

FISCAL YEAR 2006  
SECRETARY OF DEFENSE ENVIRONMENTAL AWARDS  
U.S. ARMY NOMINATION

# FORT RILEY, KS

ENVIRONMENTAL RESTORATION, INSTALLATION



**SUSTAINING THE ENVIRONMENT** FOR A SECURE FUTURE

## INTRODUCTION

Originally a fort named "Camp Center" that provided protection and safe trade for the Oregon and Santa Fe Trails, Fort Riley officially received its name on 27 June 1853 in honor of Major General Bennett C. Riley. Today Fort Riley's mission, as an Installation of Excellence, is to provide trained and ready forces to meet Joint Force requirements across the full spectrum of current and future operations; transform and manage unit readiness as directed by the Army Campaign Plan; execute unit re-stationing as directed by the U.S. Army Forces Command; execute garrison operations as directed by the Installation Management Command; conduct homeland defense operations and support civil authorities.

In close partnership with surrounding communities, Fort Riley provides housing and services that enhance readiness, retention and quality of life for America's finest Soldiers, families and civilian employees. Fort Riley's population is 16,000, composed of 6,000 civilians and 10,000 military personnel.

Fort Riley sits on just over 100,000 acres in the Flint Hills region of the high plains of northeast Kansas about one hour west of the capital of Topeka. The installation is bounded on the west by the Republican River and Milford Lake, the largest lake in Kansas. The Kansas River forms from the confluence of the Republican River and the Smoky Hill River and runs along and through the south portion of the installation. Surrounding the installation are the cities of Manhattan (where Kansas State University is located), Junction City, Ogden, Riley, Milford and Wakefield. Fort Riley provides an economic benefit of over \$938 million annually to the state of Kansas.

## BACKGROUND

### Organization and Staffing

Fort Riley's Installation Restoration Program (IRP) resides in the Conservation and Restoration Branch of the Environmental Division of Public Works. The IRP consists of an experienced, multidisciplinary team with over 50 years' combined experience in government and industry. Team members include a Restoration Program Manager who is

also the Conservation and Restoration Branch Chief, three program managers, a geologist, an environmental scientist, an engineer and a biologist. The team has public sector experience with National Environmental Policy Act (NEPA), cultural resources management, hazardous waste and natural resources management. In addition, one team member has experience as a state regulator. This combined background provides the IRP team the ability to analyze and solve complicated environmental problems, and the skills to successfully implement multi-year projects through the planning, budgeting and acquisition process.

### Management Approach

The IRP team has a fourfold management approach. First, strive to perform the necessary work to the quality standards set in the installation's mission statement. Second, provide a safe and healthy work environment for military, dependent and civilian personnel. Third, identify and implement efficiencies for both the program and project in order to reduce costs and time to the lowest denominator. Fourth, include the regulatory community, installation personnel, the general public and interested stakeholders to achieve the clean-up goals in the most expedient and efficient manner possible.

### Challenges

New missions and changes in the current Fort Riley mission, along with in-coming base realignment and closure and integrated global presence and basing strategy (IGPBS) personnel, have resulted in rapid development including training areas, housing and recreation facilities. This development has created challenges for the IRP to align its efforts with the installation's mission.

One such challenge for the team is the characterization and remediation of large soil and groundwater contamination areas in the rapidly developing

"Fort Riley considered the entire environment as they cleaned up the environment to ensure that they were not creating problems elsewhere through the cleanup work."

-Kristine Kingery, ACSIM



Camp Funston area. Additionally, regulatory acceptance and approval to close 49 sites that were improperly placed in a response complete category is an ongoing concern. The team is also challenged to complete the Pilot Study and develop a Record of Decision (ROD) for the last Operable Unit (OU), the Dry Cleaning Facilities Area (DCFA), also known as OU 003.

**Community Involvement**

Due to significant program milestones and events in the IRP, the 1992 Community Relations Plan was replaced with a Community Involvement Plan in FY 2006. The revised plan provides the public with a description of how information regarding Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)/ Superfund investigations and remediation at Fort Riley can be accessed and the influence community members can make on the installation’s restoration decisions. The U.S. Environmental Protection Agency (EPA) Region VII described the document as being “excellent” and posted the document to their Web site as an exemplary plan.

