FY 2016 Secretary of Defense

Environmental Awards

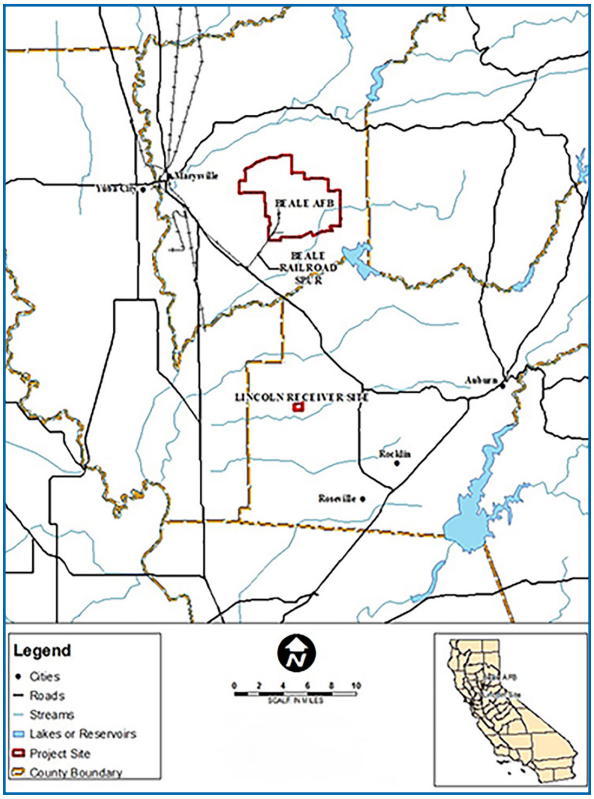
Environmental Restoration, Installation,
Beale Air Force Base, 9th Reconnaissance Wing

Introduction

Beale AFB is a 22,944-acre military installation located in Yuba County, California, approximately 40 miles north of Sacramento. The 9th Reconnaissance Wing's mission is to train, deploy, and employ our Airmen and assets to deliver globally integrated Intelligence, Surveillance, and Reconnaissance in support of National Objectives. To accomplish this mission, the Wing is equipped with the nation's fleet of U-2 Dragon Lady and RQ-4 Global Hawk reconnaissance aircraft and associated support equipment. The Wing also maintains a high state of readiness in its expeditionary combat support forces for potential deployment in response to theater contingencies. The 9th Reconnaissance Wing is composed of more than 6,400 personnel (5,407 military personnel and 1,090 civil servant and contracted personnel) in four groups at Beale Air Force Base (AFB), multiple stateside and overseas operating locations, and various tenant units. The total annual economic impact of Beale AFB to California is approximately $604M. Over 17,000 acres of Beale AFB is undeveloped and consists of riparian areas and wetlands. The base sits between the Yuba and Bear Rivers in an area characterized by the transition from the western Sacramento Valley east to the Sierra Nevada foothills. Beale AFB also owns a 235 acre communication site, known as the Lincoln Receiver Site, located in Lincoln, California. Beale AFB is responsible for the environmental restoration work at Point Arena Air Force Station (AFS), located approximately 190 miles west of Beale AFB in Mendocino County, and Tulelake AFS located approximately 290 miles northeast of the base in Modoc County.

Background

The The Beale AFB Installation Restoration Program (IRP) encompasses 49 Environmental Restoration Program (ERP) sites and the Military Munitions Response Program (MMRP), with 63 Munitions Response Areas (MRA) sites, consisting of 122 Munitions Response Sites (MRS). ERP sites are addressed under one of the following: Comprehensive Environmental



Beale AFB

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Response, Compensation, and Liability Act of 1980 (CERCLA); the Resource Conservation and Recovery Act of 1976; or the Leaking Underground Fuel Tank program. MMRP sites are addressed under CERCLA.

Contaminants of concern (COCs) for the ERP sites range from petroleum hydrocarbons to chlorinated hydrocarbons, including dense non-aqueous phase liquids (DNAPLs). The majority of the petroleum hydrocarbon contamination in the groundwater resulted from leaking old single walled underground storage tanks or fuel spills on or near the flightline. The chlorinated hydrocarbon contamination resulted from improper disposal practices or solvent spills in various locations around the installation from legacy operations occurring from the 1950s to the 1970s. Of the 49 ERP sites, 38 remain open with active remedial actions being conducted. The MMRP has several COCs based on the use of on-base ranges. Munitions contributing to COCs range from 105 millimeter rounds, white phosphorus mortars, MK II hand grenades to small arms projectiles (50 caliber and smaller). Of the 122 MRSs, 99 have been closed either administratively at the site investigation phase or through concurrence with state regulatory agencies, the Air Force Safety Center, and Department of Defense Explosive Safety Board (DDESB). Beale AFB has 23 MRSs requiring site closeout, eight of which have undergone remedial action and are awaiting approval from the California Department of Toxic Substances Control (DTSC). The approval from DTSC will allow the eight sites to achieve site closeout.

