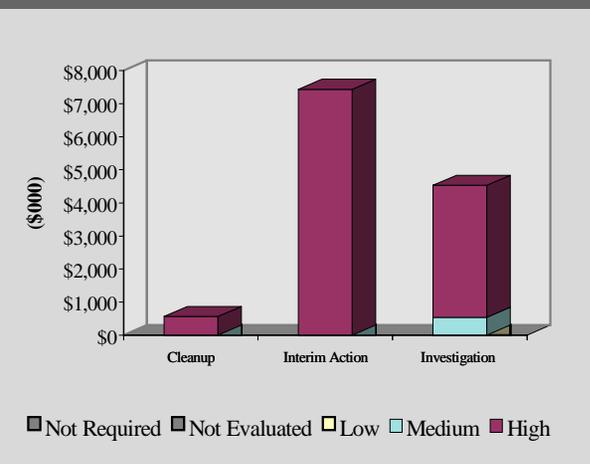
Formal partnering efforts with EPA Region 4, the Alabama Department of Environmental Management (ADEM), and the Army also began.

The first three activities in the current plan of action were originally scheduled for completion in FY97. They were delayed because the installation is awaiting EPA coordination and input.

Plan of Action

- Finalize RI/FS activities on all known Installation Restoration sites by late FY98 or early FY99
- Complete construction and startup of the groundwater extraction and treatment plant at the OB/OD grounds in FY98
- Continue negotiations on the Federal Facility Agreement in early FY98
- In FY98, use SVE at a solvent-contaminated soil site and use extraction at a solvent-contaminated groundwater location
- Continue efforts to reach Records of Decision on multiple sites in FY98

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 2,987 acres
Mission: Conduct pilot training
HRS Score: NA
IAG Status: Federal Facility Agreement signed in 1987
Contaminants: VOCs, petroleum/oil/lubricants, metals, pesticides, and herbicides
Media Affected: Groundwater and soil
Funding to Date: \$44.2 million
Estimated Cost to Completion (Completion Year): \$85.1 million (FY2029)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY1999



Reese, Texas

Restoration Background

In July 1995, the BRAC Commission recommended closure of Reese Air Force Base, which is used for pilot training and related activities. The installation closed in September 1997.

Preliminary Assessments and Site Inspections conducted from FY84 through FY88 identified 13 sites, including landfills, surface impoundments, underground storage tanks (UST), sludge spreading areas, industrial drain lines, and fire training areas. Historical waste management practices have contaminated groundwater and soil with volatile organic compounds (VOC), fuels, heavy metals, pesticides, and herbicides. To date, 30 USTs have been removed from the installation during Interim Remedial Actions (IRA), which began in the late 1980s. Of the 14 remaining USTs, 10 are regulated.

In FY93, the installation began an IRA in which an alternative source of drinking water was provided to off-base residences and businesses whose well water was contaminated. The installation has connected 28 residences and businesses to the city water supply system, provided 15 well owners with bottled water, and filtered or treated water at 11 wells. Studies determined that Reese Air Force Base was the source of trichloroethene (TCE) contamination in the sole-source aquifer for the region. An Environmental Working Group was formed in FY93 to expedite the restoration process. The group includes representatives of the installation, EPA, state regulatory agencies, the U.S. Army Corps of Engineers, and the primary environmental contractor at the installation.

In FY95, the installation reached an agreement with the state of Texas to implement an IRA to control a plume of TCE-contaminated groundwater. Under the IRA, the base installed a groundwater extraction and treatment system with an air stripper to treat groundwater contaminated with TCE and other VOCs. A pilot-scale study

indicated that soil vapor extraction (SVE) was a practicable means of treating soil contaminated with petroleum/oil/lubricants. Work plans for a full-scale SVE system were completed.

Also in FY95, the city of Lubbock formed a Local Redevelopment Committee (LRC) and issued a request-for-proposal for a study of reuse possibilities at the installation. In addition, a restoration advisory board (RAB) was formed.

During FY96, the RAB met every 2 months and established a BRAC cleanup team, which includes representatives of the installation, the state regulatory agency, and the Air Force Base Conversion Agency. The installation undertook a RCRA Facility Investigation (RFI) to determine the source and extent of contamination. The installation also began a corrective measures study (CMS) to address contaminated media identified during the RFI and completed construction of the SVE system. The installation initiated an Environmental Baseline Survey (EBS) and an Environmental Impact Survey (EIS). It also renamed the LRC the Lubbock Reese Redevelopment Authority. The authority is able to accept government funding and property through leasing.

FY97 Restoration Progress

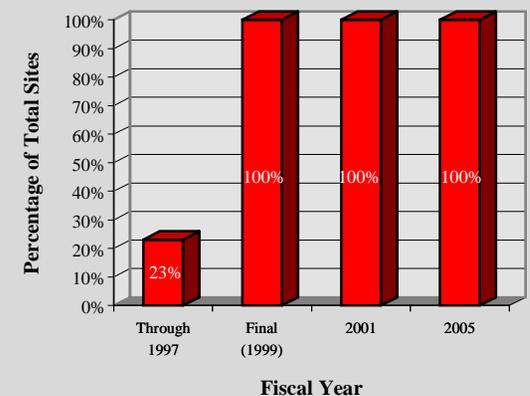
The installation completed the RFI that was initiated to determine source and extent of contamination. RFIs were initiated at 20 solid waste management units, and wells were installed at the boundary of the installation. The EBS and the EIS were completed. The RCRA permit for closure of Picnic Lake was modified and Golf Course Lake was closed.

Several activities scheduled for FY97 (completion of the CMS, implementation of an interim corrective action [ICA] at Picnic Lake, and expansion of the ICA pump-and-treat system) have not been completed, although they have been initiated.

Plan of Action

- Complete the CMS for 16 sites in FY98
- In FY98, implement an ICA at Picnic Lake involving installation of a pump-and-treat system
- Complete corrective measures implementation at up to 16 sites in FY98
- Close the RCRA permit on Picnic Lake and Golf Course Lake in FY98
- Expand the existing pump-and-treat system in FY98
- Begin investigation of seven sites in FY98
- Remediate UST, aboveground storage tank, and oil-water separator sites in FY98
- Clean out industrial drain lines in FY98
- Design and construct a landfill cap at the Southwest Landfill in FY98

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 428 acres
Mission: Housed the 442d Fighter Wing; supported A-10 aircraft
HRS Score: NA
IAG Status: None
Contaminants: Petroleum/oil/lubricants, PAHs, PCBs, VOCs, and heavy metals
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: \$4.5 million
Estimated Cost to Completion (Completion Year): \$0.5 million (FY2000)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY1997



Kansas City, Missouri

Restoration Background

In July 1991, the BRAC Commission recommended closure of Richards-Gebaur Air Reserve Station, the transfer of the 442d Tactical Fighter Wing to Whiteman Air Force Base, and the transfer of the 36th Aeromedical Evacuation Squadron and the 77th and 78th Aerial Port Squadrons to Peterson Air Force Base. The installation was closed on September 30, 1994.

Environmental studies have been ongoing at the installation since FY82. Prominent site types identified at the installation include a fire training area, vehicle maintenance areas, hazardous waste drum storage areas, fuel storage areas, and underground storage tanks (UST). The installation conducted several Interim Remedial Actions (IRA), including soil bioventing, removal of contaminated soil, and removal of polychlorinated biphenyl (PCB)-contaminated equipment. In FY95, the installation completed an IRA involving the removal of two USTs. The installation has also installed a passive soil bioventing system at a former UST site.

An Environmental Baseline Survey (EBS) completed in FY94 designated 114 acres as CERFA-clean. The installation uses interim leases to lease parcels to the Kansas City Aviation Department (KCAD). Runway and aviation support facilities were transferred to KCAD before the installation was closed. Facilities permitted to the Marine Corps were also available for immediate reuse. KCAD developed a land reuse plan and currently allows use of portions of the property leased to it for remediation projects. Supplemental Environmental Baseline Surveys are used as attachments to finding-of-suitability-to-lease (FOSL) documents as further property is leased.

A restoration advisory board (RAB) and a BRAC cleanup team (BCT) have been formed. The station holds quarterly RAB meetings to keep the public informed of ongoing environmental activities on the base.

It also advertises RAB meetings and provides additional information in public notices. The BCT established priorities for all remaining remediation work. The BRAC Cleanup Plan was updated in FY95.

The RAB met quarterly in FY96. The BCT met monthly to discuss cleanup standards and the use of remedial techniques at a former petroleum/oil/lubricant (POL) storage yard.

FY97 Restoration Progress

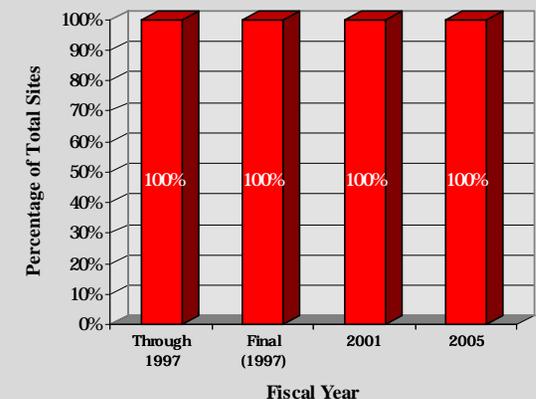
A groundwater survey was conducted for the central drainage area and five sites. In addition, the EBS was revised, and implementation of the land reuse plan continued. The installation identified 114 acres as CERFA-clean and is awaiting the concurrence of regulatory agencies. One site remains to be evaluated for relative risk.

Some activities scheduled for completion in FY97 were delayed because of the need for a Consolidation and Evaluation Study of the environmental program and a lack of state oversight due to Defense and State Memorandum of Agreement (DSMOA) funding issues.

Plan of Action

- In FY98, prepare documentation for the decision to pursue no further action at six sites
- Lease remaining property to KCAD in FY98
- Continue Phase III of the remediation project at the POL yard
- Begin long-term monitoring of groundwater in FY98
- Perform Evaluation and Consolidation Study in FY98
- Perform Focused Feasibility Study for soil and groundwater in FY98

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 2,016 acres
Mission: Provide airlift support for an Ohio Air National Guard Unit and Ohio Army National Guard
HRS Score: 50.00; proposed for NPL in January 1994
IAG Status: None
Contaminants: Pesticides, paint, spent fuel, waste oil, solvents, and heavy metals
Media Affected: Groundwater and soil
Funding to Date: \$19.7 million
Estimated Cost to Completion (Completion Year): \$15.3 million (FY2014)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY1999



Columbus, Ohio

Restoration Background

In July 1991, the BRAC Commission recommended closure of Rickenbacker Air National Guard Base. In July 1993, it was recommended that Rickenbacker be realigned rather than closed. Realignment was completed on September 30, 1994.

Environmental studies identified the following sites at the installation: fuel spill areas, underground storage tanks (UST), fire training areas, storm drainage areas, drum storage areas, pesticide storage areas, and coal storage sites. Seven miles of storm drainage system have been identified as a source of contamination. UST and fuel spill sites are potential sources of petroleum and solvent contamination in soil and groundwater. The installation was proposed for listing on the National Priorities List (NPL) because of the potential effects of contamination on underlying groundwater, which supplies drinking water to 150,000 residents in nearby communities.

In FY94, the installation formed a restoration advisory board (RAB) and prepared a basewide Environmental Baseline Survey (EBS). Remedial Investigation (RI) activities were conducted at 15 sites, and a draft RI Report was published. In FY95, the final Environmental Impact Statement was published and a Record of Decision (ROD) was signed. In the same year, the installation completed Interim Remedial Actions at two sites and removed more than 50 USTs from 13 sites.

Approximately 130 acres have been identified as CERFA-clean, but the installation has yet to receive regulatory concurrence on those designations.

During FY96, the installation conducted the fieldwork for the Supplemental RI at 14 sites, evaluated sampling results for 6 sites, sampled 11 sites, and prepared risk assessments at 3 sites. No further remedial action planned (NFRAP) documents were signed with the

regulatory agencies for seven Installation Restoration Program (IRP) sites, and seven other IRP sites were closed with regulatory concurrence. Phase II of the EBS was reviewed, and two additional sites were identified for IRP status. A project to remediate friable asbestos and lead-based paint was initiated.

FY97 Restoration Progress

The installation published the draft Phase II RI Report and initiated a Feasibility Study (FS) for six IRP sites. The Air Force Base Conversion Agency signed a Memorandum of Agreement (MOA) with, and completed the transfer of a 30-acre parcel to, the Army Reserves. The sale and transfer of the 1.3-acre electrical substation to the local power company was completed.

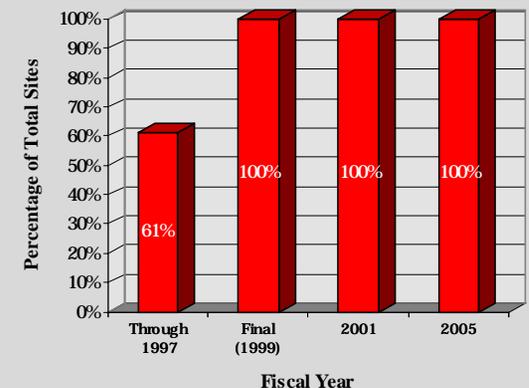
The installation completed closure of the Heat Plant Lagoon, the Water Treatment Plant Sludge Drying Beds, and the Water Production Wells. Abatement of friable asbestos and remediation of lead-based paint were also completed. The installation removed three USTs from a vehicle refueling facility vacated by the Air National Guard and completed the site assessments and Remedial Actions at two UST IRP sites. A Treatability Study and a risk assessment were started at the former hazardous waste storage area to investigate potential risk-based closure of the facility. Twelve NFRAP documents for nine IRP sites and three areas of concern (AOC) were signed with the regulatory agencies. The BRAC cleanup has given oral approval for completing NFRAP documents for eight more IRP sites and three AOCs.

Some activities scheduled for completion in FY97 were delayed because the Phase II RI Report was delayed, postponing completion of several NFRAP documents.

Plan of Action

- Reach regulatory concurrence on no further action designation and complete closure at two IRP sites
- Complete and sign NFRAP documents for eight IRP sites and three AOCs
- Publish the final Phase II RI Report and complete the FS for five IRP sites
- Complete the Remedial Design and award contracts for Remedial Actions for six IRP sites, as required
- Accomplish site assessment and publish a Remedial Action Plan for the location of the three USTs removed from the former refueling facility
- Complete the Treatability Studies and accomplish a risk assessment for possible risk-based RCRA closure of the former hazardous waste storage facility
- Begin long-term monitoring and long-term operation at two IRP sites
- Sign new MOA with Army National Guard
- Sign a long-term lease with the reuse agency for Parcel D1

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 172 acres
Mission: Manufacture grenades, projectiles, and steel cartridge casings
HRS Score: 63.94; placed on NPL in February 1990
IAG Status: IAG signed in April 1990
Contaminants: Chromium, cyanide, and zinc
Media Affected: Groundwater and soil
Funding to Date: \$39.1 million
Estimated Cost to Completion (Completion Year): \$60.3 million (FY2010)
Final Remedy in Place and Response Complete Date: FY1998



Riverbank, California

Restoration Background

In 1942, the Army constructed what is now the Riverbank Army Ammunition Plant as an aluminum reduction plant to supply military requirements. Since 1951, the installation has manufactured steel cartridge cases for the Army and the Navy. Other manufactured products include grenades and projectiles, which are shipped to other ammunition plants for loading operations.

In FY85, chromium was detected in drinking water wells at residences located west of the installation. As an Interim Action, the installation began a quarterly groundwater monitoring program. The Army provided alternative water supplies from deeper groundwater wells for five residences with contaminated wells. In FY85, a Preliminary Assessment and Site Inspection identified the following sites: an industrial wastewater treatment plant, an abandoned landfill, and four evaporation and percolation ponds located north of the plant near the Stanislaus River. Chromium, cyanide, and zinc are the primary contaminants affecting groundwater and soil.

A FY90 Interim Action included construction of a groundwater extraction and treatment system. In FY92, the Army constructed a water distribution system for 70 nearby residences. In FY93, the regulatory agencies approved the final Remedial Investigation and Feasibility Study (RI/FS) Report. The Army presented the Proposed Plan to the public for review in FY93. The plan recommended (1) expansion of the groundwater extraction and treatment system to provide complete capture of the contaminated groundwater plume and (2) placement of a final cap over the abandoned landfill.

In FY94, the installation completed a Removal Action at the four evaporation and percolation ponds and received approval from EPA and the state regulatory agency for the first installationwide Record of Decision (ROD).

The installation formed a technical review committee (TRC), which includes representatives of the Army, EPA, and the state regulatory agency. The TRC meets monthly to discuss outstanding issues. To accelerate cleanup progress, the TRC developed a process for concurrent preparation and review of documents. The process allowed the Army, EPA, and the state regulatory agency to review the draft FS Report while the Army began preparing the ROD.

In FY95, the installation completed construction of the landfill cap and awarded the Remedial Action (RA) contract for expansion of the groundwater extraction and treatment system.

In FY96, the off-site groundwater extraction system was installed and placed on-line to minimize migration of the plume and to demonstrate capture of the plume. Work to expand the groundwater treatment system was 98 percent complete by the end of FY96. The installation initiated a maintenance program for the landfill cap. The Army petitioned EPA Region 9 to remove the installation from the National Priorities List (NPL) in September 1996, the first request for NPL delisting for an entire Army installation.

FY97 Restoration Progress

The installation completed expansion of the groundwater extraction and treatment system and initiated long-term monitoring. The petition to delist the installation from the NPL was submitted as scheduled. EPA approved the Preliminary Closeout Report and the Remedial Action Completion Report.

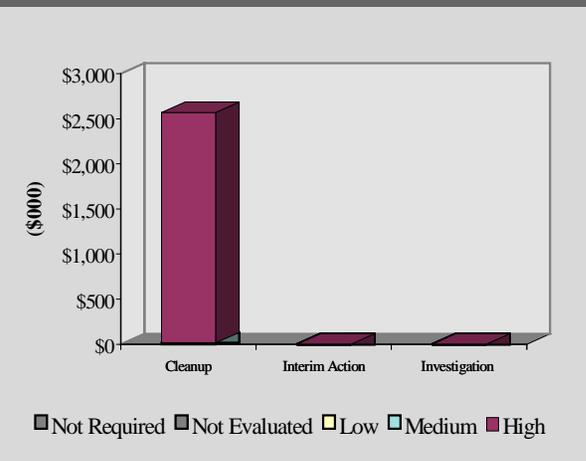
Extensive communication and negotiation with EPA made Construction Completion of the remedy possible. Riverbank became the first DoD installation to reach construction completion under the EPA Superfund 900 initiative. In addition, an innovative effort by the

design and the construction contractors to work together during operations in the first year allowed effective and efficient resolution of problems.

Plan of Action

- Complete closeout of the RA by FY03
- Achieve NPL delisting by FY03

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 8,855 acres
Mission: Provide logistics support for aircraft
HRS Score: 51.66; placed on NPL in July 1987
IAG Status: IAG signed in July 1989
Contaminants: VOCs, paint strippers and thinners, paints, solvents, phosphoric and chromic acids, oils, cyanide, and carbon remover
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: \$80.5 million
Estimated Cost to Completion (Completion Year): \$356.7 million (FY2033)
Final Remedy in Place or Response Complete Date: FY2005



Houston County, Georgia

Restoration Background

In FY82, Preliminary Assessments and Site Inspections were completed for 33 sites at this installation. The most significant site consists of Landfill No. 4 and an adjacent sludge lagoon. The site is divided into the following three operable units (OU): source control (OU1), wetlands (OU2), and groundwater (OU3). Primary contaminants at the site include trichloroethene (TCE) and tetrachloroethane in soil and groundwater. Contaminants also have been released into a wetland area in the northwest corner of the installation.

Remedial Investigation and Feasibility Study (RI/FS) activities were initiated in FY86 and FY88. In FY93, the installation constructed run-on controls at OU1 and completed the pilot-scale system for lagoon solidification at OU1. Also in FY93, the installation completed the Remedial Design of the cover for Landfill No. 4.

In FY94, the installation began a RCRA Facility Investigation (RFI) at five sites. Interim Actions included encapsulation of Landfill No. 3 and removal of hazardous and radioactive waste from two other sites. In FY94, an interim Record of Decision (ROD) was signed for OU2. In FY95, an interim ROD was signed for OU3 and Interim Actions were completed at the Hazardous Waste Site. Final decision documents for 24 of the 33 sites recommended no further action.

Innovative technologies demonstrated at the installation include a bioremediation treatment process for groundwater contaminated with volatile organic compounds (VOC) and a pilot-scale process involving in situ volatilization and ex situ solidification at the sludge lagoons.

A technical review committee was formed in FY89 and converted to a restoration advisory board (RAB) in FY94. The RAB met quarterly in FY96. One of the highlights of that year was a multimedia briefing on the National Priorities List (NPL) site status. Partnering with EPA and

the Georgia Environmental Protection Division continued through periodic team meetings concerning the RCRA sites.

Also in FY96, full-scale cleanup of the sludge lagoon was completed on schedule. The cleanup included volatilization and removal of organic compounds, removal of sludge from the lagoon, stabilization to prevent leaching of metals into groundwater, on-site placement of the sludge, and installation of a cover over the stabilized sludge. The design was completed for the full-scale leachate collection system at Landfill No. 4, the groundwater extraction system, and the associated wastewater treatment plant. Construction of the systems and the plant began. The cover for Landfill No. 4 is being redesigned.

Quarterly monitoring began at OU2. Microbial activity was evaluated for remediation of contamination in both OU2 and the Base Industrial Area. Draft corrective action plans (CAP) were completed for two RCRA sites, final RFIs were completed for four sites, and one more RCRA site was recommended for no further action.

FY97 Restoration Progress

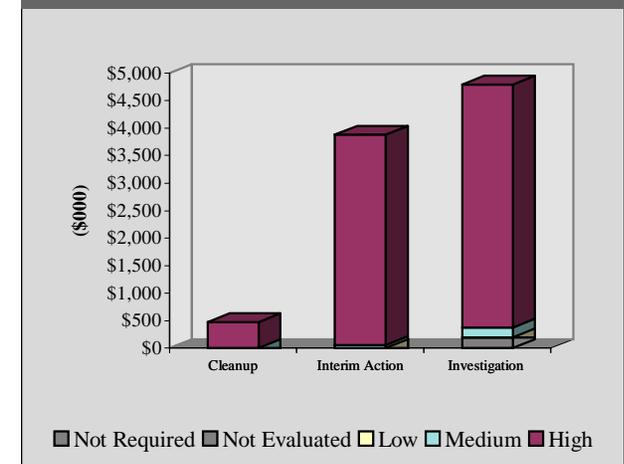
The installation completed the redesign of the Landfill No. 4 cover. The process of obtaining a National Pollutant Discharge Elimination System (NPDES) permit for a new pump-and-treat system began. In addition, a review priority list was established; this list is tracked on a regular basis.

The RAB was active and played a major role in Relative Risk Site Evaluation and in establishing cleanup priorities at the base. The RAB also was involved in the NPDES permit process.

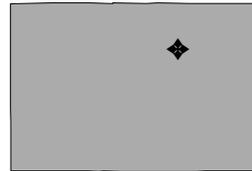
Plan of Action

- In early FY98, complete construction of the full-scale leachate collection system at Landfill No. 4, the groundwater extraction system, the Base Industrial Area interim measures groundwater hot-spot removal, and the combined treatment plant for all wastewater
- Complete CAPs for five RCRA sites in FY98
- Complete RFIs for the Base Industrial Area in FY98
- Complete OU2 construction contingency plan for containing sediment in FY98
- Complete RFI for the Horse Pasture site in FY98
- Begin remedial construction actions at three RCRA sites in FY98
- Begin design for Remedial Action at the Building 645 RCRA site in FY98
- Begin construction of Landfill No. 4 cover in FY98
- Begin final ROD and complete final FS for the NPL site in FY98
- Begin OU2 sediment removal study in FY98
- Continue quarterly monitoring of OU2 (wetlands) and analyze results of monitoring in FY98

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 17,228 acres
Mission: Manufactured and stored chemical munitions
HRS Score: 58.15; placed on NPL in July 1987
IAG Status: IAG and Federal Facility Agreement signed in 1989
Contaminants: Pesticides, chemical agents, VOCs, chlorinated organics, PCBs, UXO, heavy metals, and solvents
Media Affected: Groundwater and soil
Funding to Date: \$802.8 million
Estimated Cost to Completion (Completion Year): \$2,163.9 million (FY2033)
Final Remedy in Place and Response Complete Date: FY2011



Adams County, Colorado

Restoration Background

Rocky Mountain Arsenal served as a chemical munitions production facility from 1942 until 1982. It has been the focus of an aggressive soil and groundwater contamination cleanup program since the 1980s. Contaminated sites include liquid waste in unlined and lined lagoons and basins, open burning and detonation areas, and landfills that received both liquid and solid wastes.

In FY84, the Army completed a Preliminary Assessment and Site Inspection that identified 179 potentially contaminated sites. Subsequently, the installation was divided into two operable units (OU): the On-Post OU and the Off-Post OU. The Army completed Remedial Investigation and Feasibility Study activities for both OUs by FY96. Identification of additional sites raised the total number of sites to 209.

To date, the Army has completed 14 emergency responses at 17 sites. Under this program, four groundwater extraction and treatment systems have been installed on site and one off site. All five systems continue to operate. In FY90, 10.5 million gallons of chemical wastewater and 580,000 cubic yards of contaminated soil were removed from the Basin F Area and placed in temporary storage facilities. In addition, hundreds of drums of waste and tons of asbestos and related materials were disposed of off post. The installation closed 450 abandoned wells and the sewer systems in the South Plants, and closed and removed the former hydrazine blending facility.

The installation used an innovative submerged quench incineration (SQI) system to remediate wastewater, primarily from Basin F. The SQI system treated more than 16 million gallons of scrubber brine and recovered more than 250,000 pounds of copper. The Army subsequently dismantled the system and removed it from the installation.

The installation continued to remove chemical agent-contaminated steel and to transport it to Rock Island Arsenal for smelting. The steel was generated from chemical production equipment, storage tanks, and ancillary equipment.

In FY94, the Army converted the technical review committee to a restoration advisory board (RAB). The 40-member RAB was active and met monthly throughout the year, playing an integral role in the success of the program.

In FY96, the Army and regulators signed Records of Decision (ROD) for both the Off-Post and the On-Post OUs. Once the RODs were final, the installation formed a partnership with representatives of the U.S. Fish and Wildlife Service, the Department of the Army, and Shell Oil Company for oversight of the program management contract.

FY97 Restoration Progress

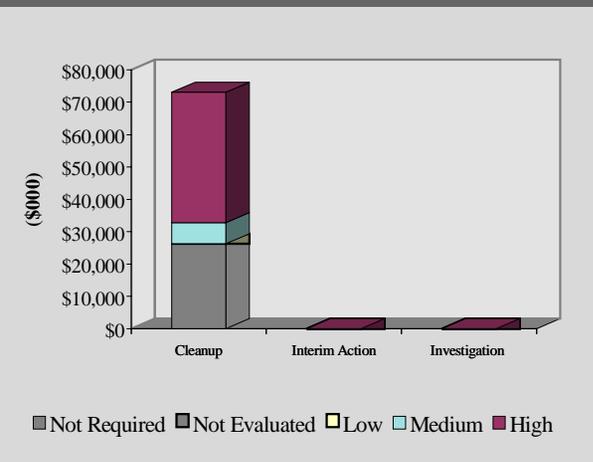
The oversight partnership, called the Remediation Venture Office (RVO), developed a Remedial Design and Implementation Schedule for the On-Post OU, and the installation continued the award process for the program management contract. The Army completed designs for chemical and sanitary sewer plugging and for slurry walls for the Army-Shell trenches and awarded contracts for construction. The Army also completed the design for the consolidation area within Basin A and continued designing an on-site hazardous waste landfill. The removal of chemical processing equipment and asbestos-containing material also continued. The use of advanced geophysical techniques accelerated the investigation of the Army-Shell trenches. The RVO continued to improve site management and develop good partnering relationships.

