

# Public Works

## D I G E S T

Volume XXVI, No. 2  
April/May/June 2014



### ARMY

# EARTH DAY

## 2014

#### **Acknowledge the past**

by restoring Army lands to usable condition and by preserving cultural and historical resources.

#### **Engage the present**

by meeting environmental standards, enabling Army operations, and protecting Soldiers, Families and communities.

#### **Chart the future**

by institutionalizing best practices and use of technology to ensure future environmental resiliency.



**SUSTAIN THE MISSION**



**SECURE THE FUTURE**



Assistant Secretary of the Army, Installations, Energy & Environment: [www.army.mil/asaeec](http://www.army.mil/asaeec)  
ARMY EARTH DAY [aec.army.mil/Outreach/PublicInitiatives/EarthDay.aspx](http://aec.army.mil/Outreach/PublicInitiatives/EarthDay.aspx)



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On April 22, the U.S. Army will join the worldwide observance of Earth Day. Army Earth Day provides an opportunity to inspire awareness and appreciation of the environment and the Army's commitment to environmental stewardship on the more than 13 million acres of land on which our Soldiers, Families, and Civilians train, live and work.

# Public Works DIGEST

Volume XXVI, No. 2  
APRIL/MAY/JUNE 2014



U.S. Army Installation  
Management Command  
2405 Gun Shed Road  
Fort Sam Houston, TX 78234-1223

*Public Works Digest* is an unofficial publication of the U.S. Army Installation Management Command, under AR 360-1, The Army Public Affairs Program. Method of reproduction: photo-offset; press run: 1,600; estimated readership: 5,000. Editorial views and opinions expressed are not necessarily those of the Department of the Army. Mention of specific vendors does not constitute endorsement by the Department of the Army or any element thereof.

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Printed on recycled  
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## IMCOM Sustainability - Then and Now

by S. Lynn Odom

Sustainability has taken on many facets within the Installation Management community over the past 15+ years. The concept of Installation sustainability was inspired by Garrison-level action officers seeking to demonstrate the core of what Installation Management Command (IMCOM) does – manage mission critical resources “to maintain the ability to operate into the future without decline—either in the mission or in the natural and man-made systems that support it..., recognizing that it must plan for and act in a sustainable manner now in order to build an enduring future.”<sup>1</sup> Then, Garrison staffs on the cutting-edge of establishing a sustainable installation, deliberately planned – taking into consideration the Installation mission, economic impact, environmental stewardship and the local community. If passions did not wane, they collaboratively worked through to resolution several Installation-wide issues related to resource limited capacities and capabilities.

One of the first Headquarters documents supporting those motivated IMCOM action officers was the Army’s Strategy for the Environment (ASE) published 1 Oct 2004, with its now famed motto: “Sustain the Mission – Secure the Future.” This strategy acknowledges the interdependence among the requirements of the military mission, natural environment, and community well-being (soon after augmented with economic benefit) – known as the “Triple Bottom Line Plus” – and has six enduring goals that are still relevant today.

### 1. Foster a Sustainability Ethic

*“It is our shared responsibility to ensure we remain the premier Army and the premier Joint Force in the world.”*

*–GEN Odierno, Chief of Staff,  
United States Army  
7 November 2013*



S. Lynn Odom, Ph. D.

2. Strengthen Army Operations
3. Meet Test, Training and Mission Requirements
4. Minimize Impacts and Total Ownership Costs
5. Enhance Well-Being
6. Drive Innovation

Now the concept of achieving a sustainable installation is widely supported as implementing Net Zero Energy, Water and Waste.<sup>2</sup> Army Directive 2014-02 (Net Zero Installations Policy) issued 28 Jan 2014, “sets policy and assigns responsibilities to strive toward Net Zero at all Army installations<sup>3</sup>...” Through this directive, the Secretary of the Army is striving to integrate and improve management practices associated with energy, environmental and green procurement programs via a holistic strategy. The intent is to use traditional financial resource streams; and leverage contract support, public- private and public- public partnerships<sup>4</sup>, alternative agreements, and enhance-use leases. Installation performance with respect to achieving Net Zero goals will be tracked and reported through existing reporting systems with Command oversight and certification on a quarterly and annual basis. The now required sharing of information, best practices, lessons learned and success stories through quarterly

Acronyms and Abbreviations	
ASA (FM&C)	Assistant Secretary of the Army for Financial Management and Comptroller
ASE	Army Strategy for the Environment
DOD	Department of Defense
FY	Fiscal Year
IMCOM	Installation Management Command
OACSIM	Office of the Assistant Chief of Staff for Installation Management
OASA(IE&E)	Office of the Assistant Secretary of the Army for Installations, Energy and Environment
SSPP	Strategic Sustainability Performance Plan

conference calls will provide Installations the opportunity to excel by building on the achievements and avoiding the set-backs experienced by other Installations in the Command.

While this Directive and the numerous interlinked requirements cited therein may seem daunting, an abundant source of best-practices, reports, guides and tools have been developed<sup>5</sup> to assist Installation staff. Despite the fact that these sources and links are extremely helpful, it will take an integrated planning, implementation, and management process<sup>6</sup> firmly aware of our financially constrained and competitive environment to achieve the aggressive ‘Net Zero’ goals set forth.

According to Assistant Secretary of the Army (Financial Management and Comptroller) (ASA (FM&C)) budget documents<sup>7</sup>, Fiscal Year (FY) 2015 “continues declining budget levels, necessitating end strength reductions and deferred modernization programs.” Given this reality the ASA (FM&C) the FY 2015 Budget Overview Briefing states, “the Army must adapt, innovate, and make difficult decisions impacting the Total Force.” Coming full-circle, the 2004 ASE declares that the Army must understand “the true cost of doing business” – i.e. ➤



(continued from previous page)

internalizing and quantifying cost that are hidden or transparent by integrating the principles and practices of sustainability [i.e. methods of long-term resource use] to “minimize impacts and total ownership costs of Army systems, materiel, facilities, and operations.”<sup>8</sup>

Keys to success include comprehensive and validated Life Cycle Cost Analysis and the amalgamation of efforts that break down barriers to cooperative collaboration 1) between IMCOM staff (internal sharing of responsibilities), and 2) by partnering with other agencies, Installation tenants and the local community (external sharing of responsibilities).


Forthcoming guidance associated with the requirements of Army Directive 2014-02 will be provided by the Office of the Assistant Chief of Staff for Installation Management (OACSIM), who will provide Command progress updates on a quarterly basis to the Office of the Assistant Secretary of the Army for Installations, Energy and Environment (OASA (IE&E)).

The many facets of sustainability (i.e. the organizational long-term resource use methods) are cross-functional complex issues needing collaborative resolution because the use of short-sighted resource use methods have the potential to configure these complex issues into functional niches or silos, e.g. sustainable high performance buildings; energy and water security; non-hazardous solid waste reduction;



rain water/stormwater management; and training lands management. This organizational tendency to isolate functional areas serves to dismantle efforts to comprehend functional interdependency and the true efficiencies revealed through integrated management and “achieve an enduring Army enabled by sustainable operations, installations, systems, and communities.”<sup>9</sup>

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#### Endnotes

- 1 Department of Defense (DOD) Strategic Sustainability Performance Plan (SSPP), 20 Sep 2013. Here the DOD demonstrates understanding that ‘sustainable’ (as an adjective) describes long-term behavioral methods related to resource use, where ‘sustainability’ (as a noun) is the long-term resource use method being referenced [definitions from Merriam-Webster Dictionary]. IMCOM resources (according to IMCOM Policy Memo 11-32) are human capital, natural capital, infrastructure (man-made) capital, information technology, financial capital and energy.
- 2 See <http://armylive.dodlive.mil/index.php/2011/02/armys-net-zero-initiative/> and <http://www.army.mil/standto/archive/issue.php?issue=2012-08-15>; and for historical information on the ASA (IE&E) pilot Net Zero initiative.
- 3 Emphasis added by the author.
- 4 See 10 USC §2336 and IMCOM Fragmentary Order 01 to Operations Order 13-196, Intergovernmental Support Agreements (IGSA) also known as Public to Public Partnerships (U).
- 5 See <http://www.asaie.army.mil/Public/ES/netzeroindex.html> and <https://eko.usace.army.mil/public/fa/netzero/> for two Net Zero data collections and supplementary links (the USACE link requires Common Access Card authentication). See <http://www.denix.osd.mil/sustainability/Index.cfm> for DOD Sustainability policy, guidance and success stories.
- 6 As advocated by the ASE, 1 Oct 2004 and DOD SSPP, 20 Sep 2012.
- 7 See <http://www.asafm.army.mil/offices/BU/Budget-Mat.aspx?OfficeCode=1200>.
- 8 See the fourth goal outlined in the ASE, 1 Oct 2004
- 9 ASE, 1 Oct 2004.

### Useful Web Links

Army’s Strategy for the Environment:  
<http://www.asaie.army.mil/Public/ESOH/doc/ArmyEnvStrategy.pdf>

Secretary of the Army, Army Directive 2014-02 (Net Zero Installations Policy):  
[http://armypubs.army.mil/epubs/pdf/ad2014\\_02.pdf](http://armypubs.army.mil/epubs/pdf/ad2014_02.pdf)

## Call for ARTICLES

The July/August/September 2014

issue of the

Public Works Digest  
will feature

### Operations, Maintenance and Engineering

Deadline is June 6, 2014

Submit articles to  
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202-761-0022

### From the editor

Please note we are reducing the number of printed copies of the Public Works Digest. If the number you receive does not meet your need, please contact me at [editor.pwdigest@usace.army.mil](mailto:editor.pwdigest@usace.army.mil) Thank you.

*Kathye Gerrity-Milibrum  
Managing Editor*



# Promoting Sustainability is Good Business for the USACE

by James S. (Scott) Strotman

From providing technical expertise for sustainable design to developing strategies to address the increased focus on renewable energy and everything in between, the U.S. Army Corps of Engineers is making strides in the sustainability arena, both at our own facilities and at those Department of Defense installations we support.

Our Sustainability Program is aligned directly with the goals established in the 2009 Executive Order 13514: Federal Leadership in Environment, Energy and Economic Performance. We take a multi-faceted approach to advance our performance in meeting the goals set out in the EO, targeting both our internal operations and infrastructure, and the products and services we provide our customers, as well as training and educating both our employees, and employees of the DOD components, to further engrain sustainability and energy efficiency into our culture and all aspects of our missions and business processes.

As the Honorable Katherine Hammack, assistant secretary of the Army (Installations, Energy and Environment),

has noted: “Senior leaders of today’s Army are making a directed effort to embed sustainability into Army culture, from both the top-down and the bottom-up.”

Helping the Army do just that is the Corps of Engineers, which the Honorable Jo-Ellen Darcy, assistant secretary of the Army (Civil Works), has called “a remarkable and unique organization.” We have an unprecedented opportunity to lead the Nation in all aspects of sustainability.

“Sustainability is good business, good government, and it will save/avoid operations and maintenance costs, build trust among stakeholders, and it will attract the next generation of talent,” Darcy said.

Some of the ways we have been doing that is through providing assistance on the Army’s Net Zero policy, providing assistance in advanced metering, using innovative financing methods such as through Energy Savings Performance Contracts, identifying methods to reduce potable water consumption, recycling grey water and retrofitting sites for low-impact development.

USACE’s nine Regional Energy, Sustainable Design and Life Cycle Cost

Acronyms and Abbreviations	
DOD	Department of Defense
EO	Executive Order
FY	Fiscal Year
LEED	Leadership in Energy and Environmental Design
USACE	U.S. Army Corps of Engineers

Analysis Centers of Expertise are designed to share knowledge both within the Corps of Engineers and throughout DOD in sustainable design, water, renewable energy sources and life cycle cost analysis in 20 focus areas. Throughout the years, USACE personnel have acquired technical expertise in these 20 focus areas that are critical to both our agency and our customers as all of us attempt to achieve our sustainability goals. These centers run the gamut from ones devoted to wind, solar thermal energy and converting waste to energy to hydrology/low impact development, and many more inbetween.

In the last issue of The Public Works Digest, there was an article profiling Jeanette Fiess, sustainability and energy program manager for our Northwestern Division, who won the GreenGov



The U.S. Army Corps of Engineers Savannah District managed the \$168 million renovation of the Maneuver Center of Excellence Headquarters at Fort Benning, Ga. The building achieved Leadership in Energy and Environmental Design Gold certification in December 2012. (Kristian Ogden)



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“Sustainability Hero” award. One of the initiatives she was involved with was developing sustainability training, along with Judy Milton of our Savannah District. What began as a one-day class turned into a week-long class that not only trained Corps of Engineers employees, but employees across DOD as well, so everyone could understand the sustainability requirements and work together to find ways to implement them.

That’s one way we’re leading the way in sustainability, another way is through our construction program. Most people know that the Army has built more than 380 Leadership in Energy and Environmental Design (LEED) projects. Although we only specify that projects meet LEED Silver certification, a number of our general contractors have been successful in obtaining not only Gold certification, but five facilities have obtained Platinum certification. Fort Carson has been the sustainability star when it comes to new buildings, as 46 of the LEED projects, or

12 percent, have been constructed at Fort Carson, and two of them, the Wilderness Road Complex and the EAB Complex, are LEED Platinum facilities.


Building new is challenging, but retrofitting an older building can be almost daunting. Our Savannah District excelled in a project to renovate the Maneuver Center of Excellence Headquarters (Bldg. 4) at Fort Benning, Ga. The 1964 building, now known as McGinnis-Wickham Hall, was renovated from top to bottom, saving the Army almost \$50 million in what it would have cost to demolish and replace it with a brand-new facility. The building, which achieved LEED Gold certification in December 2012, uses high-efficiency equipment, building automation systems, intelligent light and spray foam insulation to reduce the facility’s energy demands. It has 40,000 square feet of solar panels. The combination of energy demand reduction measures and renewable energy are expected to produce about \$450,000 a year in energy savings. It serves as a model for the Army to consider when deciding

whether to renovate existing facilities or construct new structures in the future.

With the Dec. 5 Presidential Memorandum on Federal Leadership on Energy Management, there is an increased emphasis on promoting renewable energy as federal agencies are seeing their renewable energy targets increase from 7.5 percent in fiscal year 2013 to 20 percent by FY20, a pretty sizable increase. We have been working in concert with energy managers at DOD installations to emphasize renewable energy as they attempt to attain their Net Zero goals.

It’s all part of our sustainability program -- working together to incorporate multiple strategies relating to energy, water, climate change and the environment to ensure that today’s actions protect and enhance resources for all future generations.

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## Secretary of the Army Environmental Awards

While budgets may shrink, the Army’s responsibility to the environment remains constant. This is demonstrated by the ammunition plant, three installations, and three environmental teams recognized for their outstanding environmental and sustainability program achievements.

All award winners, whether saving forests, protecting historic sites, installing solar fields, improving wastewater treatment, manufacturing green bullets, protecting endangered species, or reducing water usage, highlighted cost savings and cost avoidances associated with their environmental programs in their nomination submissions.

“The Army’s environmental professionals continue to demonstrate their commitment to restore and maintain the rich natural treasures found on and around Army lands. Each of these nominations provides examples of how the Army promotes innovative environmental practices and partnerships that reduce costs without compromising mission success,” said Honorable Katherine Hammack, Assistant Secretary of the Army for Installations, Energy and Environment. “I am proud of the accomplishments of the award recipients and thank all of the nominees for their hard work.”

The Secretary of the Army Environmental Awards represent the highest honor in the field of environmental science and sustainability conferred by the Army. For more information about the awards, visit the U.S. Army Environmental Command’s web site, <http://aec.army.mil/Outreach/Awardprograms/SecArmyandSecDef.aspx>



## Preserving Historic Legacies, Artifacts Ensures Win

by Barry R. Napp

**P**roactive stewardship of 411 historic buildings and structures, and 663 archaeological sites, some dating back to prehistoric times, gained the U.S. Army Garrison Fort Wainwright recognition as the FY 2013 Secretary of the Army Environmental Awards winner for cultural resources management in the installation category.

According to Colonel S.C. Zemp, Fort Wainwright's garrison commander, the installation Cultural Resources Management Program plays a vital role in the strategic management of Fort Wainwright's 1.6 million acres. Those lands total approximately 10 percent of the Army's total land inventory and have a varied cultural history spanning 13,000 years.

"Fort Wainwright proudly recognizes the dedicated efforts of a talented, multi-disciplined team who developed the posts' Cultural Resources Management Plan and then put in the work and tremendous effort to ensure it exceeded all expectations," said Lisa Graham, cultural resources manager, Directorate of Public Works, Environmental Division.

Training land sustainability is a key component of the Fort Wainwright mission and directly supports the enhancement of Soldiers combat readiness of and quality of life for their Family members. There are many challenges of sustaining both the environment and training Soldiers as the installations' boundaries stretch over 100 miles with training capabilities unmatched in the U.S. The staff revised and updated the Integrated Cultural Resource Management Plan in FY13 and the revision formalized and solidified Fort Wainwright's independent management of cultural resources and successfully implemented an Operations and Maintenance Programmatic Agreement that streamlines



*Archaeological excavation at Ft. Wainwright*

the consultation process under Section 106 of the National Historic Preservation Act. The team inventoried Alaskan lands that have been inhabited since the end of the glacial period, approximately 13,000 years ago. The team recorded 126 sites and completed determinations of eligibility for 33 sites. Thirteen of these are prehistoric sites determined eligible for the National Register.

An important part of the CRMP mission is to instruct Soldiers and civilians on each unit's cultural resource compliance and stewardship requirements. Presentations are given on Alaska native cultural awareness and cultural resources awareness, including responsible and respectful land use, to Soldiers and their families at newcomer orientations and during Earth Day activities and at Fort Wainwright's youth newcomer program, Camp Cheechacko.

According to Zemp, the role of local Native Alaskan tribal governments, civil government, academic institutions and local civic groups cannot be underestimated. "Our partners share this honor with the CRMP, the Fort Wainwright Garrison and the rest of U.S. Army Alaska," he said. "The Fort

Wainwright CRMP is a vital part of and plays a key role in the strategic management and proactive stewardship of cultural and natural resources so all may enjoy."

As the winner of this Secretary of the Army environmental award category, the Fort Wainwright Cultural Resources Management Team will go on to represent the Army and compete at the next level at the Secretary of Defense Environmental Awards this spring.

"We are proud of our team here at Fort Wainwright and truly feel we have an integrated program," said Lisa Graham, cultural resources manager, DPW Environmental Division. "Across the board teamwork, government-to-government tribal consultation and partnering with Texas A&M University, led to our program's recognition with the Secretary of the Army award."