Current IRP staffing at Beale AFB consists of two permanent civilians and one full-time support contractor. ERP site remediation and monitoring is conducted under a Performance Based Contract. MMRP site cleanup projects and ERP site geographically separated locations are awarded by project and not by contract.

One concept of Beale AFB's IRP management approach is to implement a communications plan that fosters the existing partnerships currently established with stakeholders (regulatory and public). The implementation of an effective communication plan is critical to the success of Beale AFB public outreach programs. The outreach program includes a Restoration Advisory Board (RAB) that meets five times per year, a RAB Newsletter published four times per year, and two Beale AFB mission-focused and IRP site tours conducted twice per year.

Beale AFB's relationship with regulatory agencies and the RAB partnership allowed Beale AFB to complete seven Records of Decision (RODs) and decision documents during the accomplishment period:

- No Further Action (NFA) ROD, incorporating five ERP sites
    - Fire Protection Training Area (Site FT003); Engine Test Area (Site SD010); Fuel Tank Repair Area (Site SD023); Building T-896, Laundry Facility (Site SD031); and Building 1086, Industrial Wastewater Line (Site SS037)
- NFA ROD for Building 440, Entomology (Site WP012)

- NFA ROD for the Flightline Westside Drainage Outfall (Site SD001)
- NFA ROD for the Flightline Shelter Area (Site SD005)
- NFA ROD for the Explosive Ordnance Disposal Area (Site WP016)
- NFA ROD for the Flightline Area Aboveground Fuel Storage Tanks (Site ST021)
- Point Arena AFS:
    - Decision Document, NFA: Landfill 1(Site LF001); Wastewater Treatment and Ground Antenna Transmit and Receive Area (Site OT029); Former Small Arms Range (Site SS005); Lead-Based Paint, Wastewater Treatment Area (Site ZZ655); Lead-Based Paint, Operations Area (Site ZZ657); and Lead-Based Paint, Housing Area (Site ZZ661)
    - Land Use Controls instituted for:Building 217, Motor Pool (SiteSS004); Building 216, Underground Storage Tank (Site TU928); and Building 202, Underground Storage Tanks B and C (Site TU932)

Challenges

Although Beale has achieved outstanding progress closing IRP sites, challenges were encountered. The primary challenge was conducting remedial action in sensitive habitat areas. Approximately 75 percent of Beale AFB is undeveloped consisting of wetlands and/or vernal pools requiring habitat mitigation for projects posing a potential impact. Habitat mitigation can have a significant impact on project costs.

The presence of wetlands and/or vernal pools can also limit the locations allowed for monitoring well installation. In an effort to alleviate mitigation costs, Beale AFB has adopted a method of "surgically" removing soil in "hot spot" areas of contamination by utilizing hand excavation near sensitive habitats, identifying hardpan depths, and ensuring the area hydrology is maintained. This approach reduces the amount of soil disturbance and soil disposal, thereby reducing sensitive habitat mitigation costs.

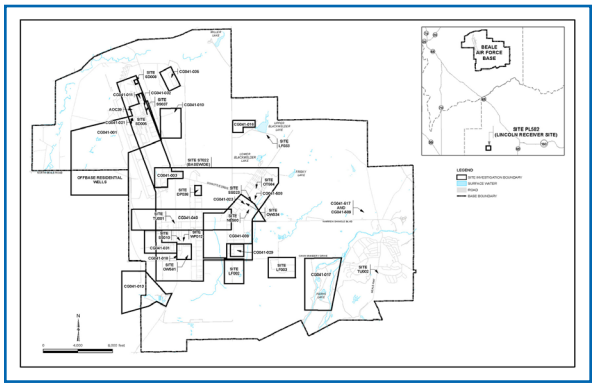
An additional challenge is working within the California regulatory climate. California has stringent guidance addressing soil, soil vapor, surface water, and groundwater cleanup actions. Some state maximum contaminant limits and public health goals for soil, soil vapor, and water are more stringent than federal levels, as are some toxicity criteria. This challenge is overcome by maintaining an excellent rapport with DTSC, Regional Water Quality Control Board, California Department of Fish and Wildlife (CDFW) and achieving consensus on the path forward when COC concentrations are above promulgated state regulatory levels and below acceptable risk levels. This includes working closely with regulatory stakeholders to develop language acceptable to all parties for inclusion in decision documents.