The first four activities in the current plan of action originally were scheduled for completion in FY97 but were delayed because the program management contract award was protested.

Plan of Action

- Award program management contract in FY98
- Complete the construction on the chemical and sanitary sewer plugging project in FY98
- Complete construction on the Army-Shell trenches slurry wall project in FY98
- Complete the contract award for the Basin A consolidation area remediation in FY98
- Complete design of the hazardous waste landfill and award the construction contract in FY98
- Complete post-ROD Removal Actions for asbestos and chemical process equipment in FY98
- Complete the Phase I (outlying areas) task design and award the construction contract in FY98
- Continue implementing the groundwater and surface water monitoring programs in FY98

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 50 acres
Mission: Provide combat communications and electronics installation
HRS Score: NA
IAG Status: None
Contaminants: Waste oil, diesel fuel, asbestos, and solvents
Media Affected: Soil
Funding to Date: NA
Estimated Cost to Completion (Completion year): NA
Final Remedy in Place or Response Complete Date for BRAC Sites: NA



Roslyn, New York

Restoration Background

In July 1995, the BRAC Commission recommended closure of Roslyn Air Guard Station. The installation closed on September 30, 1997.

Environmental studies have identified several sites at the installation. Historically, paint thinner, waste oil, diesel oil, and solvents were sprayed on the access road to control dust. Liquid industrial waste was stored at the Old Waste Holding Areas and the Engineer Shop. As a result of those activities, soil was contaminated with petroleum compounds and solvents. In addition, approximately 90 percent of the installation's buildings contain asbestos. Interim Actions conducted at the installation have included removal of all underground storage tanks and associated contaminated soil and sampling of on-site drinking water. In FY94, the installation completed fieldwork for Site Inspection activities at three sites. In FY95, the three sites were recommended by the Air Force for no further action; the state concurred in this recommendation.

FY97 Restoration Progress

The Air Force Base Conversion Agency (AFBCA) continued preparation of National Environmental Policy Act (NEPA) documentation for the transfer and reuse of the installation. An Environmental Baseline Survey (EBS) was completed in November 1996, and state concurrence on the EBS was obtained in December 1996. The EBS identified 46 acres as uncontaminated. Approximately 4 acres at nine sites were identified as requiring additional investigation to determine whether releases of hazardous materials had occurred, and if so, what the extent of the releases was. In September 1997, a contract was awarded under AFBCA direction for sampling and analysis with limited interim Removal Actions.

Plan of Action

- Complete NEPA process for the disposal and reuse of the property
- Conduct sampling and analysis as needed to transfer property
- Remediate any areas requiring action

SITES ACHIEVING RIP OR RC PER FISCAL YEAR

No data available.

Size: 2,254 acres
Mission: Provide communication support
HRS Score: 34.28; placed on NPL in October 1989
IAG Status: Federal Facility Agreement signed in March 1992
Contaminants: Heavy metals, PCBs, pesticides, herbicides, and phenols
Media Affected: Groundwater and soil
Funding to Date: \$3.5 million
Estimated Cost to Completion (Completion Year): \$0 (FY1997)
Final Remedy in Place or Response Complete Date: FY1997



Sabana Seca, Puerto Rico

Restoration Background

The Sabana Seca Naval Security Group Activity operates as a high-frequency direction-finding facility, providing communication and related support to Navy and DoD missions in the area. Areas of concern include a former pest control shop, where pesticides and herbicides were disposed of, and a leachate ponding area, which receives leachate from an adjacent municipal landfill. Because the pesticide-contaminated site (Site 6) is adjacent to the installation's picnic, playground, and housing areas, Sabana Seca Naval Security Group Activity was placed on the National Priorities List (NPL).

In FY84, the installation completed Preliminary Assessments for seven sites, and an Interim Remedial Action (IRA) at Site 5. Only Sites 6 and 7 were recommended for further study.

In FY88, an IRA was completed at Site 6. This action included placing a 6-inch cover of clean soil over the site and fencing the site to prevent exposure to spilled pesticides. In FY93, the installation completed the Site 6 Remedial Investigation (RI), which focused on pesticide and herbicide contamination. A draft Proposed Remedial Action Plan (PRAP) for the site, which was completed in FY94, called for excavation of contaminated soil and disposal of the soil at an off-site location. This proposed action was considered too aggressive in light of the small amount of contaminated soil present. A revised draft PRAP recommended capping with asphalt as the preferred remedy.

In FY89, a Site Inspection (SI) was completed for Site 7. In FY93, the installation conducted a Feasibility Study (FS) at this site to identify an IRA that could protect installation personnel from exposure to leachate from the municipal landfill. A draft FS Report was prepared. In FY94, a Treatability Study on one of the alternatives (constructed wetlands) was initiated, but the study was never completed.

In FY95, the installation completed an Initial SI and began a Baseline Risk Assessment and an Expanded Site Inspection (ESI) for Sites 1 and 3. The Agency for Toxic Substances and Disease Registry performed a public health assessment of the installation.

The installation formed a technical review committee in FY90 and converted it to a restoration advisory board (RAB) in FY96. A community relations plan was prepared in FY91, and an information repository and an administrative record were established in FY94.

FY97 Restoration Progress

The installation completed a Baseline Risk Assessment, an ESI, and a PRAP recommending no further action (NFA), and signed a no-action Record of Decision (ROD) for Sites 1 and 3. In addition, a Baseline Risk Assessment, an SI, and a PRAP recommending NFA were completed, and a no-action ROD signed, for Sites 2 and 4. The asphalt capping Remedial Action at Site 6 was completed, and the area was converted into a parking lot for the picnic area. The FS Report for Site 7 determined that the source of contamination was an off-base, non-Navy controlled landfill, and therefore no remediation was necessary. EPA concurred that no further action and no ROD were needed. Nevertheless, the Navy entered into a partnering agreement with the landfill owners and operators. The partnering agreement allows the Navy to work with the municipality to address the landfill leachate problem at Site 7.

Bilingual materials and activities, including pertinent summary documents, public notices, and a public awareness session were made available by the RAB. The RAB also reviewed and commented on all draft documents.

The two no-action ROD documents, which were used in lieu of a Facility Closeout Report, demonstrate that the Navy has completed all construction activities for all sites at the facility and that the facility is ready to be deleted from the NPL.

Plan of Action

- Have installation deleted from NPL in FY98
- Place administrative record and information repository on CD-ROM in FY98

FY98 FUNDING BY PHASE AND RELATIVE RISK

All sites are in the long-term monitoring phase.

Size: 485 acres
Mission: Repair and maintain communications and electronic equipment
HRS Score: 44.46; placed on NPL in July 1987
IAG Status: IAG signed in 1988
Contaminants: Waste oil and grease; solvents; metal plating wastes; and wastewater containing caustics, cyanide, and metals
Media Affected: Groundwater and soil
Funding to Date: \$56.0 million
Estimated Cost to Completion (Completion Year): \$8.6 million (FY2001)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2001



Sacramento, California

Restoration Background

Environmental studies conducted at the Sacramento Army Depot since FY79 identified 55 sites, 47 of which required no further action. The remaining sites were divided into four operable units (OU). The installation conducted Remedial Investigation and Feasibility Study (RI/FS) activities for the four OUs between FY89 and FY92, and an installationwide RI/FS began in FY92. The Army and regulatory agencies signed Records of Decision (ROD) for all four OUs. The Army completed the Remedial Actions (RA) at all sites, except groundwater cleanup, which requires long-term operation.

In FY93, the installation completed the RA at the Tank No. 2 OU. This RA consisted of use of a soil vapor extraction (SVE) system to clean up soil contaminated with organic solvents. In FY94, air sparging was conducted to treat soil and groundwater at Parking Lot 3 and the Freon 113 Areas. Operation of an SVE system achieved Phase I cleanup goals at the South Post Burn Pits, the source of off-site groundwater contamination. Also in FY94, the installation completed a pilot-scale test of soil washing at the Oxidation Lagoons, a BRAC Cleanup Plan, and a CERFA report.

In FY95, an installation wide ROD and the Environmental Impact Statement (EIS) for disposal and reuse were completed and signed. Other environmental restoration efforts included surveys of all asbestos and lead-based paint, radiation surveys of buildings, and closeout of the Nuclear Regulatory Commission (NRC) license. In the same year, the commander formed a restoration advisory board (RAB) to facilitate communication among regulatory agencies, members of the community, and installation personnel.

In FY96, the installation completed upgrades of the groundwater treatment plant for long-term monitoring and operations. The Army began work to determine the most effective and efficient operation

parameters for the upgraded groundwater treatment plant. The installation completed an RA at the Oxidation Lagoons and South Post Burn Pits. The soil from those two areas was treated and placed in stabilization pits.

The Army received approval to close out the NRC license for Building 300. EPA concurred with the determination that the treatment system at Parking Lot 3 is in place and is functioning as designed, thereby facilitating transfer of the property.

Sacramento Army Depot removed the source of groundwater contamination and installed a groundwater treatment system. Upgrades to the system included new piping systems and additional extraction wells. The Army also inquired about delisting the installation from the National Priorities List (NPL).

FY97 Restoration Progress

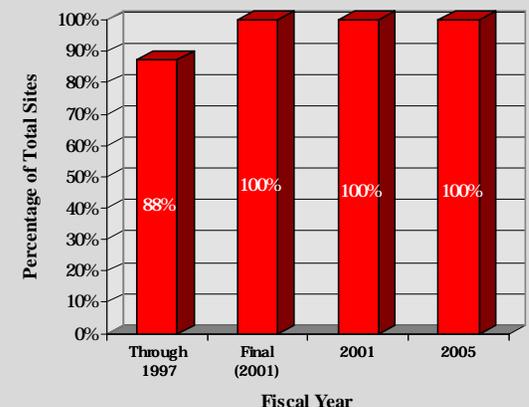
The Army initiated a partial NPL delisting for areas not associated with groundwater contamination. This was made possible by the completion of the soil stabilization project. The Army also determined that a cap for the Old Burn Pits was unnecessary. Transfer of the remaining BRAC parcels did not occur because of delays resulting from additional agency requirements and from data verification. The Burn Pits and Oxidation Lagoons Soil Stabilization cleanups were completed.

The installation maintains a partnership with the agencies through constant and open dialogue.

Plan of Action

- Complete all BRAC activities by the end of FY01

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 1,600 acres
Mission: Used as a repair facility and prisoner of war camp during World War II
HRS Score: Unknown
IAG Status: None
Contaminants: TCE, PCE, and freon 11 and 12
Media Affected: Groundwater
Funding to Date: \$1.8 million
Estimated Cost to Completion (Completion Year): \$1.4 million (NA)
Final Remedy in Place or Response Complete Date: NA



San Bernardino, California

Restoration Background

Camp Ono Army Base closed in 1947. Since then, the area has been developed for light industry and residential uses. The Newmark Groundwater Contamination Site was added to the National Priorities List (NPL) on March 31, 1989, after discovery of two groundwater plumes during a water supply monitoring program. The Newmark and Muscoy plumes are located on the east and west sides of the site, respectively.

The discovery of tetrachloroethene (PCE), trichloroethene (TCE), and chlorinated solvents in the groundwater resulted in the closing of 20 water supply wells. The state brought 12 of the wells back into operation by installing air stripping towers on eight wells and carbon filtration systems on the other four.

In May 1992, EPA conducted a soil gas investigation to evaluate the need for a Removal Action at a suspected disposal site in a residential neighborhood. No volatile organic compounds (VOC) were found in areas above the contaminated groundwater. In FY93, EPA conducted a subsurface survey to investigate a suspected military equipment disposal site; however, no site was found.

An investigation was initiated in FY90 to identify the source of the Newmark plume contaminants and to identify ways of controlling continued down gradient migration while removing contaminants. The investigation determined that the contamination originated at least 2 miles upgradient of the site in another portion of the valley. A pump-and-treat remedy using conventional activated carbon adsorption technology was chosen.

In FY92, an investigation of the Muscoy area was initiated. EPA separated the area into two projects in FY94: one to address the spread of contamination and the other to clean up the source of contamination.

DoD and EPA have been working closely with the U.S. Army Corps of Engineers (USACE) and the San Bernardino County Solid Waste Department to investigate the nature and extent of the contamination. The efforts to date have included research of military archives, numerous interviews, seismic and magnetometer surveys of the subsurface, and construction of four monitoring wells.

In FY88, EPA conducted a preliminary investigation at the installation. EPA also conducted Remedial Investigation and Feasibility Study activities in FY91, FY92, and FY95 and completed two Records of Decision in FY93 and FY94. The site has been divided into three operable units.

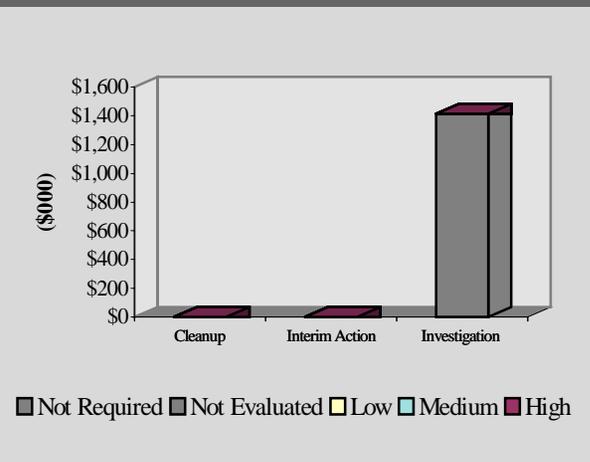
FY97 Restoration Progress

Successful partnering has occurred between EPA Region 9 and USACE personnel on the potentially responsible party (PRP) effort. Granular activated carbon and pump-and-treat remedies were employed by EPA at the former DoD property.

Plan of Action

- Complete PRP report in FY99

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 547 acres
Mission: Provide recruit training for enlisted personnel and specialized training for officers and enlisted personnel
HRS Scoring: NA
IAG Status: None
Contaminants: Paint, pesticides, solvents, and petroleum/oil/lubricants
Media Affected: Soil and groundwater
Funding to Date: \$13.6 million
Estimated Cost to Completion (Completion Year): \$17.9 million (FY2009)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2000



San Diego, California

Restoration Background

In July 1993, the BRAC Commission recommended closure of the installation and relocation of personnel, equipment, and mission support to other Naval training centers. Certain installation facilities and activities will be retained to support other Naval operations in the San Diego area. Of the 552 total acres, 503 will be available for transfer.

In FY86, an Initial Assessment Study identified 12 sites that might present environmental problems: five sites are being studied under CERCLA; seven under the underground storage tank (UST) program. Primary site types include a landfill and areas contaminated with petroleum products.

In FY91, a Site Inspection (SI) was completed at one UST site and an SI and Phase I Remedial Investigation (RI) at another. In FY92, free-product removal at a UST site was completed. In FY94, the installation completed an Interim Removal Action at a landfill.

In FY95, a Preliminary Assessment (PA) was completed for three sites, one of which will require no further action. Remedial Designs (RD) were completed for two sites, the RD for a third site is under way. An Expanded SI (ESI) was completed for one UST site. A Removal Action for petroleum-contaminated soil was completed for three UST sites. Human Health and Ecological Baseline Risk Assessments also were completed for one site.

An Environmental Baseline Survey (EBS), completed in FY94, identified 85 points of interest (POI); that number eventually increased to 93. Many of the POIs have been designated for no further action; the installation is studying 18. The installation completed its BRAC Cleanup Plan (BCP) in FY94 and a revised EBS in FY95. It

identified 115 acres for reuse by the Navy in support of other activities in the San Diego area.

A restoration advisory board (RAB) and a BRAC cleanup team (BCT) were established in FY94. In FY92, the installation developed a community relations plan (CRP), which was updated in FY95. The installation also published two fact sheets describing the base conversion process and the UST program. An information repository containing a copy of the administrative record was established in FY94 at the San Diego Central Library.

In FY96, the installation completed an ESI and initiated an Engineering Evaluation and Cost Analysis for one site. SIs were completed for two sites, one of which requires no further action. A site-specific EBS identified two additional sites under the CERCLA program and a PA/SI was completed. The installation completed the investigation for soil and groundwater cleanup for four UST sites, a corrective action plan (CAP) for two UST sites, and excavation of contaminated soil from one UST site. Cleanup was initiated for the two sites covered by the CAP.

FY97 Restoration Progress

An RI/FIS was initiated for one site. Groundwater monitoring began at one UST site and continued for two others. RD and corrective actions were initiated and completed for those three sites.

A Site Characterization and Analysis Penetrometer System (SCAPS) assessment technology was implemented at two sites and fieldwork techniques were used to expedite site characterization, including a geoprobe, ground-penetrating radar, and on-site laboratory. Cleanup for Sites 7 and 10 was completed and the installation was closed in April 1997.

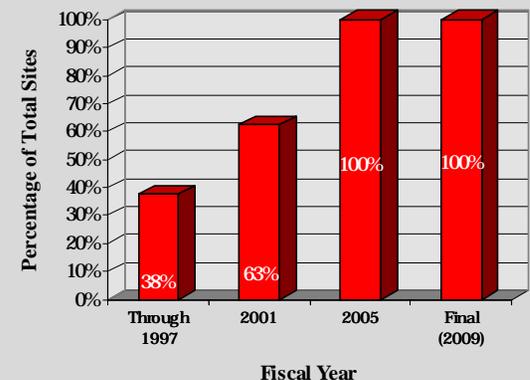
The RAB continued to hold meetings and sponsored an Earth Day open house. The BCT and the port of San Diego discussed implementing early transfer authority. The installation also completed a reuse plan and BCP. To expedite document review and resolve issues, the installation used over-the-shoulder review meetings and addressed fieldwork progress with the regulatory agencies.

Some activities scheduled for completion in FY97 were delayed because of funding delays.

Plan of Action

- Complete the RD and initiate RA for one site in FY98
- Initiate Interim Remedial Actions for two sites in FY98
- Install EPA landfill cap and update BCP and reuse plans in FY98
- Sign a Record of Decision for the Environmental Impact Statement in FY98
- Continue operation and maintenance for two UST sites
- Begin to transfer property in FY00

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 520 acres
Mission: Design, manufacture, produce, research and develop, and repair military aircraft
HRS Score: 42.24; placed on NPL in June 1986
IAG Status: None
Contaminants: Chlorinated solvents, chromium, and petroleum hydrocarbons
Media Affected: Groundwater and soil
Funding to Date: \$3.4 million
Estimated Cost to Completion (Completion Year): \$1.3 million (NA)
Final Remedy in Place or Response Complete Date: NA



Burbank, California

Restoration Background

The former Air Force Plant No. 14 is located in Area 1, Burbank Operable Unit (OU), of the San Fernando Valley Area 1 through 4 site. Since 1941, there has been a geographical, functional, and organizational relationship among Air Force Plant No. 14; two Plancors, 236 and 1193; and Lockheed Martin Corporation’s plants and air terminal. The facilities were used for the design, manufacture, and repair of military and civilian aircraft. Air Force Plant No. 14, a government-owned, contractor-operated facility, was established in 1947 when the government exchanged some of its Plancor facilities for Lockheed’s Plant B-1. In 1974, all property owned by the Air Force was conveyed to Lockheed Martin Corporation. Since DoD’s disposal of this property, Lockheed has used the facilities for the design and production of missiles, satellites, and military and commercial aircraft.

In late 1980, groundwater contamination was discovered in water supply wells in Burbank, California. The wells contained the chlorinated solvents trichloroethene (TCE) and tetrachloroethene (PCE). The results of a groundwater monitoring program conducted from 1981 through 1987 indicated that approximately 50 percent of the water supply wells in the eastern portion of the San Fernando Valley groundwater basin were contaminated.

In 1984, Lockheed began conducting extensive Site Investigations to find the sources of the groundwater contamination and to determine the extent of its migration off site. A number of sources of contamination were found, including a waste disposal area, underground storage tanks, a chip recovery area, sumps, clarifiers, degreasers, and pipes. PCE was found in the groundwater. In June 1986, the Burbank OU was placed on the National Priorities List (NPL).

In FY88, Lockheed received a Cleanup and Abatement Order for soil and groundwater remediation at Plant B-1, Building 175, where a clarifier was found to have a softball-sized hole. Soil and groundwater were remediated by an integrated soil vapor extraction and groundwater treatment system.

In FY89, EPA signed the Record of Decision (ROD) for the remediation of groundwater at the Burbank OU. This groundwater pump-and-treat system is located southwest of Plant B-1.

In FY96, the U.S. Army Corps of Engineers initiated operation of the groundwater pump-and-treat system at Plant B-1. A soil vapor extraction system also began operation at the site.

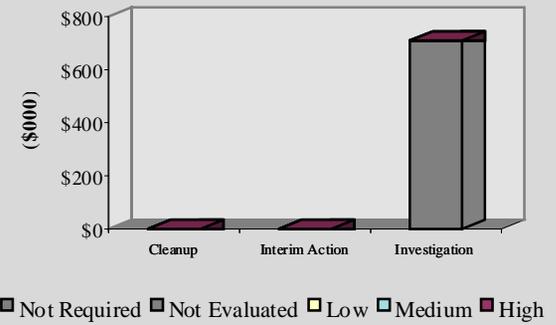
FY97 Restoration Progress

Lockheed Martin filed a CERCLA cost recovery lawsuit against the United States seeking more than \$500 million. Preparation for this litigation delayed accomplishment of some activities scheduled for FY97.

Plan of Action

- Continue review of documents and case development in FY98
- Initiate negotiations with Lockheed in FY98 to establish liability for cleanup

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 43,000 acres
Mission: Manufacture and load ordnance for shipping
HRS Score: 43.70; placed on NPL in July 1987
IAG Status: IAG signed in September 1991
Contaminants: Organic solvents, inorganic compounds, PAHs, PCBs, munitions, and heavy metals
Media Affected: Groundwater and soil
Funding to Date: \$0.2 million
Estimated Cost to Completion (Completion Year): \$50.9 million (FY2034)
Final Remedy In Place or Response Complete Date: FY2016



Carterville, Illinois

Restoration Background

The former Illinois Ordnance Plant, which operated from 1942 to 1945, is located on the eastern portion of the U.S. Fish and Wildlife Service's Crab Orchard National Wildlife Refuge. The ordnance plant served as a manufacturing and loading site for high-explosive shells, bombs, and other weapons components.

Thirty-three areas were identified for site investigation. These areas were grouped into four operable units (OU): the PCB OU, the Metals OU, the Miscellaneous OU, and the Explosives and Munitions Manufacturing Area OU. EPA was established as the lead agency for the PCB OU through a Consent Decree issued to Sangamo Electric, Inc. The U.S. Fish and Wildlife Service is responsible for the Metals OU and the Miscellaneous Area OU. The Department of the Army, represented by the U.S. Army Corps of Engineers (USACE), is responsible for the Explosives and Munitions Manufacturing Area OU.

In FY88, a Preliminary Assessment (PA) was conducted at the areas associated with the ordnance plant. A Site Inspection (SI), which focused on 14 sites, also was completed. Results of the PA and SI did not indicate widespread contamination. Two surface munitions bunkers were demolished in FY92. Other unsafe buildings were demolished in FY93.

In FY93, a Remedial Investigation and Feasibility Study (RI/FS) was completed for the PCB OU and the Metals OU. A Record of Decision (ROD) designating the environmental restoration alternative selected for the Metals OU was signed, and most Remedial Design and Remedial Action (RD/RA) activities for the Metals OU were completed in FY95. The ROD for the PCB OU also was completed.

An RI was completed to study the presence and magnitude of contamination at the Explosives and Munitions Manufacturing Area OU. Fieldwork at the OU included installation of monitoring wells, collection of soil borings and sediment samples, and excavation of magnetic anomalies. The FS for this OU was completed in FY95. Also in FY97, the RI process was initiated at the Miscellaneous Area OU, and an Engineering Evaluation and Cost Analysis (EE/CA) for ordnance and explosives waste was undertaken.

In FY96, USACE completed the ROD for the Explosives and Munitions Manufacturing Area OU and undertook fieldwork for the ordnance and explosives waste EE/CA. A draft report was issued, and preliminary study indicated a need for institutional controls. The parties involved determined that the U.S. Fish and Wildlife Service must provide preliminary investigations for uncharacterized sites.

FY97 Restoration Progress

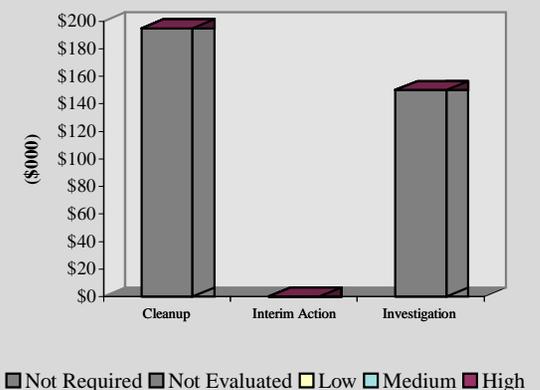
The ROD for the Explosives and Munitions Manufacturing Area OU was signed, and cleanup of the PCB OU was completed. USACE expedited approval of well abandonment plans by adapting previously approved work plans.

Monthly meetings were held with representatives of EPA, Illinois EPA, and the U.S. Fish and Wildlife Service to address issues related to environmental restoration at the site. USACE held a press conference after the completion of the incineration of the PCBs, to involve the RAB and the local community.

Plan of Action

- Complete risk evaluations for all sites in FY99
- Continue facilitated partnering with EPA and Illinois EPA in FY99

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 13,062 acres
Mission: Receive, store, and demilitarize ammunition; manufacture ammunition-specific equipment
HRS Score: 42.20; placed on NPL in March 1989
IAG Status: IAG signed in 1989
Contaminants: Explosives, metals, solvents, petroleum/oil/lubricants, and VOCs
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: \$40.5 million
Estimated Cost to Completion (Completion Year): \$397.9 million (FY2032)
Final Remedy in Place and Response Complete Date for BRAC Sites: FY2009



Savanna, Illinois

Restoration Background

In July 1995, the BRAC Commission recommended closure of the Savanna Depot Activity and relocation of the U.S. Army Defense Ammunition Center and School to McAlester Army Ammunition Plant in Oklahoma.

The installation began operation in 1917 as the Savanna Proving Grounds. During the 1920s, the mission changed to include storage, receipt, issue, demilitarization, and renovation of ammunition.

Contaminants from installation operations were released into the environment at landfills; the open burning and open detonation ground; the fire training area; and ammunition load, assemble, and pack facilities. Remedial Investigation and Feasibility Study (RI/FS) activities, beginning in FY89, delineated the extent of explosives-contaminated groundwater, soil, and sediment at all sites, including the TNT washout lagoons.

In FY90, a Remedial Action (RA) began at the TNT washout lagoons for removal of contaminated sediment. In FY92, the Army and regulators signed a Record of Decision (ROD) approving incineration of TNT-contaminated soil and sediment from the site. In FY93, the installation completed a trial burn and began full-scale sediment removal, incineration, and ash processing operations.

In FY93, the Army began using high-temperature thermal treatment for cleanup of volatile organic compound (VOC)-contaminated soil at the fire training area. In FY94, the installation completed incineration of TNT-contaminated sediment. To promote the use of innovative technologies, the Army hosted a demonstration of an ultraviolet and oxidation (UV/OX) groundwater treatment for removing TNT. During the demonstration, four UV/OX commercial vendors operated their treatment systems. The Army made the final analysis of the demon-

strations available to all DoD installations in an effort to foster technology transfer and communication among installations with similar groundwater contamination concerns. During FY95, the installation completed a trial burn for the high-temperature thermal treatment system at the fire training area.

