

FISCAL YEAR 2005 SECRETARY OF DEFENSE  
US ARMY ENVIRONMENTAL AWARDS NOMINATION



# FORT LEWIS, WA

## ENVIRONMENTAL RESTORATION



SUSTAINING  
THE ENVIRONMENT  
FOR A SECURE FUTURE

## INTRODUCTION

The Fort Lewis Environmental Restoration Program (ERP) has undergone an innovative paradigm shift in environmental management strategy that has produced dramatic results during the past two fiscal years. Fort Lewis' methods and strategy have not only been successful for this installation but also have significant implications for use throughout other Department of Defense (DoD) installations.

The Fort Lewis environmental management strategy involves use of an in-house team of qualified professionals to complete routine engineering work rather than relying solely on support from outside organizations. The most immediate and notable results of this management strategy to date have been: 1) significant cost savings; 2) increased performance in restoring land for military missions; 3) improved ability to successfully employ innovative technologies for site investigation and cleanup; and 4) improved community relations and regulator acceptance.

"By creating the new ERP team, they showed a strong commitment to the environment. Fort Lewis has always gone beyond the minimal regulatory requirements – they don't just do what's necessary, they do what's right."

- Bob Kievit, USEPA

maneuver training area located in the desert of central Washington.

The Fort Lewis ERP is tasked with the investigation and cleanup of sites at Fort Lewis and its sub-installations that are regulated by the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) or the Resource Conservation and Recovery Act (RCRA) corrective action program. Community and regulator involvement are critical components of the program.



*Fort Lewis is home to the Army's first two Stryker Brigades. Above, a Stryker and its crew participate in maneuver training at Yakima Training Center.*

The Program is responsible for four sites on the CERCLA National Priority List (NPL) and manages 12 non-NPL CERCLA sites. The program is also responsible for completing RCRA corrective actions at hundreds of RCRA corrective action sites at Fort Lewis and Yakima Training Center.

For the past five years, the Fort Lewis ERP has been responsible for both the Environmental Restoration and Compliance Cleanup Programs. Although ERP and Compliance Cleanup are separately funded programs, Fort Lewis has found tremendous synergy in managing the two programs with a single in-house team since the nature of the work is identical.

Sites managed by Fort Lewis ERP include former landfills, former small arms ranges, underground storage tanks, disposal pits, industrial yards and spill sites. Common contaminants include heavy metals, chlorinated solvents, petroleum products, pesticides and munitions constituents.

## PROGRAM SUMMARY

Prior to FY 2003, the Fort Lewis ERP operated in much the same manner as ERPs across the country. The primary function of the Fort Lewis ERP was to transfer ERP and Compliance Cleanup funding and technical workload to the United States Army Corps of Engineers (USACE), who in turn usually contracted the requested work out to an engineering consulting firm. In essence, USACE contractors completed

## BACKGROUND

Located in western Washington near the southern tip of Puget Sound, Fort Lewis is surrounded by the communities of DuPont, Lakewood, Roy, Steilacoom and Spanaway. Tacoma and Olympia, two of Washington's largest cities, are located to the northwest and south of the installation. In addition to more than 25,000 Soldiers and civilian workers, the installation supports 120,000 retirees and 29,000 family members, making it the Army's fourth most populous installation.

The 87,000-acre installation is the premier Army installation in the Northwest Region and is the only power projection platform on the West Coast. Yakima Training Center, a 327,000-acre sub-installation of Fort Lewis, is a high quality Army

the projects while USACE and Fort Lewis provided additional layers of management and quality control.

Beginning in late FY 2002, the Fort Lewis ERP Manager and supervisors within Fort Lewis' Public Works decided to make an innovative change in the way Fort Lewis' ERP operates. Fort Lewis realized that by hiring the same quality of experienced contractors used by USACE, an in-house ERP team could complete the same work in a more streamlined fashion. In doing so, the in-house team would dramatically simplify the layers of management, communication, contracting, funding, reporting and quality control from three organizations (i.e., the installation, USACE and USACE contractors) to just the installation.