Fort Riley has a Restoration Advisory Board (RAB), which was established in 1997. The RAB previously met quarterly to

provide public feedback into the IRP; however, due to the overall positive working relationship with the regulatory partners, the RAB members and regulators unanimously voted during FY 2006 to hold the meetings only for the required public comment documents, or at least annually.

The restoration section on the Fort Riley Web site is regularly updated to educate

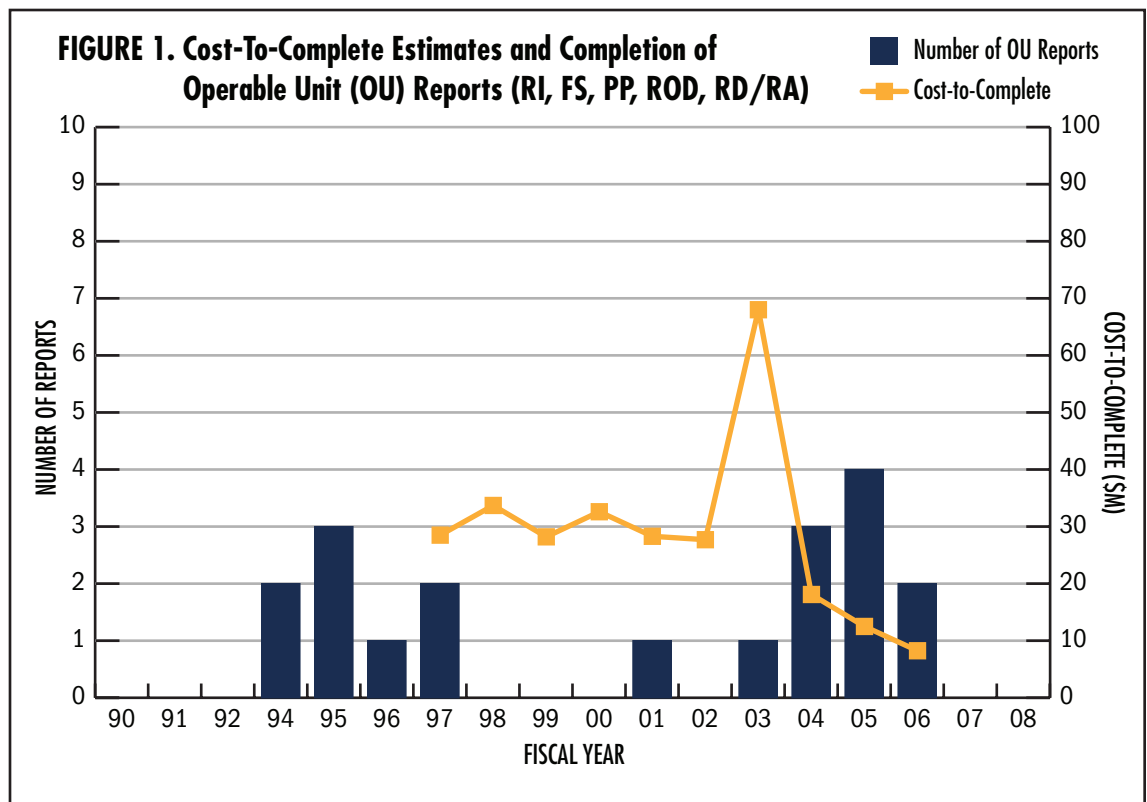
the community and the RAB about the IRP environmental initiatives to restore the environment at Fort Riley and to protect human health.

**PROGRAM SUMMARY**

The IRP works towards achieving several objectives in support of the installation’s mission while protecting human health and the environment:

- Finalized ROD and the remedial design/ remedial action plan (RD/RAP) for the Former Fire Training Area Marshall Army Airfield (FFTA-MAAF)
- Finalized ROD for the 354 Area Solvent Detection (354)
- Finalize RD/RAP for 354 in 2007
- Establish a proposed plan (PP) for DCFA in 2007
- Obtain the signed ROD and approved RD/RAP for DCFA in 2008

In 2007, Fort Riley’s IRP is anticipating receiving regulatory close out on 49 sites improperly placed in the response complete category, completing site characterization and beginning remediation of the Camp Funston areas. The IRP has performance-based incentives in contracts to encourage



The graph shows Fort Riley’s accomplishments in producing OU reports while dramatically decreasing cost-to-complete estimates.

contractors to produce the required documents earlier than anticipated.