In FY96, the Army formed a BRAC cleanup team (BCT) and a restoration advisory board (RAB). The installation also began an Environmental Baseline Survey (EBS) and drafted the RI/FS Report for sites with anticipated cleanups. The RI/FS was submitted to the regulators for comments. The installation completed RCRA closure and cleanup activities at the ammunition deactivation furnace. The BCT completed the draft EBS Report and submitted it for regulatory agency review. The installation initiated the BRAC Cleanup Plan (BCP) based on the draft EBS.

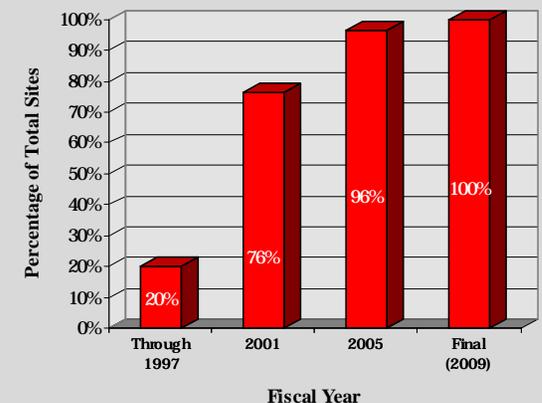
FY97 Restoration Progress

The installation completed the cleanup of the fire training area. It also completed the BCP, which is awaiting EPA approval. The Army signed a Total Environmental Restoration Contract (TERC) with Savanna as the anchor installation. The BCT held meetings each month with the Local Redevelopment Authority (LRA) and regulators. This partnering expedited an RI. The BCT also presented cleanup initiatives to the RAB for input and performed field surveys of the contaminated sites. In addition, the Old Burning Ground project is nearing a ROD, and 11,808 acres have been proposed as CERFA-uncontaminated.

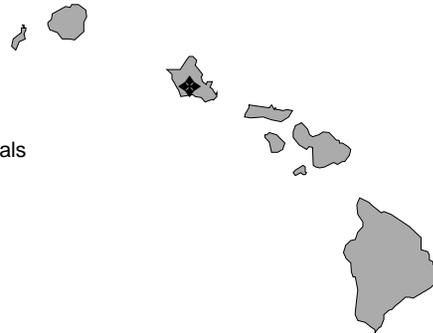
Plan of Action

- In FY98, initiate investigation of EBS-identified sites and sign ROD for Old Burning Ground remediation project
- Complete the Remedial Design (RD) for various ammunition disposal and landfill sites in FY99
- Initiate RA for various ammunition disposal and landfill sites and begin treatment of explosives-contaminated groundwater in FY00
- Complete RD for an innovative bioremediation treatment technology in FY01
- Initiate RA for bioremediation treatment of soil in FY02

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 17,725 acres
Mission: Conduct troop training and operations
HR. Score: 28.90; placed on NPL in August 1990
IAG Status: IAG signed in September 1991
Contaminants: Organic solvents, petroleum/oil/lubricants, and heavy metals
Media Affected: Groundwater and soil
Funding to Date: \$33.0 million
Estimated Cost to Completion (Completion Year): \$29.1 million (FY2100)
Final Remedy in Place or Response Complete Date: FY2000



Oahu, Hawaii

Restoration Background

Environmental studies conducted at Schofield Barracks since FY83 have identified 125 sites. Subsequent investigations concluded that 123 sites require no further action. In FY85, the installation detected trichloroethene (TCE) in drinking water wells on site. Schofield Barracks installed an air stripper treatment system in FY86 to remove TCE from the drinking water.

In FY91, to set priorities and expedite cleanup, the installation separated all sites into four operable units (OU). OU1 consists of suspected sources of TCE contamination; OU2 consists of contaminated groundwater; OU4 consists of the former Schofield Barracks Landfill; and OU3 consists of all other hazardous waste sites identified on the installation.

A Preliminary Assessment and Site Inspection (PA/SI), initiated in FY92, scoped Remedial Investigation and Feasibility Study (RI/FS) efforts for OUs 1, 2, and 4. The installation proposed several initiatives to expedite, and minimize costs associated with, those efforts. For OU2, the installation proposed limiting data collection to support a Remedial Action wellhead treatment strategy. OU4 is being addressed in accordance with EPA guidance on generic remedies for the investigation of CERCLA municipal landfills.

In FY93, RIs conducted for OU1 concluded that none of the sites at that OU required further action. PA/SI efforts for OU3 screened 106 sites and recommended no further action for 72 of those sites. The installation structured the restoration program for OU3 to minimize investigations and move forward quickly to clean up soil as necessary. Removal Actions were completed at seven underground storage tank sites.

In FY94, Phase I RIs for OU2 collected groundwater data from wells in the vicinity of the installation. Data collected allowed the installation to determine the extent of contaminant plumes and allowed evaluation of the hydrology of the site so that the movement of plumes could be predicted and potential receptors identified. Studies for OU2 did not show TCE contamination in wells other than installation supply wells. Sampling and analysis plans were developed and approved for OU3 to collect the limited data needed to screen the sites and determine the need for further action. RIs for OU4 concluded that the landfill is a continuing source of TCE contamination and other contamination in groundwater. However, the direction of the groundwater flow eliminates the landfill as the source of the TCE that is affecting the installation supply wells.

Schofield Barracks concluded investigative efforts for all sites in FY95. The installation drafted a Record of Decision (ROD) for no further action for OU1 and began to draft RI/FS reports for all other OUs.

In FY96, the installation held public availability sessions to solicit interest from the community in forming a restoration advisory board; no interest has been expressed by the community. The Army completed all RODs for this National Priorities List (NPL) site, including OUs 1 through 4. The Army and EPA approved RODs for OUs 1 and 2. The most significant is the ROD for OU2, which calls for long-term monitoring (LTM) of downgradient municipal wells and implementation of wellhead treatment as needed to remove TCE migrating from Schofield Barracks.

FY97 Restoration Progress

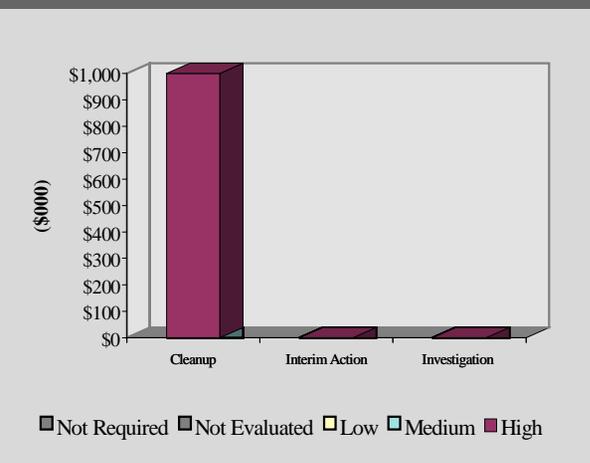
The Army petitioned EPA to delist the installation from the NPL. EPA, the Hawaii Department of Health, and the Army partnered to expedite approval of the remaining two RODs. EPA responded favorably to the NPL delisting proposal and committed to proceed to the delisting following completion of repairs to the former landfill cap for OU4. The groundwater LTM and wellhead treatment required by the OU2 ROD were implemented.

The landfill maintenance scheduled for completion in FY97 was delayed because permitting delays pushed back the start date.

Plan of Action

- Complete the landfill maintenance action for OU4 in FY98
- Work with EPA and Hawaii to delist Schofield Barracks from the NPL in FY98
- Continue OU2 groundwater monitoring and meet regularly with regulators to discuss data and need for further wellhead treatment

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 10,594 acres
Mission: Receive, store, distribute, maintain, and demilitarize conventional ammunition, explosives, and special weapons
HRS Score: 37.30; placed on NPL in August 1990
IAG Status: IAG signed in January 1993
Contaminants: Chlorinated solvents, radioactive isotopes, heavy metals, and petroleum hydrocarbons
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: \$38.9 million
Estimated Cost to Completion (Completion Year): \$120.3 million (FY2005)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2001



Romulus, New York

Restoration Background

In July 1995, the BRAC Commission recommended closing Seneca Army Depot, except for an enclave that will store hazardous materials and ores. The installation is scheduled to close in FY00.

During its operation, the installation stored munitions and supplies and distributed them to the Army. Operations such as demilitarization and disposal of munitions and explosives contributed to contamination at the installation.

Environmental studies since FY78 have identified the following site types: an open burning (OB) ground, an ash landfill, other landfills, low-level radioactive waste burial grounds, underground storage tanks (UST), spill areas, fire training areas, and munitions disposal areas.

Under the Federal Facility Agreement, the Army completed a solid waste management classification study in FY94. The study identified 72 solid waste management units (SWMU). Thirty-six of these units required no further action or completion reports, 8 required Removal Actions, and 28 required Remedial Investigations and Feasibility Studies (RI/FS). The 28 sites requiring RI/FSs were divided into 13 groups. In FY91, the installation initiated RI/FSs for two of those groups. RI/FSs at three more groups began in FY95 and one group in FY96.

Interim Actions conducted at the installation include removal of several USTs and associated contaminated soil. To expedite cleanup, the installation completed a Removal Action at the ash landfill in FY95. Approximately 25,000 cubic yards of soil were removed and treated by an innovative low-temperature thermal desorption technique that allowed return of the cleaned soil to the site.

In FY96, the installation completed RI/FSs at the first two groups of sites and drafted Proposed Plans. The installation also initiated RI/FS work plans for the remaining groups. Fieldwork began for three of the groups.

The installation commander converted its technical review committee to a restoration advisory board (RAB) and established a BRAC cleanup team (BCT). The installation started an Environmental Baseline Survey (EBS) and submitted a draft CERFA Report to the regulatory agencies for concurrence. On the basis of the EBS, the BCT completed its bottom-up review and developed a strategy for future cleanup actions. The Army determined that the Removal Actions presented in two decision documents that were submitted to the regulatory agencies in FY95 were not cost-effective. Therefore, the planned actions were not implemented. The community formed a local reuse authority and initiated a land reuse plan.

FY97 Restoration Progress

The installation completed the EBS and initiated follow-up action at newly identified sites. The Army's peer review team did a program review to streamline processes, provide technical advice, and recommend potential opportunities for cost savings/avoidance. The installation held monthly RAB meetings, which are open to the public.

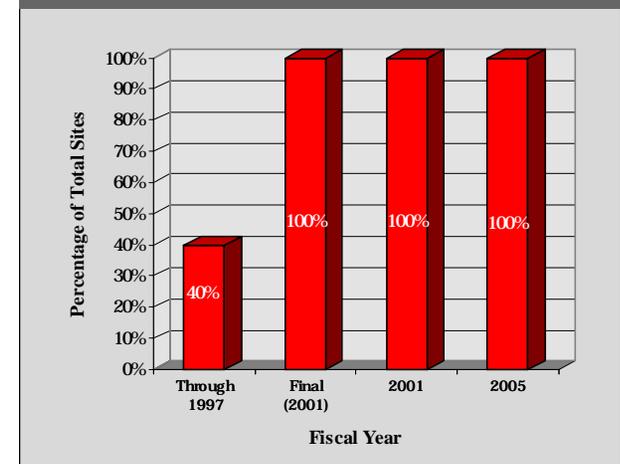
The BCT initiated a peer review action plan to implement peer review recommendations, reprioritized schedules for reuse, and initiated a risk assessment protocol for sites for which there are limited data.

The first four activities on the current plan of action originally were scheduled for completion in FY97 but were delayed. The Proposed Plans for two sites were not completed pending resolution of technical issues; therefore, Records of Decision (ROD) for the sites were not completed. Also, some investigations were not fully funded.

Plan of Action

- Employ ground-penetrating radar and EMS survey in FY98
- Complete RODs and Remedial Designs for the Ash Landfill and OB grounds in FY98
- Continue RIs and initiate three more investigations in FY98
- Integrate remediation efforts under the Local Redevelopment Authority and land reuse plan in FY98
- Complete RODs for three sites in FY98
- Implement peer review recommendations in FY98
- Institute reactive wall treatment of trichloroethene plume in FY98
- Complete a Closure Environmental Impact Statement (EIS) in FY98
- Close the installation in FY00

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 100,501 acres
Mission: Receive, store, maintain, issue, demilitarize, and calibrate special weapons, conventional ammunition, and general supplies
HRS Score: NA
IAG Status: Two-party Federal Facility Agreement signed in May 1991
Contaminants: Petroleum products, solvents, and explosives
Media Affected: Groundwater and soil
Funding to Date: \$28.6 million
Estimated Cost to Completion (Completion Year): \$64.4 million (FY2020)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2002



Herlong, California

Restoration Background

In July 1995, the BRAC Commission recommended realignment of the Sierra Army Depot by eliminating its conventional ammunition mission and reducing the installation to a depot activity. Environmental contamination at the depot originated from burn trenches, explosives leaching beds, landfills, burial sites, spill sites, sewage lines, underground storage tanks, sumps, and fire training areas. Primary contaminants detected in soil and groundwater include trichloroethene (TCE), petroleum products, and explosives. Environmental investigations identified 23 sites at the installation. Twelve sites required no further action. The Remedial Action being conducted at one site uses in-situ bioventing, an innovative technology.

The installation partnered with state regulatory agencies to set up a geographic information system (GIS) at the installation. The installation also worked successfully with the University of Nevada-Reno to develop a cooperative program. Graduate students gain experience by working on and assisting with the installation's hydrology studies. Results of the graduate studies have refined the knowledge of the aquifer in Honey Lake Valley. This information is being used and shared with the community to locate a higher quality, more dependable source of potable water.

Major environmental restoration activities completed in FY95 include a bioventing project at the active fire training area and signature of a Record of Decision (ROD) for nine sites. The seven site RODs specified the use of natural attenuation and degradation for both explosives and TCE in groundwater. This remediation process is ongoing. The selection of this remedy marked the first time that U.S. regulators allowed the use of natural attenuation as an innovative technology for remediating explosive products and TCE in groundwa-

ter. Also in FY95, the Army completed a design implementing composting for treatment of soil contaminated with explosives.

In FY96, the installation commander formed a BRAC cleanup team that published Version 1 of a BRAC Cleanup Plan. The Army developed the design concept for preventing the off-post migration of a TCE-contaminated groundwater plume. The installation updated its community relations plan and used the plan to establish a restoration advisory board in FY97. To address contaminants at various sites, the Army developed an early warning groundwater transducer program to monitor plumes containing petroleum and TCE in the vicinity of the potable water supply network. At the end of FY96, RODs had addressed 17 of Sierra's 23 sites. Work also began on the BRAC NEPA document.

FY97 Restoration Progress

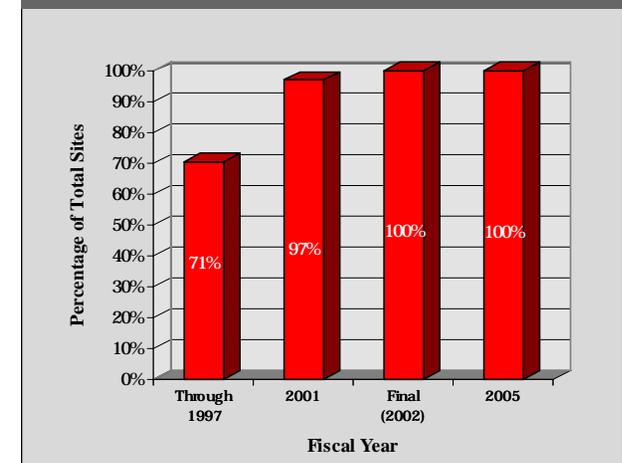
In FY97, an Environmental Baseline Survey (EBS) was completed, and 3,537 acres were identified as CERFA-clean. In addition, a report of availability and an Environmental Condition of Property (ECP) were completed for the BRAC cantonment parcel. Soil from restoration cleanup was recycled for road base. Improved site management techniques were employed at the installation, and a NEPA Categorical Exclusion was used to transfer some BRAC property. Sierra Army Depot was the first BRAC 95 installation to transfer property.

The installation participated in several successful partnering efforts. Cooperative efforts took place between the installation and several organizations in developing GIS. The installation held a signing ceremony for the first cooperative use of the health clinic with the Indian Health Services and for transfer of BRAC housing.

Plan of Action

- Complete Infield Removal Actions for BRAC property Rifle Range in FY98
- Complete Infield Removal Action for BRAC construction debris area in FY98
- Complete Infield Engineering Evaluation and Cost Analysis for BRAC unexploded ordnance areas in FY98
- In FY98, complete field review of contaminated soil area, reducing the cost of remediation by more than 50 percent
- Complete reviews of finding of suitability to transfer or ECP in FY98
- Implement natural attenuation at most contaminated groundwater sites in FY98
- Sign RODS for 18 of 23 sites by FY98
- Improve management process by increasing the use of project review meetings to eliminate exchanges of paper reviews and implementing field review project changes in FY98
- Close three sites currently undergoing remediation by FY99
- Complete the BRAC program, including monitoring requirements, by FY01

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 2,100 acres

Mission: Provide administrative coordination and logistic support for Reserve Units; provide logistic support for the Marine Air Reserve Training Detachment South Weymouth

HRS Score: 50.00; placed on NPL in May 1994

IAG Status: None

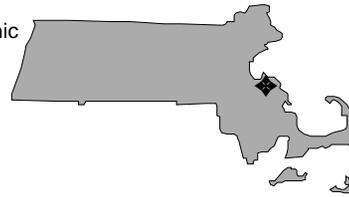
Contaminants: Petroleum hydrocarbons, solvents, acids, paints, metals, photographic chemicals, and industrial wastes

Media Affected: Groundwater, surface water, sediment, and soil

Funding to Date: \$9.6 million

Estimated Cost to Completion (Completion Year): \$19.9 million (FY2005)

Final Remedy in Place or Response Complete Date for BRAC Sites: FY2002



Weymouth, Massachusetts

Restoration Background

In July 1995, the BRAC Commission recommended closure of the South Weymouth Naval Air Station. Operations will be transferred to the Brunswick Naval Air Station, and aircraft, personnel, and equipment will be relocated. The installation was closed on September 30, 1997.

Initially, eight CERCLA sites and one RCRA underground storage tank (UST) site were identified at the installation. One of the CERCLA sites, Site 6, is being investigated as a UST site. Prominent site types include a landfill, a tank storage area, a tank farm where jet fuel is stored in five USTs, a rubble disposal area, and a fire training area.

In FY91, the waste oil tank was removed from UST 1. In FY93, an initial investigation was completed for the UST site. Between FY88 and FY91, the installation completed a Preliminary Assessment for five sites and a Site Inspection for eight sites. In FY92, several compressed chlorine gas cylinders and pesticide containers were removed from an old sewage treatment plant (Site 7). In FY93, the installation conducted a second Removal Action at Site 7 to remove contaminated soil and liquids. In FY95, during a preliminary corrective action involving removal of soil, the installation identified additional contamination at UST 1.

A third UST site (UST 2) was identified at Squantum Gardens Housing Area. Two Removal Actions, one to remove tanks and the other to remove contaminated soil, were completed for the site. The Agency for Toxic Substances and Disease Registry completed a public health assessment of the installation. The installation established a technical review committee in FY92 and converted it to a restoration advisory board (RAB) in FY94. The RAB has 20 members and meets monthly. The installation established an administrative record and

three information repositories in FY92 and completed its community relations plan (CRP) in FY93.

During FY96, the installation formed a BRAC cleanup team and began to develop its BRAC Cleanup Plan (BCP). A corrective action plan was completed for UST 1, and a corrective action was initiated for UST 2. The installation continued a Remedial Investigation (RI) for seven sites and began work on Phase I of the Environmental Baseline Survey (EBS).

FY97 Restoration Progress

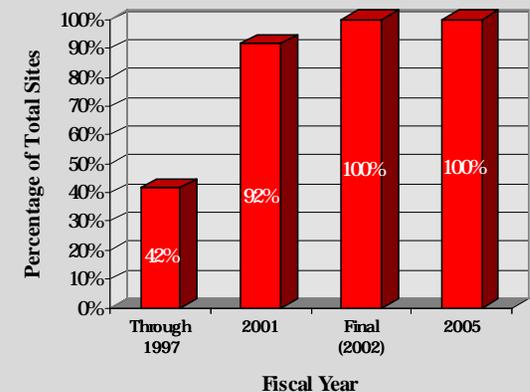
Installation operations ceased in September 1997. The design for UST 1 and the corrective action for UST 2 were completed. In addition, Phase I of the EBS was finished and Phase II was initiated. The RI Phase I Report was submitted as a draft document in FY97.

The BCT continued to meet to discuss the project progression, propose new ideas, and foster cooperation with the community members and regulatory agencies. The installation hosted an environmental workshop and regular base and site tours to increase public participation. The RAB progress in FY97 included technical review of documents and input regarding the relative risk evaluation.

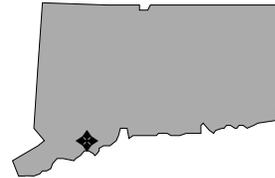
Plan of Action

- Initiate Feasibility Studies (FS) for two sites in FY98
- Update the CRP and complete the BCP in FY98
- Continue Phase II of the EBS, initiate EBS Phase II field program, and complete latest version of EBS in FY98
- Complete RI Phase I Report and RI Phase II work plans in FY98
- Foster partnership with EPA, Massachusetts Department of Environmental Protection, and the Navy in FY98

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 128 acres
Mission: Manufacture engines for heavy armor vehicles and rotary wing aircraft
HRS Score: NA
IAG Status: None
Contaminants: PCBs, asbestos, fuel-related VOCs, solvents, metals, and PAHs
Media Affected: Groundwater, soil, surface water, and sediment
Funding to Date: \$3.1 million
Estimated Cost to Completion (Completion Year): \$32.3 million (FY2001)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2001



Stratford, Connecticut

Restoration Background

In July 1995, the BRAC Commission recommended closure of the Stratford Army Engine Plant. The installation is scheduled to close on September 30, 1998.

Since FY91, environmental studies at the installation have identified the following site types: transformers that contain polychlorinated biphenyls (PCB), 29 underground storage tanks (UST), two sludge lagoons, one fire training and explosives equipment testing area, approximately 10 hazardous materials and hazardous waste storage areas, and several buildings constructed from asbestos-containing materials. Preliminary studies indicate that contaminants at the installation may include PCBs, fuel-related volatile organic compounds (VOC), solvents, metals, polyaromatic hydrocarbons (PAH), and asbestos.

Interim Actions conducted at the installation have included removal of 27 USTs, capping of two sludge lagoons, and capping of one large parking lot area to immobilize contaminated soil. The installation closed two USTs in place. In FY95, the installation began a Remedial Investigation (RI) to identify and characterize contamination and affected media throughout the installation.

In FY96, the Army appointed a BRAC environmental coordinator (BEC) and formed a BRAC cleanup team (BCT). The community formed a Local Redevelopment Authority to address socioeconomic issues related to closure of the installation and to develop a land reuse plan. Phase II of the RI was completed. The installation held two public meetings to keep the community informed about all BRAC activities and property disposal. The installation also began an asbestos survey of all buildings and started the NEPA process,

including an archive search. A draft final Environmental Baseline Survey (EBS) and a draft BRAC Cleanup Plan (BCP) were completed.

FY97 Restoration Progress

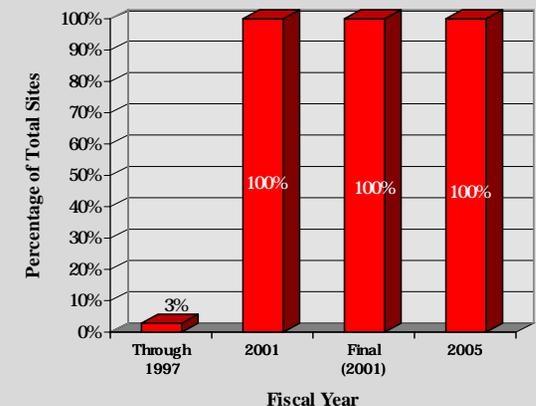
In December 1996, the installation received concurrence from the appropriate regulatory agencies on the EBS and CERFA Reports. In August 1997 RI Phase III began. The installation amended work plans for the RI and Feasibility Study (FS) to tighten schedules and activities. As a result, schedule and deliverables were monitored more closely. The BCT reviewed the EBS and CERFA Reports. The latest version of the BCP was completed in June 1997. The appropriate regulatory agencies concurred with the proposed designation of 3 acres as CERFA-uncontaminated. The installation improved its management practices by implementing systems for monitoring schedules and budgets.

The first two activities on the current plan of action were originally scheduled for completion in FY97. They were postponed due to funding delays, a vacant BEC position, and a previous RI activity that had not produced risk evaluation quality data to support any remedy selection.

Plan of Action

- Compile a community relations plan in FY98
- In FY98, select remedies to address contamination identified at the installation
- Perform risk analysis at CERFA units in FY99
- Accelerate cleanup by focusing and carefully monitoring the schedule for the RI/FS and by using Removal Actions for the appropriate documented actions where possible

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 1,386 acres
Mission: World War II basic flying training station and tactical training station
HRS Score: Unknown; placed on NPL in May 1986
IAG Status: None
Contaminants: VOCs
Media Affected: Groundwater
Funding to Date: \$.03 million
Estimated Cost to Completion (Completion Year): \$0.08 million (NA)
Final Remedy In Place or Response Complete Date: NA



Cowley County, Kansas

Restoration Background

The Strother Army Airfield near Winfield, Kansas, was declared as excess to the Government in 1945, and the property was transferred to the Strother Field Airport Commission in 1946. The commission subsequently converted the property into a municipal airport and an industrial park.

On June 10, 1986, the Strother Field Industrial Park was listed on the National Priorities List (NPL). Samples collected and analyzed by the state indicated the presence of volatile organic compounds (VOC), including trichloroethene (TCE) in groundwater. Two inactive solid waste landfills, which were used for disposal of various industrial wastes, exist at the site.

Until 1983, the Strother Field Airport Commission operated a water supply system consisting of eight wells on the site. The contaminated groundwater is no longer used for drinking but is still used for industrial processes. Drinking water was provided by trucks until the commission installed two wells upgradient of the contaminant plume. In 1985, General Electric, a potentially responsible party (PRP), installed groundwater extraction wells and air stripping towers to remove VOCs from the groundwater under an Administrative Order by the Kansas Department of Health and Environment.

The state oversaw an investigation by the PRP that identified the types of contaminants remaining in the groundwater and other areas and has recommended a remedy for final site cleanup. The remedy includes pumping and treating the groundwater and using soil vapor extraction to clean up the soil. Design of the remedy began in late 1994.

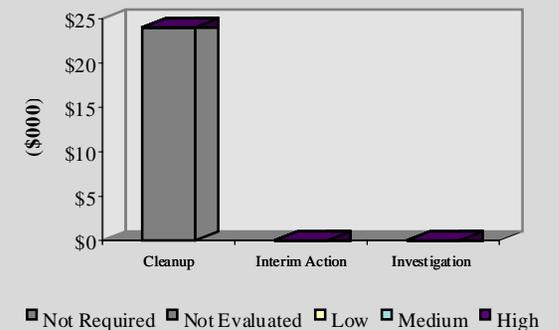
FY97 Restoration Progress

In March 1997, EPA notified the Kansas City District of the U.S. Army Corps of Engineers of DoD's potential liability at the Strother Field Industrial Park Superfund Site. The Kansas City District received authorization in April 1997 to conduct a limited investigation to determine whether DoD should be included as a PRP at the site. DoD has conducted a preliminary evaluation of DoD's liability and is working with the Department of Justice and EPA to determine whether DoD should remain a PRP.

