Fiscal Year 2004 Secretary of Defense Environmental Awards Nomination

ENVIRONMENTAL RESTORATION

FORT RILEY, KS

Sustain the Mission. Secure the Future.

INTRODUCTION

In 1853, the Army established Fort Riley as a frontier cavalry post, strategically positioned to protect trade and travel along the Santa Fe and Oregon Trails. Today, Fort Riley is known as "America's Warfighting Center," a modern military installation providing training, readiness and deployment support for US Army Reserve, National Guard and active duty troops.

Spanning 100,656 acres across the Flint Hills, Fort Riley is located approximately 125 miles west of Kansas City, Kan. Fort Riley has an approximate population of 47,775: 4,813 civilians, 11,616 Soldiers and 31,346 family members and retirees. In FY 2003, Fort Riley's economic impact on communities surrounding the base, as well as the state, was over $866.7 million.

Fort Riley's mission is to combine military readiness with environmental stewardship, while providing an exemplary quality of life for Soldiers, their families and the civilian workforce. In support of this goal, the Directorate of Environment and Safety (DES) protects life, property and natural resources for use today and in the future by integrating environmental stewardship and risk management with Fort Riley's mission. In this role, DES manages 145 miles of rivers and streams, over 1,500 wetland acres and 200 plant species and a broad variety of wildlife, including threatened and endangered species like the bald eagle.

BACKGROUND

Meeting Environmental Challenges

Fort Riley's Installation Restoration Program (IRP) team is committed to environmental restoration and protection by addressing conditions resulting from previously accepted practices. In the past, over 50 of Fort Riley's IRP sites were designated as closed without regulatory concurrence. The team's current challenge is to adequately investigate these sites and obtain regulatory closure. Despite these obstacles, the current IRP team has paved a path to success through dynamic collaboration with regulators and a determined focus on achieving site closeout and restoring beneficial reuse while protecting human health and the environment.

Figure 1 details the history of Fort Riley's environmental restoration in terms of program milestones for each Operable Unit (OU).

Figure 1. Fort Riley Installation Restoration Program Milestones

	OU 001	OU 002	OU 003	OU 004	OU 005
ROD	1997	1997	2006	2005	2006
PP	1994	1997	2005	2004	2005
FS	1994	1997	1998	2003	2004
RI	1994	1993	1995	2001	2003
PA/SI	1993	1993	1993	1995	1998

Maintaining a Unified Team

A unified team of professionals executes the Fort Riley IRP, a part of the DES Conservation Division. The Chief, Conservation Division, DES, who reports to the Director of Environment and Safety, is the Remediation Project Manager (RPM). A geologist, who reports to the RPM, supervises three IRP site/project managers: two environmental engineers and an environmental protection specialist (a biologist with risk assessment expertise).

Managing Toward Goals

While the IRP is a process-driven program, the Fort Riley team aspires to be results oriented. The objective for all contaminated sites – to be cleaned up, closed and have unrestricted land use – is always foremost in the team's mind. By focusing on the projected completion dates of primary documents during meetings and in published schedules, the IRP management has shifted the team's focus and energy to the overarching goal of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA): to achieve the regulatory designations "Response Complete" or "No Further Action required." In addition, Fort Riley relied on strong regulatory partnerships to help reduce cleanup costs and shorten project schedules. Fort Riley considers its counterparts at the US Environmental Protection Agency (USEPA) and the Kansas Department of Health and Environment (KDHE) to be crucial and invaluable members of the IRP team.

Involving the Community

Since 1997, Fort Riley has involved surrounding communities in environmental restoration activities through the Restoration Advisory Board (RAB). In July 2002, RAB members reduced their meeting frequency from bimonthly to quarterly because they agreed the IRP was accomplishing its goals in a timely manner and needed less oversight. Between meetings, Fort Riley keeps RAB members informed through a quarterly newsletter and updates to the Fort Riley Web site. Additionally, the RAB Community Co-Chair actively participates in the annual Installation Action Plan workshop. RAB outreach initiatives have included open houses, off-post meetings at convenient locations (including a local university) and personal invitations to adjacent landowners. Fort Riley is currently updating its community involvement plan, which was first developed in 1992.