Accomplishments

Beale has a very challenging IRP, due to the mixture of complicated ERP and MMRP. To address these challenges, Beale developed a comprehensive and dynamic restoration program focused primarily on site cleanup and management to protect human health and the environment.

Partnerships

By developing and maintaining a proactive and cooperative relationship with state regulatory agencies, Beale AFB has successfully achieved performance goals at multiple ERP



ERP Sites
Beale AFB has 39 ERP sites located throughout the installation and at geographically separated locations. A majority of the sites are clustered around areas where maintenance activities were conducted and where underground storage tanks were located.

sites. Through its investigation and cleanup efforts at an oil-water separator located near the Commissary (Site OW034), Beale demonstrated the location was suitable for residential use with no further action five years ahead of schedule. In addition, Building 2145 (Site SS039) achieved cleanup levels in less than one year as demonstrated through a treatability study. The site met cleanup levels prior to the ROD being signed with allowed for site closeout in 2016.

Success was also realized at the J Street Gas Station (Site TU001). The installation obtained regulatory concurrence with NFA at Site TU001 approximately one year ahead of schedule. By working closely with state regulatory agencies, three additional sites achieved response complete, with site closeout to follow the decommissioning of site infrastructure in 2016.

At one of the most complex sites on base, Best Slough (Site OT017), Beale AFB worked closely with state regulatory agencies to decouple soil and groundwater and address them as separate components. As groundwater contains DNAPL at this site, decoupling allowed the Air Force to move forward with the soil-only site and obtain response complete successfully; groundwater is managed as part of the base-wide groundwater unit. The site's complexity stems from chlorinated solvents in the form of DNAPL that had settled on fractured and weathered bedrock directly beneath a creek (Best Slough). Best Slough was diverted to prevent VOCs being released to the surface water. A slurry wall and a phytopumping system were also installed around the source area. The phytopumping system uses vegetation to direct the flow of and treats groundwater.

Through its collaborative partnership with state regulatory agencies and installation leadership, Beale AFB created and implemented a streamlined process for obtaining concurrent signatures on decision documents from the Air Force, California Department of Toxic Substances

Flightline Westside Drainage Outfall
A collaborative partnership between Beale AFB and the United States Fish and Wildlife Service allowed the removal of a lead waste pile near vernal pools containing sensitive species. Leveraging hand digging, the Air Force saved over $275k in wetland mitigation fees.

Control, and the Regional Water Quality Control Board, which saved the Air Force approximately 21 days of processing time. The expedited process allowed the installation to obtain unrestricted site closeout for nine ERP sites and 19 underground storage tanks, which decreased the number of active sites by 20 percent.

Green Remediation

Beale AFB implemented and maintains 10 source area remedies considered green and sustainable, including two subgrade biogeochemical reactors, five enhanced in situ bioremediation (EISB) treatment areas, four in situ chemical oxidation treatment areas, a phytopumping system, the use of vegetation to direct and treat groundwater, and a permeable reactive barrier. For example, the Jet Engine Test Area (Site SD010) EISB system treated a 12-acre source area to depths of 75 feet below ground surface by recirculation of food-grade sodium lactate, serving as a hydrogen donor and stimulating naturally occurring bacteria to perform remediation on chlorinated solvents. Meanwhile, the installation continues to shutdown less sustainable remedies, including seven Soil Vapor Extraction (SVE) systems and five biovent systems. Shutting down the seven SVE systems will lead to site closeout for those locations. The groundwater ROD that is in progress includes shutting down two of the three pump-and-treat systems and the last two SVE systems by the end of 2017. By reducing the amount of active treatment systems, the majority of the installation's remediation systems will be passive systems, which will save an estimated $220K annually in waste characterization, waste disposal, and utility costs.

Environmental Stewardship

Beale AFB implemented a multifaceted response to the unprecedented drought in California and minimized off-base groundwater pumping impacts to the installation's groundwater plumes. Beale AFB worked with the Yuba County Water Agency to identify impacts from the agency's groundwater substitution transfer program (off-base agricultural groundwater pumping) on Beale's groundwater plumes.