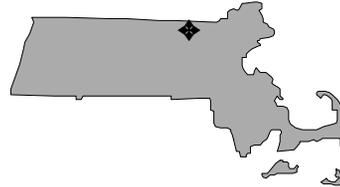
Plan of Action

- In FY98, work with the Department of Justice and EPA to determine DoD's liability, if any, for the former DoD property
- In FY98, plan a further course of action, if necessary

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 2,292 acres
Mission: Train troops and test ordnance, material, and equipment
HRS Score: 35.57; placed on NPL in February 1990
IAG Status: IAG signed in May 1991
Contaminants: VOCs, PCBs, pesticides, and heavy metals
Media Affected: Groundwater and soil
Funding to Date: \$12.5 million
Estimated Cost to Completion (Completion Year): \$3.9 million (FY1998)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY1998



Middlesex County, Massachusetts

Restoration Background

In July 1995, the BRAC Commission recommended closure of the Sudbury Training Annex. Sudbury Training Annex is a subpost of Fort Devens in eastern Massachusetts. Environmental studies since FY80 have identified several site types, including an old landfill, disposal and dump areas, a fire training pit, ordnance test areas, a leach field, underground storage tanks (UST), a drum storage area, a burning ground area, and a chemical research and development area. In FY86, Remedial Investigation and Feasibility Study (RI/FS) activities confirmed groundwater contamination at two sites. The primary contaminants at the installation are volatile organic compounds (VOC) and pesticides in groundwater and soil.

Interim Actions conducted at the installation include the removal of drums, petroleum-contaminated soil, and a UST. In the mid-1980s, the installation excavated fuel-contaminated soil from a burning ground area and polychlorinated biphenyl (PCB)—contaminated soil from a transformer storage area.

In FY94, the installation conducted Removal Actions involving removal of 2,300 tons of contaminated soil, 15 tons of debris, 107 abandoned drums, and 13 abandoned oil USTs.

In FY95, the installation identified two additional sites, bringing the total number of identified sites to 74. FY95 cleanup and study actions at individual sites included (1) signing of decision documents for no further action at 19 sites; (2) completion of the FS, Proposed Plan and Record of Decision (ROD) for 5 sites, with Remedial Design (RD) activities initiated; (3) completion of final RI completed for five sites; (4) completion of Screening Site Inspections (SSI) for 15 sites; (5) initiation of SSIs for 10 additional sites; and (6) of Engineering Evaluation and Cost Analyses for 4 sites. The installation also

conducted a Removal Action to remove 1,200 tons of arsenic-contaminated soil.

The Army signed a ROD for five sites, completed RD for those sites, and began Remedial Action (RA). The installation began an Environmental Baseline Survey, which was nearly complete at the end of FY96. SSIs of 15 sites also were completed. The Army performed Removal Actions at nine sites, resulting in the removal of 11,800 cubic yards of soil contaminated with total petroleum hydrocarbons, polyaromatic hydrocarbons (PAH), and metals. RODs for no further action were signed for five additional sites.

A technical review committee (TRC) was formed in FY90 and meets quarterly. The TRC greatly improved management of the installation cleanup and helped foster partnerships with EPA and state regulatory agencies. Local environmental groups participated in the review process for the installation cleanup program through the TRC. The installation also helped minimize regulatory actions by EPA and the state by adhering to preestablished state cleanup standards for soil. In FY96, The commander of the installation determined that there was insufficient public interest to convert the TRC to a restoration advisory board. The Army appointed a BRAC environmental coordinator to oversee restoration efforts.

FY97 Restoration Progress

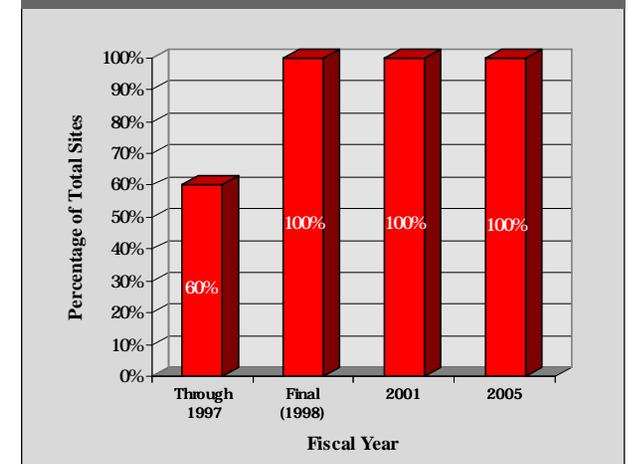
In early FY97, the Army completed Removal Actions at nine sites for metals, pesticides, PAHs, and VOCs. In addition, all outstanding Site Inspections were completed by early FY97. The installation completed an archive search for unexploded ordnance and an installationwide arsenic study. It also installed a landfill cap. Site cleanups were completed, and a ROD for no further action was signed for Sites A4, A7, and A9.

The installation implemented an innovative Geonet gas-venting system and consolidated the removed soil from nine sites as subgrade under the landfill cap, saving off-site disposal expenses. The installation held public hearings and four TRC meetings.

Plan of Action

- Complete survey of cultural and natural resources by FY98
- Transfer installation property to the Department of the Interior, FEMA, and the Department of the Air Force in FY98
- Accomplish site delisting from National Priorities List in FY99
- Complete all BRAC activities except long-term monitoring by end of FY05

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 9,065 acres
Mission: Manufactured smokeless powder and propellants; on standby for production of nitroguanidine
HRS Score: 50.00; proposed for NPL in February 1995
IAG Status: None
Contaminants: Nitrates, sulfates, lead, chromium, and propellants
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: \$13.1 million
Estimated Cost to Completion (Completion Year): \$54.2 million (FY2029)
Final Remedy in Place or Respnse Complete Date: FY2003



De Soto, Kansas

Restoration Background

The Sunflower Army Ammunition Plant began operations in 1942. Its primary mission was to manufacture smokeless powder and propellants. Additional installation operations included the manufacture and regeneration of nitric and sulfuric acids and munitions proving. The majority of the installation is on standby, inactive status. Potential sources of contamination at the installation include production line areas, magazine storage areas, and about 50 RCRA solid waste management units (SWMU). EPA proposed listing the installation on the National Priorities List (NPL) after five munitions manufacturing surface impoundments were evaluated as potential sources of hazardous waste.

Prominent site types at the installation include a landfill, open burn areas, aboveground and underground storage tanks (UST), propellant production areas, dump sites, a battery handling area, settling ponds, wastewater lagoons, and a drainage ditch.

A groundwater contamination survey conducted in FY87 and a Site Inspection conducted in FY88 revealed contaminated groundwater at the installation. Results of an analysis also indicated contamination of surface water and sediment by heavy metals. Interim Actions at the installation have included removal of USTs and associated contaminated soil.

The installation's technical review committee, which includes representatives of EPA, state regulatory agencies, the U.S. Army Corps of Engineers, and contractors, continues to meet monthly to discuss restoration activities and devise ways to reduce regulatory impediments.

In FY95, the installation began preparing a community relations plan (CRP). It also began soil and groundwater sampling and analysis and

completed investigations of SWMUs. In FY96, the installation submitted the draft CRP to EPA and the Kansas Department of Health and Environment (KDHE) for review.

The Army completed an Ecological Risk Assessment for the entire installation and submitted the document to EPA and KDHE for review. The assessment concluded that no further action was necessary for most of the areas studied. A final survey of benthic macroinvertebrates was completed. This survey concluded that the biological features of surface water appear to be in good condition. A site visit and summary conducted by the Agency for Toxic Substances and Disease Registry identified no specific environmental or public health concerns related to the installation.

The installation completed demolition of one wastewater lagoon and began demolition of a second lagoon. Sludge in the remaining four lagoons is undergoing nitrate reduction by bioremediation. The Army initiated a phytoremediation study of sites contaminated with lead. This study was funded by the Army Environmental Center and conducted by the Tennessee Valley Authority.

FY97 Restoration Progress

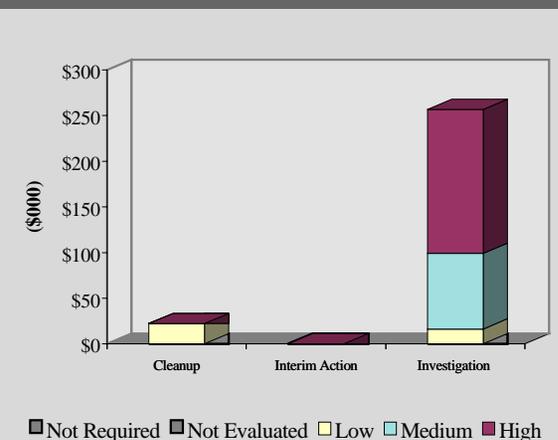
Remedial Design and site cleanup were completed for SWMU 50. RCRA Facility Investigations for 15 priority-one SWMUs were also completed. The installation completed Relative Risk Site Evaluations for all sites. The cleanup of three of the four remaining wastewater lagoons was also completed.

CRP completion, scheduled for FY97, was postponed because of delays in EPA review.

Plan of Action

- Form a restoration advisory board in January 1998
- Submit final CRP in FY98
- Close last wastewater lagoon in FY98
- Complete the Interim Remedial Action for SWMU 50 in FY98 and for SWMUs 10/11 and 22/32 by FY99
- Complete Feasibility Study for 12 SWMUs in FY98 and for 13 SWMUs in FY99
- Complete groundwater investigations at Operable Unit 1 by FY99

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 5,044 acres
Mission: Repair aircraft, weapons, and engines
HRS Score: 42.24; placed on NPL in July 1987
IAG Status: IAG signed in September 1988
Contaminants: Organic solvents, heavy metals, and low-level radioactive material
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: \$131.0 million
Estimated Cost to Completion (Completion Year): \$220.6 million (FY2023)
Final Remedy in Place or Response Complete Date: FY2008



Oklahoma City, Oklahoma

Restoration Background

Environmental studies at Tinker Air Force Base have revealed contamination at Soldier Creek and Building 3001, as well as a 220-acre contaminant plume in the upper aquifer. Additional sites include landfills, underground storage tanks (UST), waste pits, fire training areas, spill sites, and low-level radioactive waste sites.

The installation has implemented numerous Interim Actions, including removal of contaminated soil and USTs and installation of landfill caps, free-product recovery systems, bioventing systems, a biostripping system, and a solidification and stabilization system. A Record of Decision (ROD) was signed for Building 3001 in FY90, and a groundwater extraction and treatment system is operating at the site. A ROD for Soldier Creek was signed in FY93.

In FY94, to combine technology demonstrations and save time and money, a partnership was established among the installation, the Tyndall Air Force Base Armstrong Laboratory, North Dakota State University, and the U.S. Army Corps of Engineers Waterways Experimental Research Station.

The installation also participated in EPA's Superfund Innovative Technology Evaluation program. Through a partnership with EPA, the Department of Energy, and the New Jersey Institute of Technology, the installation demonstrated pneumatic fracturing, which is designed to improve permeability in fine-grained formations. In FY94, fieldwork was completed on the project and a final report was prepared.

In FY95, the installation expanded the fuel recovery system at the North Tank Operable Unit (OU) and all USTs were removed from four sites. The installation also began a Phase II RCRA Facility Investigation for 18 sites and completed the majority of the Remedial Investigation (RI) for the Industrial Wastewater Treatment Plant

(IWTP)/Soldier Creek Off-Base Groundwater (SCOBGW) OU. A bioslurping system and a bioventing system were installed to treat fuel-contaminated soil. Remedial Actions involving the treatment of fuel and solvent contamination also were implemented at two sites.

Also in FY95, a two-dimensional (2-D), high-resolution seismic reflection study was completed along a 3-mile stretch to identify preferential contaminant-migration pathways. To improve site characterization, the installation began using a geographic information system (GIS) to centrally manage and analyze data collected during environmental investigations.

The installation completed a Phase II RFI Report in FY96. Actions to increase product recovery and reduce the volume of extracted groundwater were implemented at fuel-contaminated sites. Seven interim corrective actions were initiated, and one was completed. A draft final RI and Feasibility Study of the IWTP/SCOBGW OU also was completed.

The installation formed its restoration advisory board (RAB) in FY94 and completed selection of RAB members in FY95 by naming 16 community representatives. During FY96, the RAB participated in the Renew America National Town Meeting and the Oklahoma Governor's Conference on the Environment. It also published a newsletter, *The Link*.

FY97 Restoration Progress

The installation removed low-level radioactive waste and completed cleanup of Radioactive Waste Disposal Site 1030W. In addition, the base completed the capping preparation of Landfill 2, capping of Landfill 4, construction of a bioventing system for the Fuel Purge Facility, and construction of another treatment system for the Area A Service Station. Implementation of these early response actions

reduced the risk of five high-risk sites, thereby achieving Air Force and DoD risk reduction goals.

The installation implemented several fieldwork techniques including 2-D/3-D shallow seismic reflection, a Global Positioning System (GPS)-based radiation detection system, and a GPS magnetic and electromagnetic induction survey. In addition, a surfactant-enhanced contaminant recovery demonstration took place.

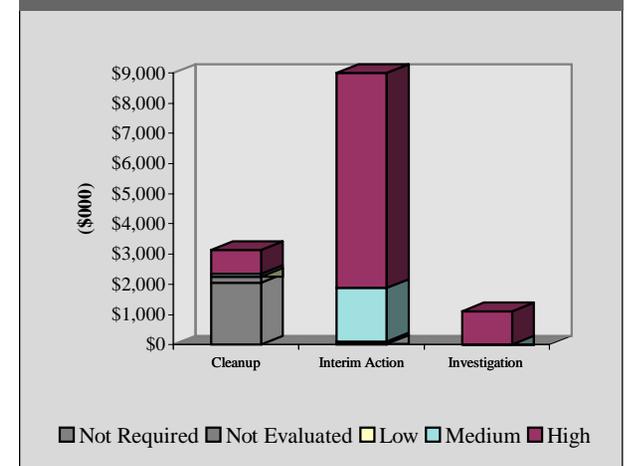
The restoration program was restructured with regulatory buy-ins that integrated site characterization and interim and final response actions. To expedite document review, regulators were provided with detailed briefings on the action before the review.

Delays in regulatory approval held up some actions scheduled for completion in FY97.

Plan of Action

- Install a RCRA cap at Landfills 5 and 2 and a SW Quadrant Groundwater Containment System in FY98
- Complete Proposed Plan and sign ROD for IWTP/SCOBGW OU in FY98
- Conduct a source removal at Waste Pit 1 in FY98

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 1,293 acres
Mission: Provide logistics for communications and electronics equipment
HRS Score: 37.93; placed on NPL in August 1990
IAG Status: IAG signed in September 1990
Contaminants: Heavy metals, VOCs, PCBs, petroleum/oil/lubricants, and UXO
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: \$13.7 million
Estimated Cost to Completion (Completion Year): \$15.9 million (FY2011)
Final Remedy in Place or Response Complete Date: FY2011



Tobyhanna, Pennsylvania

Restoration Background

Environmental studies since FY80 have identified several sites at the installation, including landfills, a disposal pit, underground storage tanks (UST), burn areas, drum staging areas, a surface disposal area, a waste treatment plant, a spill site area, an unexploded ordnance (UXO) area, and a fire training area. The most prominent sites are the burn areas and a drum staging area, which together form Operable Unit (OU) 1. Contamination at these sites includes volatile organic compounds (VOC), solvents, and heavy metals in groundwater; solvents, heavy metals, polychlorinated biphenyls (PCB), and petroleum/oil/lubricants (POL) in surface water and sediment; and solvents, heavy metals, PCBs, POLs, and UXO in soil.

The installation initiated several Interim Actions between FY87 and FY91. It provided bottled water to 26 residences and 1 business. In FY91, it constructed a water line extension from the installation to the affected residents. Since FY90, the installation also removed 17 USTs.

Remedial Investigation and Feasibility Study (RI/FS) activities began in FY90. In FY92, the installation completed RI fieldwork at OU1 and a Treatability Study of a soil volatilization technology. In FY94, the installation completed the Phase I RI field investigation at 11 sites, submitted a draft technical report for regulatory review, and initiated a Removal Action at 1 of the 11 sites. In addition, the installation has begun a basewide Ecological Risk Assessment (ERA).

In FY95, the installation submitted an RI work plan for construction and installation of groundwater wells at the Inactive Sanitary Landfill. It also submitted a proposal to address three OUs comprising five sites. In addition, the installation conducted an Interim

Remedial Action at OU1 Area B to remove contaminated soil, eliminating the need to treat the soil on site.

Since the Federal Facility Agreement (FFA) was signed in FY90, installation personnel have worked closely with regulatory agencies on the performance of restoration activities. In FY95, the commander formed a restoration advisory board (RAB). Early RAB meetings focused on restoration activities, monitoring of results, and evaluation of Proposed Plans. The installation initiated partnering efforts with EPA Region 3 and the U.S. Army Center for Health Promotion and Preventive Medicine to jointly prepare risk assessments.

In FY96, the installation increased the RAB's involvement in the cleanup process to facilitate document review. The RAB helped coordinate the efforts of the installation and the local government in application of geographic information systems (GIS). The installation continued to work in partnership with EPA and the Pennsylvania Department of Environmental Protection to jointly prepare Proposed Remedial Action Plans and RODs for OU1 and OU4. The installation also completed a verification study of 11 areas of concern (AOC).

The installation completed negotiations with EPA and the Pennsylvania Department of Environmental Protection on the restoration of OU1 and drafted the Proposed Plan. In addition, a cleanup action was completed at Oakes Swamp, AOC 8. EPA approved additional steps for the ERA and continued the basewide ERA to identify sites that could pose significant ecological risks.

FY97 Restoration Progress

The installation completed a Record of Decision (ROD) for OU1 groundwater that specifies natural attenuation in conjunction with long-term monitoring. This is significant in that Pennsylvania formerly had a background-level ARAR. Risk-based standards will result in a significant cost avoidance. The RI for the Inactive Sanitary Landfill was also completed. Additionally, a close out document has been drafted to permit the closure of 35 no-further-action sites.

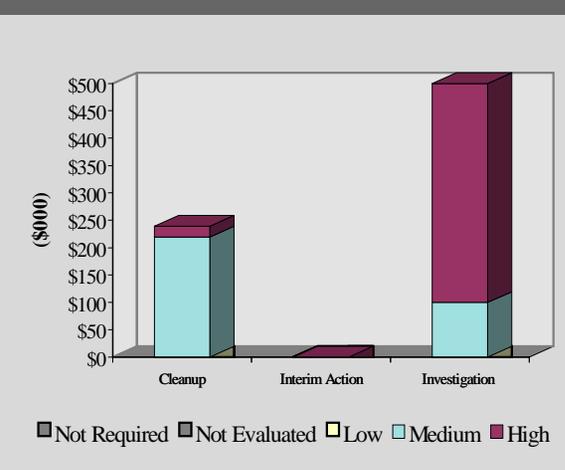
The RAB members became involved in reviewing proposed remedial action plans and draft RODs, and also offered input on the cleanup process. This helped to speed up the review process. The RAB also assisted in coordinating efforts between the installation and the local governments in the application of GIS.

The first item in the current plan of action was not completed as scheduled because of the FFA. The fourth and fifth items in the plan of action were not delayed because they are pending EPA review.

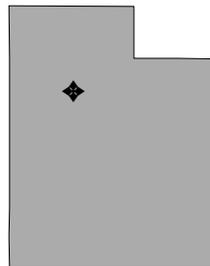
Plan of Action

- Complete two RODs for additional OUs in FY98
- Amend the FFA in FY98
- Complete the basewide ERA in FY98
- Initiate the FS for the Inactive Sanitary Landfill in FY99
- Complete all RODs by FY00

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 24,732 acres
Mission: Store munitions and maintain equipment
HRS Score: 53.95; placed on NPL in August 1990
IAG Status: Federal Facility Agreement signed in September 1991
Contaminants: Solvents, metals, explosives, petroleum hydrocarbons, and PCBs
Media Affected: Groundwater and soil
Funding to Date: \$74.3 million
Estimated Cost to Completion (Completion Year): \$134.0 million (FY2037)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2001



Tooele, Utah

Restoration Background

In July 1993, the BRAC Commission recommended realignment of Tooele Army Depot and its reduction to a depot activity and placement under the command and control of Red River Army Depot. The commission also recommended retaining the depot's conventional ammunition storage and chemical demilitarization missions. The Army will transfer 1,700 acres and retain 23,032 acres for the ammunition mission.

Environmental studies have been under way at the installation since FY79. Sites identified include open burning and open detonation areas, an ammunition demilitarization facility, landfills, firing ranges, industrial sites, underground storage tanks (UST), surface impoundments and lagoons, and drain fields. Organic solvents are the primary contaminants affecting groundwater.

Tooele's environmental program is regulated under a CERCLA Federal Facility Agreement (FFA) and a RCRA corrective action permit dated 1991. To date, 56 sites have been addressed under RCRA or CERCLA. Of the 56 sites, 4 require no further action under CERCLA and another 4 require no further action under RCRA.

Interim Actions completed at the installation include construction of an industrial wastewater collection system and treatment facility, removal of polychlorinated biphenyl (PCB)-contaminated soil, cleanup of residual sludge from a degreaser unit, and removal of other soil and debris. In FY93, the installation completed an Interim Remedial Action at the Tire Disposal site. It also began using a groundwater extraction and treatment system to clean up water contaminated with solvent in a plume extending approximately 4 miles by 2 miles.

In FY94, the installation removed 13 USTs. In addition, the Army and EPA approved a Record of Decision addressing six sites (with determinations of no further action for four of the six). A final CERFA report was completed and submitted to the regulatory agencies for review. The installation converted its technical review committee to a restoration advisory board, which addresses issues related to the BRAC environmental program. The installation holds periodic public meetings to discuss milestones related to the CERCLA and RCRA corrective action programs.

In FY95, the BRAC cleanup team (BCT) prepared Version II of the BRAC Cleanup Plan. BCT members also participated in the preparation of 10 finding-of-suitability-to-lease (FOSL) documents. The installation prepared a draft disposal and reuse Environmental Impact Statement (EIS) and identified 932 acres as CERFA-clean. In addition, the community completed a draft land reuse plan.

In FY96, Tooele Army Depot completed the Disposal and Reuse EIA after obtaining approval from the regulatory agencies. The document covers 1700 acres available for transfer. The installation completed a Finding of Suitability for Transfer (FOST) to transfer the Consolidated Maintenance Facilities to the Tooele City Redevelopment Agency. For all sites, the Army completed RCRA Facility Inspection and Remedial Investigation (RFI/RI) activities. Regulators have approved all RFIs/RIs with the exception of Group C, which includes SWMUs 49 through 57. Those studies recommended no further action at 10 of the 29 sites.

The installation completed two small Remedial Actions (soil and drum removals) conducted under the FFA were completed and their close-out reports accepted by regulatory agencies. The Army initiated Corrective Measures Studies (CMS) at 20 sites and Feasibility Studies (FS) at 11 sites.

FY97 Restoration Progress

During FY97, the installation delineated the contaminated groundwater plume and prepared FOSTs for the remaining BRAC property. A treatability study successfully demonstrated the effectiveness of treating explosives-contaminated soil through windrow composting. Composting is a remedial alternative being considered for use at TEAD-81, the TNT Washout Facility. Regulatory Agencies have concurred with the designation of 340 acres as CERFA clean.

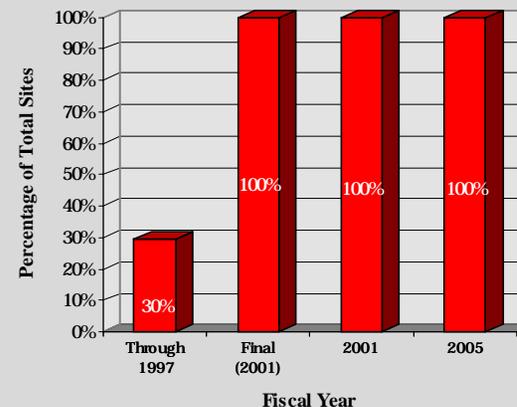
The BCT executed a FOSL for the Master Lease, completed the Master Lease, and completed and received approval for RCRA Facility Investigations (RFI) at 7 sites, completed RFI at 9 sites, and initiated Corrective MEasures Studies (CMS) on 7 sites. All investigations are now complete and remedial alternatives are being evaluated.

The first, third and fifth items on the current plan of action were scheduled for completion in FY97. They were postponed due to delay in completing the EOD risk assessment, delays in regulatory approval and lack of funding.

Plan of Action

- Conduct two Removal Actions in FY98
- Execute a lease for remaining BRAC property (to the Tooele Reuse Authority) in FY98
- Complete soil washing at the Skeet Range in FY98
- Further propose CERFA-untcontaminated acreage in FY98
- Complete all CMSs and FSs in FY99
- Have BRAC cleanup activities operating by FY07

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 5,025 acres
Mission: Provide air refueling and strategic airlift services for troops, cargo, and equipment
HRS Score: 29.49; placed on NPL in November 1989
IAG Status: Federal Facility Agreement signed in September 1990 and amended in May 1993, October 1995, and July 1996
Contaminants: VOCs, heavy metals, and PAHs
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: \$54.3 million
Estimated Cost to Completion (Completion Year): \$144.8 million (FY2032)
Final Remedy in Place or Response Complete Date: FY2005



Solano County, California

Restoration Background

Travis Air Force Base has supported Air Force operations since 1943 by providing services to troops, cargo, and equipment. Historical activities resulted in numerous releases of fuels, solvents, and petroleum/oils/lubricants, which migrated into groundwater beneath the installation. Since FY85, studies have identified a number of sites, including old landfills, a closed sewage treatment plant, four fire training areas, disposal pits, spill areas, the storm sewage drainage system, a pesticide disposal site, and a low-level radioactive waste burial site. In FY93, the Air Force divided the entire installation into four operable units (OU).

The Air Force implemented several Interim Actions at the installation, including the removal of 27 underground storage tanks. Granular activated carbon treatment systems were installed to treat groundwater contaminated with trichloroethene (TCE) at a storm sewer outfall in Union Creek and a source area for the installation's largest TCE groundwater plume. Treatability Studies were conducted in FY94 on the use of horizontal wells, two-phase extraction systems, bioventing, and bioslurping. The installation also completed an analysis of the feasibility of applying intrinsic remediation to petroleum-contaminated groundwater that lies underneath the base gasoline station.

In FY95, the installation formed a restoration advisory board (RAB) and established the RAB Relative Risk Focus Group to address restoration priorities, the Technical Review Focus Group to review draft documents, and the Community Relations Focus Group to disseminate information to the general public. The installation completed field investigations for three of the four OUs and Remedial Investigation (RI) Reports for the North and East Industrial OUs. The installation also completed one TCE Removal Action at the storm sewer outfall and implemented another TCE Removal Action

incorporating horizontal extraction wells and two-phase extraction technology.

During FY96, the installation developed a model to help set priorities among high-relative-risk sites for Remedial Action. The installation also developed a chemical reference handbook for the public that describes the contaminants present at the installation and the potential effects of those contaminants on human health and the environment.

In FY96, the installation also completed the RI Report for the West Industrial OU and combined the North, East, and West Industrial OUs (NEWIOU) into a single OU for the Feasibility Study (FS), the Proposed Plan, and the Record of Decision (ROD). This consolidation saved both time and money. The FS for the NEWIOU and the Proposed Plan for the groundwater part of the NEWIOU were completed. Work began on expanding the Interim Action for the installation's largest TCE groundwater plume to an additional source area. The Interim Action at the outfall in Union Creek was completed, and the treatment facility was secured.