▲ *Fort Riley RAB meetings are held quarterly and serve as a primary mechanism through which the Army communicates with the public about the IRP.*

PROGRAM SUMMARY

Fort Riley was added to the National Priority List in 1990. IRP staff initiated field work in 1993. The objective of Fort Riley's IRP is to attain the Defense Environmental Restoration Program (DERP) goals in a manner that supports the installation's mission and efficiently uses budgetary and personnel resources. Specifically, the IRP team strives to meet two components outlined in the DERP's first statutory goal:

> "The Fort Riley IRP staff has shown a commitment to its restoration goals, to the environment and to a working relationship that is not often found. The attitude of solving the issues in the most expeditious and cost-effective fashion has proven extremely effective."
>
> – *Bryant Burnett, USEPA*

1. Identification, investigation, research and development and cleanup of contamination from hazardous substances, pollutants and contaminants. Fort Riley is on track to reach Records of Decision (RODs) for the current OUs by 2006 or earlier. Innovative approaches are being used to address the remaining, inadequately investigated group of sites. Due to technical and administrative constraints, as recently as 2003 Fort Riley anticipated being unable to meet the Defense Planning Guidance (DPG) goals, requiring all cleanup/remedial systems for high relative-risk sites to be in place by FY 2007. Through subsequent collaborative efforts with the KDHE, USEPA, US Army Corps of Engineers (USACE) and environmental contractors, Fort Riley designed a condensed process - which streamlined development of Feasibility Studies, Proposed Plans and RODs to expedite closure of sites with contamination below maximum contaminant levels (MCLs). The streamlined remedy selection process will ultimately allow Fort Riley to achieve closure ahead of the DPG goals and under budget.

2. Correction of other environmental damage (such as detection and disposal of unexploded ordnance [UXO]), which creates an imminent and substantial endangerment to the public health, welfare or environment. The former Southwest Funston and Camp Forsyth Landfills are located adjacent to the Kansas and Republican Rivers, which traverse nearby cities and rural areas. Serious erosion along the riverbanks threatened to release toxic landfill contaminants and UXO materials into the rivers. To reduce risks to human health and local ecosystems, Fort Riley constructed limestone baffles to provide riverbank stabilization, conducted periodic UXO surveys followed by UXO removal or detonation, seeded native grass landfill covers and posted warning signs for the public. While Fort Riley personnel continue to identify and safely dispose of UXO along the riverbanks, an April 2003 survey found that the risk management initiatives implemented have proven highly effective in protecting the public from harm.

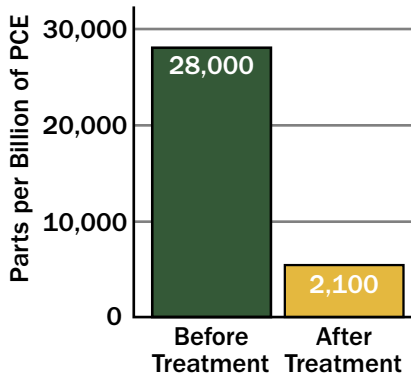
ACCOMPLISHMENTS

Innovative Technologies: Soil Remediation Pilot Study (OU 005)

In March 2004, Fort Riley initiated a soil remediation pilot study to remove chlorinated solvents at OU 005, a former graveled motor pool and artillery gun shed area. The study tested the use of potassium permanganate ($KMnO_4$) to oxidize tetrachloroethylene (PCE), trichloroethylene (TCE) and dichloroethylene (DCE) present in a "hot spot" under the asphalt. Extensive soil sampling showed the primary contaminant, PCE, to exist at potentially hazardous levels ranging up to 28,000 parts per billion (PPB).

The IRP staff first investigated the use of permeable reactive barriers (PRBs) to treat the contamination; however, they concluded PRBs were not a cost-effective option. They halted the study, which saved Fort Riley more than $1.75 million and shortened the time required to attain a ROD by approximately one year. After consulting with the KDHE, USEPA and USACE, Fort Riley decided to use $KMnO_4$ to oxidize the chlorinated solvents to produce benign byproducts.

Figure 2. Reduction in PCE Levels at OU 005



After removing the asphalt, a contractor used a modified excavator equipped with a Deep Digger In-Situ Blender to mix 13,000 pounds of $KMnO_4$ and 22,000 gallons of water to a depth of 10 feet below ground. Three weeks later, the highest recorded levels of PCE in the soil samples dropped more than 90 percent.

Due to the project's effectiveness, the installation's regulators allowed Fort Riley to decrease sampling to 16 monitoring wells yearly rather than 38 wells biannually, as well as to

In-situ Potassium Permanganate Treatment

▲ *Asphalt removal.*

▲ *Potassium permanganate being added to soil.*

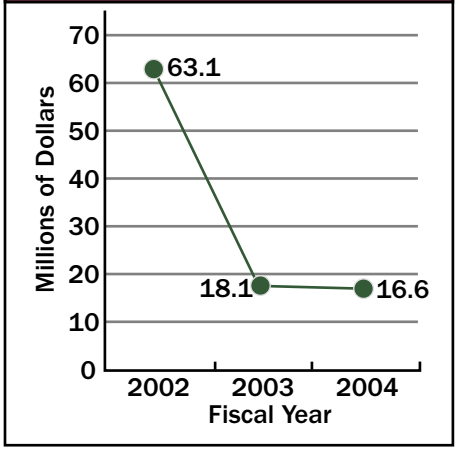
▲ *Digging and blending.*

decrease the number of analytes sampled. Blending $KMnO_4$ into the soil shortened the estimated Monitored Natural Attenuation (MNA) time from 20 years to approximately five years. By shortening the cleanup timeframe and thereby reducing the need for long-term monitoring, the IRP team saved Fort Riley an additional $2.5 million.