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### Acronyms and Abbreviations

CRMP	Cultural Resources Management Plan
------	------------------------------------



# Riley Keeps the Prairie Healthy

by Cathy Kropp

Partnerships are helping keep the prairie healthy at Fort Riley, Kansas, and have helped earn the installation's Natural Resource Team the FY 2013 Secretary of the Army Environmental Awards Program team award for Natural Resources Conservation.

"Fort Riley has great partnerships with our Flint Hills neighbors," said Colonel Andrew Cole, Fort Riley garrison commander. "Our partnerships have effectively enhanced our sustainability objectives in support of Fort Riley's mission and the well being of our Soldiers."

The team acquired \$84,000 in supplemental funding and equipment from Pheasants Forever, the National Wild Turkey Federation, Ducks Unlimited, the Rocky Mountain Elk Foundation, Remington, Eagle Claw and Quail Forever. The funding was used primarily to enhance habitat and improve hunting and fishing opportunities on the installation.

Through a collaborative effort with the Fort Riley Outdoors Group, the Fort Riley NR team provided turkey and deer hunts for dependents of deployed Soldiers. This program received national attention and media coverage.

The U.S. Fish and Wildlife Service and Fort Riley team partnered to install a water diversion structure to divert waste products from an off-post cattle holding facility, establishing a grass buffer to improve water quality for the endangered Topeka shiner.

The USDA and the Fort Riley team initiated a wildlife damage assessment for Marshall Army Airfield's wildlife airstrike hazard assessment guidance. This effort

prompted nuisance animal removal and led to innovative methods to reduce potential animal strikes.

The NR team also partnered with the installation's Army Community Services and provided mentoring and NR management to nine Warrior Transition Battalion Soldiers and two military family volunteers, through the ACS Volunteer Program.

The Wildcat Creek Conservation Partnership and the Greater Prairie Chicken Partnership Coalition enabled the NR team to complete seven stream improvement projects benefitting the federally endangered Topeka shiner, develop a 20,000 acre easement protecting prairie chicken habitat, and undertake other prairie maintenance projects.

Fort Riley hosted the Kansas Department of Wildlife Parks and Tourism Region 2 annual meeting. Discussions and interactions with these officials have led to extended hunting seasons on Fort Riley for Soldiers returning from deployments and waiving the fishing permit fee. One particular interaction resulted in an Army Compatible Use Buffer Program partnership where the Kansas DWPT is now owner to a parcel that is land locked by Fort Riley. This allows Army use of helicopter flight routes over the area, while preserving rare bottomland forest habitat along the Kansas River.

Recognizing the need to partner with adjacent landowners, the Fort Riley NR team used the USFWS's Partners for Wildlife Program to create a tri-party agreement to improve the condition of private lands adjacent to the installation and control invasive eastern red-cedar. This expands the high quality habitat past Fort Riley's border.

As a member of the Wildcat Creek Work Group, Fort Riley, which owns more than 30 percent of the creek's watershed acreage, played a critical role in the creation and acceptance of a Flood Mitigation Plan and installation of an early warning system



The rolling Flint Hills of Central Kansas are typified by numerous species of wildflowers, warm season grasses and gallery forests. (Austin Colbert, Flint Hills Media Project)



to let military families know when they are in harm's way.

Working with the U.S. Army Central Region Environmental and Energy Office, the Riley team helped contribute to the passage of Kansas legislation directing local government agencies to collaborate with Department of Defense activities prior to executing decisions that could negatively impact military training.

"Fort Riley is an excellent example of how the Army's environmental programs, a great team of dedicated professionals, and regional communication and coordination can effectively support the accomplishment of the military mission," said David B. Snodgrass, deputy director, Office of the Assistant Secretary of the Army for Installations, Energy and Environment, Central Region

These and other partnerships help the Fort Riley NR team enhance training, improve quality of life for Soldiers and their families, and minimize regulatory encroachment, all of which result in a more sustainable training environment.

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Acronyms and Abbreviations	
ACS	Army Community Services
DPW	Directorate of Public Works
DWPT	Department of Wildlife Parks and Tourism
FY	Fiscal Year
NR	Natural Resources
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service





# Size, Complexity Requires Innovative Management of Installation Cleanup

by Barry R. Napp

**A**ggressively seeking ways to rapidly reduce any potential threats to human health and the environment, while also cutting life-cycle remediation costs, helped Fort George G. Meade win the Secretary of the Army Environmental Award for Environmental Restoration in the individual/team category for fiscal year 2013.

For almost 100 years, Fort Meade's various missions from cavalry and mechanized units to information, intelligence and cyber operations have contributed to our national defense. During those activities, post practices for the storage, handling and disposal of chemicals and other wastes always followed accepted practices of the time. More recently some of those materials and methods have been found to have potentially adverse environmental impacts.

Fort Meade is addressing any possible contamination through its installation restoration and military munitions response programs. Investigations found 41 identified sites, including six military munitions response sites, plus 83 active areas of interest. The size and complexity of these restoration efforts require innovative management and outreach to ensure cleanup goals align of with both installation use, and the health and safety of the community.

"In just the last two years, over 130 acres of land previously suspected of being contaminated have been investigated and determined available for beneficial reuse," said Paul Fluck, program manager for Fort Meade's installation restoration program. "While the issues we are remediating stem from historic operations, the correction of those problems will benefit generations to come and we're all proud of that."

The installation's restoration team worked collaboratively with EPA, the Maryland Department of the Environment, and the local community

to reduce the time and costs associated with project remediation. A more robust sampling effort, coupled with a streamlined risk assessment process, released Fort Meade from restricted use on 134 acres by enabling consensus among all concerned regulators that no further action was necessary on a number of sites.

"We are most proud of our innovative scientific and management techniques that reduce risk of exposure to harmful chemicals in soil or groundwater and still save the Army approximately \$17.5 million dollars," Fluck said. "I think it's a true demonstration of Fort Meade's commitment to the environment and the people who live, work and participate in recreational activities here."

The restoration team is always looking for opportunities to not only clean up the land, but also to reduce the installation's carbon footprint. In addition using an electric vehicle whenever possible, the team saved the army money and fuel, reduced truck traffic and limited exhaust by arranging for the disposal of investigation-derived waste at the post wastewater treatment plant.

Instead of just demolishing one of the post's boiler plant groundwater treatment systems, the team identified and recycled 89.76 tons of the total 90.2 tons of material associated with its deconstruction. Members also removed and recycled another 22 tons of concrete at an uncontrolled dump site.

"We are extremely fortunate to have a dedicated and hardworking team of professionals on our staff," said Fort Meade garrison commander Colonel Brian P. Foley. "To have official recognition by a panel of experts that our environmental restoration program is the best in the Army is particularly gratifying."

As a Secretary of the Army environmental award winner, the Fort Meade team will represent the Army in the Secretary of Defense Environmental Awards competition this spring.



*The groundwater collection and treatment system at OU-2 was deconstructed after the site reached regulatory closure. System deconstruction, as opposed to demolition, maximized the amount of material suitable for recycling. Of the total 90.2 tons of material associated with the treatment system, 7.17 tons of steel and 82.59 tons of aggregate were recycled (recycling rate of 99% material by weight).*

"Environmental stewardship is a responsibility we owe the American people and in particular our local Maryland community," Foley said. "We take this responsibility seriously and will continue maximum effort to ensure a healthy and sustainable environment for future generations."

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Acronyms and Abbreviations	
EPA	Environmental Protection Agency



# Fort Hood Recognized for Environmental Quality

by Cathy Kropp

**E**nvironmental excellence is a way of life for Fort Hood, and it shows in the consistent recognition the installation receives for its environmental program. Having captured no less than eight different awards from the state of Texas, the Army and the Department of Defense during the last two fiscal years, Fort Hood can now add the FY 2013 Secretary of the Army Environmental Quality Award to its list of accomplishments.

“The dedication and service of Fort Hood’s environmental programs team has been outstanding over the years. I am extremely proud of them and their all-encompassing efforts that have been recognized by this award,” said Colonel Matt Elledge, garrison commander.

The installation’s holistic approach to environmental stewardship is one reason for its continued recognition. As stated in the latest nomination, “Fort Hood is committed to promoting environmental excellence, reducing its environmental impact, improving the efficiency of costs of processes, encouraging stakeholder involvement,” all while taking care of 218,823 acres and supporting a population of just under 75,000.

“The Fort Hood community works together to integrate environmental excellence into daily operations,” said Steve Burrow, chief of environmental programs. “Soldiers, civilians, contractors, and their families recognize that each of their actions has an impact on the environment.”

The installation’s environmental management system helps identify environmental vulnerabilities and opportunities for improvements in current processes. The system helps leaders establish goals and objectives and measure performance.

“NetZero 2020 has been a part of Fort Hood’s operations for some time now. The team continues to find and develop newer



*Dale Frederick, Environmental Compliance Assessment Team Leader, gives training to Soldiers, civilians and contractors. (Christine Luciano, Fort Hood DPW Environmental)*

and innovative ways to reduce the carbon footprint here and will continue to do so until we reach zero waste,” Elledge said.

The installation’s waste reduction efforts continuously exceed established objectives thanks to the full engagement and support of its military leadership, as well as strong relationships and partnerships throughout the community beyond its gates.

Meetings, training, and outreach efforts through community events help keep everyone involved, aware of the installation goals and informed of how they can help. Fort Hood boasts the Army’s largest recycling facility, and is continually expanding its program. In fiscal 2013 the program began accepting all plastics, small household appliances, athletic shoes and holiday lights. Adding the in-house capability to process styrofoam enabled 4,000 pounds to be diverted from the landfill in just three months.

The installation also works with the towns outside its gates to help establish recycling programs and collection points within their communities. The installation partnered with a local scrap and metal company to hold two electronics and

household appliance collections, netting more than 18,000 pounds of waste.

“The goal of our partnerships is to share ideas, techniques, and procedures that can help each other,” Burrow said. “Working together with other communities helps to educate the region, get citizens involved and influence change for a greener future.”

The installation is also continuing its water conservation and pollution prevention efforts. In addition, Fort Hood increased energy conservation this year by adding a solar farm that generated 1.2 million kilowatt hour in fiscal 2013, 25 percent of the overall load for 300 single-family homes.

With these continuing efforts, Fort Hood is likely to remain in the winner’s circle for even more environmental awards.

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# Minnesota Army National Guard Team Recognized for Environmental Quality

by Cathy Kropp

Planning, promoting and tracking its sustainability efforts spell success for the Minnesota Army National Guard environmental program's improvements and initiatives. The team's efforts also spell "winner" in the FY 2013 Secretary of the Army Environmental Awards, Environmental Quality Team category.

The MNARNG Environmental Quality Team is responsible for compliance, conservation, and sustainability management for all MNARNG facilities and training areas. The team prioritizes environmental management to support Soldier readiness, and ensures environmental quality and sustainability is demonstrated in everything they do, from pollution control to environmental management system implementation.

"One of the overarching directives of the campaign plan for the Minnesota National Guard calls for developing a sustainable infrastructure," said Colonel Larry Herke, construction and facilities management officer. This directive provided an excellent foundation for completing a Sustainability Master Plan for which I must ensure implementation of as the Construction Facilities Management Officer."

In addition to the conventional management plans the team maintains with annual reviews and regular updates, the EQ team finalized a Joint Sustainability Plan, State Sustainability Plan, phase 2 of their Operational Range Assessment, and a Wellhead Protection Plan during the rating period. Launched in 2012, the MNARNG Sustainability Working Group was created to promote and track sustainability measures. The group is working on several initiatives including a wind energy study at Camp

Ripley and an audit to see what solid waste can be redirected or eliminated from the waste stream.

The EQ Team oversees the MNARNG's Qualified Recycling Program which brought in approximately \$1,000,000 in revenues. Those funds support the recycling program, pollution prevention and abatement projects, MWR activities and energy-efficient updates.

As part of their renewable energy initiatives, MNARNG received a \$1.9 million state grant to install a biomass heating system at Camp Ripley. This system will cover seven buildings and replace approximately 14,000 million cubic feet of natural gas usage.

To ensure the project success the team partnered with University of Minnesota at Morris, which has a working biomass plant, and the Region 5 Community Development organization, which is responsible for regional sustainable development.

When the new field maintenance shop at Arden Hills Training Site was in the planning stage, the team was involved in incorporating a solar photovoltaic system on the roof and solar thermal heating for the water in the plans. At the Pine City Armory, the team helped with plans to reduce energy consumption by using windows with automatic lighting and darkening features.

The EQ Team works closely with regulators to keep permits for stormwater, underground storage tanks, hazardous wastes and NPDES current. No findings of noncompliance resulted from the 18 regulatory inspections MNARNG underwent during the rating period.

"Without exception, MNARNG's EQ Team ensures compliance with all local, state, and federal environmental regulations," said Marty Skoglund, environmental program manager. "The Team understands that the consequences of not doing so would negatively impact our ability to train Soldiers, not to mention the disappointment it would cause in the eyes



A 40kW solar photovoltaic system on the new Field Maintenance Shop at the Arden Hills Army Training Site. The system will satisfy about 6.5% of energy requirements of the building. This is the first use of solar energy for the Minnesota Army National Guard and more is planned.


of our leadership and our communities."

The team's success in maintaining compliance and furthering EMS goals is credited in part to the development of training resources. The EQ team scripted and launched new courses on energy efficiency, global harmonizing systems and Camp Ripley environmental management, through the MNARNG Learning Management System.

Every initiative the EQ team undertakes is in support of the MNARNG mission and a sustainable Army. Planning is key, but it is not enough to guarantee success.

Compliance monitoring and management ensures that training sites and facilities will not be impeded by regulatory issues. Training programs help Soldiers and staff meet EQ benchmarks and perform their jobs more safely and efficiently. Recycling, waste stream reduction and energy conservation all help to stretch the MNARNG's resources further and make the organization more self-reliant.

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Acronyms and Abbreviations	
EMS	Environmental Management System
EQ	Environmental Quality
MNARNG	Minnesota Army National Guard
MWR	Morale, Welfare and Recreation
NPDES	National Pollutant Discharge Elimination System



# Invaluable Ecosystem Opportunity Found at Camp Johnson

by Cathy Kropp

Successful partnerships and shared goals equaled a win for the Vermont National Guard in the Secretary of the Army Environmental Award's Natural Resources Conservation, Small Installation category.

Despite its small - only 660 acres - size, Camp Johnson is an important location and habitat plays a large role in preservation and conservation efforts for both the Army and the state. With approximately 175 acres of pitch pine forest, the installation boasts Vermont's largest remaining stretch of this habitat, which supports 15 state-listed rare plants as well as many insect species that are depended on this type of habitat.

"Folks really don't understand that this place is home to one of the last natural communities of pitch pine," said Major Jacob Roy, environmental program manager. "The Guard can protect and revive it. That's a pretty big legacy to leave behind, especially taking into consideration that it's in the middle of a training area. We can continue training and the Guard can fulfill its mission, and we can still save, restore, and rejuvenate a threatened natural community."

Camp Johnson has partnered with a number local agencies to help its natural resources conservation program succeed. The Vermont Agency of Natural Resources provided two staff members to assist the Army in developing pitch pine nursery seed stock. The Green Mountain Power Company donated use of a bucket truck to gather the seed. The University of Vermont nursery raised the seedlings until they were ready for replanting.

"The Vermont National Guard knows the importance of working with the community as a team. I am very proud of our staff's coordinating with our community partners to help make projects happen successfully. This award is a testament to not only the Vermont National Guard Conservation Program, but to how we work together as a Guard family," said Major General Steven A. Cray, the adjutant general.



*University of Vermont students are core sampling on frozen Lily Pad Pond at Camp Johnson. In this peat bog they have found pollen spores and remnants of plants dating back over 10,000 years.*

The Army does their part to preserve this valuable ecosystem. For the past two years, funding for invasive species control has come from the forestry reserve fund. Camp Johnson's natural resource staff applied for and won grants of \$15,000 in 2012 and 2013 for invasive species management (honeysuckle) in the pitch pine forest.

Forest management is Camp Johnson's main natural resource tool for preserving this important ecosystem. Reviving the installation's prescribed burn program; continuing invasive species management, wildlife protection and habitat enhancement, and adding logging operations that allow tops of logged tree to dry out and provide more debris fuel, have all contributed to the post's success and its recognition in the Secretary of the Army Environmental Awards Program.


Camp Johnson has an in-house burn crew and fire staff that led their prescribed burns. They were assisted by the City of Colchester and St. Michael's College fire departments. A special exemption to the statewide fire ban was granted based on the National Guard's demonstrated fire management capability. The College conducted pre- and post-fire analysis of

effects on plant and insect species.

After invasive species have been eradicated and prescribed burns completed, Camp Johnson's Natural Resource staff uses pitch pine seedlings for replanting. Out of the 120 seedlings raised in the university's nursery, half were planted in 2013. Plans call planting the remainder in 2014.

Partnerships have been essential to the Vermont Army National Guard's success at Camp Johnson. The states' Agency of Natural Resources and St. Michael's college have been the primary supporters of the camp's natural resource projects, providing staff, funding, expertise, materials, and research capabilities. Sharing what is learned by each of the partners helps everyone succeed, and ensures this invaluable ecosystem not only survives, but thrives.

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## A Cooperative Yellow Star Thistle Management Success Story

by Dawn Rodriguez

The Southern Monterey County Rural Coalition (SMCRC), Monterey County (MC), and Fort Hunter Liggett (FHL) have joined forces to control Yellow Star Thistle (YST), an invasive non-native noxious weed in the San Antonio Valley. The stakeholders selected a 40-acre parcel of military land just north of Argyle Road to serve as a demonstration plot. The plot has been heavily infested with YST for several years, and the area just south of Argyle Road is similarly infested, and serves well as a “control area.”

On November 26th, 2012, the FHL Fire Department burned the demonstration plot to stimulate germination of the YST seedbank. Then, if the burn is followed by a successful management treatment in the spring timeframe, the YST seedbank can be depleted more rapidly, decreasing the overall economic costs of management. Although the burn helped to reduce some of the thick, dense patches of YST, it was not a complete burn. Some of the YST stands were left untouched due to a rain just prior to the burn.

In order to reduce some of the remaining stands of YST to ensure that the spring herbicide applications would directly contact the emerging YST rosettes, the FHL Roads and Grounds Crew mowed the demonstration plot on March 5th, 2013. The January through March timeframe is the best time to spray for YST, as YST is in the early rosette stage where herbicide treatments of YST are most effective. On March 14th 2013 the three stakeholder agencies came together to spray the demonstration plot with Milestone™. Milestone™ provides excellent pre- and post-emergence control of YST, and is benign to most other families of plants.