The Fort Lewis ERP Manager began by adding an Environmental Engineer/Hydrogeologist to the ERP staff. When cost savings and improved performance exceeded expectations, Fort Lewis hired a Civil Engineer and Geologist in FY 2004 and a Chemist in FY 2005 to complete the ERP Manager's vision.

Typical technical tasks for the in-house ERP team include: 1) completing the planning, field work and reporting tasks for projects in all remedial action phases from preliminary assessment through remedy implementation; 2) writing decision documents for remedy selection and site closeout; and 3) maintaining the administrative record, community relations program and land use control plan.



Groundwater monitoring wells are installed as part of an in-house Site Investigation at one of Yakima Training Center's ERP sites.

## ACCOMPLISHMENTS

### Cost Savings

The cost savings realized through the redesign of the Fort Lewis ERP are significant. As shown in Table 1, the team has realized savings of \$500,000 per year by completing recurring remedial action operation and long-term monitoring tasks in-house at five Fort Lewis ERP sites.

Site #/Phase	Previous Annual Cost (\$K) [1]	Current Annual Cost (\$K)
FTLE-33 RAO	735	383 [2]
FTLE-54 LTM	30	1
FTLE-57 LTM	80	3
YFCR-01 LTM	25	3
YFCR-53 LTM	25	5
<b>TOTAL</b>	<b>\$895K</b>	<b>\$395K</b>

[1] From FY 2003 or FY 2004 Installation Action Plan  
 [2] Includes labor cost of two contracted in-house staff

The in-house team also realized almost \$4 million in savings during FY 2004 and FY 2005 by completing various phased, non-recurring ERP projects as shown in Table 2.

Site #/Phase	Estimated Cost (\$K) [1]	Actual In-house Cost (\$K)
FTLE-18 Decision Document	5	0
FTLE-31 Remedial Action	3000 [2]	0
FTLE-59 Site Investigation	55	8
FTLE-62 Remedial Investigation	130	0
FTLE-69 Remedial Action	400	3
FTLE-18/46/69 Well Decommissioning	40	13
YFCR-01/32/34 Site Investigation	260	68
YFCR-47 Remedial Action	45	0
YFCR-49/50 Site Investigation	255	70
Labor cost of one contracted in-house staff for two years		250
<b>TOTAL</b>	<b>\$4,190K</b>	<b>\$412K</b>

[1] From FY 2003, FY 2004 and/or FY 2005 Installation Action Plan  
 [2] Based on January 2005 Decision Document

Similar cost savings have also been produced for Compliance Cleanup-funded sites. Prior to FY 2004, the annual budget spent on Compliance Cleanup work at Fort Lewis and Yakima Training Center ranged from \$1.5 million to \$2 million per year. At the end of FY 2005, the total cost-to-complete estimate for all Fort Lewis and Yakima Training Center Compliance Cleanup sites has been reduced to only \$537,000. In fact, the former Evergreen Infiltration Range cleanup described below was funded in FY 2004 – years ahead of schedule – because the Fort Lewis ERP realized an FY 2004 Compliance Cleanup cost reduction of approximately \$1 million.

**Increased Performance in Restoring Land for Military Missions**

The objective of any restoration program is to complete remediation of contaminated sites. As established by Defense Planning Guidance, one of the most important performance metrics is obtaining Remedy-in-Place (RIP) status. As illustrated in Table 3, Fort Lewis’ ERP has officially obtained RIP status for eight of the 10 remaining CERCLA sites over the past two fiscal years and is positioned to obtain RIP for all sites well ahead of the RIP deadline.