Landfill Bioreactor
Beale AFB installed and maintains 2 bioreactors used to treat groundwater. The groundwater is pumped to the top of the bioreactor and allowed to percolate through layers of mulch, gravel, molasses, and vegetable oil. The molasses and vegetable oil act as nutrients for the microbes that breakdown the chlorinated solvents.

The County's program allows landowners to pump groundwater to irrigation canals to supplement surface water sources. The open dialogue identified contingency actions to prevent possible plume migration off-base. In addition to partnering with the Water Agency, the groundwater treatment system at Landfill 13 (Site LF013) was optimized to maintain plume capture despite groundwater elevation dropping up to 50 feet due to off-base groundwater pumping. Optimizing the treatment system

Swainson's Hawk Survey
Ms. Carolyn Rech (CDFW) and Mr. Darren Rector (AFCEC/CZOW) conducted a Swainson's Hawk Survey on Munitions Response Site GR592. A Swainson's Hawk nest was noted prior to the site excavation. The CDFW agreed weekly surveys and reporting could be conducted by Mr. Rector, eliminating additional project costs.

increased the amount of treated groundwater by 65 percent. Although there was an increase in groundwater treatment, 100 percent of treated groundwater is reused for on-base irrigation.

Innovation

Beale AFB successfully developed an excavation process, which satisfies the United States Fish and Wildlife Service's (USFWS) stringent guidelines for ground disturbing activities near sensitive species habitat. The remedy for the Former Skeet Range (Site DP038) was revised to avoid expensive wetland mitigation, saving the Air Force approximately $3M. The revised remedial action approach is to use hand excavation near sensitive habitats, identifying hardpan depths, and ensuring the areas hydrology is maintained to "surgically" excavate lead "hot spots" to prevent disturbance of sensitive wetland habitat. The same approach was used during excavation of the Flight line Westside Drainage Area (Site SD001), where the USFWS allowed hand excavation to be conducted within five feet of vernal pools to remove lead-contaminated soil piles without requiring wetland mitigation, saving the Air Force an additional $275K.

Accelerated Environmental Cleanup

A single systematic review of 63 MRAs consisting of 122 MRSs was conducted by the new program manager to identify and correct any existing inconsistencies. The review uncovered inconsistencies between the Comprehensive Site Evaluations and the Enterprise Environmental, Safety, and Occupational Health Management Information System (EESOH-MIS) database. The program manager identified 640 acres which were not properly accounted for in EESOH-MIS. The analysis also revealed 70 MRSs that were approved for site closeout by DDESB, the Air Force, and California regulatory agencies, but had not been formally processed by the Air Force. Documentation was submitted to formally document the MRSs for NFA site closeout. This action reduced the active MRSs by 81 percent and returned 8,537 acres to the installation for unrestricted use.

Restoration Advisory Board Tour
Beale AFB conducts RAB tours twice a year, focused on an installation mission and restoration site visit. Participation includes concerned community members, Board members, Beale AFB residents, and civic leaders.

An excellent rapport with the regulatory agencies carries over to the MMRP. The installation established a relationship with the CDFW during project site visits to the Coyote Run Golf Course (MRS GR592) to identify nesting Swainson's hawks, listed as a threatened species by the CDFW. During the site visit, the CDFW's lead biologist allowed the Air Force to conduct Swainson's hawk surveys during the nesting season until the young had fledged, which prevented the need for a contract modification, avoided project delays, and saved $8.5K for off-site biologist support to conduct project surveys.

Stakeholder Involvement

Beale AFB has established a robust community involvement program, including the cornerstone RAB. The Beale AFB RAB was established in 1994 as a short-term organization to gain public feedback on two ERP sites. As the ERP program grew, the RAB grew with it. Currently there are nine RAB members who have served for over 10 years, and several active members who have participated since the RAB's inception 20 years ago. The RAB is co-chaired; one chairperson from the public voted in by RAB members; and the other is the Base Civil Engineer.

To ensure public participation, meetings to present proposed remedial actions are conducted in conjunction with RAB meetings. Public participation has increased to approximately 30 individuals per meeting, which provides the public with increased opportunity for comment and helps the Air Force develop consistent and thorough decision documents.

Beale AFB successfully coordinated and facilitated one public meeting in 2014 for the Group 1 NFA proposed plan for five ERP Sites; and seven public meetings in 2015 for NFA proposed plans. By scheduling public meetings in conjunction with RAB meetings, and presenting the proposed plans after a RAB meeting, the installation benefits from greater public participation. The Air Force has received no significant comments on proposed plans presented to date.