A local company, Integrated Crop Management (ICM), sprayed the demonstration plot using a spray rig with two 9-foot spray booms towed by an ATV. In some areas, hand-held sprayers were utilized to assure maximum coverage of the herbicide. On the same day, the MC Ag Department sprayed the adjacent roadside access, assuring elimination of subsequent YST spread from the roadside to the

Acronyms and Abbreviations	
ATV	All Terrain Vehicle
FHL	Fort Hunter Liggett
ICM	Integrated Crop Management
MC	Monterey County
MC Ag Dept	Monterey County Agricultural Department
SMCRC	Southern Monterey County Rural Coalition
YST	Yellow Star Thistle

demonstration project.

The MC Roads Department provided the water truck, which was used to provide the water that needed to be mixed with the herbicide applications. Die-off of the thistle rosettes was observed within 10 days from the application date. Since the spraying of the YST plot on March 14th 2013, the MC Ag Department has returned to the site to re-apply herbicide to some spots that were missed along the road right-of-ways. In May, 2013 the SMCRC installed four signs at the site purchased with FHL Environmental Division funds.

Stakeholders gathered on June 6th 2013 to observe the condition of the treatment plot, and to determine whether any additional spot spray treatments were needed for any infestations of YST.

After visiting the YST demonstration plot, coalition members had the opportunity to discuss how to move forward in working together to reduce the spread of YST in the San Antonio Valley. The coalition is committed to continuing to monitor and treat the YST demonstration plot as needed, as well as to joining forces with other stakeholders and landowners to target additional areas to be treated.

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Yellow Star Thistle Emerging Rosettes (C. Lopez)



# Listing of the Northern Long-Eared Bat Under the Endangered Species Act: Implications for West Point and Other Military Installations

by Marnie Miller-Keas

Every installation is required to follow specific guidelines when an endangered species, state or federal, resides on the property. The installation must balance the needs of the listed species while attaining the goals of the mission. Currently, West Point may be facing a new challenge: The Northern Long-Eared Bat (NLEB, *Myotis septentrionalis*), found throughout 39 of the 50 States, has been submitted for review under the Endangered Species Act. Previously one of the most common bats of the northeast, the rapid decline of NLEB has been due to a mysterious disease known as white-nose syndrome (WNS).

White-nose syndrome, caused by an introduced fungus that grows on the nose and wings of hibernating bats, is

responsible for millions of bat mortalities across the eastern United States. Originating near Albany, New York, in the winter of 2006, WNS has spread as far north as Quebec, Canada, and as far south as Alabama. The westernmost confirmation of an infected bat appeared in Missouri in December 2013, and the fungus will likely continue to spread west through bat-to-bat contact. Out of the six hibernating bat species in New York State, NLEB was most significantly affected, with an overall population decrease of 98 percent<sup>1</sup>. Several summer bat surveys conducted at West Point pre-WNS indicated it was one of the most common species on the installation. However, after the first signs of WNS were observed at West Point in 2009, annual hibernacula counts and summer surveys indicated a decrease in *Myotis* species, including the NLEB, and an increase in the more resistant species, most notably the Big Brown Bat (*Eptesicus fuscus*). If NLEB is listed, it will have broad implications for West Point and other military installations within its range, which includes much of the eastern and north central United States.

Although more research is needed to determine current status, life history, and specific habitat requirements of NLEB, biologists do know they utilize caves and abandoned mines for hibernation and trees and buildings for summer roosts. Few NLEB were found during hibernacula surveys at West Point before WNS, most likely because the species tends to use cracks and crevices that make them difficult to find. However, aggregations of up to 100 females known as “maternity colonies” were documented on the installation, and NLEB was the most frequently encountered species in mist-netting surveys conducted at West Point in 2006. While not comparable to mist netting<sup>2</sup>, acoustic surveys pre-WNS and post-WNS indicated a drop in NLEB numbers. The most recent data collected in

Acronyms and Abbreviations	
NLEB	Northern Long-Eared Bat
WNS	White-nose Syndrome

the summer of 2012 did not identify any NLEB at West Point. More monitoring is needed to determine the current status of the species at West Point and the rest of New York State; it is possible only one small population remains statewide.

Now, four years since WNS was observed at West Point, the species is on its way to being federally listed as endangered. Because NLEB are known to use buildings as roost sites, new species conservation guidelines may alter pest control and construction practices as well as forestry. For example, using guidelines developed for the already endangered Indiana Bat (*Myotis sodalis*), timber harvesting or clearing would be restricted while bats are using trees as summer roosting and maternity sites, typically between 1 April and 30 September. Although there is habitat overlap with the Indiana Bat, NLEB is more flexible when selecting roost sites, using anything from small live trees (≥ 3 inches in diameter at breast height) to large dead snags. Also, when compared to the Indiana Bat, NLEB uses closed canopy forest and uplands more than open riparian habitats, which would further limit forest management practices. The most current guidance circulated by the US Fish and Wildlife Service (Northern Long-Eared Bat Interim Conference and Planning Guidance, found at <http://www.fws.gov/midwest/endangered/mammals/nlba/index.html>) outlines basic protocols. The final decision on the listing will occur October 2014.

The West Point Natural Resources Branch plans to continue long-term bat monitoring using hibernacula counts, spring emergence harp trapping, mist-netting, and acoustic surveys. Whether the species is found to be present or not, the listing of this species will potentially ➤



Hibernating Northern Long-Eared Bat (A. Hicks, NY State Dept. of Environmental Conservation)



# Huntsville Center Helps Clean Up Ex-Artillery Range

by William S. Farrow

Geophysicists and ordnance experts with the U.S. Army Corps of Engineers Baltimore District and the Engineering and Support Center, Huntsville are using a technology to clear former artillery range at Camp Edwards, a 15,000 acre training area located on Joint Base Cape Cod, Massachusetts.

The corps is using a technology system called the Metal Mapper, an array mounted on a wheeled chassis and pulled behind conventional vehicles such as an all-terrain vehicle or garden tractor, to identify and remove munitions from the site after the Environmental Protection Agency ordered the cleanup to protect local drinking water. Joint Base Cape Cod sits on a sole-source aquifer, the sole source for drinking water for the installation as well as the Massachusetts's upper cape towns of Borne, Falmouth, Ashby and Sandwich. In 1996 an EPA mandated Impact Area Groundwater Study Program was established to investigate and clean up groundwater related contamination at the Camp Edwards' Impact Area and training ranges.

Joint Base Cape Cod is a complex place. As a military installation, JBCC has been used for military purposes since 1911 and Camp Edwards was used as a training ground for anti-aircraft units prior to overseas deployment during World War II. For more than six decades, military

training at Camp Edwards resulted in munitions fired and impacting the Camp's artillery ranges. To find the unexploded ordnances buried beneath the ranges, there is no better tool to use than the Metal Mapper, a system which uses time domain electromagnetic principles to induce electrical currents in buried metallic objects and then measure the effects of those currents in receivers on the surface.

After using conventional detection devices to detect and map subsurface anomalies, Elise Goggin, project geophysicist, said the Metal Mapper, is used to conduct a "cued-indentification" investigation. "We basically look at a screen. On that screen we have loaded in all the points we need to sit the machine on top of," Goggin said. "So we navigate to those points, set down the array, and sit there for about a minute so it can collect the data." She said after the Metal Mapper is placed above each anomaly, it transmits electromagnetic signals in three dimensions, and it then records the return electromagnetic signals in three dimensions. These recordings describe and characterize the buried object and can be used to calculate the size, depth and shape of a buried metallic object.

Goggins, who works at Huntsville Center's Engineering Directorate Geosciences Branch, then compares the collected data against signals documented in a "library" of known munitions and compile a "dig list." Then unexploded ordnance technicians excavate all anomalies labeled likely or uncertain ordnance by the geophysicist. Goggin said there are around



Huntsville Center geophysicist Elise Goggin uses a tractor to pull a Metal Mapper along an artillery range at Joint Base Cape Cod. (P. Bloodgood)

30 acres requiring investigation. "Right now we have completely finished around eight acres and we are hoping to complete the rest by 2015. It was an impact area for over 60 years, so there is a lot of stuff out there and the current project goal is to remove 75-95 percent of the munitions containing explosives," she said.

Ben Gregson, remediation manager for the groundwater study program, said the Metal Mapper is the best technology they have found to meet their installation's needs and requirements. Gregson said not only is the system helping preserve the drinking water for the area, it also is keeping down the costs of cleaning up the site. Much of the effort and expense at a typical munitions response site is expended on the wasteful excavation of objects such as nails, pieces of barbed wire, as well as "frag," metal from exploded ordnance.

"The metal mapper allows them to discriminate with higher fidelity and identify what's in the ground," Lt. Col. Shawn Cody, program manager for the Army National Guard impact area groundwater study program, said. "We are anticipating reducing our digs by up to 70 percent which is a huge cost-savings."

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## Acronyms and Abbreviations

EPA	Environmental Protection Agency
JBCC	Joint Base Cape Cod
Lt. Col.	Lieutenant Colonel

(continued from previous page)

influence many aspects of operations and management on military installations within its range.

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Endnotes:

- 1 Reported by Carl Herzog, Biologist, Department of Environmental Conservation
- 2 Mist-netting is a method of capturing individual bats at a specific site; acoustic surveys use a recording device to detect ultrasonic bat calls (on a route or at one site for a variable amount of time) and require software and/or experts to identify the bat calls to species.



# Construction at Grafenwoehr Airfield

by Manfred Rieck

In fall 2014, the US Army Garrison Bavaria was able to finalize a four-year construction period at the Grafenwoehr Army Airfield bringing the air field in compliance with host nation laws while meeting mission requirements under the premise to come up with a low cost/low maintenance approach.

It took four years of construction to complete two projects required by host nation authorities. The first project was to install an airfield runoff collection and deicing substance treatment facility followed by connection of the aircraft refueling locations to an oil water separator.

The two projects had a long history reaching back into the years 1994 – 1996. Urea was used for deicing that contaminated the groundwater and the host nation water office asked to change to a less harmful substance. The first step was to use acetate (“Safeway”) as an interim solution and to work out the most efficient and cost effective method that meets all legal requirements and best suits training requirements.

Towards the end of the 1990s an agreement was reached with host nation authorities to conduct onsite tests at the airfield. The tests were to determine the

most effective and efficient treatment method. Site investigations were finally conducted from 2001 to 2003 and a pilot project was initiated for decentralized onsite runoff treatment and analysis of alternate methods. The treatment method was selected after a 4-year test conducted by the environmental division in close cooperation with the local water office and the airfield management. It ensures an effective treatment with very low operation and maintenance costs.

The four methods and their results which were compared to each other were:

- (I) Decentralized site treatment
- (II) Centralized on-site treatment
- (III) Connection of the airfield to the sewage plant of the neighboring city, and
- (IV) Application on airfield grass land via sprinkler system

The host nation water office clearly favored the decentralized site treatment method (alternate I). The original idea of having treatment beds adjacent to the runway, however, was abandoned due to airfield safety reasons. Instead, a central treatment facility was constructed outside the airfield safety zone. To further improve the treatment of airfield deicing runoff,

it was decided to plant reed (*Phragmites australis*) in the treatment beds.

The new treatment facility collects and treats the airfield deicing runoff during the wintertime, when a deicing substance must be applied to the airfield surface to ensure safe flight operations. This project was completed in June 2012 for an amount of \$ 2,959,648.99 (including mitigation and additional services). A treatment bed consisting of different layers of gravel and sand planted with reed plants (*Phragmites australis*) ensures an effective and safe degradation of the deicing substance. During the course of the last two winters, the facility provided effective treatment with very low operation and maintenance cost.

The exemplary cooperation between the local water office, the airfield management and the Garrison Engineering and Environmental Division throughout several years finally turned the project into a success story.

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Treatment plant construction – shortly after completion





# OANRP Investigates the Utility of Automatic Rat Traps

by Katie Franklin

The O'ahu Army Natural Resources Program (OANRP) has managed more than 60 endangered species since 1995 across the island of O'ahu to include plants, invertebrates and one forest bird species. Because invasive rats (*Rattus* spp.) are known predators of many Hawaiian flora and fauna, a rodent control program plays a critical role in the stabilization and recovery of many of these endangered species.

The haha (*Cyanea superba* subsp. *superba*) is one species that has shown particular vulnerability to rat predation. In the late 1990s, the species was facing extinction with only six *C. superba* plants in the Wai'anae Mountains. The OANRP installed rat bait stations and traps around the last remaining wild plants in order to protect their invaluable fruit. Thankfully, viable seeds were collected before the last plants died. Because of the effort, there are now hundreds of *C. superba* plants in the forests of the Wai'anae Mountains.

Recently, the OANRP acquired a new tool that may prove to be an important component for long-term rat control efforts: automatic rat traps. These automatic traps are designed to kill rats and stoats (a New Zealand pest) and are powered by compressed carbon dioxide (CO<sub>2</sub>). Goodnature® Ltd., a New Zealand-based company, invented and designed the traps specifically for conservation use. Unlike single-kill snap traps, which can often be found unsprung with bait missing or sprung with no animal, the automatic traps remain set and baited. The traps can reset up to 24 times before the CO<sub>2</sub> canister needs to be replaced and are a humane alternative to other rat control methods.



*The haha, or Cyanea superba subsp. superba, is an endangered species managed by the O'ahu Army Natural Resources Program on Army Training lands. Non-native rats feed on the haha fruit (pictured here), threatening the survival of this fragile Hawaiian forest plant.*

The OANRP began putting this new rat control technology to the test in October of 2012, when the staff installed a small grid of 45 automatic traps around an outplanting site of *C. superba* in Pahole Natural Area Reserve in the northern Wai'anae Mountains. The objective of the project was to systematically collect data regarding trap performance, rat activity levels and ecological response to the traps. This data was compared to two neighboring areas: Kahanahaiki, where 464 traditional Victor snap traps were set in a grid across 26 hectares; and Kapuna, a control area with no rat control measures in place. Data was collected until the project concluded in August 2013.

Analysis of the data indicated that the automatic traps were successful at reducing local rat abundances at Pahole. The automatic traps eliminated 1.5 times more rats per hectare and were maintained with roughly 35 percent of labor required for the Kahanahaiki snap trap grid.

The automatic traps appeared to give

“more bang for the buck” than snap traps.

Finding bait that lasts as long as possible is crucial to maximizing the effectiveness of both traditional snap traps and automatic traps. The bait is contained in a compartment at the top of the trap, behind the trigger, and is virtually inaccessible to the rats.

Even with the high cost per trap (\$123 each), the OANRP is optimistic that the automatic traps could reduce long-term costs for maintenance of rat control grids and foresees their greatest utility in remote areas that are typically accessed by helicopter. Rats are a difficult pest to control as they are abundant, very prolific and highly adaptable to their environment. Using a combination of methods, adaptive management strategies and defining management goals (i.e., localized control around vulnerable species or ecosystem-wide protection) will lead to the best strategy for each rat control site.

Ultimately, decisions regarding future rat control strategies must be made by

Acronyms and Abbreviations	
CO <sub>2</sub>	Carbon Dioxide
KNHP	Kalaupapa National Historical Park
OANRP	O'ahu Army Natural Resources Program



# Conservation Programs Positively Impact Installation Infrastructure

by Matt Mattox

Installation management is a term that when mentioned often results in a broad or abstract perception of the many parts and pieces that this term actually entails. It is common nature to drive to work every morning through the guard gates and pass buildings, open space, and other installation infrastructure, and take for granted that these areas are being properly managed. While installations can support different missions and include many moving parts, they all include natural resources.

As easy as it is to drive by a motor pool and take for granted what happens behind-the-scene to keep it running smoothly, such as fuel spill prevention and response; it is just as easy to drive by forested or grassland areas and not realize the benefits that proper management of these natural resources provide to those that live and work on installations.

On many installations in the Southeast, personnel in and around the cantonment area benefit from reduced wildfires due to the implementation of prescribed burning of forestland. Air quality and reduced accidents and visibility impacts on adjacent roadways are often overlooked benefits of properly implemented prescribed burning. Personnel on installations in the Midwest are likely to notice bales of hay on right-of-ways, recreational areas, or near airfield operations. This is evidence of an

agricultural out-lease being implemented to remove excess vegetation while minimizing maintenance costs and also realizing income from the out-lease, and in many cases rental offsets such as access road maintenance, fence repair, and soil fertility management. Other indirect benefits of natural resource management in and around cantonment areas include: erosion control, water quality, noise abatement and visual barriers for neighboring communities, and wildlife habitat.

Down range, these grass or forested landscapes are managed to support realistic training landscapes to prepare our nation's war-fighters. The benefits within maneuver corridors and training lands are more direct than the secondary benefits seen on cantonment areas. Some examples of these benefits are habitat management to prevent the loss of training days due to compliance issues with threatened and endangered species, or the collaboration between trainers and natural resource managers to selectively thin forestland to meet training requirements while maintaining the sustainability of the resource.

These benefits, however, do not come without a cost. Many installations utilize the Forestry and Agricultural/Grazing Conservation Reimbursable Programs to help fund the management of natural resources. In any year, 40- 50 Army

Acronyms and Abbreviations	
ACOMs	Army Commands
OACSIM	Office of the Assistant Chief of Staff, Installation Management


installations participate in these programs to manage Army timber and agriculture or grazing out-leases. These programs are operated on one-year cycles requiring a strategy to predict proceeds for the fiscal year and manage expenses during the year of execution. Annual funding for Army Commands (ACOMs) and support functions through the U.S. Army Corps of Engineers is provided by the Office of the Assistant Chief of Staff, Installation Management (OACSIM). The U.S. Army Environmental Command provides technical assistance to the ACOMs and financial tracking support for these programs to OACSIM.

During the last five years the Army Forestry and Agricultural/Grazing Conservation Reimbursable Programs have averaged approximately \$20 million dollars in revenue that is used to fund natural resource management on Army installations.

In addition to supporting the local and regional logging industry, 40 percent of the net income that a participating installation derives from the sale of forest products such as timber, firewood, and pine straw is designated for schools and roads in the counties where the installation is located, with an average of \$1.6 million dollars paid over the past five years for these purposes.

More information on how the Army's Conservation Reimbursable Programs can benefit your installation can be found at <http://aec.army.mil/Services/Conserve/ConservationReimbursablePrograms.aspx>.