The team generated six primary documents: feasibility studies, PPs, and RODs in FY 2005 and FY 2006. This continues a trend of producing primary documents with 10 completed in the last five years, compared to nine in the preceding 10 years. The graph on page two shows Fort Riley's accomplishments in producing OU reports while dramatically decreasing cost-to-complete estimates. The peak in the 2003 cost-to-complete was due to budgeting for a permeable reactive barrier, which was dropped the following year. Specific cost-saving measures are discussed in the next section.

## ACCOMPLISHMENTS

### Providing Cost Savings

Prior to CERCLA, hazardous substances were inappropriately disposed of or released on Fort Riley. The results were contaminants seeping into the soil and groundwater. The IRP team conducted a suite of samples at three OUs that covered volatile organic solvents and other contaminants. The IRP team negotiated the following reductions with the EPA and the Kansas Department of Health & Environment (KDHE).

- Sample intervals reduced from semi-annual to annual
- Reduced the length of time monitoring will be required to three years, if the contaminants remain below regulatory standards
- Reduced the number of wells to be sampled from 157 wells to 59 wells at FFTA-MAAF, 354, and DCFA, for a 62% reduction
- Reduced the number of analytes to the contaminants of concern at the sites

"Fort Riley exemplifies the mission of sustainability by restoring the environment while promoting its current and future use."

-Mark Smith, Branch Chief, Georgia Department of Natural Resources



*The team uses fire as an ecological management tool on the Southwest Funston Landfill evapotranspirative cover's native grasses.*

These remedial process optimizations yielded a reduction in frequency and required analytes that provided a cost-to-complete savings of \$1.4 million.

The Fort Riley IRP ecological reuse efforts also provided cost savings by leasing out the now closed Southwest Funston Landfill, an OU with a ROD, for hay production. This provides a local farmer with a source of income and animal feed while helping to maintain the native grass evapotranspirative cover. By leasing the area, Fort Riley avoids maintenance costs of over \$4,000 (estimated at \$12 per acre per year) to mow the grass and keep the area maintained. Instead, Fort Riley receives approximately three dollars per acre in annual rent for a net gain of over \$1,000.

### Dry Cleaning Facilities Groundwater Remediation

In FY 2006, the DCFA underwent a pilot study to investigate and remediate hot spots using two innovative techniques for treatment of chlorinated solvents in soil and groundwater. An eastern plume of tetrachloroethylene (PCE) contaminated groundwater was known to originate from a broken, plugged sanitary sewer line. When Fort Riley sought a clean background well, a seemingly



disconnected, up-gradient, western plume was discovered (see Figure 2). It presented a challenge as it did not have an apparent source. After a records review and examination of the site utilities, it was determined that PCE-contaminated water from the plugged sewer line had moved, under pressure, preferentially through a utility corridor from the eastern side of the site to the western side. This is an extremely unusual occurrence of a contaminant having moved through utility corridors and slightly uphill, resulting in the new area of contamination.

Fort Riley evaluated remediation technologies that would be both effective and economical. The team chose a high-pressure injection system to emplace potassium permanganate. This strong oxidizer was used to treat the groundwater in sandy alluvium deposits to mitigate the western plume. This is the first time a high-pressure (10,000 psi) injection system had been used to inject potassium permanganate.

A unique challenge arose while addressing the groundwater contamination at the DCFA; a portion of the site known as "the island" was designated as bald eagle habitat. In order to minimize habitat disturbance and tree clearing, Fort Riley obtained a permit from the Union Pacific Railroad to access "the island" through a boring drilled under the adjacent railroad tracks. This allowed the high-pressure injection equipment to remain outside the "island" proper, but still allowed the treatment of the contaminated groundwater.

The team worked with the natural resources management staff to conduct activities in and near the bald eagle habitat without impacting the birds or the habitat. This contributed to Fort Riley winning the U.S. Fish and Wildlife Service Military Installation Conservation Partnership Award in FY 2006.