FY97 Restoration Progress

The RI for the West/Annexes/Basewide OU and the expansion of the Interim Action for the installation's largest TCE-contaminated groundwater plume were completed. One early action occurred in August 1997. Cone penetrometer testing in FY97 accelerated fieldwork.

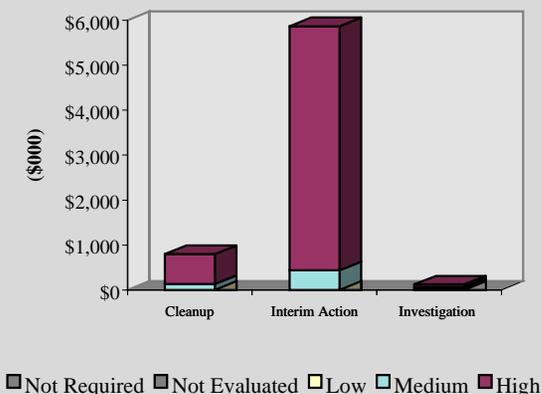
Consultation helped resolve issues with regulatory agencies, and an Interim ROD was successfully negotiated with state agencies. The RAB encouraged communication with the community through a RAB/Installation Restoration Program (IRP) display booth at two Air Expos and an Earth Day RAB/IRP Panel.

Several activities scheduled for completion in FY97 were deferred until FY98 because regulatory coordination and review time exceeded that allowed for in the project schedule.

Plan of Action

- Complete the Interim ROD for groundwater in the NEWIOU in FY98
- Complete the NEWIOU Proposed Plan for surface water, sediment, and soil in FY98
- In FY98, begin the Remedial Action at three sites from which contaminated groundwater has migrated off site
- Develop a model for evaluating the effectiveness of natural attenuation for remediation of groundwater plumes in FY98
- Employ two-phase extraction technology in FY99

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 522 acres
Mission: Provide services and materials to support units of operating forces and shore activities
HRS Score: NA
IAG Status: Federal Facility Site Remediation Agreement signed in September 1992
Contaminants: Petroleum hydrocarbons, VOCs, SVOCs, chlorinated solvents, metals, pesticides, and PCBs
Media Affected: Groundwater and soil
Funding to Date: \$15.2 million
Estimated Cost to Completion (Completion Year): \$89.8 million (FY2004)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2003



Treasure Island, California

Restoration Background

In July 1993, the BRAC Commission recommended closure of Treasure Island Naval Station. The commission recommended relocating the Naval Reserve Center to Alameda, California, and the Naval Technical Training Center to Great Lakes, Illinois, and Little Creek, Virginia. Operational closure was completed on September 1997.

Thirty-one sites, including a former fire training area, a landfill, a former dry-cleaning facility, an old bunker area, fuel farms, and a service station, have been identified since environmental investigations began at the installation. Contamination at the sites is largely the result of migration of petroleum products from fueling operation areas.

A Preliminary Assessment and a Site Inspection were completed for 26 sites in FY88. Remedial Investigation and Feasibility Study (RI/FS) activities were initiated for 22 sites in FY93. In FY95, the installation began removing floating product from one site and contaminated soil from another. Of the 73 underground storage tanks (UST) identified at Treasure Island, 37 have been removed and 14 have been closed in place. An Environmental Baseline Survey (EBS) was completed for all sites in FY95. Under the EBS, nine parcels were designated as CERFA-clean.

The installation formed a technical review committee and converted it to a restoration advisory board (RAB) in FY94. Twenty community members serve on the RAB and participate in monthly meetings with the installation and regulatory agencies. The installation completed a community relations plan (CRP) in FY92 and established two information repositories and an administrative record. The CRP was updated in FY97. A BRAC cleanup team (BCT) was established in FY94. The team has conducted site tours and workshops for RAB

members and members of the local community. The installation completed a BRAC Cleanup Plan (BCP) in FY94 and updated it in FY95.

During FY96, the RAB met monthly, the BCP was updated, and a land reuse plan was completed. Findings of suitability to lease were also completed for six buildings, and the buildings were leased to the city of San Francisco for movie and television production. A finding of suitability to transfer was completed for transfer of 35.5 acres to the U.S. Department of Labor. Also during FY96, the installation completed an RI for 25 onshore sites. The removal of floating product continued at one site. A Record of Decision (ROD) for no further action was initiated for two sites. In addition, a corrective action plan was initiated for nine UST sites, two USTs were removed from one site, and 11 USTs were closed in place. A bench-scale soil bioremediation Treatability Study was initiated at one site. In addition, a Phase II Ecological Risk Assessment was completed for 21 onshore sites.

The Federal Facility Site Remediation Agreement, signed in FY92, was amended during FY96 to include three newly identified sites and to group offshore Installation Restoration Sites 13 and 27 into one offshore operable unit (OU). The schedule in Appendix D of the agreement was revised to conform to the comprehensive strategy set forth in the BCP.

FY97 Restoration Progress

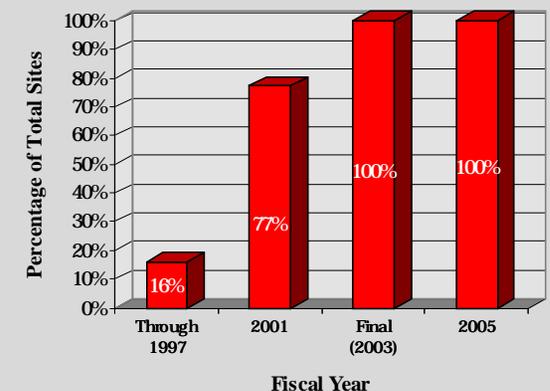
The installation initiated an installationwide interim groundwater monitoring program. The CRP was updated. The installation transferred nine sites to the CAP. In FY97, the BCT held BCT meetings, as well as RAB meetings.

Some activities scheduled for completion in FY97 were delayed because of delays in funding.

Plan of Action

- Complete FSs for 21 onshore sites in FY98
- Initiate Remedial Action Plan and ROD for remaining onshore sites in late FY98
- Begin groundwater sampling in FY98
- Complete an RI for one offshore OU site in FY98
- Complete an FS for one offshore OU in FY98
- Complete a Remedial Design (RD) for UST sites and initiate the RD for fuel lines in FY98

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 66 acres
Mission: Test engine systems and components
HRS Score: NA
IAG Status: None
Contaminants: Trichloroethene, ethylene glycol, freon, fuels, and solvents
Media Affected: Groundwater and soil
Funding to Date: \$10.9 million
Estimated Cost to Completion (Completion Year): \$8.2 million (FY2005)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY1999



Trenton, New Jersey

Restoration Background

In July 1993, the BRAC Commission recommended closure of this installation. Operations will be transferred to the Arnold Engineering Development Center and the Patuxent River Naval Air Station. The installation is scheduled to close in September 1998.

Contamination at the installation resulted from various fuels used to operate engines during tests and from trichloroethene (TCE), ethylene glycol, and freon used to cool the air entering the engines. Residues of fuels and solvents have been detected in groundwater and soil. Site types include underground storage tanks (UST), disposal areas, and spill sites. The TCE-contaminated groundwater is the issue of greatest concern at the installation.

Since FY86, environmental studies at the installation have identified nine CERCLA sites and two UST sites. Removal of a tank and its associated contaminated soil was completed for UST 2 in FY92 and for UST 1 in FY93. The two UST sites then were recommended for no further action.

During FY95, the installation initiated an Interim Remedial Action to treat TCE-contaminated groundwater at Site 1. To identify fractures and establish the properties of the rock, the U.S. Geological Survey conducted geophysical borehole investigations in conjunction with performance of aquifer tests by the Navy. Data from the investigations will enable the Navy to place future monitoring wells accurately to delineate the groundwater plume.

A technical review committee was formed in FY91 and converted to a restoration advisory board (RAB) in FY93. The 12 members of the RAB include representatives of the Navy, EPA, the state, and the local community. In FY94, a BRAC cleanup team (BCT) was formed. Its membership includes representatives of the Navy, EPA, and the state.

The BCT prepared a BRAC Cleanup Plan in FY95 and developed a partnering agreement that established a series of goals for community involvement in the cleanup process. Under the partnering effort, members of the reuse committee commented on the Environmental Baseline Survey (EBS).

To accelerate community reuse of installation property, a local company used one building under an interim lease. The installation has been divided into three parcels of property and an EBS completed for all parcels. One area covering about 10 acres has been identified as CERFA-clean.

During FY96, the design of a modified treatment plant was completed and the design of an iron-filings treatment system for Site 1 was initiated. Removal of contaminated sludge was completed at Site 3. The installation also initiated Phase II of the EBS for the three parcels of property and completed a Land Reuse Plan. Several activities planned in FY96 were deferred because of funding constraints and delays in regulatory review.

FY97 Restoration Progress

Construction of a modified treatment plant for groundwater contamination and installation of monitoring wells at Site 1 were completed. In addition, the installation completed the Remedial Investigation and Feasibility Study for Site 2 and Sites 4 through 9. A decision document for no further action was prepared for Site 3. Also completed were Phase II of the EBS and design of the final iron-filings treatment system for Site 1 groundwater contamination. The iron-filings treatment system was implemented at the installation.

The BCT prepared and reviewed the latest versions of the BCP and the EBS. It also conducted Site 3 decision-document review, Site 1 groundwater investigation, Site 8 barometric well closure, and

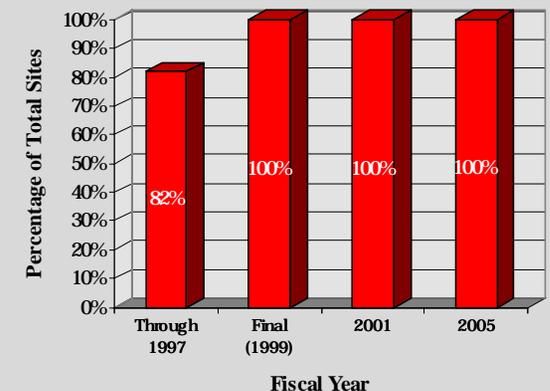
preparation of a no-further-action document for Sites 2, 5, 6, 7, and 9, among other activities.

The Environmental Impact Statement (EIS), which was scheduled for completion in FY97, was delayed because of delays in the reuse plan.

Plan of Action

- Complete an EIS in FY98
- Investigate possible leaking lines in the barometric well at Site 8 in FY98
- Complete Site 1 Focused Feasibility Study in FY98
- Complete the no-further-action decision document for Sites 2, 4, 5, 6, 7 and 9 in FY98
- Finalize decision document for Sites 1 and 8 in FY98
- Complete latest versions of EBS Phase III and BRAC Cleanup Plan in FY98
- Close the installation in FY98

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 84 acres
Mission: Provide Air National Guard training
HRS Score: 57.86; placed on NPL in September 1983
IAG Status: Federal Facility Agreement signed in October 1994
Contaminants: TCE, tetrachloroethene, chromium, petroleum hydrocarbons, and petroleum/oil/lubricants
Media Affected: Groundwater and soil
Funding to Date: \$7.4 million
Estimated Cost to Completion (Completion Year): \$13.8 million (FY1999)
Final Remedy in Place or Response Complete Date: FY1995



Tucson, Arizona

Restoration Background

Environmental studies at Tucson International Airport have identified eight sites, including fire training areas, solvent dumping areas, storm drainage discharge areas, the old wash rack area, petroleum/oil/lubricant areas, and spill areas. Waste disposal and spill sites have had the greatest effect on the environment. The principal contaminant is trichloroethene (TCE), which has been detected in groundwater. Tetrachloroethene and chromium also have affected groundwater, but to a lesser extent. In addition, total petroleum hydrocarbons have been detected in soil at the installation. In FY94, the installation finished Remedial Investigation activities for all identified sites.

The installation established successful partnerships with citizens and regulators. The Unified Community Advisory Board (UCAB) provides a forum in which citizens and organizations can discuss current environmental issues. Representatives of regulatory agencies, the state of Arizona, Pima County, and the city of Tucson and leaders of community groups regularly attend meetings of the board.

In FY96, the installation complied with the Federal Facility Agreement and reevaluated all sites through the Relative Risk Site Evaluation process. A Record of Decision was completed for the cleanup of contaminated soil. During the summer of 1996, the installation began construction of a permanent groundwater extraction, treatment, and recharge system to clean up contaminated groundwater.

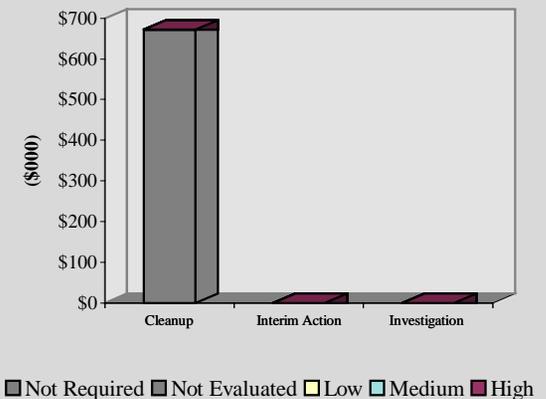
FY97 Restoration Progress

The groundwater extraction and treatment system and the soil vapor extraction and treatment system were installed and operated continuously in FY97. Restoration advisory board activities with the UCAB were successful, as were continuing partnering efforts with other agencies.

Plan of Action

- In FY98, continue partnership with EPA Region 9 and the Arizona Department of Environmental Quality
- Prepare pump-and-treat system for groundwater media in FY98
- Complete soil cleanup at Site 5 in FY98

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size:	1,383 acres
Mission:	Provide services and materials to support operations of the Third Marine Aircraft Wing; provide operations training facility support; operate helicopter outlying fields and maintain area landing sites; operate air traffic control facility; provide weather support
HRS Score:	NA
IAG Status:	Under negotiation
Contaminants:	VOCs, dichloroethane, trichloroethene, BTEX, naphthalene, petroleum hydrocarbons, and pentachlorophenol
Media Affected:	Surface water, groundwater, and soil
Funding to Date:	\$40.4 million
Estimated Cost to Completion (Completion Year):	\$2.8 million (FY2005)
Final Remedy in Place or Response Complete Date for BRAC Sites:	FY2002



Tustin, California

Restoration Background

In July 1991, the BRAC Commission recommended closure of Tustin Marine Corps Air Station with retention of the family housing and related personnel facilities in support of El Toro Marine Corps Air Station.

Environmental studies since FY85 have identified 16 CERCLA sites, 250 areas of concern, 129 underground storage tank (UST) sites, and 19 aboveground storage tank sites. Currently, 24 CERCLA sites are in the study phase, and the Expanded Site Inspection (ESI) phase or the Remedial Investigation and Feasibility Study (RI/FS) phase has been completed at 14 of those sites.

Two phases, preliminary review and a Visual Site Inspection and sampling visit, of a three-phase RCRA Facility Assessment (RFA) have been completed. Phase III of the RFA is ongoing at 12 sites. Interim Remedial Actions completed at the installation include removal of USTs and construction of a drainage system to collect contaminated surface water. In FY86, the installation completed a Removal Action involving excavation and disposal of contaminated soil. In FY88, a Gunite concrete slurry wall was installed at the same site. In FY92, 39 tanks were removed at the Fuel Farm. Thirty additional USTs were removed in FY93.

In FY95, the installation undertook Engineering Evaluations and Cost Analyses for three sites at which Removal Actions are planned. Contaminated soil was removed from the Fuel Farm, and an innovative treatment process was used to accelerate the cleanup schedule for the Fuel Farm to meet the reuse priority.

The installation also began a parcel-specific Environmental Baseline Survey (EBS) to support transfer of clean property in FY96. It has

proposed 1,285 acres as clean, and the regulatory agencies have orally concurred in this determination.

The BRAC Cleanup Team (BCT), which was formed in FY94, meets regularly to address cleanup issues at the installation and to expedite the remediation process. During FY95, the BCT, in cooperation with the Local Redevelopment Authority (LRA), developed strategies for cleanup based on the draft land reuse plan (LRP). A restoration advisory board (RAB), formed in 1994, comprises seven subcommittees organized to address specific areas of concern or interest.

In FY96, RI/FS fieldwork was completed at Operable Unit (OU) 1, OU2, and OU3; a draft ESI was issued for 5 sites; a draft RFA was issued for 15 sites; and the final Phase III RFA was issued. Also, an on-site remediation project was completed at the Fuel Farm, and a draft LRP was finalized and submitted to the Department of Housing and Urban Development. The BCT negotiated with the LRA to determine the priority for reuse parcels without compromising mission requirements or cleanup activities. Draft findings of suitability to transfer were prepared for eight parcels, and environmental work was completed to clear six parcels for transfer.

FY97 Restoration Progress

Removal Actions for Sites 2, 9, and 13W and the ESI for five sites were completed. The final RI/FS for OU3 was issued, and a landfill containment presumptive remedy was implemented.

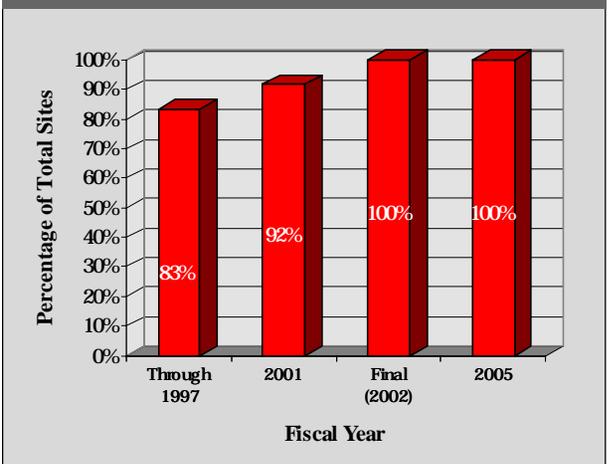
The BCT reviewed draft RI/FSs for OU1 and OU2, sampling plans, and a draft Record of Decision (ROD) for OU3. The BCT also agreed on data quality objectives for Site 9N and completed the latest BRAC Cleanup Plan (BCP) and EBS.

Discovery of a trichloroethene plume at Site 13 delayed some activities scheduled for completion in FY97. The OU3 ROD was not signed because of Marine Corps BRAC office direction.

Plan of Action

- Complete RI/FS at eight sites and issue final RI/FS at OUs 1 and 2 in FY98
- Complete latest BCP and EBS (parcel-specific) and update CERFA EBS in FY98
- Complete RCRA cleanups at 15 sites in FY99
- Transfer at least 10 parcels of property in early FY99
- Complete corrective action plans for all UST sites in FY99
- Sign three RODs for six sites and complete Remedial Actions in FY99

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 2,370 acres
Mission: Modified caretaker; provide support to DoD tenants; formerly manufactured small arms ammunition and projectile casings
HRS Score: 59.60; placed on NPL in September 1983
IAG Status: Federal Facility Agreement signed in August 1987
Contaminants: VOCs, PCBs, and heavy metals
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: \$105.9 million
Estimated Cost to Completion (Completion Year): \$215.4 million (2080)
Final Remedy in Place or Response Complete Date: FY2007



Arden Hills, Minnesota

Restoration Background

Since FY81, environmental studies verified that past waste disposal practices released hazardous contaminants into soil, groundwater, and sediment, which migrated into the Minneapolis-St. Paul groundwater supply. Twenty-eight sites are grouped into three operable units (OU), which include former landfills, burning and burial grounds, ammunition testing and disposal sites, industrial operations buildings, and sewer system discharge areas.

Ammunition-related metals, volatile organic compounds (VOC), and polychlorinated biphenyls (PCB) are the primary soil contaminants at the installation. Soil vapor extraction (SVE) systems have been installed to remove VOCs from soil. In 1989, the thermal treatment of 1,400 cubic yards of PCB-contaminated soil was completed.

VOCs are the primary contaminants in groundwater. In FY86, groundwater extraction and treatment systems were installed. In FY88, the installation constructed the Boundary Groundwater Recovery System (BGRS) to contain and treat VOC-contaminated groundwater at the installation's southwest boundary. The Army provided a permanent groundwater treatment system for the city of New Brighton in FY90. In FY93, the installation provided a municipal water supply hookup at the Lowry Grove Trailer Park.

In FY94, the OU3 Plume Groundwater Recovery System and the OU1 and OU3 municipal drinking water interconnection became operational. In addition, a boundary plume containment system designed to prevent the off-post migration of VOCs in shallow groundwater was initiated.

The installation established a technical review committee (TRC) in 1985 and a restoration advisory board (RAB) in FY96 to allow community input on cleanup decisions.

In FY96, the installation continued work on the Outdoor Firing Range Remedial Investigation/Feasibility Study (RI/FS), the Grenade Range FS, and closure of Site F. The Water Tower Area site was closed, and a well advisory was implemented for OUs 1, 2, and 3.

FY97 Restoration Progress

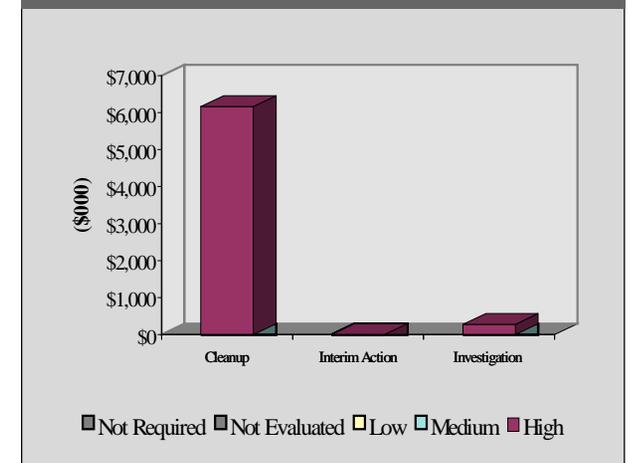
The Army implemented the alternate water supply plan, abandoning five residential wells. Five other wells were considered for alternate water supply and/or abandonment. For OU1, the installation completed or initiated construction at the two sites and installed two performance-monitoring wells. Upon completion of the OU2 FS, the installation drafted the OU2 ROD. Engineering Evaluations/Cost Analyses (EE/CA) were also drafted for the Grenade Range and the Outdoor Firing Range areas. The Army initiated Remedial Design (RD) for eight Shallow Soil Sites and two Deep Soil Sites and completed the removal of all contaminated soil from the Ammunition Burning Ground. The installation drafted an Ecological Risk Assessment (ERA) of surface water and sediment for the entire installation. A field investigation to characterize soil at the north boundary used accelerated field techniques (geoprobe and a mobile laboratory) to accomplish rapid results.

The signing of the OU2 ROD was scheduled for FY97 but was delayed because new guidance was proposed by EPA. Completion of Tier I and Tier II was delayed because of lack of concurrence by the regulators and lack of funds.

Plan of Action

- Continue alternate water supply plan and complete construction of containment wells and performance monitoring wells for OU1 in FY98
- Complete OU2 ROD, closure of Site F, and EE/CAs for Grenade Range and Outdoor Firing Range in FY98
- Complete RD and initiate Remedial Action (RA) for five sites and complete RD for Deep Groundwater Source Control at OU2 in FY98
- Complete Tier I ERA of surface water and sediment and Tier II Investigation in FY98
- Initiate phytoremediation demonstration project at Site C in FY98
- Complete RD and initiate RA for five sites at OU2 in FY99
- Complete RA for five sites at OU2 in FY99
- Complete characterization of two sites at OU2 in FY00
- Complete Tier II ERA in FY99
- Operate and maintain all RAs at OUs 1 through 3 in FY00
- Complete RI and EE/CAs for Primer Tracer Areas at OU2 in FY00-FY03
- Initiate all remaining RAs by FY05

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 28,824 acres
Mission: Provide advanced F-15 fighter training
HRS Score: 50.00; proposed for NPL in June 1996
IAG Status: None
Contaminants: Petroleum/oil/lubricants, chlorinated solvents, pesticides, metals, PCBs, and general refuse
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: \$8.7 million
Estimated Cost to Completion (Completion Year): \$28.7 million (FY2001)
Final Remedy in Place or Response Complete Date: FY2001



Panama City, Florida

Restoration Background

Tyndall Field was activated in 1941 as the Flexible Gunnery School of the U.S. Army Air Corps. The installation became Tyndall Air Force Base in 1947 when the Air Force became a separate branch of the military. The installation currently leases or owns an additional 300 acres in neighboring areas.

Initial environmental studies, beginning in FY81, identified 18 sites at the installation. By FY92, an additional 18 sites had been identified. Principal site types include fire training areas, spill sites, landfills, and disposal trenches. Of the 36 sites, one (OT-18, Lynn Haven Defense Fuel Supply Point) is being cleaned up under the direction of the Defense Logistics Agency. Five of the remaining 35 sites are located in the neighboring area.

In FY95, a RCRA Facility Assessment (RFA) identified 58 solid waste management units (SWMU) and 18 areas of concern.

In FY94 and FY96, efforts were undertaken to establish a restoration advisory board (RAB). The installation distributed a survey to solicit community concerns and interest in forming a RAB. Public response indicated a high level of trust and no need for a RAB. In light of Tyndall's status on the National Priorities List (NPL), the issue will be addressed again in FY98. As an additional measure, a community relations plan (CRP) has been completed to inform the public and include them in the Installation Restoration Program (IRP).

During FY96, the installation entered into a partnership with the Florida Department of Environmental Protection (FDEP), EPA, and restoration contractors.

Technologies implemented at several sites include dual-phase vacuum extraction, microbubble injection, and bioslurping. The installation completed pilot tests for dual-phase vacuum extraction, soil vapor

extraction (SVE), and air sparging at site SS-15. A bioslurp field test was completed at Site FT-23 and resulted in recovery of more than 2 gallons of free-product emulsion per hour over a 2-day period.

The installation completed a well assessment report for all 141 monitoring wells. At Site FT-16, a contamination assessment report (CAR) was completed. The installation also completed Chemical Data Acquisition Plan Addendum 3 for Site OT-29. Remedial Investigation (RI) fieldwork was conducted at Sites SS-20, SS-26, and OT-29. The installation also completed RCRA clean-closure activities at Site LF-36, as required by FDEP.

FY97 Restoration Progress

The installation signed decision documents and received no-further-action concurrence from FDEP and EPA for 13 sites. Interim Remedial Actions were initiated at three sites, and the CAR for Site SS-19 was completed. In addition, the air sparging/SVE pilot test for Site FT-16 was completed.

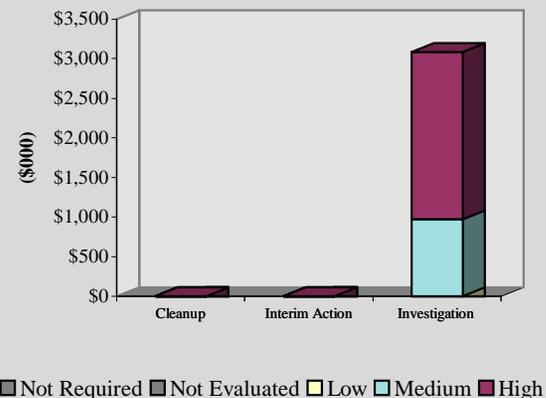
The installation's partnership with FDEP, EPA, and restoration contractors evolved into a cohesive and efficient project team that meets every month. This project team also serves as the technical review committee.

Turnover of personnel caused delays in some actions scheduled for FY97. In addition, several investigations showed that the projects originally planned were not applicable. Site OT-29 was placed on the NPL and has more-widespread contamination than initially anticipated. Interim Remedial Actions (IRA) for Sites SS-20 and SS-21 were not conducted because contamination levels were lower than thought.