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weighing options and assessing the costs and benefits of using each type of trap. While the data in Hawai'i is not yet ready for such a cost-benefit analysis, the C. superba in Pahole will continue to benefit from reduced rat predation, thanks to this new rat control technology.

This project was partially funded by Kalaupapa National Historical Park (KNHP) in order to share traps and information. The conclusion of the project culminated in a visit to KNHP

in September 2013 to share the results and provide recommendations for use at their field sites.

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# Environmental Compliance Assessments in FY13

by Martin Roberts

The U.S. Army Environmental Command (USAEC) executes the Environmental Performance Assessment System (EPAS) program, in order to assess an installation's compliance posture against all applicable environmental regulations world-wide.

FY13 was a difficult year financially for everyone in the Department of Defense, with the EPAS program being no exception. We focused our remaining resources on the highest priority environmental areas, those with highest potential for regulatory fines and penalties. Here are the most common findings and trends from FY13.

## Air Emissions

• Manometers on paint booths inoperative – Most paint booths on a military installation are exempt from Federal painting-related regulation; however, most state and/or local regulations require that air pollution control equipment be maintained “in good working order” or “in a manner consistent with good air pollution control practice.” Manometers, which measure air flow through paint booth filters, sometimes have no fluid, read incorrectly, or are completely ignored. Recommended solution: A daily checklist encompassing all environmental requirements at each paint booth will ensure proper operation and data collection is completed.

## Hazardous Waste

• Excessive storage of hazardous waste at Satellite Accumulation Points (SAPs) (40 CFR 262.34(c)) – SAPs allow for management of small quantities of hazardous waste under less regulation than at a longer-term storage facility. Total quantity of hazardous waste stored at a SAP cannot exceed 55 gallons for non-acute wastes or one quart for acutely hazardous wastes. This is a cumulative total for all hazardous waste types, not 55 gallons per waste type. Once 55 gallons has been exceeded, the waste

must be removed within three days. Additionally, SAPs must be located at or near the point of generation of the wastes. Designating multiple SAPs in one work area as a way to circumvent the 55 gallon limit violates the quantity restrictions of a SAP. Recommended solution: If multiple types of waste are stored at a SAP, use smaller containers to avoid exceeding 55 gallons.

## Petroleum, Oils, and Lubricants (POL)

• Nonexistent or inadequate secondary containment (40 CFR 112) – Secondary containment for POL tanks must have the capacity to contain the contents of the largest single container plus additional capacity to contain precipitation and must be free of cracks, holes, etc. If the secondary containment structure has a valve for releasing accumulated rainwater the valve must be kept in the closed position. Recommended solution: Ensure tank inspection checklists include checking the valve position.

## Solid Waste

• Specific types of paper or cardboard not recycled (40 CFR 246) – Federal agencies have specific requirements for the recovery of resources from solid waste through source separation, i.e. recycling, based on waste type, quality, quantity, etc. For example, if an installation generates ten tons or more of cardboard per month it is required to recycle cardboard. This includes providing separate cardboard collection bins to organizations that generate the cardboard for the purpose of segregating the material from other solid wastes. Also, if an installation has office facilities of over 100 workers segregation and recycling of high-grade paper is required. Recommended solution: Complete a Waste Stream Analysis to determine if your installation meets any of these thresholds and take appropriate actions.

## Wastewater/Stormwater


Acronyms and Abbreviations	
BMPs	Best Management Practices
CFR	Code of Federal Regulations
EPAS	Environmental Performance Assessment System
FY	Fiscal Year
NPDES	National Pollutant Discharge and Elimination System
POL	Petroleum, Oils, and Lubricants
SAPs	Satellite Accumulation Points
USAEC	U.S. Army Environmental Command

• Non-compliance with National Pollutant Discharge and Elimination System (NPDES) requirements, including Best Management Practices (BMPs) (40 CFR 122) – Many discharge permits require that the permittee adopt BMPs for management of their storm water which then become federally enforceable. Consequently, BMPs that require extensive resources to maintain are often not fully maintained and become permit violations. Recommended solution: Ensure your BMPs are easily maintainable or that long-term resources exist for adequately maintaining them.

## Water Quality (Drinking Water)

• Wells, drinking water system not adequately protected, including insufficient backflow prevention devices (BPDs) (40 CFR 141) – High priority buildings, such as a fuel lab, require BPDs to protect the drinking water system from potential contamination.. Recommended solution: After an initial comprehensive BPD survey is completed, install BPDs where needed and ensure new facilities incorporate required BPDs .

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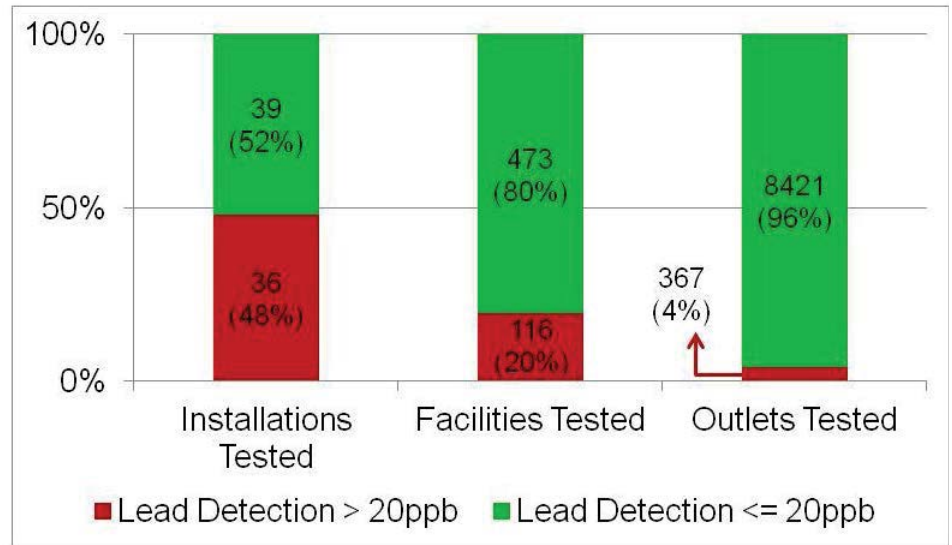


# IMCOM Initiative on Sampling for Lead in Drinking Water - Part 1

by Richard Morris

The U.S. Army recently demonstrated that it is committed to the health and safety of Soldiers, Family Members and its civilian and contractor workforce by sampling drinking water for lead concentrations in 100 percent of Installation Management Command's (IMCOM's) high risk facilities. Army Child Development Centers (CDCs) have been in the spotlight due to a number of recent events including concerns raised regarding whether children, youth, and pregnant mothers at Department of Defense (DOD) CDCs, Youth Centers (YCs), schools, and medical facilities are being adequately protected from potential exposure to lead in drinking water.

The Environmental Protection Agency (EPA) identifies young children and pregnant women as the individuals with the highest risk from elevated lead exposure, which can cause serious medical issues including permanent damage to the brain and nervous system and result in behavioral and learning disabilities. The EPA established a recommended action level of 20 ug/L for CDCs and schools with a sample size of 250 mL. Most IMCOM garrisons are and have been in full compliance with the minimum



requirements for sampling drinking water for lead. The Safe Drinking Water Act (SDWA) requires sampling of drinking water systems, but not at specific distribution points-of-use (i.e. drinking fountains, kitchen faucets, etc.). Targeting is typically based on age of construction and materials used, but the Rule does not specify testing of any particular types of facilities. An installation is in compliance if 90 percent of samples are below the action level. An exceedance of the action level in more than 10 percent of the samples requires some form of mitigation measures to decrease the exposure.

In 2013, HQ IMCOM canvassed all garrisons in the Command to identify which, if any, were proactively targeting facilities with higher risk populations, as well as to obtain the results of any prior sampling. It was determined that 46 out of 81 installations (57 percent) had sampled at CDCs, YCs, schools, and medical facilities for lead in drinking water. In 33 facilities located on 17 of those 46 installations (37 percent), lead in drinking water had exceeded the action level at some point-of-use since 2001. In May 2013, IMCOM resampled those facilities with previous action level exceedances. Sample results revealed 11 of those facilities (33 percent)

still had points of use with lead above the action level.

IMCOM manages 873 facilities that serve the highest risk population. Previous sampling occurred at a total of 151, or about 17 percent, of these high risk facilities. An Operations Order released on June 24, 2013, directed garrisons to perform sampling in 722 facilities. After development of the initial list, primary drinking water in 571 high risk facilities was sampled for lead. Approximately 52 percent of all IMCOM installations had facilities with action level exceedances. Out of 8,421 samples collected, approximately 4 percent of all POUs exceeded the action level for lead.

The Office of the Secretary of Defense was briefed on the results of drinking water testing in February 2014. Secretary of Defense directed the Safe Drinking Water Act Services Steering Committee to take the lead in developing a DOD policy implementing the mitigating actions identified through the IMCOM sampling effort. HQ IMCOM G4, the Assistant Secretary of the Army (Installation and Environment), the Deputy Assistant Secretary of the Army (Environment, Safety, and

Acronyms and Abbreviations	
CDCs	Child Development Centers
DOD	Department of Defense
EPA	Environmental Protection Agency
FGS	Final Governing Standards
HQ	Headquarters
HQDA	Headquarters, Department of the Army
IMCOM	Installation Management Command
mg	milligram
ml	milliliter
OCONUS	Outside the Continental United States
POU	Points of Use
SDWA	Safe Drinking Water Act
ug/L	1 microgram per liter
YCs	Youth Centers



# Restoring of Longleaf Pine-Wiregrass - Ecosystems on Fort Stewart, Georgia

by Dee Mincey

When European settlers arrived on the shores of North America, there were about 92 million acres of longleaf pine (*Pinus palustris*) ecosystems that stretched from Virginia, to Florida, to Texas. Less than three per cent of that original acreage remains today, making it one of the most imperiled habitat types in our nation. Longleaf pine ecosystems are among the most diverse ecosystems in the world and they rival the species richness of tropical rain forests. Many of the plants and animals found in longleaf pine ecosystems are found nowhere else in the world.

Fort Stewart, Georgia, harbors more than 150,000 acres of upland pine forests that are a part of that diminishing ecosystem. Historically, longleaf pine was associated with a dense ground cover of grasses, forbs, and shrubs where groundcover plant richness could attain 150 to 300 plant species per acre. Longleaf pine - wiregrass systems are home to more breeding bird species than other southeastern pine forests. They harbor 60 percent of the amphibian and reptile species found in the southeastern U.S., many of which are endemic to the system, and at least 122 endangered or threatened plant species. Some of the rare species occurring on Fort Stewart that are



*Controlled burn during the growing season*

associated with longleaf pine include the endangered red-cockaded woodpecker (*Picoides borealis*), the threatened eastern indigo snake (*Drymarchon couperi*), the threatened frosted flatwoods salamander (*Ambystoma cingulatum*), and the state listed Georgia plume (*Elliottia racemosa*). Many other declining species such as the Bachman's sparrow (*Aimophila aestivalis*)

and hooded pitcher-plant (*Sarracenia minor*) thrive on Fort Stewart.

The longleaf pine and its associated species are fire-dependent, meaning that fire plays a vital role in sustaining the ecosystem. Many plants like wiregrass (*Aristida stricta*), require fire to stimulate flowering and seed production. Frequent fire also controls hardwood trees that compete for limited resources, and in the absence of fire, crowd out less shade-tolerant pines. Fire also consumes ground litter, which prepares a seedbed for longleaf pine and wiregrass seed germination. A number of animals benefit from prescribed fire because it creates open habitats and promotes nutritious and palatable forage when plants sprout back following fire. Aside from the benefit to plants and animals, frequent prescribed burning lowers the overall risk of wildfire and improves the landscape for military training.

Wiregrass is crucial to this habitat because it provides the main fuel for

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Occupational Health), the Office of the Assistant Chief of Staff for Installation Management, U.S. Army Public Health Command, Medical Command, and the Army Environmental Command will collaborate to assist the Services Steering Committee in developing a long term strategy for an updated Army drinking water policy to protect military personnel, families, children, and civilians on DOD installations.

IMCOM is committed to the belief that we absolutely owe it to our military,

families, and civilians to ensure they are provided safe, first-rate facilities on our installations. This link contains additional information and guidance provided by EPA regarding drinking water in schools and CDCs.

[http://www.epa.gov/ogwdw/schools/pdfs/lead/qrg\\_lcr\\_schools.pdf](http://www.epa.gov/ogwdw/schools/pdfs/lead/qrg_lcr_schools.pdf)

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# Fort Leonard Wood Protects Their Hellbenders

by Kenton Lohraff

**B**ecause they belong here, that's why. That's the simplest answer to a sometimes asked question "Why should we care about a declining, uncharismatic, seemingly useless, perhaps even unsightly species?" Fort Leonard Wood (FLW), Missouri is going to great lengths to protect its biodiversity; all of it! In the heart of the Missouri Ozarks FLW provides around 62,000 acres for military training but also provides habitat to some unique wildlife such as the eastern hellbender (*Chyptobranchus alleganiensis alleganiensis*). They are North America's largest salamander with adults reaching up to two feet in length and a life expectancy in the wild of 30+ years. Wildlife biologists with the Natural Resources Branch, Environmental Division, Directorate of Public Works at FLW have been working diligently to protect this remarkable amphibian in the Big Piney River flowing through the installation.

Hellbenders are strictly aquatic, requiring clean fast-flowing streams where they reside under large rocks. They breathe through their characteristic flappy skin-folds that increase surface-area. They are



primarily nocturnal and often not seen by the casual river observer except perhaps by nighttime fish-giggers in the fall, or fishers that occasionally catch one with live bait. Adult hellbenders may look formidable but

they are harmless.

The installation biologists have been surveying and monitoring hellbenders on FLW since they first discovered them

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prescribed fire, but wiregrass disappears from areas where soils were cultivated or where fire has been excluded. To improve the ecological health of areas where wiregrass has been eliminated, natural resource managers attempt first to restore wiregrass and associates in current and former longleaf pine habitats. Because there are few consistent commercial sources of wiregrass seed, Fort Stewart managers harvest seed from sites on the Installation using a seed stripper, and then sow it on sites slated for ecological restoration using a hay blower.

It generally takes two to three years for

wiregrass to develop to the point where it is capable of carrying a fire that will control hardwoods or undesirable pine species that might compete with longleaf seedlings. After wiregrass establishment, sites are burned during the growing season, and then planted the following winter using a tree planter or by hand. Using this process, Fort Stewart plants 150-200 acres of wiregrass and longleaf pine per year. Once an area is restored, prescribed fire, especially applied during the growing season, controls invasion of the site by hardwoods and undesirable pine species.

Efforts to re-establish and conserve longleaf pine-wiregrass on the Installation have met with great success. Restoration

efforts not only benefit the environment by promoting biodiversity, but also have proven beneficial to military training by providing open pine savannas that improve visibility and maneuverability. Proactive habitat conservation through habitat restoration also serves to reduce or eliminate military training restrictions associated with endangered species – a "Win-Win-Win" scenario for promoting quality military training, ecosystem health, and training land sustainability.

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# Fort Bragg Installation Receives Green Award

by Jonelle Kimbrough

The Installation Transportation Deployment Support Area facility at Fort Bragg, North Carolina was recently named “Best Green Project” at the annual Fayetteville/Cumberland County Community Appearance Awards.

A Leadership in Energy and Environmental Design Silver certifiable facility, the ITDSA is environmentally and fiscally sound in numerous ways. Energy conservation features include radiant floor heating and ground source heat pumps. Its building components are manufactured with locally sourced materials, recycled content and minimal volatile organic compounds that support

the regional economy, reduce waste and improve air quality. White concrete reduces the urban heat island effect, and permeable asphalt manages storm water on the site. The ITDSA’s most unique feature, though, is its vegetated roof. The vegetated roof is covered with over 500,000 evergreen and deciduous succulent plants that are designed to absorb and filter rain water, create an aesthetically pleasing microclimate and regulate the facility’s temperature to reduce its energy costs by 25 to 50 percent.

The Fayetteville/Cumberland County Community Appearance Awards are presented each year by the Joint

### Acronyms and Abbreviations

ITDSA	Installation Transportation Deployment Support Area
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Appearance Commission of Fayetteville and Cumberland County. The program seeks to promote the appearance and beauty of properties and businesses in the Cape Fear region.

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on base in 2004. Eastern hellbenders were listed as state endangered in Missouri in April, 2003. A look-alike subspecies, the Ozark hellbender (*C. a. alleganiensis*), occurs in other watersheds south of FLW in Missouri and Arkansas, was federally listed in October, 2011 as an endangered species under the Endangered Species Act. Hellbenders do not pose any conflict with ongoing military training because they only occur in the river where training is limited.

Populations of both subspecies have undergone dramatic population declines in Missouri in recent years. Likely causes of decline include habitat degradation, water quality deterioration, siltation, contaminants, and disease. In many places just a few older individuals remain where populations used to thrive, even where waterways still seem pristine. Recruitment of juveniles into adult populations is low. It seems that a combination of multiple stressors can take a toll on hellbender populations and we are perhaps just now seeing the effects of a slow decline.

FLW is active in protecting

watersheds and controlling sediment runoff due to erosion but biologists wondered what else they could do to improve the prospects for this species. FLW biologists added large slab-rocks to known and hopefully future hellbender sites to augment habitat for hellbenders and their main prey – crayfish. These are large flat rocks; the larger, car-hood-sized, the better; the very largest slab rocks that could be transported and placed in the river. Since the first supplemental rocks were added in 2005, both hellbenders and crayfish have been utilizing the new habitat; so they are working.

In 2007, FLW biologists, in cooperation with their conservation partners at the Missouri Department of Conservation (MDC), found a group of around 400 eggs in the wild and collected what was later confirmed by DNA analysis to be a double-clutch from two different females. Males fertilize eggs externally and guard prime nest sites during the fall breeding season. The eggs were carefully transported to a MDC hatchery where they were hatched and raised for five years until the juveniles reached about seven inches long. They were all tagged and in 2012 released back into the Big Piney


### Acronyms and Abbreviations

'benders	hellbenders
DNA	Deoxyribonucleic acid
FLW	Fort Leonard Wood
MDC	Missouri Department of Conservation

River. The young 'benders quickly found new homes in the newly added rock slabs. This captive rearing is part of the recovery plan for the species and will hopefully give the young 'benders a head-start on life back in the wild river; being a bit larger and less likely to become potential prey for fish predators and whatever else might like to try hellbender for supper.

FLW continues to monitor their hellbender populations. Hellbenders may be underappreciated by most folks but they are irreplaceable and exceptional organisms that play a unique role in their aquatic ecosystems, even if we don't fully understand what that role is. They just belong here.