**Table 3. RIP Status at Fort Lewis CERCLA Sites**

Site #	RIP Goal (FY)	Actual RIP Date (FY)	Site #	RIP Goal (FY)	Actual RIP Date (FY)
FTLE-10	2007	1999	FTLE-46	2007	2005
FTLE-16	2014	2005	FTLE-51	2014	2007 (projected)
FTLE-17	2014	1999	FTLE-54	2011	2004
FTLE-18	2007	2005	FTLE-57	2007	2004
FTLE-28	2014	1999	FTLE-58	2007	1992
FTLE-31	2007	2005	FTLE-59	2014	2006 (projected)
FTLE-32	2007	1999	FTLE-67	2007	2002
FTLE-33	2007	2005	FTLE-69	2014	2005

Fort Lewis’ ERP has obtained response complete (RC) status, the ultimate ERP goal, for two of its CERCLA sites in the past two years and a third site slated to receive RC status in FY 2006. Fort Lewis’ ERP has also positioned itself to obtain RIP or RC status for the entire Yakima Training Center sub-installation by the end of FY 2006.

The ERP team has also been able to obtain RC status for the majority of Fort Lewis RCRA corrective action sites over the past two fiscal years. The number of non-RC sites and the amount of land those sites occupy on Fort Lewis has been dramatically reduced from 92 separate sites covering approximately 1,200 acres in FY 2003 to 18 sites totaling only 80 acres at the end of FY 2005.

The increased performance of Fort Lewis’ ERP has enabled the Program to more effectively enhance the military and civil works mission at Fort Lewis by: 1) decreasing the amount of Fort Lewis and Yakima Training Center lands with environmental restrictions; 2) increasing funding for other Army programs by decreasing required funding for ERP and Compliance Cleanup sites; 3) effectively implementing land use controls via a comprehensive land use plan that does not discourage appropriate redevelopment or training; 4) championing sensible brownfield redevelopment projects such as construction of a softball complex on top of a former landfill; and 5) improving ERP outreach to other land use planning and training organizations at Fort Lewis through a dig permit process, land use “deconfliction” meetings and master planning coordination.

**Employing Innovative Technology**

Since the in-house ERP team is designed for routine and recurring engineering work, Fort Lewis’ ERP continues to partner with USACE Seattle District, Army and national laboratories, and contractors when specific technical expertise or substantial project support is needed. However, the interaction with these experts is now more efficient with the in-house team. Four prominent examples of successful innovative technology partnerships at Fort Lewis

“The first thing that struck me was how responsive Fort Lewis and the Army were when the new program was implemented. Working with the in-house team seemed to take only one-third of the time. [It] truly was a world of difference between the former program and how it is now.”

- Greg Caron, Washington Department of Ecology

in FY 2004 and FY 2005 have been: 1) electrical resistance heating (ERH) at the Logistics Center NPL site; 2) ERH performance assessment activities; 3) research projects funded by DoD research and development programs; and 4) a soil recycling project at a former small arms range.

**ERH at the Logistics Center.** The Logistics Center site includes a former industrial landfill, where chlorinated solvents and other wastes were historically dumped. The landfill has contaminated groundwater with multiple trichloroethene plumes. By using ERH – an in-situ electrical heating technology that applies electricity into the ground to volatilize contaminated soil and groundwater for subsequent recovery – the team has recovered and destroyed more than 2,800 pounds of solvents and 24,000 pounds of various other hydrocarbons from the landfill. The ERH project has prevented future groundwater contamination and has reduced the projected cleanup timeline from the very distant to the foreseeable future.



*Electrical resistance heating, an in-situ technology, in use at the Logistics Center NPL site.*

**ERH Performance Assessment.** When the Army decided it needed to verify the effectiveness of ERH at Fort Lewis, since the technology has the potential for application at other DoD sites, the in-house Fort Lewis ERP team provided the necessary leadership to keep a complex team of researchers and stakeholders from Fort Lewis, the US Army Environmental Center, US Environmental Protection Agency (EPA), USACE, Pacific Northwest National Laboratory, multiple teams of university researchers and various contractors on schedule

and within budget. A discussion of the specific innovative technologies used to assess the performance of ERH is beyond the scope of this nomination as evidenced by the acceptance of eight technical abstracts from the larger Fort Lewis ERP team of experts at Battelle's 2006 Remediation of Chlorinated and Recalcitrant Compounds Conference.