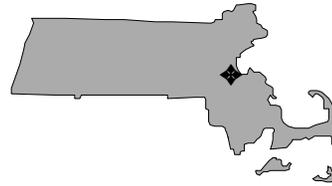
Plan of Action

- Complete RIs for Sites FT-17 and SS-26 in FY98
- Conduct RI fieldwork at Site OT-29 in FY98
- Conduct IRAs for Sites SS-20, OT-21, and FT-23 in FY98
- Conduct post-IRA groundwater assessment for OT-21 in FY98
- Modify and continue air sparging/SVE pilot test for Site FT-16 in FY98
- Complete CARs for Sites SS-20 and FT-23 in FY98
- Reduce the relative risk at least one site in FY98
- Sign decision documents and receive no-further-action concurrence from FDEP and EPA for two additional sites in FY98
- Use consensus scoping to complete project planning and award by second quarter of FY98

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 78 acres
Mission: Research and develop food, clothing, equipment, and materials to support military operations
HRS Score: 50.00; placed on NPL in May 1994
IAG Status: None
Contaminants: Pesticides, herbicides, pentachlorophenol, solvents, and VOCs
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: \$13.5 million
Estimated Cost to Completion (Completion Year): \$46.0 million (FY2030)
Final Remedy in Place or Response Complete Date: FY2003



Natick, Massachusetts

Restoration Background

Since 1954, the former Natick Laboratory has supported several industrial, laboratory, and storage activities for research and development in food science and aeromechanical, clothing, material, and equipment engineering. Operations at the installation used various volatile organic compounds (VOC), including tetrachloroethene (PCE), trichloroethene (TCE), carbon disulfide, benzene, and chloroform. Site types at the installation include contaminated buildings, spill sites, storage areas, disposal pits, dry wells, and underground storage tanks.

In FY89, soil gas surveys detected VOCs under Building T-25 and the former proposed gymnasium areas. Groundwater, soil, and surface water samples collected during subsequent studies also contained VOCs.

The installation completed an Expanded Site Inspection in FY92 that confirmed TCE contamination in groundwater. A Remedial Investigation (RI) and Feasibility Study began in FY93. The Phase I RI Report for the Building T-25 area was drafted in FY94. In FY95, the installation started Phase II RI activities.

The installation has performed several Interim Actions, including removal of waste and contaminated soil and pavement from the drum storage area. The installation also removed a 1,000-gallon waste oil storage tank and associated contaminated soil and removed polychlorinated biphenyl (PCB)-contaminated soil from an exploded transformer.

The installation conducted a groundwater pump test in the Building T-25 area and used the information collected to characterize conditions in the area and provide hydrogeologic data for Interim Actions and design activities. In FY95, the Army completed a

groundwater flow model for the Building T-25 area to determine the effects of pumping of on- and off-site drinking water wells on migration of the contaminant plume.

After its placement on the National Priorities List (NPL) in May 1994, the installation increased partnering efforts with state and federal regulatory agencies and worked to keep open communication lines with the community. The installation also drafted a community relations plan. In FY95, the installation established a restoration advisory board (RAB).

In FY96, the installation conducted an extensive Phase II RI of the Building T-25 area to address the concerns of regulatory agencies and the RAB. The Army completed the first iteration of the groundwater model, detailing movement of water and contaminants within the complex alluvial aquifer. The Phase I RI for the Building T-25 area was completed, incorporating the views of the regulatory agencies.

A step test to determine which monitoring wells might be used as extraction wells was completed. The installation also began developing the work plan for the RI of the former proposed gymnasium site. The installation began receiving drinking water from public wells; therefore, sampling of the installation's drinking water wells was discontinued.

In FY96 all active sites received an initial Relative Risk Site Evaluation ranking, which incorporated the views of the regulatory agencies. The installation provided two semiannual environmental newsletters to the community and conducted the second annual public availability session. The RAB met nine times over the year, receiving and reviewing work plans and reports and participating in relative risk rankings for NPL sites.

FY97 Restoration Progress

The installation monitored groundwater contaminant levels in the monitoring well network on a quarterly basis. It also employed accelerated fieldwork techniques. Bimonthly meetings were held with regulators, increasing coordination between regulators and installation. In addition, sequential review of documents was implemented to expedite document review.

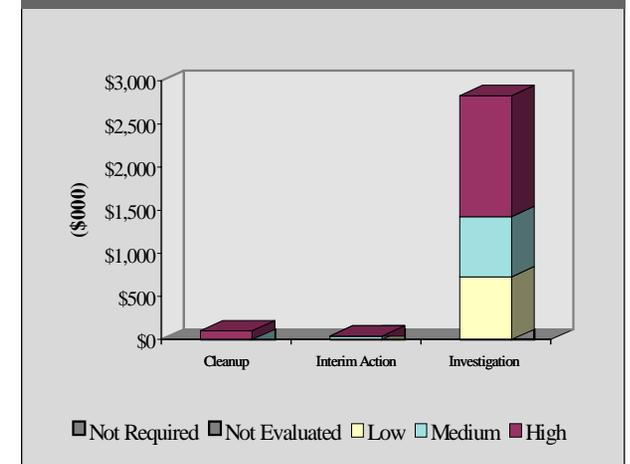
To resolve issues with regulators, the installation established a consensus approach to new work. Field screening with geoprobe and ground penetrating radar was used to advance quickly toward an area of concern, expediting site characterization. The installation initiated partnering with EPA, the state, and the town on the first Remedial Action; held nine RAB meetings; and sent out three environmental newsletters.

All activities in the current plan of action were scheduled for completion in FY97. They were delayed because of increased input from regulatory agencies and the RAB.

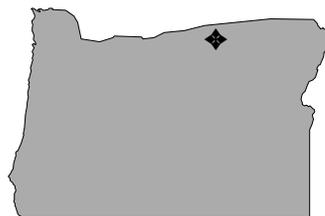
Plan of Action

- Complete fieldwork for the RI of the former proposed gymnasium site in FY98
- Continue quarterly monitoring of groundwater contaminant levels in the monitoring well network, both on and off site, in FY98
- In FY98, implement the T-25-Area approved Treatability Study plan for containing contamination within the post boundaries
- Complete plans for removal of pesticide-contaminated soil in FY98

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 19,729 acres
Mission: Store ammunition
HRS Score: 31.31; placed on NPL in July 1987
IAG Status: Federal Facility Agreement signed in October 1989
Contaminants: Explosives, UXO, heavy metals, pesticides, and nitrates
Media Affected: Groundwater and soil
Funding to Date: \$48.0 million
Estimated Cost to Completion (Completion Year): \$42.2 million (FY2023)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY1998



Hermiston, Oregon

Restoration Background

In 1941, the Army established Umatilla Chemical Depot Activity as an ordnance facility for storing conventional munitions. Between 1945 and 1955, the installation's functions expanded to include demolition, renovation, and maintenance of ammunition. In 1962, the Army began to store chemical munitions at the depot. In December 1988, the BRAC Commission recommended the realignment of the installation.

Studies from FY87 to FY90 identified 80 sites, including explosives-washout lagoons, an open-burning and open-detonation area, pesticide disposal pits, a deactivation furnace, and landfills. In FY92, the sites were grouped into nine operable units (OU).

During the Remedial Investigation in FY89, a pilot bioremediation study investigated the effectiveness of composting for treatment of contaminated soil. In FY92, the Army signed a Record of Decision (ROD) selecting bioremediation by windrow composting as the treatment for the Washout Lagoon Soil OU. A ROD was signed for the Deactivation Furnace OU, selecting solidification and stabilization of lead-contaminated soil. In FY93, the Army and regulators signed two RODs for no further action at two landfills. Phase I Remedial Designs (RD) for the washout lagoons and the deactivation furnace were completed in the same year, and cleanup contracts were awarded.

In FY94, the installation completed Phase I of the bioremediation program for explosives-contaminated soil in the washout lagoon and stabilized approximately 4,800 cubic yards of lead-contaminated soil from the deactivation furnace. To meet BRAC program milestones, the installation finished transferring its conventional weapons mission to another installation.

Also in FY94, a BRAC cleanup team (BCT) was formed, a BRAC

Cleanup Plan (BCP) completed, and the installation's technical review committee converted to a restoration advisory board. In FY95, the installation designated 14,000 acres as CERFA-clean, and regulatory agencies concurred on about 11,000 acres. The installation completed RODs for the Groundwater OU, the Washout Plant OU, the Miscellaneous Sites OU, and the Ammunition Demolition Activity Area (ADA) OU. A decision document was completed for supplementary sites.

In FY95, the installation removed 13 underground storage tanks. The installation began surface sweep and clearance of unexploded ordnance (UXO) at the ADA OU. The RD was completed for groundwater treatment and for soil stabilization at the Miscellaneous Sites OU, the ADA OU, and the Bomb Washout Plant OU. The RD for the Groundwater OU addressed a 170-acre plume contaminated with explosives.

In FY96, Umatilla Depot began constructing the groundwater treatment facility and remediating contaminated soil at the ADA OU, the Miscellaneous Sites OU, and the Bomb Washout Plant OU. The lead-based-paint assessment was completed, as was bioremediation of 10,000 cubic yards of explosives-contaminated soil.

FY97 Restoration Progress

The Army began operation of the groundwater facility and completed remediation for contaminated soil in the ADA OU, the Miscellaneous Sites OU, and the Bomb Washout Plant OU.

The BCT held quarterly progress meetings, approved the final Environmental Monitoring Plan for the Active Landfill OU, held scoping meetings for the closure cap at the Landfill OU, conducted UXO subsurface characterization at the ADA OU, and completed the latest BCP. The BCT also began preparing clean-closure documents

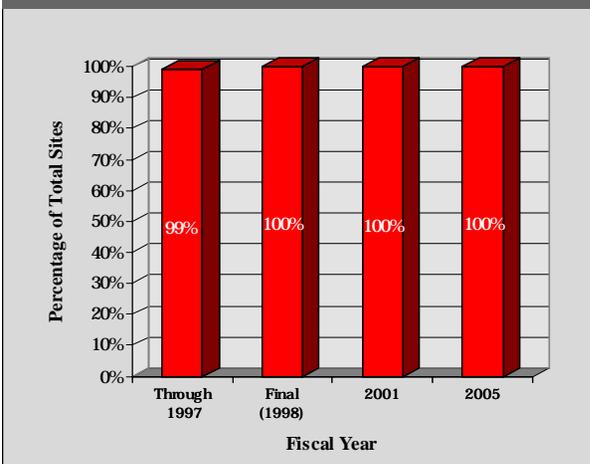
for ADA and Washout Lagoon soil, the Miscellaneous Sites U, the Deactivation Furnace OU, and the Bomb Washout Plant OU.

The first two activities in the current plan of action were scheduled for completion in FY97. They were delayed because of late release of funding to cap the landfill and insufficient funding so that only two of four closure documents were completed.

Plan of Action

- Complete closure and capping of the active landfill in FY98
- Prepare closure documents for Bomb Wash Out Plant OU, ADA OU, Deactivation Furnace OU, and Landfill OU in FY98.
- Complete National Priorities List delisting documents in FY98
- Complete negotiation for UXO cleanup at ADA OU in FY98
- Complete next BCP in FY99
- Prepare the remaining documentation needed for property transfer in FY01–FY03

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 701 acres

Mission: Provide logistics support for assigned signals intelligence and electronics warfare weapon systems and equipment; provide communication jamming and intelligence fusion material capability

HRS Score: NA

IAG Status: None

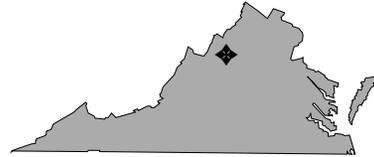
Contaminants: Metals, cyanide, VOCs, petroleum hydrocarbons, PCBs, photographic wastes, and asbestos

Media Affected: Groundwater, surface water, sediment, and soil

Funding to Date: \$8.4 million

Estimated Cost to Completion (Completion Year): \$4.4 million (FY2001)

Final Remedy in Place or Response Complete Date for BRAC Sites: FY1999



Vint Hill Farms, Virginia

Restoration Background

In July 1993, the BRAC Commission recommended the closure of Vint Hill Farms Station and the subsequent relocation of the maintenance and repair functions of the Intelligence Material Management Center to Tobyhanna Army Depot, Pennsylvania, and transfer of the remaining components to Fort Monmouth, New Jersey.

The installation officially closed on October 1, 1997. The installation is in a caretaker status, providing minimal operation and maintenance (O&M) and oversight of remedial activities until final transfer can be made. During the 1940s and 1950s, Vint Hill Farms Station served as a training center for Signal Corps personnel and as a refitting station for signal units. More recently, the installation also conducted military intelligence and communication activities.

In FY90, a Preliminary Assessment (PA) identified 26 sites, including underground storage tanks (UST), landfills, lagoons, storage areas, pit areas, fire training areas, disposal areas, spill sites, areas with asbestos-containing materials, lead-based paint areas, and transformers with polychlorinated biphenyls (PCB).

The installation conducted Removal Actions for USTs, contaminated soil, and PCB-containing transformers. In FY90, soil and groundwater sampling revealed petroleum and solvent contamination. In FY92, the installation suggested treating the groundwater by using an oil-water separator and carbon filtration.

In FY94, an enhanced PA identified 16 additional sites. Twelve of these sites were recommended for no further action (NFA). An installation-wide Site Inspection (SI) also began in FY94, and the Army submitted two draft Site Characterization Reports on UST sites to the regulatory agencies for review.

In FY94, the installation formed a BRAC cleanup team (BCT) and completed the final CERFA Report and Environmental Baseline Survey, which identified 417 acres as CERFA-clean. The BCT expedited the document review process by conducting scoping meetings to incorporate regulatory requirements into SI and Remedial Investigation and Feasibility Study (RI/FS) activities.

In FY95, the installation formed a restoration advisory board to help facilitate communication among the regulatory agencies, contractors, and members of the local community. The land reuse plan was completed and submitted to the regulatory agencies for approval. The installation also initiated an RI/FS for the Phase I reuse priority area, as identified by the Local Redevelopment Authority, and an Environmental Impact Statement (EIS).

In FY96, the Army completed a final SI Report identifying 24 sites for further investigation. The RI/FS Phase I fieldwork was completed. Execution of the Phase II RI/FS was assigned to the U.S. Army Corps of Engineers (USACE) for inclusion in the Total Environmental Restoration Contract.

FY97 Restoration Progress

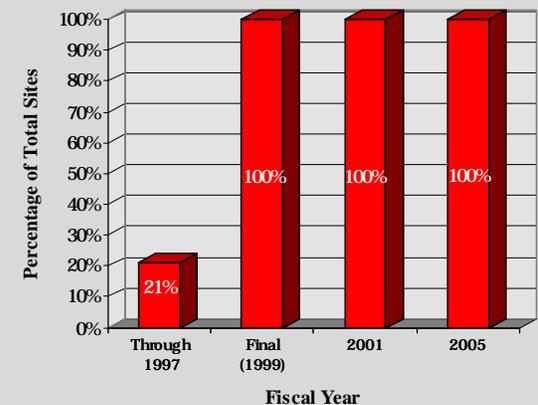
The Army submitted the Phase I RI Report to the regulatory agencies for review and approval. The report recommended only four areas requiring environmental evaluation (AREE) for remediation, all others were recommended for NFA. The Army recommended Interim Remedial Actions for the four AREEs needing remediation and received regulatory approval. The Army also prepared Proposed Plans for these actions and published them for public comment. Remedial work should be completed in December 1997. The Army also completed Phase II RI fieldwork. Partial concurrence was received on 417 acres proposed as CERFA-uncontaminated acreage.

The first, fourth, and fifth activities in the current plan of action were originally scheduled for completion in FY97. They were delayed because regulatory reviews took more time than anticipated.

Plan of Action

- Complete a decision document for Phase I RI/FS sites and begin Remedial Design and Remedial Action (RD/RA) in FY98
- In FY98, complete Phase II draft RI Report and forward to regulators for comment and concurrence
- Complete supplemental fieldwork and FS and begin RD/RA for Phase II sites in FY98
- Issue final EIS and Record of Decision in FY98
- In FY00, complete action directed by the Phase II RI/FS, an effort to be conducted by USACE and its contractor
- Complete all BRAC activities by the end of FY01

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 839 acres
Mission: Perform research, development, testing, and evaluation for Naval aircraft systems and antisubmarine warfare systems; perform associated software development
HRS Score: 57.93; placed on NPL in October 1989
IAG Status: Federal Facility Agreement signed in September 1990
Contaminants: VOCs, heavy metals, firing range wastes, fuels, industrial wastewater sludges, nonindustrial solid wastes, paints, PCBs, sewage treatment sludge, and solvents
Media Affected: Groundwater and soil
Funding to Date: \$13.1 million
Estimated Cost to Completion (Completion Year): \$14.7 million (FY2005)
Final Remedies in Place or Response Complete Date for BRAC Sites: FY1998



Warminster Township, Pennsylvania

Restoration Background

In July 1991 and July 1995, the BRAC Commission recommended that Warminster Naval Air Warfare Center Aircraft Division be realigned and closed. The installation closed in March 1997, with final transfer of property targeted for December 1998.

In FY79, metals and volatile organic compounds (VOC), primarily trichloroethene (TCE) and tetrachloroethane, were detected in local groundwater wells. Environmental studies at the installation have identified nine sites, of which eight were recommended for further investigation. Site types include waste burn pits, sludge disposal pits, landfills, waste pits, and a fire training area.

Identification and removal of one underground storage tank and contaminated soil occurred between FY86 and FY90. In FY93, the installation signed a Record of Decision (ROD) for Operable Unit (OU) 1. Remedial Design (RD) activities for the site were completed in FY94. The installation's contract for an extraction and treatment system for the groundwater at OU1 now includes OU3.

In FY93 and FY94, the installation completed groundwater Remedial Investigation and Feasibility Study (RI/FS) activities for eight sites. In FY96, groundwater RI/FS activities at Area D, known as Site 9, were completed, and the RD for Sites 4 and 8 was completed.

In FY95, the installation completed a Remedial Action (RA) for residential wells contaminated with TCE. The Navy distributed bottled water, installed temporary treatment systems at each affected well, and worked with EPA and the local water authority to install public water service for the affected residential areas.

A BRAC cleanup team was established in FY94. The installation completed the BRAC Cleanup Plan and a Phase I Environmental Baseline Survey (EBS) in FY95. The property was divided into eight

parcels, with 353 acres identified as CERFA-clean. In FY95, the installation began a Phase II EBS, which is continuing through FY98 with the goal of area of concern (AOC) closeout by Removal Action Contract (RAC) remediation, CSO housekeeping, or risk assessment documentation.

A technical review committee, formed in FY88, was converted to a restoration advisory board (RAB) in FY94. The installation completed its community relations plan and established an administrative record in that same year.

FY97 Restoration Progress

A source Removal Action was completed at Site 4, and another was initiated at Site 6. Ongoing investigation will determine what, if any, additional Site 6 source removal is needed. The installation completed a final Remedial Action at OU3, began operation of an extraction and treatment system, and started long-term monitoring (LTM).

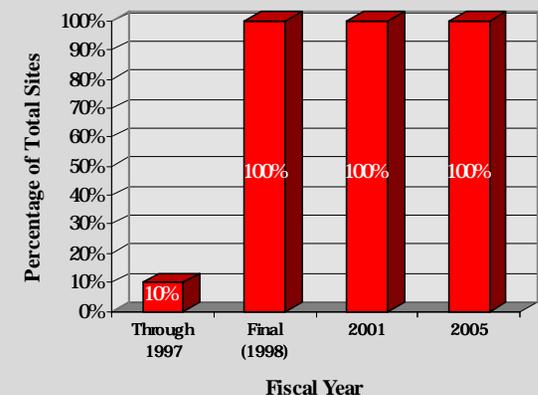
Ongoing, regularly scheduled Tier II meetings between the Navy and EPA have improved site management and helped resolve issues.

Off-site access and funding problems; extended review periods and scoping issues; and the high priority given to the groundwater effort, findings of suitability to lease (FOSL), and findings of suitability to transfer (FOST) delayed accomplishment of some activities scheduled for completion in FY97.

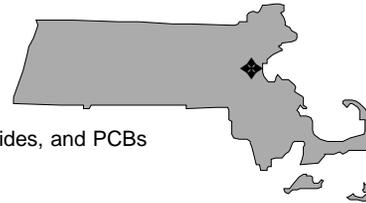
Plan of Action

- Complete Phase II EBS in FY98
- Sign final ROD for Sites 5 through 7 (Area B) in FY98
- Continue long-term operations at Area C in FY98
- Continue perimeter and off-base well sampling program in FY98
- Complete Phase III RI/FS for media other than groundwater in FY98
- Initiate and complete interim RD/RA for Areas A and D groundwater in FY98
- Initiate Area A and D source removal in FY98
- Issue ROD for no further action for Sites 4 and Site 6 source removal in FY98
- Complete RI well installation, water-level measurements, and sampling on and off base in FY98
- In FY98, issue FOST and FOSL for parcels as installation restoration sites are addressed
- Initiate RD/RA for Areas A, B, and D groundwater in FY98
- Complete RA for OU1 in FY98
- Initiate RD/RA or a Removal Action in FY99 at Sites 1 through 3, 8, and 9, as appropriate
- Begin long-term monitoring for OU1 in FY99

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 48 acres
Mission: Conduct materials research and development
HRS Score: 48.60; placed on NPL in May 1994
IAG Status: Signed July 25, 1995
Contaminants: Radionuclides, heavy metals, petroleum products, solvents, pesticides, and PCBs
Media Affected: Soil and surface water
Funding to Date: \$90.6
Estimated Cost to Completion (Completion Year): \$10.5 million (FY2006)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2001



Watertown, Massachusetts

Restoration Background

In December 1988, the BRAC Commission recommended closure of the Watertown Army Research Laboratory (formerly the Army Material Technology Laboratory). The Army has moved the installation's mission activity to a combined laboratory located at Aberdeen Proving Ground in Maryland. The installation closed, as scheduled, on September 30, 1995.

Environmental studies at the installation concluded that most of the soil was contaminated with heating oil, pesticides, and polychlorinated biphenyls (PCB). Similar chemical and metal contaminants were present in a number of laboratories and machine shops. The installation divided its Remedial Investigation and Feasibility Study (RI/FS) activities into three different areas (indoor, outdoor, and Charles River).

During this process, the installation completed several Interim Actions, including asbestos abatement, removal of all known aboveground and underground storage tanks, remediation of petroleum-contaminated soil, decommissioning of the central heavy-oil-fired power plant, retrofitting and disposal of PCB-contaminated transformers, closing of cooling water discharge sources, and reactor decommissioning.

The installation formed a BRAC cleanup team (BCT) and a restoration advisory board (RAB) in FY94. In FY96, the installation completed decommissioning of facilities contaminated with radioactive materials. The installation also completed the removal and demolition of the tank farm (Structure 295). A cost saving resulted from using the tank farm structure as beneficial backfill.

The Army and regulators signed a Record of Decision (ROD) for the Outdoor Soil and Groundwater Operable Unit (OU) in September

1996. In response to a request from the Watertown Arsenal Development Corporation (ADC), the BCT expedited development of a second ROD for Building 131. This ROD would allow cleanup of the Outdoor OU parcel in the first quarter of FY97 and transfer of the property in the spring of 1997.

Working with the RAB and the Watertown ADC, the BCT identified and approved an alternative remedy that reduced the remediation effort by 1 year, with sizable savings. During the design phase, the BCT reevaluated the risks associated with the Indoor OU cleanup. This reevaluation resulted in reduced cleanup cost. In addition, all indoor remediation should now be complete during FY98.

FY97 Restoration Progress

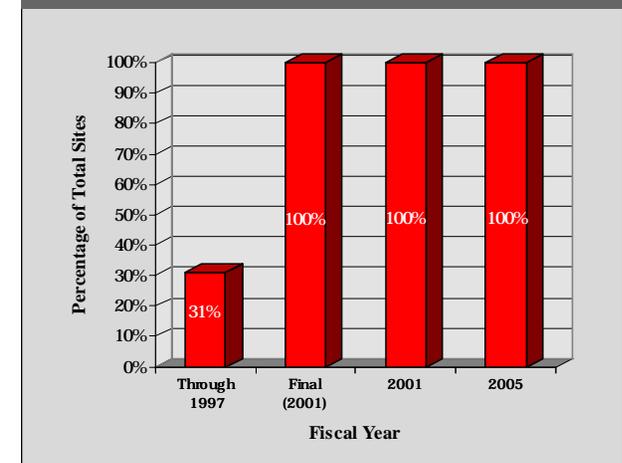
The installation initiated soil and indoor remediation. It also initiated a finding of suitability to transfer for various properties and completed cleanup for 11 soil areas. Document review was expedited through simultaneous review by all agencies. The BCT separated the 11-acre River Park Parcel from the 37-acre Installation Parcel for future resolution, coordinated soil remediation, assessed indoor cleanup criteria, and developed the Charles River RI/FS and the Building 60/227 petroleum reference criteria.

The first three activities on the current plan of action were originally scheduled for completion in FY97. They were delayed because RI/FS data indicated that the extent of contamination and the size of the contaminated area were greater than anticipated.

Plan of Action

- Complete soil remediation in FY98
- Complete indoor remediation and cleanup in FY98
- Complete RI for Charles River Area in FY00
- Complete transfer of 37 acres in FY98
- Nominate installation as a National Historical Site in FY98
- Complete NEPA Environmental Assessment at River Park in FY98
- Complete RODs at Charles River Park and Charles River in FY00
- Transfer Charles River Park in FY98
- Complete all BRAC activities by the end of FY01

SITE ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 17,232 acres
Mission: Manufactured TNT and DNT during World War II
HRS Score: 30.26; placed on NPL in February 1990
IAG Status: IAG signed in 1990; amended in August 1991
Contaminants: TNT, DNT, lead, asbestos, PCB, PAH, and low-level radioactive material
Media Affected: Groundwater and soil
Funding to Date: \$141.0 million
Estimated Cost to Completion (Completion Year): \$104.6 million (FY2013)
Final Remedy In Place or Response Complete Date: FY2013



Weldon Spring, Missouri

Restoration Background

From 1941 to 1944, the Weldon Spring Ordnance Works produced explosives for the Armed Services. The Army currently occupies the 1,655-acre Weldon Spring Training Area. The majority of the remaining property is owned by the state and is maintained as a wildlife area and an agricultural research facility of the University of Missouri.

Sites at the Weldon Spring Ordnance Works include lagoons, landfills, burning grounds, and trinitrotoluene (TNT) and DNT production lines. Ongoing environmental studies, beginning in FY77, have revealed contamination of groundwater and soil. Initial assessments indicated the presence of explosives, lead, asbestos, pentachlorophenol (PCP), and polyaromatic hydrocarbons (PAH). Areas containing radioactive material also were identified; those areas are being addressed and remediated by the U.S. Department of Energy (DOE), with the cost of remediation shared by DoD and DOE.

Cleanup activities at the former DoD property are grouped into two operable units (OU): OU1 includes contamination of soil and pipelines, and OU2 includes groundwater contamination. Remedial Investigation and Feasibility Study (RI/FS) activities at OU1 began in FY91. The RI Report was completed in FY92.

The U.S. Army Corps of Engineers (USACE) conducted several studies that relate to remediation efforts at the site: a biodegradation research study with the University of Idaho (FY92); a historical survey of past activities at the installation, with the University of Cincinnati (FY94); and a study, with Texas A&M University, of the genetic effects of hazardous substances on organisms. USACE also established two community focus groups that included representatives

of environmental groups and members of the community. The goal of the focus groups was to obtain objective, unbiased viewpoints on cleanup decisions.

In FY94, the Kansas City District of USACE began predesign studies and initiated the Remedial Design (RD) for OU1. The predesign studies and RD were completed in FY95. USACE also worked in a partnership with DOE to prepare final joint RI/FS work plans for OU2 and to jointly complete two rounds of quarterly groundwater monitoring.