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## Army Reserve Sustainability Excellence at the Vancouver AFRC

by Steve Patarcity

**L**eadership in Energy & Environmental Design (LEED) has been instrumental in changing the way architects and engineers think about how buildings and communities are designed, constructed, maintained and operated. Developed by the United States Green Building Council, LEED encompasses the entire life-cycle of a building or structure and recognizes best building strategies. Designed to give a third-party verification of “Green” buildings, LEED encourages various techniques that enable the planning and construction team to earn points, achieving different levels of certification in various sub-rating systems.

Since 2008, the Army Reserve Installation Management Directorate (or ARIMD) at the Office of the Chief, Army Reserve (OCAR) has incorporated LEED techniques into all aspects of facility design and construction for every Military Construction (MILCON) project. LEED Silver is the maximum allowed per Department of Defense (DOD) guidelines. However, a facility is permitted to achieve the higher LEED standards of Gold or Platinum if no additional costs are incurred. Such was the case with the Vancouver Armed Forces Reserve Center (AFRC) which was constructed to replace the more than 150 year old Vancouver Barracks.

As the Army modernized and changed,



*The new Vancouver, Washington Armed Forces Reserve Center (Bernardo Wills Architects)*

Vancouver Barracks rapidly became obsolete. According to Mr. David Robinson, Chief of Assets Branch of ARIMD and tasked with executing Army Reserve (AR) MILCON appropriations, many of the buildings used for AR units and operations were outdated pre-WW I construction, to include water and sewage systems with wooden pipes, ancient heating and air conditioning systems and an infrastructure unsupportable for information technology. Army Regulation 600-20 and the Defense Base Realignment and Closure (BRAC) Act of 1990, as amended November 9, 2005, ordered the closure of Vancouver Barracks. Once the site was declared as a candidate for BRAC 2005 action, the National Park Service and the AR worked to ensure a seamless transfer of the historic lands and buildings of the post from the Department of the Defense to the Department of the Interior. On Memorial Day, 2012, the East and South Vancouver Barracks transferred to the stewardship of the National Park Service.

Vancouver AFRC was a \$30 Million Dollar BRAC MILCON project designed to support up to 750 AR and ARNG Soldiers and consist of 115,000 square feet of training and administrative space plus a maintenance shop on 25 acres of land. Vancouver AFRC incorporated factors into the design, construction and owner contributions processes which enabled a LEED Gold rating such as:

- Plumbing fixtures using minimal water for operation;

- Heating, Ventilation and Air Conditioning (HVAC) systems using minimal energy and resources to heat/cool the building;
- Air barrier systems to prevent air leakage from conditioned spaces to the exterior;
- Rooms equipped with daylight and occupancy sensors, allowing lights to be turned off automatically with sufficient daylight or when the room is unoccupied;
- Diversion of 92 percent of construction waste from landfill and repurposed for other use;
- A 20 percent use of recycled materials, coming from local suppliers and manufacturers;
- Special paints, carpets, composite woods, adhesives and sealants to prevent off gassing and air quality issues;
- “Green” cleaning practices by requiring maintenance and janitorial contracts to use non-toxic and environmentally sound cleaning products;
- Design accommodating alternate transportation methods such as carpooling, bicycle parking, and bus access;
- Habitat restoration to include the replanting/ landscaping of previously cleared land; maximum use of open space in/around buildings and native plantings that would survive without the use of a permanent irrigation system;

Acronyms and Abbreviations	
AFRC	Armed Forces Reserve Center
AR	Army Reserve
ARIMD	Army Reserve Installation Management Directorate
ARNG	Army Reserve National Guard
BRAC	Base Realignment and Closure
DOD	Department of Defense
HVAC	Heating, Ventilation and Air Conditioning
LEED	Leadership in Energy & Environmental Design
MILCON	Military Construction
OCAR	Office of the Chief, Army Reserve
WW	World War







# Fort Bliss Energy and Water Conservation and Net Zero

by BJ Tomlinson

Fort Bliss has embarked on an extraordinary journey to become the United States Army's premier Net Zero Installation for Energy, Water, and Waste. This far-reaching and ambitious goal is within realization through innovative approaches to leverage natural resources at and around the post, large and small scale project development, partnerships, and integration of sustainable and renewable technologies into new developments and the legacy infrastructure. In an effort to streamline and reinforce its energy and water conservation efforts, Fort Bliss will finalize its Integrated Net Zero Plan with the assistance of the Fort Worth Army Corp of Engineers in its role as the Net Zero Integrator for Fort Bliss. This effort will also incorporate actions from the Fort Bliss Energy Action Plan that includes the overall Energy & Water Conservation plan, the development of Energy Savings Performance Contractor (ESPC) projects, Energy Conservation Investment Program (ECIP), other Army funded projects, and potential Utility Energy Savings Contracts (UESC) projects with local utilities.

For over a decade, the conservation efforts at Fort Bliss have been a primary focus for the Directorate of Public Works. Implementation of conservation efforts have been mainly focused on energy savings, but recent innovations from our ESPC, Johnson Controls Inc., has enabled bundled efforts that include water projects such as low flow shower heads and faucets, waterless urinals, and expanded use of


reclaimed water. It was through our ESPC that Fort Bliss has managed to implement over \$52M in investments for conservation with over \$5M per year savings.

Although large scale renewable energy projects have not yet emerged from the Army's program development efforts, considerable progress has been made in energy conservation and small scale renewable energy projects. Fort Bliss has seen success in the deployment of rooftop and ground mounted solar across the post. Our ESPC has implemented a 1.35MW ground mounted array near the 1AD Headquarters Building and several 100kW arrays in the training areas of Fort Bliss. Our ESPC is also in the process of implementing a 2MW array in the Main Cantonment area and several additional projects in various areas across post. The Corps of Engineers are managing an ECIP project to develop a microgrid around several key facilities on Fort Bliss. The microgrid will include up to 1MW of solar generation. Additionally, our Residential Communities Initiative (RCI) partners, Balfour Beatty Communities (BBC), are in the process of installing roof mounted solar on many of their Army family homes. They have currently installed over 1MW of generation and expect to finish the project with over 13MW installed by 2016. By end of FY2013, Fort Bliss has installed a capacity of 2,493 kW-DC Solar Photovoltaic systems among 40 different locations across post.

Fort Bliss has recently contracted

history, while our Soldiers, Civilians and Families are better served with a facility that supports our mission as a life saving, life sustaining force for the Nation, and is more sustainable and environmentally sound.

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## Acronyms and Abbreviations

1AD	First Armored Division
BBC	Balfour Beatty Communities
DC	Direct Current
DOD	Department of Defense
ECIP	Energy Conservation Investment Program
ESPC	Energy Savings Performance Contract
FY	Fiscal Year
kW	Kilowatt
MW	Megawatt
RCI	Residential Communities Initiative
UESC	Utility Energy Savings Contract

the Army Corps of Engineers, Fort Worth, to serve as the 'integrator' for the various Fort Bliss efforts in energy and water conservation, waste diversion, and renewable generation. The Corps will utilize internal expertise to assist Fort Bliss in integrating the various studies and efforts by others with respect to recommended policies, procedures, and projects to achieve Net Zero. The Corps are focused on the big picture with regard to the complex utility infrastructure, regulatory limitations, and funding scarcity to be able to give Fort Bliss the roadmap to the future with the right balance of renewable energy projects, water projects, waste diversion, and infrastructure investments.

Fort Bliss is striving to achieve DOD, Army, and Net Zero goals for energy, water, and waste. Energy and water conservation are key efforts that are a prime focus for Fort Bliss leadership. Through complimentary efforts from our ESPC, Army funded conservation projects, smart water reduction and conservation, and development of key renewable energy generation Fort Bliss will achieve its goal of Net Zero.

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- More effective storm water management by site containment, managed on site to prohibit storm water runoff to affect adjacent properties;

Heritage and traditions – the “Old Gold” of the Army – were properly preserved and transferred to the National Park Service for preservation of a significant portion of our nation's



# Beneficial Reuse of Treated Groundwater Moves APG Closer to NetZero Water

by Nicole L. Hernandez

The Aberdeen Proving Ground (APG) Garrison Department of Public Works is completing a project for the beneficial reuse of treated contaminated groundwater in the Edgewood Area of APG. This water, which has previously been released to surface waters, will be piped to the main Edgewood Boiler Plant and be re-purposed for boiler process water. This beneficial re-use will result in a significant reduction in potable water usage at APG and its associated cost. This off-set of potable water usage will help the installation secure its current water supply for mission requirements and meet its NetZero Water goals.

The groundwater to be re-purposed in this project is withdrawn from the Canal Creek area of the Edgewood Area of APG. APG has been a center for the development, testing, and manufacture of military-related chemicals since World War I, with industrial activities concentrated in the Canal Creek Area. Past activities have resulted in a groundwater plume primarily contaminated with volatile organic compounds. These compounds include 1,1,2,2-tetrachloroethane (PCA), trichloroethylene (TCE), and their breakdown products. The groundwater is treated in a groundwater treatment facility and then discharged into Canal Creek. The extraction/treatment system for the plume includes extraction wells

and precipitation/filtration technologies to treat inorganics and metals. An absorption process with resin is used to remove organic constituents in the groundwater.

The Canal Creek groundwater treatment facility is part of a 2000 Record of Decision to clean up the groundwater plume and was developed in accordance with the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980 as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986. Treatment of the water is funded through the Army Environmental Restoration Account.

By using the treated groundwater for boiler process water, APG will achieve savings by displacing nearly 15 percent of the Edgewood Area potable water demand (150,000 to 170,000 GPD). This is equal to 3.39 kgal/year. This project alone will have a significant impact on APG's aggressive NetZero Water conservation goals that stem from Aberdeen Proving Ground's selection as a NetZero Water Pilot Installation in April 2011. (All federal agencies have been mandated to reduce potable water consumption by 26 percent by 2020, per EO 13514. However NetZero Water installations have stricter standards. The NetZero program goals for APG are reduction of water consumption of 26 percent by 2015 and 52 percent by 2020.)


The reuse of this water also eliminates costs associated with producing or purchasing water from other sources. The resulting reduction in potable water usage will save \$207,000/year. The cost of the pumping station and associated piping connecting the Canal Creek Groundwater Treatment Plant to the Edgewood Boiler Plant is estimated at \$1.4 million and a return on investment of 6.9 years. This effort is programmed into the APG Garrison Department of Public Works' Energy Savings Performance Contract (ESPC) project for execution in FY 14. The ESPC contract mechanism used to

Acronyms and Abbreviations	
APG	Aberdeen Proving Ground
DPW	Department of Public Works
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
ESPC	Energy Savings Performance Contract
FY	Fiscal Year
GPD	Gallons Per Day
PCA	1,1,2,2-tetrachloroethane
RDT&E	Research, Development, Test and Evaluation
SARA	Superfund Amendments and Reauthorization Act
TCE	trichloroethylene

execute the project is possible due to the generation of a saving stream by displacing expensive sources of potable water and their associated pumping and treatment costs.

Being a Research, Development, Test and Evaluation (RDT&E) installation presents numerous challenges. There are significant life, health and safety factors that make APG missions very water intensive. Unique mission requirements include munitions testing and numerous laboratory facilities conducting tests with biological and chemical agent. Water efficiency and water conservation efforts and implementation of Net Zero initiatives are necessary to ensure mission failure does not occur. APG's Net Zero strategy requires a unique combination of approaches to reduce usage. Projects such as the beneficial re-use of the treated contaminated groundwater in the Edgewood Area of APG are critical to mission success.

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Process tanks at the Canal Creek Groundwater Treatment Plant at Aberdeen Proving Ground



# Korea's Area 1 Protects Cultural Artifacts

by Roland E. Langford

In 1453 A.D. in Chosun, today's Korea, there was a crisis. Great King Sejong, Korea's greatest king, had died three years earlier, and his eldest son ascended to the throne -- until his untimely death. Sejong's grandson, a 12 year old boy, suddenly became king. The boy's uncle, Sejong's second son, decided to usurp the throne; he killed the young king's supporters, and declared himself King Sejo. After the coup, scholars, aristocrats, and the general populace rose up against the usurper. King Sejo called upon General Aw Yoo-So to put down the uprising, which the general did and went on to greater honors in battle with northern tribes and eventually served as Minister of War.

General Aw is buried on U.S. Army Garrison Red Cloud's Camp Hovey. It is the responsibility of the USAG Red Cloud's Environmental Division of the Directorate of Public Works (DPW) to maintain and ensure the protection and solemnity of these graves as well as other cultural objects, including pagodas, guardian statues, and stone carvings.

The Environmental Division has identified several sites of cultural interest. Within Story Life Fire Complex lies the grave of Great King Sejong's sister, Unsong Buwongun. The old metal sign marking her grave was deteriorated and in danger of being lost. The Environmental Division requested that the local Yeonchon-kun authorities make a new sign more fitting of her memory. The new sign, a stone marker in both Korean and English, has been replaced and will last for many years.

Also located on U.S. Army property is a 15th Century stone pagoda. It has been relocated from its original site in Seoul and now stands across from the Deputy Commanding General (Maneuver)

Headquarters at Camp Casey. The pagoda was donated in 1962 to the U.S. Army by a Korean minister in appreciation of the service of U.S. personnel to Korea.

The Cultural Affairs Team of the Environmental Division also identified an even more ancient site. Korea has thousands of dolmens, stones structures some more ancient than Stonehenge, which were used as burial sites during the Stone Age (Paleolithic Age). A suspected site was identified by the Environmental Division on Camp Hovey. A request was made of the Dongducheon City and national authorities to investigate. The investigation showed that the area was not itself a dolmen site, but was used for quarrying stone to be used as dolmens and is thought to be of Paleolithic age.

On Rodriguez Live Fire Complex, members of the Environment Division identified a potential pottery kiln. An investigation showed that it was, most likely, a site producing Korean celadon pottery in the 17th and 18th Centuries.

The Environmental Division, in addition to ensuring protection of the environment, works to protect artifacts important to the Korean people. However, sometimes things go wrong. What military units thought was beautification of ancient statues by painting them, was considered by the Koreans to be a desecration as Koreans do not paint their statues, The Environment Division is currently in the process of gently removing the paint without harming the cultural artifact.

Part of the Division's mission is to educate personnel about the culture of Korea in order to respect the history of this ancient people. There are plans to distribute a booklet listing the various statues, graves, and other artifacts for personnel in Area 1 as well as improving signs describing the importance of the site or object. The U.S. Army works in cooperation with our Korean neighbors



Environmental Division personnel removing paint on statues

to protect the environment, natural and cultural resources, and defend peace on the Korean peninsula.

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## Acronyms and Abbreviations

DPW	Directorate of Public Works
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# Best Sustainable Practices at Fort Buchanan’s New Directorate of Public Works Building

by Francisco J. Mendez

“That is a Best Practice!”, expressed Mr. Davis D. Tindoll, Jr., U.S. Army Installation Management Command (IMCOM) Atlantic Region Director; in reference to the Water Harvesting System used in the new Directorate of Public Works (DPW) at Fort Buchanan, Puerto Rico. Upon Mr. Tindoll’s visit in February 2014, the DPW Director, Mr. Pascual A. Quiñones proudly showcased all the sustainable practices and energy conservation measures incorporated in the construction of said facility. The new DPW was completed under the military construction program in order to replace the former Building 556, which suffered extensive structural damage due to an explosion blast at the adjacent fuel farm (off Post) known as Caribbean Petroleum Company (CAPECO) on 23 October 2009.

On 19 April 2012, the start of the construction of the new DPW took ground. The buildings’ sustainable design features were the result of

thorough analysis requirements of the Energy Policy Act 2005 (EPACT 2005), Executive Orders, the National Defense Authorization Act (NDAA), Army Regulations and Strategic Plan goals. Nowadays, the new DPW leads the way and establishes the benchmark for sustainable design for all future construction on the Garrison. The sustainable design features of the facility includes; water harvesting systems, sensor controlled fixtures, ultra low flow urinals/toilets. A major driver for this “Best Practice” was Fort Buchanan’s designation as a Net Zero Water Installation (NZWI) by the Assistant Secretary of the Army for Installations, Energy and Environment (ASA-IEE). This action immediately resulted on developing a Water Reduction Strategy supported by Fort Buchanan Environmental Management Action Plans in order to meet the 60 percent reduction goal by FY2020.

Among other sustainable practices, an alternative renewable energy producing

Acronyms and Abbreviations	
ASA-IEE	Assistant Secretary of the Army for Installations, Energy and Environment
CAPECO	Caribbean Petroleum Company
DPW	Directorate of Public Works
EPACT 2005	Energy Policy Act 2005
FY	Fiscal Year
IMCOM	Installation Management Command
kW	kilo Watt
LED	Light Emitting Diode
LID	Low Impact Development
NDAA	National Defense Authorization Act
NZWI	Net Zero Water Installation

system offsets up to 30 percent of the new DPW facilities energy demand by an array of ground-mounted photovoltaic modules rated at 250 kW. In addition, a solar water heating system, energy efficient chilled water air conditioner systems, LED interior lighting with occupancy sensors and LED street-parking lighting systems were installed.

Other energy efficiency provisions include building envelope elements such as; reflective roofing, enhanced wall and roof insulation and high efficiency windows with integrated Bahama shutters for shade and storm protection. To comply with storm water quality and quantity Low Impact Development (LID) regulations, the project is minimizing building roof’s rain water runoff by harvesting the water and holding up to 40,000 gallons in a bio-retention pond to reduce storm water sedimentation and to slowly release the water into the storm drainage system. Compliance and solid waste reduction programs become supported via the integration of standard working stations equipped with recycling-bins.

The emphasis shown on the sustainable design features for the new DPW buildings truly depicts the US Army Energy Security and IMCOM Strategy Plan to which ➤



The New Directorate of Public Works front entrance façade. Note the South Gate Wind Turbine in the background one of two built under Fort Buchanan Energy Savings Performance Contract. (Francisco J. Méndez)



# Meeting Energy Consumption Goals Improves Lake Facilities

by Diana McCoy

Sustainability has been a part of the culture of the U.S. Army Corps of Engineers since March 2002, but execution of the sustainability and energy requirements for the Kansas City District did not get underway until 2012. This was due to lack of funding in the budget for investments in facility energy/water efficiency. Nearly two years later, after receiving funding in 2012, several sustainability projects have been completed around operations projects, and the district is meeting its overall goal.