Fast Track Cleanup: Dry Cleaning Facilities Area (OU 003)

The IRP staff is remediating two areas contaminated with PCE at the Dry Cleaning Facilities Area. In 2003, the projected completion date for the Feasibility Study Addendum was October 2007. Fort Riley, with regulator concurrence, bypassed preparing a technical memo and began work early on the addendum, which was completed in February 2005.

Figure 3. Estimated Cost-to-Complete for IRP Projects



This spring, Fort Riley will initiate a pilot study to test removal technologies for the contaminant source. Soil excavation will be conducted at one area of concern to determine if MNA will reduce groundwater contaminant levels after the excavation has been completed. In the second area of concern with deeper soil contamination, either in-situ enhanced bioremediation or in-situ chemical oxidation will be used to remediate the contaminant source. The groundwater will also be monitored to determine if MNA will effectively reduce contaminants below risk levels. If the pilot study is successful, further remedial actions may not be necessary—shortening the response complete date by years and reducing the project costs by millions of dollars.

Partnerships with Regulators

By maintaining an excellent working relationship with the installation's regulators and support agencies, Fort Riley informally resolves issues that could lead to schedule delays or formal disputes. For example, in July 2003 the Fort Riley IRP staff worked with the USEPA and the KDHE to reduce the total cost-to-complete for Fort Riley restoration projects by $45 million. In 2004, the IRP staff collaborated with the KDHE and USEPA to shorten the time required to complete Fort Riley's three outstanding OUs by as much as one year per OU, which reduced the total cost-to-complete figure by an additional $1.5 million.

Every month, IRP managers meet with the USEPA and the KDHE representatives to present site status updates and discuss environmental restoration progress, emerging problems and outstanding issues. Additionally, the USACE Kansas City District assigns a project manager to Fort Riley who interfaces with the IRP staff and calls upon geologists, chemists and risk assessors to provide advice to the IRP team and review documents. Fort Riley also meets regularly with the US Geological Survey, and consults with Army support agencies. For IRP actions within endangered species habitats, IRP staff consult with the Kansas Department of Wildlife and Parks and the US Fish and Wildlife Service.

> "The Fort Riley IRP staff has shown an outstanding commitment to environmental stewardship. Combined with their technical expertise, problem solving skills and cooperation, the IRP team has worked effectively with the regulators and local community not only to achieve substantial time and cost savings, but to implement highly-effective environmental solutions. It has been a pleasure to work with these dedicated individuals to meet the needs of the Army, the EPA and the state of Kansas."
>
> *– Rob Weber, KDHE*

Risk Reduction Initiatives: Former Fire Training Area – Marshall Army Airfield (OU 004)

OU 004 was used previously to conduct fire-training exercises during which flammable liquids were poured into the training area, ignited and then extinguished. An inadvertent release of PCE in 1982 impacted the soil and groundwater. Installation-wide and site-specific investigations ascertained

that groundwater contamination extended off post. In 1995, the IRP staff used soil vapor extraction and bioventing to treat the contaminant source. MNA has substantially reduced the contaminant plume over the last several years with only one well remaining above MCLs for the daughter product, DCE. To address regulatory concerns, IRP staff replaced two water supply wells for private landowners and plugged and abandoned five substandard wells in 2003. These actions removed the potential risk for exposure and represent a successful collaboration between Fort Riley, the regulators and the community.

Collaboration with Small and Disadvantaged Businesses

Fort Riley's commitment to collaborating with small and disadvantaged businesses is evidenced by the IRP's budgetary figures: In FY 2003, 17 percent of Fort Riley's $2.7 million in IRP work was performed by small businesses, a percentage which grew to 30 percent of Fort Riley's $1.25 million IRP work in FY 2004. Small and disadvantaged businesses have supported many environmental restoration projects over the past two years, including long-term groundwater monitoring activities, site investigations for a removal action, soil and groundwater sampling analysis and subsurface investigations.

CONCLUSION

Fort Riley's IRP has achieved success by testing innovative technologies, reducing risks to human health and the environment, collaborating with small and disadvantaged businesses and working hand-in-hand with regulators to reduce environmental restoration costs and the time required to complete restoration projects. Moving forward, the IRP team will continue to support military readiness by providing Fort Riley and the surrounding community with an unparalleled level of excellence as it fulfills its objectives.

▲ *This map shows the former fire-training area where Fort Riley has conducted soil vapor extraction bioventing to treat contamination.*

▲ *Workers plug an existing monitoring well on Fort Riley (pre-treatment).*

"I am proud of Fort Riley and its continuing efforts to preserve our environment by improving the quality of water, air and natural resources through sensible and meaningful actions."

– U.S. Congressman Jerry Moran