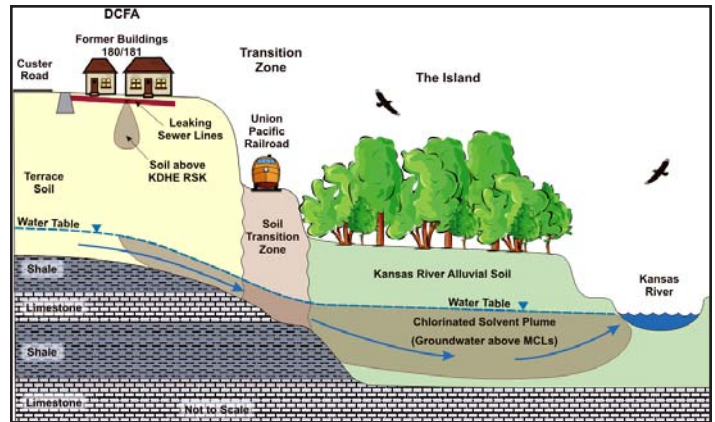


Figure 2. The conceptual model of the Dry Cleaning Facilities Area shows the hot spots and the plumes.



The IRP team used high-pressure permanganate injection equipment to treat the groundwater of the Dry Cleaning Facilities Area.



A geoprobe and small pump were used during the CAP-18 soybean oil injection.

The eastern groundwater plume had evidence that PCE biodegradation was occurring. The limiting factor was determined to be the existing aerobic environment. To enhance biodegradation, a proprietary refined soybean oil product known as CAP-18 was injected into the plume to serve as a source of energy for microbes and to force the groundwater into an aerobic state. The eastern plume's lower PCE concentration made this approach the most economical. These two techniques are expected to accelerate the cleanup of the site by potentially many years.

The IRP team developed an expedited low-cost sampling plan to evaluate the extent and level of potential lead contamination at the former site of the National Rifle Range. The objective was to establish whether a problem existed that would impede the turnover of the property to the Residential Communities Initiative partner. The results cleared the area for unrestricted use.

### **Tactical Unmanned Aerial System Operational Area**

The Army identified the need for a Tactical Unmanned Aerial System (TUAS) operational area. For approximately five months, the IRP team worked with installation planners, unit personnel and the installation headquarters to establish a viable location for this vital asset. Through intense and proactive coordination with all parties, a closed landfill monitored and managed by the IRP program was selected as the most appropriate site. The IRP team and installation personnel worked with the KDHE to secure approval for the TUAS runway and operational facilities in order to meet the July 2006 time-critical completion date. Working as an integrated team, the installation and regulatory personnel were able to get the mission essential asset placed and enhance the installation's capability to meet its mission requirements. The IRP team's knowledge of the boundaries of the landfill and requirements of the landfill's post-closure management plan protected the landfill cover and minimized exposure to wastes during construction of the TUAS runway and their future operations.

"Fort Riley should be commended for their innovative use of a high pressure injection system that allowed for treatment of contaminated groundwater while minimizing the impact on sensitive Bald Eagle habitat."

*-Joanne Walser, Senior Project Manager, O'Brien & Gere*

### **Marshall Army Airfield Well Reengineering**

Global restoration actions resulted in the stationing of a Combat Aviation Brigade at Fort Riley. This necessitated a change in mission requirements at the Marshall Army Airfield. A safety review mandated that a monitoring well within an aircraft approach zone be made frangible. The IRP team researched the concept and developed a course of action. A data collection platform and the concrete-filled protective bollards were removed, the steel well casing was cut and a flexible rubber collar and a solar-powered obstruction light were installed. The well structure was made to be frangible, and the well was not compromised. The IRP's in-house solution saved an estimated \$20,000 that would have been required to replace the well.

### **CONCLUSION**

The IRP team at Fort Riley has utilized ingenuity, team work and a wide range of skills to achieve its cleanup objectives. The use of remedial process optimization, incentivized contracting efforts, and thoughtful planning for future actions has led to reductions in long-term management costs; cooperative placement of mission essential assets; implementation of innovative techniques for cleanup; and a positive attitude working to support the installation mission while sustaining the environment. These endeavors by the IRP team improve the quality of life for Soldiers, civilians, and the neighboring cities while enhancing Fort Riley's ability to remain a vital command and meet its mission requirements.

*On the cover: U.S. Army Private First Class Christopher V. Rosal, C Company, 1st Engineer Battalion, Brigade Combat Team 1, 1st Infantry Division, Fort Riley, KS, mans the turret of an Armored Personnel Carrier in Ar Ramadi, Iraq. (DoD photo by: PFC Brandon E. Loveless, USMC)*