“The Corps of Engineers is tasked to reduce our energy usage for our goal subject stationary energy consumption in our buildings by 23 percent,” said Charles Hall, the district’s operations sustainability coordinator. “Right now, because of what we did in 2012 as well as all the lake projects looking at ways to reduce energy, we’ve met that goal for our operating projects.”

Projects have been completed at Truman, Smithville, Rathbun, Long Branch, Melvern, Pomona, Stockton and Perry lakes. Smithville Lake has been one of the biggest success stories for the district. Sustainability projects have caused energy consumption in the visitor center and administrative office to be cut down by about 50 percent.

“It was somewhat easier for us to cut down on our energy consumption here because we only have the visitor center, and we don’t have to manage campgrounds and multiple facilities like other lake projects

do,” said Lora Vacca, the operations project manager for Smithville Lake.

The biggest project completed at Smithville was a partial window replacement of the second story windows. The old windows were 30 years old and had become leaky and drafty. Other projects at Smithville include switching florescent bulbs to light-emitting diode, commonly known as LED lighting, which uses less electricity and far outlasts florescent lights; installing occupancy sensors, which is basically a motion detector that senses when someone walks into a room and causes the lights to automatically turn off and on; and the installation of a daylighting system.

Several sustainability projects have been completed at Harry S. Truman Lake as well. Jason Hurley, an environmental specialist at the project, oversees all of the endeavors. “A lot of our projects to date have been lighting unit upgrades. We’ve also done HVAC (heating, ventilation, and air conditioning) upgrades, put a new roof on an office building, and completed some plumbing upgrades,” said Hurley. Many other projects have been completed and according to Hall, the energy consumption at Truman Lake has been cut down to about 40 percent.

Like the Smithville Lake office, all of the lighting at Truman was upgraded. A project that’s currently in progress is the replacement of overhead doors in the maintenance building. “We recently had an energy audit completed by an outside




*The drafty, 30-year-old second story window at the Smithville Lake Visitor Center was replaced, causing employees to notice an immediate difference. (Amy L. Phillips)*

team, and we’re still waiting for the results on that audit,” said Hurley. “We had an internal audit done in 2011, but we were still considered a high energy user compared to the rest of the Corps.”

Hurley said they have multiple large buildings that require a significant amount of energy to operate and a large staff, so by nature, they are using a lot more energy. Also, technology has improved since the buildings were originally constructed.

Hall said the initial cost of sustainability improvements is expensive, but there is a payback after so many years—just as with any home improvement project. To date, eight project offices in the district have completed 21 sustainability projects at a cost of just over \$1 million.

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Fort Buchanan is steered during such economic hardships. In addition, as a direct result of the organization continuous process improvement structures, Fort Buchanan was the recipient of the 2013 Army Community of Excellence “Most Improved Installation” Award. “I thoroughly enjoyed the tour of the post, particularly

the fascinating energy projects”, stated LTG Jeffrey W. Talley 32nd Chief of Army Reserve, in December 2013. The DPW, through its support services, is committed to maintain Fort Buchanan’s high operational sustainability, readiness, and efficiency for the wide range of integrated services in order to be relevant and improve the quality of life of our Armed Forces community.

“Sustaining the Environment, for a Secure Future” “ Army Green is Army

Strong”

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# Greening Army Medicine

by Tammy Ford

The Army is building a culture that recognizes the value of sustainability measured not just in terms of financial benefits, but benefits to maintaining mission capability, quality of life, community relationships, and the preservation of options for the Army's future.

To safeguard mission readiness, MEDCOM developed a Sustainability Program that aligns with Executive Order 13514 as well as the DOD Strategic Sustainability Performance Plan (SSPP) and the Army Sustainability Campaign Plan (ASCP). Through sustainability, MEDCOM is working to reduce the total costs of operation and ownership, improve the quality of life for hospital staff and patients, and strengthen community relationships.

Every year, hospitals in America spend over \$8 billion on energy.<sup>1</sup> Most of the energy used in American hospitals is derived from fossil fuels. Dependence on fossil fuels poses a national security concern. Energy saving measures reduce utility costs and can extend equipment life, which reduces MEDCOM's operational costs.

Army medical treatment facilities (MTFs) generate a complex variety of waste streams and are typically the largest generator of waste on a military installation. Producing less waste provides fiscal savings and environmental benefits, including lower waste disposal costs and less landfill space needed for waste disposal.

MTFs are typically the largest consumer of water on an installation, with a mission-critical need for large volumes of high-quality water. Water conservation at MTFs reduces operational costs while conserving a critical resource that is scarce in many areas. Furthermore, a considerable amount of energy is required to treat and deliver potable water to consumers. Reducing the amount of potable water used also results in reduced energy consumption.

Today, the MEDCOM Sustainability Program focuses on: establishing

sustainability teams at all MEDCOM MTFs; reducing the amount of solid waste, hazardous waste and regulated medical waste (RMW) generated at MTFs; increasing recycling; maximizing energy and water conservation; and, increasing environmentally preferable purchasing

MEDCOM leads interactive workshops to stand up sustainability teams at each MTF; define specific, measurable sustainability goals for each MTF; and develop a roster of initiatives to achieve those goals. These MTF-specific goals are then aggregated into an MTF Sustainability Action Plan tailored to the individual situation and needs of the MTF in alignment with MEDCOM sustainability goals, the DOD SSPP, the ASCP, and EO13514.

No two MTFs are exactly alike. The differences in geographic location, patient population and even recycling opportunities can result in different drivers and challenges at each facility. It is not realistic for every MTF to tackle every MEDCOM sustainability goal. However, when taken in aggregate, sustainability implementation at the MTFs will support MEDCOM sustainability goals; and ultimately achieving the goals set forth in EO13514. Since inception of the MEDCOM Sustainability Program, the Command has documented sustainability savings of over \$21 million with sustainability teams established at only 12 of the 23 Army MTFs.

The MEDCOM Sustainability Program has garnered many awards during its existence.

1. In 2013, MEDCOM won the Military Health System Healthcare Innovation Program Per Capita Cost Award for the program to green Army operating rooms.

2. In 2013, six MTFs received Practice Greenhealth (PGH) Environmental Excellence awards. Since 2010, a total of 19 MTFs have won PGH awards for sustainable healthcare.

Acronyms and Abbreviations	
ASCP	Army Sustainability Campaign Plan
DOD	Department of Defense
EO	Executive Order
MEDCOM	U.S. Army Medical Command
MTF	Medical Treatment Facility
PGH	Practice Greenhealth
RMW	Regulated Medical Waste
SSPP	Strategic Sustainability Performance Plan

3. In both 2012 and 2013, Madigan Army Medical Center, Joint Base Lewis-McChord, WA, received the elite Environmental Leadership Circle award, America's most prestigious award for sustainable healthcare. Madigan is the only Federal hospital to earn this award and the only Federal hospital to receive it in back-to-back years.

4. In 2012, the MEDCOM Sustainability Program won the inaugural Society of American Military Engineers Sustainability Award for Education and Outreach.

By supporting mission readiness through sustainability, MEDCOM is demonstrating that green medicine is not only practical and sustainable on a large scale but that it is also fiscally and socially beneficial to implement such practices. MEDCOM is executing our mission with remarkable success through trying times. There are difficult challenges ahead, but our vision remains unchanged: Strengthening the health of our Nation by improving the health of our Army.

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Endnote:

1. "Hospital Energy Alliance 2012 Annual Report," U.S. Department of Energy, October 2012.



# Fort Riley Net Zero Water Demand Project

by Mike Nye and Chris Otto

In April 2011, Fort Riley was selected as one of eight installations to pilot the Army's Net Zero Water initiative. A Net Zero Water Installation is one that limits the consumption of freshwater resources and returns water back to the same watershed so as not to deplete the groundwater and surface water resources of that region in quantity and quality. The Army set ambitious goals for water conservation on Net Zero Installations including reducing the amount of water used per square foot of building space by 50 percent by 2020 (using a 2007 baseline).

In an effort to find innovative solutions to conserve water, the EPA's Office of Research and Development (ORD) and the Assistant Secretary of the Army for Installations, Energy, and Environment (ASA IE&E) signed a Memorandum of Agreement (MOU) in November 2011. As part of that MOU the EPA has teamed up with the Fort Riley Directorate of Public Works (DPW) Environmental Division to find new ways to save water.

The EPA and Fort Riley DPW have started several projects intended to reduce water use or to demonstrate how to use less water. One exciting project is focusing on how people use water instead of finding new technologies to reduce water use. While new, low-cost technological advancements are essential to improve our ability to manage water more efficiently, part of the Net Zero water solution is behavioral or demand-oriented

(i.e. choosing to water the lawn during cooler periods of the day). A recent Water Balance Audit by the Pacific Northwest National Laboratory (PNNL) determined that Fort Riley cannot meet its Net Zero water goals without addressing the demand component. Addressing water demand as a product of the social and technical systems that shape water use patterns on the installation will help the Army understand how to promote more sustainable water use behaviors that work in the wider context of life and work on a US Army base.

Groups of Fort Riley participants, working with EPA technical experts and Army personnel, will be empowered and encouraged to save water in different ways that address key water use/ waste 'hot-spots' around the installation (as identified PNNL). The backbone of the project is a community-based social marketing (CBSM) campaign that encourages participants to pledge to make small, but potentially significant, changes in behaviors targeted at the hot spot areas.

As an avenue to reach families living in Family Housing on post, the EPA and DPW teamed up with the local school district to train teachers about water conservation. In October 2013, the EPA sponsored a Water Education for Teachers (Project WET) workshop for all 5th grade teachers on post. Those teachers agreed to incorporate water education into activities through the school year and to help recruit volunteers to further participate in the project.

Some of the 5th graders, their families, and others living on post have volunteered to test near real feedback from advanced water meters as an additional behavior change tool. The CBSM campaign is also linked to a broader water-saving education and awareness raising program that is being rolled out in conjunction with the DPW at Fort Riley, state conservation groups, and the local school district. Outcomes from these activities will be assessed using



*EPA sponsored a Water Education for Teachers (Project WET) workshop*

water meters and periodic surveys of water conservation attitudes and behavior. The project is specifically designed to have a grass roots feel; Ft Riley personnel and residents will have significant opportunities to steer the agenda and propose their own water savings projects or pledge-based behaviors.

There are three main objectives for the project. First and foremost, the project will reduce water demand on Fort Riley by targeting key behaviors linked to high-volume, hot-spot water uses with good potential for savings. The meters used to measure reductions in demand will also help the Army more accurately measure the overall water use 'profile' of residential water use groups across the installation, which in turn will help the army better understand and plan of the current and future water needs of the installation. Finally, the project will promote a culture of practical and effective water conservation that is aligned with Army's mission and that makes sense to the Fort Riley community.

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Acronyms and Abbreviations	
ASA IE&E	Assistant Secretary of the Army – Installations, Energy, and Environment
CBSM	Community Based Social Marketing
DPW	Directorate of Public Works
EPA	Environmental Protection Agency
MOU	Memorandum of Understanding
ORD	Office of Research and Development
PNNL	Pacific Northwest National Laboratory
WET	Water Education for Teachers



# Sustainability Outreach at Joint Base Lewis-McChord

by Miriam Easley

Those in sustainability know one of the keys to a successful program is getting buy-in from the community -- and that takes a comprehensive outreach program. Joint Base Lewis-McChord has two outreach coordinators focused on sustainability and recycling. They're not alone though, each sustainability team plays a part in the outreach of their subject matter. While the outreach program is multi-faceted, there are three initiatives proving vital to the program.

The Net Zero Competition is a semi-annual award program targeted toward military units. Units compete during each four-month contest period for up to \$7,500 for their unit fund account. This award program is funded by the Qualified Recycling Program so Service members see direct results from their sustainability efforts in the form of recognition and a monetary award. The award program concentrates on JBLM's five Net Zero goals -- Net Zero Water, Waste, Energy, Land, and Air -- with required and elective actions in each category. Actions can vary each competition period and include such

things as providing POC information/training for Building Energy Monitors or Unit Transportation Coordinators; ensuring purchase card holders receive training on Green Procurement requirements; and promoting recycling and water and energy conservation awareness. Disqualifiers include breaches in the training area, open burning, or consistently contaminated recycling containers. Many units go above and beyond the required or elective actions and list their accomplishments in the Initiatives and Innovations section. Below are examples from past competitions:

- The Northwest Joint Regional Correctional Facility's organic farm where inmates learn horticulture or vermicomposting.
- 542nd Support Maintenance Company coordinated with free issue and other units to reuse equipment and material usually discarded, resulting in saving tens of thousands of dollars.
- 7th Airlift Squadron created eye-catching marketing material for energy and water conservation targeted towards the

Acronyms and Abbreviations	
DFMWR	Directorate of Family, Morale, Welfare and Recreation
FDA	U.S. Food and Drug Administration
IAW	In Accordance With
JBLM	Joint Base Lewis-McCord
LCD	Liquid-Crystal Display

Airmen in their unit.

- Madigan Army Medical Center arranged for six different types of used Single Use Medical Devices to be reprocessed IAW FDA standards and resold as reusable.

The Net Zero competition is getting Service members to incorporate sustainability into their day-to-day missions. It also provides a way to reward units who already demonstrate sustainable actions.

The Sustainable JBLM brand has been evolving since the inception of the program in 2002, the most recent evolution occurring with the introduction of the Net Zero program. To incorporate the Net Zero initiatives while preserving the sustainability identity, the current Sustainable JBLM brand was created by the JBLM DFMWR marketing department with input from the Sustainability Team. The brand includes an overall logo for Sustainable JBLM and individual logos to represent each of the Net Zeroes. A style guide was created so the brand could be used consistently by each of the sustainability teams. The brand is used in all marketing materials and can be seen in various locations around the base. Because of its consistent use, brand recognition is occurring.

Sustainability is a big concept and the umbrella for all of the environmental programs. The '12 Months of Sustainability' communication campaign was created to organize the outreach of these topics. Each month has a different theme, often coinciding with national campaigns. For instance, October is

Joint Base Lewis-McChord is committed to supporting a strong national defense, securing the integrity of our natural and cultural heritage, and conserving our natural resources for tomorrow's generations, while seeking choices that enhance our neighboring communities' abilities to have a productive future.



The Sustainable JBLM brand connects the Net Zero initiative with the sustainability goals for the installation. (Kimberly Rowe)





# Recycled Furnishings Resuscitate Fort Bragg Medical Clinic

by Jonelle Kimbrough

If one man's trash is another man's treasure, then Staff Sergeant Eric McEllen has discovered a veritable trove in the form of chairs, filing cabinets, shelves and desks. With donations of furniture and assistance from other installation agencies, McEllen and the personnel at the Medical One Stop Clinic at the Fort Bragg Soldier Support Center have transformed their space from sterile and decrepit to stylish and efficient.

The Medical One Stop Clinic offers comprehensive health assessments for Soldiers arriving at or leaving Fort Bragg. "The appearance of the clinic is important to me because every Soldier at Fort Bragg comes into our care at some point," said McEllen, who is the clinic's noncommissioned officer in charge. According to McEllen, the Medical One Stop Clinic can assess as few as 50 or as many as 300 Soldiers every day. "We never know how many Soldiers will come through our doors, so we have to be prepared," he said.

Before the renovations, the defunct and sparse amenities could barely accommodate the patient load. Now, the clinic can offer a more pleasing and more professional space for its personnel and the Soldiers receiving care there. McEllen partnered with Marty Clark, the facility manager at the Soldier Support Center, to acquire recycled furniture, art and other items from Womack Army Medical Center, the Warrior Transition Battalion, Corvias

Military Living and offices housed in the Soldier Support Center.

"All of this furniture was destined for the trash," Clark said. "Even though the furniture is not really new, it is new to us," McEllen added. "In this time of economic uncertainties and fiscal shortfalls, we have to learn how to do more with less. We have accomplished that mission here."

As a result of the efforts, the Soldiers and the health care personnel at the clinic can enjoy comfortable chairs, sturdy desks and colorful art work – all of which contribute to an enhanced experience for both the patient and the provider. The health care providers said that many of the patients have voiced positive remarks about the clinic's refreshed appearance.

McEllen also partnered with installation agencies to procure recycled computers for electronic medical assessments. The Medical One Stop Clinic initially offered three computers. McEllen has created a computer lab with 14 stations to provide Soldiers with Internet access, which expedites the assessment process.

The renovation project at the Medical One Stop Clinic has reaped environmental and fiscal benefits as well. Hundreds of pieces of furniture were diverted from the waste stream, and McEllen estimates that the reuse project has saved \$500,000 in Army funds. In addition, McEllen has developed mutually beneficial relationships with Clark and other individuals and




Recycled furnishings for medical clinic

agencies on Fort Bragg. "Working with these agencies and especially with [Clark] has been a wonderful experience," McEllen noted. "I am proud of what [the Medical One Stop Clinic] has become."

Hopefully, the resourcefulness of the Medical One Stop Clinic, the Soldier Support Center and the agencies who assisted in the furniture project will inspire others to join forces in Fort Bragg's efforts to reduce, reuse and recycle. Reducing, reusing and recycling have certainly provided the Medical One Stop Clinic with a new lease on life – in every sense of the word.

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Energy Awareness, May is Bike to Work, and April is Earth Month. Outreach for each month includes a two-page newsletter, an article in the base newspaper and MWR Focus magazine, social media posts, and advertising on the base's readerboards and LCD screens. Additional outreach activities include: humorous yet informative videos

on sustainability topics; recycling flash mobs where unsuspecting recyclers in a populated location are surprised with a cheering crowd and a coin from the Joint Base Commander; and events that provide information and services related to energy conservation and recycling.

These three initiatives, combined with on-the-ground outreach, training, various events, and partnerships with organizations on and around JBLM are the keys to a

successful outreach program. Culture change is hard to do, but with good plans and consistent efforts progress is not only possible, but evident.

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## Geomagnetic Storms Pose Potential Threat to Army Energy Systems

by William Croisant and Ned Shepherd

**G**eomagnetic storms have the potential to disrupt and damage electrical infrastructure, leading to serious consequences for installations and surrounding communities. For this reason, the U.S. Army Installation Management Command asked the Engineer Research and Development Center to assess Army energy systems' vulnerability to these events.

A geomagnetic storm is a solar-related global phenomenon that can last several days and can affect multiple continents. Geomagnetic storm impacts are a low probability-high criticality concern that is increasing in near-term likelihood due to the nation's reliance on and type of electricity use, expanding use of automated power controls, and cyclic changes in solar activity. Possible adverse installation impacts include an unscheduled loss of electrical service for hours to months and damage to transformers, computers, communications networks and Supervisory Control and Data Acquisition networks.