**DoD Research.** There have been many notable research projects undertaken at Fort Lewis in recent years. One of the more promising research projects has been a pilot test funded by the Environmental Security Technology Certification Program. This project is studying enhanced dissolution of chlorinated solvents prior to in-situ bioremediation. Preliminary results indicate that proprietary additives can increase mass transfer of non-aqueous phase liquid into the dissolved groundwater phase, which greatly improves biodegradation of chlorinated solvents in groundwater.

**Soil Recycling Project.** An expedited cleanup of lead in soil at the former Evergreen Infiltration Range was required due to construction of military barracks on the site. The cleanup was completed after 9,000 tons of soil and nearly one ton of bullets were removed. By separating bullets from the soil and utilizing a phosphate additive that prevents lead in soil from leaching, Fort Lewis' ERP was able to recycle the excavated soil at an active small arms range – which resulted in significant cost savings by minimizing hauling and disposal costs compared



*At the former Evergreen Infiltration Range, a phosphate-based stabilizer is added to prevent lead in the soil from leaching during a soil recycling project.*

to a traditional “dig and haul” approach. Other innovative project optimizations included the use of a performance-based contract, use of EPA’s “Triad” investigation approach, use of an X-ray fluorescence instrument to guide excavation, and dry sieving of soil to remove uncontaminated gravels from the waste stream.

**Improved Community Involvement and Regulator Acceptance**

Due largely to the fact that Fort Lewis’ ERP consistently completes projects that are timely, cost-effective and protective of human health and the environment, surrounding communities have expressed no interest in establishing a Restoration Advisory Board (RAB) at Fort Lewis or Yakima Training Center. Despite the absence of a RAB, Fort Lewis ERP continues to employ many traditional community involvement methods such as maintaining the installation’s administrative record, seeking public comment on proposed remedies, holding monthly regulator meetings and participating at regional and national conferences.

Not content with the status quo, Fort Lewis ERP has also improved its community involvement and outreach program by conducting annual



*As part of its community involvement and outreach, Fort Lewis hosts annual open house events at its facilities. Above, exit interviews are conducted during the 2005 Installation Restoration Program Open House.*

open houses of its facilities, hosting field trips, distributing annual community newsletters and sponsoring research projects.

Fort Lewis has always enjoyed strong relationships with the EPA and state regulators. Since regulators were intimately aware of the time and cost involved with the traditional ERP management model, EPA and state regulators were supportive of the switch to the Fort Lewis ERP in-house team. Since creation of the in-house team, they have repeatedly praised the

Fort Lewis ERP for its improved ability to investigate and clean up sites in a more effective and less time- and cost-consuming manner.

**Intangible Benefits**

While this nomination highlights some of the quantifiable results produced by Fort Lewis, there are other direct benefits created by the in-house team, which include: 1) improved retention of institutional knowledge; 2) improved program flexibility; 3) streamlined communication; 4) improved program decision-making; 5) improved ability to educate regulators and resolve regulatory conflicts; and 6) improved manpower to support other core Fort Lewis Public Works’ functions such as the Sustainability Program, the Safe Drinking Water Act Program and the Toxic Substances Control Act Program.

**CONCLUSION**

A successful restoration program is critical to an installation’s ability to maintain mission readiness. The creation of an in-house Fort Lewis ERP team has enabled Fort Lewis to maintain mission readiness and address environmental challenges in a more responsive, dynamic and efficient manner.

“It’s heartening to look at Fort Lewis and be able to see real environmental benefits as a result of the new ERP program.”  
- Greg Caron, Washington Department of Ecology

The innovations and efficiencies realized by Fort Lewis can be applied at other appropriate installations. The synergy, flexibility, innovation, performance and cost savings realized by the Fort Lewis ERP are indicative of a program second to none.

*On the cover: Top: Aerial view of Mount Rainier. Bottom: Pfc. Jose Ruiz overlooks Mosul from a rooftop during a combat operation. Ruiz is a member of the 3rd Battalion, 21st Infantry Regiment, 1st Brigade, 25th Infantry Division (Stryker Brigade Combat Team) from Fort Lewis, Wash.*