During FY96, USACE completed the RD and the ROD for OU1. The draft RI for OU2 was submitted to the regulatory agencies for review. In addition, groundwater monitoring was completed at OU2.

A technical review committee (TRC) meets periodically to discuss cleanup issues and address comments on documents. TRC members include representatives of the community, the state regulatory agency, EPA, and other government entities, including the U.S. Geological Survey, the U.S. Army Reserve, and DOE.

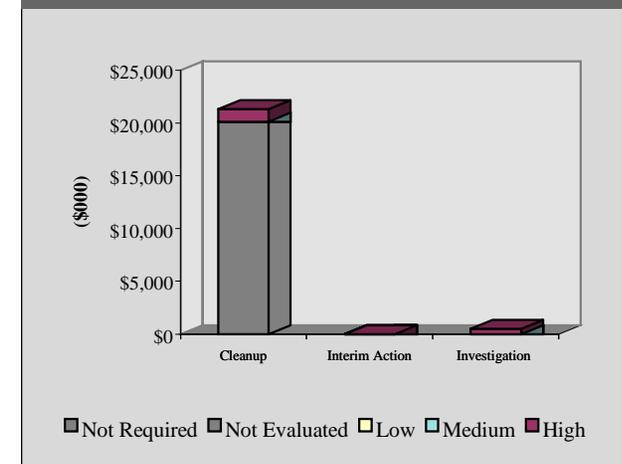
FY97 Restoration Progress

USACE Kansas City District completed the combustion Risk Assessment for OU1. A Remedial Action (RA) contract was awarded, and preparation began for the OU1 work plan. Groundwater monitoring for OU1 resumed in FY97 and will continue for approximately 2 years. USACE finalized the RI and prepared the draft FS for OU2. USACE completed underground storage tank (UST) removal in FY97. USACE also held a partnering conference and developed a restoration advisory board (RAB) to increase the level of community participation in project activities and to address community concerns.

Plan of Action

- Finalize Proposed Plan for OU2 in FY98
- Complete RA work plans for OU1 in FY98
- Erect and operate incinerator in FY98
- Continue partnering meetings with regulatory agencies and operate RAB in FY98
- Complete remaining OU1 cleanup activities in FY99
- Prepare and complete ROD for OU2 in FY99

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 2,704 acres
Mission: Manufactured TNT
HRS Score: 35.72; placed on NPL in September 1983
IAG Status: First IAG signed in September 1987; second IAG signed in July 1989
Contaminants: TNT, DNT, and organic compounds
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: \$46.4 million
Estimated Cost to Completion (Completion Year): \$23.0 million (FY2022)
Final Remedy In Place or Response Complete Date: FY2022



Point Pleasant, West Virginia

Restoration Background

From 1941 to 1946, the West Virginia Ordnance Works manufactured TNT from toluene, nitric acid, and sulfuric acid. By-products of the manufacturing process included TNT, DNT, and organic compounds, which were released into groundwater, soil, surface water, and sediment. Principal site types include TNT manufacturing areas, wastewater sewer lines, and wastewater ponds known as the “Red and Yellow Water Ponds.”

Preliminary Assessments and Site Inspections (SI) in FY81 and FY82 identified two operable units (OU). The former DoD property is now divided into 12 OUs. Restoration activities include capping contaminated soil, capping two ponds and a reservoir, constructing a groundwater extraction and treatment system, and building three ponds for wetlands mitigation.

In FY88, contaminated soil was capped in the TNT manufacturing area. Caps for the ponds and the reservoir (OUs 2 and 3) were completed in FY92. In FY93, the installation began Remedial Investigation and Feasibility Study (RI/FS) activities at OUs 8, 9, and 11. The U.S. Army Corps of Engineers (USACE) also began operation and maintenance (O&M) and long-term monitoring (LTM) for OUs 1, 2, and 3.

In FY94, the site management plan for the former installation was completed. Remedial Design (RD) activities were completed for OU4 and the groundwater extraction and treatment system. RI activities continued for the other OUs and Expanded Site Inspections (ESI) were initiated. Sampling and RD activities continued at OU6. USACE removed 546 tons of hazardous material from the TNT manufacturing area and backfilled open pits and manholes.

Also in FY95, USACE completed Removal Actions for asbestos in the acids area and two powerhouses and performed follow-on building demolition. USACE also initiated quarterly LTM of the adjacent Point Pleasant and Camp Conley municipal water supply wells. Also in FY95, USACE began construction of a groundwater extraction and treatment system at OU4 and continued RI activities at OU5. At OU6, sampling was completed, and the RD was initiated for the construction of wetlands. Potentially responsible party (PRP) efforts began for OU7, and RI activities continued for the other OUs. A risk assessment was initiated at OU11.

USACE formed a restoration advisory board (RAB), which meets every 2 months. Agenda items for RAB meetings include the current status of restoration activities, future activities, ESI and RI data, issues related to PRPs, local issues and concerns, and socioeconomic effects on the local community.

During FY96, USACE continued O&M and LTM for OUs 1, 2, and 3; RI at OU5; ESI activities; and RD at OU6. USACE also continued PRP efforts at OU7. USACE submitted a risk assessment and an RI report to EPA Region 3 and initiated FS at OUs 8, 9, and 11. USACE also initiated final Baseline Risk Assessments for OUs 10 and 12.

FY97 Restoration Progress

USACE completed construction of the groundwater extraction and treatment system and submitted a Remedial Action Report for OU4. The final Alternative Analysis Report for OU5 and final Baseline Risk Assessment for OUs 10, 11, and 12 also were submitted to EPA. USACE presented a draft FS for OU10, a draft risk evaluation for ESI 3, and a Proposed Plan for OU11. The conceptual design for OU5 also was initiated.

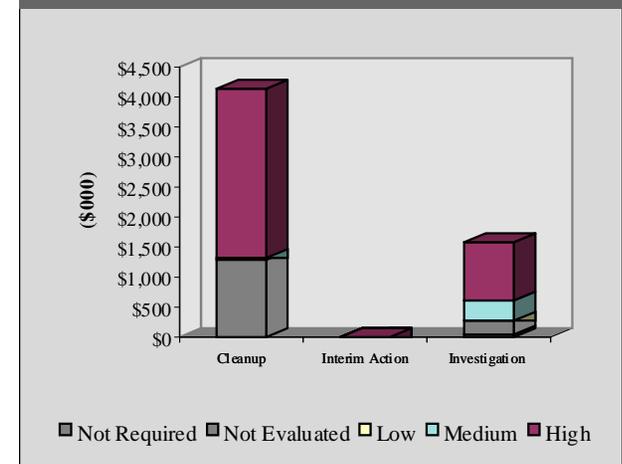
USACE worked with the RAB to reestablish project priorities and participated in the county fair. Additionally, a no-action Record of Decision (ROD) was reached for OU11 through partnering with regulatory agencies.

Some activities scheduled for completion in FY97 were delayed because of a shift in project priorities. Also, the FSs for OU10 and OU11 were not recommended.

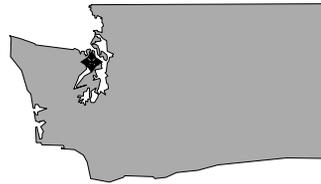
Plan of Action

- Complete OU11 ROD (no action) in FY98
- Complete sitewide groundwater model in FY98
- Revise OU5 ROD in FY98
- Conduct Removal Action for OU5 in FY98
- Complete OU1 burning grounds investigation in FY98
- Extend burning ground cap in FY98
- Develop decision documents for ESIs 1, 2, 3, 8, and 9 in FY98
- Complete Proposed Plan and ROD for OU10 in FY98
- Complete Proposed Plan and ROD for OU12 in FY98

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size:	7,000 acres
Mission:	Serve as training and operations center for the A-6 and A-6E bomber squadrons; serve as center for U.S. Navy and Marine Corps reserve training in the Pacific Northwest
HRS Score:	39.64 (Seaplane Base); placed on NPL in February 1990 48.48 (Ault Field); placed on NPL in February 1990
IAG Status:	Federal Facility Agreement signed in September 1990
Contaminants:	Chlorinated solvents, PCBs, and PAHs
Media Affected:	Groundwater, surface water, sediment, and soil
Funding to Date:	\$67.6 million
Estimated Cost to Completion (Completion Year):	\$105.1 million (FY2029)
Final Remedy in Place or Response Complete Date:	FY2013



Oak Harbor, Washington

Restoration Background

Whidbey Island Naval Air Station occupies four separate areas on Whidbey Island: Ault Field, the Seaplane Base, the Outlying Field, and the Lake Hancock Target Range. The Seaplane Base and Ault Field were placed on the National Priorities List (NPL) in February 1990. Past disposal practices resulted in contamination at several sites, including six former landfills. Other operations that contributed to contamination are aircraft maintenance, vehicle maintenance, public works shop activities, and firefighting training activities.

Environmental investigations, which began in FY84, have identified 52 sites at the installation. These 52 sites have been grouped into 5 operable units (OU). Of the 52, 18 were recommended for no further action. No sites were identified at the Outlying Field. The installation also has 36 underground storage tank (UST) sites.

In FY90, the Navy signed a Federal Facility Agreement (FFA) for Ault Field and the Seaplane Base. The FFA specified that 26 sites were to undergo more-intensive sampling programs under a Hazardous Waste Evaluation Study (HWES) for potential inclusion in a Remedial Investigation and Feasibility Study (RI/FS). After the HWES was completed in FY94, two sites were recommended for an RI/FS because of soil and groundwater contamination. Removal Actions were recommended for seven sites.

From FY91 to FY95, early actions, including UST Removal Actions, removal of contaminated soil, and Interim Remedial Actions, were conducted at the installation. The installation also conducted corrective actions at 16 UST sites in FY94.

During FY95, the installation completed RI/FS activities at one OU. A Record of Decision (ROD) was signed and a Remedial Design (RD) completed for another OU. Remedial Actions (RA) were completed at

two OUs, and various USTs were removed from the installation. Groundwater contamination from a former Navy landfill was found to be migrating off base and threatening the water supplies of private landowners. A pump-and-treat system began full-scale operation to control the migration of contamination. In addition, the private wells have been closed, and the residences have been connected to public water supplies.

An RA that removed sediment by dredging 7,000 linear feet of runway ditches was completed. The sediment is contaminated with petroleum hydrocarbons, inorganic compounds, and polyaromatic hydrocarbons.

In FY95, the Seaplane Base was deleted from the NPL and from the state of Washington's Hazardous Sites List. Soil excavation activities have sufficiently reduced the threat to human health and the environment.

The installation converted its technical review committee to a restoration advisory board (RAB) in FY94. The Navy prepared a Readers Guide for the RAB and the community. The guide provides a technical summary of RI/FS activities at a specific OU. The installation completed a community relations plan (CRP) in FY91 and updated the CRP and solicited comments from the community at an open house in FY95.

During FY96, the RAB met monthly. The installation updated the CRP and completed the RA to remove contaminated sediment from the runway ditches. Work continued on the landfill cap while the pump-and-treat system at the landfill was upgraded. Other activities that occurred in FY96 are the signing of a ROD, the beginning of RD at OU5, continuation of long-term monitoring (LTM) at OU2, and the closing-in-place of a UST.

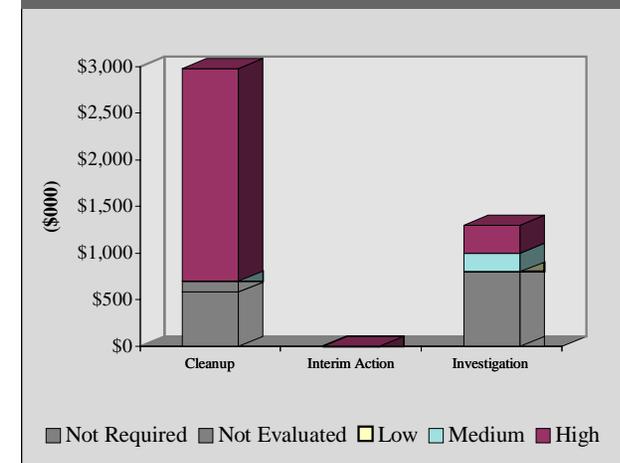
FY97 Restoration Progress

The installation completed the RD and the RA for three sites at OU5. The landfill cap was also completed. RODs for three sites were signed, and RDs for two sites were completed. The process of deleting OU3 (Ault Field) from the NPL began in FY97 with the completion of the Construction Complete milestone. In addition, LTM and operation and maintenance (O&M) continued at OU1, and LTM continued at OU2.

Plan of Action

- Continue LTM and O&M at OU1 in FY98
- Continue LTM at OU2 and OU5 in FY98
- Close monitoring wells at OU3 in FY98

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 710 acres
Mission: Research, develop, test, and evaluate ordnance technology
HRS Score: NA
IAG Status: None
Contaminants: Explosive compounds, waste oil, PCBs, heavy metals, VOCs, and SVOCs
Media Affected: Groundwater, surface water, sediments, and soil
Funding to Date: \$7.2 million
Estimated Cost to Completion (Completion Year): \$30.1 million (FY2005)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2003



Silver Spring, Maryland

Restoration Background

In July 1995, closure of White Oak Naval Surface Warfare Center was recommended by the BRAC Commission. The functions performed at White Oak are to be absorbed by Panama City Coastal Systems Station and Carderock's Indian Head and Dahlgren Divisions. The facility closed permanently in July 1997. The General Services Administration (GSA) and the Local Redevelopment Authority are developing a land reuse plan.

Historical activities at the installation include landfill disposal of oils, polychlorinated biphenyls (PCB), solvents, paint residue, and miscellaneous chemicals (including mercury); disposal of chemical research wastewater in dry wells; burning of explosive ordnance; and composting of sludge. Records also indicate that a radium spill occurred at the installation. The primary contaminants of concern are volatile organic compounds (VOC), PCBs, cadmium, chromium, lead, mercury, nickel, and ordnance compounds, such as RDX and TNT. Contaminants are primarily affecting groundwater and surface water.

Environmental studies have identified 14 sites at the installation. Seven sites required no further action after the Preliminary Assessment phase in FY84. Activities for the remaining sites proceeded to the Site Inspection (SI) phase, which was completed in FY87. Contamination was detected at all seven of the sites included in the SI, and further investigation was recommended. PCBs detected in surface soil at the Apple Orchard Landfill site represented a risk to people who had access to the site; therefore, a fence was installed to restrict access.

The installation completed the Remedial Investigation and Feasibility Study (RI/FS) phase for all seven remaining sites in FY93. The Human Health Risk Assessment identified a present risk at the Apple Orchard Landfill site and a potential risk at the remaining six sites. On

the basis of the risk assessment, source removal was recommended for five sites and encapsulation for two sites. A public comment period on the proposed remediation technologies followed a public meeting held in FY94. The installation began Remedial Design (RD) for six of the sites in FY94.

Meanwhile, a RCRA Facility Assessment, conducted in FY89, identified 97 solid waste management units (SWMU) and 19 areas of concern (AOC), including the 14 sites identified during the Preliminary Assessment. Thirty-eight of the SWMUs required further investigation.

A technical review committee (TRC) was formed in FY89. In FY94, the installation established an administrative record, which is maintained at the Engineering Field Activity Chesapeake. The installation also established an information repository for the public at the White Oak Library in White Oak, Maryland. A community relations plan was published in FY94.

During FY96, the installation converted its TRC to a restoration advisory board (RAB), which meets monthly. The installation also formed a BRAC cleanup team (BCT); completed RDs for Sites 8, 9, and 11; initiated Remedial Actions (RA); completed an Environmental Baseline Survey (EBS); and began to develop a BRAC Cleanup Plan. The RDs for Sites 2, 3, and 4 also continued during FY96.

FY97 Restoration Progress

A Finding of Suitability to Transfer to GSA and the Army was conducted at the installation. Interim Remedial Actions (IRA) for Sites 8, 9, and 11, and several underground storage tank removals, were completed, and the RI/FS for Sites 7 and 9 was initiated. Relative Risk Site Evaluations have been completed at 29 sites.

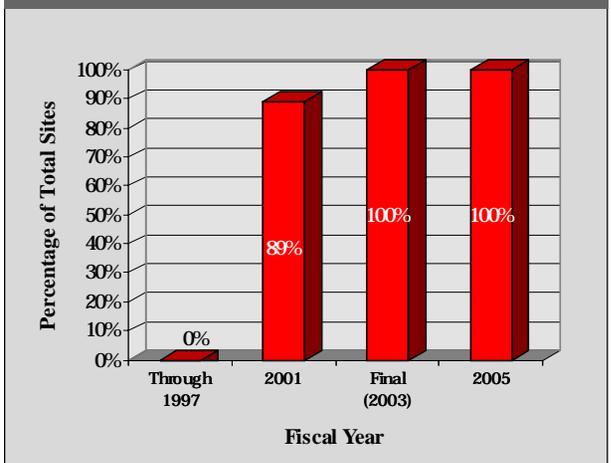
To improve site management, the installation is using a partnering approach with the BCT. An increase in conference calls by the BCT and better communication have helped expedite document review and resolve issues with regulatory agencies. The BCT approved a Removal Action for the Army site and work plans at AOC 1, a basewide background study, and the SI for Site 46. The RAB provided input on all FY97 actions.

The land reuse plan that was scheduled for development in FY97 as a prerequisite for leasing property to GSA and the Army was not completed because it was not required for a federal-to-federal transfer.

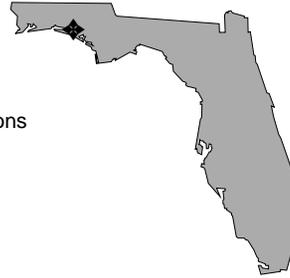
Plan of Action

- Initiate RI/FS at 18 sites in FY98
- Initiate RA at two sites in FY98
- Initiate IRAs at three sites in FY98
- Initiate RDs at four sites in FY98
- Perform RI/FS activities at Sites 5 and 6 in FY00
- Begin RAs for six sites in FY02
- Begin RD for the remaining site in FY02, with RA beginning in FY03

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 2,560 acres
Mission: Train student naval aviators
HRS Score: 50.00; placed on NPL in May 1994
IAG Status: Federal Facility Agreement under negotiation
Contaminants: Pesticides, PCBs, VOCs, heavy metals, and chlorinated hydrocarbons
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: \$19.0 million
Estimated Cost to Completion (Completion Year): \$56.3 million (FY2015)
Final Remedy in Place or Response Complete Date: FY2013



Milton, Florida

Restoration Background

In FY85, a Preliminary Assessment (PA) identified 23 sites at Naval Air Station (NAS) Whiting Field. In FY89, a supplemental PA identified five sites at the Outlying Landing Field (OLF) Barin. Site types include disposal areas and pits, storage areas, spill areas, landfills, a disposal and burning area, a maintenance area, underground storage tanks (UST) and fuel pits, fire training areas, and drainage ditches. There are currently 39 CERCLA sites.

In FY87, Site 5 was determined to require no further action (NFA). In FY89, Remedial Investigation and Feasibility Study (RI/FS) activities began for most sites at the installation. In FY92, soil contaminated with mercury, lead, and methylene chloride was detected at the OLF Barin. RI/FS activities were initiated for the five original sites and for five new sites at OLF Barin and for six sites at NAS Whiting Field.

In FY94, the installation completed a Baseline Risk Assessment for the OLF Barin and a Baseline Risk Assessment work plan for the NAS. In FY95 and FY96, the installation completed the RI/FS activities and closed four sites at OLF, with NFA necessary.

During an assessment of six UST sites, contamination with chlorinated hydrocarbons was detected, and 19 tanks were identified. In FY92, Removal Actions were completed for all USTs and associated soil. In FY94, two UST sites were closed. In FY95, a corrective action plan (CAP) was completed for one UST site, and corrective measures were initiated for three sites. A decision for NFA at three UST sites has been approved, and three UST sites remain.

The NAS formed a technical review committee (TRC) in FY89. A community relations plan (CRP) was completed in FY91 and updated in FY95. NAS formed a TRC for OLF Barin in FY92. A CRP was

completed for the OLF Barin in FY93. In FY95, both TRCs were converted to restoration advisory boards (RAB).

Also during FY95, NAS initiated a partnership agreement with regulators and stakeholders.

FY97 Restoration Progress

Five sites were completed and closed at OLF Barin. Two of the sites required NFA. Two sites required Interim Removal Actions, then NFA. One site required a Removal Action. At the NAS, groundwater was broken out as a separate site. This decision enabled the installation to finish investigations at 17 sites. After completion of a Baseline Risk Assessment for Sites 1, 2, 6, 9 through 16, and 29, and an NFA letter proposal for Sites 36 and 37, these sites are expected to require NFA. After an Interim Remedial Action (IRA), Site 17 is expected to require NFA.

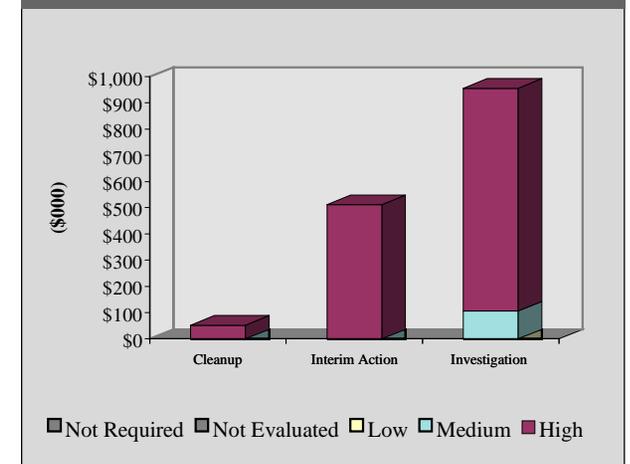
During FY97, a large UST site was investigated and a significant amount of petroleum-impacted soil was found. Changes in state regulations and the low risk of migration of contamination from the site may allow the site to be approved for a monitoring-only designation. Existing funds were used to investigate Clear Creek and off-base migration. The NAS completed a CAP and began a Remedial Design (RD) for one UST site. NAS has placed a contractor on the board review to ensure that all permits are in place. Partnering efforts made the Clear Creek investigation a success.

Lack of funding delayed implementation of some actions planned for FY97. In two cases, RD was delayed, pending collection of data on natural attenuation. Reports scheduled for FY97 were delayed so that the installation's cleanup team could collect more information.

Plan of Action

- Conduct field investigations at NAS for Sites 3, 4, 30, 32, and 33 in FY98
- Complete IRA at NAS for Site 17 in FY98
- Complete NFA letters for Sites 36 and 37 at NAS in FY98
- Add a new site for the Machine Gun Butt Area NAS in FY98
- Prepare Remedial Action Plan for one site at NAS in FY98
- Continue long-term operations and maintenance for UST site at NAS in FY98
- Finish RI/FS for Site 22 at OLF Barin in FY98
- Complete Installation Restoration Program at OLF Barin in FY98
- Finish RI/FS Report at NAS for Sites 3, 4, 30, 32, and 33 in FY98
- Complete RI/FS with a NFA designation for NAS Sites 1, 2, 6, 9 through 17, and 29 in FY99
- Complete groundwater investigation at NAS in FY99
- Sign Federal Facility Agreement for NAS in FY99

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 4,042 acres
Mission: Supported pilot training and ground equipment maintenance
HRS Score: 37.93; placed on NPL in November 1989
IAG Status: Federal Facility Agreement signed in 1990
Contaminants: VOCs, petroleum/oil/lubricants, heavy metals, and pesticides
Media Affected: Groundwater and soil
Funding to Date: \$41.2 million
Estimated Cost to Completion (Completion Year): \$1.6 million (FY2027)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY1999



Chandler, Arizona

Restoration Background

In July 1991, the BRAC Commission recommended closure of this installation. Williams Air Force Base (AFB) closed on September 30, 1993.

Before base closure, environmental studies identified 15 sites at the installation. These sites were consolidated into three operable units (OU). In FY93, an Environmental Assessment of 30 additional areas resulted in creation of two more OUs, including 17 new Installation Restoration Program (IRP) sites. OU1 contains 10 sites; OU2 is the liquid fuels storage area; OU3 consists of Fire Training Area No. 2 and a collapsed stormwater line; OU4 contains 9 sites; and OU5 contains 9 sites. A sixth OU was created by Consensus Statement at the April 1997 Technical Working Group Meeting at Williams AFB (Site SS-17 was moved from OU4 to maintain the OU4 schedule). OU6 is the Old Pesticide/Paint Shop.

Removal Actions and Interim Remedial Actions included removal of buried containers, contaminated soil, and 12 underground storage tanks (UST). In FY94, all known USTs and oil-water separators were removed. A free-product extraction system was installed at IRP Site ST-12 (OU2) in FY90 and operated through 1996. At ST-12, approximately 10,000 gallons of free product of the estimated 500,000 to 1 million gallons of fuel spilled have been removed.

In FY93, a Record of Decision (ROD) was signed for OU2, and the installation began Remedial Design and Remedial Action activities (RD/RA). An ongoing pilot study at OU2 is investigating the effectiveness of horizontal wells for groundwater extraction and treatment. Soil at OU2 is being treated to a depth of 25 feet by soil vapor extraction (SVE).

In FY94, a ROD was signed for OU1. In addition, the installation formed a BRAC cleanup team (BCT) and a restoration advisory board (RAB). The community relations plan, initially approved in FY91, was revised in FY94. The Environmental Baseline Survey was completed in FY93, identifying approximately 2,900 CERFA-clean acres. Federal and state regulatory agencies have concurred with the designations.

In FY95, under a Removal Action, the installation removed a UST from the Airfield Site. Also removed were stained-soil areas, drums, and asbestos-containing material from the Concrete Hardfill Site. Risk assessments were prepared for two sites during FY95, and decision documents for no further action were prepared for five sites at OU5. The installation also completed a Feasibility Study (FS), a Proposed Plan, and a draft ROD for OU3. Under the ROD for OU1, installation of a landfill cap was completed.

The RAB met quarterly in FY96. A ROD was signed for OU3, and the installation adopted an innovative remediation pilot test to evaluate the suitability of intrinsic bioremediation at the site. The test determined that horizontal wells were largely ineffective for use in groundwater extraction and treatment. Treatability Studies (TS) of free-product removal, natural attenuation, bioventing, and SVE were initiated at OU2. After the TS, the ROD was revised to address contamination of the vadose zone as well as soil and groundwater contamination. The installation also completed Remedial Investigation activities at OU4 and OU5.

During FY96, the installation completed an investigation of the extent of petroleum contamination at the Civil Engineering Prime Beef Yard Site. Oil-contaminated soil was removed according to RCRA closure guidelines, and two areas of the site were deemed clean by the regulatory review agencies.

FY97 Restoration Progress

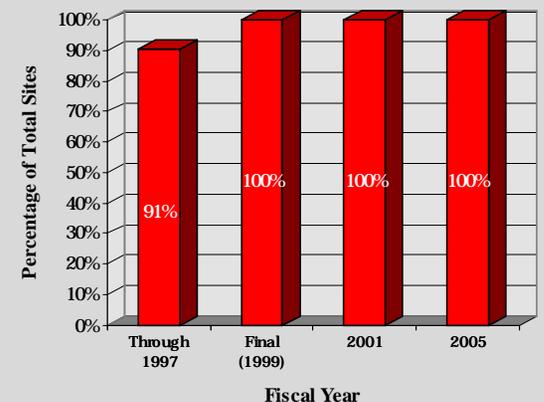
An OU2 TS evaluated natural attenuation and SVE as replacement remedies for pump-and-treat technology and free-product recovery. The TS demonstrated that SVE is more effective for source removal and fuel mass reduction for the soil at ST-12 than is free-product removal by pumping. An OU3 TS addressing vadose zone contamination and an Engineering Evaluation and Cost Analysis also were completed, and RD activities were initiated.