Geomagnetic storms are caused by coronal mass ejections (CME) impacting the Earth's magnetosphere. CMEs are explosive releases of enormous quantities of charged particles and electromagnetic radiation from the sun. A CME disturbs the Earth's magnetic field as can sometimes be seen by the display of an aurora (northern and southern lights).

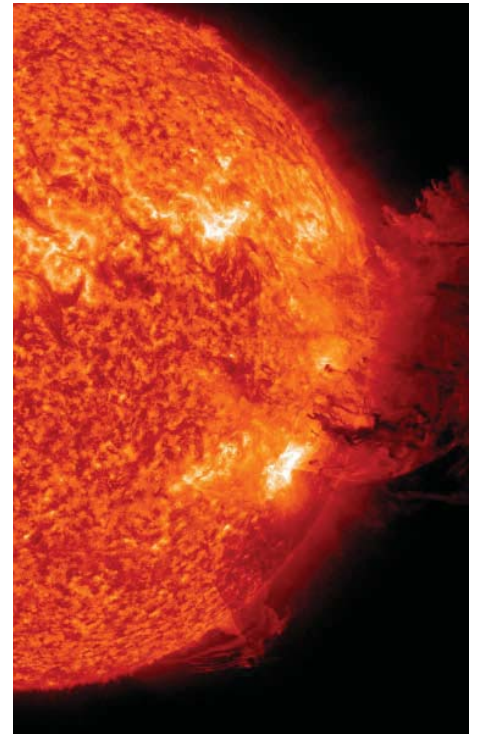
When the charged particles enter the earth's atmosphere, unevenly distributed electrical currents can build up in the earth's crust. These geomagnetic induced currents (GIC) are especially a concern when they find a man-made path of lower resistance (as compared to the earth itself) in long metal conductors such as electrical

lines, communication lines, and pipelines. Direct currents as high as 300 amperes in the neutral of some transformers have been reported. This is enough stray current to damage equipment far from the source of the intrusion. The geomagnetic storm on March 13-14, 1989 led to a power outage in the entire Province of Quebec, Canada, and in parts of the Northeastern United States

Several factors influence the impact of GICs on the electric grid. These include line length and orientation, line resistance, ground resistance, transformer design and quality of electrical infrastructure. GICs are more prominent at higher latitudes (near the poles of the Earth); however, GICs have been reported at middle and lower latitudes. The GIC situation can be serious near the coasts where highly conductive seawater interfaces with poorly conductive ground.

Electric system configuration is another consideration:

- Long electrical lines serve as antennas that collect GICs. Greater line length poses an increased risk because of the voltage difference at the grounded ends.
- GICs cause partial saturation of power transformer cores, which results in transformer heating and distortion of the alternating current waveform leading to faulty operation of relays and other equipment
- The impact of GICs depends on the specific transformer design. Transformers with a wye (or "star") wiring configuration with a grounded neutral are more susceptible to GICs than transformers with a delta wiring configuration. Extra high voltage (more than 345,000 volts) transformers are particularly vulnerable to GICs
- Aging electrical infrastructure, such as transformers, tend to be more susceptible to failure. Repeated exposures to GICs can cause cumulative damage that ultimately can lead to



*This coronal mass ejection was detected by the National Aeronautics and Space Administration on June 7, 2011. (NASA)*

transformer failure.

While geomagnetic storms are unpredictable, the U.S. National Oceanic and Atmospheric Administration provides information on space weather conditions (<http://www.swpc.noaa.gov>). Through the agency's product subscription service, registered users can receive alerts, warnings, watches, forecasts, and summaries via email within moments of an event being detected.

Experts recommend a mix of hardening (material/physical) infrastructure and operational strategy (nonmaterial) measures to reduce vulnerability to and consequences of severe geomagnetic storms. With enough advanced warning, installations can implement contingency plans modifying the way they operate during severe geomagnetic storms to even include total shutdown and physical disconnection of vulnerable systems. These contingency ➤

Acronyms and Abbreviations	
CME	Coronal mass injection
ERDC	Engineer Research and Development Center
GIC	Geomagnetic induced currents
NASA	National Aeronautics and Space Administration



# Innovative Approaches for Cleaning Up Legacy Radioactive Waste Sites

by Karen Keil

Projecting costs and completion dates for cleaning up radioactive waste sites is challenging. There are many uncertainties that must be considered when remediating subsurface contamination. The U.S. Army Corps of Engineers Buffalo District is responsible for 11 of the 24 sites that are currently part of the Formerly Utilized Sites Remedial Action Program (FUSRAP), which was created to address sites throughout the nation contaminated as a result of Manhattan Engineer District or early Atomic Energy Commission activities. As a leader in the field of radiological remediation, the U.S. Army Corps of Engineers Buffalo District utilizes two different innovative approaches to develop better cost and schedule estimates and also save money on the off-site transportation and disposal of radiologically contaminated soil, which often represents the largest portion of overall remediation costs for a FUSRAP project.

The first innovation is the use of a risk-based budgeting and scheduling method known as the Cost and Schedule Risk Analysis (CSRA) process. The CSRA process incorporates the Monte Carlo method which uses a series of random samples taken from a range of variables that can affect cost and schedule to create a cost and schedule forecast with a

definable level of certainty. For example, the cost of transportation is highly affected by the cost of fuel. The amount of contaminated soil requiring excavation and off-site disposal can also change as more information is gathered during the remediation. The CSRA estimate considers the full range of all of these variables rather than a single point value for each input to the cost estimate. Input to the CSRA includes a project-specific risk register that is generated by gathering input from all team members. Finally, a computer simulation yields a range of cost and schedule contingencies and associated confidence levels. The U.S. Army Corps of Engineers Buffalo District selects the 80 percent cost and schedule confidence level for budget and schedule commitments. This CSRA process was first used in 2009 on five of the Buffalo District FUSRAP sites, including Linde. The Linde FUSRAP Site near Buffalo, New York, was used for the separation of uranium ores in the early 1940s. The Department of Energy began their investigation of the site under FUSRAP in the early 1990s. Use of the CSRA at the Linde Site allowed the Buffalo District to provide a more comprehensive and certain cost-to-complete projection for national FUSRAP budgeting purposes. It also enabled project and program leadership to identify and more effectively manage the cost and schedule risks. The Linde project was completed in less time and for less money than projected by the re-baselined 80 percent CSRA confidence level estimate.



Excavation in progress at the Linde FUSRAP site showing subsurface remediation adjacent to an existing building

The second innovation is the use of automatic soil sorting technology. This state-of-the-art technology utilizes gamma radiation detectors to separate contaminated soils from non-contaminated soils excavated during cleanup. Once soils are excavated, they are transferred on a conveyor belt and passed under gamma radiation detectors to separate soils that are radiologically contaminated above the cleanup goals from soils that are not above the cleanup goals. Without the use of this technology, it would be difficult to separate potentially clean overburdened soil from soil that is in fact radiologically contaminated. This automatic soil sorting technology was recently used at the Painesville Site, a 30-acre, privately-owned site located about 22 miles northeast of Cleveland, Ohio. The site became contaminated when scrap steel containing radioactive residues was shipped there. Use of the soil sorter reduced the volume shipped for off-site disposal by 96 percent, thereby achieving \$6 million in project savings.

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Karen G. Keil, Ph.D., is an environmental toxicologist and risk assessor in the Environmental Branch of the U.S. Army Corps of Engineers Buffalo District.

Acronyms and Abbreviations	
CSRA	Cost and Schedule Risk Analysis
FUSRAP	Formerly Utilized Sites Remedial Action Program

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plans may well need to be dynamic to take into account electrical and communications systems design and condition, mission criticality and the need to continue operations during an event, and an ability to recover should damage occur.

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# Fort Carson Selects Cost-Effective Alternative Landfill Cover

by Joe Gallegos, Mike Ayala and Mona Dowillard

Fort Carson, Colorado, installation restoration projects, funded by the Army Environmental Command through a performance based contract, recently faced the challenge of closing four large separate landfills in a short timeframe. The PBC required the contractor to cap the landfills (approximately 90 acres) in compliance with stringent Colorado Department of Public Health and Environment requirements. Building on the experience gained during the recent closure of two smaller but similar Fort Carson landfill sites, the landfill cover type selected, and approved by CDPHE as the most effective and efficient method of closing the CLA landfills, was a 4-foot-thick, modified evapotranspiration cap.

“ET Covers are ideal for the semi-arid conditions we experience in Colorado and for the type of hazardous waste landfill involved with this project,” said Carlos Rivero-deAguilar, Fort Carson Directorate of Public Works Environmental Division chief. “By using this type of alternative

cover, Fort Carson saved millions of dollars in project costs, and is at the forefront of clean, green and economical landfill closure technology in the US.”

While traditional landfill cover systems use man-made materials or imported clays with low permeability to provide a barrier between precipitation and landfill material below, ET systems are constructed with minimally compacted soil that has the capacity to store rain water at a high volume. These engineered covers act as a reservoir rather than a barrier, holding moisture until it transpires through the landfill cover vegetation or evaporates from the soil. This approach of balancing and storing the water keeps it from passing through to the landfill material, avoiding leaching contaminants and potentially impacting groundwater.

ET systems have many benefits compared to traditional landfill covers. The cover systems are truly “green”, consisting only of natural native materials. Because of this, they are typically cheaper

Acronyms and Abbreviations	
AEC	Army Environmental Command
CDPHE	Colorado Department of Public Health and Environment
CLA	Combined Landfill Area
DPW	Directorate of Public Works
ET	Evapotranspiration
PBC	Performance Based Contract

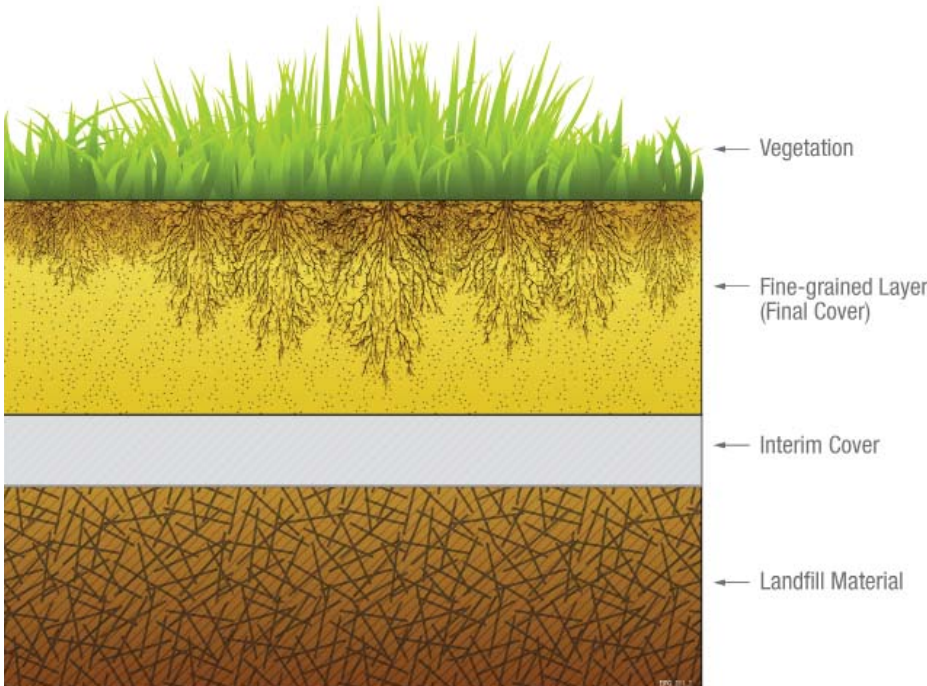
to repair and maintain than traditional covers. Depending on the location of the soil source, they can also be cheaper to construct if cover soils are available near the landfill.

The challenge with ET systems is that in order to function properly, the cover soil used must exhibit certain physical properties favorable to water storage while being able to support a healthy stand of native vegetation. Without healthy vegetation to absorb the reservoir of precipitation trapped in the soil below, ET systems will not necessarily operate as intended. The selection, seeding and maintenance of the landfill area vegetative cover are, therefore, a critical aspect of an effective ET system.

Following CDPHE’s acceptance of the final design for the first of the four CLA landfills, cover construction work began the first week of June 2013. By mid-October, approximately 697,000 cubic yards of soil had been excavated from a contiguous borrow area located within the overall CLA site, transported and placed to construct the bulk of the ET cover system within the CLA. By using the available soils within the CLA, the project team was able to install the specified ET cover soil at an approximate cost savings that exceeded \$3.5 million. Once the final cover thickness was verified by survey, a seedbed was prepared to receive the permanent vegetative cover.

The Fort Carson DPW Stormwater Program was instrumental in the field effort that shifted towards the construction of an engineered series of surface water run-on and run-off controls including soil berms, soil-lined and concrete-lined channels, above and below grade

## CONCEPTUAL DESIGN OF A MONOLITHIC ET FINAL COVER



Gallegos: Evapotranspiration conceptual design graphic. (CB&I Federal Services)



# Variable Flow Hood Controls Save Energy

by David Underwood

A project funded by the Department of Defense proved the potential for cost savings by installing variable flow exhaust hood controls in dining facilities. Under the Environmental Security Technology Certification Program, the Engineer Research and Development Center demonstrated the controls at four installations starting in 2011.

Exhaust hoods in dining facilities usually run for long periods of time at design conditions regardless of the demand, which does not exist when no one is cooking or which is reduced at low-level activity. The control system demonstrated under ESTCP uses temperature and opacity sensors to determine the level of cooking activity at the time. If the activity is low or non-existent, a variable frequency drive can reduce the power for exhaust and makeup air, saving energy to run the fans, heating and cooling systems.

The technology uses sensors that detect the actual cooking load. It includes a temperature sensor to monitor the heat load and an optical sensor to measure the smoke load. The optical sensor also has an air purge unit that ensures the sensor

stays clean with a positive pressure of clean, uncontaminated air from above the hood. Other components are the processor, user interface, and variable-frequency drives, which control the speed of exhaust and make-up air fan motors.

ERDC's Construction Engineering Research Laboratory demonstrated the variable flow exhaust hood controls at Fort Lee, Virginia, Ellsworth Air Force Base, South Dakota, and at Fort Carson and the U.S. Air Force Academy in Colorado. Energy use was measured over a minimum of a six-week period (three weeks prior to and post-retrofit) and extrapolated over a year to estimate total savings.

The benefits varied from site to site and as could be expected, larger hoods had the best potential to save on energy with the controls in place. The conditions that boost energy savings are:

Larger hoods of more than 5,000 cubic feet per minute are good candidates

Heating and/or cooling make-up air is required

Operation time is more than 30 hours per week

Dedicated make-up air unit exists for the kitchen

The controls could be considered for either new construction or retrofits. For retrofit projects, the Directorate of Public Works must pay careful attention to the existing condition of the mechanical



Large kitchen hoods like this one in a dining facility at Fort Carson, Colo., are candidates for variable flow exhaust controls. (ERDC)

systems. The technology cannot fix issues with existing exhaust /make-up systems. For the demonstration sites, installation costs averaged \$43K and payback is estimated at five to seven years, depending on the hood size. An Engineering and Construction bulletin with more information will be published by Headquarters, U.S. Army Corps of Engineers.

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## Acronyms and Abbreviations

CERL	Construction Engineer Research Laboratory
ERDC	Engineer Research and Development Center
ESTCP	Environmental Security Technology Certification Program

(continued from previous page)

corrugated steel pipe down drains and riprap outlet protection. While only partially completed at the time, these control measures proved instrumental in minimizing damage to the site due to a severe storm event that hit the area during the latter part of September, which allowed the project to remain on schedule.

The CLA cover will be monitored for erosion, settlement, maintenance of vegetation and proper drainage and groundwater and soil gas monitoring for a period of 30 years, which are minimum standards in Colorado for landfill covers. By early January 2014, approximately eight and a half months after construction started, Fort Carson's CLA was successfully closed in place through the teamwork and cooperation between federal and state governments, contractors, AEC, the U.S.

Army Corps of Engineers and DPW staff.

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# Resource Efficiency Manager Helps Identify Big Energy Savings

by Debra Valine

The National Training Center at Fort Irwin, California, is getting a replacement hospital that will improve patient care and incorporate energy savings measures that will save millions of dollars in energy costs.

A Resource Efficiency Manager working under contract with the U.S. Army Engineering and Support Center, Huntsville, was part of the design and energy planning team that helped identify seven major conservation measures that will decrease energy use by 33.2 percent. The design team, led by the Los Angeles and Sacramento districts, Corps of Engineers, included Huntsville Center's Medical Center of Expertise and Mobile District as well, and earned an Honor Award for Conceptual Design from the 2012 Chief of Engineers Awards of Excellence Program.

Huntsville Center has an Indefinite Delivery Indefinite Quantity contract with a pool of four REM contractors available to any federal agency. According to Hossam Kassab, the REM at Fort Irwin, the Weed Army Community Hospital replacement project was conceived by the Army to improve the medical care provided to Soldiers, military families and retirees in the Fort Irwin community.

"This mission-critical project includes the design of a replacement hospital, clinic alterations, utility plant building, ambulance shelter and helipad," Kassab said. "The project combines a state-of-the-art facility design with innovative energy conservation and generation features. As the nation's first carbon-neutral hospital, this project will establish Fort Irwin as a leader in energy independence in the health care and military sectors – setting a precedent for future military facilities. My involvement as the REM at Fort Irwin was instrumental in the design process helping



REMs help installation energy managers identify energy cost savings opportunities.

to coordinate the sustainable features of the design to work with the local climate and the existing base infrastructure."

Sustainable principles, including life cycle cost-effective practices, are integral at each phase, from design and development through construction.


"As part of the project team, I worked to incorporate seven major conservation measures that will decrease energy use by 33.2 percent," Kassab said. "These measures will reduce greenhouse gas emissions by 1,403 metric tons per year below the baseline. Additionally, renewable energy systems, including a photovoltaic (PV) array and a solar thermal array, take advantage of the site's solar irradiance potential and meet all the hospital's energy needs. Clean power sources include a 2.4 megawatt solar photovoltaic array and a solar thermal array that provides a majority of the hot water the hospital requires. I successfully worked with the local utility company to help secure more than \$2 million in rebates that will help minimize initial costs. In addition, I will be helping commission the hospital once completed to ensure the mechanical and electrical systems perform as designed."