Partnering efforts helped resolve lead cleanup at Site SS-19. The BCT conducted three technical working group meetings in FY97. The latest version of the BRAC Cleanup Plan also was completed in FY97. With regulatory concurrence, 3,796 acres were designated as Category 1 uncontaminated property and are environmentally suitable for transfer. The ROD for OU5 was signed in September 1997.

Plan of Action

- Complete the FS, Proposed Plan, and ROD for OU4 in FY98
- Complete the RA at OU4 sites in FY98
- Continue long-term monitoring and operation and maintenance at the liquid fuel storage areas and the capped landfill No. 4 until FY98

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 1,090 acres
Mission: Serve as Reserve Naval Air Station for aviation training activities
HRS Score: 50.00; placed on NPL in September 1995
IAG Status: Federal Facility Agreement under negotiation
Contaminants: Heavy metals, PCBs, petroleum/oil/lubricants, and solvents
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: \$4.3 million
Estimated Cost to Completion (Completion Year): \$34.1 million (FY2017)
Final Remedy in Place or Response Complete Date: FY2006



Willow Grove, Pennsylvania

Restoration Background

Environmental studies at the installation identified 11 CERCLA sites and two RCRA sites. Site types at the installation include landfills, underground storage tanks (UST), and a fire training area. In an effort to close out sites that pose no risk, decision documents recommending no further action (NFA) at five sites have been submitted for review.

In FY86, Preliminary Assessments (PA) were completed for nine sites. Five sites were recommended for further investigation because of potential contamination of surface water and groundwater. In FY90, all nine sites were included in the Site Inspection (SI), along with a new site (Navy Fuel Farm). An Expanded Site Inspection (ESI) was recommended for Site 7 because of trace levels of methylene chloride. Remedial Investigations and Feasibility Studies (RI/FS) were recommended for Sites 1, 2, 3, and 5. Decision documents recommending NFA for Sites 4, 6, 7, 8, and 9 were submitted to EPA Region 3.

In FY92, two 210,000-gallon USTs were removed from the Navy Fuel Farm (Site 10). Innovative technologies were used in the Remedial Design (RD) for this site. A pilot-scale recovery system for removal of free product was installed in FY93 and continued to operate through FY95.

In FY93, an RI for Sites 1, 2, 3, and 5 recommended a Phase II RI/FS to fill data gaps and identify alternative cleanup actions. In FY95, a Phase II RI work plan was issued for these four sites and for Site 11. Because of funding constraints, however, Site 11 was removed from the work plan.

In FY95, a Removal Action was completed for removal of 6,000 cubic yards of soil at Site 10. A state-approved plan allowed the Navy to

remove the soil from this site and spread it on another area at the installation.

The installation formed a technical review committee in FY90. In FY91, it established an administrative record and an information repository. In FY95, the installation established a restoration advisory board (RAB) and developed a community relations plan (CRP). Parties in the community have contacted the installation to express interest in becoming members of the RAB, which is expected to meet quarterly.

In FY96, the first RAB meeting was held. The installation continued to update the CRP while the Phase II RI work plan was made final. The work proposed for four sites was approved. The pilot study of free-product recovery at Site 10 was completed.

FY97 Restoration Progress

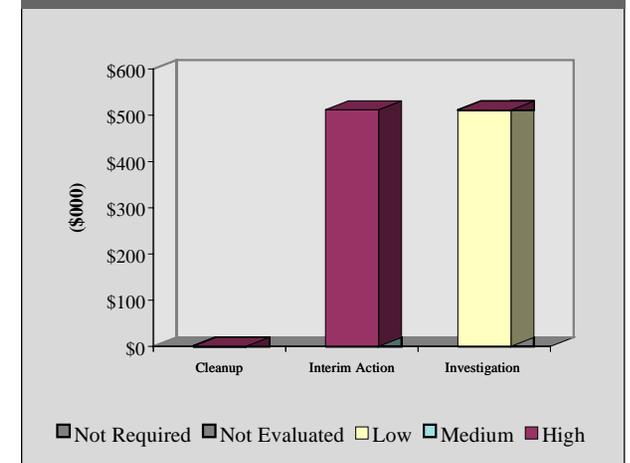
The CRP was completed in conjunction with the Phase II RI work plan. A draft site management plan also was completed. A design-and-build approach was used for Site 10 that allowed the Remedial Action (RA) to be awarded with the RD and completed under one delivery order. Vacuum-enhanced recovery of light nonaqueous-phase liquids with full-time water-table depression and immunoassay kits for polychlorinated biphenyl screening helped accelerate site characterization and fieldwork. Scoping meetings with regulators expedited finalization of the Phase II RI work plan, which allowed an earlier start date for fieldwork and helped resolve issues with regulatory agencies.

Site management plan submissions to EPA, which were originally scheduled for FY97, will occur in FY98. The Phase II RI Report and the FS also have been rescheduled for FY98.

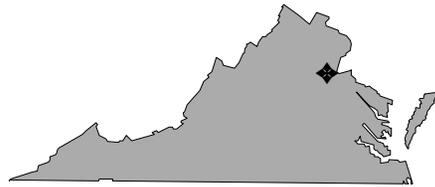
Plan of Action

- Complete a final site management plan in FY98
- Complete the Phase II RI/FS for four sites in FY98
- In FY98–FY99, develop a Record of Decision for Site 1 on the basis of the results of the FS and initiate a RD for the preferred alternatives
- Initiate RI/FS activities for Site 11 in FY98
- Initiate RD activities for two sites in FY99 and two sites in FY01
- Implement RAs for all media at all sites between FY99 and the end of FY04

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 580 acres
Mission: Conduct electromagnetic testing
HRS Score: NA
IAG Status: None
Contaminants: PCBs, PAHs, pesticides, petroleum hydrocarbons
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: \$7.9 million
Estimated Cost to Completion (Completion Year): \$3.8 million (FY1998)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY1998



Woodbridge, Virginia

Restoration Background

In July 1991, the BRAC Commission recommended closure of the Woodbridge Research Facility and the relocation of its operations to White Sands, New Mexico; the Adelphi Laboratory Center in Adelphi, Maryland; and Aberdeen Proving Ground, Maryland. Pursuant to Public Law 103-307, the Army will transfer the entire installation to the Department of the Interior (DOI), which plans to include the property as a component in the National Wildlife Refuge System.

Since FY92, site characterization activities have identified 49 areas of concern at the installation. Verified site types include former disposal areas and spill sites. Releases of polychlorinated biphenyls (PCB) and petroleum hydrocarbons from those sites have contaminated groundwater, surface water, sediment, and soil.

In FY94, the installation formed a BRAC cleanup team (BCT) and improved communication among the Army, DOI, and regulatory agencies. The BCT accelerated cleanup efforts by adopting a concurrent document review process.

In FY95, Interim Actions included removal of approximately 1,100 tons of PCB-contaminated soil and approximately 40,000 gallons of PCB-contaminated groundwater and surface water from one site. The installation also completed the design process for removal of one underground storage tank (UST), one oil-water separator, one acid neutralization pit, and two abandoned groundwater production wells. In addition, the commander formed a restoration advisory board.

FY97 Restoration Progress

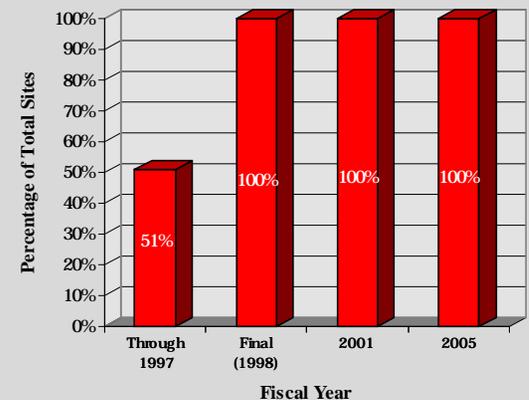
The installation essentially completed the field phase of an installationwide Remedial Investigation and Feasibility Study (RI/FS) begun in FY96. Decision documents for Remedial Actions (RA) at two operable units (OU) were completed in September 1997, along with a decision document calling for no further action (NFA) at 37 installation sites. By the end of FY97, the Army had made RA or NFA decisions on 46 of the 49 sites at the installation.

The installation removed eight USTs, one septic tank, one oil-water separator, one acid neutralization vault, and an array of buried ethylene glycol-filled hoses. In addition, two abandoned water production wells were properly closed.

Plan of Action

- Complete transfer of the installation to DOI in FY98
- Complete RAs at OU1 and OU3 in FY98
- Complete decision-making process at three open sites in FY98
- Complete the installationwide RI/FS in FY98

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 8,511 acres
Mission: Serve as host to many organizations, including Headquarters to Air Force Material Command
HRS Score: 57.85; placed on NPL in October 1989
IAG Status: IAG signed in March 1991
Contaminants: Waste oil and fuels, acids, plating wastes, and solvents
Media Affected: Groundwater and soil
Funding to Date: \$174.9 million
Estimated Cost to Completion (Completion Year): \$33.0 million (FY2028)
Final Remedy in Place or Response Complete Date: FY1998



Dayton, Ohio

Restoration Background

Past activities at Wright-Patterson Air Force Base have created spill sites and unlined waste disposal areas, including landfills, fire training areas, underground storage tanks, earth fill disposal areas, and coal storage areas. In FY82, 24 sites were identified at the installation. Subsequent investigation revealed an additional 41 sites. Soil and groundwater at the installation have been contaminated with volatile organic compounds, semivolatile organic compounds, and benzene, toluene, ethyl benzene, and xylene compounds. Past fire training exercises conducted in unlined pits have contaminated soil and groundwater with fuel and its combustion by-products.

In FY89, the installation began Remedial Investigation and Feasibility Study (RI/FS) activities for 39 sites. Early in FY92, the installation completed a Removal Action along the installation boundary to intercept and treat contaminated groundwater flowing toward wellfields in the city of Dayton.

In FY94, the Record of Decision (ROD) for Landfills 8 and 10 was approved and the Remedial Design (RD) was completed to cap the landfills. An Engineering Evaluation and Cost Analysis (EE/CA) and a Removal Action Plan (RAP) for all landfills were approved by regulatory agencies. Approval of the EE/CA and the RAP resulted in adoption of a list of presumptive remedies, expediting the cleanup decision-making process. Also in FY94, an alternative drinking water supply was provided to 12 off-base residences located near landfills on the installation.

In FY95, the installation conducted a pilot-scale study of bioslurping, using vacuum-enhanced extraction. The installation continued to operate the air sparging groundwater treatment system, began construction of the Remedial Action (RA) at Landfills 8 and 10, and performed an Interim Action at Landfill 5 to construct a landfill cap. A restoration advisory board (RAB) was formed and held bimonthly

meetings that focused on the application of the Relative Risk Site Evaluation process.

The installation has participated in partnering sessions with EPA and the state regulatory agency to address issues impeding the restoration process, including risk-based funding and the disposal of investigation-derived waste. The installation and regulatory agencies signed a consensus statement to streamline the RI/FS process through the use of generic remedies, establishment of an installationwide groundwater monitoring program, and use of semiquantitative risk assessments.

During FY96, RAB meetings focused on project priorities, funding issues, and the adoption of methods developed at DOE installations and at other DoD installations. In May 1996, a public meeting and presentation session was held to address 21 installation sites that require no further action. Also in FY96, the installation capped three landfills (an Interim Action at Landfill 5 and a final RA at Landfills 8 and 10). A ROD was completed for 21 sites that required no further action. RD was initiated for Landfills 1, 2, 3, 4, 6, and 7, following the basewide Removal Action presumptive remedy process.

FY97 Restoration Progress

RI's were completed at the remaining 10 sites and for Operable Units (OU) 8, 9, and 11. A bioslurper was installed and began operation at Fuel Spill Site 5. Geoprobe technology and an on-site laboratory were used, and a natural attenuation ROD for Fuel Spill Sites 2, 3, and 10 was completed.

A dedication ceremony was held for the final closure of Landfills 8 and 10, and a press conference took place to highlight the progress made by the Installation Restoration Program (IRP). The installation continued its involvement as a principal partner in the "Groundwater

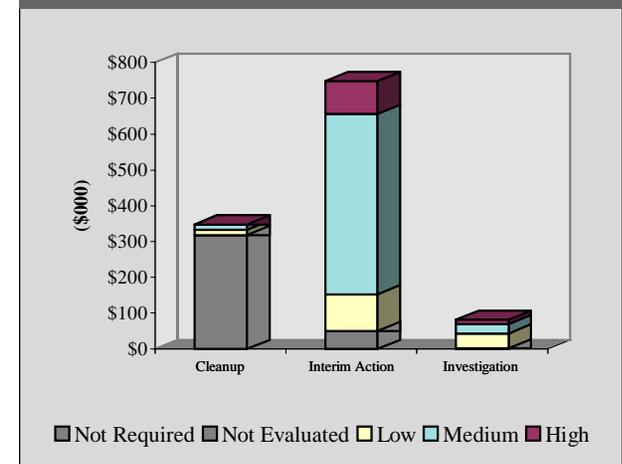
2000" initiative. This project involves the preservation and protection of the region's sole-source drinking water aquifer.

Preparation of an Action Memorandum for a basewide monitoring program and the final ROD for the entire base were delayed because of delays in preparing the groundwater risk assessment.

Plan of Action

- Prepare an Action Memorandum for groundwater in FY98
- Prepare a final ROD for the entire base in FY98
- Install a landfill cap for Landfills 1, 2, 6, 7, and 9 and a french drain at Spill Site 11 FY98
- Complete excavation of Landfill 12 contents in FY98
- Complete RODs for OUs 8 and 9 and groundwater in FY98
- Design and construct soil Removal Action at Heating Plant 5 in FY98

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 4,626 acres
Mission: Conducted tactical fighter and bomber training
HRS Score: 50.00; proposed for NPL in January 1994
IAG Status: None
Contaminants: Waste fuel and oil, spent solvents, VOCs, paints, heavy metals, and explosives
Media Affected: Groundwater and soil
Funding to Date: \$32.3 million
Estimated Cost to Completion (Completion Year): \$15.5 million (FY2015)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2000



Oscoda, Michigan

Restoration Background

Wurtsmith Air Force Base operated as an aircraft training facility. In July 1991, the BRAC Commission recommended closure of Wurtsmith Air Force Base, transfer of KC-135 aircraft to the Air Reserve Component, retirement of the assigned B-52G aircraft, and inactivation of the 379th Bombardment Wing. The installation closed on June 30, 1993.

Sites identified include a waste solvent underground storage tank (UST), bulk storage areas for petroleum/oil/lubricants (POL), aboveground storage tanks, a landfill, a fire training area, and an aircraft crash site. Volatile organic compounds (VOC) present at the installation include trichloroethene; dichloroethene; vinyl chloride; and benzene, toluene, ethyl benzene, and xylenes, all of which primarily affect groundwater.

Under Interim Actions at the installation, drinking water has been provided to affected communities in the area and air strippers have been installed to treat groundwater contaminated with VOCs. Remedial Actions (RA) include implementation of three groundwater extraction and treatment systems with air stripping capabilities.

The installation's BRAC cleanup team (BCT), which was formed in FY94, developed a master environmental restoration schedule and set priorities for site investigations and actions. A BRAC Cleanup Plan was prepared. Regulatory agencies concurred with the designation of 2,257 acres as CERFA-clean. Intrinsic remediation projects are under way at four fuel-contaminated sites. In FY95, Supplemental Environmental Baseline Surveys were completed to facilitate the transfer of property.

In FY95, the installation conducted Relative Risk Site Evaluations (RRSE) at all sites, involving both the restoration advisory board

(RAB) and the BCT in the effort. Draft Feasibility Studies were completed for seven sites, and the installation obtained the concurrence of the regulatory agencies on nine sites designated for no further action. An RA for the removal of eight USTs and most of the piping for the hydrant refueling system also was completed. Additional Interim Actions include removal of the hydrant refueling system and closure of five oil-water separators. The installation also installed groundwater monitoring wells and used groundwater modeling to monitor the natural attenuation of groundwater contaminants.

During FY96, the installation removed 38 USTs and 10 aboveground storage tanks. Three aboveground storage tanks were demolished. Cleanup decisions were made for at least nine sites. Two of the three sewage treatment plant lagoons were closed and the sludge removed. A contract was awarded for installation of a modified pump-and-treat system at Site OT-24. Remedial Design projects for seven sites also were awarded. The installation entered no further remedial action planned decision documents for seven sites and updated RRSEs as new site data were obtained.

Two pilot tests were conducted simultaneously at the former POL storage yard to determine whether free fuel product could be removed from the water table. The bioslurping test failed, but the bioventing test worked properly and is now in use.

FY97 Restoration Progress

In early 1997, the installation's water and sewer systems ceased operating, but physical closure was cancelled at the request of the township of Oscoda so that the plant could be used as a municipal sewage treatment plant in place of the town's current plant. In FY97, an enhanced in situ bioremediation process for groundwater at LF30/31 was agreed to, and the process is under design. The technology will

include injection of chemicals to speed up the natural bioremediation process. This will reduce the remediation time significantly over the next 4 years. Furthermore, through the RAB, the installation was able to obtain stakeholder concurrence on the Remedial Action Plan (RAP) for LF30/31. Field investigations at two landfills indicated that no further action is required, and a draft report will be submitted in FY98.

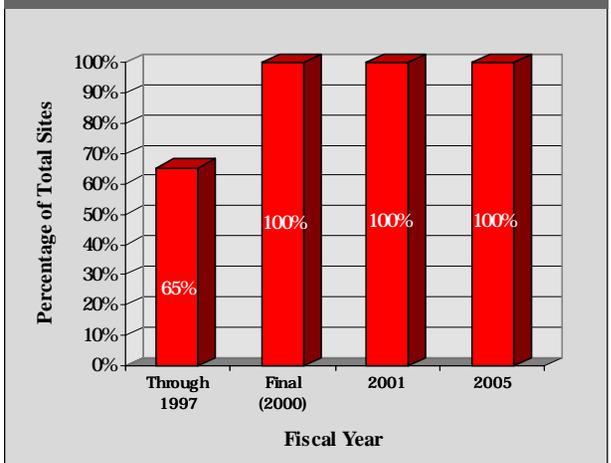
The state of Michigan's expedited review of RAPs has saved time. The BCT also is helping expedite document review by agreeing to the default approval of response to comments if no objection to them is received within 10 days.

The design of the cleanup system RAs experienced some problems, delaying completion of these actions.

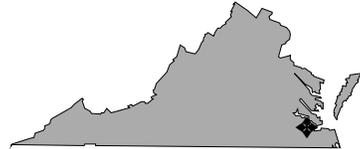
Plan of Action

- Complete unfinished investigation projects by mid-FY98
- Complete the cleanup systems for nine sites in FY98
- Submit draft report showing that no further action is required at two landfills in FY98

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



Size: 10, 624 acres
Mission: Provide ordnance technical support and related services; provide maintenance, modifications, production, loading, off-loading, and storage for the Atlantic Fleet
HRS Score: 50.00; placed on NPL in October 1992
IAG Status: Federal Facility Agreement signed in September 1994
Contaminants: Acids, asbestos, explosives, cadmium, lead, mercury, nickel, paint thinners, solvents, PCBs, varnishes, and waste oil
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: \$22.6 million
Estimated Cost to Completion (Completion Year): \$31.2 million (FY2019)
Final Remedy in Place or Response Complete Date: FY2009



Yorktown, Virginia

Restoration Background

Since FY84, environmental studies at Yorktown Naval Weapons Station have identified 50 sites. No further action has been recommended for 13 sites. The installation was placed on the National Priorities List (NPL) primarily because of contamination at six sites identified in FY92. These sites are hydrologically connected to the Chesapeake Bay. Contaminants include explosives and nitramine compounds and primarily affect groundwater, surface water, and sediment.

During FY93, the installation completed an initial site characterization for all four underground storage tank (UST) sites. A corrective action plan (CAP) also was completed. In FY95, corrective actions were completed for USTs 1 and 2.

Between FY84 and FY93, the installation completed an Initial Assessment Study for 19 sites, a confirmation study for 15 sites, and a Site Inspection (SI) for 1 site. During FY94, a Remedial Investigation and Feasibility Study (RI/FS) was completed for one site and Removal Actions were completed for three sites. An SI also was completed for one solid waste management unit (SWMU).

During FY95, an SI was completed for three SWMUs, an RI was completed, and a Record of Decision for no further action was signed for one site and one SWMU. Also in FY95, an innovative process was used to determine whether samples of composite carbon zinc battery waste were hazardous. Test results demonstrated that the waste was not hazardous. This approach saved more than \$1 million in disposal costs.

During FY96, the installation completed an SI for eight SWMUs. An RI/FS was completed, and Remedial Design (RD) initiated, for another site. RI/FSs were also initiated at eight sites and five SWMUs.

In addition, a Removal Action was completed for two SWMUs to remove three fire training pits and contaminated soil, a UST and piping, and many underwater ordnance items.

The installation formed a technical review committee in FY91 and converted it to a restoration advisory board (RAB) in FY95. A community relations plan also was completed. A comprehensive site management plan was completed in FY94. The installation also began a joint program with the U.S. Army Corps of Engineers Waterways Experiment Station in Vicksburg, Mississippi. Under this program, the Navy and the Waterways Experiment Station are conducting a Treatability Study of two technologies for treatment of explosives-contaminated soil.

FY97 Restoration Progress

RI/FSs were initiated and completed for four sites. The installation completed field- and bench-scale Treatability Studies for one site and began Remedial Actions for one site. SIs were completed at four SWMUs/Site Screening Areas (SSA). Early actions took place at two SSAs (SSAs 3 and 7). The installation implemented a large-scale pilot study to treat approximately 700 cubic yards of explosives-contaminated soil using an anaerobic bioslurry/biocell technology that employed potato waste as a co-metabolite to enhance degradation.

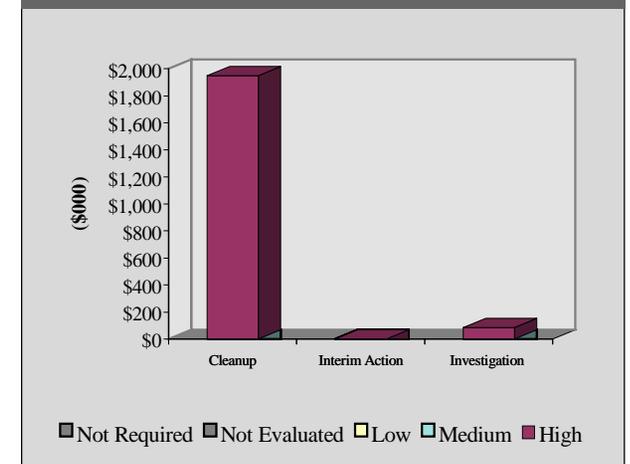
RAB meetings continued to foster a high level of trust within the community and a high level of installation commitment to the community. The installation employed partnering efforts to expedite document reviews and to facilitate work with regulatory agencies.

Some RI/FSs, SIs, and RAs that were originally scheduled for FY97 were pushed back to FY98.

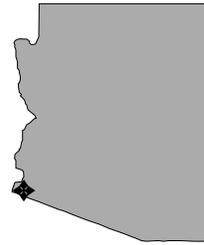
Plan of Action

- Complete RI/FSs for two sites in FY98
- Complete SIs at 10 SSAs in FY98
- Begin RAs for three sites in FY98
- Employ anaerobic bioremediation of explosives-contaminated soil at Site 19 in FY98

FY98 FUNDING BY PHASE AND RELATIVE RISK



Size: 3,000 acres
Mission: Support tactical aircrew combat training for Pacific and Atlantic Fleet Marine Corps Forces
HRS Score: 32.24; placed on NPL in February 1990
IAG Status: Federal Facility Agreement signed in January 1992
Contaminants: JP-5, petroleum hydrocarbons, SVOCs, trihalomethanes, and VOCs
Media Affected: Groundwater and soil
Funding to Date: \$31.2 million
Estimated Cost to Completion (Completion Year): \$28.4 million (FY2011)
Final Remedy in Place or Response Complete Date: FY2007



Yuma, Arizona

Restoration Background

Investigations conducted between FY85 and FY92 identified 20 CERCLA sites and 5 underground storage tank (UST) sites at Yuma Marine Corps Air Station (MCAS). Site types include landfills, sewage lagoons, liquid waste disposal areas, and ordnance and low-level radioactive material disposal sites.

Under the Federal Facility Agreement, the sites were divided into three operable units (OU) to facilitate cleanup efforts. OU1 addresses installationwide groundwater contamination, OU2 addresses surface and subsurface soil contamination at 18 sites, and OU3 was established for sites that may be identified in the future.

In FY80, the installation completed a Removal Action at one site to remove sealed pipes containing low-level radioactive dials, gauges, and tubes. Site Inspections were completed at two sites in FY88 and at 10 sites in FY91. Under another Removal Action in FY93, the installation removed 92 waste drums from a drum storage site. Initial site characterizations (ISC) were completed at two UST sites in FY93 and at one UST site in FY94. During the FY94 ISC, a pilot Treatability Study was initiated to remove petroleum from the groundwater. The installation constructed three air sparging and soil vapor extraction systems, including one at the fuel farm and one at the motor transportation pool area. During FY95, the installation completed a corrective action plan (CAP) at one UST site and initiated a corrective action at another.

During FY95, the draft Remedial Investigation (RI) Report for OU1 was submitted to regulatory agencies for review. The report identified several areas of contamination that required further investigation. The OU2 RI Report was submitted to regulatory agencies and recommended no further action at 12 sites, industrial controls at 3 sites, and

minor surface Removal Actions for asbestos-containing materials at 3 sites.

Field investigations at OU3 were completed during FY96. The installation also completed RIs for OU1 and OU2 and submitted a draft Feasibility Study (FS) Report for OU2 to the regulatory agencies for review. Also during FY96, the draft Proposed Plan and Record of Decision (ROD) were submitted for OU2. Two pilot studies for in situ cleanup of groundwater were performed for Site 19. Fifty UST site assessments have been performed on UST Units 2, 3, and 4. Approximately 40 of those units are candidates for clean closure, pending approval of the Closure Reports by the state of Arizona.

The installation established a technical review committee and two information repositories in FY90. In FY95, the installation converted the technical review committee to a restoration advisory board (RAB). The community relations plan was completed in FY93 and updated in FY94. Through partnering and an innovative approach, the Yuma MCAS project team, established in FY94, has been able to save 2 to 3 years and approximately \$10 million on the RI phase of the cleanup program. The innovative approach consisted of developing expedited, site-specific work plans; using on-site mobile laboratories and cone penetrometer testing and transmitting the resulting data to regulatory agencies; and obtaining concurrence on further sampling without delay.

FY97 Restoration Progress

The installation completed draft CAPs for four USTs and closed six other USTs. A Removal Action and a closeout report were completed for the recently discovered UST B1040. FSs were completed for OU1 and OU2, as was a draft Proposed Plan for OU1. Additionally, the

installation implemented geosorbers, a geoprobe, in-well air stripping, and a pre-pilot ozone sparging study.

To expedite document review, Implementation Memorandum Reports were prepared instead of full work plans, thereby simplifying documents and reducing document size. The installation met with the RAB and presented the Proposed Plan for OU1.

The installation is working with the state to document the ability to file a Voluntary Environmental Mitigation Use Restriction for a land use restriction in the state of Arizona. This process delayed other activities scheduled for FY97.

Plan of Action

- Remove and remediate 12 USTs in FY98
- Complete RODs for OU1 and OU2 in FY98
- Complete Removal Actions at OU2 in FY98
- Complete final CAPs in FY98

FY98 FUNDING BY PHASE AND RELATIVE RISK