"The Huntsville Center places REMs

at installations to work with local energy program managers to identify cost-effective programs and practices to reduce energy and water costs," said Karen R. Moore, the REM program manager. "Savings generated more than offset the cost of the REM. REMs provide a comprehensive energy portfolio for the installation to reduce their energy consumption and plans to meet federal mandates to use renewable energy sources. In addition, the REM program is expanding to use REMs at higher headquarter levels to perform energy saving audits across multiple installations and national programs."

In the May 12, 2013, 2012 Net Zero Progress Report, the Honorable Katherine Hammack, Office of the Assistant Secretary of the Army for Installations, Energy and the Environment, recommended REM as one of four best practices to achieve Net Zero.

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Acronyms and Abbreviations	
PV	Photovoltaic
REM	Resource Efficiency Manager



# 63d Regional Support Command Works with EPA

by Gaelle Glickfield

Folks that work and stay in Moffett Field's Navy Lodge, Military Entrance Processing Station, and the old Building 685 may have seen some strange silver metal globes in their areas recently. They may have wondered what these strange space-age looking contraptions were, what they were for, and why they had "Do Not Disturb" signs on them. Answer: these items were "summa" canisters, which are so named because of the special type of metal finish on them; they had been placed in and around the three buildings to measure concentrations of volatile organic compounds (VOC) in the air.

Much of the South Bay sits atop groundwater that has been contaminated over the decades by various industrial processes, and the portion of Moffett Field owned by the Army Reserve is no exception. The groundwater beneath a large portion of the property contains a few VOCs derived from trichloroethene (TCE), a chemical that has historically been used in a wide variety of industrial processes throughout the region. While the 63d RSC did not contribute to the contamination, they are taking precaution to provide an environmentally clean work place for their employees and tenants.

Although the groundwater is not used for drinking or irrigation and remains undisturbed underground, the VOCs in the water could potentially volatilize and come up as vapors through the soil into the air above-ground. Although these contaminants quickly disperse in outside air, they can accumulate inside buildings

through foundation cracks and pose a risk to building occupants. The process is called vapor intrusion, and if it is found to be affecting a building, actions are taken to address any risk.

A growing awareness of the issue of vapor intrusion has prompted many investigations all over the United States of buildings that are at risk. Colonel S. Fearon, the Director of Public Works, said "the 63d Regional Support Command is committed to promoting a healthy and safe environment for the Soldiers and Civilians within our facilities while exercising environmental stewardship of all real property within our region." So the 63d Regional Support Command partnered with Alana Lee at the U.S. Environmental Protection Agency (EPA) and the U.S. Army Environmental Command (USAEC) to test the Reserve-owned buildings on the former Orion Park Housing Area.

The U. S. Army Corps of Engineers (USACE) began the process by working with EPA Region 9 to select the sample locations and get a work plan approved. Once the plan was in place, it was time to place the 22 test canisters in the sample locations to begin the tests, which ranged from 8 minutes to 22 hours in duration. Ambient air, including any VOCs, was collected by the canisters during the test periods and immediately shipped to a lab for analysis.

Including TCE, a total of five VOCs were tested for. Although there were low level detections of the VOCs in some of the samples, not a single sample exceeded any applicable health criteria for any of the chemicals. It was especially important that samples taken under the building slabs not exceed criteria, since these types of samples are indicative of whether there is a potential for vapor intrusion to be a problem in the future. Since none of those samples, called sub-slab samples, exceeded



"Summa" Canisters

their applicable criteria, the buildings have been cleared and no further testing is required.

Future actions regarding the cleanup of the VOC plume have not been determined by EPA. But, the 63d RSC is dedicated to taking all and any necessary actions to ensure the health and safety of anyone onsite should an environmental concern be identified.

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Acronyms and Abbreviations	
EPA	Environmental Protection Agency
RSC	Regional Support Command
TCE	Trichloroethene
USACE	U. S. Army Corps of Engineers
USAEC	U.S. Army Environmental Command
VOC	Volatile Organic Compounds



# Fire Code Training Enhances Structures' Sustainability and Safety

by Patrice Creel

While necessity may lead to invention, fire-related tragedies such as the 2003 Rhode Island nightclub fire that killed 100 patrons can result in new International Code Council (ICC) regulations. The fundamentals' classes (Nov. 14-15, 2013) coordinated by Craig Prevost, facility engineer for the U. S. Army Research and Development Center's (ERDC) Directorate of Public Works (DPW), this featured expert training by Terrell Stripling, a former firefighter and 20-year veteran instructor with the ICC.

Prevost invited lab facility managers and interested architects to join DPW personnel in learning about code regulations and identifying fire safety measures for ERDC buildings and structures.

According to the ICC's website, the member-focused organization was formed in 2003 to protect people's health, safety and welfare by creating safe buildings and communities. Its mission is providing the highest quality codes, standards, products and services for all concerned with the safety and performance of building environments.

Most U.S. communities and many global markets choose the International Codes (I-Codes) to provide minimum safeguards for people at home, at school and in the workplace, as a set of comprehensive, coordinated building safety and fire prevention codes. The Department of Defense references the I-Codes for constructing military facilities, including those that house U.S. troops at home and around the world.



ERDC employees participate in a two-day course on International Fire Codes to learn building fire safety measures and procedures. (P. Creel, ERDC)

Stripling said the ICC regulations are revised every three years and that the fire codes pertain to existing structures, while the building codes apply to fire prevention in new construction.

"We are doing the fundamental class on the International Fire Code (IFC) which is one of 22 different model codes within the ICC," Stripling said. "Jurisdictions, whether local, state or federal, adopt and then build and maintain buildings according to these codes. The fire code is a maintenance code, and it relates to fire safety systems and the occupants inside a building, protecting them and getting them out. Two thirds of the course relates to hazardous materials or processes in how they are handled and stored. This training is to help the folks at ERDC maintain the buildings that they have, and to help them bring buildings up to code that are altered or redone with the newest technology," Stripling said.

In another example of code changes in reaction to a tragedy, Stripling detailed the Charleston, South Carolina fire on

June 19, 2007, where nine firemen died while fighting an inferno in a 42,000 sq. ft. mattress super store. "The one in Charleston did not have a sprinkler system. So when the upholstered furniture and mattresses caught on fire, it caused too big a fuel load, and it collapsed the building while they were in there. They changed the code dealing with upholstered furniture and mattresses after that. They now require a certain area like 1500 sq. ft. or 2500 sq. ft, depending on whether it is a mercantile store or factory, to install sprinkler systems to protect firefighters going in there. The purpose of a sprinkler system is to hold the fire in place in the area where firemen are working and not let it spread, so you could get out. That fire spread and it got in the roof and it collapsed on them," Stripling said.

The National Fallen Firefighters Foundation produced a video, "Charleston 9: The Ultimate Sacrifice," sharing the dramatic changes made in the Charleston Fire Department operations.

Acronyms and Abbreviations	
DPW	Directorate of Public Works
ERDC	Engineer Research and Development Center
I-Codes	International Codes
ICC	International Code Council
IFC	International Fire Code
Sq. ft.	Square Feet







## Corps Teaches 120 Third Graders “Regulatory 101”

by Tracy Robillard

Inside a colorful, decorated classroom at Marshpoint Elementary School, Brian Moore, a regulatory specialist with the U.S. Army Corps of Engineers Savannah District, poured a gallon of water over a row of sponges. “We use sponges to represent wetlands because they absorb and filter water,” Moore explained to a group of third graders. “Wetlands filter water so that it’s clean for us to drink.”

The sponges are part of a floodplain model the Corps uses in public outreach events to teach the functions of wetlands. The model ties in with the Corps’ Regulatory program, which oversees permitting for any projects that might impact streams, rivers and wetlands under Section 404 of the Clean Water Act. As the sponges grew plump with water, the excess flowed down the model into a simulated river channel, and then drained into a bucket that represented the Atlantic Ocean. The children looked on with curiosity.

“But then people start moving in, and new developments go up, and people want to expand—they need to build houses, hospitals, schools, roads and bridges,” Moore said, as he placed tiny toy houses next to the river bed. “And then we need to build grocery stores and parking lots and other facilities for us to use,” he said, removing the sponges from the model and replacing them with a toy storefront building and miniature cars.



*STEM - Regulatory Specialist Brian Moore uses an interactive floodplain model to demonstrate how wetlands absorb storm water and filter drinking water to a class of third grade students encouraging STEM. (G. Jumara, USACE)*

“So what’s missing from the picture now?” he asked. The children raised their hands. “The wetlands are gone,” one said. “They can’t absorb the water anymore,” said another.

To demonstrate, Moore poured another gallon of water over the model. Within a few seconds, water flooded the river channel and washed the toy houses down the drain. The children shrieked with excitement. “The houses are flooding! The water is too high!” they said.

“So what can we do to fix the problem?” Moore asked. The children’s responses

were unanimous—put the wetlands back.

Moore used this scenario to explain the Corps of Engineers’ role in issuing permits under the Regulatory program. “My job is to work with the public when they want to build something to make sure we find the right balance between what people need and what the environment needs,” he told the class. “We try to avoid any impacts to wetlands if at all possible. If we absolutely can’t avoid it, then we try to make the impact as small as possible. And then we make sure that we make up for any impacts we made by restoring or protecting a wetland somewhere else.”

In addition to the model, the students got to see and touch pieces of animal fur, snake skins, deer antlers, and sharks teeth.

“We’re demonstrating the types of animals that live in the various ecosystems in Georgia, and we’re telling them about how we have to consider habitat and endangered species when we issue permits,” said Regulatory Specialist Donald Hendrix, who led the show-and-tell activity. He said the children particularly liked the sharks’ teeth. The presentation was

*(continued from previous page)*

[www.youtube.com/watch?v=mqiRN9rygoI](http://www.youtube.com/watch?v=mqiRN9rygoI)

The requirements of sprinkler systems for ERDC buildings were a main topic of conversation and questions by attendees. “They asked about the different processes in the buildings and what are some of the thresholds when a sprinkler system needs to be installed,” Stripling said.

While he attended a fire code and

sprinkler system prospect course at OSU, Prevost said sponsoring the course locally was beneficial for ERDC team members, and he plans to expand code training opportunities and offer it to other departments in the future.

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# Career Program-18 Proponency Office - New Staff to Meet New Mandates and Challenges

by Ted Kanamine

“I hold each Army Civilian accountable for mapping and navigating a progressive program of self-development. Commanders, supervisors and managers share responsibility for enabling Army Civilian employees to reach their full potential.”

John McHugh, Secretary of the Army (Army Directive 2012-09, March 19, 2012).

The Secretary of the Army’s (SA) mandate in the quote above is like an artist’s design rendering of a long-awaited layout of new a new community development. Viewers can “see” the tangible interpretations of their wish list of requirements in the artist’s rendering.

The SA’s mandate, and subsequent Army guidance, was the go-ahead “rendering” for a long wish list policies, resources and processes for implementing Army civilian career management and ultimately fulfilling Congress’ goal of civilian workforce transformation (<http://www.asamra.army.mil/cwt/>). The budgetary and bureaucratic journey to achieve the capability of workforce transformation by implementing career management has been bumpy but persistent.

Building on the groundwork of the existing, fewer and understaffed, career program offices, Under Secretary of the Army, Joseph Westphal, in June

2013, directed the Army to establish career management support positions to staff thirty-one Army civilian career program proponency offices, like CP-18 Engineers and Scientists (Construction). Implementing the new CP-18 Proponency Office has also been bumpy but persistent.

As with other newly staffed Army CP offices in this cutthroat budgetary environment, the CP-18 Office is earning to fly while still building the plane. This analogy also applies to several important career management websites that Army is mandating for all Army civilians. For example, all civilians must now use Army Career Tracker (ACT) website (<https://actnow.army.mil>) for personalized management of one’s own career. The CP-18 staff can assist members navigate the program and plan their career using ACT.

The CP-18 Proponency Office has expanded to support the CWT initiative to recruit, develop, sustain and retain a purpose-driven, highly-professional, fully-competent civilian workforce capable of leading the Army of the future. The CP-18 Proponency Offices’ purpose is to determine, facilitate, and promote technical and non-technical career competency training and development to meet an individual’s mission requirements. The Career Program duties and responsibilities are assigned and outlined in AR 690-950

Acronyms and Abbreviations	
ACPMs	Activity Career Program Manager’s
ACT	Army Career Tracker
ACTEDS	Army Civilian Training, Education, and Development System
AR	Army Regulation
CMS	Competency Management System
CP	Career Program
CPD	Competitive Professional Development
CPM	Career Program Manager
CWT	Civilian workforce transformation
FC	Functional Chief
FCR	Functional Chief’s Representative
SA	Secretary of the Army

Career Management, AR 350-1 Army Training and Leader Development, and AR 600-3 Army Personnel Development System.

The new CP-18 Proponency office has three teams: the Army Civilian Training Education and Development System (ACTEDS) team; the Workforce Development Team; and, the Operations and Strategic Communications Team. Though separate teams, effective service dictates a lot of synergy among and between team members. So, connecting with someone in the CP-18 office will lead to being directed to the right person or team. The three teams consist of the ACTEDS/Outreach Team, the Workforce Development Team, and the

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part of a unit of study the third grade class is doing on Georgia ecosystems. “In third grade, students have to learn about the regions and habitats of Georgia, ecosystems, our natural resources, the interdependence of our indigenous plants and animals, as well as preservation/conservation efforts,” said Carole Foran, a third grade teacher at Marshpoint Elementary. “Through

your [the Corps’] presentation, children were engaged in hands-on, age appropriate activities,” Foran said. “It also provided meaningful opportunities for them to recognize career possibilities in your field. They don’t realize there are people whose jobs are focused on the environment.”

Moore and Hendrix also talked with students about careers in Science, Technology, Engineering and Mathematics, or STEM. While the

children have a long way to go before they enter the workforce, a few of them said they wanted to be scientists. One child even mentioned that he wanted to be a herpetologist, which he already knew was a person who studies reptiles.

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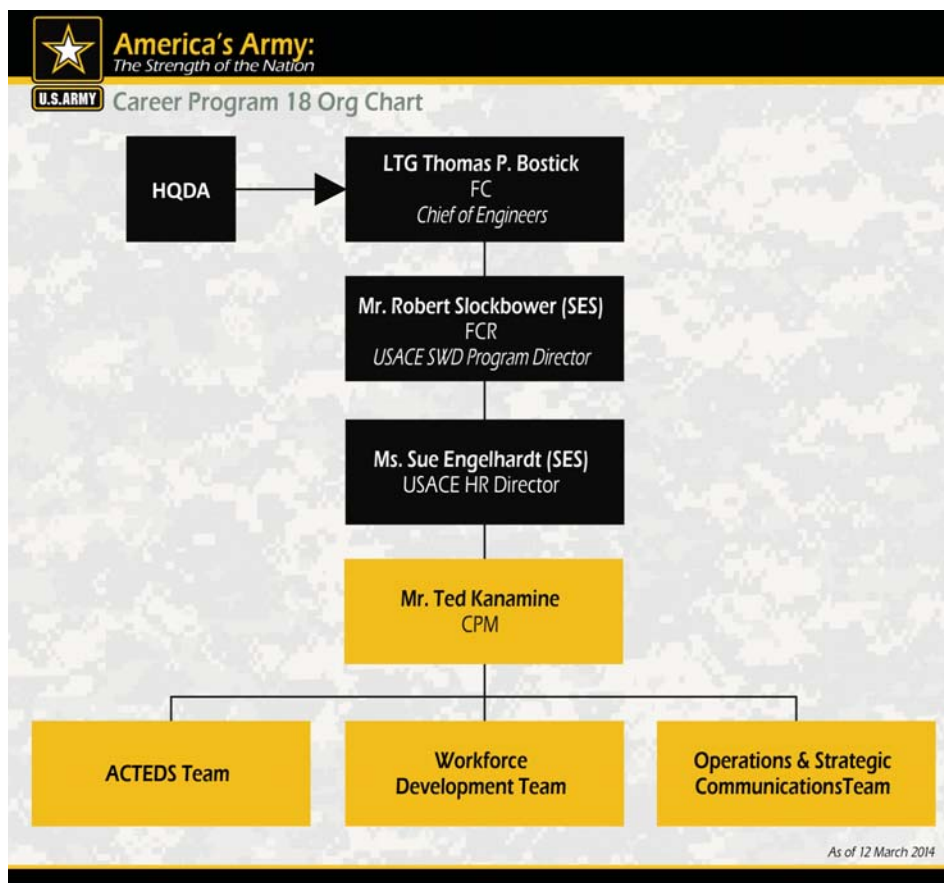
Operations and Strategic Communications Team.

The ACTEDS/Outreach Team. This team provides funding and assists the careerists in identifying potential career advancement programs and strategies. The team also assists and advises members' progression through the Army Civilian Training, Education, and Development System (ACTEDS). The ACTEDS team ensures development of Army civilians through a blending of progressive and sequential work assignments, formal training, and self-development from entry level to key positions. The team also seeks to assure the systematic development and sustainment of the Army's civilian workforce, and the development of technically competent and confident civilian leaders which is essential to Army readiness.

The team manages the competitive CP-18 Career Intern Program and assists preparing employees in various occupations for subsequent advancement in professional, administrative, and technological career fields. The intern program prepares participants to be future leaders in Army's professional occupations.

The ACTEDS team is also responsible for funding competitive Professional Development (CPD) opportunities within CP-18 to include: Continuing Job-Related Education; Technical Training; Accredited Continuing Education Programs; and Career Broadening Developmental Assignments. These opportunities are designed to develop a pool of high-potential careerists for positions of leadership or positions with higher responsibility in the career program and to challenge existing leaders to reach new levels of professional achievement while fostering career goals.

The Workforce Development



Team. This team frames and develops strategy and planning of the overall CP-18 workforce lifecycle. The team is responsible for producing the ACTEDS plan including an updated master training plan for careerists and a master intern training plan for interns; and, career maps for all occupational series. Additionally, this team helps an individual's CP-18 development through the Army Competency Management System (CMS) in documenting skills and competency gaps. Surveys are being developed for individuals and supervisors to document the most important competencies for CP-18 careerists to do their job and where the biggest gaps in training occur.

Operations and Strategic Communications Team. This team provides program policies and guidance

to the Army CP-18 workforce. The team hosts a range of webinars to provide insight, training and program guidelines for the CP-18 careerists, Activity Career Program Manager's (ACPMs), supervisors and interns. The team disseminates program updates and information through the CP-18 ACPMs to ensure that communication and knowledge is shared at every level. CP-18 information will also be published quarterly in the Public Works Digest, newsletters and the CP-18 Proponency web site at [https://eko.usace.army.mil/careerprograms/cp\\_18/](https://eko.usace.army.mil/careerprograms/cp_18/).

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